

Seminar 4: The Heyday of Logical Positivism

The Turning Point in Philosophy, the New Logic, and the Elimination of Metaphysics

In 1930 Rudolf Carnap and Hans Reichenbach founded the journal *Erkenntnis* as a house journal for logical empiricism. The lead article in the first issue was Moritz Schlick's "The Turning Point in Philosophy." Schlick contended that after millennia of little or no progress, characterized by the "anarchy of philosophical opinions," "we now find ourselves at an altogether decisive turning point in philosophy, and ... we are objectively justified in considering that an end has come to the fruitless conflict of systems." Crediting Frege and Russell for their work in logic, Schlick identifies the *Tractatus* as being the turning point.

According to Schlick, Wittgenstein's chief contribution came from substituting the question "What do we mean?" for the question "What can we know?" Once we understand that meaning is verification, we see that every meaningful conjecture is capable of being known to be true or known to be false, leaving no unanswerable questions. Since verification is empirical, it is outside of philosophy. Unlike logic and mathematics, philosophy also isn't devoted to constructing a system of a priori truths. Philosophy's job is to clarify meanings.

Carnap advanced a similar view in "The Old and the New Logic," which, also appeared in the first issue of *Erkenntnis*. Unlike Schlick, Carnap focused on the new Frege-Russell logic and the thesis of the derivability of mathematics from logic, which he wrongly took to be an established fact. He continued this pattern of enthusiastically unsupported claims about logic and mathematics by accepting the tractarian claim that anything that is a logical truth can be recognized by its form alone. Since this implies that logical truth is decidable, we now know this not to be so. Nevertheless, it fed the idea that logical truths, or as he dismissively called them, *tautologies*, have no content, and so tell us nothing.

If...we are told a tautology, no possibility is excluded. ... Consequently, we learn nothing about reality from the tautology. ... Tautologies are, therefore, empty. They say nothing; they have, so-to-speak, zero content. (142-3 in the reprinting in Ayer 1959)

The doctrine that all logical, necessary and a priori, truths are empty, and so say nothing comes, not from with the new logic, but from the *Tractatus*. Despite being counterintuitive, Carnap gives it no defense. Surely, to say that first-order arithmetic is incomplete is to say something more informative than that $0 \neq 1$. Also, if to assert or believe these truths were to assert or believe nothing then presumably to assert or believe their negations would be to assert or believe everything. Since it is impossible to (simultaneously) assert or believe everything (and its negation), it would follow that no one has ever asserted or believed a logical, mathematical, necessary, or a priori falsehood. This a *reduction ad absurdum* of the tractarian view Carnap accepted.

In 1932, Carnap published another article in the second volume of *Erkenntnis*, this time emphasizing the negative lesson of the *Aufbau*. *The positive lesson was that philosophy's chief task in clarifying meaning was to reveal the logical and epistemological structure of science, and to systematize it into a unified whole.* The negative lesson was that philosophy must remove metaphysics and ethics, which are impediments to achieving that goal. The burden of the new paper was to explain the means by which these impediments were to be shown to be meaningless. According to Carnap meaning is given by specifying the contents (i.e. the entailments) of elementary sentences in which words appear. Whenever a word W is definable in terms of another expression E, the contents of simple sentences containing W will match those of corresponding sentences containing E. For Carnap, the process of defining words in

terms of other words must continue until we reach observational vocabulary. He took the meanings of observational terms to be given by the fact that the elementary sentences in which they occur are direct reports of sense experiences.

In this way every word of the language is reduced to other words and finally to the words which occur in the so-called “observation sentences” or “protocol sentences.” It is through this reduction that a word acquires its meaning...[A] sequence of words has a meaning only if its relations of deducibility to protocol sentences are fixed...and similarly, a word is significant only if the sentences in which it may occur are reducible to protocol sentences. (P. 63 in 1959 reprinting of Carnap 1932)

For Carnap at this time, every meaningful empirical term was either itself an observation term or an observationally definable term. Meaningless terms found in metaphysical and normative theories don’t satisfy this condition. This leads Carnap to a general conclusion.

