84
Notre Dame Journal of Formal Logic
Volume XX, Number 1, January 1979
NDJFAM

PEIRCE ON THE NATURE OF LOGIC

FREDERICK MICHAEL and EMILY MICHAEL

By 1860[1], at the age of twenty-one, Peirce had written some brief comments on logic.[2] By 1866, we find discussion of logic in a large number of unpublished manuscripts.[3] Even in this early period Peirce had developed a unique and innovative view of the nature of logic. It is our purpose in the following to examine the source and nature of Peirce's view of logic at this early period.[4]

Peirce's earliest comments on logic, those of 1860, as might well be expected, were not significant contributions to the field of logic. They are of interest, however, in showing the direction and nature of Peirce's initial concern with logic, as well as in showing that by 1860 at the age of twenty-one Peirce was seriously concerned with the field of logic. In a short paper written on June 23, 1860, (MS. 743), we find a concern with considering: (1) the nature of logic, and (2) the elements and principles of logic. We will examine his early discussion and innovations in relation to the first of these two areas. The first concern is expressed on the title page of the manuscript of 1860, (MS. 743):

> The RULES OF LOGIC LOGICALLY DEDUCED; with no attempt at Originality however but only at putting Old Ideas into a Suggestive Form; with special reference to the Question whether THE SYSTEM OF LOGIC is an ART and therefore to be constructed only with reference to convenience of Use after the Older Logicians or a SCIENCE and therefore to be an erection consisting of all the known LAWS OF THOUGHT after Hamilton and other smaller moderns.

The question of whether logic is an art or a science, a question vigorously discussed by Whateley, Bowen, Thomson and Hamilton, is not taken up in the manuscript of 1860. This question and more general discussion about the nature of logic is pursued in Peirce's 1865 lecture series. His approach towards examining the nature of logic and aspects of his solution take rise from his early reading, but much of the influence of his predecessors, we find, was negative, moving Peirce to criticize and correct positions that he found inadequate.

Received December 9, 1975

Peirce rejected the view that logic is an art out of hand.[5] Hamilton, as his followers Thomson and Bowen, present the 'Kantian' view that logic is a science which investigates descriptive laws of thought. Peirce agreed with the 'Kantians' that logic is a descriptive not a normative science, but he objected to the view that the subject matter of logic is thought. (Ms. 340). Such a view leads to pitfalls such as:

> Kantians, taking logic to give us laws of thought, assume that they do not apply to what cannot be thought. Hence, some make out that there is something of which it is not true that A is not not A. (Ms. 340).

Peirce distinguished his unpsychological view from this Kantian psychological view. According to Peirce, both thoughts and words are symbols; thoughts are internal symbols; utterances and inscriptions are external symbols. (Ms. 726). The subject matter of logic is symbols in general whether spoken, written or thought. Peirce thus says:

> Logic needs no distinction between the symbol and the thought, for every thought is a symbol and the laws of logic are true of all symbols. (Ms. 340).

Logic, Peirce argued, investigates the necessary laws of all symbols whether these are internal symbols (thoughts) or external symbols (utterances and inscriptions). Thus logic investigates thoughts, but only insofar as thoughts are symbols; in this way we can avoid the psychologism involved in the view that led logicians to argue about how we in fact think and what can be thought rather than to deal with the necessary relations between all symbols, whether they are actually thought or not. Logic, then, is not concerned with the empirical but with the logical structure of thought; as such, it deals not with how we in fact think, but with logical relations between symbols. From this viewpoint, Peirce objects to Hamilton's justification of quantification of the predicate "on the ground that the predicate is quantified in thought" for "he is going beyond the bounds of logic", (Ms. 741). Peirce claims that "in logic we are not occupied with cognition or the mode of cognition, but only with the forms of representation", (Ms. 741), that is, only with formal relations between symbols. In support of his position, Peirce offers the following example, (Ms. 726): Consider an argument in a language no longer understood. We would not say that such an argument was valid when it was understood and thought, but now that no one can understand it, it is no longer valid. The argument is valid, Peirce tells us, by virtue of the relation between symbols, whether they are understood and thought or not. Peirce thus maintains:

> the unpsychological view makes that systematically evident, which it would seem were otherwise sufficiently axiomatic, that these laws apply not merely to what can be thought but to whatever can be symbolized in any way. And hence extends their validity to all subjects of argumentation whatever. (Ms. 340).

