2015

ISHN

INTERNATIONAL SOCIETY FOR THE HISTORY OF THE NEUROSCIENCES

WASHINGTON, DC • JUNE 1-6, 2015

In collaboration with:

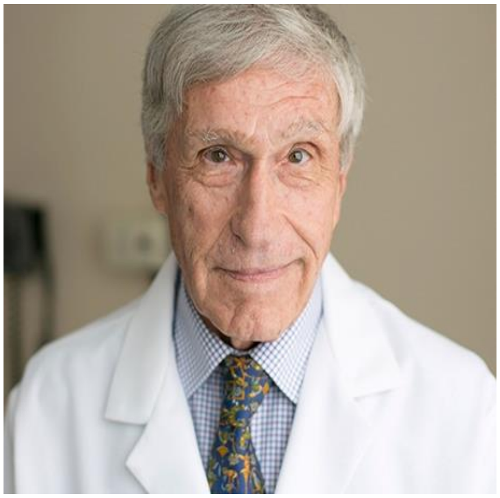
THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC

Sponsored By:

Department of Neurology **Department of History**

President's Welcome



On behalf of the International Society for the History of the Neurosciences (ISHN), it is my privilege to welcome you to our 20th Annual Meeting. IT IS sponsored by the Department of Neurology and the Department of History at the George Washington University in Washington, DC.

The program deals with various aspects of the history of neurosciences and includes a presentation discussing the assassination of President Abraham Lincoln 150 years ago. Our keynote speaker, Dr. Daniel Drachman will present the history of myasthenia gravis. A new feature of the meeting is the emphasis given to posters. They are prominently displayed and special prizes will be awarded to the best ones.

We have planned the event so that the participants will also have time to explore the city and its cultural and artistic attractions. We chose the United States Botanical Garden as one of our excursions. It is the oldest continually operating botanic garden in the country. The excursion will focus on the medicinal plants and THEIR importance in the history of neurology. We also propose a visit to the National Museum of the American Indian, which houses one of the world's largest and most diverse collections of its kind. The tour will highlight the Native Americans' contributions to the science of Neurology. Another optional tour will take the participants to the National Museum of Health and Medicine. Among many others, the museum's Neuroanatomical collection includes the Yakovlev-Haleem collection of normal and pathological development of the brain collected by Dr. Paul Yakovlev between 1930 and 1994. Finally, the traditional Gala Dinner will be held at the historical Whittemore House. A joint meeting of the ISHN and the Association of Academic Neurologists of the greater DC area will take place during the gala dinner which will include a commemoration of Norman Geschwind by 3 of his former students

I am confident that the days spent at the meeting will encourage you to strengthen relationships with fellow scholars from different parts of the world. I am absolutely delighted at the prospect of meeting you in the heart of the nation's capital.

François Boller

President, International Society for the History of the Neurosciences

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Acknowledgement

The organizers of the 2015 ISHN gratefully acknowledge the generous support of the following individuals and organizations that have helped make this meeting possible:

Epilepsy Foundation of America

George Washington University, School of Medicine and Health Sciences

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The Office of Continuing Education in Health Professions (CEHP)

Myasthenia Gravis Foundation

Mr. and Mrs. Edward J. Fine

INTERNATIONAL SOCIETY FOR THE HISTORY OF THE NEUROSCIENCES

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AGENDA

Monday, June 1, 2015

6:00pm – 8:00pm	Opening Reception	
	Ross Hall, George Washington University	
	An illustrated History of the First Twenty Years of the International Society for the History of the Neurosciences	Wendy Finger

Tuesday, June 2, 2015

7:00am	On-Site Registration	
8:30am	President's Welcome	François Boller
	Chairman's Foreword	Henry Kaminski

- Moderators: Henry Kaminski and François Boller

9:00am	**History of Myasthenia Gravis**	Daniel Drachman

- Moderators: Wayne Lazar and Sherry Ginn

10:00am	**Renaut Corpuscles or Peripheral Nerve Infarcts**	Mohamed Kazamel Christopher J. Boes
10:30am	Coffee Break	
10:45am	**Back to the Future, or Ahead into the Past?**	Eugenio Frixione
11:15am	**The Mythical rete Mirabile: From Galen to Berengario to Vesalius**	Douglas Lanska
11:45am	**Pulfrich's "Stereo Effekt" (1922) Modeling Target Trajectories for Pulfrich's Historic Demonstration Devices and a 2D Pendulum**	Douglas Lanska Joseph Lanska
12:15pm	Lunch Break	

- Moderators: Julien Bogousslavsky and Marjorie Lorch

1:30pm	**Revisiting the Beginning of Modern Neuroscience: Beyond the Neuromolecular Gaze**	Youjung Shin

2:00pm	**Mechanical "Neuroscience" in Operetta**	Lorenzo Lorusso Alessandro Porro Antonella Franchini
2:30pm	**Color Vision: Chevreul and Ibn al-Haytham**	Gül A. Russell
3:00pm	**Multiple Sclerosis in Fictional Literature (1954-2012)**	Axel Karenberg
3:30pm	**Experimental and Human Research on the Cerebellum as Represented in the Magnus-Rademaker Film Collection**	Kimberley Fleuren Peter J. Koehler
4:00pm	Coffee Break	
4:15pm	**Neurology in Popular Songs**	Bruno Colombo Alessandro Porro Antonella Franchini Lorenzo Lorusso
4:45pm	**A Brief History of Neurology in Film**	Eelco F.M. Wijdicks
5:15pm	Adjourn	
5:15pm – 7:00pm	Board Meeting - International Society of the History of the Neurosciences	

Wednesday, June 3, 2015

- Moderators: Frank Stahnisch and Moshe Feinsod

8:30am	**Hector Berlioz's Neurophysiological Imagination**	Carmel Raz
9:00am	**The Role of Quarantine in Communicable Diseases of the Nervous System: Historical and Clinical Perspective**	John P. Conomy
9:30am	**Hysteria versus Simulation During World War I: Sollier versus Babinski**	Julien Bogousslavsky
10:00am	Coffee Break	

- Moderators: John Conomy and Eugenio Frixione

10:15am	**Standards of Care in the Army of the Potomac: Case Studies of Head Injuries During the American Civil War**	William C. Hanigan
10:45am	**Loose Ties: The Paradoxical Position of Norman Geschwind and the Theory of "Disconnexion"**	Scott Phelps
11:15am	**C. Miller Fisher and his Examination of The Comatose Patient**	Eelco F.M. Wijdicks
11:45am	**Tracy Jackson Putnam (1894-1975): The Context that Changed**	Diane B. Freedman
12:15pm	Lunch Break Board Meeting – Journal of the International Society of the History of the Neurosciences	

- Moderators: Axel Karenberg and Peter J. Koehler

1:30pm	**Lesser Known European Contributions to Neuroscience: Linguistic Militancy, Myrmecology and the Cinema**	François Boller Lorenzo Lorusso
2:00pm	**Frank Clifford Rose Memorial Lecture: Franz Joseph Gall on Greatness in the Fine Arts Demanding Multiple Cortical Faculties of Mind**	Stanley Finger Paul Eling
2:30pm	**Huygens' Headache**	Peter J. Koehler
3:00pm	**Benjamin Franklin's Wife's Apoplexy and Mid-Eighteenth Century Medicine**	Stanley Finger
3:30pm	Coffee Break	

- Moderators: Harry Whitaker and Ted Rothstein

3:45pm	**Charles Judson Herrick: A Founder of American Neuroscience**	Robert Y. Moore
4:15pm	**The 'Sale' of the Archivio and the Destruction of Public Neurosciences in Italy**	Sultana Banulescu

4:45pm	**A Story of an Utopia: Why Labor Asylum in Yasnya Polyana was Not Materialized**	Elena Bobkova Boleslav L. Lichterman
5:15pm	**The Australian John Hunter: An Extraordinary Neuro-Anatomist And a Legend in his Own Short Lifetime**	Katherine Storey
5:45pm	**Christopher U.M. Smith Presidential Address: Neurology and Psychiatry Two Disciplines, One Target**	François Boller
6:15pm	Adjourn	

Thursday, June 4, 2015

- Moderator: Stanley Finger

8:45am	**Native American Contribution to Medicine and Neurology**	Edward J. Fine
9:15am	Visit to the National Museum of the American Indian Museum	
	Visit to the United States Botanical Garden	
12:00pm	Lunch Break	
1:00pm	National Museum of Health and Medicine Tour (Optional)	

Friday, June 5, 2015

- Moderators: Douglas Lanska and Edward J. Fine

8:30am **Symposium: Early contributions on Movement Disorders in the Nineteenth Century and the Beginning of the Twentieth Century**

Jean-Martin Charcot and Movement Disorders: Neurological Legacies to the 21st Century	Christopher G. Goetz
Georges Gilles de la Tourette and Tic Disorders	Oliver Walusinski

	Early Illustrations of Geste Antagoniste in Dystonia	Emmanuel Broussolle
	A Brief Historical Review of the Medical and Surgical Therapies for Parkinson's disease	Ted Rothstein
10:30am	Coffee Break	

- Moderators: Karen Langer and Samuel Greenblatt

10:45am	**The Birth of Neurosurgery in Malaysia**	Shun Ning Wong
11:15am	**Repressed Neurosurgery:**	Boleslav L. Lichterman
	Life and Fate of Max Skoblo	Mikhail Kozovenko
11:45am	**Psychosurgery in Washington, DC**	Donald C. Shields
12:15pm	Lunch Break	
1:30pm	General Assembly	

- Moderators: Lorenzo Lorusso and Gül A. Russell

2:00pm	**Cerebral Angiography: Courageous Beginnings to Amazing Interventions**	Haris Kamal
2:30pm	**The Emergence of "Amnesia as Identity Loss" in Nineteenth Century Scientific and Popular Culture**	Mary V. Spiers
3:00pm	**The Treatise on Pain in the Archipathologia of Filipe Montalto**	Paulo Fontoura Manuel Marques Adelino Cardoso
3:30pm	**On Anchoring Impressions into Memory: A Historical Perspective**	Karen Langer
4:00pm	Coffee Break	

- Moderators: Mark Hallett and Donald C. Shields

4:15pm	**The Vision of Alfred Yarbus**	Nicholas Wade

4:45pm	**An Eighteen-year Exploration of the Language Faculty through a Single Case**	Marjorie Lorch
5:15pm	**Apraxia: The Rise, Fall, and Resurrection of Diagrams**	Mark Hallett
5:45pm	Adjourn	
7:00pm - 9:00pm	Gala Dinner: Whittemore House	
	Commemoration of Norman Geschwind by three of his former students	

Saturday, June 6, 2015

- Moderators: Yuri Zagvazdin and Catherine Storey

9:00am Symposium: The History of Neuroscience in Canada

	Some Milestones from the History of Neuroscience in the Province of Alberta	Frank Stahnisch
	Laboratory Techniques and the Search for a Rational Therapy for Epilepsy in the Interwar Period	Delia Gavrus
	Paradigm Shift in the Treatment of Complex Cerebral Aneurysms: The Drake Fenestrated Clip and Drake Tourniquet	Rolando Del Maestro
	"Je me souviens d'eux" – A Featured Symposium Commentary	Harry A. Whitaker
11:00am	Coffee Break	

- Moderators: Boleslav L. Lichterman and Mohamad Koubeissi

11:15am	**History of Antiepileptic Drug Development**	Richard H. Mattson
11:45pm	**The Early Years of Epilepsy Surgery: From Trephination to Cortical Resection and the Contributions by Fedor Krause**	Uwe J. Neubauer

12:15pm	**Origins of Surgical Epilepsy: A History of its Development From Animal Experimentation and Clinical Observation to Effective Treatment**	Edward J. Fine
12:45pm	**Jose Maria Ramos Mejia and the Management of Epilepsy in Argentina During the Late Nineteenth Century**	F.J. Rodriguez Porcel H.S Schutta
1:15pm	Adjourn	

The 'Sale' of the Archivio and the Destruction of Public Neurosciences in Italy

Sultana Banulescu, PhD Candidate
History Program
City University of New York Graduate Center

In 1939 Padre Agostino Gemelli (1878-1959), an Italian Franciscan friar and a professor of applied psychology at Milan's Università Cattolica del Sacro Cuore (which he had founded), wrote: "I cannot and will not accept a gift from Levi Bianchini; I do not want a donation from a Jew… I am buying the *Archivio*, and I am buying it for 10,000 Lire." The object of this forced sale was a scientific journal dedicated to neurology, psychiatry, and psychoanalysis (*Archivio generale di neurologia, psichiatria e psicoanalisi*, founded in 1920 by Marco Levi Bianchini). Soon after taking over the journal, Gemelli, inspired by the leadership of German psychiatrist Mathias Göring (Hermann Göring's cousin), expunged Bianchini and psychoanalysis from the journal on the basis of their "Jewish origins," but he also undertook an effort to dismantle a unique forum where neurologists had been engaging the general public.

This paper will show how, between 1920 and 1938, the *Archivio,* while starting as a journal primarily dedicated to publishing neurology research, became progressively diversified and more accessible to the public. By drawing from Gemelli's correspondence as well as the complete collection of the *Archivio*, this paper will elucidate the connections between the vicissitudes of the *Archivio* and those of the broader Italian society. Letters and journal articles by Gemelli demonstrate that his goal was not only to racially purge the journal, but also to fundamentally alter the journal's vision by steering it away from its engagement with politics, literature, and the arts. In his personal writing, Gemelli (who defended his M.D. thesis under neuroscientist Camillo Golgi, 1906 Nobel Prize Laureate) shows that he was open to a plurality of disciplines but intolerant of the interaction between humanities and sciences, which he regarded as a worthless hindrance to his religious and scientific work.

