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ABSTRACTS

NEUROPSYCHIATRIC DEPARTMENTS IN THE PERSIAN HOSPITALS FROM ANCIENT TIMES TO 15TH CENTURY

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The first hospital reported from 6th century AD was in the Jondishapour University as an educational and also therapeutic hospital. After the entrance of Islam to Iran, hospitals were growth all around Iran. Hospitals had different wards such as internal, surgery, orthopedic, pharmacy, gynecology, etc. and also different specialists who worked on. One of the interesting departments was for psychiatric and also neurologic disorders; in some hospitals there were two separate departments too. An especial location, namely "*dar al majanin*" was established for acute maniacs. On the other hand, many of famous Persian doctors who worked in hospitals had great achievements in neurosciences such as Rhazes. Others were specialist in neurology, such as Akhawaini, who was called "*pezeshk e divanegan*" (physician of maniacs). In this study have been considered the following hospitals: *Azodi* hospital in Shiraz (10th century AD), *Mozafari* hospital in Shiraz, *Sahebi* hospital in Tabriz (13th century AD), *Ghazani* and *Rabe' Rashidi* hospitals in Tabriz (14th century AD). The importance of neurologic and psychiatric disorders in medieval Persian hospitals is clearly shown. History helps us to clarify some aspects of the development of neurosciences.

MUSIC AND THE BRAIN AFTER BROCA

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Soon after Pierre Broca's pioneering observations on aphasia in 1861 the interest of some investigators turned to the cerebral representation of musical competences in the brain. The first attempts to localise musical functions can be found in papers published in 1865 by Bouillaud and 1888 by Knoblauch, who coined the word "amusia" and analysed the disturbed musical functions of patients with brain diseases. However, although interest never ceased, there were only relatively few further publications until 1977, when the now classic book "Music and the Brain", edited by Macdonald Critchley and R. A. Henson came out. This book substantially alerted the scientific community to the neurological aspects of music by providing a complete account of the literature on the subject: no more than thirty papers, including that of Alajouanine [1948] on Ravel's degenerative encephalopathy and the paper by Luria et al [1965] on Shebalin's stroke.

Subsequently, various groups gradually emerged that gave a new impetus to investigating the relationships between the neurosciences and music. The investigations have taken advantage of the wide range of modern techniques and have led to impressive advances in our understanding of the musical brain. The main groups interested in neurosciences and music were present at the conference "The Biological Foundations of Music" (New York 2000) sponsored by the New York Academy of Sciences, and at the series of "Neurosciences and Music" conferences sponsored by the Mariani foundation of Milano (Venice 2003, Leipzig 2005, Montreal 2008, and Edinburgh 2010). These meetings originated a series of volumes published in the Annals of the New York Academy of Sciences, which reflect the development of *Neuromusic* in the last ten years (Zatorre and Peretz 2001 Avanzini et al 2003, Avanzini et al 2005, Dalla Bella et al 2009) .

FRANCIS SCHILLER, WILDER PENFIELD, AND THE NATURE OFT HE MIND

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Francis Schiller (1909-2003) was a distinguished neurologist who devoted much of his scholarly competence to the history of his field. He is best known for the monograph on Paul Broca, the French explorer of the brain. Wilder Penfield (1891-1976) worked over several decades as a neurosurgeon at the Montreal Neurological Institute and was famous for his successful treatment of temporal lobe epilepsy. As clinicians, both Schiller and Penfield were confronted with the problem of human consciousness. In addition to the practical aspects, Schiller and Penfield were interested in the neurophysiologic mechanism of consciousness. This question led them to formulate hypotheses concerning the interaction of mind and brain. Their ideas of the mind differed substantially. Penfield conceived the mind as an independent substance which directs the brain in action. Schiller maintained the view that the mind is not material: Mind is a word which stands, not for a thing or substance, but for a set of powers and activities.

THE WOMEN'S BRAIN AND MENTAL SKILLS: A NEVER ENDING STORY?

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The history of localization of mental skills in the brain has implicated, over the centuries, approaches based on physiognomics, phrenology, and the study of élite brains. Women are rarely mentioned in physiognomics essays, except for stereotyped representations of aesthetic beauty or anomalies. Women have also received little attention in phrenology, although phrenological maps of women's heads can be found in the iconography of the times. Concerning the brain of gifted individuals, in the mid-1850s Rudolph Wagner described a remarkably convoluted appearance of the brain of the physicist and mathematician Carl Friedrich Gauss but could not confirm such features in the brain of other intellectuals. Wagner, however, took for granted that the minor development of cerebral convolutions was characteristic of arrested individual formation and indicated as examples of such "minor development" the brains of women and black Africans. This was in line with the belief of other eminent scientists, including the French psychologist and anthropologist Gustave Le Bon, who wrote in 1879: "In the most intelligent of races, as among the Parisians, there are a large number of women whose brains are closer in size to those of gorillas than to the most developed male brains…" Reports on the brain of famous women are very few, either because famous women were very few and/or that the woman's brain did not attract interest at times when scientists did not need to be "politically correct". Gustaf Retzius, however, examined the brain of the Russian mathematician Sonja Kowaleskaya. James Papez investigated the brain of Helen Hamilton Gardener, an American freethinker, and indicated in his study that women's mental capacity was potentially equal to men's. Gender- and sex-targeted neurobiology is nowadays in the forefront of neurosciences, but are we sure that the history of skills and women's brain has found an end?

CULTURE AND POLITICS IN VENICE BETWEEN LATE 1500 AND EARLY 1600: GALILEI AND SARPI

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The *Serenissima* Republic of Venice was an independent State located inside a country, Italy, that was in part subject to direct control by Spain and in part under the influence of the same country. The Republic itself was neutral, which did not mean, however, being unarmed. Venetians had fortified Bergamo and built the town of Palma to face the Hapsburg threat and the pressing and mobbing from Madrid and Vienna. Venice was diplomatically active, working for a solution of the crisis in France, which could help in balancing the international situation, and thus reducing Spanish predominance. This could allow for the independence of the *Serenissima*, which would otherwise ran the risk of suffocation. The free exercise of such independence was furthermore threatened by the interference of post-Tridentine Rome within the framework of *mixti iuris* (mixed jurisdiction). Sarpi (1552-1623) and Galilei (1564-1642) met against this background. They shared a passion for science, but had very different political attitudes and beliefs. Galilei's mind was focused on reading the “book of nature” through “mathematical sciences”. His truth, meaning the truth of science and in science, was *super partes*, and it did not belong to a history of confused turmoil. What Galilei demanded of history was an optimal basis for his own investigations. Proof of this is the fact that eventually he left Padua for the “*terrazzo eminente*” (eminent terrace) from which he could study the sky, i.e. the position offered to him by the Medici micro-absolutism in Florence. Venice would not provide him with anything like that. By doing so, however, Galilei left behind those who could defend him from Rome. Galilei was not aligned with any political parties. This did not mean – despite his neutrality – that he could avoid being affected by the turmoil of his times. In addition to the truth of science, truth should also be compatible with history. Galilei turned out to be a victim of history. On the other side, Sarpi was politically aligned. Coming out of the clash between Venetian and Papal power, he decided to fight by singing “political songs” and putting the “thought on natural and mathematical things” aside. He returned to those topics later on in his life, as his trust in history had weakened.

COGNITIVE NEUROPHYSIOLOGY AND MENTAL PROCESSES: NEUROPHYSIOLOGY AND NEUROPSYCHOLOGY

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The pioneering studies of the physiologist Angelo Mosso on bodily and cerebral concomitants of emotions and other mental activities in humans had established strong links between brain physiology and psychology in the Italian academia of the 19th century. These links were weakened in the first decades of the 20th century when academic physiologists thought that the best tradition of their discipline required them to work on many disparate organs, apparatus and functions of the body, and not solely on the nervous system, and that animals were preferable to humans as subjects for fully controlled experiments. The research style developed in England by Sherrington and Adrian, who as professors taught all of physiology but did their experimental work only on the nervous system, and are therefore known as bona fide neurophysiologists, was introduced in Italy in the 1950s by Giuseppe Moruzzi, who had been trained by Mario Camis, a pupil of Sherrington, and by Adrian himself. Moruzzi did not work on humans, but made major contributions to the understanding of mechanisms of human consciousness, and thus to neuropsychology, with his discovery with Magoun of the brainstem reticular formation, and with his midpontine cat preparation as an animal model of the human locked-in syndrome. I started my career as a neurophysiologist under Moruzzi more than 50 years ago, and the research interests that I have developed during a half century have brought me repeatedly in contact with neurologists, psychologists and other neurophysiologists attracted by the scientific enterprise called neuropsychology and more recently cognitive neuroscience. In this presentation I will describe

some of my personal experiences as a participant to the foundation of the first neuropsychology group in Italy, a member of the International Neuropsychological Symposium, and a contributor to the editorial activities of the two earliest neuropsychological journals, Neuropsychologia and Cortex.

ART AND NEUROLOGY: JEAN-MARTIN CHARCOT

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Jean-Martin Charcot was one of the first clinicians to introduce systematic drawing of patients, lesions, and histological studies into the routine in hospital practice. Later in his career, he stimulated the use of photography for the same purpose, and was at the origin of the famous 3-volume set of the "Iconographie photographique de la Salpêtrière", which was produced by Regnard and Bourneville, and focused on patients with hysteria and epilepsy. He also supported the career of Paul Richer, who was both a neurologist and an artist, and who ended up as a full professor at the Beaux-Arts Institute in Paris. Thanks to Richer, several of Charcot's cases were immortalized in vivid drawings, which subsequently illustrated textbooks on hysteria and other topics. Their co-authored book on difformities in art has remained famous today. It was probably the first attempt to pick up and analyze specific diseases represented in religious and non-religious paintings, statues and architecture. But Charcot also used to make private drawings such as sketches of colleagues during boring faculty meetings, self-portraits which were surprisingly comical, and copies of medieval statues and pictures. A few drawings by Charcot under the influence of hashish are also known, at a time when experimental intake of this substance was popular in intellectual circles. However, Charcot's artistic tastes were rather conventional, and he never supported or acquired art from contemporary «avant-garde» artists, such as the impressionists. Charcot's home was overloaded with pseudo-gothic furniture, which suggested a capharnaum. Charcot's wife also painted flowers, and their son Jean-Baptiste inherited their skills, which he mainly used for drawing boats, even before he left neurology to become a famous polar explorer.

TWO PROFESSIONAL GROUPS, TWO JOURNALS: A REFLECTION OF THE HISTORICAL EVOLUTION OF NEUROPSYCHOLOGY IN ITALY AND IN EUROPE

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This presentation focuses on the development of Neuropsychology in Europe and in Italy through the study of two groups, the International Neuropsychological Symposium (Symposium) and the World Federation of Neurology Research Group on Aphasia and Cognitive Disorders (RGACD). It will also relate the birth of the first Journals dedicated to Neuropsychology: *Cortex* and *Neuropsychologia*.

The idea of creating a group "to promote knowledge and understanding of brain functions and cognitive issues on the borderland of neurology, psychology and psychiatry" saw the light in 1949 and led to the first Symposium in 1951. Early on, membership included, in addition to Henry Hécaen and Oliver Zangwill, neurologists mainly from Germany and Austria. Starting in 1964, participation of the Milan group and other Italian researchers became more and more noticeable. The topics covered at the Symposium meetings showed a gradual shift from syndromes to finer analyses of brain and behavior relationships, as well as processes such as consciousness and motivation.

The RGACD (originally "Problem Commission on Aphasiology") held its first meeting in Varenna, Italy in 1966. Many Italian neurologists (including Ennio DeRenzi, Luigi Vignolo, first Deputy Secretary and Guido Gainotti, Chair from 1984 to 1990) played a prominent role in its

development. Initially dedicated mainly to language disorders, the group added Cognitive Disorders to its name in 1992. It now emphasizes other disciplines particularly Neuropsychology and Cognitive Psychology.

The foundation of *Cortex* and *Neuropsychologia* was intertwined: when the original Editorial Board of Neuropsychologia heard about the project to create Cortex, they toyed with the idea of merging the two Journals because they felt that there was no room in the publishing world for more than one Journal. A 2004 publication (Sullivan et al., *J Clin Exp Neuropsychol* 26: 291, 2004) lists 31 Journals that are considered essential in clinical neuropsychology.

AGALMATOPHILIA OR THE LOVE OF STATUES: FROM PSEUDO-LUCIAN TO DSM-IV

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Many accounts attest that one can enjoy with a work of art relations more akin to those of carnal love than to the contemplative delectation one attributes to the connoisseur.
Pygmalion was said to have fallen in love with a pretty ivory Venus he had sculpted. The goddess took pity on him and brought the statue to life. The myth has a happy ending: Pygmalion wedded the animated statue, and the couple lived happily ever after. His many imitators were less fortunate.

Romantic poets such as Eichendorff or Heine relate many strange tales of love for statues (*agalmatophilia)*, typically describing the adventures of a young man attracted by a graceful marble Venus.

The prototype of these marble beauties is Praxiteles' *Aphrodite of Cnidos*, for which Phryne, a celebrated *hetera*, was said to have been the model. The pseudo-Lucian describes the enthusiasm of three young visitors who first see the statue in her sanctuary. When they notice a small blemish on her buttocks, the guardian tells them the incredible story of a young man who had desperately fallen in love with the goddess. One day, he slipped through the door, hiding himself in the innermost recess, and in the evening, he was locked into the temple. Need I mention, adds the pseudo-Lucian, "the daring assault perpetrated on that wicked night"? At day-break, the traces of his lovemaking were discovered, and the goddess bore the stain as a sign of the outrage she had suffered. As for the young man, he is said to have thrown himself into the waves of the sea. Dangerous fantasies! In agalmatophilia, there is always a hint of melancholy, of necrophilia even. It is the soothing arms of death that we seek in the marmoreal embrace.

Literature may indeed offer a more insightful approach to agalmatophilia than psychiatry. Krafft-Ebing described several cases of *Statuenschändigunen* in his *Psychopatia Sexualis* (1893), but agalmatophilia was introduced in the anglo-saxon nosology only in 1975, by Scobie and Taylor. In 1994, it was admitted into the DSM-IV, among the paraphilias; and it may be "depathologized" in the DSM-V.

CRYSTAL SOULS: ERNST HAECKEL'S MONISM AND THE EVOLUTION OF THE SOUL

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Neurophilosophy has revitalized the ancient debates between monism and dualism, and between different shades of monism. In this context the theories of the German zoologist Ernst Haeckel (1834-1919) deserve to be revisited.

A fierce defendant of Darwinism, a leading systematist specialized in marine zoology, and the popularizer (if not the author) of the influential "biogenetic law" (ontogeny recapitulating phylogeny), Haeckel was a multifaceted genius: as the author of a first "synthesis" of evolution, linking

morphology, comparative anatomy and embryology, he may be considered as the father of "evo-devo"; his book *Kunstformen der Natur* influenced "art nouveau" artists such as Binet and Obrist; and he also acted as the prophet of a new materialist religion, Monism, that he preached through his popular books and through the German Monist League.

This presentation will focus on Haeckel's idea of the evolution of the soul (*Seele*), based mainly on his lesser known writings *Die Perigenesis der Plastidule* (1876), *Zellseelen und Seelenzelle* (1878), *Gottnatur* (1914) and *Kristallseelen* (1917).

Haeckel's monism resembles hylozoism, as his hierarchy of souls includes the inorganic matter. Atoms have a "proto-psychism", attraction and repulsion being akin to and desires and aversions, as in Goethe's *Wahlverwandschaften*. Between atoms and cells Haeckel postulates an intermediate elementary particle, the "*plastidule*", a material, living, thinking, remembering entity resembling Leibniz's monad. Cells have a "cellular soul" that is the integrated sum of the psychic life of the plastidules. Pluricellular organisms have a more complex soul integrating their cellular souls. Crowds, nations, have a collective soul.

Haeckel thus attempts at providing a "monist and materialist" explanation of the mind and of its evolution, where life and mind are constitutive of the elementary components of living organism, the "*plastidules*", which also carry heredity.

Haeckel's monism has a distinct romantic character. A great admirer of Goethe, Haeckel sees Nature as divine (*Gott-Natur*), as the great Unity linking the inorganic and the organic world, the microcosmos and the macrocosmos, represented in an emblematic fashion by the genealogical trees showing the kinship of all natural beings. His chains of ancestors may be seen as a novel version of the *scala natura* of the *Naturphilosophen*.

KARL POPPER'S ACADEMIC MISTREATMENT IN AUSTRALIA: AN UNINTENDED BENEFIT TO NEUROSCIENCE?

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Since historians can hardly experiment, asking "What if?" is their only substitute. There have been several such questions in Australia's intellectual history. One of the earliest concerns what might have happened to Australian biological science, not to mention the reception of Darwin's *On the origin of species*, if the first Senate of the University of Sydney had not inexplicably deleted TH Huxley's yearned-for professorship of Natural History from its small group of foundation Chairs in 1849? And what if Karl Popper had been appointed to one of the Australian academic positions for which he applied and not been forced to accept "exile" in New Zealand?