(Meaningful) statements are divided into the following kinds. First there are statements which are true solely in virtue of their form...They say nothing about reality...Secondly, there are negations of such statements. They are self-contradictory, hence false in virtue of their form. With respect to all other statements the decision about truth or falsehood lies in the protocol sentences. They...belong to the domain of empirical science. Any statement...which does not fall within these categories becomes automatically meaningless. (P. 76)

The Linguistic Theory of the A priori

In 1933 Hans Hahn published an article in which he criticizes P1.

P1. A priori truths of logic and mathematics are sometimes used to derive new a posteriori knowledge of the world from a posteriori knowledge we already possess.

Hahn thinks that P1 is false, since if that p entails q , then either we already know q by virtue of knowing p , or we don’t know p , despite thinking we do. His reasoning for this striking conclusion confuses an uncontentious platitude with a dubious philosophical thesis. Of course, if q is a logical/a priori/necessary consequence of p , and q turns out to be false, then p is also false, and so not known. But the mere fact that an agent A , who might otherwise count as knowing p , doesn’t already know q doesn’t show that A doesn’t know p either. *If knowing p doesn’t guarantee knowing all its logical/a priori/necessary consequences already, then the fact that A doesn’t know q is compatible with A ’s knowing p , even though q is a consequence of p .*

Of course, Hahn might reply that it is impossible for agents not to know, believe, and assert all logical/a priori/necessary consequences of what they know, believe, or assert. After all, this is suggested by three tractarian assumptions he accepts: (i) that all and only logical truths are necessary and a priori truths, (ii) that logical truths are tautologies and so say nothing, and (iii) that the conjunction of a tautology with an empirical truth p says nothing more and nothing less than p . Given (i)–(iii), all we need to get the conclusion that it is impossible to know, believe, or assert p without knowing, believing, or asserting all logical/a priori/necessary consequences of p are the assumptions (iv) and (v): (iv), that propositions are the objects of knowledge, belief, and assertion, and (v) that knowledge, belief, and assertion distribute over conjunction—i.e., if $\lceil A$ knows/believes/ asserts that $S\&R$ \rceil is true, then $\lceil A$ knows/believes/asserts that S \rceil and $\lceil A$ knows/believes/asserts that R \rceil are true. In this way, Hahn might try to justify rejecting P1.

[I]n asserting the two propositions “object A is either red or blue” and “object A is not red,” I have implicitly already asserted “object A is blue.” This is the essence of so-called logical deduction...[I]t makes us aware of all we have implicitly asserted. (Pp. 156-7 Ayer 1959)

The problem isn't with Hahn's example, but with his promiscuous generalization of it. We do implicitly assert all the relevant and trivially obvious consequences of things we *explicitly* assert. E.g., if I say "Mary solved the problem," and someone asks what I said in a context in which the fact that the problem was solved is more important than who solved it, then your report "SS said/asserted that someone solved the problem" is true. Similarly in Hahn's example, if I say both "A is either red or blue" and "A is not red," I can truly be reported to have asserted that A is blue. What is not acceptable is the conclusion he draws from this observation—namely that agents assert all consequences of what they explicitly assert. Suppose Sam happens to assert each of the premises of Gödel's first incompleteness theorem without drawing any further conclusions. Surely, we can't truly say "Sam asserted that all omega-consistent extensions of the first-order theory PA of arithmetic are incomplete." Nor is Fred truly described by \lceil Fred asserted that S \rceil for every sentence S, simply because he mistakenly asserts that first-order Peano arithmetic is complete.

In the same article, Hahn goes on to criticize P2.

- P2. The laws of logic and mathematics are a priori truths, which are the most general laws governing everything in nature.

Hahn agrees that laws of logic and mathematics are a priori, but he takes them to be true in virtue of meaning alone, and so not about anything, let alone the things existing in nature.

