

On Popper on Truth

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In the first (German) edition of The Logic of Scientific Discovery (1934), Popper expressed the view that a truth concept was an unnecessary element in his philosophy of science. Thus, he wrote, "in the logic of science here outlined it is possible to avoid using the concepts 'true' or 'false'. Their place may be taken by logical considerations about derivability relations."¹ But by the time of the publication of the English edition of this work (1959), Popper affirms that he is "no longer hesitant in speaking of 'truth' and 'falsity'.²" Finally, by the time of Conjectures and Refutations (1965) he characterizes science as a "search for truth."³

Clearly, a change in attitude is evidenced here with regard to Popper's views on the truth question. The present paper explores the reasons for, and implications of, this change. It does not, however, attempt an "archaeology" of the development of Popper's views on this issue. Rather, focusing mainly on the essays collected in Conjectures and Refutations, it uncovers the rationale for Popper's eventual endorsement of a truth concept, and examines the elements in, and implications of, the truth concept he endorses.

On the basis of this survey of Popper's position on the truth question, the argument is developed that, while the introduction of an objective theory of truth is necessary to support Popper's realist position, the absolute character of his truth concept conflicts with other central tenets of his philosophy, especially with his endeavor to specify criteria of progress toward the truth. The result is that the introduction of a truth concept also introduces inconsistencies into the Popperian system. A satisfactory way of reconciling these inconsistencies, which to date have remained insufficiently explored, has yet to be devised.

Rationale

As is frequently the case with his commentators, I have thus far referred to Popper's truth concept in the singular (and for convenience, I shall continue to do so throughout the paper). Yet it is important to re-

call at the outset that the truth concept in question is a complex one. In fact it contains at least three distinct elements: (1) a correspondence conception of absolute truth, modeled after Tarski; (2) a notion of degrees of truth; and (3) the concept of verisimilitude, a quantitative measure of truth. As will emerge more clearly as we proceed, all of these elements play an important and distinct role in the Popperian framework, and accordingly, it is not permissible (as some commentators tend to do) either to refer to them interchangeably or to equate Popper's truth concept with his account of verisimilitude. Indeed, my argument in large part is that, while each of the above components is required by some aspect of Popper's philosophy, their attempted integration within a single framework tends to destabilize the overall system.

In the successive sections of this paper, each of these components will be commented on in some detail. At this point, however, I focus on the reasons why Popper eventually moved to include a truth concept in his philosophy. And in using the term 'truth concept' in this context, I shall be referring primarily to its absolute (correspondence) element.

A first consideration in this regard is whether any special difficulties stand in Popper's way here. Did Popper have anything to lose, as it were, by changing his mind on the truth question?

According to the early text, Popper's own answer to this question is in the negative; he was of the opinion that no "particular difficulty" would be encountered were he to incorporate a truth concept; he omitted one simply because he considered it unnecessary to his position (LScD, 274-76). Later on, however, Popper does acknowledge that certain long-standing epistemological difficulties pertaining to the correspondence theory contributed to his decision to do without it.

Reflecting on the matter, it is not difficult to discern reasons for Popper's reluctance in this regard. For in addition to traditional objections to the correspondence theory as such, Popper's philosophy prevents him from appealing to frameworks which would most readily seem to accommodate such a conception of truth.

The general and long-standing objections to the correspondence theory are fairly well known. They include the fact that it is difficult (unsympathetic critics say impossible) to define satisfactorily the nature of the correspondence at issue or to explain what it is that is held to correspond. Still further problems are encountered if one attempts to answer these kinds of questions with regard to universal, negative, or counterfactual propositions. It must be admitted, however, that these kinds of difficulties have not, on the whole, prevented a good number of philosophers, including contemporary philosophers of science,

from incorporating a correspondence theory in their positions.

For Popper, however, there is the additional problem that his revolutionary stand on theories as conjectures and on science as a problem-solving activity preclude his appeal to frameworks in which such a conception of truth seems most readily at home. Thus, for example, it is clear that Popper cannot invoke the verificationist claim that the gradual accumulation of observations provides evidential justification for our (true) knowledge claims. Nor can he, as a rationale for introducing his truth concept, appeal to a view of science as an axiomatized deductive system, since he rejects this view as well in favor of a problem-solving approach, in which scientific knowledge grows as we test our conjectures and learn from our mistakes."