While in Christchurch he met and convinced John Eccles (then working in New Zealand, also in a form of exile from Australia) that his dogged opposition to the concept of chemical, rather than his favoured electrical, transmission at synapses was not a career-destroying error; rather that this scepticism (or insistence on falsification of scientific theory) is the only authentic scientific approach. Revitalised, Eccles went on to do great work on synaptic inhibition and excitation in Dunedin and Canberra and to serious collaboration with Popper on several challenging books on neurophilosophy.

What if Popper's application in 1938 for the Chair of Philosophy within the University of Queensland had not been rejected on blatant anti-semitic grounds? Or he had not felt the need to withdraw his application for an appointment in the Philosophy Department in the University of Sydney (1945) when he realized that (again for reasons of anti-semitism as well as xenophobia) his selection was highly contentious and approved by the Senate with the narrowest possible majority?

Plainly, both of those universities made foolish and intellectually costly decisions -- but what might have happened to the course of neuroscience if they had not acted so ignobly?

"WET-BRAIN" AND "DRY BRAIN": COMPETITION AND ACCOMMODATION

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Our thinking tends to be determinative. In medicine, that can dictate both action and concepts. So when medicine transformed the Aristotelian notion of the four constituent elements of the world into the four humours, this made the brain, with the other organs, subject to their influence. Inevitably, the concept of the "wet-brain" was born.

However, when, at the end of the eighteenth century, Galvani and Volta discovered "animal electricity" (which, in 1758, Hieronymus Gaubius had speculated to be the "vital force" of life), there was, in Kuhnian terms, a "paradigm shift". Thereafter, the gradual emergence of the cell theory of tissue structure and the eventual acceptance of the "neuron doctrine" demanded a new intellectual approach. How were the activities of discrete cells (notably in the integrated nervous system) to be co-ordinated?

In 1897 Sherrington devised the term "synapsis" as the mechanism, and that concept triggered remarkable developments over the following quarter century or so. In 1902 Starling and Bayliss discovered secretin, then in 1905 Starling coined the word, "hormone" for this new class of agents. Just as Cajal's histology had radically confronted Golgi's conservative notion of the syncytial neural network, that hormone concept was the death-knell of Pavlov's belief in an exclusively neural basis for physiological controls. It was not long before the discovery of insulin (1916-1921) and Loewi's demonstration of chemical transmission at vagal endings.

In this short time-span, scientific endocrinology and chemical neurotransmission were born. Around 1950 their conceptual fusion began. First with histological studies and then Harris showed that hormones can drive neurons: specific effects were exerted on reproductive behaviour from location of stilboestrol in discrete areas of the hypothalamus.

Those revolutionary findings restored the importance of the wet-brain concept to parity with the previously dominant notion of the dry-brain and neuroendocrinology was born.

AN ANTHOLOGY OF PROFESSOR CAMILLO NEGRO'S NEUROPATHOLOGICAL FILMS

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Camillo Negro (Biella, 1861 – Turin, 1927), a Turin-based neurologist, was a pioneer in experimenting with the new media of film for use in science and medicine. From 1906 to 1908, with help from Giuseppe Roasenda and in partnership with Roberto Omegna – one of Italy's most accomplished camera operators, who was also destined to play a leading role in national scientific cinematography – he filmed "classic examples" of the sick he treated at the Ospedale della Piccola Casa della Divina Provvidenza (also known as the Cottolengo) and in the nervous diseases wing of Turin's Policlinico Generale. This footage, whose original title was *La neuropatologia* and which was used for didactic purposes, was also screened in public during many scientific conferences. This work of film documentation, carried out by Camillo Negro and Roberto Omegna, continued during the First World War, filming soldiers admitted to Turin's military hospital.

In 2011 the Museo Nazionale del Cinema in Turin, in partnership with the University of Turin's Faculty of Neurosciences, published a new edition of the neuropathological films made by Camillo Negro. Starting with the original footage present in the museum's own collection and materials that had already been preserved in the 1990s, the museum has suggested a new order for the episodes, reconstructed on the basis of original prints, it has separated those materials dealing with neuropathology and those dealing with war syndromes and includes new, unpublished materials.

The museum's collection also includes 16mm footage probably filmed in the 1930s by Dr. Fedele Negro, Camillo's son. One of these films is devoted to celebrating the effects of the so-called "Bulgarian treatment" on Parkinson's disease. The footage was probably filmed to promote this treatment by presenting it to Queen Elena in the hope of gaining her financial and political support. Apart from its scientific value as a record of syndromes that today are very rare or non-existent, the new edition of *La neuropatologia* and Fedele Negro's films encourages us to reflect more generally on the relationship between doctors and patients and how impossible it is for the medium of film to remain impartial.

INFLUENCES OF FUNDAMENTAL RESEARCHES ON NEUROPATHOLOGICAL CLINICAL STUDIES IN FRANCE DURING THE 19th CENTURY

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How discoveries about the brain and the histology of the nervous system were used in the investigation of clinical neuropathologies? At the onset of the 19th century, the structure and on the properties of the nervous apparatus were largely ignored. After the disputes of Galvani and Volta on animal electricity, the pioneering works of Fontana and Rolando, the opposition between Gall and Flourens, studies were made at the level of the entire brain in order to characterize the different areas, while others in histology were made at the level of cellular organisations to define cellular bodies and peripheral fibers. In 1839, the two anatomists François Leuret (1787-1851) and Louis Gratiolet (1815-1865) described the comparative anatomy of different brains, describing different lobes and areas. Such "brain cartographies" were the beginning of other studies demonstrating the importance of localization in opposition of the theory of Flourens. The discovery of cellular organisations by Camillo Golgi and Santiago Ramón y Cajal was a great revolution affecting the Parisian scenes of neurology, physiology and anatomy. It was taken seriously and opened a large field of enquiry. It made possible the descriptions by Charcot and his pupils, Joffroy and Gombault, of the neuronal lesions involved in the paralysis of SLA. Such fundamental studies were crucial in the preclinical examination of patients. If at the start of the century, such analyses were not very as careful as at the end, these clinical examinations were particularly careful and well done as in the case of Joseph Babinski.

NEUROSCIENCE AND PSYCHOLOGY: HISTORICAL NOTES

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The relationship between neuroscience and psychology was basically born with Sigmund Freud, who in one of his first writings, *"For a project of psychology* (1895), introduces his *General Scheme* in the initial chapter: "The intention of this project is to express a psychology which appears as natural science, that is, to represent psychical processes as conditions determined in quantity from identified material particles, in order to make them clear and indisputable" (p.201), and later: "one of the main characteristic of the nervous tissue is memory, generally speaking, the faculty to suffer a permanent alteration following an event (…) The second system of neurons (ψ) could find itself in modified conditions following each excitement, and offer, therefore, the

possibility to represent memory (…) impermeable neurons, which are the vehicles of memory and presumably also some general psychical processes" (pp. 204-205) and, furthermore, "We think, at the moment, that the system *ψ* identifies itself with the grey substance of the brain"(p.209).

We find in Freud's works references to biological and neuro-scientific dimensions; in *Introduction to Narcissism* (1914): "We must remind, thirdly, that all psychological notions which, from time to time are formulated, must some day be based on an organic sub-layer" (p.448); in *Further to the principle of pleasure* (1920): Besides, it should be unmistakably cleared that the uncertainty of our speculation has been considerably enhanced by the necessity to turn to biology. Biology is a field of unlimited possibilities, from which we can expect the most surprising clarifications; we cannot, therefore, imagine which answers it may give, within a decade, to problems which we have proposed. Maybe such answers could let all the artificial build-up of our hypothesis to fall" (p.245). Freud has knowledge of the relationship between biology (neuro-science) and psychology, he catches the interconnection and he suggests the possibility for a uniform and theoretical decoding.

SCIENCE AND THEOLOGY IN GALILEO'S THOUGHT

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The paper will focus on Galileo's conception of sense and reason in the scientific investigation and their (at least partly) controversial relationship to faith. This relationship will show Galileo's indebtedness to some areas of the Aristotelian philosophy and the tradition of Averroes, a long-established and strong presence at Padua University. The question will be raised as to whether this cultural debt toward the Aristotelian side of Galileo, known for his mainly inclination towards Plato, was a tactical concession to his adversaries or reflected more genuinely his own opinion.

THE HISTORY AROUND A GENETIC CONDITION FROM DEMON POSSESSED TO LESCH-NYHAN DISEASE

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A young boy speaking in an incomprehensible manner, using foul words, moving with sudden and incontrollable movements, aggressive towards others and self-mutilating his body.

Add to this terrible image the fact that this boy has to be bound to his bed to prevent him from hurting himself or others.

There is little doubt that centuries ago this kind of a description would only fit a case of demonic possession and the restraints would be there to prevent the demon from doing harm.
In 1963, a 4 years old boy with a similar story came to the attention of paediatrician and biochemical geneticist William Leo Nyhan and his student Michael Lesch at the John Hopkins Hospital.

His terrible story had two distinctive additional features; he had uric acid crystals in the urine and a 4 years older brother with the same condition.

The two brothers led to a scientific description of the condition and it became an X-linked recessive disorder with progressive mental retardation and a bizarre tendency to self-mutilation.
Henceforth this condition became also known as Lesch-Nyhan disease (LND).

It took less than three years for dr. Jarvis Edwin Seegmiller and his colleagues to identify that LND was due to the deficiency of the enzyme hypoxanthine guanine phosphoribosyltransferase.

Science required several years until the gene encoding the human enzyme could be cloned and sequenced.

Theodore Friedmann and colleagues unravelled the code of the HPRT1 gene in 1985.
1966 was the year that gave the condition its first treatment that would dramatically improve the patients' quality of life.

The drug used was allopurinol, a purine analog capable of inhibiting the enzyme xanthine oxidase that converts xanthine into uric acid.

Sadly this treatment would be limited to the direct effects of hyperuricaemia, namely a very severe form of gout, but wouldn't allow any improvement of the "demonic possession".

Time passes and Lesch-Nyhan disease has undergone a dramatic change over time.

Today we know the "demon" and know how to deal with some aspects of its "possession".

We learned that the gout caused by HPRT deficiency isn't like the "rich men" gout and that low purine diets not only aren't useful but can harm the boys.We know so much now yet we are still struggling to find the correct "exorcism" to banish LND forever from our affected boys.

VENICE, GRADENIGO AND ITS SYNDROME

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From the thirteenth century the central organs of the government of the Venetian Republic, the *Serenissima*, formed a pyramid, with the General Assembly at its base and the doge at its apex. The nomination of the Doge, the ruler of the Venetian Republic, the Serenissima, was made by a body of wise men, or *sapientes*, whose task was to make their choice among the members of powerful Venetian families. In 1268, however was elected doge Pietro Gradenigo at the age of thirty eight and he reformed the Great Council, whose members were considered nobles and nobility was viewed not a matter of personal life but as hereditary.

The Gradenigo family is one of 12 oldest established families: Bartolomeo served as doge from 1339 to 1342 and Giovanni was elected in 1335; in the following years, and together with other members of the 'old families', the Gradenigo reappeared again and again in top commands and embassies until the end of the Venetian Republic in 1797.

Giuseppe Gradenigo (1859-1926) was the son of the physician Pietro Conte Gradenigo (1831-1904). On the advice of his father he turned to otology, working in Vienna under Adam Politzer (1835-1920), and at the same time worked on the embryology of the ear under Samuel Leopold Schenk (1840-1902). In 1889 he became head of the otoiatric department of the Torino polyclinic, and subsequently headed the ear-nose-throat chair... In 1904 he described a syndrome which carries his name, related to suppurations of the ear. This comprised a triad with diagnostic significance of infection, more or less severe, of the apex of the *pars petrosa temporalis* and of the adjacent meninx, derived from the middle or internal ear: acute or chronic suppuration of the ear; paresis or paralysis of the homolateral abducent nerve; homolateral trigeminal neuralgia.

Despite the tendency of erasing the eponyms, the Gradenigo or Gradenigo-Lannois syndrome is still widely known in the otoiatric literature.

One of Gradenigo most famous patients was the composer Giacomo Puccini (Madama Butterfly, Tosca. La Bohéme).

With Emilio Rossi (1844-1901) he founded the *Archivio Italiano di otologia, rhinologia e laryngologia* in 1893 and, with O. Brieger, the *Zentralblatt für Ohrenheilkunde* in 1902.

DOCTRINAL DISPUTATIONS. BRAIN, THE UNICITY OF MAN AND THE ORIGIN OF THE NEUROSCIENCES

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Despite their relatively young age, the modern Neurosciences have acquired in the past decades a central stand in contemporary biomedicine, branching out in innumerable fields (like economics, aesthetics, religious experience etc.) traditionally considered a reserve of the human sciences. This was perceived by some as a sort of cultural imperialism, an attempt at reducing the ineffable mystery of being human to a matter of neuronal connections and membrane potentials. The term "Brainhood" was coined to indicate the "anthropological figure" resulting from the reduction of the living subject to its brain. By exploring some of the early history (1940s-1960s) of modern Neuroscience in Great Britain and the USA, this paper aims at sketching a story parallel to that of the progressive neuralization/naturalization of behaviour. The paper will focus on some early controversies over the nature and causes of human behaviour, and especially on the question of the difference between humans and the rest of the animals, paying attention to the gradient of positions between the outspoken fideistic denial of the brain/self identity (e.g. JC Eccles, D.M. McKay) and the other extreme, the attempt at building mechanical models of the brain and of behaviour (e.g. J.Z. Young). Inbetween the extremes lie a series of ideological, epistemological and methodological stands (as expressed in the interest for the neurological correlates of religious experience or for ESP) that complicate the monolithic picture of the sciences of the brain, while showing all the complexities of their cultural descent.

AN EXPLORATION OF HYSTERIA: FROM NEUROSCIENCE TO THE ARTS AND ACROSS GENDERS

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The diagnosis of hysteria has existed for at least four-thousand years, with roots in the ancient Greek word *hysterikos*, referring to diseases of the womb. In sixteenth century medical discourses, female hysteria was caused by excess pollution of the womb, with fluids that were labelled 'female sperm' as the probable cause (Peterson 2004). The fluids, linked to menstruation, were released to save women from suffering from 'hysterical disorders'. In Shakespeare, there is a reference to *hysterica passio*, a term used by King Lear to self-diagnose an affliction, an early reference to male hysteria. *Hysteria passio* was a Latin term used to denote feelings of suffocation and choking, brought on by associated hysterical fits. Shakespeare shows how a disease associated with women, and the 'wandering womb' phenomenon that can be traced as a diagnosis back to the ancient Greeks, could have been spoken of in an associative way.

Hysteria in both sexes was famously diagnosed and catalogued by Jean-Martin Charcot at the end of the nineteenth century. Sigmund Freud, at the beginning of his career, came to Paris to study these hysterical patients. The two opened their clinic to observers which included literary men, newspapermen, doctors and artists. The visiting of his clinic became for men a kind of voyeuristic experience (Ireland 1998). Hence, in women there was a definite transformation of the nature of the meaning of hysteria from a neurological consequence of the sick womb, to sexual deviance. Portrayals of the male deviant would evolve by the Victorian era, concurrent with the diagnosis of 'spermatorrhea". There are very direct correspondences between the hysteria of spermatorrhea and the notion in Western medicine of the direct links between female hysteria and too much or not enough sexual energy release (Rosenman 2003).

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Rosenman, Ellen, “Body Doubles: The Spermatorrhea Panic.” *Journal of the History of Sexuality.* 12:3, (2003) : 365-400.

WILLIAM LENNOX ON THE STATE OF AMERICAN NEUROLOGY IN THE 1930s

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Neurology as a specialty expanded greatly in the decades before World War II. In many ways, its shape was determined by a small cadre of elite doctors, who exerted their influence through foundation funding decisions, specialty journals, and medical school hiring decisions. The values and concerns of this group permeate a private 1937 report written by William Lennox of Harvard University for Alan Gregg of the Rockefeller Foundation. Between June of 1935 and March of 1937, Lennox visited epilepsy researchers at a number of major medical schools; he also stopped to investigate several epileptic colonies. Overall, he was highly critical of even the best-equipped and most-sophisticated research individuals and groups. For Lennox, the socio-medical world of pre-World War II neurology was relatively small, its epicenters in major Northwestern and Midwestern cities, plus California (Baltimore was the most Southern city he visited.) However, the importance of this “Report” goes beyond the information Lennox offers about the directions of American epilepsy research in the 1930s. A writer who often enlivened his most technical publications with highly colorful language and images, Lennox carried that practice into the 1937 “Report.” He commented freely on personality quirks, physical appearance, gender, and ethnicity (when a researcher was Jewish). He described with care the intellectual pedigrees of those he visited, often giving special attention and praise to doctors with ties to his own institutions: Harvard Medical School, the Neurological Unit at Boston City Hospital, and the Neuropsychiatric Center at Massachusetts General. Finally, as he travelled across the United States, Lennox found many neurologists struggling to sustain research programs at hospitals that valued clinical work over (and, sometimes, even to the exclusion of) scientific experimentation. Hence, his “Report” offers valuable insight into the often-difficult situations of American brain researchers of the period.

WHAT DID KORSAKOV LEARN FROM MAGNAN?

