
**Walter Hess and Interbrain**

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Walter Rudolf Hess (1881–1973), born in Northern Switzerland, and received his medical degree from the University of Zurich in 1906. Hess was trained as a surgeon and earned his PhD in 1908.

He was also trained as an ophthalmologist and opened his own private practice in Switzerland. During these years, he developed the “Hess screen” for studying ocular imbalance. He left his lucrative practice as an ophthalmologist and went into research in physiology in 1912 under Justus Gaul (1849–1939). Hess was appointed Professor of Physiology and Director of Physiology at the University of Zürich in 1917 and later Director of the Physiological Institute, where he served until his retirement in 1951.

Hess became interested in the study of the autonomic nervous system; these nerves originate at the base of the brain (diencephalon) and extend throughout the spinal cord, controlling autonomic functions like digestion, respiration, and excretion. Diencephalon forms the central core of brain tissue (interbrain), which extends from the brain stem to the cerebrum and surrounds the third ventricle. It includes the thalamus, hypothalamus, and epithalamus (pineal region). Hypothalamus is a highly organized structure with many nuclei reflecting numerous important functions. It controls and integrates activities of ANS and is closely associated with the limbic system, and responds to complex stimuli such as stress.

Walter Hess used brain stimulation techniques with fine 0.25 mm diameter electrodes to stimulate or destroy specific areas of the brain in conscious cats that moved freely. He discovered that the seat of autonomic function was in the hypothalamus. Hess mapped the control centers for each function to such a degree that he could induce the physical behavior pattern of a cat confronted by a dog simply by stimulating the proper points on the animal’s hypothalamus. This way, Hess could induce behaviors from excitement to apathy, depending on the region of stimulation. When stimulating the anterior lateral part of the hypothalamus, he induced a fall in blood pressure, slowing of respiration and responses such as hunger, thirst, micturition, and defecation. On the other hand, stimulation of the posterior ventral part led to extreme excitement and angry behavior.

He also found that he could induce sleep in cats, a finding that was highly controversial at the time but later confirmed by other researchers. Hess’s mapping and localization of diencephalic function ultimately led to its use in treating patients with surgery for certain motor and psychological disturbances.

Walter Hess received the 1949 Nobel Prize for Physiology or Medicine, which he shared with neurosurgeon Egaz Moniz. Hess’s contribution was mentioned as—“For his discovery of the functional organization of the interbrain as a coordinator of the activities of the internal organs.”

Hess died in 1973 at the age of 92.

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