

Neuronosology

Historical remarks

Marleide da Mota Gomes

ABSTRACT

Classifications for neurological disorders have evolved from following the theory of the humors to modern anatomical pathology and, recently, to the germ theory that started the etiological era, as seen in book content lists. The symptomatic approach towards neuronosology was widely used until the middle of the 19th century. The following books are representatives of this: "*De Cerebri Morbis* (1549)"; "*De anima brutorum* (1672)"; and "*A Treatise on Nervous Disease* (1820-1823)". During the Enlightenment, "*Synopsis Nosologiae Methodicae* (1769)" had a great repercussion subsequently on neuronosology. "*Lehrbuch der Nerven-Krankheiten des Menschen* (1840-1846)" was the first systematic treatise in neurology, and "*A Treatise on the Diseases of the Nervous System* (1871)" was the first American textbook of neurology, and probably the first comprehensive one. The first Brazilian textbook was "*Lições sobre as moléstias do sistema nervoso, feitas na Faculdade de Medicina do Rio de Janeiro* (1878)". A presentation going from causes of death to the International Classification of Diseases and their importance for neurology is also made.

Key words: neurology, nosology, history.

Neuronosologia: observações históricas

RESUMO

A evolução da classificação de transtornos neurológicos seguiu desde a teoria dos humores até à anatomia patológica moderna e, recentemente, à teoria do germe, que iniciou a era etiológica, tendo em vista o sumário dos livros. A abordagem sintomática na neuronosologia foi extensamente usada até meados do século XIX. Os livros seguintes são representativos disso: "*De Cerebri Morbis* (1549)"; "*De anima brutorum* (1672)"; "*A Treatise on Nervous Disease* (1820-1823)". Durante o Iluminismo, "*Synopsis Nosologiae Methodicae* (1769)" teve grande repercussão posterior na neuronosologia. "*Lehrbuch der Nerven-Krankheiten des Menschen* (1840-1846)" é o primeiro tratado sistemático em neurologia e "*A Treatise on the Diseases of the Nervous System* (1871)" é o primeiro livro americano de neurologia, provavelmente o primeiro livro de neurologia abrangente. O primeiro brasileiro foi "*Lições sobre as Moléstias do Sistema Nervoso, feitas na Faculdade de Medicina do Rio de Janeiro* (1878)". São apresentadas desde Listas de mortalidade até as Classificações Internacionais de Doenças e a sua importância na neurologia.

Palavras-chave: neurologia, nosologia, história.

Correspondence

Marleide da Mota Gomes
Programa de Epilepsia
Instituto de Neurologia Deolindo Couto
Universidade Federal do
Rio de Janeiro (UFRJ)
Av. Venceslau Braz 95
22290-140 Rio de Janeiro RJ - Brasil
E-mail: mmotagomes@acd.ufrj.br

The main bases for medical classifications have been the theories of the humors (Hippocrates, 460-370 BC), modern anatomical pathology (Giovanni Battista Morgagni, 1682-1771) and the germ theory (Robert Koch, 1843-1910)^{1,2}. The Hippocratic system primarily classified

diseases according to symptoms, particularly in terms of the parts of the body affected by diseases. The first of these classifications was "Diseases of the head", as seen in the work *Affections*¹. Heralding the Enlightenment, Thomas Sydenham suggested that all diseases could be classified

Received 10 October 2010
Received in final form 09 March 2011
Accepted 17 March 2011

MD, PhD, Neurologist, Associate Professor of Neurology, Epilepsy Program of the "Deolindo Couto" Institute of Neurology, Federal University of Rio de Janeiro, Rio de Janeiro RJ, Brazil. Department of History of Neurology, Brazilian Academy of Neurology, São Paulo SP, Brazil.

