



## The Emerging of the Neurological Body in the 19th Century Afonso Carlos Neves

### O Surgimento do Corpo Neurológico no Século XIX Afonso Carlos Neves

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#### RESUMO

Se olharmos para a História da Neurologia através dos olhos da História Social, ou da História das Mentalidades, podemos ver o conhecimento neurológico como algo construído pelas várias condições através do tempo e do espaço que configuraram esse conhecimento sob paradigmas científicos. Uma ferramenta que podemos utilizar para compreender o conceito de Neurologia Clínica são algumas considerações do filósofo Michel Foucault (1926-1984) sobre o "corpo neurológico". No livro com as suas conferências de 1973 a 1974 no College de France, sobre o Poder Psiquiátrico, podemos ler o que ele quer dizer com a expressão "corpo neurológico". Esta ideia pode ser útil para compreender que as diferenças conceituais entre medicina geral e neurologia têm raízes históricas.

**Palavra-chave:** História, Neurologia, medicina.

#### ABSTRACT

If we look to the History of Neurology through the eyes of Social History, or the History of Mentalities, we could see the neurologic knowledge as something constructed by the several conditions through time and space that configured that knowledge under scientific paradigms. One tool that we can use to understand the concept of Clinical Neurology is some considerations of the philosopher Michel Foucault (1926-1984) about the "neurological body." In the book with his lectures from 1973 to 1974 in the College de France, about the Psychiatric Power, we can read what he means by the expression "neurological body." This idea can be helpful to understand that conceptual differences between general medicine and neurology have historical roots .

**Keyword:** History, Neurology, medicine.

#### 1 INTRODUCTION

If we look to the History of Neurology through the eyes of Social History, or the History of Mentalities, we could see the neurologic knowledge as something



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One tool that we can use to understand the concept of Clinical Neurology is some considerations of the philosopher Michel Foucault (1926-1984) about the "neurological body." In the book with his lectures from 1973 to 1974 in the College de France, about the Psychiatric Power, we can read what he means by the expression "neurological body." This idea can be helpful to understand that conceptual differences between general medicine and neurology have historical roots .

But first, we want to look to the seventeenth Century, when Thomas Willis (1621-1675) created the word "neurology" in his book publicized in 1664, *Cerebri Anatome*. He pointed to some knowledge about the encephalic structures, the spinal cord, and the nerves . Still, there was not yet the designation named "nervous system" that appeared in the nineteenth Century, together with the idea of other "systems" inside the body. The area called "neurology" as a clinical field would appear only after Charcot in 1882 when he created the first chair of Nervous Diseases in the world. After this beginning, clinical neurology would improve much more, including more studies of the semiological field .

So, we have an interval between Willis and Charcot of more than two hundred years. During this time, several things happened in history that established new paradigms in science. The eighteenth Century was a time of developing experimental science, remembering that science was still named "natural philosophy." At the end of that Century, Luigi Galvani discovered animal electricity. The characterization of this phenomenon suppressed the explanation for the neurological stimulus as a kind of pneuma or spiritus . Then, in the middle of the 19th Century, Duchenne de Boulogne started to study the 'human electricity' more concerned with muscles and nerves . So, at this time, Foucault saw the rise of what he called "the neurological body."

## 2 CHANGING PARADIGMS

For centuries, several Galenian paradigms endured until Andreas Vesalius (1514-1564) brought new ones in the sixteenth Century. Galen (129-217?) dissected only animals because in the Roman Tradition, still before Christianity,



it was forbidden to do a human necropsy. So, the Galenian knowledge of the human body was obtained only by comparison to the body of animals. Mainly for what was called later "the nervous system," he explained its function by the movement of *spiritus animalis*, through nerves and ventricles. In this way, he established a paradigm about the brain functions as located inside the encephalic ventricles .

This vision of the functioning of the nervous system went through different cultures and ages. When Vesalius did necropsies of human bodies in the sixteenth Century, he changed several affirmations of Galen and started to think about functions of the brain tissue itself . More than a hundred years later, Willis designed brain structures and functions and created several words related to them. Although he still thought under the Galenian way to explain the movement of "spirits" as the mechanism of neurological functioning, Willis proposed the corpus striatum as the "highest" point of motor function, beyond other connections among functions and structures. There was not yet a clinical or even neurological semiology well developed. That Willis's paradigm would stay until 1870 when Fritsch and Hitzig achieved experimental motor responses under electric stimulus on the animal brain cortex. In the same decade, Hughlings Jackson concluded, from clinical studies, that the motor activities could come from cortical areas and not just from and "under" the corpus striatum.

There was not a clear difference between neurology seen as "neuropathology" and neurology seen as "a clinical area." In that time interval between Willis and Charcot, more specifically in 1769, William Cullen (1710-1790) proposed a classification of diseases introducing the word "neurosis" to nominate neurological conditions without an apparent localized sign reuniting mental and physical conditions. The so called "neurosis" would change in several ways in the centuries ahead.

