

PEIRCEAN VS. ARISTOTELIAN CONCEPTION OF TRUTH

RYSZARD WÓJCICKI

0. The initial idea of this paper was rather simple. I wanted to compare Peirce's views on logic as a critical study of habits of inquiry with corresponding views of Polish logicians from the twenty years period of independence of Poland ended by the Second World War. That was a period of intensive activity and considerable achievements of the Lvov-Warsaw School of Philosophy. A rather large group of outstanding logicians, among them Kazimierz Ajdukiewicz, Tadeusz Czeżowski, Tadeusz Kotarbiński, Stanisław Leśniewski, Jan Łukasiewicz, Alfred Tarski, to mention only those to whom I will refer throughout my paper, formed a part of the Lvov-Warsaw School, and all of these were leading figures of the School of Polish Logic. Besides the names mentioned above I will occasionally refer to Ludwik Fleck, another outstanding Polish scholar, though by no means a member of the Lvov-Warsaw School. Rather, he was an eminent outsider. A microbiologist, with a keen interest in philosophical foundations of science, he was one of the earliest and most incisive critics of the doctrine of Logical Positivism both in the form known from the Wiener Kreis and that cultivated by Polish logicians and philosophers.

On second thought, however, I thought it would be wiser to limit myself to an examination of one single issue, and to compare Peirce's conception of truth with the Aristotelian one in the context of some logical issues. The views of the Polish logicians I am going to mention will merely serve as auxiliary material illustrating some of the points I am going to make. I am ready to admit that, instead of Polish logicians, I could quite easily refer to views of outstanding logicians of any other country. However, the decision to parallel or, sometimes, contrast Peirce's ideas with those of representatives of Polish pre-War logic is not as accidental as it may seem, and is by no means motivated merely by the fact that the achievements of Polish logic are part of the intellectual tradition to which I am especially close.

To begin with, the majority of Polish logicians were of realistic persuasion, and hence they were naturally inclined towards the Aristotelian conception of truth. For Alfred Tarski who was a mathematician rather than a philosopher, the fact that his colleagues, notably Kotarbiński and Łukasiewicz had never renounced the classical conception of truth in spite of all difficulties to which it gave rise, was certainly a significant encouragement to undertaking

an effort to formalize it. This also explains why his celebrated paper on the notion of truth (Tarski 1930) gained immediately the full approval of Polish logicians. More particularly, the significance of Tarski's formalization of the Aristotelian conception of truth was fully recognized in the review of Tarski's paper, published by Kotarbiński in *Przełąd Filozoficzny*, the leading Polish philosophical journal at that time.

Another justification for contrasting Peirce with the Polish logicians is the fact that various specific issues of Peirce's inquiry on the notion of truth and selected relevant topics was also discussed by the Polish logicians. The fact that Peirce and Łukasiewicz approached many logical issues in a parallel way seems to be especially instructive in this respect.

1. Though, in the context of this paper, the question is of merely secondary significance, it is worth asking of whether Polish logicians from the Lvov-Warsaw School were familiar with philosophical achievements of Charles S. Peirce. They certainly knew and appreciated some purely formal ideas of the American philosopher and were familiar with at least some of his logical writings, particularly with his "On the Algebra of Logic" of 1885. For instance, they were aware that the idea of quantifiers was developed by Peirce independently of G. Frege. They correctly credited Peirce and not Schröder with developing the idea of verification procedure of formulas of the sentential calculus known as the 'matrix method' (Łukasiewicz and Tarski 1930; Łukasiewicz 1951). Indeed Schröder (Schröder 1890-1905) published his version of this method about five years later than Peirce. The Peircean theory of relations was axiomatized by Tarski (Tarski 1941). The Polish logicians were familiar with the Peirce Law $[(p \rightarrow q) \rightarrow p] \rightarrow p$, a rather sophisticated tautology of two-valued logic, and they acknowledged the fact that Peirce was the first to introduce nullary connectives (constants) into sentential calculus. Moreover they were aware of many other contributions of Peirce to logic and the foundations of mathematics. Thus the role of Peirce as one of the founders of contemporary logic was fully appreciated by the Polish logicians.

