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ABSTRACTS (by order of presentation)

Summary

César Legallois (1770-1814), the physiologist who localized respiratory regulation in the medulla

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César Legallois (1771-1814), born in the small city of Cherrueix (Ille et Vilaine) in Brittany, was the son of a farmer and led a rather turbulent life due to his political affiliations during the French Revolution. However, in 1801 he received his M.D. in Paris, where he became one of the earliest and most able physiological experimenters of the 19th century. He conducted physiological experiments to study the basic physical conditions necessary for the maintenance of life functions throughout the organism. His methods were often brutal, but he succeeded in proving a number of important points.

In Legallois' inaugural dissertation of 1801, (an X) "Le Sang, est-il identique dans tous les vaisseaux qu'il parcourt," he anticipated the conception of internal secretions (Garrison and Morton). He discussed the origins of animal heat and built a theory on the vagus nerve in relationship with respiration. Legallois was the first to localize the respiratory center in the medulla in 1806. He found that cutting the medulla at the level of the eighth cranial nerve immediately stopped respiration. One of his most important discoveries was the demonstration of metameric organization of the spinal cord, from which each segment as a neural center of a particular region (e.g., dermatome, Myotom) serves to coordinate about their sensory and motor activity.

Legallois also demonstrated that in a case of apparent death, an organism could be revived by injecting "oxygenated blood" into the vascular system. He also was the first to consider the use of stored preserved red blood. He introduced the idea of extracorporeal circulation in his 1812 monograph «Expériences sur le principe de la vie, notamment sur celui des mouvemens du cœur, et sur le siège de ce principe», which was translated in English the following year.

Augustin Morvan (1819-1897), a rural physician and neurologist

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Augustin Morvan (1819-1897) was a contemporary of Jean-Martin Charcot (1825-1893), who practiced medicine in rural Brittany. After a short biography of this perspicacious and astute clinician, my talk will discuss the three clinical pictures that Morvan isolated for the first time, as he gave them, embellished with numerous figures of the time:

- in 1875 the semiology of myxedema,
- in 1883 the neurological semiology of syringomyelia which he called "paretic analgesia of the upper extremities"
- in 1890 the semiology of "fibrillary chorea", currently considered a model of synaptic pathology involving immunological damage to potassium channels and causing (as perfectly described by Morvan) myokymia, autonomic nervous system disturbances and agrypnia. "Fibrillary chorea" is today known as Morvan's syndrome and linked to limbic encephalitis.

The hospital in the city of Brest, built between 1937 and 1949, was named Hôpital Augustin Morvan in 1950, in honor of this important clinician. Unfortunately, the name was changed when the facility became a university hospital center, and now only one of its units bears Morvan's name.

We can read in the Bulletin de l'Académie de Médecine on 23 March 1897: "Although he lived in a remote corner of Brittany, outside of all scientific movements, Dr Morvan distinguished himself by his great appreciation for science, and his name has been associated with several discoveries." That is why I want to revive the memory of this precursor of neurology.

The trepanned skull of La Palue de Crozon: Insights into cranial surgery in Brittany

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The discovery of trepanned skulls, particularly from the Neolithic period, was not rare on French soil. While some of these skulls were found prior to the 19th century, the majority were retrieved and analyzed following the excitement initiated by Paul Broca's paper "Cas singulier de trépanation chez les Incas" (1867). Broca, along with Ernest Chantre and Paul du Chatellier, comprised some of the most prominent figures in the study of trepanation in France during the 19th century. Together, they described dozens of trepanned skulls found in different areas of France and discussed several theories on trepanation. This presentation will trace the trepanned skulls found on Brittany soil. We will focus particularly on the first skull discovered on the beach of La Palue de Lostmarc'h en Crozon by the Chevalier de Fréminville in 1843 and analyzed by both Ernest Chantre and Paul du Chatellier. This skull, along with other remains found in Saint-Urnel (Plomeur), Port Banc (Saint-Pierre-Quiberon), Saint-Clément en Quiberon or Kergoniou (Guissény), provides insight into prehistoric and medieval cranial surgery in the West of France. Since the 19th century, experts from several disciplines (archeology, neurology and anthropology) have studied these ancient skulls , highlighting the close relationship that has always existed between medicine and the humanities.

Extending the life of a brief ISHN presentation: Exposing our collection

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Each paper presented at the scientific meeting of ISHN represents a substantial investment in the author's time and expertise. Yet only a small proportion of these presentations appear in published format and often in very specialized journals, where the readership may be limited.

A paper presented at the 2019 scientific meeting investigated how sequential anatomists illustrated the cranial nerves at the base of the brain, over a period of 400 years. The works used in this comprehensive review, over 60 volumes, were all sourced from the Rare Books and Special Collections of the University of Sydney. At the conclusion of the research study, these magnificent old atlases were at risk of returning to their shelves, their stories forgotten, and their superb images once again hidden from view.

To ensure that the books were made discoverable and further promoted, the authors curated an exhibition - The beautiful brain: The exacting detail of anatomical art. This paper describes how a collaborative partnership between the School of Medicine and the Library increased the visibility of the Rare Book collection; promoted the history of the neurosciences to the University community; engaged students studying contemporary neuroscience through classes and tours; educated campus visitors of all ages and backgrounds about neurological history; and contextualized neurology alongside the history of illustration, offering opportunities for cross-disciplinary connections.

The exhibition extended the life of the brief ISHN presentation and exposed a much broader audience to the history of the neurosciences.

“Exterminating the inferior”: Medical academics in the history of eugenics in Australia

John Carmody, Discipline of Physiology, Sydney University, Australia 2006

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Few ideas – whether good or bad – die completely. Eugenics, born in England in the 1880s (notably with Galton), has recently revived, *pari passu* with developments in gene technology and Oxford’s enthusiasm for “neo-eugenics” or “procreative beneficence.” The doctrine spread to the USA, where it was contemporaneous with behaviorism. After its exploitation by the Nazis in Germany, it was widely denigrated; even so, before World War I, it developed in Australia. (The Eugenics Society of Victoria survived until the 1960s.)

There, it was driven by the confluence of two groups: 1) advocates of birth control, women in regular contact with Marie Stopes and the Suffragettes and 2) medical advocates for public health. Some of those were outspoken racists including Raphael Cilento (health administrator, John Bostock (pioneer child psychologist), Harvey Sutton (Sydney University Professor of Preventive Medicine) and Richard Berry, (Melbourne University Professor of Anatomy). They were influential in their professions and among the wider public. During the 1920s, collaborating with Stanley Porteous, Berry did dubious work on cranial size (a proxy for intelligence) using the skulls of indigenous Tasmanians. In the early 1930s, he chaired the BMA “Mental Deficiency Committee,” writing that its report avoided euthanasia, which he believed was “a very necessary part of the subject.”

Eugenics carries enduring risks despite what its advocates claim as benefits.

Friedrich Tiedemann - The measurement of brain volumes and racial equality

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In 1836 Friedrich Tiedemann, professor of Anatomy and Physiology at the Heidelberg University from 1816 until 1849, published his essay, "On the Brain of the Negro, compared with that of the European and the Orang-Outang."

For his study, Tiedemann weighed brains and measured the skull volumes of white and black males and females and of several orangutans. He found largely overlapping volume ranges and no significant differences between black and white humans, but between humans of both races and apes.

While until then size was the key, after Tiedemann's results, total brain size was not considered important or in first place anymore. However, the size of *certain parts of the brain* was considered to be critical for superiority, although the complete functions of these parts were not well understood.

The text was in sharp contrast to the scientific conviction of that time - and not only that time.

It was scientific mainstream that a hierarchic order exists in humans regarding their cognitive abilities and moral and cultural virtues. There is no question that the white, especially the Caucasian type, was believed to be on the top. The morphological justification was the higher brain volume of the white race.

The reception of the essay was either influenced by political prejudices or by scientific bias. The superiority of the white race was so "evident" that Tiedemann's conclusions necessarily had to be wrong.

The concepts of brain and racial hierarchy in the early 19th century, the criticism by Tiedemann, and the reception of his results will be presented.

