History of Neurology
Part 1
European | Eastern Hemisphere

“If I have seen further, it is by standing on the shoulders of giants”
- Isaac Newton

Richard J. Barohn, MD
Chairman, Department of Neurology
Gertrude and Dewey Ziegler Professor
University Distinguished Professor
Vice Chancellor of Research
President, Research Institute

Neurology/Neurosurgery Grand Rounds
University of Kansas Medical Center
February 12, 2016
(REVISED)
Mel Brooks' History of the World: Part I
History of Neurology
Historical Context in History of Medicine, Science & Physiology

- EARLY, EARLY “DISCOVERY” -

• 2500 BC – Egyptian papyrus

• 400 BC – Hippocrates
  – Epilepsy the Sacred Disease

• ~ 380 BC – Plato
  – Dialogues

• ~ 340 BC – Aristotle
  – Short Physical Treatises
  – Biological Treatises

• 200 AD – Galen
  – On The Natural Faculties

“Brain”
History of Neurology
Historical Context in History of Medicine, Science & Physiology

- MEDIEVAL AGES-

• Avicenna (980 – 1037)
  – B: Bukhara, Uzbekistan; D: Hamadan, Iran
  – The Canon of Medicine

• Averroes (1126 – 1198)
  – B: Córdoba, Spain; D: Marrakesh, Morocco
  – Collegiate Medical Encyclopedia
  – Commentaries on Aristotle

• Maimonides (1135 – 1204)
  – B: Córdoba, Spain; D: Fustat, Egypt
  – Guide for the Perplexed
  – Commentary on the Aphorisms of Hippocrates

• Thomas Aquinas (1225 – 1274)
  – B: Roccasecca, Italy; D: Fossanova Abbey, Italy
  – Summa Theologica (1485)

• 1st Universities
  • Bologna 1088
  • Oxford 1096
Early Eastern Civilization
Medical-Neuro Advances

• India
  – Ayurveda medicine – Evolved over many millennia, originating in prehistoric times.
    • 8 Components:
      – Internal Medicine, Pediatrics, Demonology/Psychology, Treatment of disease above the clavicle, Surgery, Toxicology, Geriatrics/Rejuvenation, and Aphrodisiac therapy
  – Sushruta (400 BC)
    • Most prominent ancient Indian physician
    • 1st plastic surgeon – rhinoplasty, cataract surgery, bladder catheter
    • Sushruta Samhita. Revised by Nagarjuna, the “Father of Chemotherapy” (100 BC – 300 AD)
    • Describes diabetes – tasting urine (sweet), wound care, leeches
  – Charaka (100 AD)
    • Charaka Samhita. Rational approach to disease Rx
    • Physical exam and observation emphasized.
  – Medicines – herbal, minerals, metals (?toxic!)
Early Eastern Civilization
Medical-Neuro Advances

- Meditation / Yoga
- Deepak Chopra (1947 – P)
Early Eastern Civilization
Medical-Neuro Advances

- Chinese Medicine —
  Per Dr. Yunxia Wang

- Neurology is a Western Concept
- Traditional Chinese medicine is developed based on a philosophical view
  - Tao, Confucius and Buddhism: Harmony is Key
  - Shen: Mind/Spirit/Conscious. Lives in the heart.
    - Shen is everywhere and nowhere. It’s a combination of everything. A person without Shen means ‘dead body’
  - It is important you cannot see it as a specific form
    - For this reason, there was no mention of brain in traditional Chinese medicine
Early Eastern Civilization
Medical-Neuro Advances

- **Chinese Medicine** -

- **Chinese Traditional Medicine** (14th – 11th centuries BC)
  - Acupuncture - 100 BC
  - Herbals
    - Ephedrine, Huperzine
  - Massage (Tui na)
  - Exercise (qigong)
  - Dietary
  - Holistic physical/mental

- **Zhang Zhongjing** (150 – 219 AD)
  - *Treatise on Cold Pathogenic and Miscellaneous Diseases* or “Cold Damage”
  - Group symptoms into patterns for treatment