A Story of a Utopia: Why Labor Asylum in Yasnaya Polyana Was Not Materialized?

Elena Bobkova, PhD
Psychiatry
The NP Kamenev Tula Regional Clinical Psychiatry Hospital

Boleslav Lichterman, PhD
Professor of the History of Medicine
The I.M. Sechenov Moscow State Medical University

Aim: To show an attempt of establishing a new type of labor asylum near Leo Tolstoy's estate in Tula region at the beginning of the XXth century.

Material and methods: Two unpublished letters by Dr. N.P. Kamenev are analyzed. They were written in 1906 and kept at a medical library of the N.P. Kamenev First Tula regional psychiatry hospital.

Results: Dr. Nikolai Petrovich Kamenev (1857—1936) was appointed a director of a psychiatry hospital of Tula zemstvo (local elected council) in 1895. In 1903 he organized a settlement for chronic psychiatry patients but he also envisaged other tasks of zemstvo psychiatry. He was convinced that "a mild nervous disorder or an emerging mental disease might be arrested and cured" with manual labor in rural setting.

In his first letter dedicated to Leo Tolstoy Kamenev mentioned the importance of supporting of neurotic persons suffering from neurasthenia, psychasthenia, hysteria, etc. The main attraction of a proposed asylum should be its location near Tolstoy's estate Yasnaya Polyana. Kamenev invited Tolstoy to become a chairman of the asylum's international board. Tolstoy replied that he is not competent to evaluate the project and suggested to meet for discussion.

The second letter was addressed to Prince Georgy Lvov (1861-1925) who was a chairman of Tula zemstvo council. It contains detailed description of the asylum tasks and mentions possible financial resources including philanthropic organizations. The first task was to establish four boarding schools for 200 children and teenagers with mental problems including epileptics and cases of moral insanity. The second task was to open four departments for 100 beds each (400 beds in total) for those adults who suffer from fatigue, general neuroses, epileptics, alcoholics and drug addicts. Payment from rich patients should be used for supporting the poor. No alcohol should be sold in the vicinity of the asylum. We are not aware of Lvov's reply.

Conclusion: Kamenev's project of labor asylum for neurotic patients and boarding school for mentally retarded and deviating children did not materialize since it was one of "ideas before their time".

Hysteria versus Simulation During World War I: Sollier versus Babinski

Julien Bogousslavsky, MD
Neurocenter Center for Brain and Nervous System Diseases
Genolier Swiss Medical Network

World War I allowed major developments in clinical observation of neurological manifestations without brain or spinal cord lesion, which were reported as war (psycho)neuroses in France and shell shock in Britain. In France, most studies were performed by direct or indirect followers of Jean-Martin Charcot, who had specifically studied hysteria after he took office at *La Salpêtrière* in 1862. What Léon Daudet had considered the two main pupils of Charcot, i.e. Joseph Babinski and Paul Sollier, followed two radically different paths in this field: While Sollier emphasized psychological factors in hysterical manifestations and their treatment, Babinski negated emotional-psychological issues, leading to the controversial concept of “unconscious simulation”.

The controversy between hysteria and simulation was not new, including in war times, and had already been addressed during the French-Prussian war of 1870. This fading of the boundaries of simulation disorders led to the hypertrophic development of certain therapies, such as galvanic and faradic current shocks called *torpillage* by the soldiers. Clovis Vincent, the future flounder of neurosurgery in France and the most cherished pupil of Babinski, and Gustave Roussy, a swiss-born follower of Jules Déjerine, the current chairman of neurology at *La Salpêtrière*, particularly illustrated themselves – often violently - in what they also called “electric psychotherapy”. A famous memory of this treatment was reported by Louis-Ferdinand Céline in one of the most celebrated novel of the century, *Journey to the end of the night* (1932), where Roussy appeared as professor Bestombes. After the war, the controversy between war-associated syndromes versus simulation continued with the issues of pensioning, as soldiers without a detectable lesion commonly were considered as malingerers.

Lesser Known European Contributions to Neuroscience
Linguistic Militancy, Myrmecology and the Cinema

François Boller, MD, PhD
Professor of Neurology
Department of Neurology
George Washington University Medical School

Lorenzo Lorusso, MD
U.O. Neurologia, A.O. "Mellino Mellini"
Chiari-Brescia

Prominent developments of Neurosciences came from England, German speaking countries and France, but people from other countries also made significant contributions.
We know Jan Evangelista Purkyně, often mis-pronounced "Purkinjee" (1787-1869) for his description of cerebellar cells, but he also made other discoveries and delved in politics. He was a champion of the use of the Czech language in higher education. Such was his fame that when people from outside Europe wrote to him, the address "Purkyně, Europe" was sufficient.
Auguste Forel (1848 –1931), one of the glories of my native land, the Canton de Vaud is known to us for his work on neuroanatomy. Structures in the subthalamic area and other neuroanatomical landmarks bear his name. His 1887 work on nerve cells inspired Cajal to formulate the neuronal theory. He also wrote extensively on various social issues, such as alcohol abstinence and sexual problems. His real passion however, developed since childhood, was myrmecology. A fiery socialist, he made unflattering comparisons between these interesting animals and human politics, thus drawing much opposition. However he has had his effigy on something many would like to have: the 1000 Swiss Francs banknote where he is surrounded by ants rather than by neurons.

Not everybody thinks of Romania as a major center for neurology, yet Gheorghe Marinescu (1863–1938) really put that country on the map. He had trained in France and in other European countries, but he held the Chair of Neurology at the University of Bucharest for 41 years. He was one of the first to postulate that Parkinson disease occurs as a consequence of damage to the substantia nigra. With Paul Blocq he was the first to describe senile plaques. He was also a pioneer in medical cinematography. In 1924, Auguste Lumière recognized the priority of Professor Marinescu concerning the first science films. He authored the first medical thesis documented by motion picutures. Between 1899 and 1902, Marinescu published eight paper on cinematography focusing on normal and pathological conditions such as hemiparesis, paraparesis, hysteria, ataxia and muscle disorders on patients recovered at the *Spitalul Pantelimon*. He considered cinematography as an irrefutable documents to show the different phases of the illness and efficacy of treatment.

Christopher U.M. Smith Presidential Address:
Neurology and Psychiatry;
Two Disciplines, One Target

François Boller, MD, PhD
Professor of Neurology
Department of Neurology
George Washington University Medical School

It is commonly thought that neurology and psychiatry were "invented" in the 19th century, somewhere in Europe, either Paris or London It is obvious, however, that interest in brain and mind has existed ever since homo sapiens started thinking and introspecting about themselves. There are of course Egyptian references (Nasser, 1987; York and Steinberg, 2010), but it is not clear that they had a well-defined notion of the nervous system. A recent paper (Reynolds and Wilson, 2014) shows that there are fairly detailed Babylonian descriptions of neurological and psychiatric disorders dating as far back as the second millennium BC. The purpose of this presentation is to show that, even though they are currently considered quite separate, there was for a long time hardly any distinction between the two disciplines. Many examples of this closeness can be provided, particularly from France, Germany and Italy.

It has been argued that neurology and psychiatry are now separated, perhaps irremediably by "an artificial wall created by the divergence of their philosophical approach and research and treatment methods." (Martin, 2002). Actually politics and opportunism have played an important role in this separation. Yet the two disciplines are again getting together in various areas of research and clinical practice in such diverse fields as dementia and psychogenic movement disorders. The willingness of people from different backgrounds to work together has resulted in the appearance of several new Societies and Journals. Even the venerable Handbook of Clinical Neurology has dedicated one of its recent volumes to Psychiatry. All these trends are bound to become even stronger and as is often the case, the past is holding the key to the future.

Neurology in Popular Songs

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The characteristics and peculiarity of different genres of music provide a way to listen and understand the evolution of sounds and rhythms during time. Popular music (erroneously considered a trivial phenomenon) is able to reveal the profound changes occurred in the creation of a modern culture. From this point of view, songs and lyrics are considered as a source of knowledge for the historical understanding of society, including Medicine.

In 18th century, the *chansons françaises* described social and medical aspects related to neurological influence such as the effect of alcohol (*chanson à boire*). In 19th century, popular song had a great success with the diffusion of public performance such as music-hall shows. These songs depicted quacks (*The Hypocondriac or A travelling Doctor's,* mentioning a strange potion to cure headache) or different drugs used in that time such as *L'Apothicaire* (Apothecary) described in a satiric approach.

In the following century, popular music had a great impact in culture according to the diffusion of music by sound-media. In the beginning of last century neurological diseases were described in *The Babbit and the Bromide* (1927) by George Gershwin (1898-1937) and *Sunshine* (1928) composed by Irving Berlin (1888-1989). The relationship between music and neurology became much more consistent in popular songs (rock, hip-hop and electronic) with description of many neurological disorders, such as: Migraine, Dementia, Parkinson disease, Stroke, Epilepsy and Multiple Sclerosis. Migraine is the commonest neurological topic in popular music (139 songs), followed by Alzheimer (70 songs) and Epilepsy. The portrayal of neurological diseases gives insight in negative and satirical perception of these pathologies in pop music. Diseases are represented as an obstacle for good relationships and associated with loneliness, solitude and hopeless. We realized that the impact of neurological disturbances in pop culture is frustrating. This suggests an opportunity for educational efforts, with the introduction of more hopeful narrative regarding recent advances in management and therapies of neurological diseases.

**Pioneering Research in Neurobiology:
Aldo Perroncito's Finding on the Regeneration of the
Peripheral Nervous System**

Valentina Cani
University of Pavia
Pavia, Italy

In the first two decades of the 20^{th} century, researches on regenerative processes of tissues had a big boost also thanks to new studies led by the students attending the Laboratory of General Pathology directed by Camillo Golgi, the same scientist who, in 1873, had developed the 'black reaction', the histological procedure that allowed, for the first time, the coloring of nerve cells with all their prolongations. Golgi also studied the method of regeneration of kidney tissue, being able to demonstrate, for the first time, the regenerative and reparative potential of the renal parenchyma in pathological conditions. Thanks to the new technical and theorical means, his students extended this research to the nervous system.

Beginning in 1905, Aldo Perroncito (1882-1929), a twenty-three years old student attending Golgi's Laboratory, carried out a series of experiments on the collateral regeneration of nerves. He was the first to describe the fundamental mechanisms regulating the initial stages of the regenerative process. The division of the fibers of the central stump in the first hours following the cut was named Perroncito's phenomenon by Santiago Ramón y Cajal, who, along with Georges Marinesco made similar experiments at about the same period. Thanks to his fundamental findings, Perroncito won the Warren Prize in 1907 and the Lallemand Prize in 1910. Along with Ramón y Cajal and Marinesco, Perroncito's work definitely refuted the poligenetic theory of Albrecht Bethe whereby the distal stump could regenerate indepenetly from its connection with the proximal neuron. While Ramón y Cajal's research on peripheral nerve regeneration has been well delineated, Perroncito's findings have often been overshadowed.

However, it should be stressed by an historical point of view that his work was one of the most original contribution provided by Italy to neurology and neuroscience over the past two centuries, the results of which were determined to lay the foundation in modern reconstructive surgery.

The Role of Quarantine in Communicable Diseases of the Nervous System: An Historical and Clinical Perspective

John P. Conomy, MD, JD
Health Systems Design, Inc.
Case Western Reserve University School of Medicine
Cleveland, Ohio

From the perspective of developed countries in the world, the specter of communicable diseases seems remote, until scourges like HIV-AIDS and Ebola Fever arise and cause an apocalypse of death and suffering. Over the history of humankind, such scourges have prominently involved the nervous system, and the first line response to all of them over the recorded experience of humanity is to invoke Quarantine. The remedy of quarantine, while not quite co-extensive with human history, is nearly so. Its name refers to that period of time, 40 days, during which the widow of a Roman Citizen was left free from bother and protected by law, to mourn the death of her husband. This period of isolation has been, literally from the dawn of history until modern times, been used to control or prevent communicable diseases from spreading. Yet quarantine is no monolithic instrument of disease control. Types of Quarantine abound.

At best, even in modern times, its invocation everywhere and at best, controls the rate of diffusion of disease among populations. Furthermore, Quarantine is in all places an instrument guided by the code of criminal law, and is characteristically variable in its effect. Quarantine is generally driven by fear, and its application is effected by criminal sanctions. The roles, origins, effects and outcomes of Quarnatine will be reviewed in a variety of communicable diseases of the nervous system. These include Leprosy, Meningitis, AIDS, Hemorrhagic Fevers, Bubonic Plague, Typhus, Malaria and Yellow Fever. Quarantine in these conditions has varied from great effectiveness in disease control, to an ineffective and dangerous instrument of public health. Quarantine has been and continues to be a powerful instrument to uphold or to sunder individual human rights.

Native American Contributions to Medicine and Neurology

Edward J. Fine, MD, FAAN
Associate Professor of Neurology,
Department of Neurology, University at Buffalo

Native Americans (NAs) made life-saving contributions to European medicine, even though they were nearly decimated by invading Europeans. NAs discovered the Western Hemisphere by emigrating from Asia over a land bridge across the Bering Strait around 12-24,000 years ago during the Ice Age. NAs developed agriculture of tomatoes, potatoes, cashews, peanuts, peppers and corn. In 1541, Francisco de Orellana was exploring the Amazon River when a companion received a wound from a small arrow shot by an NA. Orellana's compatriot stopped breathing and died within minutes. Finally in 1807, Baron von Humboldt identified the plant source as *Chondrodendron* for the poison called "curari" by t NAs. In 1828 Bousingault and Roulin extracted curarine from this plant. Keith and Langley used curare to demonstrate that a substance present in the junction between nerve and muscle could be blocked by curare. Quinine and quinidine are derived from the Quechua Inca word for bark, *quina*. NA healers had used this bark to treat fevers before malaria spread to the New World from mosquitoes in African slave ships.

