# *Torpedo fish research in Fessard's school: globalization in neurophysiology (1938-1955)*

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In France, neurophysiology emerged after Second World War as a dynamic discipline in different schools, Toulouse, Lyons, Montpellier, Marseilles, but most of all, Paris, where Lapicque was losing credit for his studies on chronaxie. Parisian neurophysiologist, Alfred Fessard (1900-1982) was the key figure in establishing a new school of neurophysiology in the lines of Edgar Adrian's Department in Cambridge, which he joined in the late thirties. Fessard was initially a student of Henri Piéron involved in experimental psychology. He made parallel oscillographic studies of elementary activities in various animal and plant preparations.

Since E-J Marey, French physiology paid much interest to the study of electric fish *Torpedo*. The continuous research in this field, up to the sixties, highlights how Fessard's school joined international science and established scientific collaborations with foreign scientists. From early work with plant physiologist Daniel Auger, establishing the theory of chronaxie in *Torpedo*'s electric organ, Fessard isolated unitary potentials and studied their synchronisation. In 1939, Fessard invited David Nachmansohn and Wilhelm Feldberg, two German Jewish scientists, to collaborate with him on the cholinergic neurotransmission in the electric organ of *Torpedo*. Fessard also collaborated with Carlos Chagas who made his PhD dissertation in Wurmser's laboratory in Paris on electric fish. This work was pursued with Fessard's wife, Denise Albe-Fessard, by regular trips to Rio de Janeiro. The nervous control of *Torpedo*'s electric organ provided a good model for intracellular studies and feed back regulations as described by cybernetics and studied with histological techniques. Albe-Fessard and Pierre Buser were involved in applying Eccles' intracellular technique to Torpedo, while the Hungarian scientist, Thomas Szabo, provided anatomical studies. The case study of *Torpedo* fish research in the school of Alfred Fessard makes clear how Parisian neurophysiology developed in a new international perspective after 1945, thanks to intense collaborations with other countries.

Session I. Electric Fish
Thursday, 19 June 2008, 10:50 - 11:10.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Hermann Munk: a nineteenth-century academic career in Prussia*

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Hermann Munk (1839-1912) was a pioneer in the field of cortical localization, and the significance of his discoveries is well documented in the literature (Schiller, 1970; Finger, 1994).
The present paper concentrates on Munk's *Curriculum vitae* and on the conditions under which his scientific work evolved. Munk was born as the son of a Jewish merchant and was educated in *Gymnasien,* elite high schools, in Berlin and Posen the latter being the capital of a Prussian province at the time. He studied medicine from 1855 to 1859 mainly in Berlin where the physiologist Emil du Bois-Reymond (1818-1896) became his mentor. Munk worked on electrophysiological problems in du Bois-Reymond's laboratory for several years until, in 1876, he was appointed Chairman of the Physiology Department at the Royal Veterinary School in Berlin. Here, he then was in the position to establish his own field of research, i.e., the physiology of the cerebral cortex as revealed by lesion experiments on dogs and monkeys (and occasionally on horses). His results so convinced his former teacher du Bois-Reymond that he proposed Munk for full membership in the Royal Prussian Academy of Sciences, and Munk was in fact elected in February 1880.
Munk also was Associate Professor at the Berlin University and promoted medical students who worked in his laboratory for their theses. Most of these students were clinically oriented and some became esteemed neurologists like Max Lewandowsky (1876-1918) and Max Rothmann (1868-1915).

References:
Francis Schiller: Hermann Munk (1839-1912) pp. 247-250 *in The Founders of Neurology*, 2nd edition, Springfield, 1970.
Stanley Finger: Origins of Neuroscience, Part I, 6. Post-Renaissance Visual Anatomy and Physiology, pp. 76-95, Oxford University Press, 1994.

Session V. Neurosciences & Academic Life
Thursday, 19 June, 2008, 17:40 - 18:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Hans Berger and his Winding Path to the EEG.*

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For more then 20 years, the German psychiatrist Hans Berger experimented with various forms of graphic recording in search for a true representation of the brain's activity before he dared a first publication on the human electroencephalogram (EEG) in 1929.
His observation turned into a scientific fact, however, only after Edgar Douglas Adrian had become aware of his paper, repeated the experiment, and arranged for a famous public demonstration in 1934. As is well known, Adrian and his technician Bryan Matthews found Berger's brain rhythm almost at once – a success that immediately questioned Berger's competence as well as the prolonged neglect for electroencephalography by the scientific community. Both questions, however, rely on a retrograde perspective; before 1929, the EEG simply did not exist, not even as an empty space on the map of neurophysiological phenomena, and Berger was left in an endless sea of electrical recordings searching for something he did not yet know.
The emergence of electroencephalography must hence be analyzed as a difficult and complex process of negotiation in which Berger gradually adapted his expectations to an abundance of conflicting and inconsistent observations. And this process did not stop with the general recognition of the EEG, since the recorded traces did not exactly match Berger's expectations – as a consequence of this, Berger continued to refine the recording of neurophysiological concomitants of psychical processes in search for a true psychograph.

Feature Lecture
Thursday, 19 June, 2008, 16:10 - 16:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *The concept of the unconscious mind: A brief historical overview*

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That our waking mind can be active outside consciousness has been underlined by many historians (e.g. Whyte, Claxton). Interestingly, several stages can be distinguished in the history of the unconscious mind.

i) Mentions of it are already encountered in Hindu Upanishads, in Greek texts (Plato, Aristotle), in the Bible (Old and New Testament) and in Augustine as well.

ii) Descartes' "static" dualism did probably not really favour interactive mind processes. Later on (early XVIII$^{th}$), as dualism's strength declined, the multiplicity of mind processes became credible, with Leibniz, Herbart, Kant, Herder, Nietzsche as well as German romantics, also favoured by the recently born Darwinism.

iii) As a consequence, the notion of unconscious mind processing became accepted or at least debated by many scientists or philosophers, von Helmholtz, Fechner, Wundt, von Hartmann, etc. on the German side, Carpenter, Hamilton, Brodie, Maudsley and others on the British side, and W. James in the USA. French philosophers were rather discreet, except perhaps Maine de Biran, while the Swiss H. Amiel introduced the French term "*inconscient*" in 1862.

iv) Accordingly, when Freud published his first book, *die Traumdeutung* in 1900, the general opinion was quite favourable. He highlighted two new and important unconscious processes, repression and the dominating influence of sex. The importance given from then on to the unconscious mind, by him and many other analysts since has profoundly influenced the way of considering mental pathology.

v) Finally however, a new concept is now developing, that of "cognitive unconscious". The story had in fact started long before, when some authors considered memory as a function including unconscious stages. Cognitive unconscious further became the "implicit" side of mental activity, extending into perception, attention, etc. (Kihlström). At present, this duality [deep analytic vs cognitive] raises a major problem, that of the mutual relationships between them. Are they quite separate, or should one try to find a hypothetical junction, possibly via the emotional domain?

Session III. We Greet the "Club d'Histoire des Neurosciences"
Thursday, 19 June, 2008, 14:00 - 14:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Neuroscience history in New Zealand: A microcosm of European thinking, reflected in the antipodes.*

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Following the signing of the "Treaty of Waitangi" with the indigenous Maori tribes in 1840, European settlement of New Zealand began in earnest. In the southern Scottish settlement of Dunedin in 1848 the first university in the land was established in 1869-71 (discovery of gold). The first medical courses were given there in 1875 and the Otago Medical School was finally established in 1887. This school reigned supreme in NZ until the University of Auckland School of Medicine opened in 1968. Basic neuroscience research in Dunedin was spearheaded by pioneering work into the nature of synaptic transmission carried out by Sir John Eccles during 1944-51. After his departure to Canberra, important research on MS was carried out by Archie MacIntyre, Keith McLeod and Ian MacDonald. Later, in the 1980s, Graham Goddard researched the importance of "kindling" in the initiation of epileptic seizures.
In the early 1980s the rural settlement of Tapanui, south of Dunedin, gave its name to the mysterious "Tapanui 'flu" (known later also as CFS, CFIDS or ME.), a debilitating condition marked by chronic weakness and fatigue, not alleviated by resting. Eventual acceptance of Tapanui 'flu as a medical condition by the medical community was due to the untiring research into the epidemic by a local GP, Peter Grahame Snow, who could not accept the then-prevailing view that sufferers were simply lazy or “work-shy”.
After European settlement there arose a generally-perceived need to manage the increasing population of persons with mental diseases and deficiencies. This led to the rapid establishment in the latter half of the 19$^{th}$ century of a string of “Lunatic Asylums” stretching from Auckland to Dunedin. These often huge institutions were epitomized by the asylum at Seacliff, some 30 km north of Dunedin. Here, many patients endured physical hardship, undeserved ill-treatment and excessive subjection to electro-convulsive and drug therapies. A graphic picture of life there in the 1940s was portrayed by the extremely shy patient and writer, Janet Frame, who, by winning a major literary prize with her first book, narrowly escaped lobotomy. After reformation of mental patient treatment in the 1980s the asylums began to disappear as quickly as they had originally been established, solving many old problems but also raising new ones which still await solution.