“We didn’t know how this worked anymore – Science:” Institutional contexts, strategies, and founding figures of brain research in the early Max Planck Society, 1948–1968

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When World War Two drew to a close in Europe on May 8, 1945, many institutes for brain research, psychology, and psychiatry of the former Kaiser Wilhelm Society (KWG) were relocated, divisions closed, collections deported, technological devices stored, and individual buildings damaged and destroyed. Numerous scientists and research scholars had been forced into exile to North America, Britain, and elsewhere around the globe; others had died in the skirmishes of warfare during the war, disappeared in prisons and concentration camps, had been incarcerated as prisoners of war, or were displaced at the beginning of 1945, so that they could no longer return to their homes or former research institutions. Those émigré brain scientists, psychologists, psychiatrists, biologists, and cyberneticists, who had been forced out of Germany and later its occupied countries, found new work settings abroad, and very few returned to Central Europe.

This paper examines the development of brain research activities as they progressed through the structures and platforms of the Max Planck Society (Max-Planck-Gesellschaft or: MPG) after its foundation on 26 February 1948 in Goettingen. It thereby relates to important changes in the cultural and political contexts of the Federal Republic of Germany, the immediate postwar period, and social reforms of the early 1960s. It is the goal of this project to tease out some formative elements and dynamics that influenced the brain sciences, behavioral sciences, and cognitive sciences of this period during the reconstruction process of the Max Planck Society. What were the main driving forces? Which personal and networking resources or structural features served the prospects of new productivity and research progress in the brain sciences since the immediate postwar period? And how were the traditions and resources from the Kaiser Wilhelm Society worked into the newly created extra-university research colossus that the MPG was to become?

This paper draws on historical archival material from the MPG (Berlin) as well as from specialized brain research institutes in Munich, Frankfurt, and Cologne, along with oral history information from interviews with former MPG members. Research support from the official Research Program on the History of the Max Planck Society is thankfully acknowledged for this project.

Evaluation of evidence for a neuroscientific concept through systematic review: The syndrome of aphasia 1861-1870

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The specialization of function in a specific area of the cortex was proposed by Paul Broca (1824-1880) in 1861 and further elaborated to include the principle of hemispheric lateralization in 1864. Broca and other French colleagues argued for and against these hypotheses, employing clinical and pathological observations of individuals with acquired language disorders as evidence. These ideas had little impact in the English-speaking world before 1864 but became a principal topic of interest after the debates at the Paris Académie de Sciences in 1865 were widely reported internationally. Over the next five years, hundreds of publications appeared on the cortical localization and laterality of findings in aphasic individuals and in larger case series.

Several large-scale systematic reviews of historic (pre-1861) and contemporary (post-1861) clinical findings were published in England and America only a few years after the syndrome had been proposed (Seguin 1866, Bateman 1868/1869, Fisher, 1870). These attempted to determine the robustness and quality of evidence regarding the specialization and lateralization of brain areas for language. However, their authors held distinct theoretical assumptions and were motivated by varied questions and ideological concerns. These efforts to assess the evidence for and against hypotheses about the organization of language in the brain are examined in order to expose the issues of live debate in early neuropsychology.

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Adolf Meyer: The neuroanatomist and neuropsychiatrist behind Meyer's loop and its significance in neurosurgery

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The insights of Adolf Meyer (1866-1950) into the neuroanatomy of the optic radiation play an important role in understanding the development of visual field deficits after temporal lobe resection. He studied medicine in Zurich, where his interest in neuroanatomy was stimulated And, in 1892, went to Chicago. In 1904, he was appointed Professor of Psychiatry at Cornell University Medical College (New York). He reached the pinnacle of his career in 1910 with his appointment as Director of the Psychiatric Clinic at Johns Hopkins Hospital, the first academic department of psychiatry in North America. However, he also made important contributions to neuroanatomy.

In 1907, he published his first work on "the peculiar detour of the ventral portion of the geniculocalcarine path," nowadays also known as the 'Meyer's loop' of the optic radiation in the temporal lobe. In 1910, he consulted in the neurosurgical ward of Harvey Cushing (1869-1939) and saw a patient with a gunshot wound through the left eye and inferior temporal lobe. After the house officer concluded that the perimetry was normal, Meyer advised performing a perimetry with <300 intervals, after which a contralateral quadrantanopia was diagnosed in the right eye. This Meyer-Cushing encounter was a pivotal moment for the discovery of and further elaboration on the anatomical course of optic radiation, the interpretation of visual field defects, and the consequent anatomical localization of the lesion, which was crucial in an epoch without sophisticated neuroimaging.

How Spinoza inspired J. Müller in his innovative ideas on hallucinations

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In the first half of the 19th century, our views on hallucinations changed fundamentally from an ancient notion of apparition into the current concept of "hallucination," meaning "the generic name for a class of utterances reporting subjective experiences (putatively) perceptual in nature which occur in the (arguably) absence of an adequate external stimulus." In this transformation, an early work of Johannes Peter Müller (1801-1858), *Uber die phantastischen Gesichtserscheinungen* (On Fantasy Images) (1826), played the role of a catalyst. (Berrios, 2005)

Interestingly, in his explanation of hallucinations, Müller refers several times to Spinoza's work, in his early as well as in his influential magnum opus entitled *Handbuch der Physiologie des Menchen* (1837-1840). So, where, when and why precisely does the German physiologist refer to the Dutch philosopher? Remarkably, this link has not yet been investigated systematically in secondary literature, even though there is much interest in Spinoza's philosophy among contemporary biologists such as Antonio Damasio, Henri Atlan, and Jean Pierre Changeux, who argue that Spinoza (1632-1677) anticipated modern biological thinking.[1] Likewise, Spinoza's name is completely absent in several important biographies of Johannes Peter Müller[2].

This paper claims that Spinoza inspired "the father of contemporary physiology," and it demonstrates ontological and methodological as well as historical reasons that played a role.

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[1] Cf. Damasio, A.R., *Looking for Spinoza. Joy, Sorrow and the Feeling Brain*. London, William Heinemann, 2003 ; Atlan H., *Cours de philosophie biologique et cognitiviste – Spinoza et la biologie actuelle*. Paris: Odile Jacob, 2018; J.P. Changeux and P. Ricoeur, *What makes us think?* Princeton/Oxford: Princeton University Press, 2000.

[2] See for instance: the introduction of Nicholas J. Wade in the first volume of his edition of *Müller's Elements of Physiology* and Laura Otis's "Müller's Lab" (2007).

The arrow in the eye

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For centuries, diagrams showing image formation in the human eye have employed an arrow as the stimulus. What are the origins of the arrows? Kubovy has suggested that the metaphor of light as an arrow can be traced to a painting by Mantegna in 1455. However, arrows are not illustrated in texts on perspective until 1646. The arrow of light did not penetrate the perspectivist's eye but ceased at its surface. Only after Kepler's (1604) analysis of image formation in the eye and Scheiner's (1619) accurate account of ocular anatomy did the arrow enter the eye to form an inverted and reversed retinal image. Arrows are represented in the 1646 Latin edition of Niceron's book on curious perspectives but not in the French edition of 1638. Niceron was an artist and mathematician who described linear, conical, and cylindrical (mirror) anamorphoses. In his Dioptrique (1637), Descartes integrated Kepler's dioptrics with Scheiner's anatomy to illustrate retinal image formation, and the stimulus was an arrow. Niceron was a pupil of Mersenne and an acquaintance of Descartes. Thereafter, arrows have been used extensively in physical and physiological optics as well as in texts on art. Thus, the arrow of light speeds towards the eye and penetrates it, leaving its mark to be processed. This metaphorical conflation of art and optics assisted in the analysis of image formation in the eye, but it has left a pictorial platform from which the analysis of perception is considered to commence.

