C.S. Peirce's Relative Product

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Tarski stated that the title of creator of the theory of relations belongs to Charles Sanders Peirce who showed that "... a large part of the theory of relations can be presented as a calculus which is formally much like the calculus of classes developed by G. Boole." (Tarski 1941: 73) Peirce's right to that title is seldom challenged, but it is generally held that Peirce's early efforts to formulate a theory of relations are misguided and confused. Misguided, because Peirce failed to follow the lead of De Morgan. Confused, because as Quine said of the 1870 paper, Peirce constructed a far-fetched and fantastic calculus along mathematical analogies. Peirce's 1870 paper, "Description Of A Notation For The Logic Of Relatives, Resulting From An Amplification Of The Conceptions Of Boole's Calculus Of Logic" (CP 3.45-149)[1] (hereafter NLR) is Peirce's first published paper on the algebra of relations and the one to which most of the following discussion is directed.

The standard assessment of Peirce's development of the algebra of relations is that he lacked an adequate concept of relation until, finally in 1883, he followed the lead of De Morgan, and in fact extended and completed the calculus De Morgan began.

Peirce is partly responsible for this assessment of his work. His writings are relatively unsystematic and often extremely difficult although, as Prior pointed out, Peirce "... had perhaps a keener eye for essentials than any logician before him." (Prior 1957: 111). C.I. Lewis, in a similar observation on Peirce's papers, remarked that "His papers, however, are brief to the point of obscurity ... as a consequence, the most valuable of them make tremendously tough reading".