We learn...to apply the designation "red" to some of these objects, and we stipulate that the designation "not red" be applied to all other objects. On the basis of this stipulation we can assert with absolute certainty the proposition that there is no object to which both the designation "red" and the designation "not red" is applied. It is customary to formulate this briefly by saying that nothing is both red and not red. This is the law of contradiction. And since we have stipulated that the designation "red" is to be applied to some objects and the designation "not red" to *all* other objects, we can likewise pronounce with absolute certainty the proposition: everything is either designated as red or as "not red," which it is customary to formulate briefly by saying everything is either red or it is not. This is the law of the excluded middle. (P. 153)

He adds, "It is this convention about the use of negation which is expressed by the laws of contradiction and of the excluded middle." (P. 156)

What are the conventions to which Hahn alludes? Perhaps they are R and R~.

- R1. For all x, if x looks like this ... , then 'red' applies to x.
 R1~. For all x, if x does not look like this ... , then 'not red' applies to x.

But these can't be the conventions that govern our understanding of both 'red' and 'not'—since in order to understand the stipulation, one must already have mastered negation. Also, suppose we grant that it follows from R1 and R1~ that everything is such that either 'red' or 'not red' applies to it. How is it supposed to follow that there is nothing to which they both apply? If the application of 'red' and 'not red' is completely determined by R and R~, it won't follow. Can this can be avoided by substituting R2 and R2~ for R1 and R1~?

- R2. For all x, if x looks like this ..., then 'red' applies to x and if 'red' applies to x, then x looks like this ...
 R2~. For all x, if x does not look like this , then 'not red' applies to x and if 'not red' applies to x, then x does not look like this ...

Since we must assume that 'if, then', 'and', 'not', and 'all' are already understood, and that the logical laws governing them are already in place, this doesn't help much. So understood, the stipulations don't explain the logical laws.

Schlick's Foundation of Knowledge

In Schlick (1934) he argued that empirical knowledge requires a basis in certainty. If *S* is meaningful, *S* must be verifiable or falsifiable. If *S* is verified, it is a candidate for being known. Schlick maintains that verification requires knowledge of observational facts, expressed by “protocol statements.” He characterizes these as statements

which express the facts with absolute simplicity, without any moulding, alteration, or addition, in whose elaboration every science consists, and which precede all knowing, every judgment regarding the world...If we succeed therefore in expressing the raw facts in “protocol statements,” without any contamination, these appear to be the absolutely indubitable starting points of all knowledge. (Pp. 209-10 in Ayer 1959)

Schlick is thinking along the following lines: (i) All empirical statements must be verified by experience if they are to be known. (ii) Call any empirical statement *p* an empirical hypothesis iff one's knowledge of it depends on the truth of other empirical statements. These are statements which, if true, one wouldn't know *p*. (iii) No one can know *p* without verifying, and hence coming to know, all the empirical statements on which knowledge of *p* depends. (iv) So, if any empirical statements are knowable, not all empirical statements can be empirical hypotheses—for if they were, verification would either fail to terminate, or become circular. (v) Since many empirical statements are knowable, there must be some empirical statements knowledge of which is not dependent on the truth of other empirical statements. (vi) These protocol statements are shown to be true by directly comparing them with experience. (vii) All empirical verification consists in the judgments expressed by these statements.

Schlick's protocol statements are about one's own “immediate perceptual experiences” at the moment one is having them. These statements can't be written down at all. Despite being synthetic, they are closely analogous to analytic truths.

I cannot raise the question whether I can ascertain the correctness of an analytic statement. For to understand its meaning and to note its apriori validity are in an analytic statement one and the same process. In contrast, a synthetic assertion is characterized by the fact that I do not in the least know whether it is true or false if I have only ascertained its meaning....The process of grasping the meaning is here quite distinct from the process of verification.

There is but one exception to this...“Confirmations”... are always of the form “Here now so and so,” for example...“Here yellow borders on blue”...“Here now pain”.... What is common to all these assertions is that demonstrative terms occur in them which have the sense of a present gesture...What is referred to by such words as “here,” “now”...cannot be communicated by means of general definitions in words, but only by means of them together with pointings or gestures...In order therefore to understand the meaning of such an observation statement one must simultaneously execute the gesture, one must somehow point to reality.

