

PEIRCE-RELATED RESEARCH

PEIRCE'S CHILDHOOD LABORATORY

Peirce's Early Chem Lab Experience Affected His Philosophical Development; Some Claims in the Secondary Literature Are Corrected.¹

Charles Peirce's writing invites biographical treatment. He tells us that "no man's philosophy can be well-understood until one knows how he came by it."² As if to answer the biographer's need, Peirce occasionally mixes autobiography with his philosophical writing. My current investigations explore the role of Peirce's early experience with laboratory chemistry in his philosophical development.

Peirce's Uncle Charles and Aunt Lizzie helped "Charley," as the youngster was called, set up a chemistry laboratory at home. The date is uncertain. Peirce gives various dates, ranging from when he was 6 years old (CP 5.411, 1897) to when he was 12 (MS 619: 06, 1909). Not surprisingly, the secondary literature on Peirce cites several dates.

It was no accident that young Charley was steered toward chemistry. Internationally, the work of Professor Justus Liebig (Giessen, Germany) was gaining recognition, and chemistry was emerging as an important new area of science. New interest in chemistry and new methods of education were brought to Harvard by Eben Norton Horsford, an American student of Liebig's. Horsford was appointed Rumford Professor of Chemistry in the Lawrence Scientific School (Harvard) in 1847. Benjamin Peirce, Charley's father, had helped organize the Lawrence School. As is evident from Benjamin's correspondence to his wife, Sarah, (22 January 1857) Charley's study of chemistry satisfied his father and seemed a way of assuring success in life.

Peirce venerated his father highly, especially intellectually. In later years, Peirce wrote, "He educated me and if I do anything it will be his work" (MS 1608: 02, c. 1894). In compliance with Benjamin's wishes, he sought to "make himself a thorough scholar in chemistry" (BP to SMP, 22 January 1857). In 1863 he took the bachelor of science degree in chemistry from the Lawrence Scientific School, *summa cum laude*. Writing to Victoria Lady Welby in 1909, he claimed, "I was the first man in Harvard to take a degree in chemistry *summa cum laude*."³

Unfortunately, the records of the Lawrence Scientific School and the *Quinquennial Catalogue of Harvard University* show Peirce's boast to have been false. Instead, sixteen men preceded Peirce in this honor. Also unfortunately, the secondary literature

on Peirce has repeated his boast uncritically. Max Fisch expressed doubt in a private note, but his published statement concurs with Peirce's version of events. Several scholars simply repeat Peirce's claim without examination. These include Carolyn Eisele, Paul Weiss, Douglas Anderson, Beverly Kent, Murray Murphey, Thomas Goudge, and James Feibleman. Joseph Brent repeats Peirce's claim, but cautions that the records are spotty and perhaps unreliable.

What kind of chemistry did Charley do in the lab his aunt and uncle helped him set up? Peirce's testimonials, considered with other evidence, indicate that it was qualitative analysis. On this point, the secondary literature is confused. According to Weiss, Murphey, and Knight he did quantitative analysis. But Brent, Fisch, and Goudge claim (correctly, I think) that it was qualitative analysis. The point is important because the procedures of qualitative analysis are a model education in the hypothetico-deductive method of science. What is the import of this for Peirce's philosophical development?

Testing in qualitative analysis involves trying out hypotheses concerning the chemical identity of an unknown substance. Such investigation follows the familiar pattern of conjecture/hypothesis followed by confirmation or refutation, with each confirmation subject to further confirmation or refutation. And there is evidence that Peirce did in fact learn the hypothetico-deductive method this way. MS 634: 3-6 (1909) contains an autobiographical-sounding conjecture of what a youngster would learn in a chemistry lab. Peirce's conjecture strongly suggests that his own manipulations of laboratory instruments, coordinated by his mind with the reports of his senses, made an impression of method that stayed with Peirce through some six decades.

Peirce's early experience with the hypothetico-deductive method seems important for his philosophical development in several ways. First, I believe this exposure was at the root of his lifelong interest in the logic of the sciences. Admittedly, Peirce himself says in several places that it was reading Whately's *Elements of Logic* at age 12 or 13 that initiated his interest in logic, an interest that grew to include the logic of science. But the methods and procedures he was exposed to in the chemistry laboratory, probably well before this, appear the more likely foundation of his interest. Even if young Charley did not reflect explicitly on laboratory method, the exposure would have set up a habit of inquiry (a point of importance in his later theory of inquiry). At any rate, experience with the method of qualitative analysis would have enriched the relevance and interest of Whately's book.

Second, I believe Peirce's exposure to laboratory chemistry was a preparation for his later formulations of pragmatism. This is indicated by a 1905 formulation of pragmatism (CP 5.458):

to what else does the entire teaching of chemistry relate except to the "behavior" of different possible kinds of material substances? And in what does that behavior consist except that if a substance of a certain kind should be exposed to an agency of a certain kind, a certain kind of sensible result *would* ensue, according to our experiences hitherto. As for the pragmatist, it is precisely his position that

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2. The passage quoted is from an unpublished manuscript, "Studies in Meaning," written in 1909 (MS 619: 03).
3. Charles S. Hardwick, ed., with James Cook, *Semiotic & Significs: The Correspondence between Charles S. Peirce and Victoria Lady Welby* (Bloomington: Indiana University Press, 1977), 114.