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A NOTE ON
*A HETERARCHY OF VALUES DETERMINED BY THE TOPOLOGY OF NERVOUS NETS**

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The term "hierarchy" was originally used to describe social organizations stratified into levels, in which an official at one level had complete control over all those within his jurisdiction at lower levels in the hierarchy. Metaphorically, then, a *hierarchy* of values is one in which there is a strict preference order, A is more valued than B is more valued than C ... In this paper, McCulloch demonstrates networks which are such that, if stimuli appropriate to a number of actions are present, then only the most valued action will be emitted (Figure 3). But he notes that neural architecture in no way implies a strict hierarchical ordering of actions, and presents (Figure 4) a net which, confronted with 3 choices: A or B, B or C, and C or A, emits A rather than B, B rather than C, but C rather than A. He calls the resultant choice structure a *heterarchy* of values. This is not the dictionary definition of heterarchy (= "the rule of an alien"). However, this sense of "a structure which might be thought of as hierarchical, but shouldn't be" has become established in the cybernetics literature - for example, Minsky and Papert (1972) stress the importance of heterarchical control structures in problem-solving.

REFERENCE

1. Minsky, M. and Papert, S. *Research at the Laboratory in Vision, Language and Other Problems of Intelligence*. Memo. No. 242, Artificial Intelligence Laboratory, Massachusetts Institute of Technology, January 1, 1972.

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* McCulloch, W.S. *A Heterarchy of Values Determined by the Topology of Nervous Nets*. Bull. Math. Biophys., (1945), 7, 98-93