On the other hand, certainly people from the Lvov-Warsaw School did not consider Peirce's contributions to philosophy as the source of inspiration for their own philosophical studies. There are several reasons for this. Some of these are sociological. At the beginning of this century, European philosophers were predominantly Europe-centered, and, although American philosophers (notably William James) were highly esteemed on the Old Continent, this was not at all the case for Charles S. Peirce who, for that matter was not terribly popular in his own country either.

But, quite independently of any geographical or sociological factors, it is rather unlikely that Polish logicians would find the main body of Peircean

ideas attractive, even if they had taken pains to study them. They were influenced by ideas of Husserl, Brentano, Meinong, Bolzano, i.e., philosophers whose views have little in common with Peircean metaphysics.

2. For Peirce and his contemporaries, notably Gottlob Frege, the received view on logic was that expressed by, among others, John Stuart Mill. Logic was viewed as part of the science that concerns reasoning considered as a psychological process. But, as we now clearly see, after the penetrating analysis of the nature of logic given by Peirce and Frege, logic concerns neither states of mind nor psychological phenomena. It took a rather long time to establish the anti-psychologistic view of the nature of logic. But already in the early writings of the Polish logicians, especially those of Łukasiewicz, it was stressed time and again that logic is not a part of psychology and that the two disciplines do not overlap each other.

There are two fundamental questions to which the anti-psychologistic position gives rise. One is what logic is about. The other concerns the epistemological status of the laws of logic. To a large extent an answer to these two questions is determined by the metaphysical framework within which they are asked.

So what is logic about? How was this question answered by Peirce and what was the answer offered by Polish logicians? The answer is that their views coincide: logic deals with methods of arriving at the truth, though it does not deal with *all* methods of this kind. It deals with those methods which do not involve anything that goes beyond language, i.e., beyond what may be articulated in the form of sentences. Thus language which is meant to be an abstract medium both to preserve and to convey any knowledge one may acquire, becomes the main concern of logicians.

In view of this fact, it is not surprising that both Peirce and Polish logicians have done so much to analyze the structure and the role of language. Clearly, the results of Polish logicians pushed further and thus complemented the work done by Peirce. For instance, he was not aware that object-language had to be separated from the meta-language; the need of such a separation was established by Leśniewski and Tarski. Nor was he interested in grammatical peculiarities the study of which resulted in Ajdukiewicz's idea of categorical grammar. Still Peirce was already fully aware that language, taken as an object of logical study, must be treated as some idealized structure formed according to certain well defined rules. Thus, long before Leśniewski and Tarski, he was one of the pioneers of the idea of the formalized treatment of linguistic phenomena.

3. To be sure that we properly understand the idea of logic as a theoretic

discipline which deals with methods of achieving truth, we should ask what is truth. At this juncture, we arrive at the question which is of central significance for a proper understanding of both the similarities and the differences between the ways of thinking of the two parties of my analysis, and which is also the central issue of this paper. Peirce's conception of truth varies with time. But there is one intuitive idea of truth that, beginning from his early paper "The Fixation of Belief,"¹ Peirce has persistently tried to grasp and to clarify: the idea of truth as the end point of human cognitive efforts. One arrives at the truth, a specific piece of truth to be sure, if one arrives at a belief that cannot be shaken by any further scientific inquiry. Of course, Peirce does not endorse the naïve view that, once achieved, truth can never be doubted again. In order to reach the end point, it does not suffice to provide a complete and adequate justification of the statement that expresses our belief; the justification must pass numerous cross confirmations, its accuracy and adequacy must be examined time and again, until the scientific community reach the full confidence in its acceptability. Only then can the end point, to use the terminology I have suggested above, be said to be achieved – the belief to be fixed.

