

Peirce, Logic, And A Strategy Of Liberal Education: Musements And Speculations

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To begin his instruction in logic at The Johns Hopkins University for the year 1882-3, C.S. Peirce delivered a lecture in which he detailed his appraisal of the overall value of "logic" for university work. President Daniel Coit Gilman, faculty, and students, including soon-to-be Peirce student John Dewey, were invited. What they heard urged in that lecture as "logic" was something apparently much larger in scope than what we would expect to find associated with the term today. As Max Fisch noted in his 1977 *Ars Semiotica* contribution "Peirce's Place in American Thought," this meaning of the term counts logic as "the *art* of devising methods of research – the method of methods." Consequently, this art, this method of methods otherwise known as pragmatism, is recommended as a constant object of concern and instrument of research and learning: it anchors a liberal education and informs us, in Fisch's language, of "*the* strategy of liberal education" (Fisch 1986: 308-9, emphases added). Thus, pragmatism, this art of devising methods, may not only provide a kind of methodological umbrella under which we employ and choose amongst various subsidiary methods, but may actually guide the progress of each subsidiary method of learning and research. Peirce remarked:

This is the age of methods; and the university which is to be the exponent of the living condition of the human mind, must be the university of methods.

Now I grant you that to say that this is the age of the development of new methods of research is so far from saying that it is the age of the theory of methods, that it is almost to say the reverse ... And it must be confessed that we students of the science of modern methods are as yet but a voice

crying the wilderness, and saying prepare ye the way for this lord of the sciences which is to come.

... when new paths have to be struck out, a spinal cord is not enough; a brain is needed, and that brain an organ of mind, and that mind perfected by a liberal education. And a liberal education – so far as its relation to the understanding goes – means *logic*. That is indispensable to it, and no other one thing is.

... a young man wants a physical education and an aesthetic education, an education in the ways of the world and a moral education, and with all these logic has nothing in particular to do; but so far as he wants an intellectual education, it is precisely logic that he wants; and whether he be in one lecture-room or another, his ultimate purpose is to improve his logical power and his knowledge of methods. To this great end a young man's attention ought to be directed when he first comes to the university; he ought to keep it steadily in view during the whole period of his studies; and finally, he will do well to review his whole work in the light which an education in logic throws upon it. (CP 7.62f.)

To round off these remarks by Peirce I may add, by way of an expanded paraphrase, that in actually *devising* a liberal education, a spinal cord of so-called coherence or required courses is indeed not enough to best fill the bill: the organizing and over-arching brain of pragmatism, however, *is* needed, and especially in this latter sense of "review."

The lecture in which these remarks occurred began Peirce's fourth year at Johns Hopkins. The Hopkins years were the period in which his single doctoral student, Alan Marquand, was finishing his dissertation on the logic of Philodemus, the same period during which the volume *Studies in Logic by Members of The Johns Hopkins University* was produced under Peirce's editorship, and was also the period

in which he and Marquand made foundational strides in the design of modern, electrically driven computing machines (see Ketner and Stewart 1984, in this regard). In spite of all these and other efforts, this fourth year at Hopkins was to be his penultimate one there: the President and Board of Trustees abolished the position of Lecturer in Logic after the fifth year.

Fisch, in that same *Ars Semiotica* contribution, described this fifth year of Peirce's as "... the strongest bid that has ever been made for the centrality of logic in the economy of research and in the strategy of liberal education," observing that with the abolishment of Peirce's lectureship Hopkins irrecoverably lost its then leading position in the field of logic. He also observed that "... the central position in higher education which Peirce envisaged for logic has not been attained by logic as now taught in departments of philosophy or of mathematics. It is nearly as obvious that logic as now taught does not merit that position" (Fisch 1986: 309; 320).

While remembering that these remarks by Professor Fisch are now almost two decades old, I still believe his verdict in these matters was right, and on both counts. For the present, though, let us consider whatever Hopkins in particular may have lost by way of leadership in this matter as not of as much concern as the fact that there remains a clear difference, in scope if in no other regard, between what Peirce in that opening lecture recommended as logic-as-pragmatism and what Max Fisch meant as "logic as now taught." With the phrase "as now taught," perhaps Professor Fisch had in mind the familiar and often repetitive routine in introductory and so-called "critical thinking" courses of a listing of informal fallacies of relevance of evidence and ambiguity of expression, a handful of syllogistic routines usually including *modus ponens* and *modus tollens*, and some rudimentary calisthenics in induction by simple enumeration. All these Peirce would have quickly deposited, in his classification of the sciences, as but a fraction of the area he called "Critic."