James Lind read Jacque Cartier's account of how NAs prevented scurvy by drinking tea from pine needles. Lind ordered British ships to provide daily lime juice to their sailors. NAS gave us cascara and ipecac for constipation and an emetic, respectively. Incas chewed coca leaves to prevent pulmonary edema when exercising at high altitudes. Incas prevented goiter by consuming kelp, rich in iodine. Mexica cultivated cacao whose bean provides beneficial flavonoids in chocolate. Rubber gloves are a gift from the NAs who heated *caoutchauc* with sulfur to make balls for play. Inca surgeons used obsidian scalpels to perform craniotomies for relief of epidural hemorrhages and headache.

Conclusion: NAs healers provided many essential medicines in our current armamentarium.

Origins of Surgical Epilepsy: A History of Its Development from Animal Experimentation and Clinical Observation to Effective Treatment

Edward J. Fine, MD, FAAN
Associate Professor of Neurology,
Department of Neurology, University at Buffalo

Pooja Sofat, MD, MBBS
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Background: Inca and prehistoric European skulls show evidence of healing after trepanation which was postulated for either relief from blood under the dura (Broca) or for cure of seizures (Horsley). Hippocrates wrote about indications for trepanation. Paré used trepanation to end convulsions of M. de Pienne in 1552. This presentation contends that aseptic technique, animal experimentation localizing specific cortical areas for motor and sensory activity, clinical observations of patients with epilepsy followed by surgery and electrical stimulation of the cerebral cortex of awake patients brought about current techniques of surgery for control of epilepsy.

Results: In the 1860s Manuel Echeverria in New York City unsuccessfully performed craniotomies and excision of cortical scars adjacent to scalp scars due to infection and faulty localization. Antiseptic surgery introduced by Lister, supplanted by aseptic surgery as promoted by William Macewen reduced post-operation infections. David Ferrier stimulated and ablated cerebral cortex of dogs and monkeys to determine location of motor and some sensory areas. Aware of his results, Victor Horsley at urging of his mentor, J. Hughlings Jackson (JHJ) performed his first surgeries for removal of epileptic foci by cerebral localization in 1882-1886. JHJ observed patients with focal motor epilepsy have movements that replicated the results of stimulating motor areas of the cerebral cortex of animals. Horsley used a sterile bipolar faradic stimulator to activate exposed cortex in an area where he suspected was the seizure focus. After duplicating the focal seizure by electrical stimulation, he excised the cortex down to the white matter. Roswell Park of Buffalo, NY observed Horsley's surgeries Park localized by electrical stimulation and successfully removed a subarachnoid cyst in a man with contralateral focal motor epilepsy. European surgeons, Feodor Kraus and Otfrid Foerster advanced techniques. Angiography and EEG monitoring introduced by Wilder Penfield, vastly improved surgical treatment of epilepsy.

Benjamin Franklin's Wife's Apoplexy and Mid-Eighteenth-Century Medicine

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Benjamin Franklin's wife Deborah, then in her early 60s, suffered an "Indisposition" early in 1769 that affected her speech and memory. Although she showed some recovery, other signs and symptoms of what was then called apoplexy affected her later in the year, making her excessively tired, confused, and melancholic. By 1772, she was writing to her husband (then in London) about a palsy that had affected her right side, as well as her very poor memory and other features of declining health. A "Paralytick Stroke," Benjamin Franklin was informed, ended her life late in 1774.

This presentation will look at what had been happening to Deborah Franklin over this 6-year period, how Philadelphia physician Thomas Bond treated her, and what her husband and his eminent medical friends in England prescribed for her. For context, it will include a sketch of what Deborah Franklin's life was like prior to 1769. Concluding parts will include a brief history of apoplexy and its treatments from ancient times into the Enlightenment, and a look at why Benjamin Franklin did not suggest medical electricity as a treatment option for his wife.

The case of Deborah Franklin is notable, not just because she was the wife of one of the most celebrated and influential men, but because it reveals much about the state of colonial medicine and therapeutics during the mid-eighteenth century, particularly for stroke patients under the care of highly-respected physicians.

Frank Clifford Rose Memorial Lecture: Franz Joseph Gall on Greatness in the Fine Arts Demanding Multiple Cortical Faculties of Mind

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Although Franz Joseph Gall is well known for his organology, i.e., his theory of cortical localization of function largely derived from skull features, little has been written about his ideas pertaining to specific faculties other than speech, and next to nothing has been written about how the individual faculties might interact or collaborate in specific situations. In this presentation we shall examine Gall's thoughts about achieving superiority or greatness in the fine arts.

Gall associated artistic genius with perceiving and understanding relationships, specifically implicating four higher faculties of mind --- color, "constructiveness," locality, and recognizing people --- while recognizing that less specific faculties (e.g., pride, perseverance, memory of things) might also be involved. How these faculties are utilized, he tells us, will vary with whether an artist works on portraits, landscapes, historical scenes, still life compositions, etc., as well as with the chosen medium (e.g., oil paints, sketching on paper, stones to be carved). We shall examine the nature and localization of these four faculties and the fact Gall does not bring the soul or a "master controller" of any sort into the equation when alluding to these parts as components of a whole functioning brain.

Experimental and Human Research on the Cerebellum as Represented in the Magnus-Rademaker Film Collection (1908-1940)

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Gysbertus Rademaker (1887-1957) lived in a period in which experimental (neuro)physiology flourished. Following his graduation in medicine, a training period in general surgery and orthopedics, and a six-year practice as GP in Dutch East Indies, he started scientific research as co-worker of Rudolf Magnus (Utrecht) and became interested in movement, muscle tone, and posture.

Owing to his remarkable surgical skills, Rademaker was assigned to a research project involving animal experiments, in which he decerebellated and decerebrated animals. The results were published in '*Das Stehen'* (1931). His surgical technique and unusual devotion to the care of his experimental animals resulted in their long-term survival, which made it possible to observe them over a long period of time.

Rademaker had a passion for cine-film recording of his experiments, which earned him the nickname 'filmmaker'. As (a part of) these films surfaced recently, we were able to study them. The aim of this study is to describe animal experiments (decerebellectomies) and human surgical cases (tumors) with respect to the study of the cerebellum. Because the films are silent, we had to search for corresponding publications.

Rademaker applied the insights he gained from his animal experiments to clinical studies of patients. This is documented in several of his publications, including a report of the *'Amsterdamsche neurologen vereeniging'* [Amsterdam Neurologist Society], where he described differences and similarities between animals and patients without a cerebellum. The patient and animals he described can be seen in the films.

Being particularly interested in the neurological examination of cerebellar dysfunction, we searched for films in which Rademaker demonstrated this. At the time, the evolution of neurological examination had been largely completed. Examination of cerebellar function appears to have been more extensive than today, as can be read in contemporary neurological textbooks and as Rademaker shows in the films.

The Treatise on Pain in the *Archipathologia* of Filipe Montalto

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The Archipathologia (1614) by Filipe Montalto is one of the first books dedicated to mental disorders in the early modern period. It consists of 18 treatises covering a variety of conditions including headache, melancholia, mania, dementia, coma, epilepsy and apoplexy. This landmark work that precedes Burton's The Anatomy of Melancholy (1621) and Willis' De cerebri anatome (1664) is remarkable for its exhaustive classification of diseases and also for the sophistication of its theory of mind. De dolore, the first treatise, offers a discussion on pain as a multidimensional phenomenon comprising sensitive, affective and intellectual levels. Pain is simultaneously an inner sensible quality (internum sensibile), the feeling of that quality, and the mental apperception of such feeling. It is not a specific modality of sensation, but common to all senses in different degrees, highest in touch, followed by taste, smell, hearing and least of all vision.

The process of pain is very complex, beginning with the detection of a noxious object, the recognition by an inner sense that this stimuli is contrary to nature (praeter naturam), and finally a higher level perception of the feeling of pain as an emotion. Montalto considers five requisites for the emergence of pain: a stimulus or object that causes a sensory disturbance (1), in a sensitive organ (2), which it is of high intensity and abrupt (3), leading to a preternatural alteration in the organ (4), and there cannot be obstacles to its perception by the mind (5) such as brain damage, paralysis or disturbances of consciousness. Pain is a symptom of "damaged function" that accompanies a morbid alteration and has the function of signalling it, reducing vigour and normal function but also contributing to the integrity and well-being of the patient.

Overall, Montalto's conceptualization of pain as an emotion caused by several kinds of high intensity sensory stimuli is in accordance with an "Intensity" theory of pain rooted in the classic writings of Plato and medieval scholars. Soon after, Descartes will propose a "Specificity" theory of pain (Treatise of Man, 1664), postulating the existence of dedicated receptors and neural pathways, which became much more influential after its anatomical validation by Bell, Magendie and others. However, the notion of pain as an emotional phenomenon that activates motivational behavior is still very relevant today, and Montalto's role as a precursor in this debate should be recognized.

From Science to Pseudoscience:
The Rise and Fall of Phrenology,
The First Science of Mind

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The nineteenth century witnessed the creation of the first science of the mind: phrenology. Phrenology began as the pet theory of German neuroanatomist Franz Gall (he preferred the term *Scheidellehre*, or "doctrine of the skull"). Gall pioneered the concept of cortical localization. However, his system was also rooted in physiognomical notions regarding the capacity to ascertain an individual's personality traits and behavioral proclivities via measuring the bumps of their skull.

Phrenology experienced an enthusiastic reception among many medical professionals in the early nineteenth century. By midcentury, however, the scientific community had largely rejected phrenology. My paper will examine the works of several leading phrenologists—Franz Gall, Johann Spurzheim, and Orson Fowler—and their leading critics. In doing so, I hope to shed light on the transformation of the first science of the mind into the century's paradigmatic pseudoscience.

Tracy Jackson Putnam (1894-1975):
The Context that Changed

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Describing Tracy Putnam's tenure as Director of the Neurological Institute of New York (1939-1947) has presented a challenge to historians of neuroscience. What explains the circumstance of recruiting a highly productive person with acclaimed achievement in clinical science, and then asked to resign eight years later and from that point forward characterized as a person whose career had essentially concluded? This presentation will bring together the histories written by people with firsthand knowledge, including Albert Deutsch, Frederic Gibbs, Alan Gregg, Albert Lamb, and Merrill Moore. Building on the recent scholarship of Lewis Rowland, David Dawson, Colin Talley, Aravind Ganesh and Frank Stahnisch, the story will be framed by describing the institutional decisions by Columbia –Presbyterian Medical Center Board Chairman Dean Sage (1923-1943) and then by the succeeding Board Chairman Charles P. Cooper (1943- 1957).

However, this presentation will assert that a broader understanding can be found within a larger context of the competing forces and relationships of university hospitals, medical schools, and the changing sources of revenue for patient care. The relationships of those entities have been in dynamic movement since the 1910 Flexner report and remain in a state of flux. This presentation will assert that it was those larger forces that ultimately impacted Putnam's career in 1944. Those forces would have been deeply problematic for anyone who was chosen for the Institute Directorship in 1939 because the stage of conflict was already in place by 1935. Of equal consideration, this presentation will offer more evidence that while these forces altered the course of Putnam's scientific career, they did not completely arrest his contributions to neuroscience in his California years.

Back to the Future, or Ahead Into the Past?
Novel Unorthodox Views of the Nerve Impulse and of Vibrations in Neuronal Microtubules are Precedented by Three Hundred year-old Similar Theories

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Controversial new explanations about key phenomena at opposite ends of the neuroscience spectrum show striking though seemingly unrecognized resemblance to nearly forgotten theories appeared in the eighteenth century. At the most fundamental level, the firmly established model of the nerve impulse as a result of voltage-gated ion channels is currently being challenged by an alternative concept of a soliton or mechanical wave sweeping down the nerve fiber with no net flux of matter. This latter idea, however, is akin to eminent professor Hermann Boerhaave's (1668-1738) account of how the “animal spirit” that he alleged is contained in the nerves, while scarcely moving itself, could instantaneously convey a signal across macroscopic distances throughout the animal body.

At the other distant edge of the neuroscience domain, the recently announced discovery of a fine vibration of microtubules within nerve cells is claimed to contribute decisively in favor of the highly debated hypothesis that consciousness originates from quantum processes in neuronal microtubules. Yet vibrations propagated along the “solid filaments of the nerves” were first conceived by Isaac Newton (1643-1727) as instrumental for all sensation and bodily movement, in a theory developed later on at length by David Hartley (1705-1757). These coincidences, along with other examples of recurrent views in neuroscience, will be discussed in terms of apparent patterns in scientific thinking, in which notions like priority, anachronism, and breakthrough all take rather relative values.

Apraxia: The Rise, Fall and Resurrection of Diagrams

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Apraxia is the failure to be able to make complex movements. While there were some historical precedents, the first well described cases of apraxia and pathological explanation were from Hugo Liepmann from 1900 to 1908. On the basis of detailed clinical assessment, Liepmann predicted brain lesions that were subsequently verified. After a series of cases, he came up with a theory of praxis and a classification of apraxia that arose from that theory. The movement formula was generated in the region of the occipital and parietal cortices and kinetic memories were in the region of the motor cortex, and movement was generated by a signal from posterior to anterior. Damage in the posterior region produced ideational apraxia, in the anterior region, limb-kinetic apraxia, and damage to the connection between them, produced ideo-kinetic apraxia. Similar ideas were coming from the early studies of aphasia such as that of Wernicke. This approach seemed successful until the attack from a distinguished series of British neurologists that reached its peak with Henry Head and his attack on the "diagram makers" (Head 1921).