- **Li Shizhen** (1518 – 1593)
  - *Compendium of Materia Medica*
  - Chinese materia medica dates to 1,100 BC

- **Tu Youyou** (1930 - )
  - Artemisinin
  - Treatment of Malaria
  - Nobel Prize 2015
History of Neurology
Historical Context in History of Medicine, Science & Physiology

- BEGINNING OF SCIENTIFIC RESEARCH -

Renaissance and Enlightenment & the Scientific Revolution
- 1543 – Vesalius – *De Humani Corporis Fabrica*
- 1543 – Copernicus – *De Revolutionibus Orbium Celestium*
- 1542 – Tycho Brahe – *Supernova*
- 1609 – Kepler – *Movements of Planetary Motion*
- 1628 – Harvey – *De Motu Cordis*
- 1632 – Galileo – *Discourses and Mathematical Demonstrations Relating to Two New Sciences*
- 1637 – Descartes – *Discourse on the Method*
- 1660 – Van Leeuwenhoek – Microscopy of “little animals”
- 1660 – Royal Society of London for Improving Natural Knowledge
- 1665 – Hooke – *Micrographia*
- 1666 – Malpighi – *De Gallis*. Microscopy of tissue, including cerebral cortex
- 1689 – Locke – *Essay Concerning Human Understanding*
- 1713 – Newton – *Mathematical Principles*
- 1748 – Hume – *An Enquiry Concerning Human Understanding*
History of Neurology

Historical Context in History of Medicine, Science & Technology

Modernization/Industrial Revolution
• 1781 – Watt – Steam Engine
• 1831 – Faraday – Research in Electricity
• 1858 – Virchow – Cellular Pathology
• 1859 – Darwin – The Origin of Species
• 1859 – Lenoir – Internal Combustion Engine
• 1864 – Pasteur – Pasteurization
• 1900 – Freud – The Interpretation of Dreams
• 1903 – Wright Brothers – Airplane
• 1904 – Einstein – 4 papers (annus mirabilis)
• 1919 – Einstein – General Relativity

Post-Modern Era
• 1928 – Fleming – Penicillin
• 1948 – Turing – Computer
• 1953 – Watson & Crick – DNA
• 1955 – Salk – Inactivated Polio Vaccine
• 1957 – The Soviet Union – Sputnik
• 1961 – Sabin – Oral Live Polio Vaccine
• 1980’s - 1990’s:
  – Jobs/Gates – Personal Computer
  – Gore – Internet!
    • 1991 – The Gore Bill
With Faint Chirp Scientists Prove Einstein Correct
New York Times; February 12, 2016

• Proof of gravitational waves
• LIGO antennas in Washington State & Louisiana
  – Laser Interferometer Gravitational Wave Observatory
  – Funded by the National Science Foundation (NSF) which as spent $1.1 billion over the past 40 years
• 2 Black holes colliding disrupt space & time
  – Produces gravitational waves
• Physical Review Letters
  – Wels, Reitze, Thair & 1,000 Authors
• Idea/Hypothesis – Einstein 1915
• Proof 100 years later; 2015
WALTER ISAACSON
author of *Steve Jobs*

“A stirring reminder of what Americans are capable of doing when they think big, risk failure, and work together.”

—The Atlantic

the innovators
how a group of hackers, geniuses, and geeks created the digital revolution

BEST OF 2014
The New York Times
The Washington Post
Financial Times
Doug Engelbart

The Mouse!
NPR – Greatest Innovations
Early, Early Neurology History
1600’s

• Thomas Willis (1621-1675); Great Bedwyn, United Kingdom
  – *Cerebri Anatome* (1664)
  – *MG*

• Thomas Sydenham (1624-1689); Wynford Eagle, United Kingdom
  – Chorea
Early, Early Neurology History
1700’s/early 1800’s

• Robert Whytt (1714-1766);
  Edinburgh, United Kingdom
  – *Observations on Dropsy of the Brain*
    (1768)