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In the 19th century, alcoholism increasingly became a problem in the society; psychiatric institutions were crowded by alcoholics. Physicians primarily focused on social consequences and on hygienic aspects. Magnus Huss introduced the notion that chronic alcohol abuse should be regarded as a disease. In France, Valentin Magnan studied some physiological consequences of alcohol. He noticed that absinthe, a very popular liquer in France, may trigger epileptic fits. However, the study of the effects of alcohol abuse is generally associated with Sergey Korsakov. At that time, Russian physicians often went to Paris for a study trip in that period, and Korsakov did too. In this paper we will discuss Magnan’s views on alcoholism and investigate in what way Korsakov was influenced by these. We will discuss Korsakov’s connection to French psychiatry and we have analyzed Korsakov’s crucial papers on alcoholism and the syndrome, now known as Korsakov’s syndrome.

CEREBRAL THERMOMETRY

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The formulation of the first law of thermodynamics ("the conservation of force") by Helmholtz in 1847 gave physiologists and physicians the theoretical basis and the impetus to study metabolic activity, expressed as temperature changes, in the organs of animals and humans in various conditions. Technological achievements created among physiologists a sense of optimism that every physiological parameter is measurable. The developing concept that "insanity" was an organic cerebral disorder motivated an attempt in 1861 to measure, non-invasively the brain temperature in patients in various forms of depressive state. Not accepting the evidence presented by physiologists that this was an unachievable goal because of the abundant cerebral blood flow and tissues conductivity, Josiah Lombard of Boston, supported by Brown-Séquard, devoted many years to the measurement of brain temperature in deranged mental state and in response to willed motor activity. His work encouraged many others, in Europe and the US, Paul Broca among them, to explore and measure, though without critical evaluation of the data, the changes of tenths of and hundredths of centigrade in the temperature of the brain in health and disease by non-invasive methods of thermometry. Throughout these attempts that persisted into the eve of the twentieth century some researchers attempted to measure the "psychic energy" and several clinicians reported success in the localization of brain tumors.

The nineteenth century desire for non-invasive cerebral thermometry is not yet achieved but is considered to be an early forecaster of modern techniques such as fMRI that provide circumstantial evidence of regional cerebral metabolic activity.

SUBACUTE COMBINED DEGENERATION AND PERNICIOUS ANEMIA: THE LONG SEARCH FOR THE CURE

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The search for the cure of pernicious anemia (PA) began with the 1851 hypothesis of Austin Flint, Sr. that PA was related to atrophy of human gastric mucosa. Thomas Addison's description (1855) of often fatal anemia centered on anemia and muscular wasting, but omitted examination of red cell abnormalities. Samuel Fenwick in 1870 linked severe gastric atrophy at with his patient's progressive anemia, yellow skin hue and progressive paralysis. Ludwig Lichtheim (1887) noted lesions in the posterior lateral columns of the spinal cord in PA patients. His student, Minnich differentiated pathology of tabes dorsalis (TD) from PA by showing that that dorsal columns alone were involved in TD. Russell, Batten and Collier (1900) published a fully annotated description of neurological deterioration in PA: stiffness in lower extremities with loss of position sense and increased tendon reflexes, followed by inability to walk and Babinski's toe extension sign. The last stage was sudden flaccid paralysis, tendon reflex loss, loosening of sphincters, coma and death. Axon loss and demyelination in peripheral nerve, and demyelination in posterior and lateral spinal columns were present. They coined the term subacute combined degeneration.
George Minot discovered that a patient who ate undercooked liverwurst recovered from PA. Then he, George Whipple and William Murphy fed patients lightly cooked ground liver or calf muscle and reversed their anemia and neurological symptoms. William Castle demonstrated that 3 factors were needed to effect cure: gastric acidity < pH 3, extrinsic factor in liver and intrinsic factor from stomach of cows or healthy humans. The long search for the cure ended in 1948 when Lester Smith and E.L. Rickes reported that repeated purifications of extrinsic factor from beef livers lead to isolating red crystals that reversed PA. Dorothy Hodgkins determined that vitamin B12 contained 4 porphyrin-like rings surrounding a central cobalt atom.

ALEXANDER VON HUMBOLDT'S PATH FROM GALVANISM TO ANIMAL ELECTRICITY

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During the 1790s, Alexander von Humbolt, who showed an interest in many facets of natural philosophy and natural history, delved into the controversial subject of animal electricity. To a great extent, he was motivated by his worldview of nature, but also by the experiments of Luigi Galvani, who favored animal electricity in more than a few specialized fishes, and Alessandro Volta, who accepted specialized fish electricity but was not willing to generalize from these fishes to other animals, thinking Galvani's frog experiments confounded by his use of metals. Humboldt's early experiments on animals and his own body left him skeptical about the animal force being qualitatively identical to true electricity, and he called the force "galvanism" and not "animal electricity" in his two 1797 volumes. Hoping to learn more, he went on to study the electric eel in South America and torpedo rays in Italy. Although some of these findings were also negative, and also might have suggested a force other than true electricity, Humboldt now abandoned his galvanic terminology and instead presented his newer findings as electrical phenomena. His new frame of mind had much to do with the advent of Volta's "pile" in 1800 for multiplying the physical and perceptable effects of otherwise weak electricity. Humboldt might have learned about Volta's battery even before leaving the New World, and it is known that, in 1805, shortly after returning to Europe, he traveled to Italy, to discuss the physics of electricity with Volta. It is noteworthy that Humboldt repeatedly cites and praises Volta when interpreting his findings with electric eels and torpedo rays.

ARTHUR SCHOPENHAUER'S PHILOSOPHY OF CONSCIOUSNESS

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In recent years great progress has been made in correlating different kinds of perceptual experiences and sensations to neuronal activity in certain brain areas. This approach has led to a better understanding of a number of different phenomena relating to perception and cognition. The conundrum of "consciousness", however, remains as mystifying as ever. Which processes within the brain are allowing for an individual's sense of self-awareness, emotion, creativity and ultimately his personal experience of reality? This question has been dubbed "the hard problem of consciousness" (David Chalmers, 1999). In an effort to find an answer to this issue philosophers of the mind and neuroscientists alike must explain "how the 'water' of neural activity is *transformed* … into the 'wine' of conscious experience – the scents, colours, sounds – we all live through day by day." (C.U.M. Smith, 2006). In this paper it will be argued that Arthur Schopenhauer (1788 – 1860) – a great exponent of post-Kantian transcendental idealism – was one of the first to philosophize about "consciousness" in modern terms, embracing the explanatory power of the emerging neurosciences of the 19th century. In his notion that objective reality is a mere brain *epiphenomenon* we can discover a historic continuity that aligns classical Platonism and German Idealism with present-day simulation theory.

IT'S NOT ME, IT'S JUST MY MIND: ENCEPHALITIS LETHARGICA AND THE LAW

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Among the major outcomes of the encephalitis lethargica epidemic of the 1920s was the recognition of the effect of non-congenital organic brain disease on behavior and personality, particularly in children and adolescents. Many young sufferers exhibited abrupt changes in behavior that combined elements of psychopathy and infantile regression. This revolution of character , however, differed from psychopathy in a number of crucial features; in particular, despite appearances, the moral sense of EL sufferers was intact. Their misdeeds – ranged from childish pranks and bagatelle offences to theft, assault and murder – were performed without their voluntary consent, or, indeed, against their own wishes. This phenomenon of divided

consciousness not only provided insights into the evolution of acts of volition acts, but also necessitated reviews of the concept of legal responsibility. These issues will be examined in a series of illustrative cases, including one followed for a half century.

CHASING VEINS IN VAIN? ON THE HISTORICAL SUCCESSION OF VASCULAR THEORIES IN MULTIPLE SCLEROSIS RESEARCH

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Since 2009, considerable attention has been drawn to the *Chronic Cerebrospinal Venous Insufficiency* (CCSVI) model of multiple sclerosis (MS) championed by Paolo Zamboni (born 1957), and the associated surgical "venoplasty" interventions have been hailed by many lay societies and the media as "liberation therapy" for MS. Yet an examination of the medical literature reveals that CCSVI, often advertised as a novel idea, has in fact been investigated in other forms as far back as the late 19th century. Using journal articles, neuroscience textbooks and reviews, this presentation will discuss the history of vascular theories in the research on MS and the respective therapeutic endeavours.

Owing to the contributions of James Dawson (1870-1927) and his contemporary neuropathologists, the vascular distribution of the lesions of MS had been well-described by the early half of the 20th century, with considerable support for Georg Eduard von Rindfleisch's (1836-1908) theory of inflammatory irritation of vessel walls contributing to the pathogenesis of MS. In the 1930s, Tracy Jackson Putnam (1894-1975) performed pathological studies that led him to regard MS as an encephalitic state caused by venous obstruction *versus* a purely inflammatory process. He attempted to treat MS patients with the anticoagulant dicoumarin, but observed little success. However, interest in the venous anatomy in MS patients was yet to settle, with physicians such as Franz Schelling (unknown birthdate) continuing the discussion of their relevance well into the 1980s.

Whereas the veins continue to be accommodated within the conventional conception of MS as playing a role in the pathogenesis of the disease via inflammation, proponents of CCSVI seek to provide a structural role for the veins in the aetiology of MS, in the form of occlusion or insufficiency. This presentation will emphasize the untold history of the vascular hypothesis of MS, briefly appraising the current state of investigations

THE DEVELOPMENT OF NEUROLOGY, FROM PADUA TO EUROPE

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The influence of Padua in the development of medicine throughout Europe is well known. At first neurology was part of what nowadays is known as general medicine and throughout Europe the specialties have developed in different ways and particularly the relationship of neurology to what we now define as psychiatry and psychology. How did the early workers view the brain and could they study its history prospectively?– could they predict the changes that were going to take place in the understanding of this enigmatic organ of the human body? – and how does this progressive acquisition of knowledge guide our thinking about the brain and what it might be capable of in the future? Each generation tends to think it has most of the answers and yet the lessons of history show us that the right person at the right time can dramatically change our understanding of the nervous system. This paper explores the lasting effects of this exceptional Italian influence upon the rest of Europe.

NEUROLATHYRISM IN VAPNIARKA: MEDICAL HEROISM IN A CONCENTRATION CAMP

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Stories abound about the medical abuses that have come to define medicine and the "pseudo"-neurosciences in the Third Reich. Well known are the Nazi policies of racial hygiene and euthanasia and the experimental atrocities committed in concentration camps. Nevertheless, during this widespread perversion of medical practice and science, true medical heroics persisted, even in the concentration camps. This paper will examine what transpired in Camp Vapniarka and explore the impact that its inmates have since had on our understanding of neurolathyrism. Shortly following Operation Barbarossa, the Nazi-affiliated Romanian authorities established a detention camp in Vapniarka, Transnistria. In order to reduce the cost of feeding the 1200, mostly Jewish, inmates of Camp Vapniarka and perhaps surreptitiously hasten their deaths, the officers of the camp began feeding them a diet high in *Lathyrus sativus*. In December 1942, the inmates began experiencing painful lower extremity muscle cramps, spastic paraparesis, and urinary incontinence. Neurolathyrism is primarily a degenerative disease of the upper motor neurons caused by the grass pea *L. sativus*. Among the inmates was Dr. Arthur Kessler, who eventually identified the source of the epidemic. Armed with this knowledge, the inmates organized to halt its spread by embarking on a near-hunger strike. After the war, many of the inmates, including Kessler, immigrated to Palestine. Colleagues of his, neurologists Dan Cohn and Max Streifler, serially examined 200 of the émigré inmates with neurolathyrism over a 30-year period, which constituted the longest ever follow-up. Their reports documented the chronic effects and exposed new aspects of the disease, such as a peripheral neuropathy. In conclusion, had it not been for Kessler's astute diagnosis, neurolathyrism may have been remembered as another weapon in the Nazi's genocidal campaign, rather than as a symbol of individual triumph and collective resistance.

PSYCHOLOGICAL AND NEUROLOGICAL CONSTRUCTS IN THE FICTION OF ANGLO-IRISH AUTHOR SHERIDAN LE FANU

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One popular souvenir postcard available to visitors to Ireland features the country's most famous authors, including Samuel Beckett, Sean O'Casey, James Joyce, Bram Stoker, and William Butler Yeats. Not included in that list is 19th century author, Sheridan Le Fanu. Author of *Carmilla*, one of the most provocative vampire stories in the English language, Le Fanu penned dozens of short stories in addition to several novels in the fields of supernatural fiction, mysteries, and Gothic horror which are almost lost to modern-day readers. And yet his stories and novels yield insight into the culture of his age and reveal much information about the human condition of mid-19th century Ireland and England. His works can especially be appreciated for the insights he provides into the psychology of his characters.

Note that Le Fanu died in 1873 before psychology was "formally" established in 1879. However, his psychological thought should not be considered in the modern sense; it is more reminiscent of the theorizing about psychology of the early 19th century with respect to the role of the ego and how it interacts with the non-ego. Le Fanu sought to show how a human being's conscious perceptions could interact with their unconscious perceptions. The connection between these two aspects of the psyche could break following trauma, sickness, ingestion of drugs, or even from guilt. A voracious reader, Le Fanu immersed himself in reading works related to the occult and magic as well as religion and theosophy. A number of his works indicate a belief that guilt or fear can manifest into a semi-independent existence that could thereafter interact with evil forces of which his protagonists were unaware. In many respects this idea predates the concept of

psychological dissociation as we know it today. At the time, it reinforced the prevailing view of evil, demonic forces at work, attempting to undermine man's sanity.

Le Fanu's short stories and novels also provide information about the emerging medical specialty of neurology; his characters frequently suffer from various "brain fevers" and other nervous maladies, such as hysteria, which were the subject of intense debate and analysis in England and continental Europe. It is also likely that his fiction was affected by the health of his wife, Susanna, who suffered from a mysterious disorder, most probably psychosomatic, and who died during an attack of hysteria.

THE USE OF ELECTRICITY IN THE HISTORY OF MEDICINE AS REFLECTED IN THE *NEDERLANDS TIJDSCHRIFT VOOR GENEESKUNDE* SINCE 1857

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During the 1850s, electrotherapy became a popular treatment for neurological conditions as appears from Guillaume Duchenne's and Robert Remak's well-known books (1856). In the same decade, the 'Nederlands Tijdschrift voor Geneeskunde' (NTvG, translated as 'Netherlands Journal of Medicine'), one of the oldest journals of general medicine, was established (1857), celebrating its 150th anniversary in 2007. All articles published between 1857 and 2008 have been digitized and are available online. This makes the NTvG-database an excellent source for historical research in medicine. We were interested to study the reflection of international literature on electrotherapy in this journal as well as in papers on electrotherapy of Dutch origin.

This literature review gives an overview of the therapeutic use of electricity throughout these 150 years, especially in neurological and psychiatric medicine. The online NTvG-database was searched for relevant articles using search terms including electricity, electrotherapy, therapeutic, history, historical, development and evolution. Moreover, the table of contents was searched per publication year and references of relevant articles were searched to find additional literature. Information on international developments and historical context was searched by using Pubmed database, Maastricht University library and public libraries.

The findings from the Dutch journal are compared with international developments and embedded in the historical context, to provide a better understanding of the history and evolution of electrotherapy.

FROM EXPERIMENTAL NEUROPHYSIOLOGY TO STEREOTACTIC NEUROSURGERY: E. A. SPIEGEL (1895-1985), VIENNA AND PHILADELPHIA

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In 1908 the stereotactic method as applied to animal experiments was inaugurated by V. A. H. Horsley and R. H. Clarke by placing electrodes in the brain. Spiegel´s achievement was to use this method for the first time operating on human brains in 1947, thus becoming the founder of stereotactic neurosurgery (first stereotactic atlas with H. T. Wycis, 1952).

Here, emphasis is mainly laid on the scientific work of Ernst Adolf Spiegel in Austria. Born in Vienna in 1895, he graduated from its University in 1918, qualified as a lecturer for normal and pathological anatomy and physiology of the nervous system in 1924 and was called at the Temple University School of Medicine in Philadelphia, where a Department of Experimental and Applied Neurology was inaugurated for him.

Spiegel performed his basic experimental investigations at the Institute of Neurology of Vienna University founded by H. Obersteiner in 1882. As a center of theoretical brain research it gained worldwide reputation. Soon he extended his work methodically from morphological and pathological anatomy to studies of functional neurology by using animal experiments. Thus, Spiegel created the dimension of experimental neurophysiology at the Vienna Institute of Neurology. Spiegel achieved fundamentally new insights into the central control of muscle tone and especially into the centers of the autonomic nervous system. Simultaneously practicing as clinician his aim was to get new explanations applicable to diagnosis and treatment of nervous diseases as well as to neurosurgery by combining his basic research with the clinical investigation of patients and with topical diagnostic. Furthermore, Spiegel anticipated the concept of closed-loop control circuit of central nervous functions previous to the era of kybernetics. The value Spiegel attached to the conversion of his theoretical findings into clinical practice is exemplified by his standard text-book on ophthalmo- and oto-neurology published in 1931.

ANDRÉ BRETON AND JOSEPH BABINSKI: SURREALISM AND NEUROLOGY

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The French writer and poet André Breton (1896-1966) is considered a founder of the surrealist movement in the 1920s. In the 1910s, he studied medicine and worked as a student in several hospitals, but also as a stretch bearer at the front during World War I. There he became interested in psychiatric diseases including hysteria and psychosis, which later served as source of inspiration for his surrealist writings and thoughts, in particular on automatic writing. Breton worked under Joseph Babinski at La Pitié, nearby La Salpêtrière, and became impressed by the ‘sacred fever’ of the famous neurologist. In this presentation, we discuss the relation between Breton and Babinski and try to trace back whether not only Breton’s psychiatric, but also his neurological experiences, have influenced surrealism. We hypothesize that Breton left medicine in 1920 partly as a consequence of his stay with Babinski.