Thus, as it was seen by Peirce, the process of scientific inquiry is cumulative. Our knowledge is not merely improving in its accuracy, exactness, economy etc., but it is also constantly expanding by establishing and thus collecting more and more true beliefs, even though we cannot be sure which of these are true and which are not.

The idea of truth as the end point of scientific investigations must be especially close to those who, like Peirce, have some mathematical training. How do we know whether a mathematical conjecture A is true? For the mathematician, the only way to settle such a question is to prove or to disprove A. When the proof of either A or not-A is given, and when furthermore, its soundness is checked a – virtually – unlimited number of times by students and users of the theorem, the fixation of belief is achieved. It becomes extremely unlikely that the truth reached in that way will be revised, that the theorem commonly accepted by generations of specialists will be waived, and that the process of inquiry will start anew.

Following Ludwik Fleck, Thomas S. Kuhn and Paul K. Feyerabend, many philosophers of science have come to doubt whether the history of science can be viewed as a history of continuous growth. Clearly, if their skepticism is justified, the idea of truth being the end point of inquiry must be unacceptable. But, in spite of that, mathematics seems to be an ideal and paradigmatic

¹The paper was published in a series entitled *Illustrations of the Logic of Science* in the *Popular Science Monthly* in 1878-9.

instance of a continuously growing body of truths. That does not mean that contemporary mathematicians share all the well-established views of their colleagues from the past, or that they never revise or improve those views, but there is a clear and easy to grasp intuitive sense in which mathematics is a discipline that grows through the process of achieving consensus amongst specialists. Mathematics is not free from error, but unless the error concerns a question of marginal significance, a question of accidental and temporary interest, the error must eventually be traced and eradicated. Consequently, any result once achieved by legitimate methods must remain unshakable. This somewhat over-optimistic picture asks for some additional comments which, unfortunately, would exceed the limits of this paper.

The conception of truth as the end point of scientific inquiry does not appeal to any notion of reality. Truth is a matter of methods and people using them. Thus, whatever may be said about the correspondence between truth and reality – if one admits that there is any reality at all – must result from some additional considerations. The end point conception of truth is purely epistemological.

4. Anyone, who wholeheartedly and without any hesitation wants to subscribe to the end point idea of truth has no other choice but to assume that truth and reality are, in a sense, indiscernible. To speak about a state of affairs *S* (say, *it rains*) and to speak about the truth of the proposition that states that *S* (it is true that *it rains*) amounts to the same. The difference, to use the terminology suggested by Carnap, consists in selecting either a material or a formal mode of speech. This view is consistent with Peircean pragmatism, for the two sentences “*it rains*” and “it is true that *it rains*” are synonymous: all practical consequences which are admitted by the former are admitted by the latter and vice versa.

According to the Peircean conception of truth, i.e., the view that truth results from a continuous effort to arrive at the views that will be unanimously accepted, the attainment of truth does not merely describe reality, it also defines it. There is no reality beyond the truth, there is no reality other than that which may be known to us. Peirce rejects the idea of incognizable reality.

There is one rather subtle point to which the Peircean idea of truth and the corresponding conception of reality gives rise. Suppose we want to know which of the two contradictory claims, *A* and not-*A*, is true, thus we want to decide between *A* and not-*A*. And suppose that, in principle, the scientific methods we have at our disposal allow us to settle the question. Does this suffice to maintain that one of the two opposite claims is true? A seemingly obvious answer is “yes.” But the positive answer alienates the truth from the actual process of inquiry. Indeed, there is little doubt that one can ask an enormous

amount of questions that can be solved with the help of scientific methods, but most of them are questions that will never be investigated. Consequently, we must admit that there are true propositions the truth-value of which is neither known nor will be known in the future. If so, truth becomes independent from the actual process of inquiry, i.e., from any *actual* scientific activity, and thus in some very specific sense truth becomes objective.

