

## Mariano Cubí, the champion of phrenology in Spain. A brief summary of the rise and decline of phrenology

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### ABSTRACT

**Introduction.** Phrenology is the study of localised modules in the brain. While its roots lie with Hippocrates and Huarte de San Juan, this practice sprang up in Central Europe in the early 19th century thanks to the German scientists Gall and Spurzheim. In Spain, the earliest attempts at teaching this new and divergent doctrine were suppressed during the absolutist rule of Ferdinand VII (1813-1833). Toward the middle of the century, Mariano Cubí returned to Spain from a long tour of the Americas to introduce and teach the doctrine of phrenology, not without opposition from Jaime Balme. This article will describe the historical context and the vicissitudes of phrenology, and Mariano Cubí's life, works, and thought process.

**Methods.** We reviewed works by the founders of phrenology (Hippocrates, Huarte de San Juan, Gall) as well as by Cubí and Balme, and describe in this article the most significant texts and commentaries.

**Results.** Thanks to Mariano Cubí's teachings and publications, phrenology made inroads in Spain albeit later than in other countries. Cubí, preceded by his fame as the proponent of phrenology, travelled the length and breadth of Spain. However, his best attempts at modernising the country had very little effect, and they vanished entirely with the arrival of the new phrenological current represented by Broca's 1861 discovery of the cerebral localisation of language.

**Conclusions.** Phrenology's irrefragable core concept anticipated the development of neurology, but this concept was undermined by the random selection of alleged functions and the assignation of brain localisations based on speculation. Considering his desire to bring new theories to Spain and his tenacious efforts as a teacher, Mariano Cubí should by all rights be considered one of the precursors of modern neurology.

### KEYWORDS

J. Balme, skull, brain, M. Cubí, J. Gall, history of phrenology

### Introduction

Anyone with an interest in the history of neurology would do well to examine phrenology, which is largely an amalgam of neurology, psychiatry, and psychology. Phrenology was a major current in 19th-century neurology before being reduced to a marginal discipline and disappearing at a later date. This practice was defined as the science of the localisation of cerebral functions. In this article, we attempt to describe the evolution, expansion, and decline of phrenology while focusing on the biography of Mariano Cubí. In line with Spain's educational tradition, he was self-taught and not licensed doctor. Cubí's tremendous faith in the

ambitious goals of the new science of phrenology spurred him to travel across Spain to spread its message, with varying degrees of success. The new current sweeping Europe and America promised to reveal the mysteries of the brain at long last, and Cubí referred to himself as the champion of phrenology in Spain.

The underlying idea was that the brain constitutes a confederation, mosaic, or array of organs, each with its own distinct function. Activity in any of these organs would result in localised hypertrophy that would leave a visible and a palpable mark on the surface of the skull. Gall, the pioneer figure of this science, states in his pivotal

study that the “doctrine of cerebral localisations” (he himself was reticent to use the term ‘phrenology’) could be summed up as follows.

My purpose is to ascertain the functions of the brain in general, and those of its different parts in particular; to show that it is possible to ascertain different dispositions and inclinations by the elevations and depressions upon the head; and to present in a clear light the most important consequences which result therefrom to medicine, morality, education, and legislation a word, to the science of human nature. (Letter to his patron, Baron Retzer, in 1798).<sup>1</sup>

### Historical background

Since the rise of scientific medicine, the brain has been known as the organ responsible for sensory and psychological functions, as well as the origin of psychopathologies. Alcmaeon of Croton and especially Hippocrates correctly defined the function of the brain, opposing Aristotle’s cardiocentric theory. Hippocrates, in a still applicable but infrequently cited passage from his great essay *On the sacred disease* provides the following outline, which might even be considered doctrinal, of the role of the brain.

