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Neurological contribution of Manuel Acuña

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Abstract

José María Barceló de Villagrán (1819-1872) was the first Professor of Topographic Anatomy in Mexico. The Mexican poet Manuel Acuña (1849-1873) was among his students. After the death of his mentor, Acuña wrote a monograph entitled "Topographic Anatomy. The Cephalo-Rachidian Cavity" (1893). For the first time we discuss the content and significance of this monograph. (Gac Med Mex. 2015;151:398-401)

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All these big things that are created
by the mind and contained by the skull.
Acuña, *El Hombre*

Introduction

In Mexico, the first professorship devoted to Topographic Anatomy was established in the National School of Medicine in 1868 and was granted to José María Barceló de Villagrán (1819-1872), who previously had been assistant professor of operative medicine[1,2]. José de Letamendi wrote about this discipline: "Topographic anatomy, which early in the century was restricted to the isolated description of some regions with application to operative medicine, has been taking shape and, moving succesively from topographic to surgical, we watch it astonished clearing the way in only a few years, and take the lead in medicine, giving advice with recognized utility for the diagnosis of medical and surgical diseases and explaining at the same time the reason of countless morbid phenomena"[3]. With regard to the textbooks on this subject in the National School of Medicine, the reference offered by Francisco A. Flores (1888) is not very clear, since very plainly, he records: "Velpeau y Beraud et Morell"[1]. The idiomatic difference in the conjunctions suggests that this is about two different works. Armand-Louis Marie Velpeau (1795-1867) wrote two anatomy treatises: *Traité d'anatomie chirurgicale* (1825) and *Traité complet d'anatomie chirurgocale, générale et topographique du corps humain* (2nd ed., 1833)[4-6]. In turn, Bruno-Jacques Béraud (1823-1865) published the *Atlas complet d'anatomie chirurgicale topographique* (1862)[7,8]. Further clarification complicates our inference: Velpeau and Béraud also wrote a manual together, the *Manuel d'anatomie chirurgicale, générale et topographique* (2nd ed. 1862)[9]. In the *Bibliothèque Interuniversitaire de Santé* there is no track of the name Morell, excluding

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Morell Mackenzie (1837-1892), who was neither French nor anatomist[10]. If we substitute the "ll" with "l", we increase our possibilities. One of the candidates is Charles Morel (1822-1884), professor of normal and pathological anatomy in Strasbourg; however, his brief treatise *Le cerveau: sa topographie anatomique* (1880) is subsequent[11,12]. This is also true for the *Manuel d'anatomie artistique* (1877) by Jules Morel[13]. As is well known, Benedict-Auguste Morel (1809-1873) was devoted to other subjects[14]. A conjoint search using the last names Béraud and Morell (or Morel) did not yield any results.

The poet Manuel Acuña (1849-1873) enrolled on January 31, 1868, in his first year of medical school[2]. When he studied topographic anatomy, he probably read a treatise by Velpeau that he may have complemented with illustrations from Béraud's Atlas. Both works were borrowed, as was his *Traité de pathologie interne* (1848), which once he tried to sell or pawn; Acuña knew well that "analphabetics *(sic)* are the owners of the best books"[1,15]. By the end of October, he participated in the foundation of the Philoiatric and Charity Society, the second philoiatric society in Mexico (the first was established in 1841). Its official publication was *El Porvenir*, the first number of which appeared on May 1869. In 1871, Acuña wrote two medical monographs that would be included in the fourth volume of *El Porvenir* (1872)[2,16].

The poet was studying the third year of medicine when, on September 5, 1872, Barceló de Villagrán, his topographic anatomy professor, died due to an apoplexy[2]. The warm esteem for his teacher is palpable in the funeral ode he dedicated in his memory: "Thus did you succumb; and even if the abyss / with your body a man steals to the world, / For the world you will remain the same / As long as the perfume of your name is alive; / Hence the feeling / That around this coffin has gathered us, / It is not the hypocritical pain that to the wind / tosses the useless complaint of a moan; / It is not the sorrow that quenches its lament / In the ungrateful silence of oblivion, / But pleasure that emerges and then raises / On the eternal trace of your footprints, / And from the hymn you wrote on them / Makes the immortal hymn it sings for you"[17]. In December of the same year, Acuña concluded his monograph entitled "Topographic anatomy. The cephalo-rachidian cavity", which would be included in the fifth volume of *El Porvenir* (1873)[2,18], and whose title recalls the discipline Barceló de Villagran taught him.