It turns out that the Peircean conception of truth admits of two alternative interpretations. One, that might be called *actualistic*, associates the notion of truth with the actual process of inquiry. Under this conception we are not allowed to declare any proposition to be true unless, sooner or later, its truth will be effectively established. The other, let me call it *virtualistic*, consists in defining the notion of truth in terms of the possibility of solving the question through a properly conducted process of inquiry, without postulating that the process should actually be implemented.

I do not feel confident enough of my knowledge of Peirce's philosophy to attempt to settle the question whether the author of "The Fixation of Belief" was fully aware of the two alternatives I have mentioned. In spite of some significant similarities, Peirce's idea of objectivity of truth and the corresponding idea of reality are not exactly the same as those implied by the virtualistic interpretation. It seems to me, however, that unless we agree that truth (and consequently, reality) should be interpreted virtualistically, the Peircean doctrine of truth is untenable.

5. It goes without saying that in order to subscribe to the Peircean idea of truth, one must believe that amongst all the methods applied in the search for truth, there is a body of methods that are not merely applied in science, but that are simply "sound," "legitimate," "good," and *therefore* scientific in the genuine sense of the word. This presents a problem the significance of which may be seen more readily by comparing the notion of truth with that of Aristotle. Under the Aristotelian conception of truth the notion of a scientific method is easily defined as a method that is infallible, i.e., a method which, if properly used, guarantees our arriving at the truth. Although this conception does not imply that we may easily recognize these methods, we at least know what it means for a method to be good, we know the *differential specific* of the class. Under the Peircean conception of truth, however, the Aristotelian definition of a scientific method is useless: one cannot define a good method by appealing to the notion of truth because the latter has been defined in terms of the former.

Peirce does offer an impressive body of efforts to define scientific methods, but we cannot help feeling that many of his proposals and suggestions are neither as clear nor as compelling as one might want them to be. Without

entering into a discussion of all the Peircean themes that are relevant to the question, such as his conception of the *phaneron* his theory of the categories, or his discussion of the three forms of reasoning, viz. deduction, induction and abduction, I shall limit myself to a few observations.

First, a preliminary remark regarding the taxonomy of the types of reasoning. It is worth noticing, perhaps, that Polish logicians (more specifically Łukasiewicz, Ajdukiewicz, Kotarbiński, Czeżowski and others) invested much effort and time to invent a clear-cut taxonomy of various types of reasoning, and it might be of some interest to compare the intuitive ideas underlying their efforts with those guiding the taxonomy suggested by Peirce. More specifically, it should be observed that, roughly speaking, abduction corresponds to the type of reasoning which Polish logicians preferred to call reduction.

But let me turn to the heart of the matter. What - according to Peirce - makes a specific form of reasoning good? No single answer to this question was offered by Peirce, rather he approached the problem in several alternative ways. Certainly, he looked at *logica utens* and by the process of suitable refinements tried to transform it into *logica docens*. But to say that a specific logical method is good because it is the refined version of a method actually applied in science may suffice as a justification of the method only if we uncritically accept the methods applied in science and, moreover, if we believe that the refinement proposed adequately grasps the essence of the method in question.

Let me dwell on this point. If we believe that science develops closer and closer to the truth, then it is only natural for us to believe that the methods applied in science are constantly improving. Moreover, upon the same belief, if a specific method proves to be unhealthy, then, perhaps not immediately, but after a sufficiently long period of time, scientists may be able to discover its deficiency and, consequently, may either improve upon the method or discard it altogether. The process of growth of science is a self-correcting process.

This may help us to grasp more adequately some rather crucial elements of Peircean philosophy. It should be remembered that Peirce distinguished four methods of fixing beliefs: tenacity, authority, the *a priori* method, and the method of science. Although each of these may be useful, the latter two were considered by Peirce to be of special significance. The description of the *a priori* method provided by Peirce (*CP* 5.392) corresponds in a striking manner to Fleck's description of the formation of "styles of thought" (*Denkstile*) (Fleck 1930). The method consists in a gradual harmonization of beliefs through the exchange of ideas among members of the scientific community, thus arriving at the stage when all members become able to see things in the same way. But Fleck and Peirce disagree rather radically as to the role of *Denkstile* or, alternatively, the *a priori* method. Fleck believed that different styles of thought could not be compared with one another, that it senseless to say that one of

them is better than another, and thus, that the substitution of one *Denkstil* by another could not be analyzed in terms of improvement. Peirce, on the other hand, treated the *a priori* approach as a stepping stone on the way to the scientific method. The essence of the divergence is clear: Peirce believed in the growth of science while Fleck was one of the earliest critics of that idea.

