HISTORIA MATHEMATICA 9 (1982) 326-332

CAROLYN EISELE'S PLACE IN PEIRCE STUDIES

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SUMMARIES

Carolyn Eisele's unique, ongoing career as a scholar is sketched, and the importance of her contributions to Peirce Studies and other fields is emphasized. The essay concludes with a series of suggestions about how to interpret Peirce's works based on themes related to the pioneering efforts of Dr. Eisele.

Carolyn Eisele poursuit une carrière originale dont nous présentons un aperçu. Nous mettons en évidence l'importance de sa contribution à notre connaissance de Peirce ainsi que son apport dans d'autres domaines. Notre essai se conclue par une série de suggestions sur l'interprétation que l'on peut donner aux oeuvres de Peirce en se basant sur quelques thèmes issus des efforts de cette pionnière qu'est Carolyn Eisele.

Es wird die einzigartige Karriere von Carolyn Eisele als Wissenschaftlerin skizziert und dabei die Bedeutung ihrer Beiträge zu Peirce-Studien wie auf anderen Gebieten betont. Der Essay schließt mit einer Reihe von Vorschlägen dazu, wie die Werke von Peirce in Verbindung mit den bahnbrechenden Bemühungen von Frau Dr. Eisele zu interpretieren seien.

The essays collected here honor two remarkable American scholarly careers, those of Charles Sanders (some add Santiago) Peirce and of a major interpreter of Peirce's works, Carolyn Eisele. We intersect with Eisele's career at a time when she has completed two major projects--her edition of Peirce's mathematical works in *The New Elements of Mathematics by Charles S. Peirce*, and Richard Martin's collection of her numerous essays on Peirce. The former is vitally important because it shows that Peirce was a master mathematician and that his work in philosophy and logic is baptized in the spring that flows

0315-0860/82/030326-07$02.00/0

from mathematics and science. The latter work, Eisele's own *Studies,* I personally regard as the best book about Peirce by a single author yet to appear, and essential reading for anyone who professes more than a superficial understanding of our country's great scientific philosopher. Moreover, she is presently engaged upon at least two other contributions: an edition of Peirce's work as a historian of science, and a monograph on Peirce's mathematically based philosophy. All of this effort will be significant in making Peirce's thought more readily accessible to contemporary discussions wherein it can render considerable aid. We who know her note with pleasure and satisfaction that her projects are coming to fruition and that her important work continues.

Here, on this occasion in New York City, it is appropriate to say something about Carolyn Eisele, her personal history and career in scholarship and education, and to be cheered by her successes thus far. She is a pure New Yorker, having been raised in Manhattan and educated at Hunter High School and Hunter College, with graduate work at Columbia University and later at the University of Chicago. Early in her academic career, she suffered, as did others, from the biases, some of which were institutionalized, against women, especially those who sought successful, independent, professional careers. It is interesting to note in this connection that Peirce was a pioneer in trying to reverse such trends in his own day. This was no doubt one of the first successful tests of her spirit, and perhaps part of the reason for its great strength. Having been recognized by some insightful and courageous academic leaders as a teacher of great promise, she soon became a regular member of the Hunter College Department of Mathematics, progressing from Instructor in 1923 through the rank of Full Professor in 1965. This is even more remarkable when one considers that although undisputably an able candidate who had completed virtually all the degree requirements, she was prevented from completing a doctoral degree by circumstances beyond her control. I am pleased to say that my own institution, Texas Tech University, conferred the doctorate upon Professor Eisele in 1980. Technically, this was an honorary degree, but we all know it was earned many times over. In presenting the degree, we were forced to waive the usual predegree formalities, for, to paraphrase the great Kittredge, Peirce's Harvard exposition teacher, "Who would we have found to examine her?"

Beginning with her paper on the *Liber Abaci* [reprinted in Eisele 1979, 11-34], she launched a series of research projects in which she has conclusively shown that Peirce was a master mathematician and scientist and historian, and that his work in philosophy and logic is *not* separate from, nor separable from, but arises out of, mathematics and science. Most scholars of Peirce have assumed that his philosophy could be properly under-

stood independently of his work in mathematics and science, but Eisele has established that this assumption is not a fact but a hypothesis, and has defeated it, and thereby has reversed the flow of Peirce studies. In the course of demonstrating this basic thesis, which we now ought to call Eisele's Law, she has traveled literally to all the civilized ends of the earth (and to some uncivilized parts also) to pursue her research at the sources and to report her findings to colleagues in many disciplines at international congresses and meetings.