CLAVIS CLASSIUM, ORDINUM, ET GENERUM*

<p>CLASS. I.—PYREXIAE.</p> <p>ORDO I. FEBRIS.</p> <p>Sec. 1. <i>Intermittentes</i>.</p> <p>1. Tertiana.</p> <p>2. Quartana.</p> <p>3. Quotidianae.</p> <p>Sec. 2. <i>Continuae</i>.</p> <p>4. Synocha.</p> <p>5. Typhus.</p> <p>6. Synochus—Hectica.</p> <p>ORDO II. PHLEGMASIAE.</p> <p>7. Phlogosis—Apsistima.</p> <p>8. Ophthalmia.</p> <p>9. Pleurisia.</p> <p>10. Cynanche.</p> <p>11. Pneumonia—Vomica.</p> <p>12. Erysipela.</p> <p>13. Caritis.</p> <p>14. Peritonitis.</p> <p>15. Gastritis.</p> <p>16. Enteritis.</p> <p>17. Hepatitis.</p> <p>18. Splenitis.</p> <p>19. Nephritis.</p> <p>20. Cystitis.</p> <p>21. Hyemalis.</p> <p>22. Haemorrhoides—Arterialis.</p> <p>23. Odontalgia.</p> <p>24. Podagra.</p> <p>25. Arthropodiasa.</p> <p>ORDO III. EXANTHEMATATA.</p> <p>26. Variola.</p> <p>27. Varicella.</p> <p>28. Rubella.</p> <p>29. Scarlatina.</p> <p>30. Poxa.</p> <p>31. Erysipela.</p> <p>32. Milia.</p> <p>33. Urticaria.</p>	<p>34. Pemphigus.</p> <p>35. Aphthae.</p> <p>ORDO IV. HEMORRHAGIAE.</p> <p>36. Epistaxis.</p> <p>37. Haemoptysis—Pulvis.</p> <p>38. Haemorrhoides.</p> <p>39. Menorrhagia.</p> <p>40. Catarrhus.</p> <p>41. Dysenteria.</p> <p>CLASS. II.—NEUROSES.</p> <p>ORDO I. COMATA.</p> <p>42. Apoplexia.</p> <p>43. Paralysis—Tremor.</p> <p>ORDO II. APHYMIAE.</p> <p>44. Syncope.</p> <p>45. Dyspnoea.</p> <p>46. Hypochondriasis.</p> <p>47. Chlorosis.</p> <p>ORDO III. SPASMI.</p> <p>48. Tetanus.</p> <p>49. Convulsio.</p> <p>50. Clonus.</p> <p>51. Chorea.</p> <p>52. Ballismus.</p> <p>53. Epilepsia.</p> <p>54. Palsia.</p> <p>55. Asthima.</p> <p>56. Dyspnoea.</p> <p>57. Pertussis.</p> <p>58. Pyrosis.</p> <p>59. Colica.</p> <p>60. Chocera.</p> <p>61. Diarrhoea.</p> <p>62. Diabesis.</p> <p>63. Hysteria.</p> <p>64. Hydrophobia.</p> <p>ORDO IV. VESICULAE.</p> <p>65. Acanthia.</p> <p>66. Melancholia.</p> <p>67. Mania.</p> <p>68. Oestrosydia.</p>	<p>CLASS. III.—CACHEXIAE.</p> <p>ORDO I. MALIGNAE.</p> <p>69. Typhus.</p> <p>70. Atrophia.</p> <p>ORDO II. INTERMITTENTES.</p> <p>Sec. 1. <i>Adiposae</i>.</p> <p>71. Polycytemia.</p> <p>Sec. 2. <i>Flaccidae</i>.</p> <p>72. Pneumonia.</p> <p>73. Typhoides.</p> <p>74. Phymosia.</p> <p>Sec. 3. <i>Apocae</i>.</p> <p>75. Anasarca.</p> <p>76. Hydropsis.</p> <p>77. Hydrothorax.</p> <p>78. Hydrocephalus.</p> <p>79. Anasarca.</p> <p>80. Hydrothorax.</p> <p>81. Hydrocephalus.</p> <p>Sec. 4. <i>Solidae</i>.</p> <p>82. Phymosia.</p> <p>83. Bichitis.</p> <p>ORDO III. INFESTIUM.</p> <p>84. Scrophula.</p> <p>85. Syphilis.</p> <p>86. Scrophula.</p> <p>87. Elephantiasis.</p> <p>88. Leprosia.</p> <p>89. Pruritus.</p> <p>90. Trichiasis.</p> <p>91. Icterus.</p> <p>CLASS. IV.—LOCALES.</p> <p>ORDO I. SPHYRTERIAE.</p> <p>92. Coligo.</p> <p>93. Anasarca.</p> <p>94. Dyspnoea.</p> <p>95. Dyspnoea.</p> <p>96. Dyspnoea.</p> <p>97. Pertussis.</p> <p>98. Anasarca.</p> <p>99. Agnoscia.</p> <p>100. Anasarca.</p> <p>ORDO II. SPHYRTERIAE.</p> <p>Sec. 1. <i>Appetitus Deficiens</i>.</p> <p>101. Hysteria.</p> <p>102. Pseudopneumonia.</p> <p>103. Pica.</p> <p>104. Strychnia.</p> <p>105. Nymphomania.</p> <p>106. Nostalgie.</p>	<p>Sec. 2. <i>Appetitus Deficiens</i>.</p> <p>107. Anorexia.</p> <p>108. Adipsia.</p> <p>109. Anorexia.</p> <p>ORDO III. SPHYRTERIAE.</p> <p>110. Aphasia.</p> <p>111. Mutitas.</p> <p>112. Paraphrenia.</p> <p>113. Pseudopneumonia.</p> <p>114. Strabismus.</p> <p>115. Dysplasia.</p> <p>116. Contractura.</p> <p>ORDO IV. SPHYRTERIAE.</p> <p>117. Prolapsus.</p> <p>118. Epithymia.</p> <p>119. Epithymia.</p> <p>120. Pyloricus.</p> <p>121. Enteritis.</p> <p>122. Genueritis.</p> <p>ORDO V. SPHYRTERIAE.</p> <p>123. Obstinata.</p> <p>124. Ischuria.</p> <p>125. Dysuria.</p> <p>126. Dyspareunia.</p> <p>127. Anasarca.</p> <p>ORDO VI. SPHYRTERIAE.</p> <p>128. Anasarca.</p> <p>129. Vexis.</p> <p>130. Ectopneumonia.</p> <p>131. Scrophula.</p> <p>132. Cancer.</p> <p>133. Bubo.</p> <p>134. Anasarca.</p> <p>135. Verruca.</p> <p>136. Clavus.</p> <p>137. Lupus.</p> <p>138. Ganglion.</p> <p>139. Hydatid.</p> <p>140. Hydatid.</p> <p>141. Echinococcus.</p> <p>ORDO VII. SPHYRTERIAE.</p> <p>142. Herpes.</p> <p>143. Pedagra.</p> <p>144. Leucitis.</p> <p>ORDO VIII. SPHYRTERIAE.</p> <p>145. Verruca.</p> <p>146. Ulcus.</p> <p>147. Acanthia.</p> <p>148. Tinea.</p> <p>149. Poxa.</p> <p>150. Pruritus.</p> <p>151. Caris.</p>
---	--	---	--