Session IV. Neurosciences "Down Under"
Thursday, 19 June, 2008, 17:00 - 17:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Albert Gombault (1844-1904), an histologist of Charcot.*

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Albert Gombault, an assistant of Charcot (1825-1893) at the Salpêtrière Hospital, described the amyotrophic lateral sclerosis (ALS). External in 1866, internal in 1869 Gombault analysed a symmetrical sclerosis of the lateral spinal column and the anterior pyramids of the brain stem (1871/1872). He presented his thesis in 1877 which was a more or less complete summary of that pathology.
Gombault was a very discreet man who was always behind the "*patron*". He appears, however, in the famous painting "*Une leçon clinique à la Salpêtrière*" (*A clinical lesson at the Salpêtrière*) presented in the "Salon of 1887" by André Brouillet (1857-1914). Gombault is on the left side near Paul Arene (1840-1913) and in front of Victor Cornil (1837-1907).
Gombault was physician in 1882 and "*chef de service*" in 1887 at the Ivry hospital with the Professor Victor Cornil. If he was a great clinician, he was mainly an experimentalist. He studied saturnism (plumbism) in guinea pigs and in humans (Gombault 1880, Charcot, Gombault 1881). Using the "teasing method", he dissociated the nervous trunks of the brachial plexus and the sciatic nerve in guinea pigs. He described the peripheral lesions and compared them with those obtained in the Wallerian degeneration. His pictures were still present in *Greenfield's Neuropathology* in the 1976 edition.
Gombault published some reviews on different pathologies, two in particular being important; one with Rendu on cerebral localisations (1877) and the other on aphasia with his assistant Philippe (1896). In 1902 Gombault contributed with the same Philippe to the "*Text-book of Histology*" from Ranvier and Cornil; they wrote the fifth part on histological pathology of the central nervous system.

Session III. We Greet the "Club d'Histoire des Neurosciences"
Thursday, 19 June, 2008, 14:20 - 14:40.

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# *From time psychophysiology to neurophysiology*

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In this paper I will try to describe the major results obtained by German school of psychophysiology of time (Helmholtz, Mach, Wundt, Stumpf), extended to the account given by William James in his *Principles of Psychology*, and the transition to more physiologically inclined researches, especially the ones performed by Adrian in Great Britain, going to his discovery of the frequency coding in the nerve and to his later appreciation of the discovery of the EEG by Hans Berger and of subsequent work by German scientists on the EEG. I will try to show how psychophysiological results on time perception paved the way to hypotheses regarding the neural basis of such properties, and fostered the interest in the role of time in neural coding, which was never lost particularly in Germany since the time of Fechner and Lotze's speculations on intensity/frequency coding in the brain.

Session III. We Greet the "Club d'Histoire des Neurosciences"
Thursday, 19 June, 2008, 14:40 - 15:00.

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# *Neurology and Psychoanalysis in the Early Twentieth-Century U.S.: The Case of L. Pierce Clark*

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When read today, the psychoanalytic writings of the American neurologist L. Pierce Clark (1870-1933), especially those on epilepsy, often appear far-fetched. (See E. Dwyer, "Toward New Narratives of Twentieth-Century Medicine," (Bull. Hist. Med. **74**, 2000: 786-793). By re-visiting and reframing these writings, this paper suggests the outlines of a somewhat different history of the place of psychoanalysis in early twentieth-century American neurology. It also expands our understanding of early twentieth-century neurologists' efforts to explain the mind/body relationship.

Three strategies are used to accomplish these goals. First, the paper situates L. Pierce Clark's psychoanalytic writings on epilepsy within the entire corpus of his published work. Thus, it explores both the connections and disjunctions between Clark's psychoanalytic writings and his other publications on movement disorders.

Second, the paper connects Clark and his psychoanalytic writings, viewed as a bit extreme even during his lifetime, to those of some of his contemporaries. Well-known neurologists, such as Smith Ely Jelliffe and Stanley Cobb, also found psychoanalysis fascinating although, to a greater extent than Clark, they were able to maintain their places within the mainstream of early twentieth-century American neurology. My hope here is to help historians better appreciate the complex intellectual terrain of early twentieth-century American psychosomatic neurology within which Clark worked and wrote.

Third, I use clips from a rare 1929 silent film documentary of one of Clark's psychoanalytic sessions, recently donated to the National Library of Medicine. This clip appears to be the only extant visual record of Clark's therapeutic practice. A 28-minute study of a single session, the film offers not only a visual complement to Clark's many published writings but also, since Clark often used the film in public lectures, suggests the arguments he used to persuade often sceptical colleagues of the therapeutic value of psychoanalysis.

Session IX. Neuropsychiatry & Neuropsychology
Saturday, 21 June 2008, 10:40 - 11:10.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *On the historical and conceptual background of the Wisconsin Card Sorting Test*

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In this paper I describe the development of the Wisconsin Card Sorting Test (WCST). I trace the history of sorting tasks from the studies of Narziss Ach on the psychology of thinking, via the work of Kurt Goldstein and Adhémar Gelb on brain lesioned patients around 1920 and subsequent developments, up to the actual design of the WCST by Harry Harlow, David Grant, and their student Esther Berg.
The WCST thus seems to originate from the psychology of thinking ('Denkpsychologie'), but the test, as it is used in clinical neuropsychological practice, was designed by experimenters working within the behaviorist tradition. Recent developments are also noted, suggesting that, contrary to the general impression, implicit learning may play a role in WCST-like discrimination learning tasks.

Session X. Methods & Techniques, Part 2
Saturday, 21 June 2008, 14:00 - 14:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *DE MOTU CEREBRI - to observe, record, understand and apply.*

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Pulsations of the brain have been observed and noted since antiquity. Willis' message to regard the cerebral solid mass as an organ to be studied may have stimulated the *Age of Enlightenment* scientists not only to ponder about the brain movements but to study experimentally whether these pulsations were generated by the *dura mater*, the respiratory movements or the beating of the heart through the arteries and the veins. The research effort moved, because of theoretical considerations that might have been stimulated by battlefield experience, to find out whether the pulsations were an innate physiological phenomenon or appeared only when the skull was opened. The devices that were developed during the first half of the nineteenth century in order to look at the brain while preserving the conditions of an unopened skull are the prototypes of today's instruments in clinical use; the problem was definitely solved only in the last decades.
The invention of the kymograph transformed the naked eye impressions into records that were open to objective analysis and established the close relation between the arterial pulse and its components to the waveform of the cerebral movements and may have instigated the idea of the existence of a transfer function between these movements that is the topic of current research. By the end of the nineteenth century the study of the brain movements was coupled with the extensive research of the cerebral circulation and of the changes in the intracranial pressure following head injury. For not yet determined reasons this wide-ranging endeavour was abandoned.
Since the 1970's when continuous monitoring of intracranial pressure became a routine clinical practice the three-centuries-old research on brain pulsations was resumed with the not yet fulfilled attempt to use the wave-form analysis of the pulsations as a means for non-invasive assessment of intracranial pressure.

Session VIII. Methods & Techniques, Part 1
Saturday, 21 June 2008, 09:00 - 09:20.

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# *Electric Fish Therapy: History and Perspectives*

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The shocks of electric fish were used therapeutically long before it was realized that they are electrical. The Romans, who seem to have discovered the new cure accidentally, used live *Torpedos* (rays) for treating headaches, pain associated with gout, and several other disorders. During the second half of the 18th century, when electricity captured the popular imagination and it was proposed that these fish might be electrical, clinical trials yielded findings like those obtained with Leyden jars, suggesting a common mechanism.

Those trials that took place in South America utilized "eels" (often called "tremble fish") and largely involved slaves and Indians, who seemed to have little say in what transpired. Interestingly, sick animals also served as subjects in some experiments. As word of some successes spread, sick Europeans and Americans volunteered and even lined up to be shocked when live eels became available.

By the end of the 18th century, electric fish therapy had become somewhat fashionable, in addition to being an exciting thing to do --- and it impacted bedside medicine and neurophysiology.

Session I. Electric Fish
Thursday, 19 June 2008, 09:50 - 10:10.

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# *Encephalitis lethargica and Schizophrenia before the parting of their ways*

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Economo remarked at the conclusion of his 1931 monograph that the “sorry fact of the helplessness” of medical science in the face of encephalitis lethargica had been partly “compensated …. by the immense gain which our knowledge of pathological and normal nervous mechanisms [had] derived from our acquaintance with this disease.” Encephalitis lethargica emerged against a medical background in which the boundaries between neurology and psychiatry were often fiercely contested, but itself defied allocation to either domain. In this context, this paper explores relationships between encephalitis lethargica and schizophrenia in terms of the interactions between the evolution of concepts of these disorders in the 1920s.

Session XI. Encephalitis Lethargica Revisited
Saturday, 21 June, 2008, 15:00 - 15:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Study, Travel, and Wishful Thinking in 19th Century Continental Europe*

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Discoveries in medicine and science during the latter part of the 19th century fueled an explosion in research directed at gaining a more comprehensive understanding of the central nervous system. Coupled with the more basic research conducted by scientists in England and the Continent was more applied research directed at answering specific questions about issues related to neurological deficits. For example, more humane methods of treating mental patients coupled with research into the etiology of these syndromes contributed to the development of psychology, as did the experiments into the structural components of the mind. More effective means of treating wounds sustained on the battlefields of Europe and America directed attention toward neurology as a scientific and medical specialty.
The purpose of this Presidential Lecture is to examine the myriad scientific endeavors which were occurring in 19th Century Continental Europe. The author will "travel" to Europe during the years 1885 – 1890, visiting the laboratories of those scientists and practitioners examining issues related to the development of psychology and neurology. Specifically, discussion will center on research conducted by Sechenov, Charcot, Wundt, Müller, Helmholtz, Golgi and Ramón y Cajal. Although assuredly not continental, the author will stop over in England on the way home to visit with Sherrington and Horsley.

President-elect Lecture: Euro-neurohistory
Thursday, 19 June 2008, 09:00 - 09:30.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *The History of Human Brain Banking*

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Understanding how the human brain functions represents one of the greatest scientific challenges. Research on brain diseases has a key role in this quest as the elucidation of pathological defects has traditionally helped to identify novel biological mechanisms. While animal models can be of great assistance, it is ultimately the structure and function of human brain tissue, both dead and alive (e.g. through imaging) that will need to be analysed. Brain banks have become the only acceptable source of research brains. In view of declining autopsy rates, brain banks are also gaining importance for medical diagnostics, quality control and teaching.
Brain archiving itself has undergone a significant evolution from the anatomical teaching collections of the 18$^{th}$ century where corpses could be supplied through the illegal activity of body snatchers to modern brain banks that are based on patient donations. The use of brain archives has also changed from viewing to destructive dissection and consumptive molecular analysis. Thus, for the continued use of brain tissue to be sustainable, a constant supply of clinically and histopathologically well-characterised brains has to be established and maintained.
Based on the very nature of their donation, brain donors can never experience a material benefit from it. They make their decision entirely on the basis of trust. Trust needs to be justified. Assistance of patient organisations and acceptance of the idea by the general public are essential in this context. Thus, there is a social dimension of brain banking the importance of which cannot be overestimated but which has been dealt with variably in medical history (e.g. collection of elite brains). New challenges arise in the face of increased financial pressures on medical institutions and raised public expectations towards ethical human brain banking in a globalised economic environment.

