

POPPERIAN AND KUHNIAN THEORIES OF TRUTH AND THE IMPUTATION OF RELATIVISM

..I believe that we simply cannot do without something like this idea of a better or more approximation to truth¹.

Granting that neither theory of a historical pair is true, they (many philosophers of science) nonetheless seek a sense in which the latter is a better approximation to the truth. I believe nothing of that sort can be found. On the other hand, I no longer feel that anything is lost, least of all the ability to explain scientific progress, by taking this position.²

These two statements obviously highlight a dispute between the two competing protagonists in philosophy of science, Kuhn and Popper, and it is a dispute of significant importance, turning as it does on the differing theories of truth that each holds. The aims of this paper are to clarify the theories and the role each plays respectively in philosophy of science; to consider criticisms of the positions taken; to show that, indeed as Popper says, truth is "...one of the points on which we are most deeply divided..."³. In order to achieve these aims, I shall in turn consider the works of both philosophers, in particular suggesting how they might answer the following two questions.

(i) What is truth ?

(ii) What role does truth play in the philosophy of science?

It is to be hoped, of course, that in attempting to answer these questions on behalf of the two philosophers, I do not commit any serious errors of misinterpretation. With that fail-safe clause out of the way, I propose to first consider Popper's position on truth. In fact, he asserts that "...I do believe in 'absolute' or 'objective' truth, in Tarski's sense..."⁴. And again he says,

Tarski's greatest achievement, and the real significance of his theory for the philosophy of empirical sciences lies, I believe, in the fact that he re-established a correspondence theory of absolute or objective truth...He vindicated the free use of the intrinsic idea of truth as correspondence with the facts... Thanks to Tarski's work, the ideas of objective or absolute

truth—that is, truth as correspondence with the facts—appears to be accepted today with confidence by all who understand it⁵.

It is clear then that Popper embraces the correspondence theory of truth—that is, a statement is true if and only if it corresponds to the facts and such a theory is philosophically sound, rehabilitated due to Tarski's work.⁶

Before proceeding much further, it may be useful to take a closer look at Tarski's work and Popper's claims for it; for the claims have come under critical scrutiny in a paper by Susan Haack. If what Haack argues is correct, then though it does not logically rob Popper of a correspondence theory of truth, it would seem to do so in a psychological manner when the following remarks of Popper are considered.

In fact, before I become acquainted with Tarski's theory of truth, it appeared to me safer and more economical to discuss the criterion of progress without getting too deeply involved in the highly controversial problem connected with the use of the word 'true'. My attitude at the time was this: although I accepted, as almost everybody does, the objective or absolute or correspondence theory of truth—truth as correspondence with the facts—I preferred to avoid the topic. For it appeared to me hopeless to try to understand clearly this strangely elusive idea of a correspondence between a statement and a fact. All this was changed by Tarski's theory of truth and of the correspondence of a statement with the facts⁷.

So, if robbed of Tarski's support, we might find Popper engaged in a Kuhnian-style avoidance of truth and its role in the philosophy of science. Whatever it may be, Popper's claims for Tarski's work can be characterised as follows. Popper views Tarski's work in such a way that

...it can be regarded, from an intuitive point of view, as a simple elucidation of the idea of correspondence with the facts.⁸

Popper continues to claim that the decisive point is Tarski's discovery that, in order to speak of correspondence to the facts, we must use a meta-language in which we can speak about two things: statements and the facts to which they refer. (Tarski of course calls such a meta-language *semantical*). Once the need for a (semantical) meta-language is realised, everything becomes clear.⁹

But things are not quite as simple as that. What Popper claims here is that, in effect, the main objection to correspondence theories of truth was the failure to elucidate the idea of correspondence to the facts, and that such failures were due to the lack of re-organisation of the need for a 'semantical' meta-language. That is, failures were due to a logical confusion concerning object and meta-language. Just how this requirement carries through language I, for one, would like to see explained more thoroughly, for leaving it at just that seems to me to leave unnecessarily nagging our minds regarding Popper's philosophy.