Fig 1. A summary of *The Synopsis Nosologiae Methodicae*, reprinted by Thomson⁹, 1827, from the edition published by William Cullen in 1784. This book was first published in 1769, and described four great classes: *Pyrexiae*, or febrile diseases; *Neuroses*, or nervous diseases; *Cachexiae*; and *Locales*, or local diseases.

to a certain definite species in the same manner in which botanists were able to describe their plants (*Genera Morborum*, 1763)^{3,4}. François Boissier de Sauvages de Lacroix established the first methodical nosology for diseases in *Nosologia Methodica* (1763), and listed 10 major classes of diseases, further broken down into 44 orders, 315 genera and 2400 species; the majority of the species were single symptoms³⁻⁵. The fourth classification includes the *spasmi*. Indeed, the book covers several movement disorders and convulsions⁶⁻⁸. However, the most commonly used classification system for diseases was published by William Cullen (Fig 1): many editions and revisions were published^{9,10}.

Books

Before the middle of the 16th century, disease entities were organized topographically, from the scalp to the toes. Epilepsy and headache were grouped with afflictions of the hair and scalp¹¹. The most renowned ancient books dealing with symptomatology of neurological importance are: *De Cerebri Morbis* (DCM) (1549), by Jason Pratensis; *De Anima Brutorum* (1672), by Thomas Willis; and *A Treatise on Nervous Disease* (1820-1823), by John Cooke. DCM was probably the first book devoted entirely to brain disorders. The discourse of *De Anima Brutorum* (1672), by Thomas Willis, and that of his *Pathologiae Cerebri* made Eadi¹² conclude that Willis subdivided clinical neurology on the basis of a hypothesis of symptom pathogenesis, such that the symptoms fell into three groups on an anatomical basis regarding animal spirits: [1] they were normal in their intrinsic na-

ture, but were underactive, or overactive, in their functioning; [2] they had taken on abnormal explosive propensities; and [3] they were otherwise abnormal in their intrinsic natures. John Cooke compiled what could be regarded as the first systematic coverage of the common neurological disorders: *A Treatise on Nervous Disease* divided the disorders into three sections: apoplexy, palsy and epilepsy based on the old schemes of broad syndromic categories of neurological disease^{13,14}.