Head strongly supported the ideas of Jackson in regard the notion of higher and lower levels of brain function, but that the brain was functioning holistically, and that it was not possible to identify brain centers for specific functions. Despite Head recognizing that such a view wouldn't make it easy for neurologists, the view prevailed to a large extent. However, basic science moved on gathering evidence for localization of function in the brain, and the tide was turned in neurology by Norman Geschwind, particularly in his important two part paper on "Disconnexion syndromes in animals and man" published in Brain in 1965. This important battle in the history of neuroscience and neurology was won by Geschwind. These days, the localization of function and brain connectivity are hot topics.

Acknowledgement: This abstract is extracted and abbreviated from a published book review: Hallett M, Apraxia: The rise, fall and resurrection of diagrams to explain how the brain works. Brain 2014 (on-line).

Standards of Care in the Army of the Potomac: Case Studies of Head Injuries During the American Civil War

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Public opinion with some justification focuses on the brutal nature of American Civil War medical care. Recent historians however have offered disparate points of view with emphasis on improvements in military medical tactics and development of research facilities and public health expertise. Using case histories from the *Medical and Surgical History of the War of the Rebellion* this talk argues that Union military surgeons (MSs) eventually practiced in specialized group settings with established guidelines for appropriate care.

Summaries of treatments and outcomes will be described for 20 casualties with penetrating head injuries sustained during four different battles from 1862 through 1865. Standards of care (SsC) followed recommendations in foreign and American military surgical manuals published before and during the war. All patients survived their initial injuries and received treatment in division or general hospitals. Surgical invention consisted of trephination or bone removal; expectant treatment usually involved cold water dressings. Anesthesia was used in most cases; second opinions were not uncommon. There were thirteen fatalities; eight fatalities and five survivors underwent surgical intervention. Autopsies were inconclusive or corroborated treatment plans in five of six fatalities. SsC were not met in two fatalities; one of these underwent surgery. These two cases will be discussed in detail.

Case reports indicated that trephination was not for tyros and used only after considerable thought by experienced MSs. As a result casualties under federal care with survivable head injuries could expect prompt transport to hospitals with competent surgical treatment and follow-up that conformed to contemporary military standards. Case fatality rates remained formidable, but these novel arrangements during the Civil War provided an organizational framework for technical changes in military and civil surgical care in the late 19th century.

One Hundred and Fifty Year Look at the Assassination of President Abraham Lincoln Using the Collections of the National Museum of Health and Medicine

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National Museum of Health and Medicine

President Abraham Lincoln sustained a gunshot wound to the head at the hands of John Wilkes Booth at Ford's Theatre. He died on April 15, 1865 just under 9 hours after assassination. This presentation will use the two autopsy reports, one written by Asst. Surg. Joseph J. Woodward assigned to the Army medical Museum, and one written by Dr. Robert Stone, Lincoln's personal physician, to look at how the medical aspects of Lincoln's death was understood at the time and compare it to contemporary understanding of neuroanatomy.

Using the Historical Collections of the National Museum of Health and Medicine, we will provide a 21st century interpretation of the events surrounding the assassination of President Lincoln using documents and actual medical instruments used to describe the treatment of and physical observations to the final minutes of the president's life.

The Neuroanatomical Collections, which is composed of over eleven different Neuroanatomical Collections relating to subject matter in Human Development, Traumatic Brain Injury, Comparative Neuroanatomy, Brain Tumors and Normal and Pathology, will be used to overlay the two autopsy reports' description of the path and final resting place of the bullet to interpret from a Neuroanatomical perspective the affected areas of the wound.

Cerebral Angiography;
Courageous Beginnings to Amazing Interventions

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In the 1920s, pneumoencephalography was the sole method to visualize the brain. Introduction of air into the ventricles as contrast media was painful and only outlined the ventricles. In 1896, Haschek and Linderthal injected a mixture of petroleum and mercuric sulfide into the arteries of the hand of a cadaver and its X-ray outlined veins and arteries. Cerebral Angiography was introduced by Antonio Egaz Moniz (1874-1955), Professor of Neurology in Lisbon, Portugal. Moniz believed that radio-opaque materials would concentrate in their brain and gave patients oral bromides; however, brains were not visualized on X-ray. He experimented on dogs and the decapitated heads of corpses. Due to his hands being severely deformed from gout, he collaborated with Almeida Lima, a neurosurgeon who performed all his carotid injections. Lima injected strontium bromide directly into carotid arteries of five patients which failed to show intracranial vessels. In the sixth patient, intracranial arteries were outlined but that patient died of cerebral thrombosis.

Finally on June 18, 1927, Lima injected 22% sodium iodine into a 20 year old man with clear visualization of his carotid tree after temporarily occluding the artery with a ligature. The first cerebral venogram was obtained in 1931 when a delay in photographing an angiographic plate led to the outlining of intracranial veins. Direct percutaneous puncture of the cervical carotid artery remained the primary technique in the 1950-60s. Sven Ivar Seldinger's technique introduced in 1953 of injecting contrast media through a catheter inserted into the femoral artery further improved access and safety of angiography. In recent years, rotational angiography and flat panel detectors for imaging revolutionized management of cerebro-vascular diseases.

Moniz is paradoxically best known for his work developing frontal lobotomies, for which he was awarded the Nobel Prize in Medicine in 1949 but his work on cerebral angiography is what will lead us into the future of Vascular Neuro-sciences.

Multiple Sclerosis in Fictional Literature
(1954-2012)

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Background & Objective: Presentations of MS in fictional literature have remained unexamined to date. Therefore, this talk takes comprehensive inventory of and analyzes all available novels and poems which include MS.

Material & Methods: The author has identified relevant works in English and German by keyword searches in OPACs/search engines as well as hand search. The neurological and literary evaluation of these 7000 pages of text combines qualitative and quantitative methods.

Results: Between 1954 and 2012 MS appeared in at least 55 literary works (35 novels, 18 poems, 1 novella, and 1 drama). A third of the predominantly female authors suffered from the disease. Fictional patients in the novels largely reflect real epidemiology as regards symptoms and disease progression. Diagnostic and therapeutic options, however, play a secondary role. From a literary point of view, "entwicklungsromane", "relationship novels", and "young adult books" can be discerned. MS is often portrayed in metaphoric language as a demon, an animal, a prison, or an abyss.

Conclusion: The MS motif evidences a medicalization of the literature as well as a literary portrayal of anthropological experiences. Successful novels can contribute to the de-stigmatization of MS.

From the Sacred Disease to DNA Microarrays:
The History of the Genetics of Epilepsy

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Magic and medicine have held hands throughout history, a relationship that set the grounds for a divine explanation of epilepsy. From ancient Mesopotamia to Greece and Rome, gods dictated seizure activity. Historians cite Hippocrates as the chief defender of the role of heredity in epilepsy. The Father of Medicine argued that cerebral dysfunction caused seizures in *On the Sacred Disease*, yet his description included faulty explanations, like seizure precipitation by weather changes. Although he laid the foundation for future study of the heredity of epilepsy, Hippocrates continued to credit Greek gods with an impact on semiology.

Despite Hippocrates' early arguments, a supernatural explanation of epilepsy persisted through Medieval and Renaissance years until the 19th century when the heritability of epilepsy was widely accepted as a component of the *neurological trait*. Physicians wrote that the trait was passed to generations with variable stigmatized manifestations, like insanity, mental retardation, substance addiction, and spine disease. Unfortunately, Mendelian patterns adopted in the early 20th century led the eugenics movement to use the trait to justify sterilization and murder of patients with seizure disorders.

Neuroscience now describes epilepsy etiologies rooted in genes and environment. Twin studies yielded scientific evidence for epilepsy genetics in the 1990s as the Human Genome Project rapidly progressed, culminating in 2003 with the complete human DNA sequence. Today, target gene testing assesses for specific disorders while gene panels examine single nucleotide polymorphisms to diagnose syndromes associated with variable causes. Whole exome sequencing examines perplexing cases, like infants with no clinical clues that reveal etiology. Results guide treatment planning, provide predictive testing for families, and aid genetic counseling. As the accessibility of genetic testing expands, gene discovery, mutation identification, and pharmacogenetics will advance the clinical understanding and management of epilepsy.

Renaut Corpuscles or Peripheral Nerve Infarcts?
Historical Overview

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Background: Renaut corpuscles are cylindrical hyaline structures that arise from the peripheral nerve perineurium and project into the endoneurium. They are now known as normal variant and were estimated to exist in 7.5% of sural nerve biopsies. In 1938, James Kernohan and Henry Woltman reported the occurrence of very similar structures as “peripheral nerve infarcts” in two out of five cases of vasculitic neuropathy due to polyarteritis nodosa.

Objective: To describe the historical evolution of our understanding of the structure and function of Renaut corpuscles.

Methods: Review of the original publications by Joseph Renaut, Eikichi Okada, Woltman and Kernohan, Wilhelm Krücke, and Peter J. Dyck.

Results: The histological structures referred to as Renaut corpuscles were first described in the nerves of horse and donkey by Renaut in 1881. Okada further characterized the structure of Renaut corpuscle (1903) in humans. However, he was not sure whether they were normal variants or pathologic structures. In his extensive review of the subject, Krücke pointed out that Kernohan and Woltman were the only ones to describe localized infarcts in the peripheral nerve bundle. He indicated that what they had described earlier could have been Renaut corpuscles rather than “infarcts”. Dyck et al. (1972) agreed with Krücke that liquifactive necrosis does not happen in the peripheral nerve in the same fashion that it does in the brain (circumscribed area of necrosis of all cellular elements leading to liquefaction surrounded by a border zone of scavenger macrophages). They indicated that nerve ischemia could lead to axonal degeneration followed by decrease in myelinated fibers density.

Conclusion: Despite the earlier accurate description of Renaut corpuscles by Renaut and Okada, Kernohan and Woltman misinterpreted them as “nerve infarcts”. Krücke and Dyck deserve credit for discovering this error and further explaining how peripheral nerves react differently (from brain parenchyma) to ischemia due to vasculitis.

Huygens' headache

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Christiaan Huygens (1629-1695) was a Dutch mathematician, physicist, and astronomer. He became well-known as inventor of the pendulum clock and described light as a wave phenomenon. He became Fellow of the Royal Society (London) and member of the Académie des Sciences (Paris). Visiting a Dutch museum (Hofwijck, near The Hague), I learned that he suffered from frequent headaches.

The aim of the present study was to search through Huygens' 22-volume *Oeuvres Complètes* (1888-1950) to find letters, in which his headaches are mentioned and translate pertinent sections into English. Several letters where found, in which Christiaan himself, his family members and his foreign correspondents referred to his headache problem.

Although a posthumous diagnosis of Huygens' headaches is somewhat hazardous, the recurrent episodes with incapacitating headache and family history over two generations are suggestive for migraine. It becomes clear that it impeded his writing, reading, and research. From the letters we get an impression of the impact of headache upon his life and the treatments that were applied in the 17th century.

Avicenna's Poem on Medicine:
A "Rap" about Human Health from Gastronomy to Astronomy

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Introduction: Avicenna, a 10th century philosopher, physician, and polymath, wrote a poem on medicine that is archived at the National Library of Medicine in Bethesda, Maryland. The poem consists of 1326 verses and includes advices regarding food and wine intake, sexual activity, aromatherapy, and relates health with astrology and weather, geographic location, and the person's age.

The Poem: The poem's lyrical meter is "al-rajaz", after which the poem is named "Ūrjūzah". This meter is a kind of iambic pentameter that flows as an easily memorable mnemonic, the purpose of the poem being to facilitate teaching medicine to students. Each verse has its own rhyme, shared between the first and the second hemistiches, before a new rhyme appears in the following verse. Thus, if the poem is read at a relatively fast pace it is reminiscent of today's rap art.

The poem references Hippocrates, Socrates, Ptolemy and Galen, and mentions some dualities that constitute the world: hot and cold, wet and dry. Four elements form the universe: water, fire, earth, and air. All beings are animals, plants, and minerals. The sources of health are the same as those of disease. Disease has its origin in the district and country, age, and the season. Pediatric diseases are different from geriatric ones, and many diseases are seasonal. Avicenna recommends specific healthy habits for each season, including foods, sexual activity, and aromatherapy. With this he mentions all the astrological landmarks of the seasons relating them to medical recommendations. He recommends using specific foods and aromatherapies for treatment of headache, diarrhea, constipation, liver disease, spleen disease, among others.

Influence: In medieval Europe, Avicenna's medical findings were widely circulated and taught. They appear in the oldest known university syllabus from the School of Medicine in Montpellier. In fact, one of the manuscripts of the "Ūrjūzah" has Latin commentaries and an addendum by Pope Clement V, issued in1309, permitting reading and teaching the work of a "heathen."

Conclusion: Avicenna's corpus needs to be taken as whole. Knowledge, for him, could not be divided into separate disciplines, and is serviced equally by philosophy, medicine, and poetry.

On Anchoring Impressions into Memory: A Historical Perspective

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Memory has been a philosophically intriguing concept since antiquity. Emerging from the domain of philosophy, the study of memory became a focus of experimental psychological methodology, towards the end of the 19th century. One early description of memory processes, involving fixing or anchoring of impressions into memory, was termed "mémoire de fixation", first coined and described in 1886 by French physician, physiologist, and Nobel Prize winner Charles Richet. In this memory process, traces of impressions from (neural) excitation, in which the effect persisted, are fixed and kept. The effect is intensified by emotional tone and focused attention.