But what Peirce meant by "logic," when speaking as he did at Hopkins about the student, "... whether he be in one lecture-room or another, his ultimate purpose [being] to improve his logical power and his knowledge of methods" and that "... finally, he will do well to review his *whole work* in the light which an education in logic throws upon it," was surely the broader compass of logic-as-pragmatism or logic-as-semiotic: the abductive or retroductive formation of hypotheses, their experimental testing, and the careful observation of the relevant results. That's my guess, at least. And we should not forget, in passing, that Peirce considered himself and all serious intellectual workers to be, first and last, *students*.

Now if we grant, for the moment, that this is indeed what Peirce meant, we might want to ask ourselves just how this odd-seeming variety of "logic" might actually exercise itself in university work. Could it serve as a unifying thread throughout a course of studies, as Peirce implies? To investigate this possibility, let us indulge ourselves by assuming that the university to whose work this logic of discovery shall be applied is one that has already provided itself a certain degree of coherence for its students, a "spinal cord," if you will, by way of a standard collection of required courses or, perhaps better still, an actual "core" curriculum. The question would then become, how could this logic of discovery known as pragmatism serve as the unifying factor in a university's core structure and, by implication, beyond it? This would seem to be the sort of strategy implied by Peirce's recommendation that this logic of discovery be applied from the outset of university work, maintained throughout its duration, and invoked at the conclusion as a technique for review, summation, and further work. This made sense in 1882 at Johns Hopkins and is not an idle speculation even today. Dozens of colleges and universities and at least two national organizations are already pondering such core curriculum questions.

I take it as a truism, I hope you will too, and I am confident Peirce did, that the overall point of a liberal education, much less a

liberal education with a well-designed core curriculum to anchor it, is to foster the acquisition and development of knowledge, namely, a "knowledge of methods." My point here, and Peirce's as well, is that the best and most generalizable way to so foster such competence is along pragmatic lines. Of the various explanations of pragmatism given by Peirce himself, the following one, provided in his proposed 1907 article for *The Nation* entitled "Pragmatism," is entirely suitable for our present understanding of this guiding principle.

The method of pragmatism is simply the experimental method, which, (taking the word "experiment" in its widest sense, so as to make it applicable to cases in which the fulfillment of the conditions has to be waited for instead of being artificially produced) is the invariable procedure of all successful science. Thomas Beddoes showed, as early as 1792, that it is the procedure even of mathematics. (Peirce 1907/MS 320: 29)

Pragmatism, as the method *of* methods, then, would function in the realm of the acquisition and development of our knowledge *of* methods as an analogue of evolution in the realm of biology. Thus, in core matters, the special or subsidiary methods of various disciplines would, within themselves and overall as a group, be approached as explanatory hypotheses. Overall, these hypotheses would be subject to retention, modification, or rejection in any given area of inquiry according to the observable consequences of their having been tested, rather like individuated species being subject, genetically, to retention, modification, or rejection in any given environment according to the observable consequences of *their* having been "tested." Just as evolution, as an overall method of methods, examines the compatibilities of various species against their environments, so pragmatism, as an overall method, would examine the compatibilities of those special subsidiary methods we call disciplines, including logic-

as-Critic, against their environments or problem areas. Thus, Pragmatism, the logic of discovery for research methods, could function in university work rather like the filtering and choosing mechanism of the oft-mentioned hypothetico-deductive process, thus asking: which subsidiary method produces the best-seeming sensible or publicly observable explanatory effects? Hilary Putnam has pointed out that this hypothetico-deductive process, in requiring retroduction or abduction, is actually *nondeductive* in overall character (Ketner and Putnam 1992: 60). And this would seem to safeguard such an application of pragmatism in university work from the irrational pitfalls of what Peirce elsewhere described as irreflectively going by a "rule of thumb" (Peirce 1900/MS 831: 11).