In other words: I can understand the meaning of a “confirmation” only by, and when, comparing it with the facts, thus carrying out that process which is necessary for the verification of all synthetic statements... However different therefore “confirmations” are from analytic statements, they have in common that the occasion of understanding them is at the same time that of verifying them. (Pp.224-5 in the Ayer 1959)

Schlick's “confirmations” are similar to Russell's sense-data statements circa 1910. A Russellian logically proper name is a term the meaning of which is its referent. His only examples were indexicals and demonstratives. For *x* to be the referent of *A*'s use of such a term at time *t*, *A* must be acquainted with *x* at *t*, which meant that *A* couldn't then be mistaken about *x*'s existence or nature. Because sense data are perceptual appearances, to know their nature is to know their perceptible properties—which are just those they appear to have. So, if *p* is a statement about the perceptible properties of *A*'s sense data, then (i) *A* can be certain of *p* when entertaining it, and (ii) *p* can be

entertained only by A, and only when A is perceiving those particular sense data. Schlick's "confirmations" were, in effect, Russell's sense data statements by another name. However, there are troubles.

What is referred to by such words as "here," "now"... cannot be communicated by means of general definitions in words, but only by means of them together with pointings or gestures. "This here" has meaning only in connection with a gesture. In order therefore to understand the meaning of such an observation statement one must simultaneously execute the gesture, one must somehow point to reality.

Although it makes sense to speak of communicating with others by gesturing at or pointing to publicly perceivable things, it doesn't make sense to speak of communicating with others by gesturing at or pointing to one's own private sense data. Nor does it make sense to point at one's own sense data for one's own benefit. Thus, Schlick faces a dilemma.

He could drop talk of gestures, pointing, and communication, and insist that the facts reported by "confirmations" are always confined to one's own private experiences. Although doing that would preserve the certainty of protocol statements, it would do so at the cost of losing their capacity to verify scientific statements. Since a scientific theory is a collective effort, its verification must also be. No set of perceptual experiences of a single agent at a single moment is sufficient to verify any significant theory. If separate verifications of different agents (at different moments) were all there was to verification, no one would verify any significant scientific statement or have any scientific knowledge.

By contrast, he could take "confirmations" to be about publicly perceivable things at which one can point or gesture. The best way of doing would be to swap talk of protocol sentences for talk of protocol propositions, identifying the latter with uses of sentences containing indexicals and demonstratives to predicate properties and relations of the referents of one's uses of those expressions. It would then follow that *an agent's use, at time t and place p, of the indexical sentence 'This object is hot now'* to predicate the property of *being hot at t* of a certain designated stone s was a protocol proposition, pp1, that could be entertained only at t and p. Of course, in entertaining and accepting pp1, an agent would also entertain and accept a representationally identical but cognitively distinct proposition pp2 that predicates *being hot* of s at t, no matter how s and t are cognized. Such an agent A entertains the two propositions simultaneously. At the moment A does so, A's rational confidence in the two propositions will be the same. As time goes by, however, A will lose the capacity to entertain pp1. Moreover, even if A retains the capacity for entertaining pp2, A's rational confidence in pp2 will drop over time. For Schlick this alone would disqualify pp2 from being a protocol proposition at any later time. But in fact neither proposition could ever have counted as indubitable. Most properties and relations predicated of intersubjectively observable objects and events involved in the verification of scientific theories are not the sort that indubitably apply to their predication targets. So even these verifying "confirmations" would lose their privileged status.

In short, one must reject Schlick's view that knowledge of empirical hypotheses always requires knowledge of a privileged set of verificatory propositions that are directly compared with experience and not in any way dependent on other empirical propositions. This in turn requires rejecting the assumption *No one can know any empirical proposition p without verifying, and hence coming to know, all empirical propositions on which one's knowledge of p depends*. There is no absurdity in maintaining that A knows an empirical proposition p by virtue of knowing the verifying evidence for it provided by q, even though there are propositions on whose truth A's knowledge of q depends that A doesn't know to be true. Schlick didn't see this.

