Sir John Carew Eccles

Melbourne, Australia, 27 Jan. 1903 - Tenero-Contra, Switzerland, 2 May 1997

Title Professor of Neurophysiology, State University of New York at Buffalo, NY, USA. Nobel laureate in Physiology or Medicine, 1963

Nomination 8 April 1961

Summary of scientific research

Research has been related particularly to the problems of communication in the vertebrate nervous system, especially on the nature of synaptic action, firstly at simpler levels as in the sympathetic ganglia, the neuromuscular junctions and the spinal cord and then from 1960-1975 at higher levels of the nervous system.

In 1951 I developed for the first time intracellular recording from neurones in the central nervous system, initially from motoneurones in the cat spinal cord. The nature of excitatory and inhibitory synaptic transmission was revealed in these analytical studies, for which I was awarded the Nobel Prize in 1963, conjointly with A.L. Hodkin and A.F. Huxley. After 1962 my interest was concentrated on higher levels of the mammalian brain, using the same techniques that had been so effective in the spinal cord. First studied were the sensory pathways up the spinal cord to the cerebellum and to the dorsal column nuclei and so to the thalamus and the cerebral cortex. Then came the study of the role of inhibition in the hippocampus, a primitive cerebral cortex. From 1963 my research was centred on the cerebellum, where one was enormously helped by the beautiful anatomic studies of Ramón y Cajal. The essential features of cerebellar physiology were published in 1967. The manner in which the cerebellum brings about motor coordination and motor learning was intensively studied from 1966-1975. After 1975 I continued in theoretical studies on the brain.

From 1961 onwards I have published extensively on philosophical problems deriving from brain science, particularly on the nature of the experiencing self and the mind-brain problem as illuminated by dualist-interactionism. A new insight is that the mind may work on the brain analogously to the probability field of quantum mechanics. In this manner there could be effective action on the probability operations of microevents in the synapses on nerve cells without violating the conservation laws of physics.