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A method for recording unit potentials during electroanesthesia

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It has been shown that marked changes occur in evoked gross potentials recorded at the cortical level during the application of electroanesthesia current. The technique described provides a means for determining the effects of sinusoidal, rectangular or other time varying currents on the activity of single neurons.

Three studies were conducted on squirrel monkeys. The skull of each animal was trephined over the sensory motor cortex and Delron chambers were mounted on the calvarium. The animals were immobilized with Flaxidil and maintained on a respirator. Unit activity was recorded by means of 3 molar KCl glass micropettes with a tip diameter of approximately 1u. Seventy Hz rectangular current pulses of 3 ms duration with a d.c. bias of 2.5 ma were chosen for the initial studies.

The cortical recordings consisted of unit activity plus the rectangular artifact pulses. The amplitude of the rectangular component was minimized by using a triaxial electrode configuration and a differential microelectrode preamplifier (designed in our laboratories). The preamplifier output was coupled to a second differential amplifier along with a sampled portion of the applied current. The artifact supressed signal was subsequently amplified, and the band limited between 100 Hz to 10 KHz.

The current used for this study was capable of inducing marked changes in the unit potential firing rate. Typical firing patterns during electroanesthesia will be presented.