In addition to misunderstanding the relationship between knowledge, certainty, and confirmation, Schlick misunderstood the relationship between confirmation and truth. His initial discussion linking the two comes in response to the Carnap-Neurath view that no empirical statements are “certain,” that all “hypotheses” are capable of being verified or falsified, and that it is a matter of theoretical convenience which empirical statements are taken to be “protocols.” Schlick responds by claiming that the Carnap-Neurath view can’t be correct because it requires rejecting the correspondence theory of truth in favor of the coherence theory of truth.

Here, what started as a dispute about knowledge, certainty, and confirmation morphs into a dispute about the nature of truth. Schlick makes the standard objection to the coherence theory – taken as a theory of what truth is. He argues (i) that the *agreement* with other statements required by the coherence theory in order for a statement S to be true can only be the *consistency* of S with the other statements; but (ii) that consistency isn’t sufficient for truth because there are many different consistent systems that are inconsistent with each other. He argues that the only alternative to the failed coherence theory is to recognize some statements, of immediate observation, the truth of which must be held fixed against all contingencies. These are to be used to *define* what it is for the others to be true.

How, one wonders, did what started out as a dispute about whether empirical confirmation and knowledge requires a basis in certainty, get transformed into a dispute about what truth is? To say of an empirical statement S that it is true is not to say of it that it has been confirmed or that it eventually will be. One might be tempted to define true statements as those that would be confirmed, if we were able to gather enough evidence, but only if by *enough evidence*, one meant something other than *all the evidence needed to show them to be true*. Since there are no obvious, non-question-begging candidates for filling this role, it is unlikely that Schlick implicitly relied on a formulation of this sort.

The most likely source of the trouble was a certain reading of the *Tractatus*, which Schlick accepted, and onto which he grafted a verificationist element. According to this reading, an elementary proposition is true iff it pictures an atomic fact; the truth of every other proposition is *defined* by its agreement, or disagreement, with atomic propositions. *This was not a doctrine about confirmation; it was a doctrine about what the truth of these different types of propositions consists in.* Since tractarian elementary propositions are logically independent of one another, Schlick concluded that judging such a proposition to be true didn’t require any assumptions about the truth or falsity of other propositions. So, he thought, elementary propositions must be capable of being known with absolute certainty. To deny this, as he took Carnap and Neurath to do, was, in his mind, to turn the tractarian theory of what truth is—correspondence with reality for elementary propositions and coherence with elementaries for non-elementary propositions—into a disastrously unmoored coherence theory of truth. Since that was unacceptable, he needed a conception of elementary propositions that explained how we can be absolutely certain of the truth of a certain kind of synthetic statement. The result was his conception of “confirmations”—uses of sentences to report immediate perceptual experience, the existence of which conclusively verifies those very uses.

Hempel: Truth, Confirmation, and Certainty

In 1935, Carl Hempel published “On the Logical Positivists’ Theory of Truth.” After describing the correspondence and coherence theories of truth, he characterizes the logical positivists as having gradually moved from a tractarian correspondence theory to a “restrained coherence theory.” He notes that for Wittgenstein, the truth of “atomic statements” consists in their correspondence with facts, that non-atomic statements are

truth functions of atomics, and hence that the truth or falsity of non-atomic statements consists in their relations to atomic statements. He then reports that Neurath believed that no statement can be “compared” with facts, because, along with Wittgenstein, he believed that we can’t meaningfully describe the relationship between language and the world. Taking Neurath to mean that “each [scientific] statement may be combined or compared with each other statement,” Hempel attributes a coherence theory of truth to Neurath.