Session X. Methods & Techniques, Part 2
Saturday, 21 June 2008, 14:40 - 15:00.

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# *Did Alzheimer believe that he had discovered a new disease?*

**Fabrice GZIL**
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Alzheimer's disease (AD) was first identified in the first decade of the 20th century. One century later, authors strongly disagree about the works which led to the individualization of AD. For many authors, Alzheimer was the first to describe the neuropathology of the form of dementia named after him. In discovering in a 51 year old woman an unknown clinical picture and unknown pathological lesions, he revolutionized the old conception of dementia and laid the foundation for current ideas. On the contrary, some authors argue that the individualization of AD 'was not a discovery'. According to them, the clinical picture and the pathological lesions described by Alzheimer were already known in 1907. Alzheimer only discovered that senile dementia could occur prematurely. Kraepelin and Alzheimer nevertheless opposed AD and senile dementia [being equated??].
Careful reading and analysis of original papers lead to an alternative approach. Alzheimer neither discovered nor created, but 'invented' AD. Severe amnesic dementia, senile plaques and neurofibrillary tangles had already been observed before 1906. Nevertheless, Alzheimer invented them because he proposed (new) etiologic and diagnostic interpretations for these phenomena. Likewise, Alzheimer invented AD, because he demonstrated that AD was an atypical form of senile dementia, i.e. that these presenile cases should paradoxically be brought nearer to senile dementia.
Thus, Alzheimer's work contained many innovative ideas, but not those which are usually discussed in this context. In 1906, Alzheimer was already convinced that degenerative dementia should be distinguished from vascular dementia. Above all, he emphasized that the relation between ageing and senile dementia was a very complex one, because in AD pathological lesions and clinical symptoms were more severe than in typical senile dementia, although patients were younger. Because Alzheimer said that AD had to be distinguished from typical senile dementia, his successors thought he conceived AD and senile dementia as two separate entities. Thus, during more than 50 years, psychiatrists and neurologists thought that AD was a presenile (degenerative) dementia, distinct from senile (vascular) dementia.

Session III. We Greet the "Club d'Histoire des Neurosciences"
Thursday, 19 June, 2008, 15:00 - 15:20.

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# *Leyden's progressive bulbar paralysis (1870) and Charcot's amyotrophic lateral sclerosis (1869, 1874) at the historical intersection of nosographical science*

**Bernd HOLDORFF**
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The initiation of scientific neurology beginning in the middle of the 19th century and the improvement of histological techniques led to the identification of hitherto undefined diseases. Systemic motor diseases described by various authors under different names can be identified by comparing several preliminary contributions from France (esp. from Duchenne de Boulogne 1860/61), Germany and England. Leyden in Germany and Charcot disagreed about the identity or diversity of Leyden's bulbar paralysis (BP) and Charcot's amyotrophic lateral sclerosis (ALS), both delineated nearly at the same time: in 1870 and in 1869/1874 respectively. Both described identical morphological traits: atrophy of the bulbar, motor cranial nerves, of the spinal anterior horn cells and sclerosis of the spinal lateral tract. Leyden – again in 1878 – stressed the separate identity of BP (even with coexisting spinal atrophy).

Charcot pointed to the importance of the primary spastic paralysis as an expression of the pyramidal tract lesion and as a cause of the secondary (deuteropathic) muscular atrophy. Even when Charcot was not right in every respect, his comprehension of the systemic character of the disease, the identity of BP and ALS and the regular finding of the lesion of the first and second motor neuron nonetheless remained stable. The eponym of Charcot's disease is based on his sophisticated analysis.

Leyden proposed two separate disease entities. Not only in this area but also in other areas of spinal and peripheral diseases he made great contributions to theoretical neurology. Nonetheless he felt himself and the German neurology neglected, as was expressed in his obituary for his Parisian scientific rival in 1893.

Session II. Poster Presentation P1
Thursday, 19 June, 2008, Formally-organized viewing time: 11:30 - 14:00.

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# *A history of coma as described in medical and neurological texts (1640 – 1960)*

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We describe observations and experiments which led to a better understanding of consciousness and coma, based on medical and neurological texts published between 1640-1960. Information on terminology, classification, causes, observation and examination, pathophysiology, treatment, and experimental coma was found. Disorders of sense, motion, and breathing, as well as changes in the patient's pulse were recognised as clinical cues up to the first part of the 19$^{th}$ century. Structural and toxic causes were distinguished early. Observed phenomena were explained from the perspective of humoral medicine and treated likewise. In the second half of the 19$^{th}$ century, experimental research of intracranial pressure resulted in important insights and more accurate clinical examination. The discovery of the ascending reticular activating system in the early 20$^{th}$ century contributed to further increase of knowledge. The understanding, clinical examination, and treatment of coma have gone through a gradual evolution over many decades. The recapitulation, in the 1960s, of clinical signs in impaired consciousness into a teachable and reproducible module marks an abrupt change in clinical approach. It is based on close clinical observation and interpretation of experimental and pathology studies and less on modern neuroimaging.

Session VI. Language
Friday, 20 June, 2008, 10:00 - 10:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Herbert von Karajan at 100: recounting the maestro's interest in the physiological sciences*

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As the world celebrates the centenary of the birth of the renowned Austrian conductor Herbert von Karajan (1908-1989), this study recounts the maestro's keen interest in neurophysiological research on music creation and perception. Karajan began his university studies in 1926 at Vienna Polytechnic before switching to conducting at Wiener Musikakademie. He remained fascinated by the scientific and technological advances of the 20th century throughout his life. In 1968 he founded the *Herbert-von-Karajan-Stiftung* in Berlin for the encouragement of scientific work on the dissemination of conscious musical feeling, and the *Forschungsinstitut für Experimentelle Musikpsychologie* (Research Institute for the Experimental Psychology of Music) at Salzburg University.
In the 1970s, Karajan participated in studies headed by Gerhart Harrer of the Institute of Forensic Psychiatry of the Salzburg University, aimed at investigating the influence of musical performance and musical experience on autonomic nervous system responses, and also the effects of piloting a plane. The parameters studied included telemetric EKG, pulse frequency, temperature fluctuations, and breathing rate. Harrer measured Karajan's signals in a four-part study. First he measured his and his students' signals while listening to a recording of Beethoven's *Leonore* Overture. Then he gave both subjects a tranquilizer and measured the same signals while the subjects listened to music. In a third part he measured Karajan's signals while conducting the same Beethoven Overture during a recording session with the Berlin Philharmonic, and in the fourth part he recorded Karajan's responses while piloting his personal plane. These results were reported in a chapter published in 1975 in German, and included in a 1977 book edited by British neurologists Macdonald Critchley and R. A. Henson. We present an outline viewed through the prism of contemporary neuroscience.

Session II. Poster Presentation P2
Thursday, 19 June, 2008, Formally-organized viewing time: 11:30 - 14:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *A Historical Introduction to the Harnack-House.*

**Georg W. KREUTZBERG**
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The opening of the Harnack-House on 7 May 1929 was a banner day for Berlin's academies and its political and economic elites. It was through their concerted efforts that Berlin finally acquired a lecture venue and social centre for members of the famous Dahlem Institute, simultaneously serving as a guest house for academics worldwide. The primary initiators of the House were Adolf von Harnack and Friedrich Glum, who energetically fought for the project.
The theologian Adolf von Harnack, first President of the Kaiser Wilhelm Society (KWS), had one single goal: to overcome the isolation of German academia after the First World War and thus enable outstanding achievement through international cooperation.
Harnack's efforts to build an international research centre in Dahlem were vigorously supported by the KWS chairman, Glum, who helped promote the idea among companies and private individuals. In June 1926 the senate of the KWS resolved to found the Harnack-House – also as a gesture of gratitude for the hospitality that German scholars had experienced abroad.
The most important political godfathers of the Harnack-House were Foreign Minister Gustav Stresemann, Chancellor Wilhelm Marx and the influential Centre-Party deputy Georg Schreiber. They undertook the political lobbying and gathered the necessary funds to build the House.
In concrete terms, the government was willing to spend 1.5 Million Mark, while the State of Prussia donated the real estate upon which the house would be built. The funds, however, were insufficient to complete the building designed by architect Carl Sattler.

(MPG)

Opening Ceremony: Inaugural Lecture
Wednesday, 18 June, 2008, 17:00 - 17:30.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *The "Munich School" of Brain research: A history of success spanning 135 Years.*

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The so-called "Munich School" of Brain Research began with the psychiatrist and neuroanatomist Bernhard von Gudden, who achieved posthumous fame through his untimely death, together with King Ludwig II of Bavaria ("mad king Ludwig") under mysterious circumstances in Lake Starnberg.
His student Franz Nissl and his friend Alois Alzheimer continued to build up the tradition.
In 1917 this led to the founding by psychiatrist Emil Kraepelin of the first interdisciplinary brain research institute in the world; an institute from which came later the neurophysiologists Erwin Neher and Bert Sakmann - joint recipients of the 1991 Nobel Prize for medicine.