Why then should Popper "bother" to incorporate a correspondence conception of truth? Given the excluded alternatives, what rationale can he offer for so doing?

Essentially, the answer to these questions centers on (1) Popper's defense of realism, his "third view" of knowledge," the merits of which he argues over both essentialism and instrumentalism; and on (2) his third requirement for the growth of knowledge, that is, the requirement that acceptable theories should pass some new and severe tests. In both cases, as we shall now see, a truth concept is needed to provide a standard of success, of scientific progress or growth.

The extent of Popper's realism can perhaps be most easily seen by contrast with his radical critique of scientific instrumentalism. On the instrumentalist view, theories are neither true nor false; they are simply computational devices for the prediction of observational phenomena." Popper attacks the instrumentalist view on both a polemical and a methodological level. On the polemical level, he castigates instrumentalism (and to an extent also pragmatism, as he understands it), in its concern for the merely useful, as "glorified plumbing," "incompatible with the appreciation of science as one of the greatest achievements of the human spirit" (CR, 102, 103). More importantly, on the methodological level Popper argues that the skills and procedures involved in trying out computational instruments and attempting to determine the limits of their applicability are very different from those involved in the testing of (genuine) theories (CR, 111). More specifically, Popper objects that "theories in so far as they are instruments cannot be refuted," at best, only the limits of their applicability (as instruments) can be ascertained (CR, 113). Hence, instrumentalism does not meet the central requirement of Popper's philosophy--that "theories are tested by attempts to refute them"; for similar reasons, instrumentalism makes nonsense of the idea of "crucial experiments" (CR, 112). Again, because it does not abide by

the canons of progress through (attempted) refutations, and because it does not concern itself with testing the more remote implications of theories, Popper condemns instrumentalism as "obscurantist," and as leading more towards complacency and stagnation than towards new scientific discovery and growth (CR, 113-14).

By comparison, Popper takes a favorable view of essentialism which maintains, *inter alia*, that scientists aim at finding true theories or descriptions of the world, and at formulating true explanations of observable facts (CR, 114). In Popper's view, however, essentialism must give way to realism because the former (unlike the latter) also maintains that scientists actually can succeed in establishing the truth of theories, and that successful scientific theories describe the "essences" or "essential natures" of things. In contrast, Popper's own position is that it can never be conclusively established that a theory is true, although it may be established (with "reasonable certainty") that a theory is false. That is to say, while scientific theories as conjectures are indeed "serious attempts to discover the truth" (through severe critical testing), they are not verifiable, i.e., capable of being shown to be true (CR, 115).

From this, it becomes clear that, if theories are not to be regarded merely as useful computational devices, a truth concept (standard) is required to gauge the extent of genuine growth in scientific knowledge. This becomes still more apparent in Popper's account of (the necessity for) his "third requirement" for the growth of knowledge.

It will be recalled that the major desideratum of the third requirement--which goes beyond the first two requirements of simplicity and testability--is that theories should pass some new, and severe, tests (CR, 242). This means that a theory, to be successful, must lead to the prediction of phenomena that have not so far been observed (CR, 241), and it must simultaneously succeed in "resisting at least some of our most determined attempts to refute it" (CR, 245). This requirement is needed, Popper argues, to eliminate trivial or *ad hoc* theories, which either may be based on *post facto* analysis and description of the data, or may yield predictions which turn out, on testing, to be immediately falsified. As just noted, the third requirement seeks to prevent the first situation from arising by requiring *new* predictions; it seeks to prevent the second situation by demanding that, despite severe testing, theories not be too quickly refuted. In short, then, the third requirement seeks to ensure the growth of knowledge by ensuring that successive theories will be "better" than their predecessors.

