History of Neurology

WALTER B. CANNON MD

FEBRUARY 13TH, 2017
NEUROLOGY RESIDENT MORNING REPORT
Walter B. Cannon MD  
1871-1945

- B: Prairie du Chien, Wisconsin  
- Harvard Med School-1896-1900  
- Instructor in Physiology at HMS  
- Mentor Henry Pickering Bowditch who trained under Claude Bernard  
- 1906-Professor and chairman of the Department of Physiology!  
  - Till 1942  
- Initial research: used newly discovered x-rays to study mechanisms of swallowing & stomach motility  
- 1st paper- Digestion in the Goose (1898)  
- In 1945 Cannon summarized his career in physiology by describing his focus at different ages:  
  - Age 26 – 40: digestion and the bismuth meal  
  - Age 40 – 46: bodily effects of emotional excitement  
  - Age 46 – 51: wound shock investigations  
  - Age 51 – 59: stable states of the organism  
  - Age 59 – 68: chemical mediation of nerve impulses (collaboration with Arturo Rosenblueth)  
  - Age 68 + : chemical sensitivity of nerve-isolated organs  
- He said “If I had not undertaken research on the physiology of the digestive tract by use of the newly discovered X-rays, I would have become a neurologist.”
Walter B. Cannon MD
Autonomic Nervous System

• 1912- Observed movements of gut stopped experimental animals were

• Prior automatic research by Gaskill/Langley showed origins distribution & local effects of autonomic neurons

• Over 20 years he & team published many papers on how under physiologic stress the sympathetic NS & adrenal medulla act to produce visceral adjustment that are needed for preservation

• Also researched on central mechanisms Involved in emotional behavior & emotional experience.

• Emergency theory of sympatho-adrenal system:
  – 1929 experiment reviewed chains of ganglia in cats – when stressed showed physiologic deficiencies

• Coined term “homeostasis”-steady state of internal milieu

• Demonstrated heart affected by product secreted by adrenal medulla-sympathetic

Amer. J. Physiol, 1929, 89:51-107
Walter B. Cannon MD: Publications for Lay Public

1915
BODILY CHANGES IN PAIN, HUNGER, FEAR AND RAGE

1931
Digestion and Health

1931
Bodily Changes in Pain, Hunger, Fear and Rage

1932
Lazaro in the pueblos:

1936
The WISDOM of THE BODY

1942
"Voodoo" Death

1945
The Way of an Investigator

His wife’s book
“VOODOO” Death

Walter Cannon

American Anthropologist, 44. 1942. 169–181.
Advice to Young Investigators From Successful, Wise Scientists Over Last 150 Years

• Claude Bernard – *An Introduction to the Study of Experimental Medicine* (1865)
• Santiago Ramon y Cajal – *Advice for A Young Investigator* (1916; 1999 English translation)
• Walter Cannon – *The Way of an Investigator: A scientist’s experiences in medical research* (1945)
• Edward O. Wilson – *Letters to a Young Scientist* (2013)
Chapter III: Fitness For The Enterprise

“As the years have gone by, I have been more and more impressed by the occasional lack of one or another of the essential qualities in a man, that spoils his otherwise excellent equipment in mind and character. As an investigator he may, for example, be rich in suggestive ideas and yet be indolent and therefore sterile; he may be a hard worker but secretive about his results and suspicious of his fellow workers, so that his is despised by them; he may be an earnest experimenter but inconsiderate of his helpers, and therefore he may find that help is begrudged him; or he may be prone to display an attitude of superiority and consequently be subjected to derision, expressed or silent. Sometimes an investigator’s excellence in important regards is so great that it overbalances his defects. I have heard of an eminent scientist who, after weeks of intense and exhausting labor on a difficult problem, would break away in a disgraceful carouse. His escapades ere tolerated because of his outstanding discoveries. Clearly such need for balancing good and evil is not to be looked upon with any enthusiasm. It is better to strive for a set of qualities that can consistently exist in one another’s companionship and that together favor effectiveness.”
The Way of an Investigator

Dr. WALTER BRADFORD CANNON, George Higginson Professor of Physiology Emeritus, Harvard Medical School, has been for more than forty years one of America's outstanding men of science. Graduating in medicine from Harvard he became professor and head of the department of physiology, leaving for a period to serve with the British and American Expeditionary Forces in 1917-18, and later as Exchange Professor to France and as Visiting Professor at Peiping. His researches have dealt with the effects of emotional excitement, internal secretions and organic stabilization and were first formulated in his book Bodily Changes in Pain, Hunger, Fear and Rage, a classic of modern physiology. Out of his war experience came a book almost as well known, Traumatic Shock, and more recently he has written The Wisdom of the Body and Digestion and Health. Dr. Cannon's distinction as a scientist has been widely recognized and marked by many honors both in the United States and in foreign countries. He has received honorary doctorates from Yale University, Boston University, the Universities of Liege, Strasbourg and Paris, as well as from Harvard. For many years he has been a member of the National Academy of Arts and Sciences, the National Academy of Sciences and the National Research Council.

The American Association for the Advancement of Science has selected The Way of an Investigator as one of the books in its Non-technical Science Series. For nearly a century the Association has been the foremost organization devoted to this field in the United States. From its founding in 1848 the name of nearly every leader of American science has been on its membership roll and the most eminent have served as its president. Not only has every American Nobel Prize winner been a member of the Association, but seven of these distinguished scientists have been elected to its presidency. Dr. Walter B. Cannon, the author of this book, was President of the Association in 1939.

Pitch for Nobel