Men ought to know that from nothing else but the brain come joys, delights, laughter and sports, and sorrows, griefs, despondency, and lamentations. And by this...we acquire wisdom and knowledge, and see and hear, and know what are foul and what are fair, what are bad and what are good, what are sweet, and what unsavory... And by the same organ we become mad and delirious, and fears and terrors assail us, some by night, and some by day, and dreams and untimely wanderings, and cares that are not suitable, and ignorance of present circumstances, desuetude, and unskilfulness. All these things we endure from the brain, when it is not healthy, but is more hot, more cold, more moist, or more dry than natural, or when it suffers any other preternatural and unusual affection.<sup>2</sup>

These lines reflect both the radical materialism and the speculative capacity of Greek scholars.

Despite the setbacks suffered by medicine during the Middle Ages, we can find ‘phrenological’ descriptions made by such discerning and observant figures as the Italian Franciscan Giovanni di Fidenza (Saint Bonaventure, 1218-1274), who wrote these lines.

A large and disproportionate head typically indicates stupidity, whereas a very small head reveals lack of judgment and memory. A head that is flat and sunken in its superior part proclaims incontinence of both the mind and the heart; a head that

is long and hammer-shaped provides evidence of prudence and circumspection. A narrow forehead indicates untamed intelligence and brutal appetites, whereas too wide a forehead shows a lack of discernment...<sup>3</sup>

This text, as we will see, was used by Cubí and other phrenologists to rebut the argument frequently made by Catholics that phrenology leads to materialism. Like the universe, the brain has always been a subject surrounded by intense debate.

At this point, we should mention *Examen de ingenios*, the influential book by Huarte de San Juan (1529-1588) which became one of the most widely-circulated Spanish treatises on medicine despite being listed by the *Index Librorum Prohibitorum* soon after it was published. Known in English as *The Examination of Men’s Wits*, the text attempts to explain the variety of human behaviours and skills according to each person’s innate cerebral architecture, especially that of the ventricles. Huarte de San Juan was born in Saint-Jean-Pied-de-Port in Navarre, practised medicine in Baeza (Andalusia) and was buried

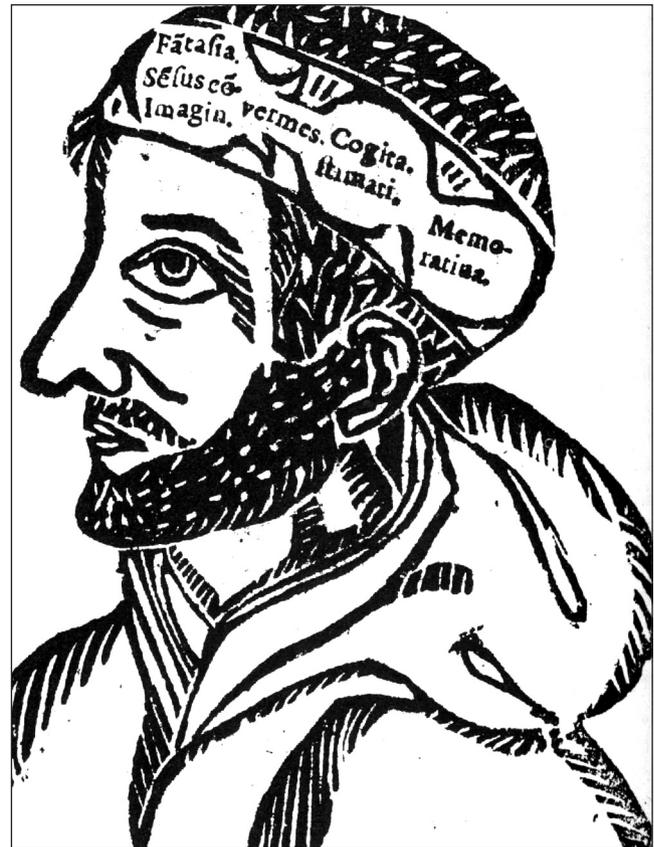


Figure 1. Primitive phrenological model by Esteban Pujasol

in Linares (also in Andalusia); many consider him to be a major precursor of the phrenologists. A brief excerpt from his book appears below.