• Percival Pott (1714-1788);
  London, United Kingdom
  – Palsy from spinal deformity
Early, Early Neurology History
1700’s/early 1800’s

• Giovanni Morgagni (1682-1771); Forli, Italy
  – *The Seats and Causes of Diseases* – (1761)
  – Brain pathology; site of lesion in apoplexy in brain on opposite side; Father of autopsy

• Alessandro Volta (1745-1827); Coma, Italy
  – Animal electricity

• Luigi Galvani (1737-1798); Bologna, Italy
  – Muscle-nerve preps
Luigi Galvani – Beginning of Neurophysiology
History of Neurology

Epicenters of Neurology in the “Modern Era”

• England & Scotland – 1800’s – early 1900’s
• France – 1800’s
• Germany/Austria – 1800’s
• USA – Early & Late 1900’s
History of Neurology
Early 1800’s

• Marshall Hall (1790-1857);
  Nottingham, United Kingdom
  – Reflex centers in CNS
    • *On the Reflex Function of the Medulla Oblongata and Medulla Spinalis* (1833)
      – Strychnine convulsions stop if cut spinal cord

• Marie Jean Pierre Flourens (1794-1867);
  Maureilhan, France
  – Cerebellar functions
  – Investigated localization using animal experimentation
  – Not a proponent of localization
History of Neurology
Early 1800’s (cont.)

• Charles Bell (1774-1842); Edinburgh, United Kingdom
  – Facial Palsy
  – *An Idea of a New Anatomy of the Brain* (1811)
  – Posterior/Anterior roots

• François Magendie (1783 – 1855); Bordeaux, France
  – Posterior vs Anterior roots
  – The law of Bell-Magendie

• James Parkinson (1755-1828); London, United Kingdom
  – Shaking Palsy (1817)
THE

ANATOMY OF THE BRAIN,

EXPLAINED IN A

SERIES OF ENGRAVINGS.

BY

CHARLES BELL,

FELLOW OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

LONDON:

PRINTED BY C. WRIGHTSON, 20-22, SADLER STREET, FLEET STREET, FOR J. N. LONSDON AND O. REES, PATERNOSTER-ROW, AND T. CADELL, JUN., AND W. DAVIES, IN THE STRAND.

1802.

THE

NERVOUS SYSTEM

OF THE

HUMAN BODY.

EMBRACING

THE PAPERS DELIVERED TO THE ROYAL SOCIETY ON THE SUBJECT OF THE NERVES.

BY CHARLES BELL, F.R.S.

LONDON:

PUBLISHED BY LONSDON, REES, ORM, BROWN, AND GREEN, PATERNOSTER-ROW; AND J. TAYLOR, UPPER GOWER-STREET.

1809.
Charles Bell
Anatomy of the Brain - 1811
Charles Bell
*Nervous System of the Human Body – 1830*
ESSAYS
ON THE
ANATOMY OF EXPRESSION
IN
PAINTING.

BY CHARLES BELL.

LONDON:
PRINTED FOR LONGMAN, HURST, REES, AND OSNE, PATERNOSTER-ROW.
1806.
Charles Bell
Anatomy of Expression - 1806
History of Neurology
Early 1800’s (cont.)

- PHRENOLOGY -

• Franz Joseph Gall (1758 – 1828)
  Tiefenbronn, Baden
    – On the Functions of the Brain and of Each of Its parts: With Observations on the Possibility of Determining the Instincts, Propensities, and Talents, Or the Moral and Intellectual Dispositions of Men and Animals, by the Configuration of the Brain and Head (1835)

• Johann Spurzheim (1776 – 1832)
  Trier, Germany
    – Phrenology, Or, The Doctrine of the Mental Phenomena (1832)
History of Neurology
Mid 1800’s

• Moritz Heinrich Romberg (1795-1873); Meiningen, Germany
  – Post columns & cerebellum
  – *Lehrbuch der Nervenkrankheiten des Menschen* (1846)
  – *A Manual of the Nervous Diseases of Man* (1853)
  – 1st Neurology Textbook