I first became closely acquainted with Carolyn Eisele in 1975 when, due to a surprising conjunction of circumstances, she assumed responsibility for organizing the first international Peirce congress, held in Amsterdam in 1976 as a Bicentennial Event under the patronage of the United States Ambassador to The Netherlands, Kingdon Gould, Jr. I volunteered to help with this project, a step I have never regretted (although she worked me unmercifully), for I was thereby able to observe her scholarly and organizational abilities at first hand and to learn from her unwreckable spirit which torpedoed obstacles as quickly as they dared to sail within range. I am happy to report that the *Proceedings* of this congress is now available from Texas Tech University Press (1981, *Proceedings of the C. S. Peirce Bicentennial International Congress*), and represents, as did the Congress it reflects, another tribute to Carolyn Eisele's leadership and vision.

I know that Dr. Eisele is still concerned that scholars of Peirce may bypass without notice her well-documented findings about the sources and fundamental nature of his philosophy. I for one am grateful to her for this basic and far-reaching lesson in logic. I hope she will permit me, as a further tribute to her as a teacher of teachers, to sketch how her work has inspired me to look into Peirce's mathematics in the way she recommends, to illuminate properly his philosophy--that is to say, so that it may be accurately understood. In conducting this interpretative exercise, I shall, as the saying goes, be standing on her shoulders. I shall give my results in the briefest form, saving elaboration for another time.

For several years I have been aware that Peirce placed a high value on his Existential Graph system of logic. (The essential book for a more detailed discussion of Peirce's graphical logic is [Roberts 1973].) He developed this system in the 1890s and used it profusely thereafter. I resolved to learn how to use it for basic logic, initially in order to understand Peirce, and perceived that it is a powerful logical calculus, one which gains in power because of its visual appeal and the fact that it has only five rules. Indeed, it is such a facile system that I have used it with considerable success as the basic calculus in my introductory logic courses for the past

few years. Having seen these results in the classroom, I resolved to try to understand why this system of Existential Graphs functions so well, and to try to find out why Peirce valued it as a general philosophical tool.

My first results along these lines were presented in 1980 to the Semiotic Society of America meeting in Lubbock, Texas. One reason Peirce thought highly of this system was that in his view, Existential Graphs provided a moving picture of semiosis (seem-eye-OH-sis), the process of sign action [Ketner 1980]. This conclusion concerning Peirce's position follows from two well-documented statements: (1) All thought is in signs [Ketner 1980, 26]; and (2) Existential Graphs provide a moving picture of thought [Peirce ms 298]. From this one concludes that Existential Graphs provide a moving picture of the sign process or semiosis; when this is coupled with other comments by Peirce, it follows that he seemed to have thought that Existential Graphs offered the best example of semiosis. The next question, then, is "What is it about the Existential Graph system that makes it the best example?" I suggest that it is not the graphic drawings themselves that are to be understood as examples, but that the whole process of using this graphic system, in its fullest context, is the example. This process, it seems to me, is simply the entire apparatus of objective or scientific or philosophic method, as Peirce conceived it. I shall advance only a few select considerations in support of this guess.

If one looks for other statements about Existential Graphs, particularly ones that show how they fit into the overall Peircean philosophic system, it becomes clear that he applauded them because they were a fine instance of what he called "diagrammatic thought." They are only one kind of diagrammatic thought, but a particularly fruitful and powerful instance of such thought for the purposes of philosophical understanding. In Peirce's account, the total category of diagrammatic thought was simply mathematics in general--mathematical thought is the thought that works by diagrams, more precisely through construction of diagrams and experimentation upon them, to reach objectively confirmed conclusions. To quote Peirce, the method of treating a problem mathematically is "constructing some sort of diagram representing that which is supposed to be open to the observation of every scientific intelligence, and thereupon mathematically--that is intuitionally, deducing the consequences of that hypothesis" [quoted in Eisele 1979, 277].

"Intuitionally!" the philosopher in me screams! This cannot be, because if Peirce had done no other thing in philosophy, he would be famous only for his refutation of epistemic intuitionism in his great series of three anti-Cartesian essays which began with "Questions concerning certain faculties claimed for man" [see Ketner 1977, 26]. "Don't collapse on reaching the first problem," I can hear the spirit Carolyn Eisele exemplifies saying, so I look a little further and find, in his review (1895)

of Klein's book on Riemann [Ketner & Cook 1978, 106], Peirce assuring us that "attentive intuition" in mathematics is not intuition in the anti-Cartesian sense of the "Questions" article. It is probably another way of focusing our attention upon a crucial aspect of diagrammatic reasoning. Thus, when a diagram is made available to the mathematical method, we begin to experiment on the diagram, creating small and very evident changes, either simple additions or simple omissions. These steps are so small and evident that any objective intelligence will come to agree that each is a correct step: that which is small and evident by way of transformation is what is "intuitive" mathematically for Peirce.

To summarize, Peirce regarded mathematical thought as an observational, experimental, and fallible objective (scientific) method. Moreover, it provides us with a very cheap experiment--the only cost is that of constructing the diagram and time spent observing it in search of as yet unnoticed relationships. Still another benefit of mathematical method, Peirce thought, is that it gives one the greatest possible generality, since the last step in the method is to generalize the results attained in earlier procedures [Eisele 1976, 3:749]. This last point suggests that even semiotic, the general theory of signs, might be the result of the application of mathematical method to a particular problem area, else semiotic would not possess the extreme generality it has.