Carnap is described as sharing the view that talk of the relationship between statements and facts is metaphysical nonsense. Thus, Hempel says, Carnap sought to avoid such talk, while leaving the rest of the tractarian conception of language in place. His solution (in the *Aufbau*) was to single out certain statements as never needing proof because they express “the result of a pure immediate experience without any theoretical addition.” Hempel describes the substitution of such “protocol statements” for Wittgenstein’s atomic statements as “the first step in abandoning Wittgenstein’s theory of truth.” Since the tractarian theory was, except for the correspondence account of atomic truth, a coherence theory, Hempel takes Carnap’s amputation of the account of atomic statements to have left him a coherence theory. But without an answer to the question “*In what does the truth of protocol sentences consist?*” Carnap had no theory of truth. Because his early position didn’t preclude the answer “*In representing the objects experienced as having properties they actually do have,*” Carnap hadn’t yet decisively rejected correspondence theories of truth.

According to Hempel, the next step in Carnap’s evolution away from the *Tractatus* involved giving up the idea that all meaningful statements are truth functions of atomic statements. The crucial examples are universal generalizations.

A general statement [i.e. a universal generalization] is tested by examining its singular consequences. But as each general statement determines an infinite class of singular consequences, it cannot be finally and entirely verified: a general statement is not a truth function of singular statements, but it has in relation to them the character of an hypothesis. The same fact may be expressed as follows: a general law cannot be formally deduced from a finite set of singular statements. (P. 52)

It’s true that no empirical universal generalization is a logical consequence of any finite set of its instances. It is also true that no such generalization is formally provable from, or conclusively verified by, any such set. But finitude isn’t the issue. Analogous results hold in standard versions of the predicate calculus no matter what cardinality the set of instances of a universal generalization has. Hempel doesn’t tell us what it is for a universal generalization to be true.

Each finite set of statements admits an infinite series of hypotheses [different generalizations] each of which implies all the singular statements referred to [their instances]. So, in establishing the system of science, there is a conventional moment; we have to choose between a large quantity of hypotheses which are logically equally possible, and in general we choose one that is distinguished by formal simplicity. (P. 52)

Since no set of instances of a universal generalization logically entails it, one may ask, “*When does knowledge of them confirm the generalization, and so justify us in taking it to be true?*” Hempel seems to say that it’s a matter of convention. But that doesn’t tell us what the truth of a universal generalization consists in. If it consists in all its instances being true, then it will be possible to be justified in believing a universal generalization that is false. Surely this trivial observation doesn’t threaten the tractarian conception of truth.

Hempel’s last step in charting in the purported evolution away from the *Tractatus* is the elimination of any statements “which are conceived to be ultimate [final steps in

verification] and not to admit of any doubt.” On this view, even protocol statements may require further empirical verification. Having made this point, Hempel says, “*Obviously, these general ideas imply a coherence theory of truth.*” Why? It may be obvious for Carnap and Neurath that for every empirical proposition p , there are situations in which knowing p depends on the truth of other propositions that themselves require confirmation. But this is a thesis about knowledge, not truth. Forget the *Tractatus*. Consider instead a version of the correspondence theory that takes all truth to be representational accuracy. According to it, for a proposition p to be true is for p to represent something as being a certain way and for the thing to be that way. This theory of truth is compatible with Carnap’s and Neurath’s views about knowledge and verification.

Many of the problems with Hempel’s discussion stem from his fixation on the *Tractatus*, which inhibited exploration of other ways of cashing out the idea of truth as correspondence. One of the main problems inherited from the *Tractatus* was the doctrine that the relationship between language and the world in virtue of which uses of language are meaningful cannot meaningfully be stated in language. If one didn’t believe that, but instead believed that the relationship can be described, one could contemplate correspondence theories that take truth to be accuracy in representation. Unfortunately, the positivists still couldn’t see this

This is reflected in the response Hempel gives to the question “*If the views of Carnap and Neurath in 1934 entail a coherence theory of truth, which such theory is entailed?*” Which of the different, but *equally coherent, systems of statements* must an empirical statement agree with in order to be true? Hempel struggles to solve this problem.