• Amand Duchenne (1806-1875); Boulogne-sur-Mer, France
  – Muscular Dystrophy
  – Electrical stimulation

• Pierre Paul Broca (1824-1880); Sainte-Foy-la-Grande, France
  – Motor aphasia, frontal lobe
Moritz Heinrich Romberg
1st Neurology Textbook
Amand Duchenne
Electrophysiology

A TREATISE
ON
LOCALIZED ELECTRIZATION,
AND ITS APPLICATIONS TO PATHOLOGY
AND THERAPEUTICS.

BY DR. G. B. DUCHENNE.

TRANSLATED FROM THE THIRD EDITION OF THE ORIGINAL,
BY HERBERT TIBBITS, M.D.,
LICENTIATE OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON;
MEDICAL SUPERINTENDENT OF THE NATIONAL HOSPITAL FOR THE PARALYZED
AND EPILEPTIC.

WITH NUMEROUS ILLUSTRATIONS,
AND NOTES AND ADDITIONS BY THE TRANSLATOR.

PHILADELPHIA:
LINDSAY & BLAKISTON.
1871.
Charles Darwin
The Expression of the Emotions in Man & Animals - 1872
Charles Darwin

*The Expression of the Emotions in Man & Animals* - 1872
History of Neurology
Mid 1800’s (cont.)

• Nikolaus Friedreich (1825-1882);
  Würzburg, Germany
  – Heidelberg (Erbs’ mentor)
  – Ataxia, Muscular Dystrophy

• Édouard Brown-Séquard (1817-1894);
  Port Louis, Mauritius
  – Mauritius/Paris/USA/UK-Queens Square
  – Cord hemisection/crossed pathways

• Theodor Meynert (1833-1892);
  Dresden, Germany
  – Univ. of Vienna, Freud mentor
  – Cortical organization/Psychiatry
COURSE OF LECTURES
ON THE
PHYSIOLOGY AND PATHOLOGY
OF THE
CENTRAL NERVOUS SYSTEM

DRAWN AT THE
Royal College of Surgeons of England in May, 1858.

BY
G. B. BROWN-SÉQUARD, M. D., F.R.S.,

PHILADELPHIA:
COLLINS, PRINTER, 765 JAYNE STREET.
1860.
History of Neurology
Mid 1800’s (cont.)

• Claude Bernard (1813 – 1878);
  Paris, France
  – Sympathetic nervous system
  – Produced ‘Horner’ Syndrome
diagnosis
  – *Introduction to the Study of Experimental Medicine* - 1865
History of Neurology
Mid 1800’s (cont.)

• Jean Charcot (1825-1893)
  – Salpêtrière, Paris, France
  – ALS, MS, myopathy cases
  – Clinical pathology
  – Classroom demonstrations - Leçons
WAYS PHYSICIANS DISCUSS NEUROLOGY

Then... Salpêtrière

*A Clinical Lesson at the Salpetriere*, Andre Brouillet (1887):
Richard Barohn, Mazen Dimachkie, Mamatha Pasnoor, Jeffrey Statland, Jon Katz, Todd Levine, David Saperstein, Katalin Scherer, Aziz Shaibani, Mike Pulley, Tony Amato, Carlayne Jackson, Osvaldo Nascimento, John Kissel, Sara Austin, Tahseen Mozaffar, Anthony Amato, Gil Wolfe, Matt Wicklund, Jaya Trivedi, Omar Jawdat, Laura Herbelin
Discussion Forum

Recent Activity

- Vaccines after AIDP? — Started by: Christina Fournier, MD, MSc
- Would you give her rituximab? — Started by: Yuebing Li, MD, PhD
- Can we sometimes dismiss an abnormal muscle biopsy finding? — Started by: Georgios Manousakis, MD
- Mild GBS treatment — Started by: Nicholas Earle, MD
- Managing Expectations in CIDP — Started by: Andrew Wong, MD
- The MDA free gene testing and wasted opportunity — Started by: Jon Katz, MD