...for men are not so different each from other, but that in divers things they agree; neither so conjoined, but that there rest in them particularities of such condition, as they can neither be delivered by speech, nor written, nor taught, nor so collected, as that they may be reduced to art...each one hath a countenance so different from other, and proper to himselfe, that it falleth out a miracle, to find two who do altogether resemble.<sup>4</sup>

As Cubí enthusiastically exclaimed about the text, “Huarte’s book is a priceless treasure for phrenology. The author stated that the brain is the seat of the soul and inferred that there are cerebral organs corresponding to understanding, imagination, and memory.”<sup>5</sup>

Physiognomy was another descendent of Hippocratic observation –recall the Hippocratic face– and it is closely linked to phrenology. Descriptions of physiognomy were frequent in Early Modern texts, such as those by Spanish Golden Age authors Cervantes and Lope de Vega. The former provides the following description of the bachelor Samson Carrasco in *Don Quixote*: “...somewhere about four-and-twenty years of age, with a round face, a flat nose, and a large mouth, all indications of a mischievous disposition and a love of fun and jokes...”<sup>6</sup>

The 17th century saw the publication of the more pretentious *Filosofía sagaz y anatomía de ingenios* by Esteban Pujasol, an Aragonese author who was greatly influenced by Huarte’s writings. Using a primitive phrenological map, Pujasol illustrates the seat of the three mental functions in the cerebral ventricles: fantasy and imagination in the anterior ventricle, knowledge in the medial ventricle, and memory in the posterior ventricle (Figure 1).<sup>7</sup> These are just a few of the currents preceding phrenology, a science with its own methodology and object of study that would emerge in the late 18th century.

#### Franz Joseph Gall and the emergence of phrenology

There are many biographies of Gall (Figure 2), and most were written by later phrenologists and loyal followers paying homage to their great master. Gall was born in Tiefenbrunn (Germany) on 9 March 1758 and received strict medical training in Strasbourg and the flourishing Vienna School. Here, he gained extensive knowledge of both anatomy and medicine under Maximilian Stoll and



Figure 2. Franz Joseph Gall (1758-1828)

the anatomist Hermann. As we will see, the unconventional nature of this discipline meant that many phrenologists, including Cubí, lacked medical training. Gall, however, was a doctor.

Rumour had it that as an adolescent, Gall had already observed on many occasions that young people with a rich and fluent command of language and prodigious memories also had bulging, pouchy eyes (*yeux de boeuf*, *yeux pochetés*). This observation pushed him to conduct additional research. As Gall reasoned, the highly developed frontal lobes in these voluble individuals exerted pressure on the eye sockets, causing the eyes to protrude. Carefully examining and palpating the cranium and establishing correlations between the anatomical relief observed or felt and the patient’s prominent behavioural traits was the procedure able to

reveal the brain's functions. Instead of the four mental faculties recognised by philosophers at the time (memory, judgement, imagination, and reflection), he created a speculative list of 27 faculties together with a topographical map of the skull. In this array of 'organs', physical love, for example, was assigned to organ number 1 at the occipital level (and attributed to hypertrophy of the cerebellum). Organ number 5, on the temporal bone, reflected murderous tendencies, and identifying this area would have a major impact on legal medicine. In his model, the 'intellectual faculties' were to be found in the anterior part of the cranium, whereas the parietal bones were marked with question marks. His choice of such different faculties as 'poetic talent', 'vanity', and so on, is capricious in many cases and does not claim to present a theory of the mind plus its functions (Figure 3). Be that as it may, his initial concept was correct and prophetic: the brain does indeed possess defined areas that correspond to specific functions. Gall presented his ideas in a series of lectures in Germany, with mixed results. He was under the patronage of Baron Retzer when he formally defined the new science of craniology. In 1801, he was accused of "propagating materialism and destroying the foundations of religion" and therefore decided to move to Paris in 1807; that city was more receptive to such "Germanic musings," according to Napoleon himself.<sup>8</sup>