MENKES DISEASE’S AETIOLOGY EXPLAINED THANKS TO AUSTRALIAN SHEEP

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In 1962 Menkes and colleagues at Columbia University in New York described a disease that affected five young boys of English-Irish descent who had characteristic hair, a neurodegenerative disorder and who manifested failure to thrive. The family history suggested an X-linked inheritance. The condition was extremely severe and the whereabouts of its aetiology unknown.

In 1972 Danks connected the characteristic hair of this disease disease, which was already known as Menkes disease although also referred as “kinky hair syndrome”, with the brittle wool of Australian sheep raised on copper-deficient areas. By measuring the serum copper levels in 7 Menkes disease patients the hypothesis found its confirmation, all had reduced copper concentrations together with reduced ceruloplasmin, the principal copper-carrying protein in the blood.

The descriptions made in the 30’s from veterinarians studying the copper-deprived lambs regarding the role of copper in the development of the nervous system were used for explaining the etiopathogenesis of Menkes disease.

Only in 1993 with the cloning of the causative gene, ATP7A, and considering all the peculiar anomalies in Menkes patients' cells it became clear that the condition was due to difficulties of copper transport, in particular of copper exiting from the cells.
It took science over 30 years to understand the etiopathogenesis of Menkes disease but almost a century after the Australian copper deprived lambs we are still struggling to find a cure for the "kinky hair syndrome".

ARTHUR SIMONS (1877-1942) AND TONIC NECK REFLEXES WITH HEMIPLEGIC "MITBEWEGUNGEN" (ASSOCIATED REACTIONS) FROM THE YEARS 1916-1919

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Tonic neck reflexes studied by Magnus and deKlejn in 1912 in animals and men, underwent a study in hemiplegic patients mainly victims of WWI, by Arthur Simons, neurologist in Berlin and co-worker of Hermann Oppenheim, and who later died in the Nazi holocaust.
The effect of the asymmetric neck reflexes after head rotation was restricted to the paralyzed side: *tonus (spasms) of extension and adduction during midposition of the head or head version to the paralyzed side; flexion tonus and abduction during head version to the non-paralyzed side, and flexion tonus (spasms) of the paralyzed limbs during flexion of the head, extension spasms by head extension.* More than this, hemiplegic 'Mitbewegungen' (Simons 1919,1920) or associated reactions (Walshe 1923) were observed. They are to be elicited by conscious innervations of the unaffected side, if by fist closure, and are increased or varied by head rotation, the tonic neck reflexes. They occurred in 25 % (Simons 1920). A film with Arthur Simons as examiner from the years 1916-1919 shows these nearly forgotten phenomena. Their daily importance was stressed already in 1920, long before the rules of antispastic positions were defined by the Bobaths.

LOBOTOMY AND THE CINEMA OF THE 1950s

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"One flew over the Cuckoo's Nest" was one of the movies that exerted an ernormous influence on the public perception of lobotomy. Yet, the novel (1962) and the film (1975) came out, when this intervention had already a strongly negative image. Thus the goal of this study is to look for earlier screen portrayals of the operation.

In the 1950s two films with psycho-surgery as a leitmotif were released, both based on literary texts. For this presentation, both films are systematically evaluated along neurological and cinematic lines.

The German movie "Senior Physician Dr. Solm"(1955) strictly follows the story-line of the homonymous novel by Hans Baumgarten. The protagonist Dr. Solm successfully lobotomizes the schizophrenic son of a psychiatrist - but without permission of the father who energetically rejects this "surgery of the soul". In contrast, the American author Tennessee Williams turned the real lobotomy of his sister into the one-act play "Suddenly Last Summer" (1957), which provided the basis for a film with the same title. This movie tells the story of Catherine, hospitalised after a family drama, who at the request of her aunt was supposed to undergo a brain operation in order to silence her. However, somewhat surprisingly, the surgeon Dr. Cukrowicz morphs from a serial lobotomist into a psychological therapist; he refuses to implement the surgery and performs the healing catharsis by means of a pharmacologically triggered hypnosis.

The refusal to carry out this kind of surgery in the American movie can be read as a statement of a society that refrains from lobotomy and opts for in-depth psychotherapy and new drugs. The

positive assessment of the fictitious lobotomy in the earlier German novel/film is difficult to interpret. Reconciliation of healing technology and humanity? Pure exoticism? Literary and cinematic reflections on psychosurgery continue to call for a thorough contextualization including the history of medicine, mentality and the media.

THE DUTCH CONTRIBUTION TO THE DEVELOPMENT OF NEUROSURGERY IN INDONESIA

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As a former Dutch colony (Dutch East Indies) until its independence in 1949, health care in Indonesia has long been associated with the Dutch system. The formal presence of a Neurosurgical Service in Indonesia dates from 1948. Previously, neurologists cooperated with general surgeons if neurosurgical intervention was needed, much like the situation in the Netherlands before 1929 when the first modern Dutch (Cushing-trained) neurosurgeon started in Amsterdam. In the post-war period, the Dutch took their responsibility and in 1948, organized a rotational scheme with six Dutch neurosurgeons participating for six months each. This did not change when Indonesia became an independent state in 1949. In the mean time Indonesian neurosurgeons were trained in The Netherlands. Dr S.K. Handoyo was the first Indonesian neurosurgeon, who took over in Jakarta in 1953. After Handoyo at least six other neurosurgeons trained in The Netherlands. Over the years the number of neurosurgeons in Indonesia increased from three in the fifties and sixties to the number of 174 in the first decade of the 21st century. This presentation offers a view of the way in which neurosurgery developed in Indonesia and provides the neurosurgical care for its large population.

NEUROCINEMATOGRAPHY IN PRE-WORLD WAR II NETHERLANDS. THE MAGNUS-RADEMAKER COLLECTION.

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Historical films made by neuroscientists have surfaced in several cities during the past years, including Leuven (Van Gehuchten), Paris (Paul Sainton), Berlin (Paul Schuster and Arthur Simons), Bucharest (Georges Marinesco), Philadelphia (Theodore Weisenburg), Turin and Bologna (Camillo Negro and Vincenzo Neri) and London (S.A. Kinnier Wilson). Although originally supposed to have got lost, we recently found a collection of films produced between 1909 and 1940 by Rudolf Magnus (1873-1927), professor of pharmacology (Utrecht) and his student Gysbertus Rademaker (1887-1957), professor of physiology (1928, succeeding Willem Einthoven) and neurology (1945, both in Leiden). Both collections deal with the physiology of body posture by the equilibrium of reflex musculature contractions for which experimental studies were done with animals (labyrinthectomies, cerebellectomies and brainstem sections) and observations on patients. The films demonstrate the results of these studies as well as babies, in whom tonic neck reflexes are shown, adults with cerebellar symptoms following cerebellectomies for tumors and several other conditions. Magnus'studies resulted in his well-known *Körperstellung* (1924, 'Body posture') and Rademaker's in his *Das Stehen* (1931, 'Standing'). Probably the films had an educative, but particularly a scientific purpose. Magnus demonstrated his films at congresses, including the 8th International Congress of Physiologists (Vienna, 1910) and Rademaker at meetings of the Amsterdam Neurologists Society (at several occasions as reflected in the Winkler-Monakow correspondence and the Nederlands Tijdschriftvoor Geneeskunde). These images are important historical sources that provide a portrait of the pre-World War II era in neuroscience, partly answering questions on how physicians dealt with patients and researchers with their

experimental animals. These movies confirm as the cinematography was an important scientific tool in neuroscience research.

PSYCHOSURGERY IN DENMARK, 1939-1960

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On 21 August 1939, the American neurologist Walter Freeman visited the University of Copenhagen, where he gave a talk on “Intellectual and Emotional Changes Following Prefrontal Lobotomy”. After Freeman’s lecture, lobotomy became a widely used treatment in Danish mental hospitals. More than 4,000 psychosurgical operations were performed in the period 1939-1960. When compared to the size of the Danish population (about 4 million people), this is an exceptional high number of lobotomies. In countries with a comparable population size such as Switzerland and Finland, only 1,000 and 1,500 lobotomies performed. Approximately 20,000 lobotomies were conducted in USA and about 12,000 in the UK during the period 1936-1956.

Recent historical studies have explained the use of lobotomy as a “last resort” that was reserved for extreme cases after less drastic therapies had failed. According to these studies, the overcrowded and often sub-par conditions of the mental hospitals also contributed to the widespread adoption of psychosurgery. Furthermore, the fact that lobotomy enabled hospitals to discharge chronic patients was an additional incentive for its acceptance. The Danish lobotomy example, however, cannot be accounted for within the theory of last resort. Lobotomy was introduced in Denmark during a period when overcrowding was considered a minor problem, and it was not only used on treatment refractory patients; several children and patients with minor disorders were also lobotomized.

By analyzing 600 patient records of Danish mental hospitals and neurosurgery departments, this paper will present a more complex picture of the use of lobotomy. Focusing on features such as the patients’ lengths of stay, indications for lobotomy, and the number of treatments tried prior to lobotomy, it will be argued that lobotomy was employed for at host of purposes ranging from corporeal control to the alleviation of despair.

FROM IMHOTEP TO STEM CELLS: A HISTORY OF IDEAS IN NEURAL REGENERATION

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The "Book of Wounds", dated 2550 BC is accredited to the Egyptian Imhotep, and contains several descriptions of head, neck and back injuries in a surprisingly modern clinical sequence. Apparently the connection between injuries to the brain or spinal cord and the resulting symptomatology was well understood; in contrast to ancient Egyptian philosophy and religious rites (especially mummification) where no function was attributed to the brain. Thinking, feeling, praying and the origin of movement were instead all located to the heart and distributed from there to the body by the vascular system.

The pre-Socratic philosophers of Greece (Alcmaeon of Croton, Hippocrates of Cos, Plato, Aristotle and Galen of Pergamon) discovered the brain as the organ of perception and thinking. Galen knew the causality of lesion and paraplegia but had no knowledge of a healing process in the CNS.
Paul of Aegina in the 7th century AD postulated suture of a cut nerve as did Avicenna (ca. 1000 AD) but there was no report of successful treatment and restitution of function after a peripheral nerve lesion; the only exception being a statement by the French surgeon Guy de Chauliac (1300 AD).

The first anatomical and functional regeneration of a nerve is credited to Cruikshank, whose crucial experiment in Glasgow was published in 1795. Successful repair of peripheral nerves stimulated

the search for regeneration in the CNS. After years of extensive experimentation by Cajal and his colleagues they conceded in 1928 that repair of CNS tracts is impossible, which halted research in regeneration for 40 years.

New impulses came from the discovery of nerve growth factors NGF and the other members of the gene family by Levi-Montalcini, Barde and Thoenen, the discovery of axonal transport by Weiss, transplantation experiments by Aguayo and colleagues and the discovery of the "Nogo" molecule by Schwab.

THE MYSTERY LEFT-HANDEDNESS: A HISTORICAL PERSPECTIVE

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This presentation examines explanations for the existence of human handedness since the late-19th century. *Homo sapiens* have been 90% right-handed since the Upper Palaeolithic. In fact, recent investigations have found "no difference" between the frequency of left-handers 10,000 years ago and contemporary French students. Indeed, other recent studies have concluded that Neanderthals had been normally right or rarely left-handed since the Upper Pleistocene. Non-human mammals are handed and/or pawed, but none are lateralized in the same way as humans. Typically, like mice, most are right or left pawed 50/50. Among primates only humans demonstrate asymmetrical or lateralized language. While non-human primates show a preference for one hand or the other, in none is one hand dominant in the majority of the species. Yet, for most of human history, including in much of the planet today, the use of the left hand for writing, tool use, eating, and hygiene, has been the focus of distain and discrimination. Moreover, since the 19th century researchers have connected left-handedness with an array of disorders including autoimmune diseases, psychiatric disorders, mental retardation, and learning disabilities. In addition, recent studies have reported that left-handers on average died nine to ten years younger than right-handers. Although these findings are controversial, the connection between left-handedness and developmental disorders and mental illness remains very much alive in current investigations. Despite disagreement about what might constitute the most persuasive genetic model, the vast majority of current researchers assume that human handedness is an inherited trait. Given its seeming lack of fitness, the obvious question arises why does left-handers exist at all? In the presentation I will examine, in historical perspective, explanations for the persistence of left-handedness.

THE CASE OF SHEBALIN. COMPARATIVE ANALYSIS OF MUSICAL SCORES COMPOSED BEFORE AND AFTER THE STROKE

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Professor Vissarion Shebalin sustained a first stroke on September 14, 1953 at the age of 51; even he had a severe disturbance of his speech, these symptoms disappeared after some weeks and he was able to return to write his scores and work with his students.

In 1959 he had a second stroke with similar symptoms, but more severe and this time the aphasia remained.

From this moment on he continued to teach to his students and to compose his music with his left hand.

He had two epileptic fits during 1962 – 1963 and on April 30, 1963 he had a third vascular accident; Vissarion Shebalin died on May 29 and just one year before he had finished his Fifth Symphony.

Postmortem examination of the brain showed a massive red softening of the left temporal and inferior parietal regions, with a hemorrhagic cyst of the left temporo-parietal region.

Over the course of three years was followed by neurologists and neuropsychologists of Moscow University who performed a careful neuropsychological examination with an exhaustive language evaluation under the supervision of Aleksandr Romanovic Luria who described it in a paper in 1965.

Shebalin was a precocious and gifted musician but the style of his musical language is mostly monotonous and gloomy with a strong Russian stamp, reminiscent of more famous Mussorsky and Prokofiev.

But the character of the musical language of the Fifth Symphony is more original and genuine, although the gloomy style.

It seems that after the second stroke despite aphasia and right hemiparesis he could compose his music in a similar way but with less inhibitions and influences.
Results of a comparative musical analysis of Shebalin's scores composed before and after stroke will be presented

THE PREMATURE LITERARY "DEATH" OF PIERRE FLOURENS, NEUROPHYSIOLOGIST AND HISTORIAN OF SCIENCE

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In 1858, at the height of Pierre Flourens' academic career, the physician and journalist Louis Fleury, under the pseudonym Dr. Periergopoulos, published a forty-eight page eulogy for him. The literary «death» of Flourens attracted a lot of attention in the scientific press, a thriving source of criticism of science and its politics in the academies. This paper presents «Dr. Periergopoulos'» biting satire on the life and career of Flourens and situates this unusual work in the context of 19th century debates on the status of physiology in France, access to academic positions, and related notions of scientific progress and merit. I will argue that this book is an important, yet relatively overlooked document in the history of French neuroscience for the following set of reasons:
The *Eloge de Marie Jean Pierre Flourens* calls attention to political aspects of scientific production and careers and their relation to national identity. The book and subsequent press coverage can help us understand popular reception of Flourens' work during this period. Finally, the book provides a critical look at Flourens' «use» of history of science. I will present extracts of my translation-in-progress which aim to capture the tone of Dr. Periergopoulos' parody of Flourens' writing style, by comparing citations of Periergopoulos to those of Flourens' original works.

BRAIN STUDIES IN UNIVERSITY OF LATVIA BETWEEN THE WORLD WARS

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After the World War I the independent Republic of Latvia was established (1918) and soon after the University of Latvia was founded (1919). The University of Latvia became the central institution for scientific research in the region. The first scientific studies on the human brain was initiated by Swedish anatomist, anthropologist and psychiatrist professor Gaston Backman (1883 - 1964), who was the head of the university's department of anatomy. Under his guidance several anatomical and anthropological brain studies were conducted, his research mainly focused on the brain weight of Latvians. Later one of his assistants, neurologist Janis Vilde (1900 - 1071), carried on clinical research of the brain. He investigated the histological changes in the brain of patients diagnosed with the progressive paralysis of the insane, that

had died after unsuccessful treatment with the malaria fever therapy. In his doctoral thesis Vilde was looking for specific signs of the leprosy in the central nervous system. Part of this study was carried out in German Institute for Psychiatric Research in Munich.

During the interwar period Vilde collected the pathological brain specimens (including his co-workers brain), made public brain demonstrations in the Latvian Society of Physicians and established a brain museum, which regretfully was lost after the World War II.

DEVELOPING PROTOCOLS FOR THE BEDSIDE EXAMINATION OF LANGUAGE IMPAIRMENT: HENRY CHARLTON BASTIAN'S (1837-1915) CONTRIBUTION TO COGNITIVE NEUROPSYCHOLOGICAL ASSESSMENT

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Henry Charlton Bastian's (1837 -1915) ideas on receptive aphasia predated Carl Wernicke's and he continued to develop his connectionist model of language processing, modality deficits and correlated lesion localizations for four decades. His ideas are little referenced today, having been overshadowed by his more eminent Queen Square colleague John Hughlings Jackson. His reputation also suffered from his insistence on the spontaneous generation of life. This paper traces Bastian's lasting but largely unattributed contribution to the development of standardized clinical neuropsychological assessment.