Popular Topics

Read All Topics

Most Active Members

#1 - Georgios Manousakis, MD
#2 - Felix Brizuela, DO
#3 - Michael Pulley, MD, PhD

Neuromuscular Polls
History of Neurology
France Late 1800’s - Salpêtrière

• Pierre Marie (1853-1940); Paris, France
  – Cerebellar ataxia/spinal AVM
  – Charcot-Marie-Tooth
    • *Revue médicale* (1886)
    • *Lectures on the Diseases of the Spinal Cord* (1895)

• Joseph François Félix Babinski (1857-1932); Paris, France
  – Extensor sign

• Joseph Jules Dejerine (1849-1917); Geneva, Switzerland
  – FSH MD

• Gustave Roussy (1874-1948); Vevey, Switzerland
  – Pain syndrome
Pierre Marie

LECTURES

ON

DISEASES OF THE SPINAL CORD

BY

DR. PIERRE MARIE,
Deputy-Professor at the Faculty of Medicine of Paris.
Physician of the Hospitals.

CONTAINING TWO HUNDRED AND FORTY-FOUR WOODCUTS.

TRANSLATED BY
MONTAGU LUBBOCK, M.D., F.R.C.P. LOND.

London:
THE NEW SYDENHAM SOCIETY.
1895.
History of Neurology
Late 1800’s – Germany/Austria

• Carl Wernicke (1848-1904);
  Gory, Poland
  – Berlin
  – Sensory aphasia, Temporal lobe

• Eduard Hitzig (1838-1907);
  Germany
  – Motor cortex stim in ___ known cortex
  – Movement opposite side

• Sigmund Freud (1856-1939);
  Czech Republic
  – Vienna
  – Founder of psychoanalysis
  – Unconscious, idealization – ego
  – Interpretation of Dreams – 1900
  – Aphasia
  – Cerebral palsy
Sigmund Freud

THE INTERPRETATION
OF DREAMS

By
PROF. DR. SIGMUND FREUD, L.L.D.

AUTHORISED TRANSLATION OF THIRD EDITION
WITH INTRODUCTION
BY
A. A. BRILL, Ph.D., M.D.

NEW YORK
THE MACMILLAN COMPANY
1915
History of Neurology
Late 1800’s – Germany/Austria (cont.)

- Carl Friedrich Otto Westphal (1833-1890); Berlin, Germany
  - First Professor of Neurology at a Prussian University
  - Absent knee reflexes in tabes

- Herman Oppenheim (1858-1919); Warburg, Germany
  - Charité in Berlin; Student of Westphal
  - Traumatic neurosis, dystonia, tabes, amyotonia congenita
History of Neurology
Late 1800’s – Germany/Austria (cont.)

• Wilhelm Heinrich Erb (1840-1921);
  Winnweiler, Germany
  – Heidelberg
  – MG, MD, spastic spinal paralysis,
    upper brachial plexus palsy

• Friedrich Jolly (1844 – 1904);
  Heidelberg, Germany
  – Berlin - Followed Westphal at
    Charité as Chair
  – “The Myasthenic Reaction” on rep
    stim
Friedrich Jolly

- Jolly Test – i.e. Repetitive Nerve Stimulation in MG (1895)
History of Neurology & The Brits – Late 1800’s/Early 1900’s

Clinical Neurology - Queens Square

- Hughlings Jackson (1835-1911);
  Green Hammerton, United Kingdom
  - Epilepsy
  - Clinical Correlation

- Henry Head (1861-1940);
  Stoke Newington, United Kingdom
  - Sensation
  - Aphasia

- William Gowers (1845-1915);
  London, United Kingdom
  - Everything clinical!
  - 1886 – *Manual of Diseases of Nervous System*

- Kinnier Wilson (1878-1937);
  London, United Kingdom
  - 1912 – Familial Progressive Lenticular Degeneration
  - 1947 – *Neurology*
    - *The best ever textbook of neurology*
APHASIA
AND
KINDRED DISORDERS OF SPEECH

BY
HENRY HEAD, M.D., LL.D. EDIN., F.R.S.
CONJULITING PHYSICIAN TO THE LONDON HOSPITAL
HONORARY FELLOW OF TRINITY COLLEGE, CAMBRIDGE
VOLUME 1

CAMBRIDGE
AT THE UNIVERSITY PRESS
MCMXXVI
A Manual of Diseases of the Nervous System

By W. R. Gowers, M.D., F.R.C.P.


