"IN SEARCH OF MEMORY: THE EMERGENCE OF A NEW SCIENCE OF THE MIND"

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Eric Kandel, born in Vienna, Austria, and a naturalized American, works at the Center for Neurobiology at Columbia University in New York. His research earned him the 2000 Nobel Prize for Medicine, also awarded to Arvid Carlsson and Paul Greengard for their work on signal transmission in the nervous system. These scientists made crucial discoveries about slow synaptic transmission, a vital type of signal transmission between different nerve cells. This work was fundamental for understanding the normal functions of the brain and the conditions of disturbances in signal transmission that may induce physical or neurological diseases.

His scientific career includes publishing the book "Principles of Neuroscience," which serves as a reference in his field of study. In his book about the brain aimed at the general public, "In Search of Memory: The Emergence of a New Science of the Mind", Kendel mixes autobiography with reports on the genesis of a new way of understanding the brain, a conjunction between behavioral psychology, cognitive psychology, neuroscience, and molecular biology. His research addressed the molecular mechanisms of memory storage in a marine mollusk (Aplysia) and mice.

In this book, the author weaves together two stories: an intellectual narrative of the extraordinary progress made in the last fifty years in the study of the mind and the story of his life and scientific career over five decades. This second narrative reconstructs how his childhood experiences in Vienna gave rise to a fascination with memory, which led him first to the study of history and psychoanalysis, then to the biology of the brain, and finally to the cellular and molecular processes of memory. "In Search of Memory" is, in the words of the author and neuroscientist, "an account of how my personal effort to understand memory intertwined with this grand scientific project — the attempt to understand the mind in cellular and molecular terms".

Furthermore, Kandel problematizes how understanding the human mind in biological terms has become the primary challenge of 21st-century science, stating, "There is a consensus in the scientific community that the biology of the mind will be for the 21st century what the biology of the gene was for the 20th century." He also emphasizes that science seeks to understand the nature of biological perception, learning, memory, thought, and consciousness, as well as the limits of free will.

From the dark events experienced in Broken Glass (1938), which led his Jewish family to leave Vienna for the United States, several pivotal questions emerged that have led to some of the most significant discoveries in neuroscience.

According to Kandel, it was fortunate for neuroscience around the world that England, Australia, New Zealand, and the United States opened their doors to notable synapse researchers who were banned from Austria and Germany, including Loewi, Feldberg, and Katz. For him, this evokes memories of a story told about Sigmund Freud, when the famous father of psychoanalysis arrived in England and was taken to the beautiful house on the outskirts of London where he would live. Observing the tranquility and civility provided by that forced emigration, Freud was led to say, in a low voice, with typically Viennese irony: "Heil Hitler!".

In the United States, Eric Kandel discovered how the efficiency of synapses can be modified and that molecular mechanisms are part of this process. Using Aplysia as an experimental model, he demonstrated how changes in synaptic function are important to learning and memory. Protein phosphorylation at synapses plays an important role in generating a form of short-term memory. To develop long-term memory, a change in protein synthesis is also required, which can lead to changes in the shape and function of the synapse.

The fundamental mechanisms that Kandel revealed are also applicable to humans. It can be said that our memory is located in the synapses. With these discoveries, it is now possible to study, for example, how complex memory images are stored in the

nervous system and how memories of ancient events are recreated. Understanding these mechanisms will enable the development of new types of medication to enhance memory functions.

Regarding the direction of the new science of the mind in the future, with regard to the study of memory storage, the author ends his narrative by declaring the certainty that cellular and molecular approaches will continue to produce important information, but that, alone, they will not be able to elucidate the secrets of internal representations in neural circuits or interactions between circuits (the key steps that link cellular and molecular neuroscience to cognitive neuroscience).