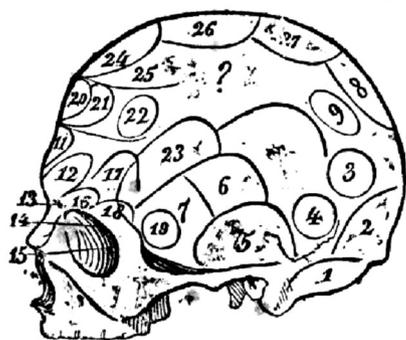
Generally speaking, Gall was well-received in Paris except in the sphere of the established sciences where his detractors included Laennec, Cuvier, and Pinel. Broussais and Flourens, however, flocked to his banner. In 1810, he wrote the four volumes of his great treatise *Anatomie et physiologie du système nerveux en général et du cerveau en particulier, avec des observations sur la possibilité de reconnaître plusieurs dispositions intellectuelles et morales de l'homme et des animaux par la configuration de leurs têtes*. Despite encountering many obstacles, Gall earned recognition in France. His teachings spread through European intellectual circles, aided greatly by his student Spurzheim, another German, who disseminated his ideas in Great Britain (it was a British doctor and phrenologist, Forters, who proposed the term 'phrenology' in 1816). Gall died of a stroke in Paris in 1828 and his brain and cranial bones "above the eyebrows" were removed as he had requested. The bone specimen remained in the craniological museum in which he himself had amassed an impressive collection. He was found to have "an extremely philosophical head".<sup>9</sup>

Johann Gaspar Spurzheim (1776-1832), mentioned above, collaborated with Gall for several years and is considered the second great figure in phrenology. He added further "primitive faculties of the soul" to achieve a total of 35, while still maintaining parts of his teacher's topographical map. Spurzheim defined these faculties of the soul in a more elaborate way and classified them as either affective (propensities and feelings) or intellectual (perceptive and reflective).

The empirical basis used to establish relationships between physical characteristics and personality was, generally speaking, poor and excessively speculative, drawing from portraits or sculptures of historical figures, or small numbers of cases collected by chance. Phrenologists were particularly interested in features indicative of criminal tendencies. The 'organ of murder', situated above the ears and listed as number 5 in Gall's and Spurzheim's classifications, was examined systematically in executed criminals. Examples included Papavoine, condemned to death for the murder of two children in the Bois de Vincennes; Madeleine Albert, who killed her mother and sisters with an axe; and the Corsican sculptor Cerracchi, accused of political conspiracy.<sup>10</sup> Psychiatry in the 19th century dedicated much of its effort to identifying the features of the 'born criminal'. Legal medicine developed quickly thanks to such figures as Cesare Lombroso (1835-1909), who was the greatest proponent of the Italian School of Positivist Criminology and who stated "all criminals are born criminals".<sup>11</sup> The famous figures in history who had provided the models for painted and sculpted heads, on the one hand, and for whom biographical and behavioural information was available on the other, were subjected to phrenological analysis.

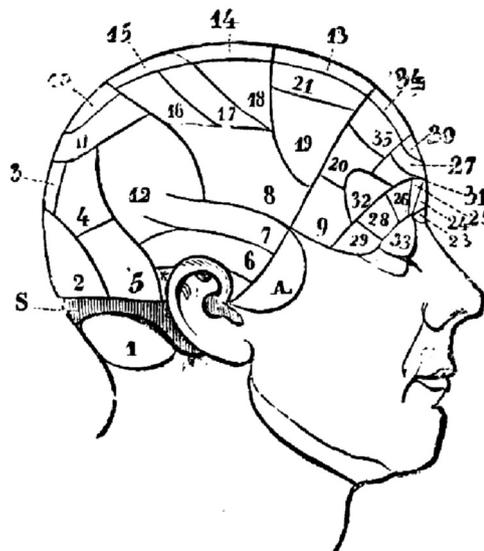
Gall left his widow a sizeable collection of skulls that he had been collecting throughout his lifetime. Each of these several hundred skulls is numbered and accompanied by a label explaining physical and behavioural findings. For example, skull 168 shows a highly developed "organ of physical love" (faculty number one) in a language teacher described as having a "lascivious temperament...and a sizeable organ of love".<sup>12</sup> Figure 3 displays the organs and functions listed by Gall and Spurzheim.