With Three Hundred and Forty-One Illustrations.

Philadelphia: P. Blakiston, Son & Co.
1613 Walnut Street
1884.

FIG. 156.

Proprietary disorder, causing the patient to rise to the sitting posture. (Drawn by Dr. H. L. Scott.)

FIG. 157.

Proprietary disorder, causing the patient to rise to the sitting posture. (Drawn by Dr. H. L. Scott.)

FIG. 158.

Proprietary disorder, causing the patient to rise to the sitting posture. (Drawn by Dr. H. L. Scott.)

FIG. 161.—Mode of rising from the ground in pseudo-hypertrophic paralysis.
History of Neurology & The Brits – Late 1800’s/Early 1900’s

Experimental Neurophysiology

- David Ferrier (1843-1928); Aberdeen, United Kingdom
  - Experimental proof of cerebral localization in animals
  - Extended concepts of Jackson & Hitzig

- Charles Sherrington (1857-1952); Islington
  - *The Integrative Action of the Nervous System*

- Edgar Douglas Adrian (1889 – 1977); Hampstead, United Kingdom
  - Won Nobel Prize in 1932 with Sherrington “for their discoveries regarding the functions of neurons”
History of Neurology & Russian Neurophysiology

• Ivan Mikhailovich Sechenov (1829-1905); Moscow, Russia
  – Moscow State University
  – Introduced electrophysiology to Russia
  – Studied in Berlin, Austria, Paris with Carl Ludwig, Herman Von Helmholtz, Emil du Bois-Reymond, & Claude Bernard
  – Book: (1863) Reflexes of the Brain

• Ivan Petrovich Pavlov (1849-1936); St. Petersburg, Russia
  – Studied digestive glands in GI system
  – Circulation
  – Neurophysiologist
  – All in intact behavior in animals
  – 1904 Nobel Prize
Ivan Petrovich Pavlov
Ivan Petrovich Pavlov
Ivan Petrovich Pavlov

The Work of the Digestive Glands

Lectures by

PROFESSOR I. P. PAVLOV

SECOND ENGLISH EDITION

ILLUSTRATED

LONDON

CHARLES GRIFFIN & COMPANY, LIMITED

1910

Figure 83. Pavlov's lectures, which summarised his work, were published in The Work of the Digestive Glands, and translated into several languages, including English. His research in this field, occupying the first twenty-five years of his scientific career, received climactic recognition in the award of the Nobel prize in 1904, this being the first Nobel prize in physiology, as well as the first to a Russian scientist. After gaining such recognition, Pavlov then inaugurated a second major research program, continuing to his eighty-sixth year and receiving even greater acclaim.
History of Neurology
The Russians!

Pupils of Sechenov

• Nikolai Yevgenevich Wedensky (1852-1922)
• Ivan Romanovich Tarkhanov (1846-1908)
• Sergei Sergeivich Korsakov (1854-1900)
• Vladimir M. Bechterev (1857-1927)
History of Neurology
Late 1800’s – Italy/Spain

• Camillo Golgi (1843 – 1926);
  Pavia, Italy
  – 1873 - Invented Silver Stain

• Santiago Ramón y Cajal (1852 – 1934);
  Madrid, Spain
  – Advanced Silver Stain

• Golgi & Ramon y Cajal co-won the Nobel Prize in 1906
Santiago Ramón y Cajal
Degeneration & Regeneration of the Nervous System

