

# CHARLES SHERRINGTON

## NOBEL LAUREATE IN NEUROSCIENCE

**Saad Shaqat**

Aga Khan University

By at least one measure that most neuroscientists will agree on, Sir Charles Sherrington (1857-1952) can be considered to have cast the longest of shadows on neurobiology. In Kandel and Schwartz's *Principles of Neural Science* (4<sup>th</sup> ed.), Sherrington receives as many as 15 citations in the index, far more than any other scientist. Founding fathers like Golgi and Cajal garner just 1 each, Ivan Pavlov and Roger Sperry get 4 each, Wilder Penfield gets 6, and even the combined total of David Hubel and Torston Wiesel does not exceed 11.

What did Sherrington do to deserve such deafening recognition and acclaim in the world of neuroscience? A tour through *Principles* reveals all. He proposed the idea of the nervous system as an integrator - a complex entity that compares, contrasts, synthesizes, and prioritizes a diversity of stimuli to produce an appropriate response. He coined the term synapse. He also coined the term motor unit. He came up with the concept of an adequate stimulus for receptor activation. He elaborated greatly on the importance of motor reflexes. He was the first to understand the role of sensory perception in the regulation of movement. In studying spinal reflexes and posture, he uncovered the phenomenon of decerebrate rigidity, a central concept in the neurological examination of patients with coma.

In 1932, Sherrington was awarded the Nobel Prize in Medicine (shared with Edgar Douglas Adrian) for "discoveries regarding the functions of neurons." At the time he held the Waynfleet professorship in physiology at Oxford University. He was born in London and grew up in a house that respected art and scholarship. Although Sherrington completed medical studies (at St. Thomas's in London) and earned an FRCS, he soon discovered physiology was his true calling. Among his early exposures to research was a stint doing bacteriology with Robert Koch. Based on this experience, he was sent to study an outbreak of cholera in Spain, where he had a chance encounter with Ramon y Cajal that unleashed his passion for neuroscience.

Sherrington had boundless energy and worked tirelessly. His great contribution has been to introduce a conceptual



Charles Sherrington

leap in the way we think about nervous systems. Building on the neuron doctrine that emerged from the work of Golgi and Cajal, he saw that the nervous system was best studied and understood as a complex multi-tasking machine. He thus took neuroscience up to the next level of analysis. His ideas brought in a new sophistication in neuroscientific hypothesis and theory, and enabled powerful and penetrating experimentation.

Almost every personal account of the man emphasizes his friendliness, humility and generosity. There was a significant creative side to him, and he indulged it by writing and publishing verse. He also expounded on philosophy and wrote a popular treatment, *Man on his Nature*, that became a famous book. He was also physically adept and active in sports, including athletics, rowing and rugby.