Lehrbuch der Nerven-Krankheiten des Menschen, by Moritz Heinrich Romberg (1840-1846), is considered to be “the first systematic treatise on neurology”. This author divided neurological disorders into “Neuroses of Sensibility” and “Neuroses of Motility”, based on the nosology of William Cullen¹⁵. These two groups were further broken down: the first group into hyperesthesia (such as neuralgias and hallucinations) and anesthesia (such as blindness and deafness); and the second group into hyperkinesia (such as cramps and epilepsy) and akinesia (paralysis)¹⁶. This author was the first to use an anatomical and physiological approach towards neurological diseases¹¹.

William Hammond’s textbook, *A Treatise on the Diseases of the Nervous System* (1871), was the first American textbook of neurology, and probably the first comprehensive neurology textbook. It was divided into sections: introduction; I - diseases of the brain; II - diseases of the spinal cord; III - cerebrospinal diseases; IV - diseases of the peripheral nervous system; V - diseases of the sympathetic nervous system; VI - toxic diseases of the nervous system; and VII - certain obscure diseases of



Fig 2. The first Brazilian neurological textbook and its author: *Lições sobre as moléstias do sistema nervoso, feitas na Faculdade de Medicina do Rio de Janeiro* (1878), by João Vicente Torres Homem (1837-1887). The author is considered to be one of the most important Brazilian clinicians of all time.

the nervous system. It went into nine editions and was translated into French, Italian and Spanish^{17,18}.

Leçons sur les Maladies du Système Nerveux faites à la Salpêtrière, by Jean Martin Charcot¹⁹, provided the first sound nosography for neurology²⁰. The highlights of Charcot's work, which was based on the clinical-anatomical method, are the descriptions on Parkinson disease, multiple sclerosis and *tabes dorsalis* dating from the 1860s, and on amyotrophic lateral sclerosis from the 1870s^{21,22}.

The first Brazilian neurological textbook, by João Vicente de Torres Homem²³ (Fig 2), was also rooted in structure, neuroanatomy and neuropathology, as well as neurophysiology. This book is presented as a series

of lessons, divided into three parts: encephalic diseases, medullary diseases and neuroses. Many of these lessons had already been published (for example in the journal *Progresso Medico*). The approach in the book is limited to brain disorders. There are eleven chapters: the first chapter covers general matters (the nine cases and the anatomical-physiological basis of the diagnosis); chapters II to VI cover "apoplectiform cerebral congestion", cerebral hemorrhage, cerebral embolism and cerebral softening due to thrombosis; chapter VII - covers aphasia; VIII - meningitis; IX - intracranial "tumor"; X - topographical diagnosis of the diseases of the encephalon (clinical-anatomical correlation); and XI - treatments for cerebral diseases. However, this great Brazilian clinician did not accept the idea that microscopic creatures "could enslave all cellular pathology"²⁴: this was a reverberation from the pre-germ theory that was also common to the works by Charcot and Hammond.

Today, books on neurology do not differ in their conceptual organization from the nosological paradigm given to us by Charcot and other pioneers of the 19th century, as mentioned by Greenblat²².

From causes of death to the International Classification of Diseases

The roots of an international classification of diseases (ICD) went on being planted by John Graunt (1620-1674), William Farr (1807-1883) and Jacques Bertillon (1851-1922)^{3,25,26}. Graunt is considered to be the first to analyze death records. He made a list of 83 causes of death, of which many related to neurology: apoplexy, convulsion, teeth, worms, palsy, falling sickness, sciatic,

Table. International Classification of Diseases. Nervous system disorders^{3,29}.

