W. Stanley Jevons (edited by Robert Adamson and Harriet A. Jevons). *Pure Logic and Other Minor Works*. Bristol, Thoemmes Antiquarian Books, Ltd., 1991. xxiii + 299 pp. np.

Reviewed by

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The scant notice which W. Stanley Jevons usually receives in general history of logic place his contribution to the subject as a kind of footnote to Boole. Where Boole insisted on an exclusive interpretation of disjunction when applied to classes, Jevons interpreted it inclusively, a move which is sometimes interpreted as mending a flaw in Boole's version of algebraic logic. To leave it at that, however, is largely to miss Jevons' proper and significant place in the development of the emerging science.

Jevons' "place," in fact, was to stand astride a major divide in that development. On the one side, he remained committed to an older way of thinking in terms of which logic was confined to being simply a direct representation of the actual order of thought in reasoning. The extreme longevity of the idea that the syllogism is the true focal point in logic is a result of this commitment; those who took the syllogism as mirroring the way we think were those who remained loyal to it.

On the other side, as a young mathematician Jevons had been introduced to Boole's major works, and he was considerably impressed by the clarity and generality of the more abstract approach he found in them. Now instead of speaking of eliminating a mere middle term in an inference from premisses to conclusion, Boole''s system presented a systematic method for the reduction of indefinitely large sets of equations. The problem was that for all its power and elegance, Boole's calculus was not uniformly interpretable in ordinary language. Not only did coefficients other than 1 and 0 appear from time to time, there were other expressions as well (the quantifier 'v,' for instance) which defied

commonsense interpretation. For that reason, Jevons took Boole's calculus to be valuable to logic, but not to be logic itself:

> Supposing it to be ultimately allowed that Professor Boole's calculus of 1 and 0 is not really logic at all [for it does not coincide with the form of actual reasoning; nevertheless] Logic, after his work, is to logic before his work, as mathematics with equations of any degree are to mathematics with equations of one or two degrees. He generalized logic so that it became possible to obtain any true inference from premises of any degree of complexity, and the work I have attempted has been little more than to translate his forms into processes of self-evident meaning and force. (77)

Jevons, that is, tried to find the mean between Boole's formalism with its problems of interpretation, and the common logic with its lack of breadth and rigor.

In his quest for that mean, Jevons first invoked the distinction between logic conceived extensionally and the logic of intension, i.e. (in terms popular in the day), of quantity versus quality. He then chose the intensional mode as the preferred interpretation, for he regarded quality as primary in the sense that, in his view, it made logic simpler, more general, and more powerful. As he put it ". . . it seems obvious that the comparison of things in quality, with respect to *all* their points of sameness and difference, gives the primary and most general system of reasoning." (4; emphasis mine).In other words, quantity is only one way of characterizing things, whereas quality encompasses all ways of thinking about things, and represents "the concrete existence of things." The problem with Boole's system, according to Jevons, is that it remained steadfastly mathematical, which Jevons equated with being uniformly extensional, and hence reduced in scope when being used as an interpretation.

This way of looking at logic led Jevons to adopt a primitive logicism. Logic for Jevons had to be primary, since it dealt most generally with things, and mathematics had to be derived from it since it looked at things in only one, highly restricted, way. The logic that stood preeminent was what Jevons referred to as "Pure Logic" — hence the title of the first and best known work in the volume.

The remaining three logic papers in the volume (all written in 1869 and 1870) expand on Jevons' conception of logic in one way or another. In "The Substitution of Similars," for instance, Jevons attempts to strengthen the ties between logic and mathematics by developing a

general method of rendering statements as equations, regardless of whether or not they are in quantified form. "On a General System of Numerically Definite Reasoning" takes its cue from the work of De Morgan and Boole on the same topic, and attempts to provide a simpler, more useful version of it. Finally, "On the Mechanical Performance of Logical Inference" contains an account (complete with diagrams) of Jevons' "logical abacus," which incorporates a routinized method of deciding syllogistic validity.

The final third of the book contains four articles on Mill which Jevons contributed to the *Contemporary Review* between 1877 and 1879 (plus one which was previously unpublished). Jevons was no fan of Mill; not only did their conceptions of logic clash (Jevons' pure logic ran head-on into Mill's conception of logic as the theory of concrete, empirical reasoning), but there were other areas of philosophical disagreement as well. One gets the general flavor of what is to come from a remark made early in the excerpt: "[For] my part, I will not longer consent to live silently under the incubus of bad logic and bad philosophy which Mill's works have laid upon us." (201) While obviously pointed, Jevons' critique of Mill is nonetheless valuable for anyone studying the works of either philosopher.

This facsimile reprint of the 1890 edition of *Pure Logic* is identical in all but one respect with the earlier (1971) Burt Franklin reprint. That one respect, however, is noteworthy: the print quality of the Thoemmes version is much better than the earlier one. Now it is possible to read Jevons at length without having his words seem to fade to nothingness. For that, and for maintaining the availability of *Pure Logic*, Thoemmes is to be commended.

There is, however, an addition or two which would make this and other works like it even more attractive. I have in mind the addition of a current bibliography of secondary sources on Jevons' logic, and perhaps the addition of an introduction which would place Jevons' contribution within the larger historical setting of the day.