Presidential Lecture
Friday, 20 June, 2008, 09:00 - 09:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Gustav Fritsch and the History of Electric Fish*

**Robert KUBALA**
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The German physiologist Gustav Fritsch (1838-1927) is primarily recognized for his experiments with Eduard Hitzig on motor cortex localization in dogs. Their famous 1870 paper “On the electrical excitability of the cerebrum” proved the somotatopical organization of motor cortex and also demonstrated that part of the cerebral cortex is electrically excitable. Yet Fritsch’s investigations, under the influence of his patron Emil du Bois-Reymond, ranged from neurophysiology and comparative anatomy to physical anthropology and scientific photography, and he made several journeys to Africa. On these trips he collected data on the organs of electric fish, later published in his two-volume monograph *Die elektrischen Fische* (*I. Malapterurus* (1887). *II. Torpedo* (1890). Leipzig: Veit & Co.). This presentation will concentrate on Fritsch’s interest in electric fish and their history as expressed in these volumes, parts of which have been recently translated into English by the presenter. The work reveals a striking appreciation for the early history of the electric fish in Greek and Roman times, as well as for the contributions of Fritsch’s predecessors du Bois-Reymond and Olfers to the science of electric organs. Fritsch also describes the increasing availability of materials for the study of electric fish, a process that resulted in “an astonishingly swollen literature” on the subject by the end of the 19$^{th}$ century.

Session I. Electric Fish
Thursday, 19 June 2008, 10:30 - 10:50.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Nikolai Bernstein and the neurophysiology of virtuoso piano playing*

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In the Mid-1920s, the Russian neurophysiologist Nikolai Bernstein was invited to the newly founded State Institute for the Science of Music to carry out a series of experiments. His aim was to understand the conundrum of fast parallel octaves, a technique that was reckoned to be the hallmark of virtuoso piano playing. Curiously, piano pedagogy had been unable to explain how this technique could be learned. Generations of pedagogues had advised their pupils to begin slowly in order to get a feeling for the correct movement. Once the slow movement was mastered, it could be accelerated. But many a diligent disciple found himself in the waiting room of a physician after going through this exercise.
Bernstein's experiments suggested a new form of observation: a new device, the "Kymocyklographion" that would photograph a number of experimental subjects who were all excellent pianists capable of executing the mysterious technique. The results showed that the two movements necessary for playing slow and fast octaves were not the same. Pianists switched to a different type of movement as soon as they were unable to control it consciously.
Paradoxically, the success of this technique relied on the fact that there was so much to see and hear in the concert hall: playing parallel octaves was not only louder than other techniques; it turned the concert into a spectacle. The audience could hardly believe that it was a human being who executed this sound.
My presentation will reconstruct Bernstein's Experiments from historical sources. Using Bruno Latour's concept of the "black box," as well as Hans-Jörg Rheinberger's concept of "virtuosity," it will discuss Bernstein's experiments on piano playing as an example of his concept of cyclic movement, which he later developed into his concept of "bio-cybernetics".

Session VII. Music
Friday, 20 June, 2008, 10:40 - 11:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Historians of addiction confront chronic brain disease*

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In the last 25 years brain function has replaced psychiatric and cultural factors in addiction research. This paradigm shift reflects decades of laboratory research on the impact of substances on brain reward systems and recently has relied on fMRI technologies to bolster its claims. Examination of the mechanisms associated with tolerance have led some researchers to claim that addictive substances can result in irreversible brain damage because prolonged substance abuse putatively alters the way the brain operates, thus exacerbating craving and making cessation almost impossible. From this perspective substance addiction has become characterized as a chronic "brain disease." Historians of addiction have been resistant to claims that addiction is a brain disease. Their skepticism is rooted in the persuasive evidence that each successive psychiatric addiction paradigm has revealed more about the culture that enabled it than about the robustness of scientific findings. Each paradigm has given way to successors and historians are persuaded that the brain disease paradigm will not prove different from its predecessors. Additionally, they argue that the current neurobiological paradigm is less novel than it appears, being reminiscent of John Hughlings Jackson's dissolution theory. However, for many historians, placing the current brain disease paradigm in the context of earlier sciences of addiction as culturally constructed, appears to authorize ignoring current science altogether. But the fact that science, like everything else, is socially constructed in no way diminishes its explanatory power - any more than it limits the value of historical interpretations, which, like all historical research and writing, are socially constructed and contingent. Neither this skepticism nor the difficulties in accessing current scientific claims should authorize historians of addiction from engaging this science. This presentation will explore the benefits of such an engagement and argue that it opens up an alternative interpretation that brings together seemingly contradictory social-constructionist and biologically reductionist claims.

Session IX. Neuropsychiatry & Neuropsychology
Saturday, 21 June 2008, 11:50 - 12:10.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *An Assessment of the influence of the work of Fritsch and Hitzig in the United Kingdom and the United States during the early part of the 1870s*

**J. Wayne LAZAR**
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The work of Gustav Fritsch and Eduard Hitzig in 1870 deserves to be called the most significant laboratory discovery in the history of cortical localization and even epoch-making. This paper assesses its influence in the United Kingdom and the United States during the first several years after 1870. Frequency and timing of citations in English were examined using Google Book Search, IndexCat, and library research. Besides the electronic searches, certain journals were specifically examined for the years specified: *British Medical Journal* 1870-1874, *Journal of Anatomy and Physiology* 1870-1874, *The Lancet (London)* 1871-1872, *Buffalo Medical Journal* 1870-1874, *New York Medical Record* 1870-1872, *New York Medical Journal* 1870-1874, *Boston Medical and Surgical Journal* 1871, *Journal of Nervous and Mental Diseases* 1874, and *Archives of Electrology and Neurology* 1874-1875. In total, there were 79 confirmed citations in about half as many journals.

Year to year trends show few citations of Fritsch or Hitzig before 1873, but many afterward. Furthermore, about 2/3 of the citations to Fritsch and Hitzig or Hitzig in 1873 and 1874 combined were joint references with David Ferrier who began publishing in 1873. Comparisons are made with references in a major English review of the localization literature by Dodds in 1878 and to a cursory Google Book Search for citations in German.

Reasons for the citation delay are discussed including time needed to experiment and publish, perceived values of Hitzig's and Ferrier's works, practical applicability of Ferrier's work, ignoring of Hitzig's work by the English secular press, and role of national pride on the heels of the Franco-Prussian war.

Session XII. Lateralization & Localization
Sunday, 22 June, 2008, 09:40 - 10:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Origin of the First Cranial Nerve; the Fila olfactoria, according to Santiago Ramón y Cajal and T. Blanes*

**Catherine LEVINE**
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In the late nineteenth century, Santiago Ramón y Cajal and his pupil of medicine, T. Blanes, were able to reproduce an exceptional illustration of the unique pathway of the olfactory nerve, known as the First Cranial Nerve and its myriad of cells, by using the Golgi method.

Cajal followed the trajectory of the olfactory nerve fibers as they transitioned between the peripheral and central nervous system and was able to assert that these fibers were not continuous from the olfactory bulb to the bipolar cells that relinquish into the olfactory epithelium, but that the olfactory system was made up of various cell types, characterized by possessing distinct morphologies and functions.

These meticulous histological preparations and accompanying schemata were created by first using Camillo Golgi's potassium dichromate and silver nitrate impregnation method, known as "reazione nera" or "black reaction", where nerve cells, nerve fibers, and neuroglia could be rendered visible.

The present study exhibits the structural and functional organization of the mammalian *fila olfactoria* as it was investigated in centuries past.

Session II. Poster Presentation P8
Thursday, 19 June, 2008, Formally-organized viewing time: 11:30 - 14:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *In search of sedes morbi: Virchow's impact on Russian neuro(patho)logy*

**Boleslav L. LICHTERMAN**
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Rudolf Virchow proposed his cellular theory and introduced microscopy into medical science. His works and his method became quickly known in Russia and had a profound impact upon Russian pathology and medicine. Most Russian academic medical doctors were either the pupils of Virchow or the pupils of his pupils.
The idea of localization, which was claimed by Virchow as a principal feature of modern medicine, had a profound impact on neurology and neuropathology. Early Russian neurologists were interested in pathology and were neuropathologists as well. Even nowadays the term *nevrolog* (neurologist) is mostly related to a basic neuroscientist, whereas a clinical neurologist is often called as *nevropatolog* (neuropathologist). Virchow's impact on Russian neuro(patho)logy might be illustrated by cases of Alexei Kozhevnikov (1836–1902) and Vladimir Bekhterev (1857–1927), whose ideas of strict localization of cerebral functions were rooted in the cellular theory.
The localisationist ideas of nineteenth-century German neuropathologists were put into practice in Soviet Russia, but in their own specific way such as creating the Institute of Brain (for studying Lenin's brain) in Moscow and Bekhterev's "Brain Pantheon" in Leningrad in 1920s, or establishing of neuropsychology by Alexander Luria (1902-1977) in 1940s. Therefore, in the case of Russian neuro(patho)logy one has not only to look to German origins but also to the adaptation to Russian cultural reality and identity.

Session XII. Lateralization & Localization
Sunday, 22 June, 2008, 10:00 - 10:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *The Third Man: aphasia research in the mid 19th century England*

**Marjorie LORCH**
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Robert Dunn, FRCS (1799-1877) was the third man to speak on the topic of aphasia at the British Association for the Advancement of Sciences in 1868 alongside Paul Broca and John Hughlings Jackson at the debate that never was (Lorch, 2008 in press). Several decades senior to both Broca and Jackson, Dunn represents as an interesting counterpoint to the theoretical and empirical approaches of these two key figures.
Dunn stands as an active player in the nascent fields of neurology, psychology and anthropology in London in the latter part of the 19th century. He published two major books: *An Essay on Physiological Psychology* (1858), and *Medical Psychology* (1863), and was a regular contributor to the *Lancet* and *British Medical Journal* for over 40 years. He played a role in laying the groundwork for developing a physiological branch of psychology in England between 1850 and 1875 along with Carpenter, Brodie, Holland, Laycock, Morell and Noble. Over the span of his professional career, he made the intellectual transition from phrenology in the first half of the century to the clinico-pathological empiricism in his later years.
This paper will consider Dunn writings on language and its mental organization, his clinical cases of aphasia, and his more general works on medical psychology and anthropology.