However, regardless of how Popper's Tarskian crutch supports the correspondence theory which Popper utilises, I do not think Popper makes the naive error of considering Tarski's theory of truth as a correspondence theory. In fact, I think it misleading to talk of Tarski's work as a theory of truth. What Tarski provides is quite a formal definition of truth, a semantic definition which is language dependent. Perhaps it is because of his talk of a Tarskian theory of truth that Susan Haack makes her most fundamental error—reading Popper as interpreting Tarski's work as a correspondence theory of truth. Nowhere in Popper's writings do we find such a claim. Although Popper compounds the confusion by also speaking of Tarski's theory of truth he considers Tarski's work not to be an exposition of a correspondence theory of truth but as a support, a vindication, a good reason for such a theory. We must note that there is a world of difference between a statement being a part of a theory and it being a reason for that theory. It is not the case that this vindicates Haack's arguments, but it merely makes them somewhat irrelevant to the central issue, namely, how Tarski's work supports the correspondence theory of truth. This criticism applies directly to sections 1 and 2.1 of Haack's paper.

In section 2.2 she considers what she feels to be "...the main burden of Popper's claims on Tarski's behalf" namely "...that the semantic conception of truth is objective..."¹⁰ Here again, we find the same confusion as above. Popper claims that the decisive point of Tarski's work, the idea of a semantical meta-language, supports the correspondence theory of truth, which is an objective theory of truth, not that the semantic conception of truth, which spawned the idea of a semantical meta-language, is

itself objective. One who is introduced to Tarski's paper must agree with Tarski's own conclusions: "...the semantic conception of truth is completely neutral toward all these issues"¹¹ (issues here are referring to epistemological issues, and I take the point at hand to be one).

To suppose Popper to fly into the face of this remark supposes a gross misunderstanding of Tarski's work by Popper, a misunderstanding I believe does not exist. (Haack's paper highlights Haack's misunderstanding of Popper rather than Popper's misunderstanding of Tarski).

Furthermore, on what Tarski has to say about Tarski (not that we should suppose everything Tarski says about his own work to be accepted uncritically, but because in this case it coincides well with Popper's remarks), the section 2I of his paper (entitled *Applicability of Semantics to the Methodology of Empirical Science*) may enlighten us somewhat on Tarski's own views concerning his work (or semantics in general) and its relevance to the philosophy of science. On my reading of this section, Tarski is, if anything, Popperian in his outlook. Consider the following quotes.

...it seems to me clear that any tendency to eliminate semantic notions (like those of truth and designation) from this discussion (here he refers to the "methodological discussion of science") would make it fragmentary and inadequate¹².
...there is an important postulate which can be reasonably imposed on acceptable empirical theories and which involves the notion of truth...we can give this postulate the following form: as soon as we succeed in showing that an empirical theory contains (or implies) false sentences, it can not be any longer considered acceptable¹³.

In view of this section and my previous comments, I do not think Popper's claims for Tarski's work in relation to philosophy of science are all that outrageous but are, in substance, correct as long as Popper provides more substantial argument for the crutch thesis. In any case, notwithstanding Popper's philosophical fear of 'truth', he might well use the correspondence theory of truth without Tarski's assistance. Such an action would not be a heinous crime; after all, better philosophers have done worse in their day.

Let us now return to the second of our questions: what role does truth play in the philosophy of science? Here again, we find Popper saying what he thinks, loudly and clearly:

...in the search for knowledge, we are out to find true theories or at least theories which are nearer than others to the truth—which correspond better to the facts. So one great advantage of the theory of objective or absolute truth is that it allows us to say...that we search for truth, but may not know when we have found it; that we have no criterion of truth, but are nonetheless guided by the idea of truth as a regulative principle...and that, though there are no general criteria by which we can recognise truth...there are something like criteria of progress towards the truth.¹⁴

For the fact is that we too see science as the search for truth, and that, at least since Tarski, we are no longer afraid to say so. Indeed, it is only with respect to this aim, the discovery of truth, that we can say that though we are fallible, we hope to learn from our mistake. It is only the idea of truth which allows us to speak sensibly of mistakes and of rational criticism, and which makes rational discussion possible—that is to say, critical discussion in search of mistakes with the serious purpose of eliminating as many of these mistakes as we can, in order to get nearer to the truth. Thus the very idea of error—and of fallibility—involves the idea of an objective truth as the standard of which we may fall short. (It is in this sense that the idea of truth is a regulative idea)¹⁵.