Remarkably, from bibliographic sources, the concept of mémoire de fixation, described in French neuropsychology literature, seemed relatively unknown in English literature. Immediate memory, the closest synonym in current English usage, may perhaps be distinguishable from the original term, which emphasized neurological or neuropsychological processes (including fixation and evocation) involved in memory. The notion of mémoire de fixation may well represent one of the earliest neuropsychological descriptions of memory process. The symptomatology of anterograde amnesia, amnésie de fixation, is well-described in certain neurological disorders, including among them traumatic brain injury, dementias, Korsakoff's syndrome, and others, and involving inability to fix new impressions. Nonetheless, the focus on scientific experimental methodology and on identification of stages of memory, on novel memory assessment techniques, and the unsuccessful attempts to localize the engram trace in work on cerebral localization, may all have overshadowed the continued clinical neurological descriptions of mémoire de fixation as it had been initially described.

The significance of mémoire de fixation is its fundamental importance to the process of anchoring impressions and registration of information. Appreciation of this process may further enrich understanding of concepts of memory, learning, and unawareness, and potentially contribute to contemporary perspectives on interventions for disorders of memory and awareness.

The Mythical *rete Mirabile*:
From Galen to Berengario to Vesalius

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In the second century, Galen of Pergamon described the *rete mirabile*, a division of the internal carotid arteries into a meshwork of small arterial branches near the base of the hypothalamus. Galen erroneously believed that this structure was present not only in the ungulates he had dissected, but also in humans, and that it served as an important linkage between body and mind. By the 16th century, Galen's works were widely available in convenient volumes and were enshrined as dogma in Western Europe, with discussions and illustrations of the *rete mirabile* in multiple medieval medical texts. However, in his *Isogogae Breves* (1523), Italian anatomist Jacapo Berengario da Carpi admitted his inability to find the *rete mirabile* in humans, despite many human dissections and, therefore, openly doubted its existence, a brazen conclusion for its time.

Ignoring Berengario, Flemish-born anatomist Andreas Vesalius (1514–1564) initially accepted Galen's ideas concerning the *rete mirabile* in humans, which Vesalius called the *mirabilis plexus reticularis*. In Tabula III of the *Tabulae Anatomicae Sex* (1538), Vesalius had drawn a diagram showing the *rete mirabile* in humans, indicating the Galenic doctrine that it is here that the life spirit is transformed into the animal spirit, or psychic *pneuma*, before being distributed from the brain along the nerves to the body. In Bologna two years later (January 22 and 28, 1540), Vesalius demonstrated the *rete mirabile* to the audience at a public dissection, apparently using the sheep's head he had dissected for comparison with human anatomy. It was not long after this that Vesalius began work on the *Fabrica* (1543), and at least by the time of its publication he fully reversed himself, categorically denied the existence of the *rete mirabile* in humans, and castigated himself for his prior failure to recognize this error in Galen's works.

Pulfrich's "*Stereo-Effekt*" (1922):
Modeling Target Trajectories for
Pulfrich's Historic Demonstration Devices and a 2D Pendulum

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In 1922 German physicist Carl Pulfrich described an illusory binocular perceptual disturbance in which an object moving across an observer's field of vision is perceived as travelling along a curved trajectory varying in depth (in a transverse plane) as a result of a relative difference in perceptual latency between the two eyes. Pulfrich and colleagues noted that this "*Stereo-Effekt*" could explain clinical misperceptions of moving objects reported by patients with anterior visual pathway disorders (e.g., optic neuritis). To demonstrate the effect using a smoked glass over one eye, Pulfrich devised two devices using, respectively, rotary rotation and one-dimensional (1D) simple harmonic motion (back-and-forth oscillation), but in clinical practice a 2D pendulum is typically used. Pulfrich's son, Hans, presented a mathematical analysis of the first case.

We have now modeled all three cases using computer simulations. Perceived motion was modeled as the intersection of the lines of sight from the "good" eye to the object and from the "bad" eye to a time-delayed version of the object. For 1D harmonic source motion, the 2D perceived trajectory was determined algebraically. This model was extended to rotary and pendular motions. For the pendulum case, the point of minimum distance between non-intersecting lines was taken to be the location of the perceived object.

Assuming an interocular perceptual latency, our simulations correctly predict that 1D simple harmonic motion will be perceived as an elliptical trajectory. For small-angle oscillations of a pendulum, the perceived motion appears similar to 1D simple harmonic motion but with a vertical component (and possible transient blur/diplopia). For Pulfrich's rotary device, when the spokes are rotated clockwise and counter-clockwise, they appear to be bent away from and towards the observer, respectively. Our simulations reproduce the perceived motion for each case, and extend the analysis of Pulfrich's son Hans almost a century later.

Repressed Neurosurgery:
Life and Fate of Max Skoblo

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Aim: To follow life and evaluate works of professor Max Solomonovich Skoblo (1899-1963).

Material and methods: Archival sources (Archive of St. Petersburg and Leningrad region office of FSB (Federal Security Service) and GARF (State Archive of Russian Federation) were used.

Results: Born into a family of Jewish salesmen in Vitebsk Max Skoblo made a spectacular administrative career under a new (Soviet) regime. In 1919 he joined the ranks of All-Russian Communist party (of Bolsheviks) and in 1921 was appointed a secretary of Vitebsk Regional executive committee (local governorate). In 1926 he graduated from Military Medical Academy in Leningrad followed by aspirantura (a three-year postgraduate program) at a chair of nervous diseases. In 1929 Skoblo became an assistant professor of the above mentioned chair. In 1934-1937 he was a chairman of a chair of nervous diseases of Third Leningrad Medical Institute. Since 1929 he also worked at the Institute for Surgical Neurology founded in 1926 (first as a deputy director, and since 1936 – as a director). In 1935 he defended his doctoral dissertation and became a professor.

In April 1937 M. S. Skoblo was arrested by NKVD (secret police) on a charge of counter-revolutionary activity and was convicted to 10 years of correctional labor camps with confiscation of property. The Institute of Surgical Neurology was closed down next year. Skoblo spent his term of imprisonment in correctional labor camps in Magadan region as a hospital physician at a neuropsychiatry department, then as a consultant neurologist. In 1946 he was discharged from custody and became a professor of neurology at Tomsk Medical Institute until 1949 when he was arrested again and deported to special settlement in Krasnoyarsk region. In 1954 Skoblo was allowed to return to Leningrad and was rehabilitated in 1956. From 1954 to 1959 he worked as a consultant neurologist at a psychiatry hospital, and then at an outpatient clinic.

Conclusion: Arrest of Skoblo and closure of the Institute of Surgical Neurology had a negative impact on Soviet neurosurgery.

An Eighteen-Year Exploration of the
Language Faculty through a Single Case
(1877-1896)

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From the 1860s, Dr Henry Charlton Bastian, FRS (1837-1915) trained generations of University College London medical students in neurology. He presented his earliest theories about the organization of language in different modalities in 1869, having priority over Wernicke for consideration of sensory aphasia. He also developed a rigorous approach to clinical examination and use of a systematic list of tasks for all aphasic patients. His explicit aim was to determine diagnosis, classification, and lesion localization.

Over a period of 18 years, Bastian presented lecture demonstrations of his model of aphasia to his medical students featuring the assessment of one chronic patient. Evidence regarding Bastian's examination of this case has been obtained from two unpublished archive sources. At the patient's death the autopsy revealed an extensive lesion. Bastian presented this case at a meeting of the Royal Medical and Chirurgical Society in 1897, which led to extensive discussion regarding localization of function and the role of other areas of the cortex in response to damage. Bastian published these complex findings and considered various explanations for the pattern of spared and impaired behaviour that he had so closely recorded for almost two decades. He continued to reflect on interpretations of this case in several later publications.

There were also discussions in the medical press regarding localization of function and the role of other areas of the cortex in response to damage in light of Bastian's case. This presentation will consider the significance of this emblematic case by analysing the clinical details as Bastian followed the patient until his death and how his observations of this case contributed to his ideas regarding language organization in the brain. The interpretations of the import of this case by others in the medical community will also be examined.

Mechanical "Neuroscience" in Operetta

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Operetta, or "little opera", grew out of the French *opéra comique* around the middle of the 19th century. The credit for creating the operetta should go to Hervé, real name Louis Auguste Florimond Ronger (1825-1892). This genre of music had a great success in Europe with its representation of a flashy and superficial aristocracy and bourgeoisie, influenced by the social and economic revolution of the 19th century.

The most important composer of operetta is Jacques Offenbach (1819-1880). He had a powerful influence on later composers of this genre of music. Some his "medical masterpieces" such as: *Pépito*, originally entitled *Vertigo* (1853), *Les Contes d'Hoffmann (The Tales of Hoffmann)* (1881), *Le docteur Ox (Doctor Ox)* (1877) were influenced by scientific knowledge of the industrial revolution. In particular *Les Contes d'Hoffmann* features an inventor, Dr Coppelius, who has made a mechanical doll with a description of neuroscience discoveries of that time.

Performance of a mechanical doll is present in Audran Edmond's operetta (1818-1897): *La poupée* (1896), and the French composer Clement Philibert Lèo Delibes (1863-1891) with the comique ballet called *Coppélia, ou la Fille aux Yeux d'Email (Coppélia or The Girl with the Enamel Eyes* (1870).

Composers of "little operas" were able to express in comical way some of the ideas and Neuroscience theories of their time.

Comandon and Neuroscience

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The microbiologist Jean Comandon (1877-1970) is famous for his studies on the movement of the syphilis bacteria differentiated in various forms by ultramicroscope. He was also a pioneer on the technical application of the microcinematography in laboratory research. His collaboration with clinicians and surgeons in the study of different kinds of pathological disorders is little known. He had important relationships with different neurologists from 1918 to the 1920s, such as André Thomas (1867-1963), Jean Athanase Sicard (1872-1929), the Swiss neurologist Édouard Long (1868-1929) and others, in the study of different neurological disorders by using cinematography as a scientific tool for understanding the clinical and pathological mechanisms of diseases. These collaborations allowed him to be involved in the beginnings of the French cinematography industry, especially with Charles Pathé who established a small film studio laboratory in Vincennes where a multidisciplinary group improved the application of cinematography in clinical medical practice.

In his entire cinematographic activity Comandon produced about 426 scientific films of which 103 were on Neuroscientific topics, in three main areas: 1) description of clinical neurological syndromes; 2) educational, aimed at neurologic semeiotics on various neurological clinical manifestations; 3) exprimental purposes, for describing mechanisms of neurophysiology.

Comandon collaboration with clinicians and researchers allowed for the widespread use of cinematography and the possibility of it becoming a new and popular scientific tool for neuroscience.

History of Antiepileptic Drug Development

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Antiepiletic Drug discovery goes back to 1857 with the first use of bromides by Sir Charles Locock, the obstetrician to Queen Victoria. This discovery and many of the currently available antiepileptic drugs were the result of serendipity. Phenobarbital, one of many hypnotics developed in the late 1800's by Bayer, was accidently found to possess antiepileptic properties.

Other antiepileptic drugs were found when scientists and clinicians were looking for chemicals having other properties. Carbamazepine at Geigy and clobazam at Hoffman LaRoche were born of an effort to develop psychoactive drugs after the "blockbuster" introduction of chlorpromazine in the 1950's. Valproic acid was found to have antiepileptic properties when used as a solvent to test other medicinal products. Lamotrigine was developed at Wellcome on the incorrect theory that it's anti-folate properties would make it antiepileptic. Topiramate was developed initially as an anti-diabetic by Ortho.

In more recent decades efforts have shifted to "designer drugs" with a specific goal to develop compounds with a mechanism to reduce excessive neuronal excitability. It could be argued that Tracy Putnam, a Harvard professor and neurosurgeon, semi-designed phenytoin in the 1930's and Gerhard Satzinger invented gabapentin to allow GABA, the inhibitory neurotransmitter into the brain.

Lacosamide, ezogabine, tiagabine and vigabatrin all fit in the "designer" category. Designer drugs will hopefully supplement our armamentarium, but serendipity will probably continue to be an important contributor.

Singultus foetalis:
Who was Alphons Mermann?

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During intrauterine life, hiccups are universally present, their incidence peaking in the third trimester. They can also be regularly observed in the newborn, the frequency of occurrence decreasing slowly over the first year of life. Alphons Mermann (1852–1908), a gynecologist from Mannheim, Germany, best known for having established there the *Luisenheim* lying-in asylum (*Woechnerinnenasyl*) at the end of the XIXth century, is viewed as the first physician to describe and name fetal hiccups (*singultus foetalis*) in a modern peer-reviewed scientific publication. Alphons was a pupil at the *Grossherzoglichen Gymnasium* (High School of the Grand Duchy) in Mannheim where he obtained the *Zeugniss der Reife* (University Entrance Diploma) in July 1872. Subsequently, he studied medicine in Heidelberg and Wuerzburg; after graduation he became (1877) an assistant to Professor von Winckel (1837-1911) at the *Königliche Landesentbindungsschule* (Royal Lying-in and Gynecological Hospital School) in Dresden. In 1879, Mermann returned to Mannheim to practice gynecology and obstetrics in private practice.

In a review paper from 1922, Hanns Kremer (1883 –1965) mentions that singultus foetalis was known to the ancient physicians (*"Er war bereits den aelteren aerzten gelauefig…"*) and cites two of them: von Fischer and Albrecht.

Johann Peter Albrecht (1651-1724) was the personal physician to the prince bishop and physician to the city of Hildesheim. His observation titled De Foetu in utero materno singultiente is the earliest (1687) publication on fetal hiccups known to us.

Johann Bernhard von Fischer (1685 – 1772) was a pharmacist and physician of German origin in Imperial Russian service serving i.a. as medical adviser to Anna Joannowna (1693 – 1740), regent of the Duchy of Courland from 1711 until 1730 and subsequently Empress of Russia. In his 1752 *Observatio LXXV: De Singultu & vagitu uterinis,* von Fischer refers to the Albrecht contribution on fetal hiccups and expands upon his observations.