Lorch, M. 2008. The merest logomachy: The 1868 Norwich Discussion of Aphasia by Hughlings Jackson and Broca. *Brain*, in press.

Session IX. Neuropsychiatry & Neuropsychology
Saturday, 21 June 2008, 11:30 - 11:50.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *The Italians of the Group of Munich*

**Lorenzo LORUSSO & Bruno LUCCI**
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Francesco Bonfiglio (1883-1966), Ugo Cerletti (1877-1963) and Gaetano Perusini (1879-1915) had an important role in the study of neuropathology of the dementia. They attended the School of Munich where Franz Nissl (1860-1919) and Alois Alzheimer (1864-1915) carried out studies on neurodegenerative diseases. In that period there was a debate among psychoanalysts and organicists of the different neuropsychiatric schools about understanding and interpreting mental disorders. Three Italians known as “the Italians of the group of Munich” had different careers that influenced the history of neuropsychiatry.

Gaetano Perusini studied the difference between senile and presenile dementia by a neuropathological approach. In 1915 during the First World War, his early heroic death on the slopes of Mount Sabotino ended his contribution to a better understanding of dementia.

Ugo Cerletti, after his collaboration with Perusini, became Professor of Neuropsychiatry in Rome. He is considered to be the pioneer of the application of the electroshock in neuropsychiatry. In 1938 he began to use electroshock in clinical practice; in mental disorders and epilepsy.

The last scientist of the group of Munich was Francesco Bonfiglio who became Chief of the Psychiatry Unit at the Ospedale S. Maria della Pietà, in Rome. He improved the social aspect of patients affected by mental disorders. He tried to open mental hospitals and to introduce these patients into society with the collaboration of their parents. In 1978, this approach became an Italian law, thanks to psychiatrist Franco Basaglia (1924-1980) who was able to close mental hospitals.

The experience of the Munich period for “The Italians of the group of Munich” was important for their career because they achieved by the neuroanatomical approach a new point of view on neurological and psychiatric disorders.

Session IX. Neuropsychiatry & Neuropsychology
Saturday, 21 June 2008, 11:10 - 11:30.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *The Development and Application of Cinematography in Neuroscience*

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At the end of the 19th century great advances were made in scientific cinematography by the French Physiologist Étienne-Jules Marey (1830-1904) and the English photographer Eadweard J. Muybridge (1830-1904). Application of cinematography in medicine was adopted in various other countries by physicians collaborating with pioneers in the use of cinematographic projection apparatus. A particular collaboration was born between an Italian physiologist, Osvaldo Polimanti (1869-1947) and a German producer of cinematographic apparatus, Franz Paul Liesegang (1873-1949) the second son of Paul Eduard Johann Liesegang (1838-1896). In 1854 the Liesegang family had founded the Ed. Liesegang firm, making projector apparatus in Elberfeld (Wuppertal) but later the firm was transferred to Düsseldorf where Franz Paul improved the apparatus.
In 1911, he published a manual with a description of the art and mechanics of early cinematography: *Handbuch der Praktischen Kinematographie*. In 1920, Liesegang published the first book on the application of cinematography in different fields of science: *Wissenschaftliche Kinematographie.*
In this book there is a chapter about the application of cinematography in biological and medical science: *Die Anwendung der Kinematographie in den Naturwissenschaften, der Medizin und im Unterricht* by Osvaldo Polimanti. In 1893 Polimanti obtained his degree in Medicine in Rome. After 1896 he went to various German universities where he studied the application of cinematograpy in medicine, particularly in neuroscience. In 1911, he wrote: *Der Kinematograph in der biologischen und medizinischen Wissenschaft* published by Naturwissenschaftliche Wochenschrift. He studied by cinematography the role of the cerebellum and frontal lobes in the ataxia of different animals and was a pioneer of comparative neurophysiology. The relationship between Liesegang and Polimanti is important because they were the first to apply cinematography to neuroscience and to understand its mechanisms.

Session X. Methods & Techniques, Part 2
Saturday, 21 June 2008, 14:20 - 14:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Hundred Years H-reflex: Memories of Paul A. Hoffmann.*

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It cannot always be expected that neurophysiologists, occupied world-wide in studying the H-reflex, would also know that they are dealing with the reflex described back in 1910 by the physiologist Paul A. Hoffmann (1884-1962) in the "*Archiv für Anatomie und Physiologie*". At that time Hoffmann, born in Dorpat (known today as Tartu) Estonia, worked with Hans Piper at the Physiological Institute in Berlin. This was before the golden age of electrophysiology.
Already in 1848 the Berlin electrophysiologist Emil DuBois-Reymond (1818-1896) had measured electrical activity in human muscle but these observations had long since been forgotten.
During the second half of the 19th century and the beginning of the 20th century physiologists concerned themselves with the basis of vision and skin sensitivity but Hans Piper had begun to investigate muscle activity during random innervation.
Hoffmann himself was interested from the start in the reflex response in human muscle resulting from mechanical and electrical stimulation of the nerves, and through his work with electrophysiological methods, established the basis of reflex-physiology.
This presentation describes Hoffmann's life with its successes and disappointments, also the history of research into the H-reflex and related phenomena.

Session VIII. Methods & Techniques, Part 1
Saturday, 21 June 2008, 09:40 - 10:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Consonances, from Mathematics to Physiology*

**Michel MEULDERS**
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One opposes generally the delight afforded by the listening of a consonant chord to the displeasure caused by dissonance. While sympathetic consonance of tones or intervals used to be defined in terms of subjective criteria, it did not escape several theoretical definitions throughout history. The famous work of the Pythagorean school for instance, and closer in time, those of Mersenne, Leibniz and Euler, refer to mathematics and to the relations between single numbers in order to ascribe to a combination of tones a more or less consonant property. These labours were mentally very attractive but their *a priori* reasoning was not able to face Rameau's and d'Alembert's approaches which cared much more for the facts of Nature, neither were they likely to challenge the more recent works such as those of Helmholtz, Mach or Stumpf which were based on physical and physiological experiments.

The decisive split in the history of music between the *a priorism* of numerical thought and the *a posteriori* method of experimental reasoning is the very topic of this talk, while I have to point out that this break in reasoning, although generally agreed, is a much lesser contrast than one might believe at first sight. On the other hand, the notion of consonance was far from being understood the same way by all investigators, whether on the numerical or on the experimental side.

Session VII. Music
Friday, 20 June, 2008, 11:20 - 11:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Antiepileptic Drugs and Traditional Iranian Medicine*

**Mohsen NASERI, Mahdi RAZAFSHA, Mehrdad KARIMI & Hura BEHFORUZI**
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In this presentation we will review the use of ethno-pharmacological products for the treatment of epilepsy, based on scientists' remarks recorded in Traditional Iranian Medicine (TIM).

For this purpose, eight TIM books were searched for herbal drugs which had been used by Islamic medicine practitioners to treat epilepsy. Our evaluation of this literature revealed 28 plants which could prove useful in the treatment of epilepsy.

The problem arose, however, that performing pharmacological experiments on all these plants would be very difficult, time-consuming, and expensive. A possible solution to this problem could be the application of ranking. We have therefore introduced a new approach for ranking these botanical species.

In our approach *Paeonia officinalis* (European peony German: Pfingstrose) gained the first rank and *Ferula assa-foetida* (asafoetida, German: Asant) gained the second. From this we conclude that if experiments were to be made to find an effective antiepileptic drug, it would be reasonable to begin by first studying *Paeonia officinalis*, followed by *Ferula assa-foetida*.

Session II. Poster Presentation P7 (*in absentia*)
Thursday, 19 June, 2008, Formally-organized viewing time: 11:30 - 14:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *"Lichtpunkte" – a misjudged 19th century tool for ophthalmological research.*

**Ulf NORRSELL**
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Frithiof Holmgren (1831-1897) was the first Swedish Professor of Physiology. He is sometimes remembered for his original demonstration of retinal, electrical activity, and the creation of the formerly common *wool skeins test* for colour blindness. Having spent years working with colour perception he considered the Young-Helmholtz trichromatic theory most likely to explain retinal colour sensitivity. Thus, he created a method to stimulate single retinal cones, in order to provide final evidence.

He found among other things that yellow spots of light evoked subjective flashes of red and green, and that blue spots evoked flashes of green and violet. He presented the results at the international medical congress in Copenhagen 1884, and concluded that red, green, and violet were primary colours as suggested by Young and Helmholtz, in contrast to yellow and blue as had been suggested by Ewald Hering (1834-1918).

Hering was not present at the meeting, but reacted vigorously when the proceedings were printed in 1886. He published a deprecation suggesting that Holmgren's observations were attributable to lack of understanding of elementary optics, astigmatism, and chromatic aberration. Hering himself could not reproduce Holmgren's findings. In 1888 Isaachsen, who belonged to Helmholtz's school, also announced his inability to evoke Holmgren's spots.

Holmgren refuted all of Hering's objections, with full descriptions of his techniques, in publications dated 1889, and 1892. They raised little interest among contemporaries. Nevertheless, in 1946 his observations were confirmed unbeknownst by Hartridge. Recent findings have shown that the confirmation does not verify Holmgren's findings as evidence for primary colours.

Session XIII. Seeing and Believing
Sunday, 22 June, 2008, 11:20 - 11:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Translating Science: Sounds, Words, Images, and Knowledge*

**Laura OTIS**
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"Language is often said to be inextricable from thinking," begins Chapter 59 of Eric Kandel's *Principles of Neuroscience*, "But in fact, the two should be distinguished." On the first page of this chapter, written by Nina Dronkers, Stephen Pinker, and Antonio Damasio, the authors explain that, "language is too ambiguous and sketchy to express the totality of a person's knowledge." In English composition courses, however, teachers regularly tell undergraduate science majors that if they can't express their thoughts in fluent sentences, their thoughts are not well developed. Struggling to communicate with their English teachers, many of these students describe talking and writing as translations of "mentalese," much as Pinker does in *The Language Instinct*. In this presentation, I would like to consider the role that translation plays in the creation of scientific knowledge—not just in the communication of ideas, but at the experimental level.

