

THE OBSCURATION PHENOMENON—A FORM OF NEURAL RESTRAINT

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The study of factors restraining central nervous system (CNS) activity is newer than and not so complete as the study of factors bringing about or facilitating CNS activity. Probably the first recorded example of neural restraint as such was in the field of motor activity when the Weber brothers demonstrated slowing of the heart by vagal stimulation (10). The greatest impetus to this study was given by Sherrington and his associates who evolved a new concept of CNS activity (30). This was characterized by two functions which he called central excitatory states and central inhibitory states. Functionally, CES and CIS are similar in that both show summation, convergence, overlap of liminal and subliminal fields, fractionation, recruitment, after action and certain other similarities. Anatomically, areas in the central nervous system for the production of a movement or sensation are rather well known; areas for restraint of a movement or sensation are comparatively small and few have been described in man. Inhibition in the broad sense has been loosely used to mean "the arrest or restraint of a process effected by nervous influence." Its spheres of action can probably be divided into three, motor, psychic and sensory.

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Since Sherrington's work with motor inhibition, this phase is well known. According to this school the reflex centers should no longer be looked on simply as exchanges where impulses arriving at the afferent terminals are merely "switched" to the appropriate efferent paths. Afferent impulses on their arrival at the motor neurons (i.e., at the synapses) create CES of longer duration than the impulses themselves and are capable of summation, or CIS are produced which can sum likewise. As a result, the reflex center is capable of discharging at its own rhythm and of grading its response though the impulses it receives are "all or none" in character. The sign and intensity of the resulting reflex action is dependent on the relative values of these states developed at the motor neurons of the final common pathway (5). CIS is slower to reach threshold value than CES and persists longer. In spite of their importance clinically, the fundamental nature of these states is still a matter for speculation.