[T]he concept of truth may be characterized in this formal mode of speech...as a sufficient agreement between the system of acknowledged protocol-statement and the logical consequences which may be deduced from the statement and other statements which are already adopted ...The system of protocol statements which we call true, and to which we refer in every day life and science, may only be characterized by the historical fact that it is the system which is actually adopted by mankind, and especially by the scientists of our cultural circle; and the “true” statements in general may be characterized as those which are sufficiently supported by the system of actually adopted protocol statements. (P. 54)

As (i) and (ii) indicate, this is not we understand it in science or everyday life.

- (i) The claim *that p is true* is epistemically and metaphysically equivalent to p itself.
- (ii) The claim *that p agrees with the observational and other statement that have been accepted by scientists (and others) in our cultural circle* is neither necessarily, epistemically, or even materially equivalent to p .

Because of this difference, the notion $truth_H$ that Hempel defines can’t play the roles we require of a notion of truth. For example, in the presence of classical logic—which the logical empiricists accepted— $truth_H$ fails to vindicate both the move from p to the claim that p is true, and the move from the claim that p is true to p . This devastating because, when p is a proposition that doesn’t itself employ the notion truth (or any related notion), the practical and theoretical uses of that notion depend on inferences that $truth_H$ fails to support.

Note, the notion Hempel does define involves a relationship between uses of sentences and certain facts in the world—facts concerning the acceptance of those uses by certain people. But if talk about this relationship between language and the world is meaningful, then talk about other relationships between language and the world should also be. Consider the claim about a group of speakers that (i) it is a convention among them to use ‘SS’ as a name referring to me and to use ‘is male’ as a predicative

expression standing for the property *being male* and (ii) that it is also a convention to use sentences $[N \text{ is } P]$ to predicate the property the predicative expression stands for of the referent of N . It will then follow that uses of ‘ SS is male’ represent me as being male, and so are true iff I am. Given this, we may conclude that the truth of such a use may consist in my being as the use represents me to be. None of this requires a theory of how it is possible to know I am male, or whether one can know this with certainty.

Reichenbach: The Elimination of Truth

One important reason why the logical positivists confused questions of truth with questions of knowledge, certainty, and confirmation can be identified by looking at a section of Hans Reichenbach’s 1938 book *Experience and Prediction*

Throughout the first chapter we entertained the presupposition that propositions about concrete physical facts, which we called observation propositions, are absolutely verifiable [and so absolutely certain]. A more precise analysis showed that this conception is untenable, that even for such statements only a weight [i.e., probability] can be determined. With the object of obtaining more reliable statements, we then introduced [sense] impression propositions; throughout the second chapter we upheld the supposition that at least these propositions are capable of absolute verification. We have discovered now that even this is not tenable, that impression propositions also can only be judged by the category of weight. Thus there are left no propositions at all which can be absolutely verified [i.e., of which we can be absolutely certain]. *The predicate of truth-value of a proposition, therefore, is a mere fictive quality; its place is in an ideal world of science only, whereas actual science cannot make use of it.* Actual science instead employs throughout the predicate of weight [probability]. We have shown, in the first place, that this predicate takes the place of the truth-value in all cases in which the latter cannot be determined; so we introduce it for ... indirect propositions, which remain unverified for all times [i.e., that are never fully and conclusively verified]. We see now that all propositions are, strictly speaking, of the latter type; that all propositions are indirect propositions and never exactly verifiable. *So the predicate of weight has entirely superseded the predicate of truth-value and remains our only measure for judging propositions.* If we, nevertheless, speak of the truth-value of a proposition, this is only a schematization. We regard a high weight as equivalent to truth, and a low weight as equivalent to falsehood. (Pp. 187-8)

For Reichenbach certainty is not an overwhelming feeling of confidence, but a state in which one’s basis for accepting a proposition rationally guarantees its truth. He claims that empirical propositions can never be established with complete certainty. At most, he thinks, experience can render a proposition highly probable; nothing can guarantee that further experience won’t require one to reject it. Having reached this conclusion, he immediately draws the further conclusion that truth is a fiction, with no place in science. But why should the claim that certainty is unattainable lead to the claim that truth is too?