In the late eighteenth and early to mid-nineteenth centuries, several innovative scientists tried to express sound visually in attempts to make it more knowable. Nicholas Wade has already compared the efforts of Ernst Chladni to create sound figures; Thomas Young, to visualize vibrating piano strings; and Charles Wheatstone, to build a kaleidophone. Peter Mark Roget, who created the English Thesaurus, was passionately interested in optics, and Hermann Helmholtz drew analogies between the visual and auditory systems when he designed experiments to explore the workings of each. Probably these scientists studied sound and light, hearing and vision, and in some cases, language, because they found them equally fascinating. I would like to build on Wade's work by studying their motivation for "translating" sound into visual patterns and for thinking actively about the words with which they described their findings. Even in sciences in which "seeing was believing," these investigators acknowledged the vital role of language.

Session VII. Music
Friday, 20 June, 2008, 11:00 - 11:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Hermann Oppenheim (1858-1919) – an outstanding neurologist, but without an Academic Career*

**Anja PECH & Axel KARENBERG**
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This article takes a closer look to Oppenheim's repeated, yet unsuccessful attempts to obtain the position of Assistant Professor at the University during the years 1891 to 1901.
His start at the Charité in 1883 and his teacher Carl Westphal were decisive in directing his career toward a speciality in Neurology.
Oppenheim challenged the arguments of Jean-Martin Charcot on the psychological effects of accidents as well as the main points of research in metasyphilitic illnesses supported at that time.
In 1888 he used the term "traumatic neurosis" for the first time. This diagnosis did not remain unchallenged and it became a continuous theme in his scientific work.
His special accomplishments at the beginning of neurosurgery have been unknown to date. From 1893 and 1901 he earned special awards in demonstration of patients with neurological disorders. The request for Oppenheim's nomination for remarkable accomplishments by the Faculty of Medicine to the Ministry of Culture in May of 1901 used the explicit wording,"… on the frontier border of surgery and neurology." Contrary to the press releases, the votes for Oppenheim's nomination resulted in a small margin of six to five. When in 1902, after already having waited for nine months for an answer to his request from the Minister, Oppenheim announced his resignation from the Faculty.

He ended his own tenure at the University. It seems probable that the constant delays in Oppenheim's nomination may have had anti-Semitic origins but the evidence is circumstantial in nature. During the next twelve years, in his tenure of established neurologist in the heart of Berlin, he employed up to twelve assistants.
In 1907 he was able to realize an independent neurological incorporation.

Session V. Neurosciences & Academic Life
Thursday, 19 June, 2008, 17:20 - 17:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Ibn al-Haytham: Linking the Science of Optics and Visual Perception in a Theory of Image formation and Seeing*

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In mapping the geography of the mind/brain, a key concept has been anatomical projection based on the point-to-point correspondence. Its origin has in part been attributed to Descartes' view of the re-projection of the retinal image along the central pathways to the pineal gland. It will be argued that the origin of this concept goes back to Ibn al-Haytham's (Alhazen; d.1040) *Optics* (*Kitab al-Menazir*) and specifically to his theory of image formation in Books I-III. He introduced not only the principle of a point-to-point correspondence between the object and its representation within the eye, but also the concept of re-projection from the eye to the brain. In his experimental researches of light projection in dark rooms, Ibn al-Haytham defined an optical image on the basis of corresponding points of light reflected from the surface of the visual object to the eye. In demonstrating that what is sensed is not the object itself but a punctate image due to reflected light alone, Ibn al-Haytham's revolutionary approach destroyed the viability of previous Greek and Arabic concepts of qualitative holistic 'forms' and tactile sensory impressions in vision. He is the first to bring together ocular anatomy, the visual system, and the physics of light. The image that is formed in each eye, preserving its spatially organized pattern was conveyed, via the optic nerve, to the chiasma for binocular integration. If the two images were fused by an exact match, a single image was produced which was then projected with the same organization via the optic track to the brain to be interpreted. In Books II and III, Ibn al-Haytham provides extensive experimental demonstrations of how using the cues provided by the sensory image, 'seeing' is achieved 'by unconscious inference.'. He appears to have foreshadowed some of the fundamental principles in visual perception attributed to subsequent figures in the last 200 years. Although the importance of Ibn al-Haytham's influential work in visual optics has been recognized, the significance of his contribution to the neurosciences has yet to be appreciated. The Latin translation Ibn al-Haytham's his work and its printed edition (*Opticae thesaurus*, 1572) served as a standard text in visual optics between the thirteenth and the seventeenth centuries, used by Kepler and Descartes. Its Italian translation was used by Renaissance figures such as Alberti in linking optics and visual perception as a basis of perspective painting.

Session XIII. Seeing and Believing
Sunday, 22 June, 2008, 10:40 - 11:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Bernard Katz & the history of synaptic transmission.*

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Sir Bernard Katz established the cellular basis of synaptic transmission at the neuromuscular junction, the contact point between nerve and muscle. With his death we lost one of the most distinguished biophysicists of our time. He laid the foundations for our understanding of almost every aspect of synaptic transmission. Bernard Katz revealed the existence of key molecules and formally described their interaction. With the benefit of his almost magical intuition, he formulated hypotheses that are now recognised as facts.
During his career he pioneered research in three areas. He and Alan Hodgkin elucidated the ionic basis of the action potential overshoot, as formulated in the sodium hypothesis; he unravelled the biophysical mechanisms that generate the endplate potential and the vesicle hypothesis. In particular his work on the neuromuscular junction influenced and led several generations of neurophysiologists, and it continues to do so even though research focus has shifted to synapses in the central nervous system.

Feature lecture at the Virchow "Ruine"
Friday, 20 June, 2008, 18:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Measuring Time in the Brain and Nervous System, ca. 1850-1865*

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The history of reaction-time experiments is usually traced back to the research work carried out by Wilhelm Wundt (1832-1920) and the staff of his Leipzig laboratory founded in 1879.
This paper offers a different account. It draws attention to the fact that measuring reaction times in human beings was already performed by Hermann von Helmholtz (1821-1894) in the context of his pioneering investigations of nerve impulse speed in frogs (1850).
Helmholtz did not publish any detailed report on his findings in his reaction-time experiments with humans. However, in the following years, scholars such as Adolphe Hirsch, Rudolph Schelske, Friedrich Kohlrausch, and Franciscus Donders set out to verify experimentally the general results Helmholtz had given in a popular lecture in 1851.
Based on archival evidence, the paper argues that the ensuing debate about methodological and technological problems in reaction time measurements anticipated on some of the key issues discussed by the growing community of psychologists throughout the 1880s and 1890s. The reaction time experiment is thus traced back to the research carried out by physiologists, astronomers, and physicists well before Wundt started his laboratory at Leipzig.

Session VIII. Methods & Techniques, Part 1
Saturday, 21 June 2008, 09:20 - 09:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Exceptions to the Valsalva Doctrine.*

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In 1717 Valsalva reported a cerebral hemorrhage with weakness on the opposite side of the body. Morgagni repeatedly confirmed this finding in *De Sedibus*, and referred to this situation, as **"the Valsalva doctrine".** Morgagni also observed that "…… the doctrine of Valsalva answers almost all; *though not altogether in all,"* and quotes cases where paralysis was ipsilateral to the cerebral lesion. Morgagni does not explain this discrepancy. A contralateral relationship of brain to body was recognized in Greek antiquity, and exceptions to the Valsalva doctrine were recorded before and after Morgagni.

In case 8 of the Edwin Smith Surgical Papyrus hemiparesis is not only recorded for the first time, but also an exception to the Valsalva doctrine, paralysis being ipsilateral to the head injury.

Neurologists of the 20th century occasionally encountered such exceptions to the Valsalva doctrine as follows:

Kernohan's notch: slowly expanding intracranial lesions produce a gradual shift of the cerebral contents, sometimes before damage is evident to the ipsilateral hemisphere. The cerebral peduncle of the side opposite to the expanding lesion is pressed against the sharp edge of the tentorium cerebelli producing a deep indentation in the peduncle.

Lesions of the Island of Reil. Ipsilateral deficits may also occur with damage to the supplementary motor and sensory areas of the island of Reil.

Contra-Coup injury.

Brain stem lesions with ipsilateral paralysis (Opalski syndrome).

Failure of the corticospinal tract to cross.

Cerebrovascular accidents with paralysis ipsilateral to cerebral lesions in patients with progressive scoliosis were reported recently. Crossing failures were documented in these cases and also in Horizontal Gaze Palsy with Progressive Scoliosis (HGPPS). Other genetic disorders with crossing failures include the Klippel-Feil, Kallman, and Dandy-Walker syndromes, corpus callosum agenesis and essential mirror movements.

HGPPS is due to mutations in the ROBO3 gene on chromosome 11.

Session XII. Lateralization & Localization
Sunday, 22 June, 2008, 09:00 - 09:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *Seeing and believing: three episodes in the history of neurophysiology*

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In this contribution I look at three episodes in the history of neurophysiology which bring out the complex relationship between seeing and believing.

I start with Vesalius in the mid-sixteenth century who writes that he can in no way see any cavity in nerves, even in the optic nerves. He thus questions the age-old theory (dating back to the Alexandrians in the 3rd century BC) but, because of the overarching psychophysiology of his time, does not press his case. This conflict between observation and theory persisted for a quarter of a millennium until finally resolved at the beginning of the nineteenth century by the discoveries of Galvani and Volta.