Revision	Conference year	3-digit codes or 3-character codes (ICD-10)	Nervous system disorder codes	Number of neurological categories in the Central Nervous System... (1-3 digit codes)
The French government convened revisions 1 to 5				
ILCD-1	1900	-	83-95	13
ILCD-2	1909	-	60-74	31
ILCD-3	1920	-	70-84	26
ILCD-4	1929	-	78-87	25
ILCD-5	1938	-	80-87	24
WHO assumed responsibility for preparing and publishing the revisions from revision 6 onwards				
ICD-6	1948	+(+ 4-digit codes)	340-369	29
ICD-7	1955	+(+ 4-digit codes)	330-369	29
ICD-8	1965	+(+ 4-digit codes)	320-358	28
ICD-9	1975	+ (+ 5-digit codes)	320-359	35
ICD-10	1989	+ (+ 4-character codes)	G00-G99	67

International List of Causes of Death (ILCD-1 to ILCD-5); International Statistical Classification of Diseases, Injuries and Causes of Death (ICD-6 to ICD-9); International Statistical Classification of Diseases and Related Health Problems (ICD-10). ILCD-5: mental diseases and deficiency were added (mental deficiency, schizophrenia, dementia praecox, manic-depressive psychosis, other mental disorders). ICD-6: morbidity and mortality conditions and a new chapter on mental disorders were included. ICD-11 is planned for 2015.

etc³. The first international conference convened in 1990 and revised the Bertillon or International Classification of Causes of Death that had been approved in 1893, with revisions occurring every ten years thereafter (Table). The Bertillon classification was based on the principle, mainly derived from work by Farr, of distinguishing general diseases (“Diseases of the Nervous System”) from those located in a particular organ or at a particular anatomical site (“Diseases of Organs of Special Sense”²⁷). The first Diagnostic and Statistical Manual of Mental Disorders (1952) was created as an alternative to the ICD-6⁴. In the ICD-10, achieving a stable and flexible classification was a matter of concern. There was a switch to alphanumeric notation (instead of numeric), and the chapter “Diseases of the nervous system and sense organs” of the 9th Revision was split. ICD-10 contains “families” of classifications, comprising specialty-based adaptations of the ICD. For example, neurology is allowed to provide extension of detail at the fifth character and beyond²⁸.

DISCUSSION

In this study, we weighed up neurological nosology as it came of age, beginning in the 1860s, on an anatomical-pathological basis. Thereafter, greater knowledge of the causality of disorders led to approaches of greater complexity, going from humoral theory to the germ theory, with advances within the fields of metabolism, immunology, genetics and today, predominantly, molecular biology and biochemistry, along with environmental foundations. In relation to many disorders, redirection from solely nosological concepts that currently attempt to force pathophysiological and etiological explanations within a single domain, to concepts that do not ignore all other intrinsic, environmental or socio-cultural factors can be expected. Another classification problem is the categorization and naming of particular “species” as further information comes to hand: should lumping that favors similarities be jettisoned, in favor of splitting that creates new categories to classify samples that differ in key ways? Consequently, there will probably be an ever-increasing number of classified diseases, especially coming from genetic and biochemical definitions, which will probably require total reclassification for many of them.

REFERENCES

1. Thagard P. The concept of disease: structure and change. communication and cognition 1996;29:445-478. Web. 14 Aug. 2010 <<http://cogprints.org/672/1/Concept.html>>.
2. Balint GP, Buchanan WW, Dequeker J. A brief history of medical taxonomy and diagnosis. Clin Rheumatol 2006;25:132-135.