The idea of truth enters the picture here as a methodological underpinning for the third requirement. The basic idea in this regard is that only a true the-

ory (or one that is at least truer than its predecessors) is likely to yield successful (new) predictions in the long run, and thus to withstand severe testing in a productive manner. Popper claims furthermore that this thesis is central to his notions of both verisimilitude and crucial experiments (cf. CR, 246-47). And, although this point is not explicitly made by Popper, it might be added that (as others have pointed out) unless the truth of a theory is allowed, whatever predictive success it may enjoy remains something of an inexplicable accident.¹⁰ Correlatively, without the idea of truth, Popper's realism degenerates into a kind of instrumentalism, and likewise, one could have no firm hope regarding the "enforceability" of the third requirement. It is the methodological justification of these elements in Popper's position that constitutes the rationale for his introduction of the idea of truth.

Having once introduced a truth concept, however, Popper requires (or is compelled to do so by the logic of his position) that it performs other functions in addition to those just described. This, as I shall argue in the remainder of the paper, places a considerable strain on his truth concept, and ultimately, on the consistency of his position as a whole. To pursue this argument, however, it is necessary to examine in further detail the nature of Popper's truth conception.

Nature

Absolute Truth

As was noted at the outset, a primary characteristic of Popper's truth concept is that it attempts to appropriate Tarski's definition of truth as its foundation.¹¹ To be compatible with the requirement discussed in the preceding section, Popper requires "a correspondence theory of absolute and objective truth" (CR, 223). As was also noted above--and as is in any case clear from the structure of Popper's philosophy--the requisite theory cannot, however, be verificationist or "subjectivist" in intent. As Popper affirms at some length (CR, 223-28), he believes that in the Tarskian conception he has found a truth theory that both bypasses traditional objections and satisfies the specific (nonverificationist) constraints of his own position. It remains to consider whether Popper's truth concept does in fact succeed in these regards.¹²

As is well known, in the course of developing his semantic conception of truth, Tarski establishes the condition that the sentence "snow is white" is true if, and only if, snow is white (or more generally, the condition that X is true if, and only if, p). Of course, it is this ("disquotation") aspect of the Tarskian formulation that Popper finds particularly attractive.

For as Popper understands it, the Tarskian thesis establishes both (1) the correspondence of an idea with the facts, and (2) the notion that "a theory may be true even though nobody believes it, and even though we have no reason for accepting it, or for believing that it is true" (CR, 223-25). That is to say, Popper believes that he can extract from the Tarskian formulation the required correspondence theory of absolute and objective truth in a manner which does not appeal to any verificationist justification. It is, however, highly questionable whether the Tarskian formulation can satisfy these conditions.

To begin with, it is highly uncertain whether the truth concept that Tarski developed to resolve formal problems in semantic theory has any real application in the philosophical domain as such. In this regard, it is noteworthy that, while Tarski set out to formulate a definition which would "do justice to the intuitions which adhere to the classical Aristotelian conception of truth" (SCT, 343)--broadly, a correspondence conception of truth--he equally affirms that the formulation arrived at is epistemologically "neutral" (SCT, 362), and that, in particular, the semantic definition "implies nothing regarding the conditions under which a sentence like 'snow is white' can be asserted" (SCT, 361). These "global" considerations alone should caution us against too readily applying the semantic conception of truth to the kinds of philosophical contexts that Popper intends. Coupled to this, however, there are more specific technical difficulties having to do (for example) with the possible applications of the Tarskian definition outside the domain of the purely formalized languages (which maintain, inter alia, a clear distinction between object and metalanguages) for which it was primarily intended.

Even if we allow Popper the benefit of the doubt on the technical issues mentioned thus far, significant problems remain. The problems remain even if we also admit that the Tarskian formulation provides both an objective account of truth (at least in an intuitive sense) and also one which satisfies Popper's requirement that a theory may be true even though we have no reason for believing that it is true. Even if we allow all this, significant problems still remain. Most notable in this regard is the consideration that Popper, as he repeatedly affirms (see esp. CR, 223-28), requires a correspondence theory of truth (to satisfy his realism, etc.)--a theory, that is, which would do justice to "the peculiar relation of correspondence to a fact" (see, e.g., OK, 46). Yet close analysis of the Tarskian definition indicates that it does not, nor was it intended to, support the relation of correspondence between sentences and facts.¹ Keuth, in particular, has demonstrated that the Tarskian formulation could not support a correspondence relation without falling

into the kinds of semantical antimonies it was developed to resolve.¹⁴ Accordingly, the conclusion can hardly be avoided that, while Popper's position requires an objective, non-verificationist, correspondence conception of truth, he has not in fact identified one which is adequate to the task.