Charles Judson Herrick: A Founder of American Neuroscience

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The progenitors of Charles Judson Herrick emigrated from England to Massachusetts in 1628 and moved to Minneapolis in 1854. His father was a Baptist minister and Charles was born in the baptistery, the youngest of four sons. His early ambition was to follow in his father's vocation. Influenced by his older brother Clarence, however, he became fascinated with brain-behavior relations. In 1891, Charles and Clarence, with the energy and enthusiasm of youth, founded The Journal of Comparative Neurology, still an important periodical. Tragically Clarence, then at Denison University, died of tuberculosis in 1904 and Charles succeeded him at Denison.

After a formative period at Wood's Hole, he focused his research on the brainstem and cranial nerves in fish and *Amphibia*. In 1907 he moved to the University of Chicago as Professor of Anatomy to more effectively pursue research. He concentrated on *Amphibia* concluding that they are not only simpler vertebrates but more generalized than fish or mammals. Analysis of the amphibian brain could provide, then, a *Bauplan* for the organization of all vertebrate brains. To accomplish this he analyzed sections from 500 amphibians using the Golgi stain in half, not an insignificant endeavor as he prepared the sections from all of the material himself. Among his many contributions are (1) the definitive demonstration that there are 12 cranial nerves; (2) that the amount of neuropil in gray matter in any species is the principal determinant of complex behavior; (3) localization of function is precise in brainstem and spinal cord but not forebrain; (4) the diencephalon has four longitudinal divisions; (5) promoting the importance of neuroscience to scientists and the public. His last publication, *The Evolution of Human Behavior* (1956) summarizes his work and its implications. He was still working on manuscripts when he died in 1961, age 91.

The Early Years of Epilepsy Surgery: From Trephination to Cortical Resection and the Contributions of Fedor Krause

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Surgical attempts to cure epilepsy have been made since antiquity, trephination was only one method among several others. Horsley's report "On brain surgery" including surgery in a patient with posttraumatic epilepsy based on Jackson's clinical analysis of the epileptic focus in 1886 was noticed worldwide and led to a first wave of epilepsy surgery in Europe and North America. Until the end of the 19th century numerous papers had been published including several hundred operated patients. Unsatisfactory long term results weakened the enthusiasm for the surgical treatment. On a closer look this is due to the fact that the majority of the published cases were treated by trephination only. Less than a quarter had a cortical resection. Cortical stimulation, the only method to identify the focus intraoperatively at that time, was used by a minority of surgeons only.

Fedor Krause started epilepsy surgery in 1893 in Hamburg, he consequently used intraoperative cortical stimulation in all patients. He also selected his patients clinically very carefully before he decided to operate. He was convinced that the resection of a lesion alone was not sufficient for cure but it was necessary to resect the epileptic cortex as well. In some of his cases the "primary convulsing center" was remote of a visible morphological lesion. Therefore he had very modern views of focal epilepsy. He did not restrict surgery to traumatic Jacksonian epilepsy. He even included patients without morphological lesions, when he felt he could rely on the focal origin of the epileptic convulsions. The results of his series with 40% complete seizure free patients and another 20% improved is astonishing close to the results of modern series of extratemporal epilepsies. No wonder that he continued with epilepsy surgery throughout his career which lasted until his retirement in 1931.

Loose Ties: The Paradoxical Position of
Norman Geschwind and
The Theory of "Disconnexion" Disorders

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In 1965, the American neurologist Norman Geschwind published his landmark two---part study in Brain, "The Disconnexion Syndromes in Animals and Man," arguing that nearly all disorders of higher mental function arise from the breakdown of white matter pathways connecting different parts of the cortex and subcortical structures in the brain.

Often referred to as "connectionism," the basic message of Geschwind's theory remains intact to this day, in no small part thanks to President Obama's recent enthusiastic reception of the BRAIN initiative and its bold proposal to map all of the neural pathways in the brain known as the Human Connectome Project.

Since this year marks the 50th anniversary of the publication of Geschwind's influential monograph, I propose to discuss some of the history that led to its appearance, shaped its reception, and ultimately ignited interest among American neurologists in re---examining (even re---writing) their own professional history.

José María Ramos Mejía and the Management of Epilepsy in Argentina During the Late 19th Century

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José María Ramos Mejía (1849-1914) was an Argentine physician, historian and politician and a key figure in the history of neurology in Latin America. He completed his medical studies at the Universidad de Buenos Aires in 1879 with his thesis on traumatic brain injury. His clinical skills and his writings earn him a scholarly reputation in Argentina. He was the first director of Argentina's first nervous disease ward at the Hospital San Roque of Buenos Aires, in 1885. Two years later, he became the first professor of neurology in South America, only five years after Charcot was given the chair of neurology in Paris. Although none of his training occurred in Europe, Dr. Ramos Mejia's writings show a substantial influence of European neurology.

In 1893 he published "Estudios clinicos sobre las enfermedades nerviosas y mentales" (Clinical studies of the nervous and mental diseases). In this work Dr. Ramos Mejía reported some of his clinical observation and reflections on neurological problems. A significant part of this book deals with the diagnosis and treatment of epilepsy. In this presentation we will discuss Dr. Ramos Mejía's views on the diagnosis and management of epilepsy which reflects the state of knowledge at the dawn of neurology in South America.

Paolo Pini (1875-1945):
The Italian Way to Care Epileptics

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Gaetano Pini (1846-1887), freethinker, freemason, founded (1874) The Pious Institute for Rickets Sufferers (*Pio Istituto dei Rachitici*) in Milan and (1876) the Cremation Society (*Società per la Cremazione dei Cadaveri di Milano*). His life was spent to alleviate the suffering of underprivileged. His son Paolo (1875-1945) devoted to medicine too, graduating at Bologna University in 1900. Like his father, Paolo Pini spent his life to alleviate the suffering of more underprivileged people (as epileptics were) in Milan. His degree *dissertatio* was entitled Historical and Critical Study about Pathogenesis and Therapy of Epilepsy (*Studio storico-critico sulla patogenesi e sulla terapia dell'epilessia*).

In 1902 it was published into the Hoepli Manual Series (*Manuali Hoepli*), devoted to spread technical and scientific culture in Italy. Pini proposed an integrated care (medical, pedagogical, occupational and social) of epileptics. Paolo Pini's will was realized only after WWII (because he was a strong opponent to fascism, so that he was persecuted): a special school for epileptics was founded by Municipality; a Charity Fund was established and now a non-profit Organization aids families with severe disabled children. Paolo Pini, his book and his ergobiography deserve to be analysed and hold a place in the History of Italian Neurosciences.

Hector Berlioz's Neurophysiological Imagination

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In his famous essay De la musique en général (1837), Hector Berlioz asserts that certain kinds of music induce "a strange agitation in my blood circulation: my arteries beat violently… a trembling overtakes my limbs and a numbness my hands and feet, while the nerves of sight and hearing are partially paralyzed."1 Berlioz's detailed self-report lends this account the veneer of a medical case study. Indeed, as the son of a well-known physician and himself an erstwhile medical student, Berlioz avidly followed many of the medical and philosophical debates of his day. Examining the system of embodied affect emerging from his critical writing, I focus on the composer's documented engagement with contemporaneous neurophysiology, and in particular the pioneering ideas of Marie-François-Xavier Bichat.

Bichat posits a comprehensive division of the body into two systems, la vie organique and la vie animale. The former is controlled by the passions, and comprises internal organs dealing primarily with nourishment and excretion. The latter, which corresponds to behaviors governed by the will and understanding, includes the higher functions of the brain. Both "lives" communicate with each other through a spiraling system of sympathetic interactions.

Explicating Bichat's theory of the interaction between la vie animale and la vie organique, I revisit Berlioz's critical writings on the nature of music. I argue that we can understand the biological and neurophysiological discourses underlying De la musique en général as interrogating an aesthetically generated state of transcendence. I end by considering a number of Berlioz's compositional innovations, ranging from spatializing the orchestra to its expansion to massive proportions, as steps toward an aesthetics of overpowering neurophysiological experience.

Color Vision:
Chevreul and Ibn al-Haytham

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The importance of understanding color vision was brought out in the nineteenth century with the Helmholtz-Young “trichromacy” and Hering “opponency-process” theories. The cognitive nature of color was also demonstrated to be more complex than the physics of light and the physiology of vision. Chevreul. as the new Director of the dye works at the Royal Gobelins Manufactory, discovered that the “faded” appearance of the ‘yarns’ in the woven tapestry was due neither to the quality of the actual dyes used, nor the process of dyeing. The juxtaposition of certain colors changed how we perceived them. He developed the results of his findings of color contrast and complimentary colors into a theory, which was published as *De la Loi du Contraste Simultané des Couleurs* (1839), with color plates, and an extensive range of examples.

Historically, Chevreul was preceded by much earlier descriptions of some of the key concepts in color vision, going back to Aristotle, the Aristotelian Commentators, and in particular, the experimental demonstrations of the *Optics* of Ptolemy, and the *Optics* of Ibn al-Haytham (L. Alhazen). In contrast to previous qualitative visual ray theories, Ibn al-Haytham’s the *Kitāb al Manāẓir* (1039) is an exhaustive experimental work that brings together the physics of light, the anatomy of the eye, and the psychology of visual perception. It paved the way, via its Latin translation, for the subsequent scientific study of vision. Radically diverging from the traditional notion of color as an essential, inherent property of objects, his extensive investigations include simultaneous color contrast, fusion (using a color wheel and a spinning top), effect of motion, and after images. Representative experiments in Books I-III of his *Optics* will be presented, discussed, and evaluated.

Psychosurgery in Washington, DC

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In 1935, Dr. Walter Freeman (Chairman of Neurology at George Washington University) invited the 31-year-old Dr. James W. Watts to join the Department. Dr. Watts was originally convinced by Dr. Harvey Cushing to become a neurosurgeon during his clerkship rotation at Peter Bent Brigham Hospital. Moreover, during his research with Dr. John Fulton at Yale University, Dr. Watts developed a specific interest in functional lesioning of the frontal lobes. Drs. Freeman and Watts first collaborated on their leucotomy (later renaming it a "lobotomy" or the "Freeman-Watts Procedure" to distinguish it from the prefrontal leucotomy of Dr. Egas Moniz) in September 1936. For the first 10 years, they experimented with and adapted the procedure to sever more of the frontal white matter tracts - receiving a variety of responses from their professional peers, including outraged rebuke. Over 200 surgeries (including the unsuccessful procedure performed on President John F. Kennedy's sister, Rosemary) were undertaken by Dr. Watts by 1942. Sixty three percent of these were considered improved, while 23% and 14% were classified as unchanged or worsened, respectively. Tens of thousands of lobotomies would ultimately be performed over the following decades. In 1945, Dr. Freeman performed a transorbital lobotomy without informing Dr. Watts.

Dr. Freeman was inspired by the procedure as developed in the 1930s by Dr. Amarro Fiamberti, believing the transorbital approach to be more effective, faster, and less expensive than the standard lobotomy. Using an orbitoclast (similar to a common ice pick) inserted under the upper eyelid, Dr. Freeman hammered the instrument through the bone before severing frontal white matter tracts. After being informed by Dr. Freeman, Dr. Watts refused to continue their collaboration. Dr. Freeman continued to promote the transorbital lobotomy, touring the U.S. in his "lobotomobile". Ultimately, growing concerns regarding adverse outcomes and more effective antipsychotic medications in the 1950s contributed to the decline in psychosurgery procedures.

Revisiting the Beginning of
Modern Neuroscience;
Beyond the Neuromolecular Gaze

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Nikolas Rose and Joelle M. Abi-Rached have argued that the modern neuroscience in the United States appeared in the 1960s with the establishment of the Neuroscience Research Program by Francis O. Schmitt (1903-1955). As the epistemological basis of the new field, they highlighted the emergence of a new way of seeing the brain, the neuromolecular gaze. This paper aims to argue against their claim on the birth of the neuromolecular gaze by analyzing Francis O. Schmitt's various aspects as a scientist as well as a theologian.

By showing how various perspectives Schmitt had on the brain, this paper demonstrates that what makes the modern field of neuroscience was not the epistemological shift toward the neuromolecular gaze, but rather the coexistence of various epistemologies. In addition, this paper introduces a similar way of thinking about the brain appeared in South Korea based on an examination of Chung Ho-Sun who contributed to passing the Brain Research Promotion Act in the late 1990s. By comparing the similarities and differences between Francis O. Schmitt and Chung Ho-Sun, this paper reconsiders the nature of the modern field of neuroscience and how historians have to write about the history of neuroscience.

The Emergence of "Amnesia as Identity Loss" in Nineteenth Century Scientific and Popular Culture

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It is a matter of debate as to when the notion of "Amnesia as identity loss" following brain injury, which is now a common literary and film trope, emerged into popular culture. There are suggestions throughout the historical record that identity loss in memory may be present in literature in sporadic form throughout history. However, the cultural and scientific milieu of scientific naturalism and materialism during the Victorian era in western Europe appears to offer a traceable origin for the cultural popularity of the birth of *amnesia as identity loss*. It can be argued that the confluence of ideas related to double-consciousness, memory, forgetting and brain injury, interacted with technological advances in printing and distribution to promote greater diffusion and cross-fertilization of creative ideas in literature, science and medicine. Therefore, emerging ideas of identity, consciousness memory, forgetting and amnesiac disorders became widely available to both scientific and lay audiences and were incorporated into scientific writings related to brain and memory functioning as well as in popular fiction.