During the nineteenth Century, clinical Semiology advanced in general. At the beginning of that Century, Laennec and Bichat established what Foucault called the "Bichat-Laennec system" to consolidate the clinical-pathological system founding a modern clinical semiology. Between what Foucault called a "clinical body" and a "psychiatric body," he situated the "neurological body." In his lecture of January 30, 1974. He said that between 1850 and 1860, Duchenne de Boulogne



discovered "a new body," not just a body with organs and tissues, but "a body with functions, performances, and behavior." Foucault's distinction of seeing "a body in action with behavior" as a "neurological body" is a singular mark for neurology as a clinical discipline. It can also point that a human body is more than flesh and bones .

Under this point of view, what we call 'a body' is not just the anatomical body. In true there are 'several bodies' together with the anatomical body. All of them are constructed by human knowledge and by society and culture. For example, the body that needs a space surrounding it and obeys the social rules of touch is a 'social' or 'cultural' body. The different 'bodies' that appeared after a more profound knowledge of human physiology can be seen by different semiological visions, all of them inside the unique person. Interestingly, Foucault's characterization is that it is possible to delineate differences among the clinical, psychiatric, and neurological bodies.

Foucault pointed that Guillaume Benjamin Amand Duchenne de Boulogne (1806-1875) redefined the nosology of two "functional" disorders: progressive muscular atrophy, studied from 1849, and muscular atrophies with a myopathic origin, in 1853, including the atrophic paralysis of childness (1855) and tabes dorsalis, named by him as l'ataxie locomotrice progressive (1858-59). In 1860, he described the paralysie glosso-labio-laryngée . These are examples, among others, of new neurological knowledge developed by Duchenne de Boulogne.

In the lesson of February 6, 1974, Foucault continued with his teaching: "What should we understand by neurological body"?

Foucault answers that question explaining that the neurological body is the body of pathological anatomical "localization." And that is another character of this kind of body. To reinforce it, Foucault cites an affirmation of Charcot (1825-1893) in 1879, in one of his courses saying that the "culmination of the neurology is the "triumph of the spirit of localization." Interestingly, the Chair of Nervous Diseases would be created by Charcot three years after that declaration. So, clinical neurology was already on coming.

Foucault considers the encounter of "patient-body" with "doctor-body" in neurology in a different arrangement from that of the general medicine. In parallel with this new body also it is a constitution of a "neuropathology." He described



what he considered a new way to capture the sick body by clinical neurology.

This was different from how the body was captured by clinics and general pathology surrounded by the Bichat-Laennec system. He exemplifies with an observation of a neurological patient made by a student of Charcot, describing details of the body's surface and things that the patient could obey to command or not. Foucault said that this observation was almost an impressionistic gaze, quite different from the anatomical-pathological procedure assumed by the general clinics.

For him, the Bichat-Laennec system reduced this impressionistic description with a limited number of signs to identify what was essential to a well-established clinical code correlated to pathology. So, the neurological examination was a revalidation of the impressionistic values of the surface.

Foucault considered decisive in this new clinical capture of the neurologic patient because the neurological examination was looking for "responses" instead of "effects." The Bichat-Laennec clinical system is a kind of "stimulation-effect" system, where, for example, the physician asks the patient to cough and listens to it or using percussion can obtain sounds that are not natural of the patient but were constructed by the knowledge of that system.

In the neurological examination, what makes a sign to be a sign is not the "effect" of a clinical technic but a "response" to a stimulus. It is, for example, a reflex answer, or other responses that started to be researched by Duchenne de Boulogne that called it "localized faradization", when he got a single muscular response to an electric stimulus. From this point ahead started the study of complex behavior and responses inside a neurological capture of that. So, the study of aphasia made by Broca could be inserted in this kind of reasoning, as the Duchenne study of tabetics.

In 1864, Duchenne wrote an article to give a differential description of the gait of tabetics and the rocking of vertigo of alcoholic intoxication or cerebellar disorders. He presented it in terms of stimulus-response or the behavior of walking.

Duchenne described the tabetic march as a "tightrope walker without his balancing pole, cautiously advancing one step at a time while trying to restore his balance." He presents brief spasms which flicker across the musculature of his legs. Then, gradually, these contractions become more significant until they



become voluntary when the subject becomes aware that he is losing his balance.

In the case of vertigo, he described no muscular contraction but a general weakening of the musculature and tone. As a result, the patient cannot keep to a straight line. The tabetic, however, goes entirely straight ahead.

In the case of drunkenness, there is the internal sensation of vertigo, whereas the tabetic has the impression that it is not his body that lacks balance but only his legs.

Following this kind of analysis, Foucault presents the study of Broca about aphasia between 1859 and 1865. He obtained signs of "effects" to reveal what neurologists called synergies or correlations among different muscles to get a specific response.

Another thing focused on by Foucault is that it became possible to set out a behavioral phenomenon analyzed as voluntary or automatic by some stimulus coming from outside. The capture of that response can include some intentional or subjective attitude expressed by the body. So, as in the verbal responses that were obtained by Broca. In this way, neuropathology provides a clinical instrument to capture the level of the will itself.