Actually, the three methods, of tenacity, of authority and *a priori* were viewed by Peirce as steps towards discovering the scientific one. Moreover, scientific ways of arriving at the truth must be looked for among those that are consistent with the three methods in question.

But a different way of deciding whether a method is scientific is to examine whether the method is infallible. Let me comment on this idea.

One who is familiar with Tarski's conception of consequence operation, must be struck by the Peircean idea which dates from his 1869 lecture series on British logicians, that, in order for an inference to be good, it must preserve truth. That idea is precisely the idea that was formalized by Tarski (Tarski 1936). But Tarski and Peirce were of dramatically different philosophical persuasion. Tarski's theory of truth is an implementation of the correspondence theory. Thus, as I have already mentioned, while Tarski could use the notion of truth in order to define sound inferences, Peirce could not use his notion of truth for that purpose without being inconsistent with himself. And indeed, I do not believe that he used it in that way. His penetrating analyses of the soundness of various kinds of reasoning that consisted in an evaluation of the chances they provide for leading us to the truth should not be seen as attempts at a definition of soundness. Rather, they were meant as a kind of pre-selection of the best candidates for scientific methods.

I am afraid that the way in which Peirce presented his ideas was often unfortunate. Not that Peirce failed to articulate himself in a clear manner, though various parts of his writings are not easily intelligible. What I have in mind is that Peirce tended to settle the matters he discussed in an authoritarian manner, to impose his views on the reader, rather than confronting him through an unbiased dispute with alternative ones. And perhaps, contrary to the spirit of his philosophical system, he seemed to believe that he alone was able to discover truth, though – according to his own doctrine – truth is what might be established only through the long social process of scientific investigations. This might explain why he classified some methods as scientific but failed to present arguments that would sufficiently support his view.

On second thought, however, there may be something deeply unjust in my accusing Peirce of an authoritarian attitude. His style was marked by a continual search for the ultimate solution, and in doing so he made use of several approaches and numerous variations of his ideas. Does not that prove that doubt, critical re-examination, and dissatisfaction with the results

achieved were typical of his work? Surely it does. And of course, one who keeps this in mind, would treat the authoritarian style of Peirce's writings as a disguise, or a rhetoric figure, rather than a manifestation of a genuine trait of the great thinker.

On the other hand Peirce rightly insisted that we must trust the faculties by which we acquire our knowledge as well as we must trust our ability to judge things properly. Scepticism, if overdone, hinders the growth of science, and thus, if we care for its progress, we are bound to uncritically accept some views as well as some methods applied in science. A point of discussion might be whether the "uncritical acceptance" suggested by Peirce should be understood as an acceptance that would block once and for all waiving the accepted view. I doubt this. 'Uncritical acceptance' must not be interpreted as dogmatic acceptance. Certainly, Peirce would agree that we should be prepared to give up any view, if by chance we discover a good reason to do so.

6. The final issue I want to comment upon concerns the relationship between the Peircean and the Aristotelian conception of truth. At first glance, these two conceptions are either inconsistent or incomparable or – if one prefers a more fashionable terminology – incommensurable.