From 1867 onwards, Bastian trained a generation of medical students in neurology. In 1886, Bastian published a "Schema for the Examination of Aphasic and Amnesic Persons." Patient records in Bastian's casebooks from the 1870s document his use of this systematic list of tasks for almost a decade previously. Bastian insisted on the utility of this standard battery for diagnosis, classification and lesion localization; he argued that its consistent use would allow the development of a patient corpus and the comparison of cases from other hospitals. For 18 years Bastian presented lecture demonstrations of his model of aphasia featuring the assessment of one chronic patient. At the patient's death the autopsy did not reveal the lesion which Bastian had predicted based on his aphasic symptoms. Bastian published these unexpected findings and considered various explanations for this negative evidence (1897).

The tradition Bastian established for clinical assessment of cognitive functions has propagated through the neurologists trained at Queen Square for over a century. It was exported to the United States by Norman Geschwind who trained there under one of Bastian's disciples Charles Symonds in the early 1950s. Bastian's approach to aphasia testing is reflected in the Boston Diagnostic Aphasia Exam and echoes can be found in more recent Queen Square writings on behavioural neurology.

Bastian, H.C. 1886. *Paralyses, cerebral, bulbar and spinal; a manual of diagnosis for students and practitioners*. New York, Appleton.
Bastian, H. C. 1897. On a Case of Amnesia and other Speech Defects of Eighteen Years' Duration, with Autopsy. Medico-chirurgical transactions 80: 61-86.

THE GENRE OF OPERA AS A HISTORICAL SOURCE FOR NEUROSCIENCE

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Most operas were composed when medicine was still groping and neuropsychiatry was bud. The physician in an opera could be a barber as Figaro in *The Barber of Seville*; a quack in *The Elixir of Love*; a doctor who made house calls to the sick and dying as in *La Traviata* and *Pelléas* and *Mélisande*; a skilled expert who cured people as in the surgeon in La *Forza del Destino*.

Composers loved to express medical disorders in their music. Mozart, Richard Strauss and Puccini were masters of such representations, from fatal injury with Commendatore in *Don Giovanni*, to hysterical hypochondria with Herod in *Salome* or terminal tubercolosis with Mimi in *La Bohème*.

The representation of neuropsychiatry in opera can be considered to illustrate the role of physicians and medical knowledge at different time periods. There are various neuropscychiatric examples as in *Così fan tutte*, where Mozart describes in music the invisible force of "magnetizing". The Mozart family had been in friendly contact with Franz Anton Mesmer (1734-1815) who coined the term "mesmerism". Verdi represents a scene in *La Traviata* in which Dr Grenville gives a sedative to Violetta. One of Verdi's closest friends was the alienist Cesare Vigna (1819-1892) who used music therapy in neuropsychiatry. Berg's *Wozzeck* reflects the influence of positivism and the beginning experimental method in neuropsychiatry during the Austrian expressionism and dodecaphonic development. His captain physician enrolled a soldier for his experiment and collected statistical information for measuring cerebrovascular disorder. In Berg's opera and in Strauss's *Elektra* there are elements which show the increasing interest of the inner working of the mind as exemplified by Freud.

The genre of Opera is a vehicle to express emotions and neurological description in music and provides a historical perspective to demonstrate the interconnection existing between opera and neuropsychiatry which can be a historical resource for neuroscience.

ITALIAN NEUROLOGIST FAMILIES: NEGRO AND D'ABUNDO

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In Italy at the beginning of the 19th century two families dedicated their professional lives to science and medicine and played an important role in neurology: the Negro and D'Abundo's families. Piedmontese Camillo Negro (1861-1927) was one of the first Italian Professors of Neurology in Turin. He had interests in epilepsy, myasthenic syndrome and extrapiramidal disorders and in neurological nosology. Negro described the significant neurological sign of cogwheel rigidity. At the same time, Apulian Giuseppe D'Abundo (1860-1926) was professor of Neurology for about thirty years in Catania, Sicily, where he studied the effects of psychic trauma from war and earthquakes. He was the first to develop the serum test and therapy for malaria. In 1907, he founded *Rivista italiana di neuropatologia*, *psichiatria ed elettroterapia* (Italian Journal of neuropathology, psychiatry and electrotherapy). He was president of the Società Italiana di Neurologia (Italian Society of Neurology) and he moved to Naples where he concluded his career. Negro and D'Abundo were among the founders of the Italian Society of Neurology and they both employed cinematography in their clinical practices. Their sons each followed neurological careers. Negro Felice was a Neurologist in the same city of his father and he was interested in bulgarian therapy for extrapiramidal disorders. D'Abundo Emanuele worked as a Neurologist in Milan and he was interested in malarotherapy and the localization and clinical feature of the encephalitis.Negro and D'Abundo's families represent the new neurologists who made great contributions in different fields in the advancement of the clinical neurology.

GIUSEPPE CALLIGARIS: A MULTIFACE CLINICIAN AT THE BEGINNING OF ITALIAN NEUROLOGY

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In 1901, Giuseppe Calligaris graduated in Medicine in Bologna with Professor Murri with a thesis

titled, "The thought that heals".

Calligaris born in Forni di Sotto in Carnia in 1876, was the eldest son of a general practitioner. As a young graduate he went to Rome as assistant of Prof. G. Mingazzini, and in 1909 he obtained the professorship in neuropathology. In the same year he participated as secretariat of the Italian Neurology Society meeting.

Until then he had published fifteen works in Italian and German, focused on neuropsychiatric research and sensitive apparatus.

In 1909, he abandoned his academic career and returned to Udine where he opened a "private nursing home for nervous disorders and metabolic". He continued his personal research on the topic of "skin hyperaesthesic lines" that led him to be a member of para-psychology.

His research was presented at the Academy in the presence of Prof. Roman G. Baccelli, who appointed a commission to verify the data presented.

He later participated in the Great War as a physician: an experience that inspired “Il Medico e la Guerra” (The doctor and the War) published in 1922. After the war he continued his scientific studies and published in 1927 the book, "The extrapyramidal motor system", which was widely used as an academic text, giving him the opportunity to earn the admiration of Prof. Mingazzini and much fame.

He wrote twenty books and over forty articles published in international journals.

Since the beginning of 1930, his publications touched different subjects, telepathy and metaphysics were some of these topics.

In recent years he was overwhelmed by the imaginary with a critical approach.

He worked and wrote until 1944, when he died following complications due to diabetes.

GAETANO PERUSINI AND ALOIS ALZHEIMER. THE RECOVERED MEMORY

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Alois Alzheimer headed the Laboratory of Neuropathology of the modern Psychiatric Clinic of Monaco of Bavaria led by Emil Kraepelin. Following a brief communication of the case by Auguste Deter in Tuebingen, on 3 November 1906 with the title: “Über einen eigenartigen schweren Erkrankungsprozeß der Hirnrinde” (a characteristic disease of the cerebral cortex), Alzheimer entrusted to the young Gaetano Perusini, visiting doctor, an in-depth examination of the case and its clinical anatomical correlations. The communication of Alzheimer was not published in the proceedings on the grounds that, "Zu kurzem Referat nicht geeignet" would be published the following year with a slightly modified title, "Über eine der eigenartige Erkrankung Hirnrinde". In December 1908, Perusini finished his work, in German, to form the basis of the description of dementia praecox "About klinisch und das histologisch eigenartige psychische Erkrankung späteren Lebenshalters (= clinical and histological aspects of a particular mental illness of old age)": this work, which collects detailed clinical and histo-pathological description of four cases, was published in 1909. In 1910, Kraepelin finished writing the eighth edition of his famous "Treatise of Psychiatry" and the eighth chapter of the second volume added a new disease called "Alzheimer's" to distinguish it from senile dementia. This interpretation has clashed with the school of Prague represented by A. Pick and O. Fischer. It is important to emphasize that Kraepelin in describing the new disease speaks of "cases", so it is implied that he knew of the descriptions of Perusini (4 cases). Many treaties cited the disease, Alzheimer-Perusini to mean pre-senile

dementia, until Robert Katzman in 1978 proposed a new classification of dementia expressed by the term Alzheimer's diseases; since then the name of Perusini was forgotten in the terminology of the disease. A recent review of this work has brought to light the name of Perusini that both German literature as well as Italian legislation have reassessed the eponym of Alzheimer-Perusini's disease.

THE (R)EVOLUTION OF NEUROAESTHETICS

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Spectacular advances over the past twenty years have made it easier to study the activity of the human brain. With this has come a radical departure in the scientific questions asked about the brain and indeed in our view of its functioning. We have come to understand that the brain is not a passive chronicler of what happens in the external world but an active participant in combining physical reality with genetic and epigenetic determinants of brain function to create the world that we experience. At the same time, questions that once seemed too remote have started to receive answers from neuroscientific enquiries, for instance concerning the neural correlates of love, desire and beauty, or the neural determinants of identity, empathy and social interactions. In addressing such questions, neuroesthetics has evolved as an important methodological tool and has come to play an important role in the study of how the brain actively constructs our experience of the world and of our inner state of being Initial forays in neuroaesthetics took inspiration from classical art, in particular from the impressionists and early twenty century artists such as Mondrian, to design new experimental paradigms addressing questions related to the constancy of colour and object perception. More recently, neuroaesthetics has connected with contemporary art to provide a guiding framework within which to study the neural basis of experience in all its complexity. The constant change that drives us and the world surrounding us has shaped our nervous system in such a way that, through art, it is able to extract a kind of stability from what is not stable.

CASES FOR DIAGNOSES: ALFRED WALTER CAMPBELL, NIKOLAUS FRIEDREICH, ASMUS JULIUS THOMAS THOMSEN, AND SAMUEL ALEXANDER KINNIER WILSON

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In 1917 Alfred Walter Campbell reported a case of Friedreich's Disease (Friedreich's ataxia), and in 1919 one of Thomsen's Disease (Congenital myotonia). Each varied from the 'standard' picture and posed problems for diagnosis; in fact, the subtitle of Campbell's was 'A case for diagnosis.'
The main divergences in the case of Friedreich's ataxia were that neither parent was affected, and the family history was negative although two other siblings had the disease. Some physical symptoms were also not present. In the Thomsen case, the onset was late and followed an early healthy history, the family history negative, no siblings were affected, and there were some slightly abnormal muscle responses and inconsistencies in the patient's reflexes.

Campbell's puzzlement over his case of Friedreich's ataxia is (now) readily explained. It is inherited by a mechanism that spares the parents and their ancestors but affects about 50% of their offspring. In other words, the inheritance is recessive. When Campbell wrote, that was not known. Nor until the 1980s and 1990s was it clear what caused the neurological symptoms. A similar but more complex picture holds for Thomsen's disease. It is now recognised as having two forms: one recessive and appearing in early childhood, and the other one dominant and appearing later. When Campbell wrote, only the dominant form was known, and its effects were sometimes so mild that its existence in the parents and siblings was easily missed. Not until the 1960s and 1970s did Becker identify the recessive mechanism of the early childhood form, now known as Becker's ataxia.

Campbell's puzzlement was partly because there were few applications of Mendel's laws to human neurological disease before 1930. A sharpened form of Campbell's difficulties is illustrated by Kinnier Wilson's hepatolenticular degeneration, now Wilson's disease. It was, he said, not congenital and ran in families but was not hereditary. I will discuss the reasons for the long delay in applying what was known about inheritance to neurological disorders prior to 1930.

GERARD PERCHERON

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Gérard Percheron, who died aged 80 on December 26, 2010, was a distinguished anatomist of the primate brain, who made major contributions to understanding of thalamic organisation and its relations with the basal ganglia. They were both factual and theoretical, with a leaning towards mathematical analysis of neuronal circuitry. A graduate in medicine and neurology of the Paris medical school (neurology thesis at the Salpêtrière on the vasculature of the human thalamus), he also contributed to the History of Neurology (his manuscripts on Vic d'Azyr apparently remain unpublished).

After training with Krieg in Chicago and Yakovlev in Boston, he returned to the Salpêtrière in 1967, and in 1969 joined Albe-Fessard at the Institut Marey to elaborate stereotaxic methods for the monkey brain based on radiological localisation of the anterior and posterior commissures, also contributing to studies of pig and goose brains. He established that in monkeys the cerebello-thalamic projection areas differed from somesthetic and pallidal territories, and directed the attention of his collaborators to the subthalamic nucleus.

At the end of 1975 he took an INSERM post under Scherrer at the Salpêtrière, setting up a group in the Pavillon Claude Bernard with Chantal François and Jérome Yelnik, studying connections in monkeys of the basal ganglia, and later beginning investigations of their amygdala connections. He made important contributions to Informational Neuronal Set Theory (J. Theoretical Biol, 99, 509-552, 1982) applied to the thalamus ("The primate motor thalamus", in Brain Research Reviews 22, 93-181, 1996), and to the "Basal Ganglia – Structure and Function" series of the International Basal Ganglia Society (IBAGS) of which he was President for 1993.

SIGN, STIGMA AND SYMPTOM. FOR A SEMIOLOGY OF THE TIC

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In recent years, movement disorders have become objects of closer historical and philosophical investigation. The bulk of the scholarship, however, has confined itself only to the most spectacular and seemingly prototypical instances, above all Tourette Disorder, paying, at best, only cursory attention to the wider, and far more elusive, domain of tics.

Since its assimilation into the medical discourse, the tic was granted greatly different semeiological value, depending on the contingent definitions that were given of it and the different medical theories and perspectives from which it was approached, its significance ranging from a "habitual and unpleasant gesture" (Encyclopédie) with any pathological meaning to a veritable stigmata indicative of degeneration (or instability), from a mere accessory symptom common to various diseases to a pathognomonic symptom (e.g. of the "maladie des tics", later Tourette Syndrome, or the Chronic Motor or Vocal Tic Disorder).

This paper explores some of the semeiological debates that took place about and around this fleeting phenomenon, in the XIX and early XX Century France, where the history of the tic crossed that of the nascent neurology. My presentation aims at showing how along its medical history the

tic functioned almost like a Lévi-Straussian *signifiant flottant* for different scientific discourses, playing a crucial role in the constitution and establishment of the disciplinary identity of neurology

MAGNETIC FLIMMERS. A HISTORY OF ELECTROMAGNETIC STIMULATION IN MEDICINE AROUND 1900

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Today transcranial magnetic stimulation (TMS) is an important subject of research in neuroscience and of therapy. Interest increased when Barker in 1985 showed that it was possible to stimulate the human motor cortex with an electromagnet. Modern use of TMS includes measuring nerve conduction velocities and creating virtual lesions in the brain. The latter option creates the possibility to inactivate parts of the brain temporarily without permanent damage. In 2008, repetitive TMS was approved as a therapy for major depression under strict conditions (FDA). Repetitive TMS has not yet been cleared for treatment of other diseases including schizophrenia, anxiety disorders, obesity, stroke and Parkinson's disease but results seem promising.

TMS, however, was not invented at the end of the 20th century. The discovery of electromagnetism, the enthusiasm for electricity and electrotherapy, and the interest in neurasthenia (Beard) resulted in the first electromagnetic treatments in the late 19th and early 20th century. In this presentation we provide a history of electromagnetic stimulation around 1900. We conclude that Mesmer's late 18th century ideas of "animal magnetism" and the 19th century absence of physiological proof had a negative influence on its acceptance in the early 20th century. Electromagnetism disappeared from neurological textbooks in the early 20th century to reappear at the end of that century.

EVOLUTION AND DEGENERATION: THE TWO POLES OF CESARE LOMBROSO'S ANTHROPOLOGICAL THEORIES

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Cesare Lombroso (1835-1909) is internationally renowned as one of the founder of criminal anthropology the field devoted to the study of the criminal man and woman as biological phenomena. However his school made also contributions to neuropathology such as the first documentation of the cortical malformations within the neuropathological picture of the developmental disorder currently called Taylor's dysplasia (Chiò et al. 2003). Lombroso also described pellagra in detail, and the first paper written by Camillo Golgi under his mentorship was focused on this disease. However Lombroso became world famous for his theory that criminality, madness and genius were all sides of the same psychobiological condition: an expression of *degeneration*, a sort of regression along the phylogenetic scale, and an arrest at an early stage of evolution. Degeneration affected criminals, especially the "born delinquent", whose development had stopped at an early stage, making them the most "atavistic" types of human being. Lombroso also advocated the theory that genius was closely linked with madness. A man of genius was a degenerate, an example of *retrograde* evolution in whom madness was a form of "biological compensation" for excessive intellectual development. To confirm this theory, in August 1897, Lombroso, while attending the Twelfth International Medical Congress in Moscow, decided to meet the great Russian writer Lev Tolstoy in order to directly verify, in him, his theory of degeneration in the genius (Mazzarello 2001; 2005).

Lombroso's anthropological ideas fuelled a heated debate on the biological determinism of human behavior.