Perceptual determinism in diagrams of the eye: From Ḥunayn ibn Isḥāq to Vesalius and Kepler

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Historically, the evolution of eye diagrams demonstrates a kind of "perceptual blindness" where the accepted hypotheses or conventions are so powerful that they override changing current knowledge and the observed physical reality. The role of the oldest extant schematic drawing of the eye in *The Book of Ten Treatises of the Eye* (866 AD/copy 12th century) by Ḥunayn ibn Isḥāq (d. 877), with no precursor models, provides a case in point. It represents ocular anatomy based on Galen (200 A.D.) with features that differ significantly from the modern eye; in particular, the central position and shape of the "crystalline lens", and the optic nerve.

It will be shown that between the 9th and the 17th centuries, Ḥunayn's eye served, with minor adaptations, as a model for schematic illustrations of ocular anatomy by major figures. The examples include not only Vesalius (1543),despite his direct recording of observations of serial dissection, but also Kepler (1604), who marks the beginning of scientific explanation of image formation, identifying the focusing function of the lens for the retinal image and brings optics and the new anatomy of Platter (1583) into his illustration. To acknowledge that "pictures owe more to other pictures than they do to nature" (Gombrich, 1963) is not sufficient. Why did a premodern erroneous schematic drawing continue to serve until Scheiner (1619) despite increasing evidence invalidating the relevance of its depiction? The answers will be sought in visual neuroscience and the mechanisms underlying perception. Such influencing factors as prior experience, memory, and selective attention will also be shown to apply in the historical process of transmission.

Reconsidering the epileptic personality: Shifting the focus away from the temporal lobe

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Introduction: The effect of temporal lobe epilepsy on personality is a historical observation dating back to the 1800s. In 1977, Bear and Fedio reported an excess of overt emotional traits (deepened emotionality, sadness, hypermoralism) in people with right-sided temporal foci, whereas ruminative intellectual tendencies (religiosity, philosophical interests, humorlessness, sense of personal destiny) prevailed in those with left-sided foci.[1] Emphasis on negative personality traits has instigated epilepsy-related stigmas. In the 1960s, eugenic laws barring people with epilepsy from marriage were still in force in the United States and the United Kingdom.

Methods: Review of the literature.

Results: The existence of a "temporal lobe epileptic personality" and specific personality traits in patients with temporal lobe epilepsy has been disputed, and research is inconclusive. Bear and Fedio's initial study failed to include patients with other forms of epilepsy and to control for the presence or absence of psychiatric disorder. Six percent of people with epilepsy appear to suffer from a psychiatric disorder. This rises to 10–20% in populations with temporal lobe and/or refractory epilepsy. Mood disorders (particularly depression) are most common (24–74%), followed by anxiety disorders (10–25%).[2] Comorbid psychiatric illnesses, biological factors (e.g., frequency of seizures), cultural environment and social factors (e.g. unemployment due to epilepsy) affect behaviour in patients with epilepsy.[3]

Conclusion: The assessment of behavior in people with epilepsy has evolved from measurement of personality traits to a multifactorial approach of psychological, biological, and contextual factors that may contribute to behavioral characteristics.

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The brain that will not die – Inventive, fictional, and futuristic science

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Since the mid-nineteenth century, grimaces and eye movements in freshly decapitated heads have ignited endeavors to perfuse brains by various nutrients and keep them alive and functioning. Science fiction followed these attempts and envisaged in literature and filmography isolated, evil, disembodied brains that gain control over obedient people. The Soviet Union supported keeping heads alive in order to develop techniques of resurrecting the dead. In 1929, the physicist J.D. Bernal envisaged a brain in a vat, connected by an electrical “reactor” to other brains that act as one cognizing organism. The invention of the EEG launched a flurry of science fiction books and movies in which fictional isolated brains were afforded the means of broadcasting. The isolated brain turned to be regarded as a personal, cognitive entity. The developing field of Brain-Computer Interfacing (BCI), which enables specific brain areas to transmit neuronal messages evoked by thought to disconnected muscles, turned the fantasy into a reality. Current research explores the feasibility of the idea that brain functions can be reproduced or even exceeded by electronic or computing technologies. It may turn the still-imaginary idea of creating a symbiotic relationship between the brain, data banks, or Artificial Intelligence (AI) into reality.

Investigating the “Electro” and the “Shock” behind the Cerletti-Bini ECT apparatus prototype

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The term “electroshock”, identifying the electroconvulsive device used to treat psychiatric dysfunctions, began to spread on October 15, 1938. Electroshock was the name given to the industrial version of the apparatus prototype (originally called “Apparecchio per le applicazioni elettriche”), which was assembled and tested by Ugo Cerletti and his assistant, Lucio Bini, in Rome six months prior to that date. The Cerletti-Bini electroconvulsive therapy (ECT) apparatus was the result of combining two medical traditions. Firstly, ECT followed a recent tradition on seizure inductions (i.e., “shocks”) on mental patients via inoculations, a series of therapies that became popular in the early 1930s (e.g., malaria therapy, insulin coma therapy, cardiazol and Metrazol therapy). Secondly, ECT was related to studies from the late 18th century applying electrical current to the skull to provoke epileptic-like convulsions. Intersecting bibliographical and archival material, my goal is to reconstruct the sources that led Ugo Cerletti and his team to administerelectricity as a convulsant on human beings. This procedure, which had been tested by physiologists mainly on animals for various purposes, turned out to be a less risky than pharmacological inoculations to reproduce the effects theorized by Ladislas Meduna’s hypothesis of an antagonism between epilepsy/schizophrenia.

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Archives

- Sapienza University of Rome, Child Neuropsychiatry Library, New Historical Archive “Ugo Cerletti”.
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The Denber Study

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In 1959, a clinical trial in the Manhattan State Hospital changed psychiatry, driving a wedge between western European practices and those from Anglo-Saxon countries.

Herman Denber is sometimes described as an emissary between Europe and the United States, as European psychiatric elites had problems penetrating English-speaking psychiatric culture, but his 1959 clinical trial broke rank with what was being experienced in Europe. The Denber study described haloperidol as having severe side effects and very little therapeutic efficacy. Consequences for these surprising results ranged from delayed butyrophenone penetration in the American market with real impact in clinical practice during the sixties to possible differences in neurobiological theory construction across the Atlantic.

Our presentation will revisit the conditions present in haloperidol's first American clinical trial to find answers to the discrepancy between its published results and European trials. Larger questions about methodology in clinical trials may linger, suggesting that psychiatric effectiveness may be conditioned by time and place considerations.

Worth their salt: One hundred years of hyperosmolar therapy

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Most neurologists and neurosurgeons are familiar with the use of mannitol or hypertonic saline in emergency situations where patients acutely deteriorate from brain shift. Indeed, hyperosmolar therapy is a recognized rescue therapy in patients with acute increased intracranial pressure (ICP). In 1919, anatomists Lewis H. Weed and Paul S. McKibben, working at the Army Neuro-Surgical Laboratory at Johns Hopkins, first demonstrated the effect of intravenously injected hyperosmolar solutions on reducing ICP and brain volume in cats.[1,2] While Weed and McKibben's main objective was to gain a better understanding of intracranial volume relationships, they simultaneously discovered a promising method to combat cerebral edema. Indeed, hyperosmolar therapy was quickly applied in clinical practice, even though the preferred agent and means of administration and ideas regarding the mechanism of action diverged. In this article, we commemorate the centenary of the discovery and clinical implementation of hyperosmolar therapy, a therapeutic modality still surrounded by some of the questions that characterized the field one hundred years ago.

Non-pharmacological treatments of Parkinson's disease since 1817

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Throughout the evolution of treatments for Parkinson's disease, drug therapy has been of great importance. Non-pharmacological treatments had been advocated since Parkinson's publication (1817). We describe these treatments in a general medical historical context. We consulted popular English, German, and French neurology textbooks as well as three voluminous 20th-century neurological handbooks.

James Parkinson applied bloodletting and vesicatories. Since then, a number of non-pharmacological treatments have been applied. We categorized them into 1) physical and mental rest; 2) diet; 3) hydrotherapy/balneotherapy; 4) electrotherapy; 5) nerve stretching and suspension; 6) vibration therapy; 7) exercise; 8) physical therapy; and 9) psychotherapy.