Through a discussion of influencing factors and a timeline that presents scientific, pseudo-scientific, technological and literary events of the 19th century, patterns of understanding and misunderstanding of memory functioning and amnesia emerge. Forgetting and amnesiac episodes as a device in literary fiction emerges by the 1860s and is fully formed as identity loss amnesia by the early 1890s.

The Australian John Hunter:
An Extraordinary Neuro-Anatomist and
Legend in his Own Short Lifetime

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The Faculty of Medicine at the University Sydney opened in 1883. One of its early graduates was the famed neuro-anatomist (Sir) Grafton Elliot Smith (1871-1937). From the beginning the Anatomy Department focused its research on the neurosciences, and the young Elliot Smith was awarded an MD for his thesis on *The comparative anatomy of the cerebrum of platypus* in 1895.

In 1920 the Foundation Professor in Anatomy J.T. Wilson, left his position in Sydney to take up the Chair of Anatomy at Cambridge University. John Irvine Hunter (1898-1924), a recent Sydney graduate, was appointed to the vacated chair. He was 23 years old. He was allowed a leave of absence to tour facilities in Great Britain, Europe and North America. These included periods of research with Grafton Elliot Smith in London where he carried out work on the structure and relations of the oculomotor nucleus of Tarsius and on the problem presented by the Piltdown skull; J.T. Wilson in Cambridge and Professor Ariens Kappers in Amsterdam. In Amsterdam he completed an investigation on the forebrain of Apteryx for which he was awarded an MD from the University of Sydney.

On his return to Sydney, Hunter commenced a research project to examine the sympathetic innervation of striated muscle and the effect of sympathectomy on spasticity. When the Mayo brothers visited Sydney in 1924 they were so impressed by this research that they invited Hunter and his co-worker Royle to deliver the prestigious John B. Murphy Oration at the American College of Surgeons later in the year. Following the lecture, Hunter travelled to the UK but within days he was dead from enteric fever acquired during his US visit.

It is left to imagine what advances in neurosciences might have been made if this promising neuro-anatomist, from the colonies, with already an established international reputation, had not been so tragically lost at this young age.

The vision of Alfred Yarbus

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Alfred Lukiyanovich Yarbus (1914-1986) was born Alfred Yanovich Krachkovsky and he commenced his research on visual process in the early 1950s. He introduced a new dimension of precision in recording how the eyes moved, either when attempts were made to keep them stationary or when scanning pictures. International recognition followed the translation of his book *Eye movements and vision* into English in 1967. Initial interest focussed on the methods and results from image stabilisation using suction caps, described in the early chapters of his book. Current concerns are with his experiments on attentional effects of eye movements when scanning pictures. Movements of the eyes had been remarked upon for millennia but recording how they move is a more recent preoccupation. Without adequate methods for registering eye movements concern was concentrated on where the eyes moved to rather than determining how they got there.

However, many of Yarbus's experimental conclusions had been reached using more primitive methods. The most venerable technique for examining ocular stability involved comparing the relative motion between an afterimage and a real image; this was first applied to post-rotational nystagmus. Saccades and fixations during reading were described by Hering and by Lamare (working in Javal's laboratory) in 1879; both used similar techniques of listening (with tubes placed over the eye lids) to the sounds made during contractions of the extraocular muscles. Photographic records of eye movements during reading were made by Dodge early in the twentieth century and this stimulated research using a wider array of patterns. Eye movements over pictures were examined by Stratton and later by Buswell, who drew attention to the effects of instructions on the pattern of eye movements. In mid-century attention shifted back to the stability of the eyes during fixation, with the emphasis on involuntary movements. The suction cap methods developed by Yarbus were applied with some success to recording the perceptual effects of retinal image stabilisation. It is an historical irony that the accuracy of image stabilisation with contact lenses was assessed by comparison with the oldest method for examining eye movements – afterimages.

A Brief History of Neurology in Film

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Major neurology based plot lines have appeared in cinema since the early 1930's. I reviewed 115 films from 1939- 2014. Neurologic disorders first appeared during the classic period of American film noir (1935 to 1950).The very first neurology theme based film was *Dark Victory* in 1939 which addressed the dilemma of how to discuss the diagnosis of a brain tumor and the plot suggested that giving misleading information in order not to upset the patient was justified. Other themes in these early years included the marital difficulties with spinal cord paralysis (*The Men),* poliomyelitis and living with a disabled child(*Leave Her to Heaven, Sister Kenny, The Five Pennys*), refractory migraine *(White Heat*) endemic meningitis (*The Courageous Dr. Christian)* and temporal lobe epilepsy (*A Matter of Life and Death).* Nightmares and sleep disorders have been most memorably used in the dream sequence featuring Dali-designed psychoanalytic symbols in *Spellbound* (1945). Particularly gripping for physicians is the unsettling nightmarish reliving of medical school tests of Professor Isak Borg in the Ingmar Bergman-directed *Wild Strawberries* (1957).

Films with specific neurologic portrayal start to emerge after 1980's and there has been a steady increase each decade and a fourfold increase since 2000. There has been a sharp increase in neurology based documentary films since 2010. Sixteen feature films on neurologic conditions (14%) were based on true stories. (e.*g. Reversal of Fortune, Iris, Hillary and Jacky, My left Foot, Diving Bell and the Butterfly, The Sea Inside*). Six feature films (5%) portrayed the challenges with withdrawal of care and euthanasia. The main themes are coma and awakening, Alzheimer's disease, the consequences of traumatic brain injury and seizures. Pediatric neurology is prominent in 3 films (*Extraordinary Measures, Declaration of War, and Lorenzo's Oil*).

Film makers used neurologic disease to increase drama and the "weepy factor" but accuracy of neurologic portrayal has improved. This likely is a reflection of the more visible appearance of Neurology as a specialty and the stories that affect us.

C. Miller Fisher and His Examination of the Comatose Patient

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An accurate neurological assessment of a comatose patient was a particularly deficient aspect of clinical neurology in the first half of the twentieth century. In 1969, C.M. Fisher published an extraordinarily detailed 56-page paper. He emphasized skin texture, fingernails, respiration patterns, autonomic stability, vital signs, and general posture of the patient. Fisher described ocular bobbing which he correlated with pontine pathology. He reported the 1 ½ syndrome, “wrong-way eyes”, pontine miosis, ocular agitation, doll’s eyes, eye closure and blinking in coma, and reflex blepharospasm. Fisher pointed out that the eyelid tone and length of time the eyes remain open after they are opened by the examiner are both findings that give an indication on the depth of the coma. Bilateral decerebrate posturing resulting from acute lesions involving the supratentorial motor system was described, when previously in humans it had only been described with brainstem lesions. Unilateral decerebrate posturing due to an acute hemispheric lesion was also newly described.

In his memoirs published decades later, Fisher indicated that he had discussed some of the principles of this paper with another neurologist at an academic meeting and that this person published a paper on the topic without acknowledging information from Fisher’s previously relayed experience. Without providing further details about this apparently disturbing experience, he “decided to let the matter rest” (Fisher CM. Memoirs of a Neurologist. Rutland, VT: Academy Books, 1992). It is of no surprise that other clinicians would find Fisher’s observations interesting and valuable to their practice. The paper is not been widely known and may have been overshadowed by Plum and Posner’s monograph on the diagnosis of stupor and coma published in the same year.

SYMPOSIUM
History of Neuroscience in Canada

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1. Frank W. Stahnisch: **Introduction**

2. Delia Gavrus (Winnipeg): **Laboratory Techniques and the Search for a Rational Therapy for Epilepsy in the Interwar Period**

3. Frank W. Stahnisch (Calgary): **Some Milestones from the History of Neuroscience in the Province of Alberta**

4. Rolando Del Maestro (McGill): **Paradigm Shifts in the Treatment of Complex Cerebral Aneurysms: The Drake Fenestrated Clip and Drake Tourniquet**

5. Harry A. Whitaker (Marquette): ***"Je me souviens d'eux"* – A Featured Symposium Commentary**

1. Introduction

The history of neuroscience in Canada is often viewed in the shadow of developments in the neurosciences in Europe and in the United States of America. However, spurred by new institutional arrangements, primarily the creation of the National Research Council of Canada in 1916 – in the middle of the First World War – and the support of university research departments across the country by the American Rockefeller Foundation and the Carnegie Foundation since the 1920s, increased the research potential in neurology, psychiatry, neuroanatomy, neurophysiology, and neuropathology in never-seen dimensions in the country.

The shell-shock experience of the "Great War" also contributed to an increasing research interest in biological psychiatry and the provision of new mental health facilities during this time. Pioneering research individuals have further shaped the landscape of the neurosciences in Canada in very important ways, and given rise to new tendencies in research on the brain and mind in many enriching and stimulating directions. Toronto psychiatrist Clarence B. Ferrar (1874-1970) contributed importantly to the diagnostics and treatment of shell-shocked war veterans; the neurosurgeon Wilder Penfield (1891-1976) at McGill pioneered surgical epilepsy and human cortical neurophysiology (work culminating in the description of the sensory-motor homunculus); McGill psychologist Donald Hebb (1904-1985) increased our understanding of the functioning of neurological synapses (Hebb's synapse); clinical psychologist Brenda Milner (b. 1918) at McGill laid important foundations for the study of memory functions in the human brain (patient H.M.); and in the most recent decades, Bryan Kolb (b. 1947) at Lethbridge pioneered important experimental paradigms in behavioral neuroscience; and neurophysiologist Sam Weiss (b. 1955) and his group in Calgary have described neuronal stem cells on the adult human brain for the first time. These are only a few developments and individuals that have contributed and shaped the appearance of modern neuroscience in quite intriguing and lasting ways, which shall me mentioned and described in this panel.

2. Laboratory Techniques and the Search for a Rational Therapy for Epilepsy in the Interwar Period

This paper explores the largely invisible laboratory work that legitimized particular surgical therapies for epilepsy during the interwar period in North America. I focus on the work carried out by the technician Edward Dockrill, who was employed by the surgeon Wilder Penfield first in his New York laboratory and later in Montreal.

Dockrill's refinements of specific neurohistological techniques allowed Penfield to both craft and support his vaso-motor reflex theory of epilepsy and to conceive and justify surgical therapies for idiopathic epilepsy (the sympathetic ganglionectomy and the periarterial sympathectomy). Dockrill's work as a laboratory technician, while largely invisible both to historians and to many of his contemporaries, appears marginal to broader histories of the brain sciences, but this is so only in retrospect. At the time, his work helped provide some of the scaffolding for a "rational therapy" that held enormous, if ultimately unfulfilled promise.

In addition to his work in the laboratory, Dockrill wrote a fascinating novel whose purpose was to shed light on the little-credited work of technicians who toiled in laboratories while the doctors who employed them received recognition. The publisher to whom Dockrill sent the manuscript recognized the thinly disguised identities of the main protagonists and rejected the novel. By reading Dockrill's real and fictional stories in parallel with each other, historians can illuminate the economic landscape and labor practices of the time, as well as the hopes and aspirations of a class of medical workers who have been mostly invisible. Furthermore, this case study clarifies the relationship between early 20th century neurohistological techniques, new epistemological commitments to an ideal of bench science in medicine, and the urgent hope of devising radical and rational therapies for epilepsy.

3. Some Milestones from the History of Neuroscience in the Province of Alberta

After the formation of the province of Alberta – on September 1, 1905, especially the creation of the University of Alberta (U of A) in Edmonton, owing to the Tory's University Act of 1910, proved to be a major step toward the establishment of a post-secondary institution of higher learning in Western Canada (Jamieson 1947). It was fortunate for the scientific and medical development of the Prairie Provinces that the creation of a university hospital would soon be envisaged upon the university's completion – following this was the handing-over of the conduct of medical examinations to the U of A by the College of Physicians and Surgeons of Alberta (CPSA) in 1912 (Lampard 2008).

The founding of the U of A and the creation of a medical training program with neurological and psychiatric training segments in it proved to be a novum in the early 20th century history of the Canadian university system. At that time, the only two formally constituted training programs were at McGill in Montreal and the University of Toronto (U of T) where almost all of the qualified trainees in the psychiatric, neurological and neurosurgical workforce of Canada came from (Weir 2011). In Alberta's other major city – Calgary; neurological and neurosurgical training as well as active brain research commenced only after the end of the Second World War with the arrival of Dr. Charles W. Taylor (1916-1999). He settled in southern Alberta in 1954 and opened a practice in what was still called "neurological surgery". This became the cornerstone in the development of clinical neuroscience activities in the southern part of the province (Annear et al. 2004). Dr. Taylor's pioneering work preceded the creation of the University of Calgary (U of C) Faculty of Medicine in 1968/9 (ca. 60 years after the foundation of the U of A) by one-and-a-half decades (Cochrane 1968).

In looking at these distinct developments that happened in Edmonton and Calgary, the beginning of neuroscience in Alberta could hardly be more unusual. The addition of the third Albertan research university in Lethbridge (U of L) – founded one year after the U of C (in 1967) – fits well into the picture. Its expanding laboratories in experimental psychology and the emerging renown of its foundational program in the behavioural neurosciences (Kolb 1999) eventually led to the festive opening of the Canadian Centre for Behavioural Neuroscience in 2001.

4. Paradigm Shifts in the Treatment of Complex Cerebral Aneurysms: The Drake Fenestrated Clip and Drake Tourniquet

The development of the Drake fenestrated aneurysm clip and Drake tourniquet is both a study in the history of ideas and the ability to bring innovative concepts to reality by utilizing the specialized expertise of multiple individuals. Dr. Charles Drake's (1920-1998) extensive experience with the difficulties encountered in aneurysm surgery and, specifically, those encountered in treating large basilar tip aneurysms gave him the anatomical background needed to conceptualize the problems and to search for solutions. His ability to put together a devoted team including Dr. John Allcock, (1920-2001) an expert neuroradiologist and Dr. Ron Aiken, a pioneering Canadian neuroanaesthetist, at Victoria Hospital and the University of Western Ontario in London, Canada, allowed for both the accurate identification of aneurysm location and the use of deep hypotension during aneurysm clipping. With new patients presenting daily, the daunting problem of how to approach and clip these large complex basilar aneurysms remained unsolved.

