

Meeting: 1003, Atlanta, Georgia, SS 3A, AMS-MAA Special Session on History of Mathematics, I

1003-01-145 **Ken Aizawa** (kaizawa@centenary.edu), Department of Philosophy, and **Mark D. Schlatter*** (mschlat@centenary.edu), Department of Mathematics, Centenary College of Louisiana, Shreveport, LA 71104. *Another Look at McCulloch and Pitts's "Logical Calculus"*. Preliminary report.

McCulloch and Pitts's 1943 paper, "A Logical Calculus of the Ideas Immanent in Nervous Activity", is a seminal work in the theory of neural networks. Their mathematical model of the binary neuron and their results connecting networks with statements in Boolean logic established a framework for future work in automata theory, artificial intelligence, and cognitive science. Yet most commentaries on the paper overlook the authors' focus on the theory of closed loops of neurons. McCulloch wanted to use loops of neurons to explain specific psychological phenomena, while Pitts's early mathematical papers found steady states of stimulation for neural cycles. We will review Pitts's early work and explore how it influenced the development of "A Logical Calculus". We will also examine McCulloch and Pitts's attempts to build correspondences between neural networks with loops and expressions in complex symbolic logic. (Received August 11, 2004)