Anything that can be symbolized can serve as the subject of argumentation and, as such, is subject to the logical laws that apply to all symbols.[6]

Peirce describes logic, more specifically, as "the science of the conditions which enable symbols to refer to objects", (Ms. 340). This somewhat obscure formula, advanced by Peirce as early as 1864 and maintained consistently thereafter, appears to derive from Kant. Peirce quotes Kant as saying: "Truth is the conformity of a representation to its object." (1.559). Truth, according to Peirce, is "the reference of symbols to objects", (Ms. 919). This differs from Kant's definition in the following respects: truth is restricted to symbols, which are, according to Peirce, one kind of representation (1.558); also Peirce uses 'reference' as Kant uses 'conformity' and as we might perhaps use 'correspondence'. Logic, as the science of conditions which enable symbols to refer to objects then treats—as Peirce says (1.559)—"of the formal conditions of the truth of symbols". This is somewhat misleading, however, since there are, Peirce holds, symbols that refer to no objects—terms, e.g. 'man', 'white'. (1.559)[7] Symbols which refer to objects are, for Peirce, propositions and arguments. Truth, for Peirce, then consists in the reference of propositions and arguments to objects.[8] Logic, as the science of the conditions which enable symbols to refer to objects is then the science of truth conditions of propositions and arguments.

In his 1865 lecture series in which Peirce makes his case against psychologism in logic, Peirce also objects to the view that logic is normative. Logic, he maintains, describes the necessary relations between symbols used in reasoning; it does not prescribe how we ought to reason. He says:

> It has been supposed that the laws of logic might be broken. That they say 'Thou ought' not 'Thou shalt', that, in short, they are statements not of fact but of debt. But why ought we to be logical? Because we wish our thoughts to be representations of symbols of fact. It is evident therefore that logic applies to the thought only in so far as the latter is a symbol. It is to symbols, therefore, that it primarily applies. Now by recognizing this fact it becomes plain at once that the objects of these laws cannot but comply with the laws; and hence that the whole idea of their being 'normative' is false. (Ms. 340).

The theory to which Peirce here refers appears to be one which holds that improper reasoning is akin to improper grammar or improper manners: the laws of logic are seen as only the approved rules of conduct, prescribing how we ought to conduct ourselves in reasoning. Peirce counters, in effect, that as chemistry seeks to analyze relations between chemical structures to gain knowledge of their elements and the laws of the relations between these elements, logic seeks to analyze logical structures, viz., valid arguments, to gain knowledge of their elements (symbols) and the laws of the relations between these elements. The laws of symbols are no more prescriptive than the laws of chemistry. Logic, as descriptive of symbols, describes the necessary relations between thoughts; it analyzes and describes valid reasoning.

In later years, Peirce comes to *espouse* the view that logic is normative. This looks like a radical about face, and it may suggest that Peirce

came to regard his earlier views as basically wrong. Such however is not the case. The reason Peirce changed his view is explained in the following passage:

> We have a general ideal of sound logic. But we should not naturally describe it as our idea of the kind of reasoning that befits men in our situation. How should we describe it? How if we were to say that sound reasoning is such reasoning that in every conceivable state of the universe in which the facts stated in the premises are true, the fact stated in the conclusion will thereby and therein be true. The objection to this statement is that it only covers necessary reasoning, including reasoning about chances. There is other reasoning which is defensible as probable, in the sense that while the conclusion may be more or less erroneous, yet the same procedure diligently persisted in must, in every conceivable universe in which it leads to any result at all, lead to a result indefinitely approximating to the truth. When that is the case, we shall do right to pursue that method, provided that we recognize its true character, since our relation to the universe does not permit us to have any necessary knowledge of positive facts. (1.608).

The difficulty which Peirce sees in his earlier position is that it does not accommodate inductive arguments, arguments which, though not valid, may nonetheless be good. The switch from talk of argument to talk of reasoning is instructive here. It is not the individual inductive argument that leads us to truth; even the best inductive argument may fail to be true. What is characteristic of good inductive arguments is that they exemplify a pattern of reasoning which reliably, if not invariably, leads to truth.