In the end, phrenology spread rapidly throughout Europe, although not without meeting resistance. Somewhat later, it made inroads into Spain, mainly in Catalonia, thanks to Mariano Cubí.



SYSTÈME DU DOCTEUR GALL.

- 1 Amour physique. 2 Amour de la progéniture. 3 Attachement, amitié. 4 Instinct de la défense de soi-même. 5 Instinct carnassier, penchant au meurtre. 6 Ruse, finesse, savoir-faire. 7 Sentiment de la propriété, instinct de faire des provisions, penchant au vol. 8 Orgueil, fierté, amour de l'autorité. 9 Vanité, ambition, amour de la gloire. 10 Circonspection, prévoyance. 11 Mémoire des choses, éducatibilité. 12 Sens des localités, sens des rapports de l'espace. 13 Mémoire des personnes. 14 Mémoire des mots. 15 Sens du langage, talent de la philologie. 16 Sens des rapports des couleurs, talent de la peinture. 17 Sens des rapports des tons, talent de la musique. 18 Sens des rapports des nombres. 19 Sens de mécanique, sens de construction, talent de l'architecture. 20 Sagacité comparative. 21 Esprit métaphysique, profondeur d'esprit. 22 Esprit caustique, esprit de saillie. 23 Talent poétique. 24 Bonté, bienveillance. 25 Faculté d'imitation mimique, amour du merveilleux. 26 Théosophie. 27 Fermeté, persévérance, opiniâtreté.



SYSTÈME DU DOCTEUR SPURZHEIM.

- PENCHANTS. 1 Amativité. 2 Philogéniture. 3 Habitativité. 4 Affectionnité. 5 Combativité. 6 Destructivité. 7 Secrétivité. 8 Acquisivité. 9 Constructivité. — SENTIMENTS. 10 Estime de soi. 11 Approbativité. 12 Circonspection. 13 Bienveillance. 14 Vénération. 15 Fermeté. 16 Justice. 17 Espérance. 18 Merveillosité. 19 Idéalité. 20 Causticité. 21 Imitation. — FACULTÉS INTELLECTUELLES PERCEPTIVES. 22 Individualité. 23 Configuration. 24 Etendue. 25 Pesanteur. 26 Coloris. 27 Localité. 28 Calcul. 29 Ordre. 30 Eventualité. 31 Temps. 32 Tons. 33 langage. — FACULTÉS INTELLECTUELLES REFLECTIVES. 34 Comparaison. 35 Causalité.

Figure 3. Left, Gall's phrenology map; Right, Spurzheim's phrenological map of the head. Below each engraving is a list with Gall's 27 faculties and Spurzheim's 35 faculties.

*Gall's system*

1. Instinct for reproduction; 2. Parental love; 3. Friendly attachment; 4. Self-defence; 5. murder, carnivorousness; 6. Sense of cunning; 7. Sense of property, larceny; 8. Pride, arrogance; 9. Ambition and vanity; 10. Circumspection; 11. Aptness for education, memoria realis; 12. Sense of locality; 13. Recollection of persons; 14. Verbal memory; 15. Faculty of language, philological talent; 16. Disposition for colouring; 17. Musical talent; 18. Arithmetic, counting, time; 19. Mechanical skill; 20. Comparative sagacity; 21. Metaphysical perspicuity; 22. Wit, causality, sense of inference; 23. Poetic talent; 24. Good nature, compassion; 25. Mimic; 26. Theosophy; 27. Perseverance, firmness.