Popper then sees truth as the ideal by which to judge the scientific process; as science approaches more and more closely to the truth, science progresses. This then is the role truth plays in Popper's philosophy of science. Crucial to his philosophy is the idea of a better or more approximation to the truth and to make sense of this notion Popper introduces us to this theory of verisimilitude (this is the explanation alluded to in one of the above quotations).

His theory of verisimilitude is, in essence, quite simple and goes as follows: define the truth-content of a theory (E), TC (E), as the class of true logical consequences of that theory, and define the falsity-content of a theory (E), FC (E), as the class of false logical consequences of that theory. Furthermore, assume that

both truth content and falsity content are measurable; then we define a measure of the verisimilitude (or truthlikeness) of a theory E , as follows: $V(E) = TC(E) - FC(E)$. (Popper does give a more complicated definition involving a technical discussion on content and measure, in the Addenda to *Conjectures and Refutations*; here, however, we shall only consider the above, basic definition).

The above definition obviously gives us the two basic intuitive notions concerning any proposed measure of verisimilitude viz., that $V(E)$ should increase if $TC(E)$ increases while $FC(E)$ remains the same, and that $V(E)$ should increase if $FC(E)$ decreases while $TC(E)$ remains the same.

A serious and damaging objection to the above definition of verisimilitude is raised by D. Miller¹⁶ and reported on by S. Haack in her already mentioned paper; Miller shows that no false theories, A and B , are comparable by verisimilitude. I think the objection is a valid one, hence, Miller has shown that Popper's above definition will not give him what he wants. However, Miller presses on from here to the conclusion, and Haack agrees with him, that no such precise sense can be given to the idea of relative closeness of truth. This is shown, Miller claims, by consideration of the following argument. Consider a simple language, L_1 , in which the whole truth consists of the three sentences p , q , r and another language, L_2 , which has the sentences p , s , t where s is equivalent to $p \leftrightarrow q$ and t to $p \leftrightarrow r$. Now the theory, T_1 : $\neg p$ and $\neg q$ and $\neg r$ is further from the truth than T_2 : $\neg p$ and q and r , since the first has three and the second only one false component; that is $\neg T_2$ has greater verisimilitude than T_1 . But, in L_2 , ' $\neg p$ and $\neg q$ and $\neg r$ ' is ' $\neg p$ and s and t ', whereas ' $\neg p$ and q and r ' is ' $\neg p$ and $\neg s$ and $\neg t$ '; thus T_1 has one false component and T_2 has three, so that T_1 is nearer to the truth than T_2 i. e. T_1 has greater verisimilitude than T_2 .

The above result, *prima facie* a contradiction, puts an end to any hopes one may have had regarding rationalisation of the concept of verisimilitude, as so Haack and Miller would have us believe. In fact, it shows not that the concept of verisimilitude is untenable but that the concept of verisimilitude is language dependent. Indeed this result indirectly lends support to the following remarks of Popper:

In Tarski's terminology, it (verisimilitude) is obviously a 'semantic' idea, like truth.¹⁷

And so, like truth, it may be expected that verisimilitude is language dependent. Popper here, has anticipated the result of Miller. Of course, to say that verisimilitude is language dependent may have some intriguing consequences and certainly raises some intriguing questions. It is for now, though, to have raised this important point.

Now I wish to turn to a consideration of Kuhn's views on the matter at hand. What is Kuhn's reply to the question "What is truth?" Well, Kuhn's theory of truth is quite far removed from Popper's, at loggerheads even, as my opening quotations suggest. To explore this area of seemingly irreconcilable conflict (well at least Kuhn's half of the area) will require a good deal more insight on our part, given the nature and style of Kuhn's writings. Still the effort is necessary, and moreover worthwhile.

In his Postscript to the *Structure of Scientific Revolutions*, though he does not directly say that truth is theory-dependent, I think such a conclusion may be validly drawn from the following passage.