Drake's propensity to modify old ideas and experiment with new ones became evident as he conceptualized one solution –a fenestrated clip. Drake called Dr. Frank Mayfield, (1908-1991) the developer of the Mayfield aneurysm clip, in Cincinnati and outlined the problem to him. Drake asked if Mr. George Kees, Jr., the engineer who worked with Mayfield, could create a small aperture at the origin of the clip blades; Mayfield and Kees brought the idea to a reality. The development of the fenestrated clip shifted the paradigm for the treatment of complex posterior fossa aneurysms significantly improving patient outcomes. Multiple new uses of the clip were soon identified. Fenestrated clip application however did not deal with all giant intracranial aneurysms and a further solution was needed. Drake and his team were then able to modify equipment being used for the introduction of subclavian catheters to develop and test an innovative operative technique that was latter know as the Drake Tourniquet.

This procedure which allowed for external but reversible slow occlusion of large vessels leading to aneurysms was one of the forerunners of present endovascular aneurysm treatment. Drake's publications and lectures disseminated information about the usefulness of these techniques and many students and surgeons visited the University of Western Ontario to learn these procedures. When technology appeared to limit the clip's adaptation to new problems, Drake convinced Dr. Kenichiro Sugita (1932-1994) of the need for further modifications, which were realized under Sugita's guidance. Every time a fenestrated clip is used to clip an aneurysm, it should remind us of the debt we owe to Dr. Charles Drake and his many collaborators.

5. "*Je me souviens d'eux*" – A Featured Symposium Commentary

The first university-based neuroscience program in Canada was launched at the University of Lethbridge, Alberta. Since then, neuroscience education and research has flourished, with particularly distinguished programs in Vancouver, British Columbia, Toronto, Ontario, and Montréal, Québec. Today's talk could be titled 'from Vancouver to Toronto to

Montréal: a professional commentary and some personal recollections of Justine Sergent (1950-1994), André Roch Lecours (1936-2005), Juhn Wada (b. 1924 – emeritus) and Endel Tulving (b. 1927 – emeritus), four Canadians whose contributions to neuroscience are recognized the world over.

From Justine we learned not only how to properly do laterality experiments but we gained new insights into the functions of the left and right brain. From Roch we learned the importance of myelogenesis, how to reveal the real history of aphasiology, the intricacies of jargon aphasia and the complexities of the brain-language relationship. From Juhn we learned a remarkable procedure, the Intracarotid Sodium Amytal test, popularly known as “the Wada test”, which significantly contributed to the efficacy of neurosurgical treatment of epilepsy as well as to our understanding of the real-time dynamics of cerebral lateralization of function. Finally, from Endel we learned how to properly model the components of human memory, in particular how to understand episodic memory which is a central part of the core of self-identity. It is my good fortune to have personally met each of these illustrious Canadian neuroscientists.

SYMPOSIUM
Early Contributions on Movement Disorders in the Nineteenth Century and The Beginning of the Twentieth Century

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Chicago, IL

Olivier Walusinski
Paris-Brou, France

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Ted Rothstein, MD
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George Washington University

1. Christopher Goetz (Chicago, USA): **Jean-Martin Charcot and movement disorders: Neurological legacies to the 21th century**
2. Olivier Walusinski (Paris-Brou, France): **Georges Gilles de la Tourette and Tic Disorders**
3. Emmanuel Broussolle (Lyon, France): **Early Illustrations of Geste Antagoniste in Dystonia**
4. Ted Rothstein (Washington, DC): **A Brief Historical Review of the Medical and Surgical Therapies for Parkinson's Disease**

1. Jean-Martin Charcot and Movement Disorders: Neurological Legacies to the Twenty First Century

Jean-Martin Charcot was the premier clinical neurologist of the 19th century. Many of his long-standing contributions focused on movement disorders, with lessons that still apply to neuroscientists of the 21st century. In his early years and with some help from his colleague Vulpian, Charcot categorized patients from the masses of randomly agglomerated patients at the Salpêtrière into units based on their predominant neurological signs. Within each category, he studied prototypic cases and subdivided each class into further designations. Among tremor patients, heretofore assembled together, Charcot examined tremor relationship to rest and to activity. As such, for the first time, he separated multiple sclerosis, typified by action tremor, from Parkinson's disease, typified by rest tremor. The rest tremor patients also had rigidity, balance problems with distinctive retropulsion and most distinctively, bradykinesia, never specifically described by Parkinson himself.

Charcot's documentation of movement disorders was highly detailed and creative scientifically. He engaged medical artists and medical sculptors. For gait analysis, he had patients step into ink pads or cinder boxes and walk on a surface to document their gait patterns. He added to the field of medical illustration a wing to embrace the new field of photography. Following this evolving field with avid interest, he incorporated multiframe timed photography to capture mobile disorders like Gilles de la Tourette syndrome. Because of his conceptual framework that all primary neurological disorders were hereditary, he did not appreciate the distinctive genetic cause of Huntington's disease and considered Sydenham's chorea and Huntington's disease variants of the same disease.

The volume of patients allowed Charcot the opportunity to establish the prototypic movement disorders and thereby to appreciate the variants of the archetype. Early photographic examples from the Charcot School show cases that today would likely be considered examples of parkinsonism-plus syndrome. Charcot was never daunted by complicated cases that did not quite fit his archetypal picture and warned his students: "When a patient calls on you, he is under no obligation to have a simple disease just to please you" (Nov 15, 1887).

2. Georges Gilles de la Tourette and tic disorders

Gilles de la Tourette (1857-1904), a French neurologist from the Salpêtrière School in Paris, is most reknown for the disease that bears his name (Tourette syndrome). His biographical sketch is presented, with unpublished family photographs, the origin of the name "Gilles de la Tourette", his medical heritage and the key events of his life. Gilles de la Tourette was a prolific author. From 1881, he started to publish articles in *Le Progrès Médical* particularly translations of English medical journal articles. His most well-known translation of "The Jumping Frenchmen of Maine" by Beard dates from 1881 and is indicative of his early interest in abnormal behaviour. His first book in 1884, a biography of Théophraste Renaudot, the founder of journalism, was released while he was an *interne* under Charcot.

As Charcot was interested in a more accurate nosological classification of chorea and tics, he conferred this task to Gilles de la Tourette because of his good knowledge on tics including studies from the English medical literature and also because he had examined a boy with tics in the clinical ward. A review on the pioneering work on tics during the 19th century by Bouteille, Itard, Trousseau, Beard and Hammond is presented along with a discussion on how their findings relate to Gilles de la Tourette's famous 1885 article about 9 patients. Gilles de la Tourette used the expression "*incoordination motrice*" (motor incoordination) to describe how his patients moved, whereas Charcot in his Lessons referred to tics, echolalia and coprolalia (attributing this word to Gilles de la Tourette) and also "thinking tics". Undoubtedly, Gilles de la

Tourette deserves recognition for his remarkable clinical description of observations on tic disorders which were poorly described and separated from other movement disorders prior to his work. He can also be credited for having disclosed the characteristic progression of the condition as chronic, fluctuating and life-long.

3. Early illustrations of geste antagoniste in dystonia

The *geste antagoniste*, also known as *sensory trick,* is a voluntary manoeuvre that temporarily reduces the severity of dystonic postures or movements. It is a classical feature of cervical and focal dystonia, more prominent in primary that in secondary dystonia. Brissaud in Paris first described this phenomenon in 1893-1894, demonstrating seven patients with torticollis in his 24th lesson. He noted that a violent muscular contraction could be reversed by a minor voluntary action, as if patients had superimposed simple mannerisms, childish behaviour or simulated pathological movements in addition to the torticollis. Brissaud thus evoked a psychic disorder and introduced the term *mental torticollis*. The term *geste antagoniste* was quoted by Brissaud's pupils, Meige and Feindel, in their 1902 book on tics. This masterpiece was almost immediately translated into German and English and thereby contributed to the rapid diffusion of the use of the *geste antagoniste* term.

Other early illustrations of this sign in patients with torticollis and generalized or torsion dystonia reinforced the concept of dystonia as a psychiatric rather than neurological disorder. Even though the *geste antagoniste* is easily recognizable today on these photographs, it was not universally identified by authors at the time of many publications. These include among others a German 1850 report by Steudel, cases from Babinski and Destarac in 1901 in France, and the photographs illustrating Oppenheim's famous article on dystonia musculorum deformans in 1911 in Germany. The psychogenic hypothesis of dystonia was strengthened after the 1929 Paris international congress. Herz, in 1944 in USA, brought dystonia back to the neurological realm whereas Marsden, in the 1980s in London, established its organic nature. Today, every neurologist looks for *geste antagoniste* when a dystonic syndrome is suspected. In 2014, a new denomination was proposed, *alleviating manoeuvre.* This important sign should be considered in the definition of dystonia.

4. A Brief Historical Review of the Medical and Surgical Therapies for Parkinson's Disease

The classic features of Parkinson's disease (PD) were described by James Parkinson and improved upon by Jean-Martin Charcot. But their contributions relied on advances in science and understanding of brain anatomy and physiology that evolved from ancient times. The neuropathology of Parkinson's disease depended upon observations of Fritz Heinrich Lewy who described the occurrence of intracytoplamic inclusions, a hallmark feature of the disease. The pivotal role dopamine plays in the normal function of basal ganglia has led to major therapeutic breakthroughs over the past 4 decades for patients with Idiopathic Parkinson's Disease and remains the usual approach. However, in advanced stages of PD, patients often experience motor fluctuations, increased “off time” and dyskinesias which cannot be controlled or may be worsened with medical therapy. As a result of improved understanding of the neurophysiology of the basal ganglia and thalamus, elucidation of the direct and indirect pathways, improved quality and more accurate brain imaging, more refined surgical techniques with decreased surgical morbidity and mortality, as well as the development of deep brain stimulation, there has been a reawakening of interest in surgical intervention for PD. This presentation will provide a brief historical overview of the revolutionary achievements in our understanding of the disease process, the medical treatment of PD, and the role that both science and serendipity have played in the evolution of surgical advances.

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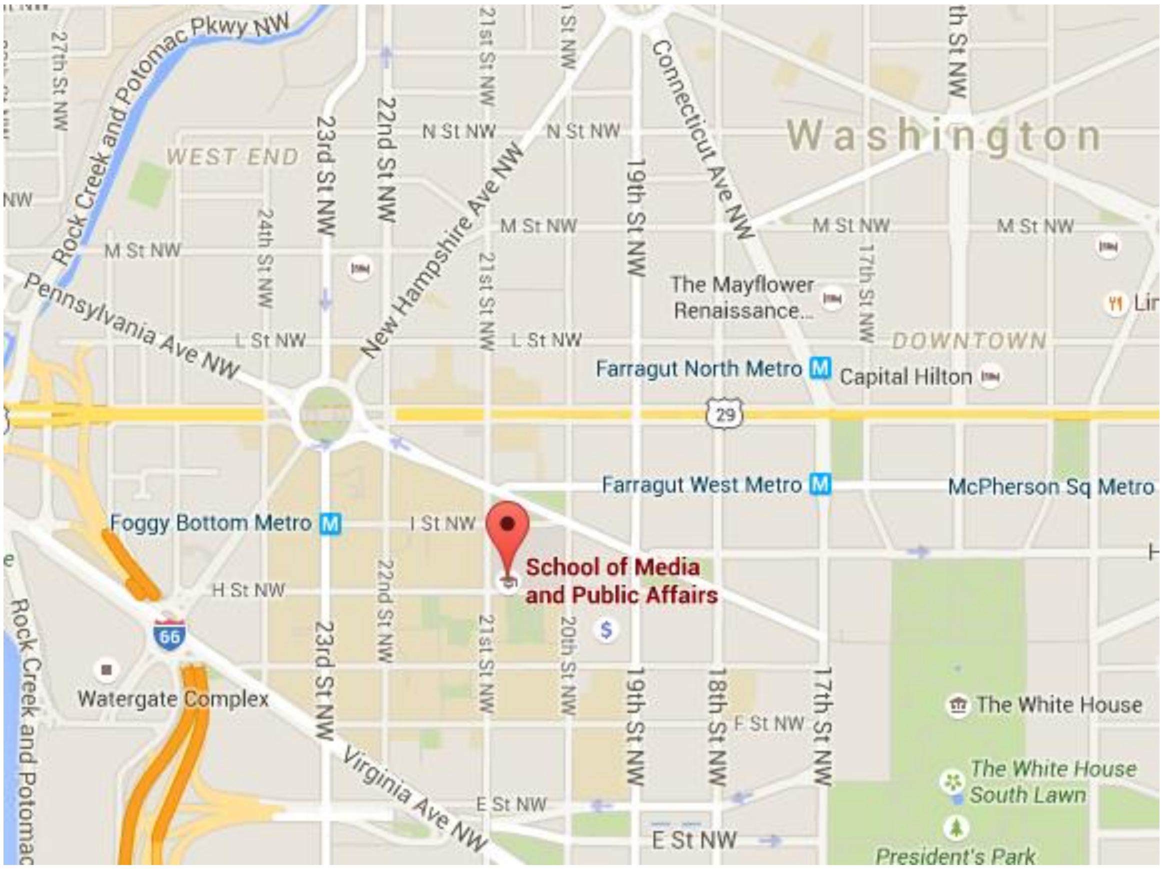

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