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Reprinted from
J. Neurophysiol. 1964, 27
pp. 546-578

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(Received for publication August 22, 1963)

INTRODUCTION

THE PRESENT WORK is part of a more general investigation into neurophysiological activities of the cerebral cortex which may be involved in the elaboration or mediation of conscious sensation. The primary concern in these studies is the dynamics of the processes involved, rather than their topographical representation.

In this study a number of parameters which affect the adequacy of direct cortical stimulation for the production of a conscious somatic sensation at the threshold level were investigated quantitatively.[3] The question of the specific modalities of sensation elicited in relation to the nature of the stimulus is to be considered more specifically in another paper; here we are concerned with the question of whether threshold has been achieved. The reasons for first developing this aspect were twofold. The longer range objective in these studies requires that one be able to examine responses just above and below the threshold for conscious awareness of a sensation which has been elicited by a direct cortical stimulus. Secondly, knowledge of the significant stimulus parameters, and of the parametric regions in which such stimuli are adequate, might itself lead to suggestions about the kinds of activities in primary sensory cortex which are involved in eliciting a subjective sensation. This hope of deriving from this work some clues to the underlying processes for conscious sensation was in fact realized.

Included in the set of parameters were peak current (I), polarity of pulses, pulse duration (PD), pulse repetition frequency (PF), train duration (TD), train repetition rate (TRR, i.e., interval between successive tests),

[1] This study was supported successively by the Air Force Office of Scientific Research, Contract AF 18(603)-48, Office of Naval Research Contract Nonr-2968(01), and Public Health Service Grant NB-01963; and by the Harry Freund Memorial Foundation.

[2] Supported by Research Career Program Award NB-K3 16,729 from the National Institute of Neurological Diseases and Blindness.

[3] Preliminary reports of this work have been presented (27, 28).