A scientific theory is usually felt to be better than its predecessors not only in the sense that it is a better instrument for discovering and solving puzzles but also because it is somehow a better representation of what nature is really like. One often hears that successive theories grow even closer to the truth. Apparently generalisations like that refer not to the puzzle solutions and the concrete predictions derived from a theory but rather to its ontology, to the match, that is, between the entities with which the theory populates nature and what is "really there".

Perhaps there is some other way of salvaging the notion of 'truth' for application to whole theories, but this one will not do. There is, I think, no theory independent way to reconstruct phrases like 'really there'; the notion of a match between the ontology of a theory and its "real" counterpart in nature now seems to me illusive in principle¹⁸.

The above conclusion gains strong support from a bolder and somewhat more direct statement in his "Reflections on My Critics."

If I am right, then 'truth' may, like proof, be a term with only intratheoretic applications¹⁹.

(The 'If I am right' phrase refers to Kuhn's argument against the possibility of a neutral language with which theory comparison may be possible; that is, the incommensurability controversy. Thus Kuhn seems to suggest here that if he is right about incommensurability, then he is right about 'truth'.)

So, Kuhn's hesitancy aside, I consider Kuhn to hold the above position regarding truth, that is, that truth is an *intra-theoretic* concept, not an *inter-theoretic*; using Popper's terminology, when he talks of the Myth of the Frame-work, the framework according to Kuhn contains the truth within it, and truth is *not* outside of the framework; it is not an independent or absolute or objective concept, but is relative to the theory utilising it. On this reading of Kuhn (a reading I believe to be highly plausible) I can see no way that Kuhn can avoid the charge of relativism laid at him with respect to truth. Kuhn acknowledges the change in his "Reflections on My Critics", wherein he discerns two senses of the term relativism, where "in one sense of the term I may be a relativist; in a more essential one I am not"²⁰.

Let us now look at Kuhn's defense of his position. The first of Kuhn's senses of relativism, the 'more essential one' where he is not a relativist, I am not quite clear about. When he states he is not a relativist in this first sense, he proffers the following lines as support.

For me therefore scientific development if, like biological evolution, unidirectional and irreversible. One scientific theory is not as good as another for doing what scientists normally do²¹.

From this passage I deduce that in this sense relativism means something like scientific development is relative to the theories one chooses to judge it by; Kuhn's stance on this matter seems to me to be a reasonable one though, as Triggs²² points out, it creates a tension between incommensurability on the one hand, which denies even the possibility of theory comparison, and the idea of scientific development on the other, which must involve theory comparison. Regardless, what if Kuhn's second sense, where he admits that he 'may be a relativist'. This sense of relativism is

precisely the one discussed above concerning truth and as far as I can see there are no mitigating circumstances which would allow Kuhn the grace to use 'may' in the above phrase; Kuhn is a relativist with respect to truth. What we must now do is to consider what sorts of problems, if any, relativism (in this sense) entails, whether the problems are central to Kuhn's main thesis, and how they might be resolved within the context that Kuhn sets.

Reading the literature, one gets the impression that 'relativism' is used almost in a rhetorical sense; that is, critics call Kuhn a relativist and leave it at that, having relegated him to an obviously highly obnoxious, under-privileged, and under-developed minority group. There must of course be something more to it than this inflated description. There are two main objections to relativism regarding truth, and they are too serious for Kuhn not to consider them more seriously than he has thus done so. The first relates to his first sense of relativism discussed above, namely the problem of scientific development or rather scientific progress. Truth, objective truth, as we have seen, is for Popperians the goal of science and scientific progress is explained as progressed towards explaining and describing this objective truth. Kuhn eliminates this criterion of progress and so the onus is on him to propose alternative criteria. This, he does, citing consideration such as "...maximum accuracy of predictions, degree of specialisation, number (but not scope) of concrete problems situations ...²³"; these considerations "...would enable any observer involved with neither theory to tell which was the older, which is the descendent"²⁴. Kuhn seems here to equate progress with chronological sequence, which is a moot point, as is his claim that the answer to the problem of progress "...must, in the final analysis, be psychological or sociological"²⁵. Regardless, as previously raised, the above explanation of progress entails a further problem, and so in that sense, Kuhn's solution is no solution at all.