In most textbooks, the section of non-pharmacological treatments is much smaller than that of pharmacological treatments. Charcot, Gowers, and Oppenheim seem to have been important sources for many of the textbooks listed, although the particular authors did not always share the opinion. Physical and mental rest was popular around the turn of the century and then became less important. Dietary advice was provided in only a few textbooks. Hydrotherapy, in particular warm baths, was suggested by many authors, although some warned against the hydrotherapy institutes that had become fashionable in the 1840s. Electrotherapy was advised by most but criticized by some. Nerve stretching, more particularly suspension treatment, was applied for a short period. Vibration therapy was gradually taken over by physical therapists, sometimes using Zander apparatuses. The latter were also offered for passive and later active exercises (looking like modern home-trainers).

The history of hippocampus: Three centuries of terminological discussions

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As a part of the limbic system, the hippocampus (today defined as two allocortex laminae, cornu ammonis (hippocampus proper) and gyrus dentatus, one rolled up inside the other) plays a crucial role in memory. Slow discovery of the hippocampus over centuries led to various terminologies linked to zoology and mythology. Some of them are discussed. **Seahorse or silkworm?** The first denomination of hippocampus (from the Greek horse and sea monster) is credited to the Italian anatomist Julius Caesar Arantius (ca 1530-1589) around 1570. Hippocampus refers to the small marine fish called seahorses and also to a mythological creature that pulled Poseidon's carriage. Arantius compared the whole structure, or maybe only the gyrus dentatus, to a seahorse or a silkworm. As demonstrated later in the anatomical works by Félix Vicq d'Azyr (1748-1794) and Gustaf Retzius (1842-1919), displaying the seahorse appearance of the hippocampus requires a method of dissection starting from the ventral surface of the brain. Johannes Georg Duvernoy (1691-1759), who probably provided the first accurate illustration of the hippocampus in 1729, also hesitated between the terms of seahorse or silkworm. Jean Cruveilhier (1791-1874) still suggested the comparison to a silkworm, but only the term hippocampus has endured until the present days. **Ram's horn or Ammon's horn?** In the first half of the XVIIIth century, Jacques Bénigne Winslow (1669-1760) compared the hippocampus to a ram's horn. Two French anatomists of the Enlightenment, René-Jacques Croissant de Garangeot (1688-1759) and Claude Flurant (1721-1779), introduced the term Ammon's horn (cornu ammonis). The metaphor Ammon's horn refers to the ram-shaped horns on the head representing the Egyptian god Amon. **Hippocampus or Hippopotamus?** The German anatomist Johann Christoph Andreas Mayer (1747-1801) miscalled this structure hippopotamus in 1779 inducing confusion in anatomical terminologies over many years. ***Calcar avis* or Hippocampus minor?** The *calcar avis* (bird spur) of the occipital horn of the lateral ventricle, initially described by Sauveur-François Morand (1697-1773), was renamed the hippocampus minor by Félix Vicq d'Azyr in 1786. This term was subjected to ridicule when it became the center of the debate called the Great Hippocampus Question. The term was removed from the classifications at the end of the 19th century. **Hippocampus or hippocampal formation?** These discussions finally led to a larger definition of this anatomic region to encompass other structures such as the subiculum or the gyrus of Andreas Retzius (1796-1860).

History of amnesia

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Forgetfulness and memory loss have generated interest dating back to antiquity. However, memory loss was first classified as a medical malady by Sauvages (1763), whose taxonomy included "amnesia." Weakening or dissolution of memory characterizing amnesia was attributed to factors including brain disorders of stroke, hemorrhage, and traumatic head injury, excesses, strong emotions, and intoxication. Amnesia was noted as a distinct primary condition, or as secondary, accompanying certain serious medical conditions. Medical dictionaries and encyclopedias provided recognition of amnesia as an independent disorder of memory, distinguishable from disorders of global intellect or language.

Concepts developed in the 19th century captured descriptive, diagnostic, and prognostic aspects of memory difficulties. Retrograde (forgetting knowledge preceding onset) and anterograde (difficulty learning or recalling new information) features, pathogenesis, duration, course, and severity remain essential current parameters of amnesia. Conditions primarily characterized by amnesia are described. Korsakoff's syndrome vividly depicted a profound alcoholic amnesia. Functional (psychogenic) amnesia permitted neuropsychiatric differential diagnosis and study of dissociation and subconscious recall.

Certainly, a most compelling case of amnesia is that of H.M., who, after bilateral medial temporal lobe resection in 1953, displayed lifelong severe anterograde amnesia notable for ongoing, recent events. Early memory retention, without general intellectual or perceptual compromise, was reported. Skill-based sparing and implicit learning were later suggested. His amnesia described as "unforgettable," HM's heartrending legacy furthers appreciation of neuropsychological functions of learning and memory, serving as a poignant reminder of profound effects of amnesia on everyday life. Amnesia endures as an evocatively challenging clinical phenomenon in neuroscience.

Proust's way: From medicine to memory

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Swann's Way (and all subsequent volumes of *In Search of Lost Time*, Marcel Proust's masterpiece) is commonly considered as the great "memory novel" of modern times, as symbolized by the famous reminiscence episode linked to tasting a little madeleine cookie. Indeed, we found over 1200 citations on memory in the 3000 pages of the book! In our presentation, we will focus on how the author developed his various, sophisticated concepts of voluntary and involuntary memory, largely on the basis of a solid medical knowledge. Proust's father was a famous physician, who had briefly worked with Charcot, and because of his own medical condition, Proust met many physicians involved in "nervous disease." This allowed Proust's biographer Jean-Yves Tadié to state that Proust seemed to know all the neurologists in Europe! This included Édouard Brissaud, Joseph Babinski, Jules Dejerine, and mainly Paul Sollier, who had written several works on memory.

Proust indeed underwent a cure in Sollier's institution, and it appears that his ideas on the mechanism of involuntary surges of memory largely originated from this stay. Proust subsequently elaborated concepts of voluntary memory, affective memory, creative vs. destructive memory, the mutually contradictory aspects of memories, as well as the active process of forgetting.

Cultural neuroscience: Significance and perspectives

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Cultural neuroscience is an emerging field that studies the influences of culture on psychological, genomic, and neural processes from a global perspective. The experts seek answers for two main questions: how cultural traits affect neurobiology and behavior of humans and how neurobiological mechanisms are linked to the emergence and conservation of cultural traits. In 1991, Markus and Kitayama published an important study that related culture with social psychology and cognition. They argued that the constructs of the individual self differ substantially in Eastern and Western societies. In Eastern collectivist cultures, an individual self is interdependent and connected tightly with other people, while in the more individualistic Western countries, individual self is more independent with a lower degree of connectedness. Cultural neuroscience also includes researching populations on the differences in brain activity and wiring. Using fMRI imaging, Zhu et. al (2007) found that Chinese individuals use the medial prefrontal cortex to represent both intimate others and self, while, in contrast, in western subjects, activity of this area reflects representation of only their individual selves. Cultural differences seem to affect the expression of serotonin-transporter isoforms, which influence predisposition to mood and anxiety disorders (Chiao et. al. 2009). The goal of our study is to discuss the historical aspects, significance, and perspectives of this emerging field.

A brief history of electroencephalography

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Electroencephalography (EEG) is the non-invasive measurement of the brain's electrical activity. Electrodes positioned on the scalp record voltage potentials resulting from neurons' electrical activity. EEG is almost a century old. This long history has given EEG a rich range of applications (Biasiucci et al., 2019). EEG still surprises us with information that we have not yet been able to explore. With its excellent time resolution, its ease of use, and its noninvasiveness, in combination with advances in data analysis, EEG is currently a neuroimaging technique in both cognitive and clinical neuroscience. In this talk, in addition to the brief history of the EEG, I will focus on the new technologies permitting the use of scalp EEG signals to track dynamics of cortical brain networks with high spatiotemporal resolutions (Hassan and Wendling, 2018).