The second case is provided by the early history of retinal synaptology. Schultze in 1866 had represented rod spherules and bipolar dendrites in the outer plexiform layer as being separated by a (synaptic) gap, yet in his written account, because of his theoretical commitments, held them to be continuous. Cajal later, 1892, criticised Schultze for this pusillanimity, but his own figure in *La Cellule* is by no means clear. It was only with the advent of the electron microscopy in the mid-twentieth century that the true complexity of the junction was revealed and it was shown that both investigators were partially right.

My final example comes from the Hodgkin-Huxley biophysics of the 1950s. Their theory of the action potential depended on the existence of unseen ion pores with quite complex biophysical characteristics. These were not seen until the Nobel-prize-winning X-ray diffraction analyses of the early 21st century. Seeing, even at several removes, then confirmed Hodgkin and Huxley's belief.

The relation between seeing and believing is by no means straightforward.

Session XIII. Seeing and Believing
Sunday, 22 June, 2008, 11:00 - 11:20.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *«Heroic Self-Experimentation» as Neurophysiological Method: The Case of Alexander von Humboldt's (1769-1859) «Experiments on Electric Fish»*

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Self-experimentation as a physiological method had long been applied through different historical epochs. It served the epistemic purpose to gain "true insight" into natural phenomena by making use of direct sight, touch, taste, hearing, or smelling of the objects under consideration. Impacted by the empiricist methodology of John Locke (1632-1704) and the French *Idéologues*, scientific knowledge was closely equated with subjective experimental methods during the Enlightenment. German polyhistorian, natural philosopher and world explorer Baron Alexander von Humboldt was a firm believer in the value of self-experimentation. Yet his "heroic" use of his own body to acquire knowledge is often overlooked or glossed over by historians of neuroscience.

This presentation examines Humboldt's research on animal electricity before he left for South America; his work on the "eels" he encountered in what is now Venezuela; and his experiences with Italian *Torpedo*s upon his return to Europe. Its emphasis will be on how Humboldt used and abused his own body to reveal Nature's secrets. It will cover not only his more disciplined practices of physiological experimentation, but the sometimes social character, and personal joys and risks, which could accompany such observations. These different perspectives provide insights into how medical knowledge was acquired late in the eighteenth and early in the nineteenth centuries, particularly among the German-speaking natural philosophers, who found great value in subjective experimental science.

Session I. Electric Fish
Thursday, 19 June 2008, 10:10 - 10:30.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *"An Eldorado of quackery"; phrenology in the colony of New South Wales*

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Phrenology is often relegated to the ranks of quackery and there was certainly a variety of ‘unregistered practitioners’ in the state of New South Wales in the later decades of the nineteenth century who nominate phrenology as their area of expertise.

In 1993, the University of Sydney purchased for the Rare Book section of Fisher Library, a collection of over one hundred items relating to nineteenth century phrenology. In the following year, under-graduates students of the Unit for History and Philosophy of Science made an extensive study of the available material. Their efforts resulted in an impressive exhibition *Reading Heads and Ruling Passions,* which explored the historical background of phrenology, the rise of phrenology in Britain and America, the later influences of phrenology on social issues, and a pictorial history of phrenology in Australia. The aim of the exhibition was to demonstrate that ‘as a window on cultural values phrenology deserves wider recognition than it has received’.

There is however, little published information on the role of phrenology in Australian society. The penal colony of New South Wales did hold a special interest for the practical phrenologist, both in Britain and in the colony. There are many examples of attempts to utilise this 'science of the mind' in the understanding of criminal behaviour. Phrenology was also popularised through public lectures in a similar manner to that in Great Britain and America.

This study will trace the developments of phrenology in the colony of New South Wales from its use in the understanding of the criminal mind, the rise of phrenology as a scientific tool and its longevity as a form of public entertainment and in the provision of vocational advice.

Session IV. Neurosciences "Down Under"
Thursday, 19 June, 2008, 16:40 - 17:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Green tea and hallucinations: Examples from 19-20th century literature*

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Today, green tea is known to have a general protective effect against several types of cancer. Moreover, a case-control study in Japan (Kuriyama et al., 2006, *JAMA*, 296:1255) found an inverse relationship between green tea consumption and overall mortality. This is attributed to the herb's range of catechins, especially epigalocatechin gallate. In Japan, the consumption of cold green tea containing high levels of catechin has been increasingly popular as a means for reducing body fat. In general, green tea is considered as a healthy beverage.

However, in Europe where people were not so familiar with green tea as in Asia, this beverage took a strange role in popular novels. Joseph S. Le Fanu (1814-1873), an Irish writer, wrote a horror story "Green tea" (1872), in which the main character suffered an awful experience. Later, a German medical doctor concluded that the person who drank too much strong green tea had a hallucination. Another British writer Ruth Rendell (b. 1930) wrote a detective novel "The Speaker of Mandarin" (1983), in which Inspector Wexford assumed a hallucinatory effect resulting from drinking green tea.

In terms of psychopharmacology, the effects of green tea are roughly the same as those of black tea and coffee, since the main psychotropic agent is caffeine. Interestingly, the main ingredient of tea was once called by mistake teein or thein(e), which was eventually identified as caffeine. In fact, there are a variety of side effects resulting from an overdose of caffeine; including restlessness, anxiety, or insomnia, and now caffeine is considered an aggravating factor in panic disorder.

Session II. Poster Presentation P3
Thursday, 19 June, 2008, Formally-organized viewing time: 11:30 - 14:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Fin-du-siècle attempts at bridging neuroscience and education: Henry Herbert Donaldson and Reuben Post Halleck*

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Neuroeducation is a challenging field among the 'new' neurosciences that extend beyond biomedicine. The attempt to build a bridge between neuroscience and education, however, is not new. This presentation reviews two pioneering 'neuroeducational' works in particular, those authored by Henry Herbert Donaldson (1857-1938), a noted figure in the history of neurology, and Reuben Post Halleck (1859-1936), a prominent educator and essayist. A native of Yonkers, New York, Donaldson held faculty appointments at Johns Hopkins University, Clark University and the University of Chicago. His life's work centered around the growth of the nervous system, especially after having studied the brain of a woman with multiple disabilities. That endeavour resulted in *The Growth of the Brain: A Study of the Nervous System in Relation to Education* (Scott, 1895, 374 pp.; part of 'The Contemporary Science Series' edited by Havelock Ellis), a rather technical monograph epitomizing the then available knowledge on the development, structure and function of the nervous system, aiming at those occupied with the brain's crucial role in education, including parents, teachers and physicians. Halleck, also a native of New York, had studied English at Yale, where there are currently Halleck Professorships in languages, philosophy, and psychology. A principal of the Boys' High School in Louisville, Kentucky, he authored *The Education of the Central Nervous System: A Study of Foundations, Especially of Sensory and Motor Training* (Macmillan, 1896, 258 pp.), a work attempting to apply neurobiological principles to educational problems, ranging over topics such as brain plasticity, early intervention, the role of nutrition and fatigue in learning outcomes, moral responsibility, and bioethics, issues that are currently at the core of scientific interest. Therefore, these two early works offer complementary views by a neurologist and an educator on the biological foundations of educational practice at a time when the latter field was chiefly dominated by psychological theories.

Session II. Poster Presentation P4
Thursday, 19 June, 2008, Formally-organized viewing time: 11:30 - 14:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Alfons and Christfried (Christofredo) Jakob: two Bavarian neuropathologists in Latin America*

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Neuropathologists are familiar with Bavarian-born Alfons Maria Jakob (1884-1931), Professor of Neurology and Psychiatry at Hamburg University, after whom Creutzfeldt-Jakob disease is named.

Another Jakob, unheeded in the English biomedical literature until recently, is the neuropathologist Christfried Jakob (1866-1956), 18 years senior to Alfons, also Bavarian-born, considered to be the father of neurology in Argentina, his adopted homeland. This study views the scientific travels of the two neuropathology namesakes. The multifarious professor “Christofredo” Jakob, besides his lifelong research on comparative and human neuroscience, integrated such diverse pursuits as general biology, anthropology, paleontology, biogeography, philosophy and music. A landmark experience in his studious itinerary must have been his 1923 voyage to La Tierra del Fuego aboard the steamer *Cap Polonio*. Jakob presented a narrative of his impressions at the 12th ordinary session of the Buenos Aires Popular Institute of Conferences in September 1924.

Alfons Jakob also crossed the Atlantic on two occasions: in March-April 1924, on the maiden voyage of ocean liner *Deutschland*, arriving at New York from Southampton as guest lecturer at institutions that included Columbia University. Four years later, he journeyed to Latin America to deliver a 20-lecture course on nervous and mental pathology in Rio de Janeiro in May-July 1928. He continued to São Paulo and Buenos Aires (where he met with Bernardo Alberto Houssay and visited the neuroanatomical institute of his fellow countryman Christfried), over the Cordillera to Santiago and Valparaiso, Chile, and back, over the Andes, to Montevideo, Uruguay. Alfons Jakob gave a presentation of his South American impressions at the Hamburg Medical Association in December 1928. Further documentation is presented to help recreate the journey's scientific and historical atmosphere.

Session II. Poster Presentation P5
Thursday, 19 June, 2008, Formally-organized viewing time: 11:30 - 14:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *A tribute to Hsiang-Tung Chang: The dendritic arborisation revisited.*

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Hsiang-Tung Chang passed away on November 4th 2007 in Shanghai. He was 100 years old. He is widely considered as a founding father of modern neuroscience in China and internationally recognized for his pioneering work in the field of dendritic physiology. He carried out fundamental comparative studies on the structure of the central nervous systems of various animals such as hedgehog, pangolin, dog and macaque. He was one of the first to postulate the functional significance of the dendritic potentials and to propose a fundamental distinction between axosomatic and axodendritic synapses.
Born in 1907, Hsiang-Tung Chang grew up in an extremely poor village in the North of China. It was only at the age of 14 that he could formally enrol in a primary school. According to his autobiography the fact that he could enter college and university was entirely due to chance.
He studied under Professor John Fulton in the Department of Physiology at Yale University and received a Ph. D from Yale in 1946. He worked on the representation map of body muscles in the Monkey cerebral cortex, the classification of afferent nerve fibres from the muscles and the cortico-thalamic reverberating circuits.
His seminal papers on electrophysiology of the dendrites of cortical neurons were published in the 1950s with its important contribution published in a Cold Sring Harbor Symposium in 1952 in which he proposed his new concept of the function of electrical activity in the apical dendrites in the cortex. Analyzing his results and hypothesis reveals how much he was in advance of his time. He predicted the modern view of the role of functional dendritic fields even though the modern current terminology is lacking in Chang wording. His ideas are still central to the study of the function of dendritic arborizations.