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THOMAS MANN'S "DEATH IN VENICE" AS EUROPEAN NERVOUS NOVELLA

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Death in Venice, published in 1912, is the first novella written by the German novelist Thomas Mann under the influence of Sigmund Freud's thoughts. In his earlier work Mann used the current concepts of general nervousness to explain the often strange behaviour of his protagonists. Degeneration was an especially widely used concept in European psychiatry at the time. Its doctrine contained the genetic transmission and even aggravation of illness in subsequent generations, a concept that has been found to occur in some neurodegenerative illnesses.
Unlike the characters in Mann's early work the protagonist in *Death in Venice* is described as a man of fame and reputation. Nevertheless, during his holiday in Venice Gustav von Aschenbach undergoes a dramatic change when he falls in love with a young boy. His behaviour then clearly depicts the Freudian mechanisms of repression and sublimation. In addition it has been conclusively shown that the story contains passages, that presuppose the knowledge of Freud's first literary interpretation of Wilhelm Jensen's *Der Wahn und die Träume*. This observation may also explain the wealth of allusion to psychoanalysis in Mann's *Magic Mountain*, a novel intimately connected to *Death in Venice*

In *Death in Venice* Mann was able to introduce a new motivation for the behaviour of the many strange characters in his literary work, namely the efficacy of the subconscious and the impact of hidden and forbidden wishes. Furthermore, he could create a link between the individual and myth. Finally, Mann felt that the psychological interpretation needed some sort of scientific amplification, which he found in the increasing role of biology which he first used in *The Magic Mountain.* This explains the constant juxtaposition of the psychological and the biological views of human behaviour in Mann's writings.

THE ICONOGRAPHY IN SURGERY: "ART" IN NEUROSURGERY

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The use of the image of the surgical field and of the pathological findings removed and the need to explain clearly some technical passages of the intervention have characterized from the beginning the activities of neurosurgeons. Some of these (such as Cushing and Dandy in the United States and Fasiani and Maspes in Italy) were also true of "artistic talent". The design are then joined the photography and cinematography. Explain the historical development of this "neurosurgical iconography" is the purpose of our communication.

AN EXPERIENCE OF MUSIC THERAPY OF MENTAL ILLNESS IN 19th CENTURY AT THE PSYCHIATRIC HOSPITAL OF VENICE

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That music can positively influence the human psyche is a very ancient concept. .In the Bible (Samuel, 1, 16) is written: "David took the harp and played, and then Saul calmed down and the bad spirits away from him".

Many writers and poets spoke of the relationship between music and mental disorders and various therapeutic approach were made through music.

There seems, however, a particularly interesting experience that created by a psychiatrist musicologist, Cesare Vigna, Director of the Psychiatric Hospital San Clemente in Venice from 1873 to 1891.

Cesare Vigna was a fine musicologist and had already known his articles on the "Gazzetta Musicale di Milano" published by Ricordi when he began his friendship with Giuseppe Verdi.
It was on this music magazine that Cesare Vigna defenses Giuseppe Verdi negative criticism that greeted the premiere of La Traviata. For this reason the first poster of La Traviata appears in large letters: "As a token of esteem and friendship to Mr. Dr. Cesare Vigna".

As many psychiatrists alienists used to do in 19th Century, Vigna thought that taking care of the mentally ill presupposes a comprehensive study of the human person both physical and "moral". To cure the moral vineyard was identified with the music that could lift the mind from mental illness brutalized.

When in 1873 Cesare Vigna could leave the San Servolo's asylum ad move to a new one built in San Clemente island (close to San Servolo), he could realize his project for a "musical asylum" . Each patient was induced to make music, listen, sing or whatever. The nursing and ancillary staff had to play an instrument or sing and even visitors of the patients were asked to start the interview in a musical way.

MUSIC INDUCED PLASTICITY OF THE HUMAN AUDITORY CORTEX

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The ability across the life span to change its function due to experience and demand is one of the most fascinating features of the human brain and perception will vary with these changes. Over the last ten years music has developed as a tool for studying brain plasticity in different sensory modalities and as a suitable way for changing the brain functional organization. We have shown in series of experiments that musical training has pronounced effects on the functional reorganization and plasticity of the human auditory cortex. When functional brain changes go into the right direction, it might enable extraordinary and very useful proficiencies. However, if it goes wrong, it can produce serious symptoms and pathologies. However, once plasticity went wrong, fortunately the avenue of plasticity itself can be used to reverse maladaptive changes, in terms of rehabilitative plasticity and again music can be used for this neurorehabilitation. Over the last years evidence has been accumulated that tinnitus perception is related to unfavorable cortical plastic changes. Maladaptive auditory cortex reorganization may contribute to the generation and maintenance of tinnitus. Since cortical organization can be modified by behavioral training, potentially via reversing maladaptive auditory cortex reorganization, we attempted to reduce tinnitus by developing and experimentally evaluating a customized music training strategy, based on lateral inhibition and plasticity of the human auditory cortex that appears capable of both reducing cortical tinnitus related neuronal activity and alleviating subjective tinnitus perception.

THE ORIGINS OF ITALIAN NEUROPSYCHOLOGY: A DISCIPLINE AT THE BOUNDARIES BETWEEN MEDICINE, PSYCHIATRY AND PSYCHOLOGY

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Neuropsychology, defined as the scientific discipline devoted to the study of brain structures and functions, as related to specific psychological and behavioural processes, has a relatively recent history in Italy. It developed in full during the early 1960s within neurology, spreading among psychologists only later. Since the 1990s neuropsychology has been included among university courses in psychology.

The early roots of Italian neuropsychology, however, can be traced back to a more distant past. During the XIX century, a number of studies on the relationships between the functions of the brain and behavioural diseases had already been carried on by researchers coming from different scientific contexts, and professional trainings, who started to develop the very first principles of the discipline, working with different methods (physiology, psychology, neuropathology). Since the second half of the XIXth century these researches were mostly developed within the largest field of psychiatry, that in those years was strictly connected with the rising neurological science. Names to be mentioned as examples include Leonardo Bianchi, Giovanni Mingazzini, Gaetano Perusini, Augusto Tamburini, and Eugenio Tanzi.

Paying attention to the crucial role of methodological issues, in this presentation I will focus on the analysis of these first steps of Italian neuropsychology, exploring the main lines of its development in the European context, with the aim of tracing a map of the discipline's state-of-the-art before the advent of its “modern era” with the “Milan Group”.

NOT ONLY ELECTROSHOCK: UGO CERLETTI'S SCIENTIFIC BIOGRAPHY

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In the field of the History of Science Ugo Cerletti's name is connected with the invention of the ElectroConvulsive therapy (ECT), that he set up in Rome in 1938, and that for its importance has been compared to nothing less than the discovery of antibiotics (Gozzano, 1964). Still, the relevance of ECT's discovery, that has deeply influenced the history of psychiatric practice worldwide, has ended up making us lose sight of Cerletti's real scientific stature. A sort of confusion and identification between the scientist and his invention has taken place. With the reconstruction of an accurate and detailed scientific biography, based on an extensive analysis of edited sources and, for the first time, of so far unpublished archival papers as well, I have tried to make up for this kind of confusion, and to give to Cerletti his appropriate historical profile in the field of the History of Science and of the XXth Century Neuropsychiatry.
More particularly, the crossing and comparision between edited sources and unpblished documents has permitted to depict a full profile of Cerletti's scientific and human figure. His work, whose early roots can be traced in Italian positivistic culture as well as in German scientific context, is characterized by a "passionate attitude" toward research, expecially basic research. An enemy of 'remedies' in the name of knowledge, Cerletti is a neuropsychiatrist who faced in depth and without any simplism the body-mind philosofical problem, driven by a phantasy as sharp and unprejudiced as much rigorously disciplined under the control of an exact research method.

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LOOKING INTO THE DISTANCE, TO THE MOON AND STARS, THROUGH THE EYES OF PAOLO SARPI

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Paolo Sarpi (1552-1623), a Venetian friar and member of the Order of Servites, is best known for his theological and political endeavours aimed at reforming the Catholic church at the turn of the sixteenth and seventeenth century, and for the vicissitudes connected to the strong contrasts between Venice and Rome (the "Venetian Interdict" of 1606). However, from his youth he developed a strong interest in various aspects of science (mathematics, optics, magnetism, astronomy, mechanics, and also anatomy and medicine). Sarpi's scientific commitment has been studied mainly for its possible role in Galileo's improvement of the telescope and in his first astronomical observations. Little has been written about Sarpi's studies of sensory physiology and psychology. Of particular significance are investigations connected to the possible deceptive nature of the images of distant objects, and especially the appearance of the vault of the heavens. In Sarpi's manuscript *Pensieri* (thoughts) we find a perceptive explanation of the phenomena known as the celestial illusions of the moon, sun and constellations. In these the apparent size of celestial bodies are larger when they are near the horizon than at the zenith. Sarpi's interpretation, which is based exclusively on perceptual mechanisms, anticipated the modern analyses of the phenomenon.

MIRACLES OF VISION: THE CONVEX SHADOW OF THE CROSS ON THE CONCAVITY OF THE APSE IN A CHURCH OF PISA

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One of the most complex goals of vision is to restore the three-dimensional appearance of objects. At close distances stereoscopic cues provide enough information to resolve solidity. For distant objects, appearance is based in part on previous sensory experience. It may also be influenced by a series of complex factors which can lead to conflict between perception and physical reality. Such circumstances are typically called visual illusions. This is what happens in the Church of San Michele degli Scalzi in the Lungarno of Pisa. Here the shadow of a beautiful Middle Age wooden cross (a *Croce dipinta*), projected on the concave apse of the church, often appears convex in its central part with the lateral arms projecting far away from the observer. The appearance changes and corresponds more closely to the physical reality of the apse concavity only when viewed from very short distances. The phenomenon is also evident in photographs of the cross and shadow. By using these images it can easily be shown that the deceptive convex aspect of the shadow becomes concave when the image is turned upside-down. The same effect can be observed in the church if the visual inversion is achieved by viewing the shadow with the head inverted (a physically demanding task that might not be considered appropriate in the confines of a church!). An interpretation of the phenomenon is provided, mainly based on unconscious inference of the direction of illumination.

TO PADUA: TRAVELS, MEN AND SCIENCE BETWEEN XVIIITH AND XIXTH CENTURY

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In the18th century and for some time in the 19th century (especially during the Austrian domination between 1815 to 1866), Padua University has been a meeting point for the flow of men and ideas

coming from regions of continental Europe and descending along the Italian peninsula through the routes of the *Grand Tour.*

Padua was also the center of interest for men coming from Western and Eastern territories of Pianura Padana, up to the city of Trieste and the imperial oriental territories (and viceversa). Here, we wish to trace some of these human, intellectual and scientific paths, related to medical and chirurgical fields with particular reference to the disciplines that today are known as neuroscience.
Particularly, we willl discuss: some physicians, such as Michele Vincenzo Giacinto Malacarne (1744-1816), and Bartolomeo Signoroni (1796-1844), surgery professors in the Universities of Pavia and Padua, and their activity in the field of neuro anatomy (cerebellum) and neurosurgery; Filippo Lussana (1820-1897), neurophysiologist, professor in the Universities of Parma and Padua, who dealt with various topics, including synesthesia; the psychologist Vittorio Benussi (1878-1927), representing the school of Graz and professor of Psychology at the University of Padua.

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"MASK AND BRAIN": CONTRIBUTION TO CRIMINAL ANTHROPOLOGY BY NEUROSCIENTISTS

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In the late 19th century a new biological approach was postulated by Cesare Lombroso (1835-1909) to recognize criminals by their physical and mental abnormalities. The new discipline, criminal anthropology, considered that some criminals are unchangeable, doomed to lives of crime. Born criminals form a distinct criminal type with twisted bodies, minds, and morals. Many neuroscientists speculated about and discussed the location of a moral sense in the human cortex. Of particular interest are the localisation of immorality put forward by the Hungarian-Austrian neuropsychiatrist Moritz Benedikt (1835-1920), German neuropsychiatrist Paul Flechsig (1847-1927), German neurologist Oskar Vogt (1870-1959), Belgian neurologist Arthur Van Gehuchten (1861-1914), Russian-Swiss neuropathologist Costantin von Monakow (1853-1930) as well as numerous Italian neuroscientists such as neuroanatomist Lorenzo Tenchini (1852-1906), neuropathologist Luigi Roncoroni, and neuropsychiatrist Agostini Cesare (1864-1942). All of these neuroscientists found cerebral abnormalities in criminals while putting forward various views on their significance and scientific value in public debate.

In Italy, in 1885, Tenchini published his observation on cerebral conformation and crime with associated wax masks for each criminal studied in four books by title *I cervelli di deliquenti* (The Criminal's Brain). In November of the same year, in Rome there was a criminal anthropology meeting attended by Moritiz who supported the role of the occipital lobe in criminality. In the following years the debate was focused on microscopic cortical abnormalities and in 1896, Lombroso's pupil Roncoroni observed a relationship between criminality, epilepsy, and genius. Lombroso in fact supported a common origin of criminality, genius, and epilepsy as caused by

factors impairing the embryonic development of the CNS. This discovery was a misconception on Lombroso's part while it explained further the mechanism of epilepsy. Despite the fact that this research was motivated by ideas regarding criminal anthropology these neuroscientists made an important contribution to the localisation process in neuroscience.

1862-2012: THE IDENTIFICATION OF CEREBRAL PALSY AS CLINICAL ENTITY

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This year (2012) marks the 150th anniversary of the first clear description of "cerebral palsy" by William John Little (1810-1894), and as such provides us with a timely opportunity to remember the historical pathway to identify this condition. The first reports of "muscular stiffness associated to the birth" were made by the French surgeons Nicolas Andry de Bois-Regard (1658-1742) and Jacques Mathieu Delpech (1777-1832), fathers of the modern concept of Orthopedics. In 1840 the German physician Jacob von Heine (1799-1879) described other three cases of cerebral palsy; he named them as "*paraplegia spastica cerebralis*". Five years later, Catullo Rogier, author of the first Italian treatise on "Orthopedics", wrote on "convulsive muscular retractions" due to "alterations of nervous centers" that generated spasticity. Even if these early works had identified the clinical features of cerebral palsy, the total number of cases studied was far too limited. Since 1853, the British surgeon Little, founder of the first "Royal Orthopedic Hospital" in London, had collected quantitative perinatal data in 24 patients for generalized spasticity: he noted associations with varying degrees of prematurity, difficult labor, instrumentation (forceps), asphyxia, and convulsions. On October 1861, Little presented his conclusions before the Obstetrical Society of London: "On the Influence of Abnormal Parturition, Difficult Labours, Premature Birth, and Asphyxia Neonatorum, on the Mental and Physical Condition of the Child, Especially in Relation to Deformities". In this lecture, published in the following year, Little first argued that asphyxia at birth could occasionally cause permanent central nervous system damage. At the end of the century, Sigmund Freud (1856-1939) conducted several studies on this condition, being the first to write about cerebral palsy as a nosographic category. In conclusion, the history of this condition highlights also the decisive role of non-neurologists, particularly orthopedic surgeons and pediatricians, in the history of neuroscience.

AT THE ORIGINS OF BEHAVIORAL NEUROTOXICOLOGY

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Behavioral toxicology studies the effects of neurotoxic agents on human behavior. The history of this discipline and its intersections with neurotoxicology parallels the history of psychology and psychiatry as different disciplines from neurology. Ancient physicians and non-medical authors incidentally described the effects of neurotoxic agents on mood. In his allegoric journey into the Hell, the Medieval Italian poet Dante meets the angry and quarrelsome souls of alchemists, some of them were afflicted with limb; both physical (palsy) and behavioral (mood changes) states may be due to the use of neurotoxic metals by these workers. Bernardino Ramazzini (1633-1714) was one of the first physician to clearly describe the effects of mercury on motor function and mood. Johann Peter Frank (1745–1821) described an early case of neuropsychiatric symptoms due to ingestion of metal particles derived from pots or other cookware. Another historical example of "dietary effects on behavior" is offered by "convulsive ergotism". During the Industrial Revolution exposure to neurotoxicants became widespread in the western world, causing a pandemic of neuropsychiatric disturbances. Indeed, in that period, scientists first acknowledged some metal-

related neuropsychiatric disorders, such as the “mercurial erethism” (Pearson, 1805), the “saturnin encephalopathy” (Tanquerel des Planches, 1836), the “carbon disulfide psychosis” (Delpech, 1856) and, more recently, the “*locura manganica*”. At the beginning of the 20th century, some pharmacologists, such as Giusto Coronedi (1863–1941) and Mario Aiazzi Mancini (1897–1980) began to study systematically both neurological and behavioral effects of hazardous substances; their experiences may be looked upon as precursors of neurobehavioral toxicology. Since 1960s specific tests for cognitive functions and computerized systems were developed for the assessment of behavior in human, and in the latest years they have now integrated with information from neuroimaging and neurochemistry, as well from molecular biology and epigenetics.

CLAUDE BERNARD’S *PICÛRE DIABÉTIQUE* AT MEXICO’S NATIONAL INSTITUTE OF NEUROLOGY AND NEUROSURGERY (INNN)

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In 1848, the French physiologist Claude Bernard (1823-1878) injured the base of a rabbit’s fourth ventricle and triggered what he called “artificial diabetes”, since after the lesion the animal developed glycosuria and albuminuria. This totally fortuitous finding resulted from an accident, that occurred while Bernard was sectioning the cerebellar peduncles, whose function he was interested in defining. In a world just as competitive as ours, the French scientist published his results, which stated that the nervous system plays a fundamental role in sugar production and regulation in animal economy. Though diabetes mellitus was a longstanding problem, its etiology was unknown.
The objective of this study is to reproduce and verify that experiment. Bernard was not partial to statistics and championed “experimental determinism”, which held that, if an experiment is well done, it should be possible to reproduce it at will, and thus provide sufficient evidence to confirm scientific advances.