In a sense, however, the foregoing criticisms only represent the tip of the iceberg, so to speak, so far as Popper's truth concept is concerned. For, as has already been noted, the Tarskian element is but one component in Popper's truth concept. And, as we shall now see, each of the other components--the notions of degrees of truth and of verisimilitude--present very significant problems in their own right. Let us consider first the introduction of the notion of degrees of truth in Popper's philosophy.

Degrees of Truth

For the purposes of the remainder of this paper, we may suppose that Tarski's definition does indeed provide the kind of support for Popper's (correspondence) truth concept that Popper himself believes it does. This strategy will allow us to discern more clearly how significant problems of another sort arise in the applications to which Popper subsequently puts his objective truth concept (on the assumption--incorrect, as we have just seen--that it does find adequate support in Tarski's definition).

Specifically, new problems begin to surface as soon as we examine Popper's affirmation that, although there are no criteria of truth as such, there are indeed criteria of progress toward the truth.

Taken by itself, the first part of this claim (viz. that there are no criteria of truth) is relatively unproblematic. Certainly, it does relegate Popper's (objective) truth definition to the status of a regulative ideal that can never be known to be attained in practice (CR, 226). But this is completely consistent with Popper's non-verificationism. (Indeed, more generally, it is consistent with the fact that correspondence theorists rarely claim to be providing criteria of truth.) It is also consistent with Popper's attempt to hold open the (ongoing) reviseability of theories--in a manner that does not commit one to holding as absolutely true (at one time) a theory which subsequently comes to be refuted as false (as has happened on more than one occasion in the history of science). Taken in conjunction with Popper's claims regarding criteria of progress toward the truth, however, the idea of absolute truth experiences a certain strain.

The fundamental problem I am pointing to here is, of course, that of whether an absolute conception of truth (even when taken in a regulative sense) and a notion of degrees of truth (or of progress toward the

truth) can be consistently accommodated within a single framework. More specifically, can the Tarskian definition on which Popper relies so completely also accommodate a notion of degrees of truth?

This problem, it must be noted, occurs to Popper also. He acknowledges that to make sense of the idea of getting nearer to the truth (progress towards the truth), we would have to be able to speak of better (and worse) correspondence to the facts. And he goes on to ask, with reference to the Tarskian position in particular, "Can we really speak about better correspondence? Are there such things as degrees of truth? Is it not dangerously misleading to talk as if Tarskian truth were located somewhere in a kind of metrical or at least topological space . . . ?" (CR, 232). Popper's own answer to this question is a confident affirmation that we can indeed speak of better and worse correspondence to the facts, and that it is not misleading to do so. I must admit, however, that I have considerable difficulty in accepting this conclusion.

Briefly stated, my objections center on the fact that, as usually understood, the correspondence theory of truth entails the view that a sentence is true if, and only if, it corresponds to the facts; otherwise it is false; and it is difficult to see how this definition, which on both traditional¹⁵ and Tarskian¹⁶ interpretations is held to support the laws of contradiction and of excluded middle, can be reconciled with a notion of degrees of truth. Within the Tarskian framework in particular, can we meaningfully say, for example, the sentence "snow is white" is partly true? I cannot see either this or Popper's own example ("snow is usually white") as viable within the Tarskian framework (CR, 234). Perhaps some (more intuitive) version of the correspondence theory can accommodate the idea of better (or worse) correspondence with the facts, but it seems to me that it has yet to be demonstrated that the Tarskian definition can do so. Again, it is a Tarskian-style interpretation of the correspondence theory that Popper, in fact, needs in view of his non-verificationism.

It must be noted, however, that in attempting to demonstrate the plausibility of the idea of better correspondence to the facts, Popper himself appeals most directly to the comparative verisimilitude of theories (CR, 232-33). Thus far, I have not focused on this aspect of Popper's attempt to justify his notion of degrees of truth because, for the reasons now to be considered, the notion of verisimilitude (although taken by some to be virtually synonymous with truth for Popper) itself stands in a dubious relation to truth as such, and thus raises a new level of problems.