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“Seelenarbeit im Sozialismus” – Psychiatric care in between: Assistance, custody, and abuse

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Thirty years after the German reunification, the Federal Ministry of Education and Research (BMBF) promoted a network of projects to investigate the role of institutions, their general conditions, and representations of the former GDR. “Seelenarbeit im Sozialismus” is part of the network, and within the scope of this project was greater elucidation of the role of psychiatry within the health system of the GDR .

Scientific research on the subject of the psychiatric care of the GDR was often characterized by differing interests and various historic events. Initial research dealt with the critical political involvement in psychiatric institutions after the Reunification followed by academic analysis relating progressive approaches, their implementation, and everyday practice of psychiatric care in the GDR.

None of this led to a systematic reappraisal of the supply situation of psychiatric patients or to reappraisal of the role of the overall structure of the GDR psychiatry. Therefore, the objective of this project is to assess the range of psychiatric care and specific characteristics of GDR psychiatry.

Psychiatry in the last century usually took place beyond everyday life. Its social representation is reflected by employees and patients, conceptually in public regulations, treatment plans, or the number and size of care facilities.

Therefore, interviewing contemporary witnesses and doing archival researchis necessary not only to classify the nature of the GDR psychiatry more accurately but also to provide the general public with an insight into the findings and conclusions through an online-database.

Contemporary Neuro-Opera

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Neuropsychiatric and neurological diseases are represented in Opera in the contemporary era. The influence of the theories of Sigmund Freud (1856–1939) is well evident in *Salome* (1905) and *Elektra* (1909) by Richard Strauss (1864–1949), by the Austrian composer Schoenberg (1874–1951) in *Erwartung* (1924), and in *La cena delle beffe* (1924) by Umberto Giordano (1867–1948).

Neuropsychiatric diseases are presented in clinical connotations by Igor Stravinsky (1882–1971) with *The Rake's Progress* (1951). Benjamin Britten (1913–1976) offered *Peter Grimes* (1945), *The rape of Lucretia* (1946), *Midsummer Night's Dream* (1960), *Curlew River* (1964) and *The Burning Fiery Furnace* (1966). The English composer Peter Maxwell Davies (1934–2016) composed *Eight Songs for a Mad King* (1969). The Swedish composer Livlægens Besøg's *The Visit of the Royal Physician* (2008), and the German Detlev Glanert's *Nijinskys Tagebuch* (2008) deal with problems related to schizophrenia. Dementia is shown in *The Lion's Face* (2010) by the English composers Elena Langer and Glyn Maxwell, and *Love Hurts* (2016) by Nicola Moro.

There are recent works related to neuroscientific problems, such as those of the English composer Michael Nyman with *The Man Who Mistook His Wife for a Hat* (1986), from an adaptation of a book by the neurologist Oliver Sacks (1933– 2015). Nyman himself, with *Facing Goya* (2000), refers to a biological theme between innate and acquired traits such as craniology or craniometry. The theme is closely linked to a work by the Italian Fabrizio de Rossi Re entitled *Cesare Lombroso o il corpo come principio morale* (2001).

In contemporary period, opera continues to reflect the neuroscientific debate.

Starch, sweat and space: The life and work of Victor Minor

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Victor Lazarevich Minor (1890-1969) is widely known as an author of the starch iodine test for hyperhidrosis (Minor's test). The aim of this presentation is to demonstrate the life and career of a Soviet neurologist in its professional, social, and historical context. It is based on archival materials – Archive of Imperial Moscow University, Archive of the Burdenko Neurosurgery Institute, and a private archive of Minor's family.

Victor was a son of Lazar Minor, an internationally famous professor of neurology from Moscow . In 1916 he graduated from the medical faculty of Imperial Moscow University and, after two years of military service, returned to Moscow and worked in a neurology clinic. Studies of the autonomous nervous system and various methods of treatment of autonomic disorders were very popular in the 1920s. In 1926 Victor Minor suggested evaluating autonomic disorders by a simple test: covering a body region with an iodine solution, and then (when it dries), powdering the region with starch; when person oozes sweat, the starch turns blue. In 1927, Minor visited O. Foerster's neurosurgery clinic in Breslau, where L. Guttmann became interested in Minor's test and modified it. In the late 1930s, Minor married his PhD student Lidia Novikova and fathered a son, Alexander, who became a biophysicist and studied olfaction. From 1944 until 1953, Minor headed a "cabinet for neurology of sweating" at the Burdenko Neurosurgery Institute and studied sweating disorders after peripheral nervous system damage. Shortly before Stalin's death, he was fired from the institute because of his Jewish origin.

During the last decades of his life, Victor Minor worked in private neurological practice and wrote a fantastic novel about Moon exploration. His biography may serve as a case study of a clinical neurologist in the 20th century.

Jan Bureš: Entering Big Science

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Jan Bureš (1926-2012) was one of the most distinguished and renowned neuroscientists in Central and Eastern Europe. In the early 1960s, he established a research school in Prague that attracted the attention of many young and more senior scientists. His publications concerned the mechanisms of cortical spreading depression, as well as behavioral studies of learning and memory. As Bureš writes in his autobiography, Ivane Beritashvili on behalf of the Georgian Academy of Sciences invited him to participate in the Third Gagra Symposium on the Mechanisms of Conditioned Reflexes in the autumn of 1957. The conference took place in January 1958 in the Georgian black seaside resort of Gagra. Gagra was one of the last preliminary meetings from which Soviet speakers were selected before the prestigious Moscow meeting. Young Bureš had such a junior position in his institute that the invitation surprised him and his superiors. As it turned out, the invitation was prompted by Beritashvili and his colleague, Alexander Roytbak, who were interested in two papers on depression that Bureš published in the Czech journal *Physiologia Bohemoslovaca* in 1954. Several months later after the Gagra Symposium, Bureš was selected from the Gagra participants and invited to an international colloquium in Moscow. It was, thus, that Bureš entered "big neuroscience."

Reviews, critiques ,and criticisms from Robert Wartenberg

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Robert Wartenberg was a master clinical neurologist who had a career split between Europe and the United States. Born in Grodno, in present-day Belarus, in 1887, he enjoyed a productive career in Germany until 1935, when he fled to the United States with the rise and consolidation of Nazi rule. His career had many facets, but his editorial activity injected his personality into the academic landscape. American neuropathologist Webb Haymaker called Wartenberg an “addict to hyperbole,” who was a “self-ordained critic” with a “particular aversion to mediocrity.” As one might imagine, this personality combined with an editorial platform at times led to conflict. Sir Francis Walshe, having taken exception at a piercing review from Wartenberg, sent an “unprintable letter of protest” in return. Wartenberg may have had a lack of insight into the gravity of his criticisms as he “could not understand why Walshe had taken his ‘constructive’ criticism so poorly.” Based on that response, one might think that Wartenberg had little insight into how his reviews might affect their recipients. In reality, he was likely well aware as reflected by a personal review he sent to his friend Haymaker upon the publication of his book “Haymaker and Woodhall Peripheral Nerve Injuries.” Wartenberg provided the self-aware title of “Malignant remarks on E & W Peripheral Nerve Injuries by a Fussy and Finicky Carper.” Wartenberg was a lively neurologist whose critiques and reviews reflected his personality including aspects that alienated their recipients.

The adventurous life of Wolfgang Jablonski, a neuroscientist and a “distinguished” doctor from the last century

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In resuming his lectures at the University of Turin after the tragic years of the war, Giuseppe Levi expressed his appreciation to some young researchers from his lab, “for the friendship they wished to maintain [with him] in such a difficult period,” and singled out a “Jablonski”, without indicating his given name and nationality. Working with Moshe Feinsod, I discovered some aspects of the complex life that led this young man (b. 1912), Wolfgang Jablonski, a German Jew belonging to a wealthy Berlin family, to flee Germany before the Nazi persecution, to settle in Italian-speaking Switzerland, to earn an MD degree in Basel in 1935, and afterwards, having lived for a while in Florence, to work in Levi’s lab in Turin. In Turin, he conducted important research on cultured nerve cells with Hertha Meyer (also a young German Jew on the run). Jablonski left Turin for England when the “racial laws” forbade him to work in Italy, but there he was suspected of being a Nazi spy and sent to prison in Cyprus. After a hunger strike, he succeeded in convincing the authorities of his real identity and in 1940 participated as a military doctor in the battle of Tobruk. After being discharged in 1945, he moved to Israel, where with his Hebrew name of Yuval Adams – [יובל אדם], he served first as a kibbutz doctor and afterwards as a family physician. He was recognized as “distinguished citizen” of Jerusalem, where he died in 2003.