Actually, I do believe that no keen student of the issue can think about truth without vacillating between the Aristotelian and the Peircean idea of truth. These two conceptions are complementary in a rather substantial sense. As Peirce believed himself and as it follows from the virtualistic interpretation of his view on the subject, his conception of truth is hardly intelligible without the hypothesis regarding the existence of objective reality. But if so, the question arises regarding the correspondence between reality and language, which, as we know from Tarski, is the central question regarding the Aristotelian theory of truth. On the other hand, in order to make the idea of objective reality intelligible, we must assume that, in one way or another, reality is accessible to us. But this in turn raises the question of the adequacy of the methods which make this reality accessible. Surely, whatever we know about objective reality, must be known through our methods of inquiry.

In spite of rather substantial metaphysical difference between the Peircean and the Aristotelian conceptions of truth, and more particularly, in spite of the fact that (under the Peircean terminology) the former is realistic while the latter is nominalistic, the two doctrines do not differ essentially unless the Aristotelian conception is paired with the belief that there is a reality inaccessible to us, i.e., a reality of which we cannot learn nothing. Indeed, if whatever exists can be learned, then reality may be defined in function of appropriately selected methods of inquiry. And in this way the Aristotelian and the Peircean views may be reduced one to the other.

But even if there should be an inaccessible reality, there still is a version of the correspondence conception of truth that is pragmatically (i.e., under the Peircean doctrine of pragmatism) equivalent to the conception of Peirce. I mean the version according to which a statement about an empirically inaccessible reality has no truth-value. In fact, this was exactly the conception of truth put forward by Kotarbiński, on which Łukasiewicz based his idea of three-valued logic. Now, from the Peircean point of view, inaccessibility of some part of reality is pragmatically equivalent to the fact that some questions are not decidable by scientific methods. The belief that such questions may exist motivated Peirce's criticism of the Law of Excluded Middle. Somewhat incorrectly this fact has been occasionally interpreted as an indication that Peirce was a precursor of three-valued logic.

7. The above discussed questions concerning the scientific method, and the relevance of those questions for the notion of truth belong to the area of investigations that, under the Peircean terminology, is covered by the term 'logic.' The way in which Peirce related logic to other philosophical disciplines, ethics and esthetics in particular, is well known. It may be of some interest to notice that Peirce was not alone in viewing truth as an ethical value. A very closely related position on the matter was held by Łukasiewicz. In fact, it seems to be held – at least implicitly – by anyone who, like Peirce, believes that the search for truth is the ultimate aim of scientific activity. For, if so, then truth becomes a kind of goodness scientists try to achieve. This may be an old-fashioned, not to say romantic idea of science, but one which perhaps we ought to try to keep alive.

Polish Academy of Sciences

REFERENCES

Fleck, Ludwik [1930]

Entstehung und Entwicklung einer wissenschaftlichen Tatsache. Einführung in die Lehre vom Denkstil und Denkkollektiv. Frankfurt am Main: Suhrkamp Verlag.

Łukasiewicz, Jan [1951]

Aristotle's Syllogistic. Oxford: Clarendon Press.

Łukasiewicz, Jan and Tarski, Alfred [1930]

Untersuchungen über der Aussagenkalkül, *Comptes Rendus des séances de la société des sciences et des lettres de Varsovie.* III,23:30-50.

Schröder, A [1890-1905]

Vorlesungen über die Algebra der Logik. Berlin.

Tarski, Alfred [1930]

O pojęciu prawdy w językach nauk dedukcyjnych (On the Concept of Truth in Languages of Deductive Sciences), *Travaux de la Société des sciences et des lettres de Varsovie*. Warsaw. See also: German version: Der Wahrheitsbegriff in der formalisierten Sprachen. *Studia Philosophica* Warsaw, 1933:261-405. English translation of the German version: The concept of Truth in Formalized Languages. In: Tarski 1956:152-278.

— [1936]

O pojęciu logicznej konsekwencji (On the Concept of Logical Consequence). *Przegląd Filozoficzny*, 39. English translation in Tarski 1956:409-420.

— [1941]

On the Calculus of Relations. *The Journal of Symbolic Logic*, 6.

— [1956]

Logic, Semantics, Metamathematics: Papers from 1923 to 1938, translated by J.H. Woodger. Oxford: Clarendon Press.