Verisimilitude

Verisimilitude is intended to provide a quantitative measure of progress toward the truth. From Popper's point of view, it has the advantage of providing for a clearly-defined, non-instrumentalist assessment of theories, given that we cannot actually know them to be true. Overall, of course, it presupposes that good sense can be made of the notion of degrees of truth within the Popperian framework. But even if we suppose that better sense can be made of the latter notion than I have been prepared to allow, further significant difficulties emerge on closer examination of the concept of verisimilitude itself.

Verisimilitude is defined by Popper as the truth-content of a theory minus its falsity-content, and Popper indicates that it is especially helpful in the comparative assessment of theories.¹⁷ Despite the appearance of quantitative exactitude, however, as a measure of truth, verisimilitude turns out to be a rather elusive concept.

A first and major difficulty regarding its application is that we cannot take an assessment of verisimilitude to be a measure of progress toward the truth unless we already know what is true (of course, according to Popper, we cannot know this).¹⁸ Even if we succeed in obtaining a measure of the comparative verisimilitude of two theories using the Popperian definition--and this might not always be possible, especially in the case of false theories--we can by no means immediately claim that the theory with higher verisimilitude is closer to the truth than the theory with lower verisimilitude; on subsequent testing, the former may still turn out to have many more false consequences than the latter--and hence, actually be further from the truth than the latter, this outcome being presently obscured perhaps by its relatively higher content (high content, it will be recalled, is encouraged by Popper's injunction in favor of bold conjectures). To repeat, for these and related reasons even a high degree of (comparative) verisimilitude cannot demonstrate that a theory is closer to the truth; to establish this, we would already need to know what was true.

Noting this difficulty, Ackermann distinguishes between apparent and actual verisimilitude, and he concludes that all we can know in practice is that we have increased (or decreased) the apparent (not actual) verisimilitude of theories (Ackermann, 90, 93). But with this shift from actual to apparent verisimilitude, however, the notion becomes largely irrelevant as a measure of truth (or degrees of truth); it remains instead as a measure of corroboration; a measure simply of the content of theories, of how well they have survived the tests they have been subjected to.¹⁹ The (near) equation of verisimilitude with corroboration, it may be

noted, does not only have the effect of rendering the former dispensable as a measure of truth; in addition, it equates verisimilitude with another concept in Popper's philosophy (corroboration) that has in turn been criticized for its possible links with verificationism and inductivism (see, e.g., Ackermann, 93)--the very elements that Popper's complex truth concept was constructed to avoid. Paradoxically, then, it may be the case that far from resolving the truth enigma in Popper's philosophy, the notion of verisimilitude (if pushed to the limits) threatens the system with self-contradiction.

Summary and Conclusion

The present paper has argued that, while in his early work Popper could dispense with a truth concept, his increasing emphasis on realism, and on the need for subjecting theories (conjectures) to new, and severe, tests, (eventually) necessitated his introduction of a notion of absolute and objective truth. However, the appeal to Tarski's semantic definition of truth, which Popper makes to avoid verificationism, cannot provide support for the kind of correspondence theory Popper requires.

It has been argued further that the notion of degrees of truth (of better or worse correspondence to the facts), which Popper introduces to underpin the idea of the (comparative) progress of theories toward the truth, and to prevent his truth concept from becoming a vacuous regulative principle, cannot easily be reconciled with the overall absolute and objective sense of truth that he endorses.

Finally, it was argued that verisimilitude, Popper's proposed quantitative measure of progress toward the truth, in fact measures, not truth, but corroboration. This not only renders verisimilitude dispensable as a measure of truth, but also, paradoxically, links it with one of the more verificationist aspects of Popper's thinking.

To date, these inconsistencies and tensions in Popper's position on truth have not been much commented on. Certainly, if they are resolvable, this has yet to be demonstrated.

NOTES

¹Karl Popper, The Logic of Scientific Discovery (New York: Basic Books, 1959), pp. 273-74 (hereafter, LScD). The original text of Logik der Forschung (Vienna: Springer, 1934) was left unchanged for the English

translation, but new appendices and clearly identified footnotes (cf. n. 2 below) were added at the time of translation "to bring the book up to date" (LScD, 6).