BY

S. RAMON Y CAJAL, M.D., F.R.S.
Director of the Instituto Cajal, Madrid
Honorary Professor of Pathology in the University of Madrid

TRANSLATED AND EDITED
BY

RAOUL M. MAY
Ph.D. (Harv.), D.Sc. (Paris)
Laboratoires d'Anatomie et Histologie Comparées et de Chimie Biologique
Faculté des Sciences, Paris

VOLUME I

OXFORD UNIVERSITY PRESS
LONDON: HUMPHREY MILFORD
1928
History of Neurology

More Recent Leaders – UK

• Gordon Morgan Holmes (1876 – 1965);
  Farnham, United Kingdom
  – Research of the cerebellum and visual cortex

• F.M.R. Walshe (1885 - 1973);
  London, United Kingdom
  – 1943 - Diseases of the Nervous System; 11 editions

• Russell Brain a.k.a. Lord Brain (1895 – 1966);
  Reading, United Kingdom
  – 1933 - Diseases of the Nervous System; 12 editions
  – Editor of journal Brain!
History of Neurology
More Recent Leaders – UK (cont.)

• MacDonald Critchley (1900 – 1997); Bristol, United Kingdom
  – 1953 - *The Parietal Lobes*

• Lord John Walton (1922 - ); United Kingdom
  – Newcastle on Tyne
  – 1960’s - *Disorders of Voluntary Muscle*; 6 editions

• Sir Roger Bannister (1929 - ); London, United Kingdom
  – Ran 4 min mile as a med student based in Oxford!
  – 1983 - *Autonomic Failure*
History of Neurology

More Recent Leaders – UK (cont.)

- Sir John Carew Eccles (1903 – 1997); Melbourne, Australia
- Sir Alan Lloyd Hodgkin (1914 – 1998); Banbury, United Kingdom
- Sir Andrew Fielding Huxley (1917 – 2012); Hampstead, United Kingdom

Co-won Nobel Prize - 1963
- Studied giant axon of squid
- Sodium & Potassium ions and membrane conductance
- Excitation & inhibition in the peripheral & central portions of the nerve cell membrane
Neurologists Famous for Non-Neurology Stuff

• Benjamin Rush (1746 – 1813)
  • Signed the Declaration of Independence
• S. Weir Mitchell (1829-1914)
  – Author- 19 novels, poetry, and short stories.
• Roger Bannister (1929 – P)
  – Record for the first 4 minute mile
• Michael Burry ( 1971 – P)
  – The Big Short
Infamous Neurologists

• Hans Berger (1873 – 1941)
  – Invented the EEG
  – Known Nazi & member of the SS “Schutzstaffel”

  – Hallervorden-Spatz Disease
    • More commonly referred to as “Pantothenate kinase-associated neurodegeneration”
  – Known Nazi Party members
# Neuro & Muscle Nobel Prize Winners

*Blue = European; Grey = American*

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Ivan Pavlov</td>
<td>1904</td>
<td>Conditioned reflex</td>
</tr>
<tr>
<td>Santiago Ramon y Cajal &amp; Camillo Golgi</td>
<td>1906</td>
<td>Structure of the nervous system</td>
</tr>
<tr>
<td>Julius Wagner-Jauregg</td>
<td>1927</td>
<td>Malaria therapy for dementia paralytica</td>
</tr>
<tr>
<td>Edgar Adrian &amp; Sir Charles Scott Sherrington</td>
<td>1932</td>
<td>Function of neurons/ Neurophysiology reflexes</td>
</tr>
<tr>
<td>Sir Henry Hallett Dale &amp; Otto Loewi</td>
<td>1936</td>
<td>Chemical transmission of nerve impulses</td>
</tr>
<tr>
<td>Joseph Erlanger &amp; Herbert Spencer Gasser</td>
<td>1944</td>
<td>Functions of single nerve fibres</td>
</tr>
<tr>
<td>Carl Ferdinand Cori, Gerty Theresa Cori &amp; Bernardo Alberto Houssay</td>
<td>1947</td>
<td>Discovery of the catalytic conversion of glycogen</td>
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</tbody>
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### Neuro & Muscle Nobel Prize Winners

