A NOTE ON PEIRCE ON BOOLE'S ALGEBRA OF LOGIC

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Peirce was quite naturally led to the development of innovative improvements in logic through critical investigation of the writings of other logicians, e.g., the traditional system of syllogistic, Boole's algebra, Hamilton's system, and Mill's logic. In the following I will consider his early reaction to Boole's algebra of logic. In his 1865 lecture series, Peirce indicated great respect for Boole's accomplishments but also pointed out many failings in Boole's system. By 1865, twelve years before the first publication of Schroeder, Peirce had read and had begun to work on revisions of the algebra of logic developed by Boole.

One of Boole's most significant achievements, in Peirce's view, was his contribution of an effective symbolic notation.[1] Indeed, Boole's was not the first attempt at a symbolic notation for logic, but Peirce maintains, it is more adequate in fulfilling the aims desired from using such a notation. Ordinary language, with its ambiguities and richness, is inadequate for the investigation of logical form. The symbols most effective for the science of logic should have the power of diagramming significant linguistic forms and of aiding in the analysis of the laws of the necessary relations between such forms. Boole's symbolization, according to Peirce, is the first significant approach towards fulfilling these objectives. Thus Peirce attempts to convince his 1865 lecture audience that Boole's approach is of great value and well worth studying; still, he explains, there is much that is wrong with the system.

The notation is not adequate, for example, to express all types of propositions. In particular, Peirce, in his 1865 lecture series, expressed dissatisfaction with:

(1) Boole's symbolization of particular propositions. Boole used the symbol 'v' to indicate the indefinite class; for example, he symbolized the particular proposition 'Some X's are Y's' as '$v . x = v . y$'. This method of symbolizing particular propositions, Peirce argued, is not adequate to indicate the existential presupposition of particular propositions.