LETTERS TO THE EDITOR

Pitts—A Proposed New Unit

Dear Sir:

I propose the establishment of a new intermediate unit of frequency — *pitts*. The pitts equals "pulses per second," "nerve pulses per second," or "spikes per second," all relatively clumsy terms used indeterminantly by neurophysiologists, brain research workers, and others.

The proposed new unit honors the late Walter Pitts, colleague of the late Warren McCulloch. Pitts and McCulloch, then at the University of Illinois Medical Center in Chicago, published a brilliant series of papers in the *Bulletin of Mathematical Biophysics* during the forties (1, 2, 3). Their papers lay the foundation for the treatment of central nervous system physiology as information processing within networks of "formal neurons," now called McCulloch-Pitts neurons. Their work was highly original; we must go back to Descartes with his postulation of the reflex and reciprocal innervation for previous concepts of similar grandeur. An interesting consequence of their work, not widely known, is that John von Neumann, after personally discussing with McCulloch at the train station at Princeton (!) the logical calculus that is possible by utilizing the McCulloch-Pitts neurons, chose this method to state the logical design functions of the EDVAC computer. Thus, these advanced scientific concepts of brain function early influenced the engineering development of the digital computer: an example of "bionics," or to use the term McCulloch preferred, "biomimetics."

The "pitts" if adopted widely by neurophysiologists will simplify the descriptive prose and lettering of our present-day papers and their graphical figures.

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REFERENCES

1. McCulloch, Warren S., and Walter H. Pitts. 1943. *Bull. Math. Biophys.* **5**:115.
2. Pitts, Walter, and Warren S. McCulloch. 1947. *Bull. Math. Biophys.* **9**:127.
3. McCulloch, Warren S. 1965. Embodiments of Mind. The Massachusetts Institute of Technology Press, Cambridge.

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