Peirce's account of the nature of mathematical thought bears interesting resemblances to the current school of Brouwer, the so-called Mathematical Intuitionists (see selections in [Benacerraf and Putnam 1964]. Some preliminary study shows that Brouwer was associated with Mannoury and the Signific Group in The Netherlands. The Signific Group is very significant, for its members were disciples of Victoria Lady Welby, the founder of significs, who was solidly influenced by Peirce. Peirce had even sent her some accounts of his Existential Graphs (see the Peirce/Welby correspondence in [Hardwick 1977]). I am pursuing this matter further, and I see good reason to believe that Peirce's account of diagrammatic thought might deal more effectively with some issues addressed by mathematical intuitionism. But that is a future task.

With the forgoing in mind, perhaps we can now appreciate why Peirce wrote to his friend, Judge Russell, that it was his business "to apply the ideas of mathematics in philosophy" [Eisele 1979, 277]. This also lends support to claims that Peirce had a philosophy amounting to a unified theory of objective methodology, or at least a philosophy that equals a theory, itself advanced as an objective hypothesis, concerning where objective (nonarbitrary) method is to be found, how such method functions, and what such method presupposes. Peirce's answer in part is that it is encountered almost everywhere in human affairs, but that its purest form is found in mathematical

method. Further confirmation of this interpretation was presented in Professor Eisele's paper on the *Liber Abaci*, wherein she noted an important statement by Peirce: "From the moment when I could think at all, until now, about forty years, I have been diligently and incessantly occupied with the study of methods of inquiry, both those which have been and are pursued and those which ought to be pursued" [Eisele 1979, 11-34].

In conclusion, let me offer one additional suggestion which arose from a comment Professor Eisele once made to me. She remarked that Peirce's pragmaticistic maxim was little more than an abstract characterization of the general form of any scientific experiment. If so, this would mean that the pragmaticistic maxim is the result of mathematical generalization from concrete experience, a kind of procedure basic to the objective method of resolving doubts, a method that sharply contrasts with the nonobjective or arbitrary methods of doubt resolution Peirce sketched in his famous "Fixation of Belief" article [see Ketner 1977, 107]. From this it would follow that pragmaticism as a maxim is a necessity for any instance of objective method, if experimentation is essential for objectivity. But in his later years Peirce used the term Pragmaticism as a name for his entire philosophy and announced that he had achieved a proof of pragmaticism. Attempts to reconstruct such a proof have as yet been less than satisfactory. Perhaps we have been looking with the wrong preconceptions in mind. If we donned the mathematical and methodological spectacles which Carolyn Eisele recommends, perhaps something like the following is plausible. It may well be that Peirce was dogged most of his life by the difficulty he noted at the end of the Fixation article, namely, the fact that there is no reason engraved somewhere within the cosmos to which a person in need of a method can appeal in selecting the objective method from among the total list of methods he mentions. Concisely, this difficulty is "Why be objective (Why use the objective method)?" In the same article, Peirce hints that the answer to this question is not to think in terms of seeking reasons (a Lamarkian strategy), but to think of consequences (a Darwinian strategy). That is, the value of any method lies in its consequences. So, if one wants to give a proof of the objective method, it must be accomplished through the functioning of the pragmaticistic maxim (through experiment, in other words). Hence the proof of "capital P Pragmaticism" is not a demonstration of pragmaticism the maxim, but an apology or defense of the preferability of objective method in general using pragmaticism the maxim. This, if true, would mean that the defensibility of Pragmaticism, the name of Peirce's entire philosophy or unified theory of the nature of objective method, is the object of the proof of pragmaticism. This interpretation might also help to clarify Peirce's reasons for referring constantly to Existential Graphs and diagrammatic thought when he

discusses the proof of pragmaticism. Because the Existential Graph system is an instance of diagrammatic thought, it is therefore a cheap experiment, and a natural "pocket laboratory" or example for use in discussions of the processes of objective method. This would also mean that the proof of Pragmaticism is in some sense a mathematical proof. In carrying out the implications of such suggestions, one will clearly have to rely upon many of the results of Carolyn Eisele's distinguished career, her permanent accomplishments and ongoing research.

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References to Peirce's publications are according to a standard system given in [Ketner et al., 1977]. P 12, for example, refers to the twelfth item (chronologically) published by Peirce. Also, references to Peirce's manuscripts follow a system developed in [Robin 1967] as supplemented by [Robin 1971].

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HISTORIA MATHEMATICA VOL. 9, NO. 3, PP. 263-371 AUGUST 1982

A publication of the International Commission on the History of Mathematics of the Division of History of Science of the International Union of the History and Philosophy of Science.

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