VENN DIAGRAMS EXTENDED: MAP LOGIC

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1 From Venn to Karnaugh   The Venn System of logic diagrams is a beautiful and effective system, it has, however, hitherto been of such restricted range that it has been relatively neglected.* To the best of our belief the only established writer to see its real possibilities is W. V. O. Quine. In his *Methods of Logic*[1] he touches on the use of diagrams for complex terms as in E a $(S \vee P)$, or $(W \cdot S)$ a E and he suggests one might go beyond three or four variables by splitting a longer argument into several three-variable parts.

Some six years ago the authors encountered the Karnaugh Map (a version of the Veitch-diagram adapted by Dr. M. Karnaugh, who presented it as an improved method of simplifying the design of computer circuitry[2]) and saw that this provided a mechanical method for handling a large range of logical problems.

In using Karnaugh Maps for logic, maps for two, three, and four variables are drawn as follows; Figures 1-3:
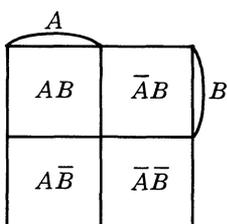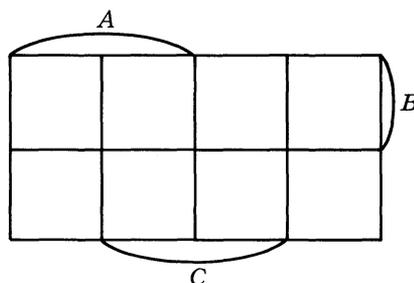

Figure 1

Figure 2

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*The substance of this paper was originally presented as part of an informal staff-seminar to some senior members of Sydney University Philosophy Department, November 28, 1973.

1. W. V. O. Quine, *Methods of Logic*, Second Edition, Routledge & Kegan Paul, London (1966), pp. 79-81.

2. M. Karnaugh, "The map method for synthesis of combinational logic circuits," *Transactions, American Institute of Electrical Engineers,* pt. 1, Communications & Electronics, vol. 72 (1953), pp. 593-599.