His *picûre diabétique* will be reproduced through radiosurgery: a series of blood and urine samples will be taken to determine glucose levels, before sacrificing the animals to perform histopathological studies designed to corroborate the site of the lesion.
Our goal is not to debate whether Bernard’s conclusions as to the origins of diabetes mellitus are true or false; rather, we are interested in obtaining support for the argument concerning reproducibility in experimental science.

KAMAL AL-DIN AL-FARISI AND THE EXPERIMENTAL DEMONSTRATION OF ‘PURKINJE IMAGES’ BEFORE PURKINJE IN A FOURTEENTH-CENTURY ARABIC TEXT

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The concept of the eye as a ‘mirror’, reflecting images, has a history going back to the Greeks. In explaining vision, they used the observational evidence of seeing one’s face in the pupil of another person directly facing them. Only in the nieteeenth century, however, experimental evidence was provided that images can be formed by reflection from the cornea as well as from the anterior and posterior surfaces of the lens. Subsequently, ‘lenticular images’ played an important role in explanations of accommodation (Cramer, 1851; and Helmholtz, 1855) due to a change in the curvature rather than the position of the lens. The discovery of these images is attributed to Purkinje (1823) and Sanson (1827).

A much earlier description and experimental demonstration of similar images exist in a fourteenth-century Arabic manuscript, the *Tanqiḥ al-Manāẓir,* by Kamāl al-Dīn al-Fārisī (d. 1320). Initially

undertaken as a critical revision of Ibn al-Haytham's *Optics* (L. Alhazen; d.1040), the *Tanqiḥ* constitutes a major extension of as well as a departure from Ibn al-Haytham, with important original contributions in optics and vision.

In a series of studies of image formation in dark chambers, with a single source of light, Kamāl al-Dīn demonstrated, under controlled and repeatable experimental conditions, that the transparent parts of the eye both refract and reflect light, depending on the angle of incidence of the incoming rays, the position of the observer, and the observed eye. It will be shown that his direct observations, using a sheep's eye, correspond to two of the 'Purkinje images': one reflected from the cornea, and the larger but fainter second image reflected from the anterior surface of the crystalline lens. Why he conducted these experiments, the experimental techniques he used, and how he attempted to account for the formation of such images, and the difference in their sizes will be discussed, and their significance evaluated.

Kamāl al-Dīn's work had no influence on the West, as no evidence exists of its translation into Latin. Although the importance of his research in optics has been recognized (Schramm 1959; Rashed, 1970; Sabra, 1989; Russell, 1996), no modern critical edition or translation of the *Tanqiḥ* has as yet been made.

RICHARD BRIGHT'S OBSERVATIONS ON APOPLEXY AND CEREBRAL SOFTENING (RAMOLLISSEMENT)

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Richard Bright (1789-1858), an English physician, is the founder of nephrology, but his interests were not confined to the kidney. In volume II of Guy's Hospital (London, where Bright worked) Reports he reported 310 examples of brain diseases, which he arranged according to his notion of their causes, namely, inflammation, pressure, irritation and inanition. He demonstrated the effects of "pressure" with cases of apoplexy or paralysis, emphasizing the importance of the circulation, and hinted on the need of cerebrovascular autoregulation. Bright noted that the distribution of abnormal signs depended on the location of the lesion thus contributing to the notion of cerebral localization. He described symptoms characteristic of the thalamic syndrome, maintained that seizures were due to damage of the surface of the brain, described hemianopia, and emphasized the relationship of brain diseases to diseases of the heart, lung and kidneys. Bright could not free himself of the notion, so eloquently advocated by Morgagni, that some cases of apoplexy were due to extravasation of "serum". Ramollissement du cerveau, (cerebral softening") was reported by Lallemand in 1820, who believed that it was due to an inflammatory process, which he thought was underlying all apoplexies. "Karenberg pointed out that an opportunity was missed to establish cerebral localization and the role of vascular pathology in stroke, a damage that was soon repaired by a number of scholars and for which Bright could claim priority.
Bright decided that cerebral softening was often due to insufficient blood supply, like gangrene in a limb, but conceded that it could also be the result of "inflammation" or congestion. In the treatment of apoplexy Bright ignored the sage advice of Thomas Sydenham and used every remedy prescribed by humoral medicine.

ROSARIO MAGRÌ (1924-2005), NEUROLOGIST, WRITER, MASTER IN MEDICINE, A PERSONAL MEMORY

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Rosario Magrì was born in Catania, May 22nd 1924; he graduated in Medicine at the Università degli Studi di Milano (the so called "Università Statale") in 1948, and in 1952 he specialized in Mental and Nervous Disorders under the tutorship of Professor Giuseppe Carlo Riquier (1886-

1962). In 1957 he became assistant neuropsychiatrist in the Neurological Clinic of the University, which was headed, at the time, by Professor Ermenegildo “Gildo” Gastaldi (1907-1973). In 1959 he obtained recognition as University teacher in the Clinic for Nervous and Mental Disorders.
Afterwards, he won the directorship of the Neurological Department in the “San Carlo Borromeo Hospital”, in Milano in the !966-1989 period.

In 1999, following the death of his wife, Olimpia, he felt that it was a nuisance to breathe, but somehow, life still intrigued him. He would have continued along his path, had not a serious brain hemorrhage, within a short time, put an end to his days.

His literary works included lyrics, some of them even humorous, written for the weddings of two of his dear assistants; a poetic version on the clinical angiographic correlations of thrombosis of the internal carotid.Dated 1957 is the volume, “La battaglia per la vita” (The Battle for Life), a marvelous story on medicine, from amulets to antibiotics.Various other works followed, six in all, from historical novels to detective stories, set up in ancient Rome.

A paternal respect not only of the sick person, but also of family members that shared such sickness, made him a friendly person to whom they could ask for help, a responsible and experienced friend, that could grant trust and to whom they could give trust.

An extremely learned man, he felt the “moral” duty in sharing such knowledge by requesting us, the younger ones, to study hard, being this the only instrument to obtain knowledge and to guide us along the bedside of sick people, where listening had to be privileged, symptoms be simplified, showing us the way to reach a diagnosis.

Humility for nature and science, that tries to interpret it, made him aware of his limits, and although accepting the challenge that diagnosis and illness submit, he was hopeful that one day he could be judged not for his results but for his good intentions.

DEEP BRAIN STIMULATION: HISTORICAL AND ANTHROPOLOGICAL CONSIDERATIONS

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The electrical stimulation, used since antiquity to modulate the nervous system, has been a fundamental tool of neurophysiologic investigation in the second half of the 18th century and was subsequently used by the early 20th century, even for therapeutic purposes. The advent of stereotactic procedures has allowed, in mid-20th century, in a few decades, the drift from lesional to stimulating technique of deep nuclei of the brain for therapeutic purposes. In this way, DBS was born, that, over the last two decades, has led to positive results for the treatment of medically refractory Parkinson's disease and dyskinesias. In recent years, the indications for therapeutic use of DBS have been extended to Tourette's syndrome, psychiatric diseases (depression, obsessive-compulsive disorder), eating disorders, some kinds of headache, and the minimally conscious state. The potentials of the DBS are fascinating, but there are still many anthropological and ethical problems.

TEN YEARS OF NEUROETHICS

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Ten years ago neuroethics was officially born. This term was used for the first time in a official context by William Safire, writer and columnist for the New York Times, as well as chairman of the

Dana Foundation, a private philanthropic organization dedicated to the support of research in the neurosciences, organizing of the first conference on hot “ethical issues” of the brain. In 2002 Safire defined neuroethics as “the examination of what is right and wrong, good and bad about the treatment of, perfection of, or unwelcome invasion of and worrisome manipulation of the human brain”. The term was resumed by the philosopher Adina Roskies in a paper published on “Neuron”. Safire considered it as “ethics of neuroscience”, i.e. the field of philosophy that deals with right and wrong aspects of a treatment or enhancement of the human brain, while Roskies proposed, in addition to this definition, to investigate – through modern neuroimaging techniques – the “neuroscience of ethics”, i.e. the ability to analyze and try to understand the fundamental nature of issues such as how brain makes decisions and what is the neural substrate of the representation of values in the brain. Neuroethics is now the last frontier of neuroscience: a field of investigation related to the current progress of neuropsychobiological knowledge and their ethical, legal and social implications rather than a new cognitive discipline. This work’s aim is to conduct a historical analysis of "neuroethics before neuroethics" and to show the evolution of this new frontier of neuroscience research.

ART AND CEREBRAL LESIONS: THE BIOLOGICAL AND HISTORICAL ORIGINS OF NEUROAESTHETICS

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Early attempts at understanding the biological origins of painting as expressive behaviour in superior animals and man go back to the beginning of the twentieth century. Winthrop’s and Luella Kellog’s (1933) pioneering studies, followed by those, more systematic, by Bernhard Rensch and Desmond Morris (1965) on “artistic behaviours” of apes and their relationship with human art, pave the way to modern neurology of art or neuroaesthetics that, also by means of neuroimaging progresses, nowadays actively lives through scientists as Vilaynur S. Ramachandran and Semir Zeki, among the most significant protagonists.

Anther important branch of research is dedicated, on the one hand, to the analysis of expressive modifications in artists following the onset of vascular, tumoral, traumatic or degenerative brain lesions (art and neurological diseases) and, on the other hand, to the understanding of the relationship existing between artistic expression and mental diseases (art and psychiatry).

Neuroaesthetics and the neurology of art, neuropathology of painting and pictorial production from psychiatric patients open, in this day and age, novel fascinating perspectives for understanding our brain.

VENTRICULAR NEUROPSYCHOLOGY: SOME PERPLEXITIES AND CONTINUITIES

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The Alexandrian physiologists distinguished vital spirit in the arteries from animal spirit in the nerves, but do not appear to have made much of the ventricles. Later, Galen argued that animal spirit in the nerves and ventricles was not essential to life but a mere messenger. Mentality was an affair of the brain’s substance. He regarded the posterior ventricle as concerned with cogitation and memory and that ingress was controlled by a valve formed by the cerebellar vermis. The earliest proponents of ventricular (or cellular) psychology also conceived the psyche to be incorporeal, located in the substance of the brain, and to interact with animal spirit via the ventricular walls. They retained Galen’s concept of a valve controlling the movement of the spirit from anterior to posterior (and vice versa), and this idea is also to be found in the medical texts of medieval Europe. This ambiguity about the psycho-physical character of the spirit(s) persisted. It

was regarded as a messenger, but also sensitive. In the ventricles it had the role of what we now call an 'information' carrier from one faculty to the next. Over time, Galen's cerebellar 'worm' somehow changed into the pineal or even the cerebellar choroid plexus. The animal spirits in Descartes' neurophysiology, in contrast, are straight-forwardly physical, and, in a sense, Galen's 'worm' made a final appearance as Gland H. It is a short step to modern ideas. But the confused notion of animal spirits as psychophysical entities lived on for many decades after Descartes in popular thought. This paper reviews the history with special reference to this psychophysical duality.

MUNTHE AND CHARCOT – WHAT IS THE TRUE ABOUT THEIR CONTACTS?

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One of the most popular autobiographies written by a physician is "The story of San Michele" by Axel Munthe (1857-1949). The book was written in English and first published 1929, and later translated to more than twenty-five languages and a best-seller for decades. The main theme in "The story of San Michele" is Munthe's struggle to restore the ancient *Villa San Michele* on Capri.

Axel Munthe was born in Sweden but had his medical education in France and later worked in Paris and in Italy. During the *First World War*, Munthe served in a British ambulance corp. From the age of twenty he had very little contact with Sweden with one exception; he served as the personal physician of the Swedish queen Victoria. The queen spent several months every year on Capri together with Munthe.

In "The story of San Michele" Munthe also writes about his years in Paris and the contacts with Charcot. Munthe describes himself as a favorite pupil with a lot of duties at the *Salpêtrière* hospital, but when Munthe tried to protect and help one of the patients it came to a conflict with Charcot and Munthe had to leave Paris.

When "The story of San Michele" was published Jean-Martin Charcot had been dead for decades but his son Jean-Baptiste Charcot denied that his father have had any contact with Axel Munthe. Later several persons have tried to find documents that can prove that a contact between Munthe and Charcot existed, but without success. An interesting point is however that one the founders of Swedish neurology, Per Henrik Malmsten, was Axel Munthe´s cousin. Malmsten had already died in 1880 and it is not known if Malmsten could have introduced his young relative to Charcot.

E. GRAEME ROBERTSON. AN INTERNATIONAL REPUTATION ESTABLISHED ON PNEUMOENCEPHALOGRAPHY

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It must be inconceivable for a young neurologist to imagine neurological practice without a means of identifying intracranial pathologies other than on the autopsy table. Yet, this was the case until the early decades of the twentieth century.

In 1918, Dr. Walter Dandy described ventriculography. He demonstrated that it was possible for air introduced directly into the ventricular system to outline pathologies that distorted the ventricles. Pneumoencephalography (air instilled via the lumbar route) became a standard test in neurology departments worldwide.

One Australian Neurologist, Dr. E. Graeme Robertson, developed an international reputation for his work, his publications, and his researches on the technique of pneumoencephalography.

Robertson, published 3 authoritative monographs on pneumoencephalography in 1941, 1946 and 1957 in addition to numerous scientific papers, which include a detailed review in *Brain* in 1947. For at least 50 years this important procedure provided one of the few ways to image intracranial lesions. The results facilitated countless neurosurgical operations. Just as E Graeme Robertson completed his definitive publication on pneumoencephalography for the Handbook of Clinical Neurology in 1974, the introduction of computerized tomography imaging sounded the death knell for the procedure. Pneumoencephalography was quickly abandoned; the specialized equipment discarded and the technique was confined to history.

Robertson's research was not in vain. Robertson demonstrated that even in a busy private neurological practice, in Australia, when international communications were not as sophisticated as they are today, a man of Robertson's caliber was able to produce the quality of research that he did; he did a great deal to promote Australian neurological clinical research to the rest of the world. His contribution to neuroscience, albeit long forgotten is worthy of reconsideration. This paper will investigate the rise and demise of pneumoencephalography and Robertson's more lasting legacy to the Australian community.

RECAPITULATING NEUROLOGICAL SEMIOTICS: THE CASE OF HERR GIERLICH AND THE LACK OF HAND SUPINATION

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Ontogeny is the theory of the development of one individual encompassing its entire lie-span, *i.e.*, comprises the developmental processes and acquisitions specific to the individual, in contrast to phylogeny, which involves the processes of evolution and acquisition particular to a species. At the end of the nineteenth century, Darwin's theory of the evolution of animal species paved the way for further reflections on these themes, permeating all the branches of science including neuroscience and clinical neurology. At that time, the level of functioning of an "earlier" species was believed to be retained in a virtual state in "later" species. This concept was further explored by Ernst Haeckel (1834-1919) in its "recapitulation theory", often summarized by the sentence "*ontogeny recapitulates phylogeny*".

Aim of this presentation consists in showing that, at the end of the nineteen century, one prevailing scientific idea was that some functions with adaptive value for lower animal species persisted in a virtual state and could be re-actualized by pathology: failure of control at a higher level liberated lower levels in this hierarchy. This idea clearly influenced many authors, including key figures in the early national neurological schools, such as the French Joseph Babinski (1857-1932), the German Adolf Strümpell (1853-1925), or the British John Hughlings Jackson (1835-1911), consequently shaping their concepts on developing semiotics. In fact, this impact is still often discernible nowadays through the study of the evolution of some currently used neurological sign. As an example, we will track down the history of the hand pronation phenomenon, highlighting the contribution of Nikolaus Gierlich (1865–1944), an obscure German scholar able to significantly illuminate previous distinguished contributions describing this sign as an actual lack of supination.

THE BIRTH OF MODERN ITALIAN NEUROPSYCHOLOGY: THE "MILAN GROUP" 1960-1975

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In the late 1950s an Italian neurologist, Ennio de Renzi, in the Clinica delle Malattie Nervose e Mentali of the University of Milano, started a research program in brain-damaged patients with

unilateral lesions, in order to investigate the relationships between the side and the site of the lesion (anterior or posterior) and disorders of language, perception, object recognition, spatial exploration. In the 1960-1970 decade De Renzi catalysed the formation of a group of younger neurologists (Luigi Vignolo, Pietro Faglioni, Hans Spinnler, for a shorter period François Boller and Giuseppe Scotti, and, with a somewhat independent approach, Edoardo Bisiach) and a psychologist (Anna Basso): the so-called "Milan Group". De Renzi, Vignolo, and the Milan group set up a neuropsychological approach novel for Italy, and highly original in the European context. Their studies privileged the investigation of the behavioural abnormalities of large series of brain-damaged patients ("group studies"), through standardized tests, using state-of-the-art (at least for that time) methods for statistical analysis, although with a gross anatomical localization of lesions. This methodological approach set up a new paradigm, as compared with the prevailing practice in clinical neurology of describing qualitatively the (sometimes peculiar) behavioural disorders of single brain-damaged patients (single-case studies, sometimes with an accurate post-mortem description of the cerebral lesion), with neither standardized testing nor statistical analyses, as in the "classic" period of French and German neuropsychology in the second half of the 1800. The "Milan Group" approach was readily adopted by a number of neurologists and physicians (Guido Gainotti, Franco Denes, Luigi Pizzamiglio), giving rise to an important development of neuropsychological research in Italy, which continues today, with a main contribution from psychology. Finally, the liberal or even "leftwing" political views of the "Milan Group" are considered, as related to its scientific program, and Italy's political situation in the 1960s.