Session III. We Greet the "Club d'Histoire des Neurosciences"
Thursday, 19 June, 2008, 15:20 - 15:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Kozhevnikov epilepsy: the history of the disease and its eponym.*

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Alexei Ya. Kozhevnikov (1836-1902) is considered to be the founder of the Russian neurological school. He was the head of the first Russian Independent Department for Neurological and Mental Diseases (1869) and later, of the very first specialist Clinic for Nervous Diseases in Russia and Europe (1890).
In the western medical community, Kozhevnikov is best known for his work on epilepsia partialis continua, published in 1894. In this work he excellently described four patients with persistent localized motor seizures. From then on, this disease rightly carried the eponym of its author and was known as Kozhevnikov syndrome or Kozhevnikov epilepsy.

It took some time before epilepsia partialis continua was recognised beyond Russia. The syndrome had not been mentioned in the main monographs and textbooks on neurology at the turn of the 19$^{th}$ and 20$^{th}$ centuries. It was in 1902 that Kozhevnikov epilepsy was described for the first time in a foreign journal: the *Neurologisches Zentralblatt*. Later, a series of observations appeared mostly by Russian but also by European and American authors.

In 1937, 35 years after Kozhevnikov's death, the Russian neurologist L.I Omorokov (1881 - 1971) observed that most cases of Kozhevnikov epilepsy he collected may have been caused by Russian spring-summer tick-borne encephalitis. From then on, it was erroneously thought that Kozhevnikov had described a new epileptic syndrome in patients with acute Russian spring-summer tick-borne encephalitis. This historical error resulted in an unfair reduction in references to Kozhevnikov, an incorrect description of Kozhevnikov epilepsy in the Classification Scheme of the International League against Epilepsy, and even in the eponym being replaced with another.

Session VI. Language
Friday, 20 June, 2008, 09:40 - 10:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
Berlin, Germany, 18-22 June 2008

# *The Matheson Patient Files: What Can They Tell Us About Encephalitis Lethargica*

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Encephalitis lethargica (EL) was an epidemic neurologic disease that occurred from approximately 1916-40 and killed as many as 500,000 people worldwide. Its polymorphic manifestations plus the absence of any pathognomonic signs, symptoms or laboratory tests hinders diagnosis of purported modern victims of the disorder and the search for its cause. In order to refine our compilation of the signs and symptoms of this order, we analyzed 54 available EL patient files from the New York Neurological Institute's Matheson Commission, which was formed partly to test serum and vaccines to cure EL. The primary clinician associated with the Commission was Dr. Josephine Neal, who supervised the compilation of the three massive Matheson surveys (1929, 1932, and 1939) of the world's literature on EL, and therefore was among the most knowledgeable EL physicians of the time. Dr. Neal and her associate, Dr. Kate Constable, maintained detailed records on their patients, some of which spanned 15 years and therefore provide in-depth long-term information that expands our understanding of EL.

Drs. Neal and Constable typically searched for a history of an infectious illness during the acute phase of the disease, often influenza (which they thought was really misdiagnosed encephalitis), before diagnosing EL. Tremor was the most common sign, appearing in 46 patients. Gait disturbances, often a typical Parkinsonian gait with festination, were found in 36 patients. These patients frequently had poor general health; 31 had recurring upper respiratory infections, including colds and sore throats, and 19 had poor dental hygiene, including pyorrhea and loss of multiple teeth. Although poor dental health was typical of the period, the loss of all teeth in young adults was sometimes striking.

Our findings lend some support to the recent theory that EL is an autoimmune disease associated with previous *Streptococcus* infections (the most common cause of pharyngitis), and to the much older theory that the etiological agent in EL is an oral *Streptococcus* associated with dental and gum disease.

Financial support provided by the Sophie Cameron Trust (www.thesophiecamerontrust.org.uk)

Session XI. Encephalitis Lethargica Revisited
Saturday, 21 June, 2008, 15:20 - 15:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Seeing is deceiving: Illusions and visual neuroscience*

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Visual illusions have provided a source of intrigue for many centuries, but what constitutes an illusion has changed over that period. More than one third of Ptolemy's second book on *Optics* was devoted to illusions of colour, position, size, shape and movement, and this range was extended by Ibn al-Haytham (Alhazen) in the eleventh century. The definition of geometrical-optical illusions did not appear until the mid-nineteenth century, when they were studied intensively in German universities. Many novel illusions were named after those who first described them, like Oppel, Helmholtz, Poggendorff, Zöllner, Wundt, Hering, Ebbinghaus, Lipps, Münsterberg and Müller-Lyer. Visual scientists would now say that an illusion occurs when there is a mismatch between the physical description of a stimulus and its perception. Hence, lines that are physically equal in length can appear otherwise as a consequence of inducing elements, or objects that are physically stationary can appear to be moving. The term visual spatial illusion is applied mainly to mismatches in size and orientation of specific two-dimensional figures. Patterns that alternate in apparent depth or interpretation tend to be termed ambiguous figures, and they have a longer history in art than science. Illusions of motion have been studied more consistently over the last two millennia and are not associated with particular discoverers. Indeed, many can be experienced in the natural environment and so it is difficult to divine who first reported them. Theories of visual spatial illusions abound and none are widely accepted; a more modest (neuroscience) approach involves relating particular effects to known processes in the visual system. This strategy has proved successful with motion illusions, which have both suggested processes that have subsequently been found in visual neuroscience (like motion detectors) and provided further challenges for contemporary neuroscientists.

Session XIII. Seeing and Believing
Sunday, 22 June, 2008, 11:40 - 12:00.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Broadbent's Law and Cerebral Localization in the Nineteenth Century*

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We investigated the influence of William Broadbent's explanation of the distribution of weakness in hemiparesis on the acceptance of scientific cerebral localization. In 1855, William Carpenter articulated the theory that the corpus striatum is the highest level of motor function and the thalamus the highest sensory level. Physicians objected that patients with infarction or hemorrhage confined to these structures had neither complete sensory loss nor total hemiplegia. Rather, they had mild sensory loss and weakness confined to the tongue, the lower face and the limbs, sparing the upper face, the intercostal muscles and the abdominal muscles.

In 1866, William Broadbent asserted that the multiplicity of sensory pathways accounted for the incomplete anesthesia in focal lesions of the thalamus, and that contemporaneous explanations of the distribution of weakness were insufficient. He observed that where muscles on both sides normally move together, commissures connect their motor nuclei at the bulbar and spinal level so that they act as a single nucleus. When one striatum is destroyed, the other moves both sides. By contrast, where muscles on both sides move independently, unilateral destruction of the striatum leads to paralysis of the muscles on the other side of the body. Broadbent observed that his hypothesis explained the distribution of hemiplegic weakness.

Broadbent's law, as it came to be known, was accepted as the explanation for lateralized weakness in brain disease. Hughlings Jackson used it to differentiate the causes of facial weakness and to support the concept to upper and lower motor neurons. In 1888, William Gowers contrasted Broadbent's law with Pitres's demonstration of uncrossed motor fibers and Sherrington's observation of re-crossed motor fibers. He concluded that all three explanations could co-exist. Broadbent's law was a key element in the global acceptance of clinical localization in the end of the nineteenth century.

Session XII. Lateralization & Localization
Sunday, 22 June, 2008, 09:20 - 09:40.

13th Annual Meeting of the International Society for the History of the Neurosciences (ISHN)
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# *Meningitis and the history of clinical neuroscience: the role of the disease in the development of American osteopathy and a tribute to the pioneer studies of Salmonellae in its pathogenesis.*

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The inflammatory nature of meningitis as a medical condition that affects the nervous system has been recognized since the first half of the 19th century. The exact causes of the disease, however, remained obscure until the crucial advances in bacteriology in 1870-1880's. The diagnosis of the illness signified a grim prognosis. Epidemic cerebrospinal (e.a. *Meningococcal*) meningitis was among the most frequent forms of the disease. A. T. Still, the founder of the American osteopathic medicine, referred to this malady as a "whirlpool of death". He defined the role of cerebrospinal meningitis in developing his ideas and principles as "the pointer which led me to philosophize as a mechanic" or "an engineer"[1]. At that time the absence of effective drugs left the enhancing natural healing powers of the body as the only option available for treatment. Among notable successes of osteopathic therapy in combating meningitis is the story of Louisa Burns, who was freed from its disabling effects. Subsequently, she earned her D.O. degree in early 1900's and became the head of the A.T. Still Research Institute in Chicago[2].

Among the rare causes of meningitis were bacteria of genus *Salmonella*. For the last four decades, the first account of meningitis caused by a microorganism from this group was attributed to a report made by the Austrian pathologist A. Ghon in 1907. However, we present evidence that the paper published by H. Neumann and his colleague R. Schaeffer from Berlin in 1887 documented the earliest proven case of the meningeal infection caused by *Salmonellae*. We also examine the factors that misled authors of more than a dozen articles in crediting Ghon with the first report of this condition.

References:

1. A. T. Still. Osteopathy, Research and Practice. Kirksville, MO, 1910, 543 pp.
2. Louisa Burns, D.O. Memorial. Ed. M. C. Beal. Am. Acad. Osteopathy 1994 Year book, Indianapolis.

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