The second major problem Kuhn involves himself in, in disposing of objective truth, is one which he seemingly does not recognise, as witnessed by the following quote:

In the present context, its intra-theoretic uses seem to be unproblematic. Members of a given scientific community will generally agree which consequences of a shared theory sustain the test of experiment and are therefore true, which are

false as theory is currently applied, and which are as yet untested.²⁶

The gloss contained in this passage is a damaging comment of Kuhn's consideration of this point, for Kuhn profess no answer to the glaring question 'how do the members of a given scientific community...generally agree which consequences of a shared theory sustain the test of experiment and are therefore true...?'²⁷. Surely Kuhn does not imply here that truth is, to use that infamous phrase, a matter of mob-psychology. Yet if he doesn't, then the onus is on him to make explicit just what considerations are entered into on the part of the scientist when making his decision concerning the truth of a consequence of a theory. The only consideration offered by Kuhn in that passage is that the consequences "...sustain the test of experiment and are therefore true..."²⁸.

To say that a consequence 'sustains the test of experiment' should mean, however, unless words are being oddly used, that a 'match with nature' has been achieved (Kuhn indirectly supports such an implication himself, when he uses such phrases as "most of the puzzles of the normal science are directly presented by nature."²⁹) and "...puzzles presented by nature..."³⁰). But to admit this is to give the whole game away. This, far from being unproblematic, intra-theoretic usage of truth contains deeply imbedded in it a problem just as serious for Kuhn as the inter-theoretic one posed by scientific progress. (The intra-theoretic problem is also raised by Trigg in his section on Kuhn and truth).

Thus, with respect to truth, we find Kuhn to be a relativist and anti-Popperian ("not that scientists discover the truth about nature, nor that they approach ever closer to the truth"³¹). This being so, what role does truth play in Kuhn's philosophy of science? Well, a lot of what has gone before, in the previous discussion of what is truth for Kuhn, points the way to an answer to this question. In contrast to the central role truth plays in Popper's philosophy of science, truth for Kuhn (at least the Kuhn of *Structure of Scientific Revolutions*) makes a cameo appearance in a role akin to the devil's advocate. Truth has a very negative part to play; it is a problem, a hindrance for Kuhn, something which has to be explained away. This is caused precisely because of the immensely positive contribution truth makes to Popper's philosophy; contrasting Popper and Kuhn leaves a burden on

Kuhn to explain how it is that his philosophy can forsake such a powerful analytical artifact as truth. Of course, it cannot forsake it completely; Kuhn readily uses it, as we have seen, in intra-theoretic applications (though, as I have argued, perhaps not with the security that Kuhn obviously feels he has). It is with respect to theory comparison that Kuhn would like to eliminate talk of truth;

Dealing with the comparison of theories designed to cover the same range of natural phenomena, I am more cautious.. 'cautious' being the operative word. Stating just how far he will go with this talk of truth, he continues.

..if they are historical theories, like those considered above, I can join Sir Karl in saying that each was believed to be true in its time but was later abandoned as false. In addition, I can say that the later theory was better of the two as a tool for the practice of normal science, and I can hope to add enough about the senses in which it was better to account for the main developmental characteristics of the sciences³²,

though without reference to truth, one might add. So this is where Kuhn draws the line. As previously mentioned, this leaves him with two main problems for his philosophy, one of which he mentions in the above quote: they are, accounting for scientific progress and the hidden problem of intra-theoretic truth-usage. About this last problem Kuhn has nothing to say, of course, thinking as he does that the intra-theoretic use of truth is 'unproblematic'. About the first we have already discussed.

To sum up, then, Popper is an absolutist and Kuhn a relativist with respect to truth. Each of these positions seems to have its own special problems; for Popper, it is giving a sounder account of the idea of verisimilitude and, for Popper's own peace of mind, giving a better account of Tarski's crutch; for Kuhn, it is explaining scientific progress without forsaking incommensurability and giving a better account of the use of truth in the intra-theoretic context. While either of our two protagonists leave the above points unsettled, neither may claim to have a superior philosophy of science.

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NOTES

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