3. Laurenti R. Análise da informação em saúde: 1893-1993, cem anos da Classificação Internacional de Doenças. Rev Saúde Pública 1991;25:407-417.
4. Mack AH, Forman L, Brown R, Frances A. A brief history of psychiatric classification: from the ancients to DSM-IV. Psych Clin N Am 1994;17:515-523.
5. Konofal E, Karroum E, Montplaisir J, Derenne JP, Arnulf I. Two early descriptions of restless legs syndrome and periodic leg movements by Boissier de Sauvages (1763) and Gilles de la Tourette (1898). Sleep Med 2009;10:586-591.
6. Boissier de Sauvages F. *Nosologia methodica, sistens morborum classes, genera et species, juxta Sydenhami mentem et botanicorum ordinem*, 1763. Web. 14 Aug. 2010 <<http://books.google.com.br/>>.
7. Entralgo PL. La escuela de Montpellier: nosotaxia “more botanico” y patología vitalista In: Historia Universal de la Medicina. tomo V, Barcelona: Salvat Editores SA, 1975:75-76.
8. Dordain G. Le concept de tic dans l’histoire des mouvements anormaux. Rev Neurol 1986;142:803-807.
9. Thomson J. The works of William Cullen: containing his physiology, nosology, ...: Volume 1, Edinburgh: printed by John Johnstone.1827. Web. 14 Aug. 2010. <<http://books.google.com.br/>>.
10. Johnstone RW. “William Cullen”. Medical history 1959;3:33-46.
11. Pestronk A. The first neurology book. De *Cerebri Morbis* (1549) by Jason Pratensis. Arch Neurol 1988; 45:341-344.
12. Eadie MJ. A pathology of the animal spirits: the clinical neurology of Thomas Willis (1621-1675) part I - background, and disorders of intrinsically normal animal spirits. J Clin Neurosci 2003;10:14-29.
13. Dictionary of National Biography volume 12.djvu/98. Web. 14 Aug. 2010 http://en.wikisource.org/wiki/Page:Dictionary_of_National_Biography_volume_12.djvu/98.
14. Pappert EJ, Goetz CG. Early American neurologic textbooks. Neurology 1995;45:1228-1232.
15. Moritz Heinrich Romberg (1795-1873). Editorial. JAMA 1965;193:1119-1120.
16. Schiffter R. Moritz Heinrich Romberg (1795-1873). J Neurol 2010;257: 1409-1410.
17. Hammond W. A treatise diseases of the nervous system. m. d., eighth edition, New York: Appleton and Company and 5 bond street, 1889. Web. 15 Aug. 2010. <<http://ia360615.us.archive.org/0/items/treatiseondiseas-00hammuoft/treatiseondiseas00hammuoft.pdf>>.
18. Todman D. William Alexander Hammond (1828-1900). J Neurol 2008;255:777-778.
19. Charcot JM. Leçons sur les maladies du système nerveux, recueillies et publiées par Bourneville, - Tome I (1872-73). Web. 14 Aug. 2010 http://jubil.upmc.fr/sdx/pl/toc.xsp?id=CH_00000070_toc1&qid=sdx_q2&fmt=upmc&idtoc=CH_00000070-pleadetoc&base=fa&n=1&ss=true&as=&ai=>.
20. Goetz CG. Jean-Martin Charcot and Movement Disorders: Neurological Legacies to the 21st Century. Web. 21 Aug. 2010 <http://www.movement-disorders.org/monthly_edition/2009/08/charcot.php>.
21. Scott G, Toole JF. 1860-Neurology was there. Arch Neurol 1998;55:1584-1585.
22. Greenblat S. The development of modern neurological thinking in the 1860. Persp Biol Med 1991;35:129-139.
23. Torres Homem JV. Lições sobre as moléstias do sistema nervoso, feitas na Faculdade de Medicina do Rio de Janeiro. Rio de Janeiro: Typographia Academica, 1878.
24. Seda H. Torres Homem, patrono da reumatologia Brasileira. Boletim da Sociedade de Reumatologia do Rio de Janeiro 2004; 32(114): Outubro a Dezembro.
25. International List of Causes of Death / International Classification of Diseases. Web. 14 Aug. 2010 <<http://www.wolfbane.com/icd/index.html>>.
26. Champion J. Epidemics and the Built Environment in 1665. Web. 14 Aug. 2010 <http://www.history.ac.uk/ihr/Focus/Medical/epichamp.html>.
27. American Public Health Association; Conference of state and provincial boards of health of North America. The Bertillon classification of causes of death (1899). Lansing [Mich.] R. Smith print. co., 1899. Web. 14 Aug. 2010 <<http://www.archive.org/details/bertillonclassif00amer>>
28. van Drimmelen-Krabbe JJ, Bradley WG, Orgogozo JM, Sartorius N. The application of the International Statistical Classification of Diseases to neurology: ICD-10 NA. J Neurol Sci 1998;161:2-9.
29. International List of Causes of Death / International Classification of Diseases. Web. 14 Aug. 2010 <<http://www.wolfbane.com/icd/index.html>>.