Female contributors to the early neurosciences: Case studies of Diana Beck (1902-1956) and Sofia Ionescu (1920-2008)

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There exists an understated but persistent debate within the neuroscientific literature as to who was the first female physician to practice modern, neurosurgical techniques within a clinical setting. Both the British practitioner and instructor, Diana Jean Kinloch Beck (1902-1956), and Sofia Ionescu (1920-2008), a Romanian neurosurgeon, have frequently been proposed as deserving of this accolade. Nonetheless, contention over the subject remains because of nuances that invariably emerge when one attempts to discuss "firsts" in interdisciplinary clinical developments. We present evidence in the form of two case studies of these pioneering neurosurgeons, who performed their first intracranial procedures in the mid-twentieth century in contexts where overcoming significant adversity in the form of institutional, social, and cultural barriers was undoubtedly part of the process. This issue is more complex than the question of who was simply first to perform a specific operation, scalpel in hand, as the two clinicians' first confirmed procedures were several years apart. Rather, the subject matter presented in this work pertains to a wider issue of academic exclusivity, crucial historical issues of gender in the neurosciences, and this, in turn, raises important questions regarding the nature of qualification and innovation in the related fields.

Marian Lydia Shorey (1873-1922): The sad story of a brilliant woman scientist at the inception of modern neuroembryology

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Marian Lydia Shorey (1873-1922) was an American scientist in the early twentieth century who is hardly remembered in the history of science. When she is mentioned, her name is often misspelled. Sometimes she is mistaken for a man, and almost no biographic data can be found on her. Nevertheless, her experimental work on chick embryos during the preparation of her PhD thesis at the University of Chicago, which led to the publication to two papers in 1909 and 1911, represents a milestone in the birth of modern of neurobiology. Through the subsequent research of Samuel Randall Detwiler and Viktor Hamburger in America and Rita Levi-Montalcini and Giuseppe Levi in Italy, Shorey's results opened a research path that would eventually lead Levi-Montalcini and Stanley Cohen to discover Nerve Growth Factor, the first molecule of an entirely new and extremely important class of biological regulators. Here I report the results of biographical research, initiated in collaboration with Germana Pareti, which sheds light on the complex and sad events that led a promising woman scientist from rural America, to fail to establish a research and teaching career and, eventually, to take her own life on 26th August 1922, like her sister, Bina May, had done six years earlier.

The advent of fear conditioning as an animal model of post-traumatic stress disorder (1980-2020)

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Fear conditioning (FC) is one of the dominant models of post-traumatic stress disorder (PTSD). While the first results of FC experiments were published in the 1920s, PTSD appeared as a diagnosis in 1980 (DSM-III). Models of PTSD based on FC have been criticized for lack of validity. Then, how did FC become a dominant model of PTSD?

The aim of this work was to shed light on how conceptual links between the constructs of PTSD and FC have emerged and evolved.

We found that constructs of FC and PTSD were first linked by analogy shortly after the recognition of PTSD (1980s). Fear conditioning only started to be used as an animal model of PTSD in 2003, ten years after the creation of the first explicit model of PTSD. From there, FC has rapidly expanded to its current dominant position. Conceptual links mostly concern circuits of fear and extinction. We propose that the convergence of scientific theories of fear and extinction circuits, and synaptic plasticity within a political context of strong interest in PTSD has stimulated research on FC to model PTSD. This convergence stemmed from collaborations between clinician-scientists within the US Department of Veterans Affairs and medical academic centers.

Collision of medical, scientific, and political history has resulted in FC becoming a dominant model of PTSD. Current uses of FC in modeling PTSD are heterogeneous, introducing conceptual vagueness and ambiguity. These issues should be clarified in the future.

A case of neurotoxic warfare in classical times

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Introduction: In the year 66 BC, Roman soldiers were victims of deliberate poisoning after ingesting a honey-derived neurotoxic substance. The poisonous honey was well known at the time; several classical writers mention it. Strabo describes the incident, and Pliny designates the honey as μελι μαινομενον (mad honey). It comes from the nectar of Rhododendron heather in the Pontus region in northeastern Turkey. The neurotoxic substance is now known to be Granayotoxin (GT). In nerve tissue, GT blocks sodium channels in the activated, open state leading to hyperpolarization. Mad honey is still produced, and Turkish physicians report cases of poisoning.

Question: Is the description of 'mad honey disease' by classical writers consistent with that of modern authors, and if not, what is the explanation?

Methods: Review of classical and modern literature.

Results: Some classical writers describe mad-honey poisoning in detail. The disorder is primarily neurological in nature; symptoms include confusion, turmoil, hallucinations, drunken gait, drowsiness, and coma. Modern descriptions are cardiovascular: hypotension, bradycardia, and cardiac arrhythmias. All describe a favorable course with recovery after 24 to 48 hours.

Conclusion: The description of GT-poisoning by classical and modern writers differs considerably. Modern physicians mention cardiovascular findings from medical examination; classical writers describe a neurological picture based on observation. Are these poisons really the same? Physicians in antiquity physicians could not produce modern medical data; however, the lack of neurological phenomena in modern mad honey literature is striking. Modern physicians, describing a disease state, seem to prefer objectifiable medical findings to observational characterizations.

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A war of minds, disciplines? Gordon Holmes and Charles Myers on shellshock

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Post-traumatic stress disorder is a complex disorder with both functional and organic features of illness, now clinically classified as PTSD. Historically, it has been a significant burden of war in combat veterans.

Documentation, categorization, and treatment of shellshock experienced by soldiers during World War I represents one of the earliest concerted efforts in modern history toward a military mental health care policy. This effort was complicated by a lack of consensus among military physicians on the etiology of shellshock. Due to their fundamentally different approaches, neurologists and psychologists often found themselves at odds over the care and treatment of PTSD. This is exemplified by the British neurologist Gordon Holmes (1876 –1965), and his psychologist counterpart, Charles Myers (1873 –1946), both consultants for British Expeditionary Forces at the Queen Square Hospital in London.

A comparative analysis of their specific views provides an excellent opportunity to examine how their differences influenced military mental health care policy. Holmes, who was in charge of military policy towards shell shock and overruled Myers' psychologically oriented approach, will be considered within an historical context. Material from the archives at The National Hospital for Neurology and Neurosurgery in London (formerly the Queen Square Hospital) and the Wellcome Library will be explored, in addition to other original contemporary works. This research also highlights the lessons to be learned from military mental health policy in WWI and the importance of an interdisciplinary approach to PTSD.

What do the WW2 French battlefields tell us about the history of neurology and psychiatry? Revisiting *Let There Be Light and Shades of Gray*

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Here in Rennes, close to the beaches and 75 year after D-day, it should be remembered that neurology, psychiatry, and psychology – the main clinical pillars of the neurosciences— came together on the battle fields. I revisit the consequences of battle using two major documentaries to illustrate this major event. In 1943, John Huston (feeling anger himself when he returned from WWII) directed the documentary *Let There Be Light* showing the rehabilitation of returning soldiers. The hypnosis and psychoanalysis of the soldiers in *Let There Be Light* are front and center with psychiatrists seeking prior traumatic events or difficult parental relationships. The Army followed up in 1948 with *Shades of Gray* (meaning most men are not "100% perfect; nobody has pure white mental health"). Psychiatrists felt they could identify a predisposition to mental breakdown, but the overall idea was that it can happen to anyone. Neurologists saw no obvious trauma but rather functional symptoms such as paralysis and inability to speak.