Now let us investigate what, for Peirce, the norms of logic might be. Inasmuch as Peirce identifies conformity to custom with "conformity to norm or exemplar" (1.586), one may suppose that, for Peirce, the norms of logic are merely the dictates of logical custom. That however would be a mistake. Peirce explains his use of 'norm' as follows: "I never use the word *norm* in the sense of a precept, but only in that of a pattern which is copied, this being the original metaphor." (1.586). Of the norms of logic, he says: " . . . we all have in our minds certain *norms* or general patterns of right reasoning, and we can compare (any) inference with one of those and ask ourselves whether it satisfies that rule." (1.606). The norms of logic, then, are not the dictates of custom and they are not directives; they are rather patterns or paradigms of correct reasoning. As Peirce conceives of a norm of logic, it would appear to be a pattern of argument satisfying the condition that if its premises are true, its conclusion also is, or is likely to be true.[9]

Given Peirce's understanding of norms, we may conclude that though, for him, logic is normative, it is not thereby prescriptive. Whether an argument conforms to a norm of logic, for him, is just a question of fact. Thus he says:

> Granted that there *is* such a thing as reasoning, then I say there is a distinction between good and bad reasoning, and whether a reasoning be good or bad is not at all a question of how men feel or think, it is a question of fact. (Ms. 750).

NOTES

1. This project was supported by a grant from the Research Foundation of the City University of New York (Grant No. 11221).

2. Ms. 743. (All manuscript numbers refer to "The Charles S. Peirce Papers", at the Houghton Library of Harvard University, as catalogued by R. Robin in his *Annotated Catalogue of the Papers of Charles S. Peirce*, University of Massachusetts Press, 1967.) There are also scattered comments about logic in a number of early manuscripts, e.g. Mss. 920, 921.

3. Mss. 340-350, University Lecture series presented at Harvard in the spring of 1865 on the philosophy of science; Mss. 351-359, Lowell Lectures on the Logic of Science, 1866; Ms. 339, Ms. 802, etc.

4. In a small notebook of 1860, entitled *List of all the Books in the House*, (Ms. 155a), we find among the large number of books listed, the following titles of works in or relevant to deductive logic: Whateley's *Elements of Logic*, Kant's *Critique of Pure Reason*, Aristotle's *Organon*, Thomson's *Outlines of the Laws of Thought*, Mill's *System of Logic*, Hamilton's *Lectures on Logic*. There is reason to believe that this list is a good guide to the works on logic that Peirce had read by 1860 on the basis of, for example, later autobiographical comments by Peirce and books assigned for his college courses.

   By 1865, Peirce had read, in addition to the above mentioned works, Boole's *Laws of Thought*; he devotes two of his University lectures of 1865 to the discussion of Boole's algebra of logic. (Mss. 342, 344). In his 1866 lecture series, he refers to De Morgan's *Formal Logic*. (Ms. 353). In 1866, Peirce also began to display an interest in Scholastic Logic. (Mss. 351, 352).

5. e.g. in Ms. 340.

6. Psychologism was attacked by Frege and Husserl at the turn of the century. Peirce clearly saw and expressed the problems of psychologism as early as 1865, and he attempted by his approach to "avoid all possible entanglement in the meshes of psychological controversy." (Ms. 726).

7. According to Peirce, terms determine only qualities, not objects; it is propositions that refer to objects. (1.559). Then what of proper names? These, though terms, certainly seem to refer to objects.

8. This characterization of truth applies to arguments, inasmuch as arguments, as Peirce had discovered by 1867, are representable as conditional propositions, the consequent of which is the conclusion of the argument, the antecedent being the conjunction of its premises. *cf.* 3.440.

9. We may conclude that Burks is mistaken when he says in "Peirce's Conception of Logic as a Normative Science" (*The Philosophical Review*, 1943, p. 191), "The discovery of . . . ideal methods (of investigation) is just the task of logic. They will serve as norms to guide our thinking. That is why logic is a *normative* science." Although a method is a prescription, a norm, according to Peirce, is not. Also, while a method is not a pattern (although it may *follow* a pattern), a logical norm, as Peirce understands it, is a pattern; it is a pattern of correct reasoning.

Brooklyn College
Brooklyn, New York