"APOPLEXY" IN RUSSIAN MEDICINE, SOCIAL LIFE AND LITERARY FICTION

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The term "apoplexy" was wildly used in Russian medical literature until the late 19th century. As well as in the rest of Europe, the term was generic and stood for a number of different pathologies, characterized by an abrupt begin and the loss of consciousness. Though most of the case described were related to the cerebrovascular accidents, many heart conditions very equally characterized as "apoplectic". We will review the history and the development of this term in Russian neurological literature and the differences with the West European terminology. Apoplexy was one of the few medical terms that were broadly used in the every day life in Russia. We will analyze the use of this medical term in a social life and its representation in Russian literary fiction of the 19th century.

TONIC IMMOBILITY IN ANIMALS: FROM THE HISTORICAL STUDIES TO THE NEUROBIOLOGICAL UNDERSTANDING OF TRAUMA AND DISSOCIATION

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Numerous animal species suddenly undergo into a state of immobility after being constrained and no longer escape when they are released. This phenomenon has been studied scientifically ever since the 17th century. Historically, various theories have tried to explain this phenomenon, from the hypothesis that mysterious magnetic forces were at play (zoomagnetism) to the theory of animal hypnosis. More recently main focus has been examining the analogies between this natural phenomenon (called in a more scientific way as Tonic Immobility, TI) with what occurs to humans in several situations such as severe traumas, sexual violence and panic attacks. The aim of this research is to review the literature on the TI behavior in animals, and investigate how this model can contribute to our understanding of dissociative response to trauma and post-traumatic stress disorder. A review of the scientific literature was performed using Pubmed, PsychINFO, CAB Abstracts, Web of Science databases, and the consultation of other printed books on this topic.We

organized 408 selected publications into 8 categories: historical observations; zoological /veterinary research; neurodevelopment; pharmacological aspects; biochemical studies; behavior; ecological topics; comparison with humans. Our data indicate that historical research on TI in animals can contribute in the understanding of dissociative processes in response to trauma. A deep understanding of the biological and behavioral aspects causing the inability to self-defence against an aggressor could have important implications for the clinical treatment and the legal outcomes.

NEUROLOGICAL CINEMATOGRAPHY AFTER ALBERT LONDE IN PARIS

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Paris was a major centre of the origins of Neurology and Cinematography and this influenced the development of the use of scientific movies in the field of neurology. Jean-Martin Charcot (1825-1893) hired Albert Londe (1858-1917) as medical photographer who was the first to organize a photographic and chronophotographic laboratory at the Salpêtrière Hospital in Paris. In the following years various physicians used cinematography for different aspects of neurology for research and clinical purposes. In different European and American countries the cinema had a great development and diffusion in clinical practice. In Paris after Charcot his pupils used the cinema as a scientific instrument to study different neurological cases with interest towards specific disorders. Babinski, with the collaboration of his Italian's pupil Vincenzo Neri (1880-1961), was interested in gait disorders and cerebellar signs. In 1908, Neri presented his first film at the *Séance de la Société de Neurologie* in Paris. In 1922, Babinski himself presented a lecture shooting a film on *réflexes de défense* at the *Royal Society of Medicine* in London. Pierre Marie (1853-1940) with the collaboration of his pupil Paul Sainton (1868-1958) used cinematography to study movement disorders. In 1909, Sainton presented his movies at the *Congrés des médecins aliénestes et neurologiques,* in Nantes. Neri and Sainton employed cinematography as a scientific tool to analysis neurological disorders carrying on the Charcot's tradition in recording movement images. After Londe Paris remained a hub with a rich interactions between neurology and cinematography for many neurologists in the world.

BRAIN FEVER AND *FIÈVRE CÉRÉBRALE* – TERMINOLOGICAL DESIGNATION OF A LATE 18TH AND EARLY 19TH CENTURY CONCEPT

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While the disease terms *brain fever* and *fièvre cérébrale* were largely interchangeable in literature written in the second half of the 19th century – and were in fact interchanged in translations – the terms are understood differently in the medical literature. Both terms originate from the concepts of nervous fever and typhus; they constitute similar disease concepts during what was a transitional phase for the nosology of fever diseases. The prevailing belief prior to this transition was that local (cerebral) inflammation was an effect of an essential fever. This phase marks the time when others started considering the fever to be the effect of a local (cerebral) inflammation. While only a few doctors in the English-language medical literature accepted that brain fever was an entity in and of itself, the French fièvre cérébrale is accorded greater importance to a certain extent, partially induced by its inclusion in Philippe Pinel's *Nosographie Philosophique*. The descriptors of the supposed meningococcal epidemic of 1805 in Geneva also revert to this term. In the mid-nineteenth century, the term is only used as a synonym for meningitis or meningoencephalitis in both languages. As new histopathologic findings affected medical science in the course of the nineteenth century, the terms were no longer up-to-date and disappeared completely from medical terminology

CEREBRAL LOCALIZATION IN THE ANCIENT UNIVERSITIES

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Ancient universities, as centers of culture and knowledge in pre-Renaissance Europe, were hospitable places for the development of new ideas about the nervous system in the transition to Renaissance culture. The teaching of western medicine traces its origin to the medical school in Salerno, established in the ninth century, but Salernitan localization hewed to the medieval Galenic ideal. It was at the University of Padua, established in 1222 under local protection, that alternate views of localization began to take hold as the Renaissance began. In the late sixteenth century, Andreas Vesalius told how he had been taught Galenic ventricular localization, and how his views on localization had changed. More importantly, he claimed that direct observation, not theory, was the source of reliable medical knowledge, including the structure and function of the nervous system. Succeeding generations in Padua examined the nervous system empirically, and to disseminate this knowledge to other centers of advanced study in Italy and elsewhere throughout Europe. The advance of literacy, and the related proliferation of printing presses surrounding the ancient universities, enabled physicians to read of scientific and medical advances in distant places and to develop novel localization schemes as a result. By the Enlightenment of the eighteenth century, ideas of localization based on physiology had spread across Europe, though they remained concentrated around institutions of higher learning. Unlike either religious or political centers, secular medical schools in the ancient universities tolerated heterodox ideas about how the nervous system works. Cerebral localization became part of medical knowledge rather than philosophy or theology, practiced by bedside physicians rather than theoreticians.

SCOTCH NEUROSCIENCE

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The influence of the Scotch on neuroscience has not been constrained by geography. In the eighteenth century, Scotch medicine was successful, and became of increasing relevance to the emerging neuroscience, because it shifted Boerhaave's mechanistic interpretations of physiology in the direction of the nervous system. The brain and its influence on behaviour became the centre of attention rather than the body and its mechanical functioning. This realignment was effected by many physicians, like Archibald Pitcairne, William Porterfield, the Alexanders Monro, Robert Whytt, but perhaps most of all William Cullen. All studied the senses and made astute observations on their function. Cullen not only attracted many students to Edinburgh, but he also emphasized the importance of the nervous system in disease. In Edinburgh, medical students had access to patients in wards where instruction was given. Among the American students taught by Cullen was Benjamin Rush, later to be known as the "father of American psychiatry". Cullen's concerns with the nervous system and its widespread effects were continued by Charles Bell who was born and died in Edinburgh, but he made his mark in London. Other Scotch doctors who thrived in England were the brothers Hunter, Fordyce, Baillie, Wardrop, Simpson, James Crichton-Browne, Ferrier, and Riddoch. Those who sought pastures of practice in London made institutional marks there, particularly in the late eighteenth century. One reason for the blossoming of medical societies was a consequence of obstacles raised by the College of Physicians regarding requirements for Fellowship. Many of the founders were Scotch doctors who did not qualify for Fellowship without an English medical degree. Fewer remained in Scotland, but those of eminence included Black, Abercrombie, Gordon, John Brown, Thomas Brown, Crum Brown, McKendrick, MacKenzie and Macewan. Of the significant figures from outside Scotland who studied medicine there we can mention Fothergill, Lettsom, three generations of Darwins, Wells, Roget, Hall, Conolly, Lister, Laycock, Tuke, Caton and Sharpey-Schafer. Neuroportraits of these medical men will be presented.

GALILEO'S VISION OF THE SENSES

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Galileo stood at the threshold of a revolution in visual optics that took place in his own lifetime, but he did not step over it. He was a contemporary of and closely associated with those who did transform understanding of the the dioptrics and anatomy of the eye: Johannes Kepler and Christoph Scheiner. Galileo was more concerned with phenomenology than the mechanisms of the visual process. His general interest in the senses was psychological and philosophical; he reflected on the fallacies and limits of the senses and the ways in which scientific knowledge of the world could be gathered from potentially deceptive appearances. Unlike Kepler and Scheiner, Galileo continued in the tradition of observation rather than optics in accounting for visual phenomena, adding particularly to the descriptions and interpretations associated with contrast. The senses and perception featured in many of Galileo's letters and published works. For example, in *Il Saggiatore* (1623) there are some well-known passages concerned with touch, taste, smell and hearing, but very little about vision. Galileo seemed to anticipate the epistemological and physiological approaches to sensory mechanisms that we associate with Johannes Müller's doctrine of specific nerve energies. His conception of the senses represented a break with classical theories of the senses. For Aristotle sensory signals existed in the external world, and were the means by which nature communicated to living beings (particularly to humans); no errors could exist in sensation because these signals were finalized to interact with specific senses. According to Galileo, there is nothing specifically sensible in the external world and sensations are generated by an interaction between the senses and external objects; in this there is no guarantee against errors. Galileo pointed to the importance of both experimentation and direct observation in the study of the senses.

VAN GEHUCHTEN & DECROLY PIONEERS OF CINEMATOGRAPHY IN NEUROSCIENCES

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As early as 1895, Arthur Van Gehuchten (1861-1914), Belgian anatomist of renown, appreciated the scientific interest of cinematography and the value of the new audiovisual tools in teaching. A few years later, the young Ovide Decroly (1871-1932), and fellow-countryman would use the cinematography to make the first films dedicated to child development. The Belgian Society of Neurology, founded in 1896, was the crucible of the interactions of the two men. From 1905, Van Gehuchten began to systemically film patients with neurological diseases. At the time of his early death, in 1914, he had gathered a large collection of medical films. From 1901 onwards Decroly turned to the education of « irregular children » and developed an interest in measuring intellect and development, in contact with Alfred Binet. In 1906 he briefly filmed the developmental milestones of his daughter. After the First World War, motion pictures became a popular tool in the field of child behavior and development, in the hands of John B Watson at Johns Hopkins University and Kurt Lewin in Berlin. At that time Decroly, with the assistance of Antoine Castille, made a series of films where he analyzed normal and abnormal behavior in children. In 1927 Decroly participated in founding the International New Education Film Association, which intended to make films for university teaching and parent education. Decroly thus was one of the precursors in a field of research which Arnold Gesell would expand, on a huge scale with vast resources, in Yale. This cinematographic corpus fit into the development of scientific films, along with the disciplines of child psychology and education.

AMYOTROPHIC LATERAL SCLEROSIS: HISTORICAL EVIDENCE OF COGNITIVE AND BEHAVIOURAL CHANGES

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Over the last two decades the association of Amyotrophic lateral sclerosis (ALS) with behavioural and cognitive impairment has gained the interest of neurologists, neurobiologists and neuropsychologists and is now finding a preliminary rational nosographic positioning in the clinical, anatomo-functional and genetic field. Convincing evidence has now accumulated to show that ALS is a multisystem disease that affects the motor system but also behavior, language and other cognitive domains. Interestingly, a considerable body of data can be found in literature dating from the late nineteenth century, relating to the cognitive and behavioural impairments in ALS. Numerous patients were described as having a typical picture of ALS with different cognitive impairments, personality changes, psychosis or dementia, especially of frontal lobe type. Here, we report the analysis of more than eighty cases of European, American and Asian literature. All were recorded between 1886 and 1981, in which cognitive and behavioural abnormalities were associated with ALS. In a number of cases, a histological examination was carried out and in others family related occurrences of ALS with cognitive/behavioural changes were reported. These historical observations can be viewed as the natural ancestors of modern studies on cognitive and behavioural impairments in ALS to which modern clinical, neuroimaging, biochemical and genetic methods have been applied.

SURVIVING A STROKE: FICTIONAL STORIES IN EUROPEAN LITERATURE

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Casting its shadow as a sudden apoplectic fit, death often enters the narrative of novels, dramas and short stories (Karenberg, 2012). Sometimes, however, authors spare the lives of their personages. As a part of our comprehensive study of stroke reflection in fictional texts, European literature written between 1800 and 1940 was investigated. We selected prose in which characters survived apoplexy such as the first genuine novel of social realism in Romanian literature "Parvenus Old and New" (1862) by Nicolae Filimon (1819-65), a novelette "The Watch" (1875) by the celebrated Russian classic Ivan Turgenev (1818-1883), and a novel "Otilia's Enigma" (1938) by another outstanding Romanian writer George Calinescu (1899-1965). While focusing on the symbolic significance of their post-stroke existence and its evolution, we also analyzed factors that triggered the attack and paid attention to the diagnostically valuable details in the description of the illness.

In Filimon's novel, stroke turns upside down the grand life of "old" parvenu Andronache Tulzuc, one of the Phanariote Greeks, brought by the Ottomans to govern Wallachia at the end of the 18th century. Ruined by the treachery of his protégé, "new" parvenu Dinu Paturica, Andronache survived apoplexy only to endure poverty and misery. Similarly, financial and personal misfortunes brought stroke upon poor little clerk Latkin from Ryazan, a provincial city not far from Moscow. His post-apoplectic symptoms are consistent with conduction aphasia. It is intriguing that Carl Wernicke predicted this type of aphasia in 1874, one year prior to the publication of "The Watch". George Calinescu described stroke induced deficit in his character uncle Costache, who dwelled in Bucharest early in the 20th century. Paresis of Costache's arm and muscles innervated by the facial nerve clearly indicate cerebrovascular injury. The recovery of characters after stroke introduced in the text and its embellishment with clinical details open new opportunities for authors to enhance the magnetism of their literary works.

PADUA CRADLE OF THE MODERN MEDICINE

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Medical historians agree on the extraordinary role played by the Padua Medical School in the development of medical knowledge, quoting it as “the cradle of modern medicine”.
The precedents of its outstanding achievements go back almost to the origin of the Padua University (1222), when the rediscovery of the so-called “physical” writings of Aristotle stimulated renewed attention in the study of nature in opposition to theological themes, an essential aspect of the revival of the anatomical investigations. The Venetian expansion of 1405 made Padua to become the state university of Saint Mark’s Republic, starting the great moment of the “Patavina Universitas”, attended by foreign students who converged from all of the European Countries.Therefore, it can be said that in those years Padua was the centre of the medical Renaissance as Florence was the centre of the artistic Renaissance.

The fourth decade of the 16th century in Padua represents a turning point in the modern history of medicine. In 1543, when Andrea Vesalio’s (1514-1564) *De humani corporis fabrica* was published, Giovanni Battista da Monte (1489-1551) originated the method of clinical instruction at the bedside of the patient. Moreover, in 1545, the realisation of the Botanical Garden permitted the “ostensio simplicium”, that is, the demonstration of real plants, developed from the “lectura simplicium”, or, the single literary description of the subject. The teaching of Realdo Colombo (1516–1559), Gabriele Falloppia (1523–1562), Fabrici d’Acquapendente (1533–1619) followed. The permanent theatre that Fabrici erected in 1594, became the model of the demonstrative lesson of anatomy in the various European Universities. D’Acquapendente was also the teacher of William Harvey (1578–1657), the discoverer of the circulation of the blood directly connected with his Paduan education.

A second flourishing season took place in the 18th century. With his treaty *De morbis artificum diatriba* (1700, 1713) Bernardino Ramazzini established the fundament of Occupational Medicine; whereas Giovanbattista Morgagni (*De sedibus et causis morborum per anatomen indagatis,* 1761), through the anatomo-clinical method he set forth, introduced a new scientific paradigma with the shift from humoral galenic medicine to solidistic medicine.

Our medical school is today a very large one, competing at an international level. All of this comes to us from a long, rich tradition, a cultural heritage that we are deeply proud of. A historical outline on the contribution of the Padua Medical School to the development of medical knowledge will be presented along with some original research on the subject.

MANAGEMENT OF TREMOR IN MEDIEVAL PERSIA

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Tremor has been described in traditional systems of medicine throughout history. As one of those systems, neurology and neurosurgery were also widely practiced and accepted in Persian medicine in medieval times. Based on the main Persian medical manuscripts, the current study therefore focuses on the medieval concept of tremor as an important neurological disorder in order to clarify the development of neurology. Accordingly, three main approaches to the control and treatment of tremor in traditional Persian medicine are considered. First is life style modification. The administration of simple medicines is the second, and the last is the application of compound medicines. Also, those are compared with current therapeutic approaches (such as dopaminergic, antimuscarinic and anti oxidative stress agents in Parkinsonism) in this study. Many mentioned

traditional drugs possess these activities. Our study shows how much was known about tremor in traditional Persian medicine.

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