A unique collection of wax models showing neurosurgical technique

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The first anatomic wax models used for medical purposes were made in the late 1600s in Italy. In the 1800s, the Hôpital Saint-Louis in Paris became the home of French medical moulage. The first wax models at the Mayo Clinic in Rochester, Minnesota, were made in the 1920s. An invitation to create a medical exhibit at the 1933-1934 World's Fair in Chicago, Illinois, spurred the development of medical moulage at Mayo Clinic. Mayo physicians often used wax models in exhibits at the yearly American Medical Association (AMA) meeting. Moulages showing steps in surgical procedures were a prominent part of the Mayo collection. Neurosurgeon Alfred Adson first displayed wax models showing the technique of operations on the brain and spinal cord at the 1934 AMA meeting, and other neurosurgical technique models were made over the next 10 to 20 years. The neurosurgical models were generally based on medical illustrations published in articles by Adson. A clay model of the image would be made and then a plaster mold created, which was used to make the wax positive. The Mayo Clinic medical moulage collection includes surgeries for gliomas, meningiomas, vestibular schwannoma, pituitary tumor, trigeminal neuralgia, skull defects, and spinal cord tumors. The models can be directly compared to their original published medical illustrations. Mayo Clinic's moulage collection was unique in that it focused on sequential steps of surgical procedures. The beautiful models showing Adson's neurosurgical procedures are highlights of the collection.

Io Dryander's lecture concerning the usefulness of human dissection, 25 June 1536: "Sphærula fie caput eft, dogma quod omne caput…Hic fedem ratio pars deitatis habet."

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This paper translates a lecture by physician, mathematician, and astronomer, Johann Eichmann, AKA "Io Dryander," to medical students at the Academy of Marburg, Germany. He asserted that "anatomy was the most certain foundation of the whole medical enterprise."

Dryander was quick to the point. He acknowledged that the study of medicine had "labyrinths" and "alleyways," but anatomy explained the "nature of created things." Astrology offered a comparison: "Just as we study Venus' friendly coolness that tempers the burning of Mars in the heavens, we study the brain's softening of the boiling ardor of the heart." He declared that the art of anatomy provided a technique for medical inquiry, prevented lazy reliance on urine inspection, corrected mistakes in earlier texts, contributed legal evidence, and discredited the hopeless quack-doctors. Dryander then reminded squeamish students: "What is foul odor to others smells [like] sweet ointment to us," and he warned that "unless you will have investigated the individual locations and natures of the individual sicknesses…there is more danger for the sick person from the doctor than from the sickness." Finally, Dryander recommended to his benevolent Prince Philip I, Landgrave of Hesse and founder of this first Protestant University, that dissections continue after publication of his neuroanatomical text, *Anatomiae pars prior*.

Despite theological turmoil and civil war during the Reformation, Dryander was in the mainstream of German Renaissance. His advocacy for human brain dissection, delivered seven years before publication of Vesalius' *Fabrica*, argued for a rational approach to systematic medical observation and education.

The history of cranial fissures

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From Hippocrates to the mid-18th century, cranial surgery was mainly concerned with the treatment of fissures and depressed fractures. Diagnosis was by direct observation of the cranium with probe and fingers. If symptoms were judged severe and no fissure was seen, ink was used to demonstrate hairline fissures. Once detected, the next step was to determine the depth of the fissure. Following trauma with sharp instruments, some fissures only reached the diploe. The depth was determined by scraping until the mid-12th century, when Roger Frugard of Salerno showed that depth could be determined by a Valsalva maneuver. Partial thickness fractures were treated with dressings. Full thickness fissures were treated with prophylactic trepanation from Hippocrates onward with only a few exceptions because Hippocrates had taught that blood accumulations within the body deteriorate and suppurate causing death. This was accepted until understanding dawned that symptoms following cranial trauma were due to brain injury. Percival Pott specifically stated that hematomas did not suppurate if left alone, and trepanation for fissures gradually ceased.

Cranial trauma and contralateral paresis – Ignored for millenia

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Claude Bernard taught that observation must be active. In the absence of a search for a notion, the observer only sees what he/she expects to see and not what is there. An example of this phenomenon concerns failure to accept and detect that paralysis after cranial trauma was contralateral. Aretaeus the Cappadocian was the first to note that injury to the brain produced a contralateral paresis. This was ignored or forgotten, and his writings were lost until 1552. He was not alone in his observation. William of Saliceto in 1275 described contralateral paralyses and quoted Avicenna as having made the same observation. Berengario da Carpi in the 15th century described how paralyses could be ipsilateral or contralateral also quoting Avicenna. Ambroise Paré noted that a convulsion or a paresis could occur either on the injured side or the opposite side. James Hill of Dumfries was the first person to use contralateral neurological deficit as a component of his surgical planning. However, the relationship was not finally accepted until in 1867, when Sir Jonathan Hutchinson insisted that localization of an epidural haematoma could be achieved by noting that a hemiparesis would be contralateral, while a fixed dilated pupil would be ipsilateral.

A history of cranial nerves

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In 1543 Vesalius published the Fabrica, in which he illustrated and designated seven cranial nerves, with little change from the seven described by Galen nearly 1500 years before. In 1664, Thomas Willis, the Oxford anatomist, clinician, and physiologist published his work *Cerebri anatome*, in which he described 10 cerebral nerves; the Willis 10th was soon recognised as the 1st cervical nerve root. In his doctoral thesis of 1788, Samuel Soemmerring, a German physicians/anatomist, renamed the cranial nerves, nominating 12, which form the basis of our modern nomenclature.

Although German and other European anatomists soon adopted this nomenclature, British anatomists did not.

This study will follow the story of the illustration and nomenclature of the cranial nerves in works published in Edinburgh in the late 18th and early 19th centuries and, later, the London anatomy schools through the 19th century. British anatomists preferred to retain the Willis classification (1664), and only slowly did they transition and subsequently fully accept the Soemmerring (1788) classification. In Gray's famous anatomy text, *Anatomy descriptive and surgical*, first published in 1858, Gray and Carter use the Willis classification, while Soemmerring's twelve does not occur until the 11th edition of 'Gray's anatomy' in 1887. This finding is shared by all the English anatomy texts of this time.

Sympathetic innervation of salivary glands: Textbook contradictions and long-lasting conundrum in research literature

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Information regarding the effect of the sympathetic nervous system on the function of the salivary glands is contradictory and confusing. Some Anatomy and Physiology textbook authors claim that activation of the sympathetic nerves decreases flow of saliva, while other suggest that sympathetic innervation has a stimulatory effect. We have investigated the historical roots of this contradiction. Since the beginning of the second part of the 19th century, studies of C. Ludwig established the excitatory action of the sympathetic nerves on the activity of the main salivary glands. These findings were later confirmed in brilliant experiments by C. Bernard, C. Eckhard, R. Heidenhain and J. Langley. By the beginning of the 20th century, I. Pavlov and W. Cannon observed and emphasized that fear and other unpleasant emotional reactions arrest salivation and release of other digestive juices. Cannon related fear to the generalized activation of the sympathetic nervous system, the so-called “Fight or Flight” response. Apparently, Cannon’s stature and popularity became the driving force advancing the notion about the inhibitory role of the sympathetic system on the outflow of saliva. This idea permeates a segment of the teaching literature today. However, unequivocal experimental proof of the suppressive effect of the sympathetic nerves on salivary secretion is still lacking.

The vegetative nervous system in the laboratory. Experimentation in the 1920s and 1930s

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Researchers made use of various laboratory technologies and techniques in order to make sense of nervous structures and functions linked to the vegetative nervous system. Apart from the ongoing identification of vegetative functions and structures in the late nineteenth century, the antagonistic organization of the vegetative subsystems proved to be the most problematic but also the most promising aspect of this research. This paper looks at two researchers, one at Harvard University and one at the University of Zurich, and their physiological experimentation. Walter Bradford Cannon (1871-1945) in Boston and Walter Rudolf Hess (1881-1973) in Zurich, both being initially concerned with some of the central physiological problems of the time, created specific experimental systems based on the vegetative antagonism. They made use of novel technologies, techniques, animal models, and physiological concepts to investigate the 'epistemic thing' of the vegetative nervous system. Cannon and Hess represent exemplary cases in the history of the vegetative nervous system for several reasons. First, both represent one important aspect of the vegetative nervous system: in Cannon's case, the sympathetic nervous system and the 'fight or flight' mechanism; in Hess' case, the parasympathetic nervous system and sleep, respectively to relaxation. Second, both established research networks in the US and in Europe, which included the central protagonists of this sort of physiological research. Third, both were well-respected and regarded physiologists; in Cannon's case, in the context of the global outreach of his scientific and political interventions, in Hess' case, in the context of the awarding of the Nobel Prize for Physiology or Medicine in 1949.

