Disturbances in perceptual awareness or states of consciousness due to trauma or disease of the brain in man present many challenging problems to the neurophysiologist interested in brain mechanisms. Such problems are of such enormous variety and complexity that it would be pretentious indeed to propose definitive solutions in the light of the meager neurophysiological knowledge presently at our disposal. This is especially true when one attempts to cross the "no man's land" from brain mechanisms to conscious mental experience. Recent neurophysiological studies have brought to light some new principles which may be brought to bear upon some of these old problems, a few of which I would like to present for the consideration of this conference.

In particular I would like to present for discussion the following problems:

1. In what manner and to what degree is perceptual awareness dependent upon, or independent of, the exact nature of information arriving over the principal sensory pathways?

2. Is there an anatomically distinct neuronal system in some central location, with widespread functional connections with all parts of the brain, involved in the selection of the ever-changing momentary patterns?

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of neuronal activity of perceptual awareness, as opposed to those systems constantly engaged in the unconscious processing of information and in the execution of automatic movements? or,

3. Is that portion or portions of cerebral activity upon which momentary perceptual awareness depends, or upon which it persists for recall in short- or long-term memories, due only to its inherent integrative organization in the brain as a whole whereby a certain pattern out of widely dispersed synaptic circuits may dominate the rest in an ever-changing sequence?

These questions have been discussed at length in several previous symposia and conferences, beginning with the Laurentian Conference in 1953 [Adrian et al., 1954; Jasper et al., 1958; Wolstenholme and O'Connor, 1960; Moruzzi et al., 1963]. However, much new and important neurophysiological data can now be added which should enable us to re-evaluate some previous conceptions and to make possible the formulation of working hypotheses which should lead to some more critical experimental approaches to restricted portions of the age-old problem of the ultimate relationship between brain mechanisms and conscious experience.

It is possible to make a phenomenological distinction between those brain mechanisms which occur with conscious awareness and those occurring under conditions which seem to preclude such awareness (coma, sleep, anesthesia, or inattention) and, in man, those reported as not consciously perceived. Since one is fully aware of the precarious nature of such data, it must be used in as controlled a manner as possible if we are to approach the problem of the distinction between the largely unconscious complex integrative machinery of the brain and those processes peculiarly significant for conscious perceptual awareness.

I do not mean to imply that clinically defined states of consciousness, particularly impaired consciousness, may be considered a homogeneous entity with a common physiological mechanism. There are many different kinds of coma, for example, with a wide variety of neurochemical or pathophysiological causes [Fazekas and Alman, 1962; Perria, 1964]. Our problem is to examine possible common factors in these varied disturbances in brain function which lead to impaired or disturbed perceptual awareness and the associated loss of integrated adaptive responses to environmental stimuli. Bremer [1957a] has expressed it well in describing consciousness as "une qualité particulière du fonctionnement cérébral, caractérisé par une réactivité différentielle et sélective, par l'intégration et l'organisation harmonieuse des actes du comportement, par leur adaptation correcte à la situation du moment." This definition could apply equally well to man and to animals, and would, of necessity, apply to states of unconsciousness in man, or in man deprived of verbal communi-