The confusion may come from the following seductive line of thought .

- S1. If the proposition *that P* is empirical, then what one is committed to by virtue of assertively uttering
- a. It is true *that P* / The proposition *that P* is true
is *stronger* than what one is committed to in virtue of assertively uttering
 - b. It is highly probable / confirmed / supported *that P*

In each case—(a) and (b)—one is expected to have evidence strongly supporting the proposition *that P*. But for (a), this is insufficient, since one is also committed to the proposition *that P*. If it turns out to be untrue, then one who has assertively uttered (a) will have made an error; this is not always so for one who has assertively uttered (b).

- S2. Thus, the statement made by uttering (a) is stronger than the one made by uttering (b).
- S3. The strongest statement one is warranted in making about an empirical proposition is that it's highly probable/confirmed. No empirical statement can be established with complete certainty; every empirical statement is a more or less probable hypothesis the acceptance of which is a function of its role in our total scientific worldview.
- S4. Thus one is never warranted in making the statement expressed using (a). Since empirical truth is unattainable, truth has no legitimate place in empirical science.

This argument is too sweeping. We know a priori that *P is true iff it is true that P*. So, if we were never warranted in asserting that *it is true that P is true*, we would never be warranted in asserting the proposition *that P*. In short, if scientific methodology excludes truth, then it excludes all empirical propositions. This is a *reductio* of the view. The argument also confuses truth with certainty, taken as the limiting case of high probability. For any empirical p, p is probable to degree n iff *the proposition that p is true* is probable to degree n. Not so with certainty. The probability that a particular coin will come up heads is, we may assume, .5. Thus, the probability that *it is true* that the coin will come up heads is also .5. But the probability that *it is certain* that the coin will come up heads is not .5. So truth must be distinguished from certainty.

Where then does the argument go wrong? S1 is correct; but S2 isn't. One who asserts *that it is true that P* by assertively uttering (a) is thereby committed to the proposition asserted—and also (perhaps) to having evidence that renders it highly probable. This evidence is also evidence that renders the proposition *that P* highly probable. But *what one asserts*—the statement one makes in assertively uttering (a)—neither entails nor is entailed by the proposition that one has evidence rendering the asserted proposition highly probable that P. Thus S2 is false; neither the statement made by assertively uttering (a), nor the statement made by assertively uttering (b), is stronger than the other—in the sense of committing one to what the other commits one to, and more.

Step S3 is also problematic. Even if we accept the claim that no empirical proposition can be known with certainty, we must ask what it means for a statement q to be *stronger than* the statement *that p is highly probable*. If it means that q entails that statement, but not conversely, then S3 is false. On such a definition, the conjunction of any empirical proposition p with the proposition that p is highly probable will be stronger than its second conjunct. But surely, one is sometimes warranted in asserting both p and the proposition that p is highly probable. So, on this interpretation of *strength*, the argument fails for a second reason. Perhaps, however, all that is meant by S3 is that no empirical proposition can ever be established with complete certainty. If so, then, it could be maintained that no one is ever warranted in claiming that an empirical proposition p is certain; the most one can claim—about how probable p is—is that p is highly probable. On this interpretation of *strength* a statement q about an empirical proposition p is stronger than a statement r about p iff q attributes higher probability to p than r does. So understood, S3 need not be contested. Since its notion of strength differs from the one in S1 and S2, the argument equivocates and S4 isn't established.

Thus, we have no good argument to support Reichenbach's claim that predications of truth are illegitimate, or that truth is epistemically unattainable. The key to recognizing this is to observe that the claim *that P* is necessarily equivalent to the claim *that it is true that P* (while also being knowable a priori to be so) -- which, in turn, is

necessarily equivalent to the claim *that the proposition that P is true* (while being knowable a priori to be so). Once this is noted, it is obvious that truth is distinct from certainty, and that the intelligibility and legitimacy of truth wouldn't be threatened, even if it were shown that certainty was unattainable.