

36. Lilly, John C., John R. Hughes, and Ellsworth C. Alvord, Jr., and Thelma W. Galkin. 1955. "Motor Responses from Electrical Stimulation of Sensorimotor Cortex in Unanesthetized Monkey with a Brief, Noninjurious Waveform" (Abstract). *Fed. Proc.* 14:93

**301. Motor responses from electrical stimulation of sensorimotor cortex in unanesthetized monkey with a brief, non-injurious waveform.** JOHN C. LILLY, JOHN R. HUGHES, ELLSWORTH C. ALVORD, JR. AND THELMA W. GALKIN. *Natl. Insts. of Health, Bethesda, Md.*

We have found one class of stimulating waveforms which apparently does not injure neurons of the cerebral cortex when applied for many hours/day for periods up to 9 wk. The net current flow of the waveforms in this class is zero, and the pulse durations are so short that their shape is not critical; if all other parameters are held constant, the quantity of electricity delivered by each pulse determines the threshold. This class of waveforms is produced by quasi-differentiation of (0.05-0.1 ms) unidirectional rectangular pulses, and consists of a positive and a negative brief (0.01 to 0.03 ms) pulse of equal coulomb content. The motor responses elicited from sensorimotor cortex by trains of these pulses are similar to those from rectangular pulses at the same repetition frequencies. With low frequency stimulation, the cortical map of Liddell and Phillips is found, while with higher frequencies, the classical map is found (Woolsey). Physiological relaxation of the animal is accompanied by an increase in threshold about 34% over that found in the agitated state. About 1 hr. after eating there is a small (15%) reproducible fall in threshold followed by a rise to fasting levels. In contrast to the results with rectangular pulses, the thresholds fall for about 5 wk. rather than rise within the first few hours of stimulation. Neurohistological examination shows a moderate gliosis and no appreciable loss of cells or fibers in the stimulated side as compared with the control side of the cortex.