Pedro Caffarel Peralta (1984), Susana Oscoy de Ortiz (1986) and Adolfo Castañón (2012) have referred to the existence of this monograph[19,20]. However, as far as we know, its content has never been studied in depth. Even when its title suggests a neuroanatomical topic, the contents of the monograph are of clinical interest and, more specifically, for the clinical neurologist, as will be clear after our presentation.

Cranial cavity

This monograph is divided in two sections: the first is dedicated to the superior or cranial cavity and the second, to the inferior or rachidial cavity. In the second paragraph of the first section, Acuña succinctly addresses the subject artificial cranial deformation, a millenary practice that he considers completely extinct in Mexico[18]. However, today we know that remnants of this practice still prevail[21]. He then addresses Johann Friedrich Blumenbach's (1752-1840) craniology, and tracks his influence on Louis Pierre Gratiolet (1815-1865), whom we remember today in the eponym of optical radiation, and who in *Anatomie comparée du système nerveux* (1857) divided the human species in three races: parietal, occipital and frontal[18,22-25].

He mentions that, by carefully looking at anatomical differences, the sex that has belonged to a particular skull can be visually determined[18]. Acuña bases this observation on the work by Philbert Constant Philibert (1810-1896)[18,26]. In the National School of Medicine, the four volumes of Sappey's *Traité d'anatomie descriprive* were the anatomy textbook in 1857; the first of these volumes appeared in 1853[1,27].

Similar to what occurs with the shape of the skull, Acuña believed that its capacity differed between sexes, races and populations[18]. In order for not delve into the subject, the poet refers his readers to the works by Samuel Morton (1799-1851) and Paul Broca (1824-1880), whose findings can be found summarily in a recently published review[18,22,28]. Similarly, the evolution of Broca's ideas on the subject can be followed in *Origins of Neuroscience* (1994) by Stanley Finger[22].

"Thus, the cranial cavity shows a shape similar to that of the skull exteriorly observed; but we would have a rather inaccurate idea of it if we wanted to judge it exclusively based on this data. In effect, it should be just remembered that bone structures contain a large number of cavities, and that the diploe is not evenly distributed in all regions" *(sic)*[18].

Acuña uses this anatomical argument, which was previously employed by Frédéric Joseph Bérard (1789-1828) and Horace de Montègre (1805-1864), against phrenology[18,29,30]. The monograph reveals that the poet

is opposed to this discipline, which had been prohibited in Mexico in 1846 by the Superior Public Health Council. Four months after Acuña's death, *El Craneoscopo*, a "phrenologic and scientific journal" appeared in Mexico City, published by Plotino Rhodakanaty (1828-?), a Greek physician and socialist[18,31,32].

When he describes the encephalon's anatomy he quotes the *Traité pratique d'anatomie médico-chirurgicale* (1860), written by Alfred Richet (1816-1891). He refers to the hemispheres as lobes and does not mention the midbrain, as neither does Richet in his treatise[18,33,34]. Jean Cruveilhier (1791-1874) claimed in the *Traité d'anatomie descriptive* (1843) that, by filling the skull with plaster, excluding the posterior occipital fossae, the exact shape of the brain is obtained[35,36]. Based on Richet, Acuña contradicts Cruveilhier, indicating that in order for this to be possible, the existence of cranial nerves, cerebral vasculature and cerebrospinal fluid, which he names "subarachnoid fluid", should be ignored[18]" "*(sic)*".

Acuña mentions two cerebral lobes, anterior and middle[18]. Although any classification is arbitrary and conjectural (Borges *dixit*), we owe to Gratiolet (1854) the cerebral lobes' current order: frontal, parietal, temporosphenoidal (temporal) and occipital. In that same chapter, Gratiolet refers to the island of Reil as the central lobe[24,25]. The limbic lobe would be a later addition by Broca (1878)[22].

From the base of the brain he describes the *tuber cinereum* and the pituitary stalk, and then he recalls humoralism, specifically the phlegm or pituitary secretion, that humor that, according to Galen, was secreted by the brain, came out of the skull through the cribiform lamina and passed to the nasal cavity[18,37].