*(cont.)*

*Blue = European; Grey = American*

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Topic</th>
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<tbody>
<tr>
<td>Walter Rudolf Hess &amp; Antonio Caetano Egas Moniz</td>
<td>1949</td>
<td>Interbrain coordinator internal organ activity/therapeutic value of leucotomy</td>
</tr>
<tr>
<td>Sir John Carew Eccles, Sir Alan Lloyd Hodgkin &amp; Sir Andrew Fielding Huxley</td>
<td>1963</td>
<td>Excitation &amp; inhibition in the peripheral &amp; central portions of the nerve cell membrane</td>
</tr>
<tr>
<td>Sir Bernard Katz, Ulf von Euler, Julius Axelrod</td>
<td>1970</td>
<td>Discoveries concerning the humoral transmitters in nerve terminals &amp; the mechanism for their storage, release and inactivation</td>
</tr>
<tr>
<td>Baruch S. Blumberg &amp; D. Carleton Gajdusek</td>
<td>1976</td>
<td>New mechanisms for origin &amp; dissemination of infection diseases</td>
</tr>
<tr>
<td>Allan M. Cormack &amp; Sir Godfrey Hounsfield</td>
<td>1979</td>
<td>Development of computer assisted tomography</td>
</tr>
<tr>
<td>Roger Sperry, David Hubel &amp; Torsten Wiesel</td>
<td>1981</td>
<td>Information processing in the visual system</td>
</tr>
<tr>
<td>Stanley Prusiner</td>
<td>1997</td>
<td>Discovery of prions; a new biological principle of infection</td>
</tr>
</tbody>
</table>
# Neuro & Muscle Nobel Prize Winners (cont.)

*Blue = European; Grey = American

<table>
<thead>
<tr>
<th>Name</th>
<th>Year</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arvid Carlsson, Paul Greengard, &amp; Eric Kandel</td>
<td>2000</td>
<td>Signal transduction in the nervous system/learning</td>
</tr>
<tr>
<td>Paul Lauterbur &amp; Sir Peter Mansfield</td>
<td>2003</td>
<td>Magnetic resonance imaging</td>
</tr>
<tr>
<td>Richard Axel &amp; Linda B. Buck</td>
<td>2004</td>
<td>Odorant receptors and the organization of the olfactory system</td>
</tr>
<tr>
<td>Randy W. Schekman &amp; Thomas C. Sudhof</td>
<td>2013</td>
<td>Machinery regulating vesicle traffic, a major transport system in our cells</td>
</tr>
</tbody>
</table>
History of Neurology
Part 1
...Then the Americans!

History of Neurology Part 2

- Amariah Bringham
- Silas Wier Mitchell
- William Alexander Hammond
- William James
- William Osler
- Francis Xavier Dercum
- Charles Mills
- James Jackson Putnam
- Edouard Sequin
- Bernard Sachs
- Charles Loomis Dana
- Moses Allen Starr
- F. Savasy Pearce
- Smith Ely Jelliffe
- James Ramsay Hunt
- James Papez
- Wilder Penfield
- Harvey Cushing
- Walter Dandy
- Roy Grinker
- Robert Foster Kennedy
- J. Erlanger & H. Gasser
- Tracy J Putnam
- Stanley Cobb
- Abe B. Baker
- R. Sperry
- K. Lashley
- Israel Wechsler
- Frederick Tilney
- B. F. Skinner
- Houston Merritt
- Raymond Adams
- Lewis Rowland
- Dewey Zielger
- Robert Fishman
- H. Kluver & P. Bucy
- D. Hubel & T. Wiesel
- V. Mountcastle
- Stanley B. Prusiner
- Eric R. Kandel
- O. Sacks
- A. Ropper
- R. Axel & L. Buck
- R. Schekman & T. Sudhof
- R. Nudo
- Etc., etc., etc.!

To be continued...
References