The anatomical history of the brainstem

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For many species, the brainstem is all there is, but in mammals, it has been overshadowed by larger and larger hemispheres taking it out of focus. Its buried position may have contributed to its long neglect. The dorsal part of the brainstem was labeled as mounds, protuberances, and apertures with scatological designations. Edwardian contributions were largely reflex functions of the spinal cord and activities of the sensorimotor cortex, leaving the stem of the brain undiscovered. This lecture describes the discovery of the brainstem beyond its tracts and neurons and how it became recognized as the most vital part of the brain.

Cartography of the early neuro-cinema

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The birth of neuro-cinema occurred under the influence of positivism with important scientific and cultural changes. Neuropsychiatry was the first medical discipline able to incorporate and use cinematographic instruments in clinical practices, displaying various physiological and pathological phenomena of movement. Motion pictures have been an important medium for general educational purposes as well as training, scientific and clinical practice in the neurosciences. The development of neuro-cinema started with the first motion pictures in Philadelphia (1885) with Eadweard Muybridge (1830-1904) and Francis Xavier Dercum (1856-1931) and in Paris at the Station Physiologique (1882) with Étienne Jules Marey (1830-1904) and Albert Londe (1858-1917). From the early 20th century onwards,animated photography applied in neuropsychiatry spread throughout Europe: in Germany (Simons, Nonne, Krapelin, Hennes), in Italy (Polimanti, Negro, Neri), in Romania (Marinescu), in France (Sainton, Comandon in collaboration with several neurologists), The Netherlands (Rademaker), in Spain (Mestre), in the United Kingdom (Campbell), Belgium (Van Gehuchten), and in Austria (Schüller). This diffusion of neuro-cinema was crucial in disseminating knowledge of psychiatric and neurological disorders as key factor for diagnosis and therapeutical approach.

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Between superstition and science – neurology in silent fiction films

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The turn of the century was an important era for neurology. Jean-Martin Charcot made headlines with his notorious new therapeutic approaches in the no-less legendary Hôpital de la Salpêtrière. Colleagues such as Sigmund Freud developed new theories on the pathogenesis of neurological disorders and experimented with illegal substances like cocaine, for example. But did this modern image correspond to the social reception of the field? And how was it framed in films? Surprisingly, there are no systematic papers or other literature on these questions, neither by medical nor film historians. The talk aims to close the gap in contemporary research and provides a systematic overview of the representation of neurologists, neurology, and their patients in silent cinema. With the aim of sketching a representative image, ten works portraying neurological symptoms were identified and, among other things, historically classified, analyzed, and evaluated for medical correctness. The main question was: Is the subject area being distorted? Are symptoms such as seizures misinterpreted as witchcraft, or do the directors' approaches conform to scientific standard? To put it simply: where between superstition and science do early filmmakers really depict neurological disorders? And what can we learn from the gained knowledge?

Curing neurological disease „à la bretonne“: Léon Perret’s silent movie “The Mystery of the Kador Cliffs” (1913)

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A young girl develops persistent akinetic mutism after a family drama including intoxication and emotional trauma. A professor of medicine, author of the pamphlet “On the application of the cinematograph in neuropsychiatric disorders,” uses re-enactment of the drama and confrontation therapy for curing his patient. A discussion of Perret’s early masterpiece will include the influence of the coast of Brittany on cinematic characters as well as the novel idea of using film itself instead of hypnosis to cure functional neurological illnesses.

Paralysis in film: From Mary Pickford to Marlon Brando

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Paraplegia and successful recovery started in the silent film era and was portrayed in *Stella Maris* (1918). A ‘brilliant’ surgeon operates on the protagonist (Mary Pickford) so she can walk again. Pickford would reprise her role in *Pollyanna* (1920), based upon Eleanor H. Porter's beloved children books. Pollyanna Whittier is the ever so optimistic girl who sees life always from a good perspective (“the glad game” "I'm glad, glad for--everything now!"). She becomes paralyzed after she is run over by a car while saving a little child. She walks again, also after some undefined surgical procedure. Traumatic paraplegia in silent film was fully recoverable.

Brando‘s first film was *The Men* (1950). This film focused on the marital difficulties of a postwar paraplegic. Brando understood the audience’s desire to identify with the character. To prepare for the role, he spent months in a wheelchair surrounded by men with paraplegia in Birmingham Veterans Hospital. To look the part, he practiced with heavy leg splints and buffed up his upper torso. *The Men* is about the life of a paraplegic and the permanence of his deficit. Sexuality is central to the film (he is unable to father a child).

Hollywood treated traumatic paraplegia differently over a short time span and went from certain recovery to no hope for recovery. The films provide an insight into changing (more realistic) attitudes about life with paraplegia.

Dr. Oliver Wendel Holmes, Sr., and phrenology: How a physician, writer and humorist lampooned a 19th-century medical fad

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Oliver Wendell Holmes, Sr. (1809-1894), physician and Professor of Medicine at Harvard, was also one of the most famous American humorists of the nineteenth century. Trained in Boston and in Paris, he incorporated medicine in lectures, magazine articles, novels, and poetry. He was not restrained about debunking older medical fads and what he considered newer follies including heroic interventions (e.g., bleeding, purging), homeopathy, and phrenology. This presentation examines how Holmes's exposure to phrenology as a medical student, his score when Lorenzo Fowler evaluated his skull, and then how he lampooned phrenology in different venues.

Holmes saw phrenologists as frauds who selected only cases that confirmed their ideas and, as "professors" in practice, relied mainly on advanced information, observing how people dressed, and asking revealing questions. But while dismissive of craniometry and its practitioners, Holmes praised Gall for recognizing the brain as the organ of mind and for drawing attention to individual differences, how personality traits are transmitted to children, and the fact that some criminals have severe brain defects. In fact, he credited Gall and Spurzheim for helping to lay the foundations for scientific anthropology and the modern fields of psychiatry and psychology. By examining what Holmes (and, later, Mark Twain, who was not a physician) conveyed to large audiences, we can more fully appreciate some of the factors contributing to the decline of one of the most important, pseudo-scientific fads of the nineteenth century.

A phorgotten phrenologist

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There is recently rekindled attention to Franz Joseph Gall's ideas and their relationship to the historical development of neuroscience, highlighting componential models of behavior correlated with componential models of brain. With respect to language, Gall's Sprachsinn and Wortsinn are arguably linked to later 19th-century models of language that allocate the control of the vocal tract muscles, the control of the phonology of speech production, and the memory for words, to separate brain structures (e.g., Broca, Bouillaud, Dax, Parchappe, Dejerine, Marie, Wernicke, Hughlings-Jackson, Meynert et al.). Often overlooked in contemporary studies is the contribution of minor phrenologists publishing in *The Phrenological Journal* and *Miscellany* (and other phrenologically-oriented journals). For instance, an obscure country surgeon from Kilmarnock, Scotland, Mr. Alexander Hood, published a series of case histories in 1824, one of which accurately described the features of the language disorder later named Broca's Aphasia. Hood employed phrenological methods of clinicopathological correlation (curiously valid, albeit wrong) to argue for the localization of the language "organ" (to the left frontal lobe); in addition, he analyzed his patient's inaccurate utterances to fractionate language into two components for the control of speech production (articulatory and phonological) and one component of central language (word memory). This was more precise and, needless to say, more modern than Gall's model in his last six books (1825), the 18 lectures published by Spurzheim in *The Lancet* starting in 1824, or Bouillaud's famous 1825 paper.