Immediately, he briefly summarizes the cranial nerves and describes the trajectories of the olfactory, optic, oculomotor, trigeminal, facial, vestibulocochlear, glossopharyngeal, pneumogastric, spinal and "great hypoglossal" nerves. As far as vascular anatomy is concerned, Acuña mentions the internal carotid and vertebral arteries, as well as Willis polygon, which he refers to as heptagon[18].

As we noted at the beginning, this monograph deals with clinical neuroanatomy, of interest for the practitioner and, more specifically, for the clinical neurologist, as Acuña himself observes shortly before concluding the section on the cranial cavity: "Here, the organs contained in the cranial cavity are presented in broad terms; organs whose knowledge and whose topographic relationships are of considerable importance for the physician, both because this is the place where some diseases most frequently have to be fought and because it is the place that death more commonly chooses for his ambushes" *(sic)*[18].

And next, he affirms that "never will be too much the light lit to penetrate this abyss at the same time so big and so small, where nature has locked up the most beautiful and most obscure of her misteries"[18], an assertion that even in our century remains to be true.

Rachidian cavity

In the second section, Acuña affirms that the spinal cord ends at the level of the second or third lumbar vertebra. However, briefly afterwards he clarifies – and in line with Richet – that it can reach an inferior level in pediatric patients. For the poet, this specification was of special significance at the time of punctioning the cyst in case of open spina bifida[18].

With regard to spinal nerves and neurological location, he confronts us with the double problem of Joseph-François Malgagne (1806-1865), first marquess of Guadalerzas: "1st When nervous functions of a part are altered, indicate the origin of the nerves therein distributed. 2nd Given a lesion of the rachis, indicate the corresponding nerves according to the site and circumstances of such lesion. The first problem is especially important in terms of pathology for diagnosis and prognosis; the second has, in addition, therapeutic value, since it indicates the place where medicinal agents have to be applied in a case of partial paralysis, in order for them to act closer to the lesion"[18,38-41]. Acuña offers the same solution proposed by Joseph-François Malgaigne in *Traité d'anatomie chirurgicale et de chirurgie expérimentale* (1838), quotes the findings published in 1799 by Jean-François-Nicolas Jadelot (1791-1830), translator of Humboldt and currently remembered sometimes by the wrinkles that carry his name, and then, based on these same observations, he explains the effects of the medullary section at different levels[18,39,42-44].

Finally, he concludes this section discussing the dynamics and function of cerebrospinal fluid, favoring Richet over Malgaigne JF, and suggesting, in a certain way, the Monro-Kellie doctrine[18].

Epilogue

Except for Morton, all the sources used by Acuña come from France, "those people, half men and half children" *(El Pasado,* I, 5)[17,18]. This perdominance reminds us of the influence that nation came to have

on our way of thinking and practicing medicine. Although the first neurological publications in our country are dated in the fourth decade of the 19th century[45], and this monograph does not represent an avant-garde work in that sense, its significance lies in its authorship since, as José Martí declared, "a great poet that Manuel Acuña was"[46].

At the end of the first section, Acuña reinforces that the brain is "the place that death more commonly chooses for his ambushes"[18]. Both the poet and his topographic anatomy teacher ratify this assertion: Barceló de Villagrán died because of a "cerebral attack" and Juan de Dios Peza attributes Acuña's death to a "cerebral deviation"[17,47].

The incursion of the medical sphere in literary works by physician writers is a known fact[48-50]. In Acuña's poetry, we find the word "brain" four times, in the following compositions: "*La ramera*" (1869), "*El hombre*" (1869), "*A Laura*" (1872) and "*La gloria*" (1873). All these poems were written after his enrollment in the National School of Medicine, and the latter is also subsequent to his monograph *Anatomía topográfica. La cavidad céfalo-raquidiana*. In turn, the word "skull" appears in three compositions: thrice in "*El Hombre*", once in "*Oblación*" (1871) and once in "*Ante un cadáver*" (1872). These last two poems were also written following Acuña's enrollment in the National School of Medicine. The term "brain" appears also in his drama *El Pasado* (I, 5), which opened at the *Teatro Principal* on May 9, 1872[2,17,18].

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