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## Jose Delgado's "Physical Control of the Mind"

EXPERIMENTAL FACTS	IMPLICATIONS
Frog muscle contracted when stimulated by electricity. Volta, 1800; Galvani, 1791; DuBoisReymond, 1848.	"Vital spirits" are not essential for biological activities. Electrical stimuli under man's control can initiate and modify vital processes.
Electrical stimulation of the brain in anesthetized dog evoked localized body and limb movements. Fritsch and Hitzig, 1870	The brain is excitable. Electrical stimulation of the cerebral cortex can produce movements.
Stimulation of the diencephalon in unanesthetized cats evoked well-organized motor effects and emotional reactions. Hess, 1932.	Motor and emotional manifestations may be evoked by electrical stimulation of the brain in awake animals.
In single animals, learning, conditioning, instrumental responses, pain, and pleasure have been evoked or inhibited by electrical stimulation of the brain in rats, cats, and monkeys. Delgado et al. 1954; Olds and Milner, 1954; see bibliography in Sheer, 1961.	Psychological phenomena may be controlled by electrical stimulation of specific areas of the brain.
in colonies of cats and monkeys, aggression, dominance, mounting, and other social interactions have been evoked, modified, or inhibited by radio stimulation of specific cerebral areas. Delgado, 1955, 1964.	Social behavior may be controlled by radio stimulation of specific areas of the brain.
In patients, brain stimulation during surgical interventions or with electrodes implanted for days or months has blocked the thinking process, inhibited speech and movement, or in other cases has evoked pleasure, laughter, friendliness, verbal output, hostility, fear, hallucinations, and memories. Delgado et al. 1952, 1968; Penfield and Jasper, 1954; see bibliography in Ramey and O'Doherty, 1960.	Human mental functions may be influenced by electrical stimulation of specific areas of the brain.

*Summary*

Autonomic and somatic functions, individual and social behavior, emotional and mental reactions may be evoked, maintained, modified, or inhibited, both in animals and in man, by electrical stimulation of specific cerebral structures. Physical control of many brain functions is a demonstrated fact, but the possibilities and limits of this control are still little known.

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