This same logic of methods could not only so guide our employments of various subsidiary methods in university work overall, but could also guide our progress *within* any given discipline, as when we, in mathematics, for example, pass in our studies from arithmetic to plane geometry, or when we, in classical music, for example, pass from a basic ability to read a single treble clef to that of reducing a full orchestral score, at the piano, at sight. Each subsidiary method, like our logic of discovery overall, has its pragmatic part; an experimental posture is taken both in how we conduct ourselves towards new knowledge items within a subsidiary method and in how such methods themselves function. This is reflected by the mathematical component of each subsidiary method, and principally so, sometimes even exclusively so, in the sense that this mathematical component is a component of mathematical, abductive, or pragmatic *reasoning*. A comparison may help illustrate this point.

If one were set the problem of solving an unfamiliar difficulty in topical geometry or topology, assuredly not only mathematical/abductive/pragmatic reasoning would be used, but the most familiar nomenclature of mathematics, numbers, would also be employed. But if one's task were to construct a method of research that would allow a rational move of learning and understanding from, for ex-

ample, a familiar, metrically-sized reality like Renoir's *Monet Working in His Garden* (Gaunt 1970: 96) to a completely unfamiliar, theologically-sized reality like Van Eyck's *The Last Judgement* (Janson 1966: 275), a comparison of mere numbers would not be of much assistance, but an employment of pragmatism would be not just helpful, but *required*. That is, we move from the "known" of *Monet Working in His Garden* to the "unknown" *Last Judgement* by means of a trial-and-error, experimental, pragmatic process. And pragmatic reasoning was to be found in its purest form, for Peirce, in mathematics: "the only one of the sciences which does not concern itself to inquire what the actual facts are, but studies hypotheses exclusively" (Peirce 1898/MS 437: 20). At least this is so in mathematics' most "mathematical" regions, like topology.

According to Peirce's classification of the sciences, mathematics stands, as the abstractest science of investigation, at one end of a continuum. Immediately after it we find philosophy, which begins a mixing of mathematical/pragmatic reasoning with concerns for "the actual facts" which eventually leads to what Peirce called special sciences, of which the most fact-laden, in this sense, are the applied sciences or arts. But we are reminded that "every science has its mathematical part, in which the certain results of the special science are assumed as mathematical hypotheses" (Peirce 1898/MS 427: 20-26; esp. 23). An informative version of this continuous scheme of things follows.

MATHEMATICS

PHILOSOPHY

Phenomenology

Normative Sciences

Esthetics

Ethics

Semiotics [logic in the general sense]

Speculative Grammar

Critic [logic in the narrow sense]

Methodetic

SPECIAL SCIENCES [Physics, Psychics, etc.]

(from Ketner 1983: 336)

Pragmatism can serve, in a strategy of liberal education, not only as the guiding principle for selecting between and amongst various subsidiary, specific methods in the search for knowledge. It can also guide our passage from plain, ordinary ignorance to knowledge within these subsidiary methods or disciplines themselves. This biological, evolutionary approach includes and requires the basic hallmarks of pragmatism itself: experimentalism, trial and error procedures, a tolerance for plain guessing, self-correction in and of methodologies, and an embrace of and elimination of error. Thus, pragmatism, as umbrella, covers or includes a variety of "sub-pragmatisms" and, in point of fact, *requires* them for its complete realization. Its basic anatomy and physiology, as implied above, consists of a triadic structure whose components may be enumerated as 1) formation of an explanatory hypothesis that is alleged to explain or make plain 2) a given knowledge problem, with the success of this hypothesis being measured not by a strict, dogmatic adherence to any supposed *a priori* certainty, but by 3) clear-headed observation of its presently observable and, equally if not more importantly, its *conceivable*, publicly observable consequences, those results that must be waited for instead of being artificially produced." To close, now, this just might

be the guiding principle of "logic" in that kind of strategy of liberal education suggested by Peirce, noted by Fisch, and hoped for by myself and others.

Notes

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-----1900. Our Senses as Reasoning Machines. MS. 831.

----- 1907. Pragmatism. MSS. 318, 319, 320, 321.