Continuing Foucault talks about the interaction between patient and physician in the classical Bichat-Laennec system, where little is demanded from the individual, just some cooperation with the examination like lying down or coughing. The solicitations of the neurologist point to using techniques that pass through the patient's will and be able to detect voluntary and not voluntary responses. The reading of the quality of that response can be included in the neurological examination system of stimulus-response.

So, the neurological examination is not like the questioning system of psychiatry that obtains verbal responses nor the Bichat-Laennec clinical system, but it was a new apparatus that obtained responses deciphered at the level of the body.

In the understanding of Foucault, hysteria entered the space of clinics when the neurologist said to the patient, "obey my orders, keep quiet, and your body will respond." So, the body spoke in ways that were built as a disease under Charcot.

Before the official establishment of the chair of diseases of the nervous





system, in 1882, by Charcot, epilepsy was a disease of psychiatry. Neurology appeared between clinics and psychiatry, occupying a space between the mind/body opposition. At the same time, there were two diseases that occupied the fields between psychiatry and clinics, and those were general palsy and neuroses.

The emergence of the neurological body could remove the disqualification of neurosis as a territory with double epistemological and moral meaning.

So, the time since Duchenne started his studies (around 1850) and until the founding of the chair of diseases of the nervous system by Charcot, in 1882, we can see all that transformation. neurosis, general palsy, hysteria. That last received a kind of "construction" by Charcot with several criteria founded in the body.

After Charcot, his main disciple, Joseph Babinski (1857-1932), conducted the neurologic body to a new level. Not accepted as professor at the Sorbonne University by other disciple of Charcot, Babinski made in the Hospital La Pitié what we can call as a new line of Neurology, a new "school" of Neurology as to say. Babinski defined his most famous sign that inserted his name in Semiology definitively. He also added new propedeutics to understand cerebellar manifestations. But one thing that called the attention of the medical world was his definition of "pitiatism" substituting Charcot's concept of hysteria. By this proposal, Babinski explained that hysteria was induced by physicians by suggestion. In the first decade of the twentieth century the society of Paris, that used to see hysterical crisis and hypnosis in the Tuesday sections of Charcot, now were perplexed by the almost disappearance of hysteria among Parisians .

Babinski is in his apex of medical career during the years of Belle Époque. This was a time of certainty, of optimism, and faith in science as "clearing the future" even in a literal meaning as the electric light was arriving to the cities. Maybe the World Exposition of Paris, in 1889, inaugurated this period, until the First World War, in 1914 . As we can see in the correlation of society, science, and medicine, a kind of "simple feeling" or "naïve feeling" was present. The neurological body seemed "easier" to understand than before.

In 1912, Samuel Alexander Kinnier Wilson (1878-1937) in his paper



about lenticular degeneration related to his doctoral thesis, formulated the designation "extrapyramidal" . The First World War was about to begin in two years ahead. With that War, the "time of certainty" was ended. After the War, the complexity of the Nervous System was assumed, as the complexity of the society, and research about the then named "extrapyramidal diseases" was developed. In this line of studies, Tretiakoff found the neurological lesion that would make "Parkinson disease" to be out of the neurosis group . So, the neurological body became complex.

In 1934, Adherbal Tolosa from the Faculty of Medicine of Sao Paulo publicized an article in "Revista de Neurologia e Psiquiatria de Sao Paulo" about "Dissociation of cremasteric reflex" that received the name "sinal de Tolosa", described in a soldier of the Constitutional Revolution of São Paulo in 1932 . By this way, the neurologic body acquire regional characteristics. By, this way, under the complexity of that moment in the twentieth century, that semiological unity about the nervous system, in a certain way, follows the complexity of the society.

### 3 FINAL CONSIDERATIONS

The neurological body is something situated between the clinical body and the psychiatric body, characterized by the stimulus-answer system, which explains part of its specificity and some difficulty to understand by other areas. In Foucault understanding, Duchenne started the conditions to concept the neurological body.

After Babinski, the neurological body acquired new signs from Babinski studies and lost others that were established by Charcot, ironically the founder of Neurology. Hysteria became out of Neurology, but we have to say that other discoveries of Charcot were remarkable, establishing some specifications of the neurological body after Duchenne.

Although the studies of Foucault pointed mainly studies of French Medicine, there were physicians of other countries that contributed to the understanding of the neurologic body, as, for example, Romberg in Germany, or Charles Bell in England, and so others like Tolosa in Brazil, that took the signs of that concept to reach details.

Then, we can see that the "Neurological Body" is a dynamic concept and vision. When neurologists use the several parts of Semiology, beginning from Anamnesis





and Inspection, and so on to the other technics, they see the human body differently and particularly philtered by the knowledge constructed over concepts surrounding the Nervous System. Even with Neuroscience and the understanding that comes from Molecular Biology and Cybernetics, the perception of the neurological body stays under a clinical approach delimited by

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