²LScD, 274, n. *1 (a footnote added at the time of translation).

³Karl Popper, Conjectures and Refutations (New York: Harper, 1965), esp. pp. 215-50 (hereafter CR).

⁴See, e.g., Karl Popper, Objective Knowledge (Oxford: Clarendon Press, 1972), p. 319 (hereafter OK).

⁵For an insightful discussion of these and related issues, see, e.g., A. C. Ewing, "The Correspondence Theory of Truth," in his Non-Linguistic Philosophy (New York: Humanities Press, 1968), pp. 193-204.

⁶See, e.g., CR, 221-22; cf. Bryan Magee, Popper (London: Fontana, 1973), p. 65.

⁷Popper readily acknowledges that his position is a realist one, yet he equally insists that what has priority in this regard are his methodological claims--rather than any "metaphysical" label applied to them (see, e.g., OK, 203, 323).

⁸CR, 107ff.; cf. Frederick Suppe, The Structure of Scientific Theories, 2nd ed. (Chicago: University of Illinois Press, 1977), p. 167f.; Ernest Nagel, The Structure of Science, 2nd ed. (Indianapolis: Hackett, 1979), p. 130ff.

⁹Popper is so insistent on the latter requirement that at times he even speaks of "verifications" of new predictions (see, e.g., CR, 244; cf. CR, 248, n. 31).

¹⁰See, e.g., J. J. C. Smart, Philosophy and Scientific Realism (New York: Humanities Press, 1963), p. 39; Hilary Putnam, Mathematics, Matter and Method: Philosophical Papers, vol. 1 (Cambridge: Cambridge University Press, 1975), p. 73.

¹¹See Alfred Tarski, "The Semantic Conception of Truth," Philosophy and Phenomenological Research, 4 (1944), pp. 341-75 (hereafter, SCT).

¹²In the present context, I shall focus only on the question as to whether Popper's Tarskian appropriation satisfies the specific demands of his own framework. It would take a separate essay to explore the question of whether any correspondence theory can overcome the traditional objections to it (see e.g., the Ewing essay already referred to).

¹³For Popper's own arguments affirming the relevance of the Tarskian formulation to his own position, see, e.g., CR, 223-28; OK, pp. 319-40.

¹⁴See Herbert Keuth, "Tarski's Definition of Truth and the Correspondence Theory," Philosophy of Science, 45 (1978), pp. 420-30.

¹⁵Cf. Aristotle, Metaphysics, IV, 3, 7.

¹⁶SCT, 354.

¹⁷CR, 234, and Addenda. The notion of verisimilitude has received considerably more attention in the literature than that of truth itself. Significant commentators on and contributors to the verisimilitude debate include: R. J. Ackermann, The Philosophy of Karl Popper (Amherst: University of Massachusetts Press, 1976), esp. pp. 87-93; A. J. Ayer, "Truth, Verification and Verisimilitude," in The Philosophy of Karl Popper, ed. P. A. Schilpp (La Salle, IL: Open Court, 1974), II, pp. 684-92; John Harris, "Popper's Definition of Verisimilitude," The British Journal for the Philosophy of Science, 25 (1974), pp. 160-66; Anthony O'Hear, Karl Popper (Boston: Routledge, 1980), esp. pp. 47-56; G. S. Robinson, "Popper's Verisimilitude," Analysis, 31 (1971), pp. 193-96; Pavel Tichy, "On Popper's Definition of Verisimilitude," The British Journal for the Philosophy of Science, 25 (1974), pp. 155-60. In the course of these discussions, the basic definition of verisimilitude has been shown to be capable of considerable elaboration and refinement. These possible refinements, however, do not significantly affect the types of criticism raised here. The criticisms of verisimilitude I offer here are based on those of Ayer, Ackermann, and O'Hear in particular.

¹⁸Ackermann, pp. 90-91; cf. Ayer, pp. 690-91.

¹⁹Cf. CR, 58, n. 24. Indeed, Popper himself notes in passing that "corroborability by empirical tests is the proper methodological counterpart to this new methodological idea [viz. to verisimilitude]" (CR, 235); he does not, of course, draw the conclusion that verisimilitude is not an effective measure of progress toward the truth.