*Spurzheim's system*

PROPENSITIES: 1. Amativeness; 2. Philoprogenitiveness; 3. Inhabitiveness; 4. Adhesiveness; 5. Combativeness; 6. Destructiveness; 7. Secretiveness; 8. Covetousness; 9. Constructiveness

FEELINGS: 10. Self-love; 11. Love of approbation; 12. Cautiousness; 13. Benevolence; 14. Veneration; 15. Firmness; 16. Justice; 17. Hope; 18. Wonder; 19. Ideality; 20. Wit; 21. Imitation.

KNOWING FACULTIES: 22. Individuality; 23. Form; 24. Size; 25. Weight; 26. Colouring; 27. Locality; 28. Order; 29. Number; 30. Eventuality; 31. Time; 32. Tune; 33. Language.

REFLECTING FACULTIES: 34. Comparison; 35. Causality

### The origins of phrenology in Spain

It is possible to locate occasional texts predating Cubí's campaign for phrenology that inform us that the practice was already known in Spain in the early 19th century. While data are scarce and further investigations are pending, the knowledge we possess about this period in history is a testament to the research carried out by Cubí himself<sup>5</sup> as well as by Comenge,<sup>13</sup> Granjel,<sup>14</sup> and Domenech (in her most recent and elegant book *La frenología. Análisis histórico de una doctrina psicológica organicista*).<sup>15</sup> We can also learn more about this period in a novel about Cubí written by Ramón Carnicer (*Entre la Ciencia y la Magia. Mariano Cubí*).<sup>16</sup>

In 1806, before the term 'phrenology' had been coined and prior to Gall's arrival in Paris, his new theory of the brain was furtively being passed around Madrid in a little book titled *Exposición de la doctrina del doctor Gall o nueva teoría del cerebro, considerado como residencia de las facultades intelectuales y morales del alma*.<sup>17</sup> In just 189 pages on 'cranioscopy' or 'encephalocranioscopy', this book drew from early German texts to provide a correct and even critical view of the new discipline. The scientific apathy that prevailed in the days of Ferdinand VII soon snuffed out this valuable anonymous book, but an admiring Cubí would rediscover it 40 years later.

Two decades passed before Juan Drumen y Millet (1798-1863), a prestigious doctor from Barcelona with a brilliant record at the Faculty of Medicine and Royal Academy of Medicine in Madrid, updated the phrenological doctrine by describing his experiences performing autopsies on executed criminals. Spain also began to see translations of what are now phrenology classics, including José Ceber de Robles's translation of the book by Bessiers; *Nuevo Manual de Frenología*, Jose de Garaycochea's translation of Combe's *A System of Phrenology*, and Ottin's well-illustrated book from 1845.<sup>18</sup> These were followed by other texts, common both in Spain and abroad and generally deriving from Catholic doctrine, which refuted new phrenological writings on the basis of 'materialism'. One example was Lelut's controversial study of 1847, *Refutación de la organología frenológica de Gall y de sus sucesores*, published in Valencia,<sup>19</sup> and these manuscripts anticipated the heated debates in which Cubí would find himself embroiled in later years.

### Mariano Cubí: Biography

Most of the available data on the life of Mariano Cubí are taken from an apologetic posthumous biography which

his family entrusted to the pen of Miguel Arañó. This book can now be read on the Internet.<sup>20</sup>

Mariano Cubí (Figure 4) was born in the northern part of Barcelona province in the coastal town of Malgrat, which was dedicated to sea trade. This location would have a decisive effect on the twists and turns of his later life. His father, who was apparently of Italian extraction, married the daughter of a paper manufacturer from Igualada. Eight years later, the family moved to Mahón, probably because of the French invasions. Mariano helped his parents run a small shop and made good use of his skill with languages by learning English and French.

After the Napoleonic Wars, the family returned to Malgrat minus Mariano, who remained in Mahón until he had the opportunity of setting sail on a corvette bound for the United States. He taught French and Spanish after arriving in Washington, and was later made department chair of Spanish in Baltimore. His skill with languages and love of teaching led him to publish grammar books, including his *Nueva gramática española* and *Gramática castellana*. He began studying

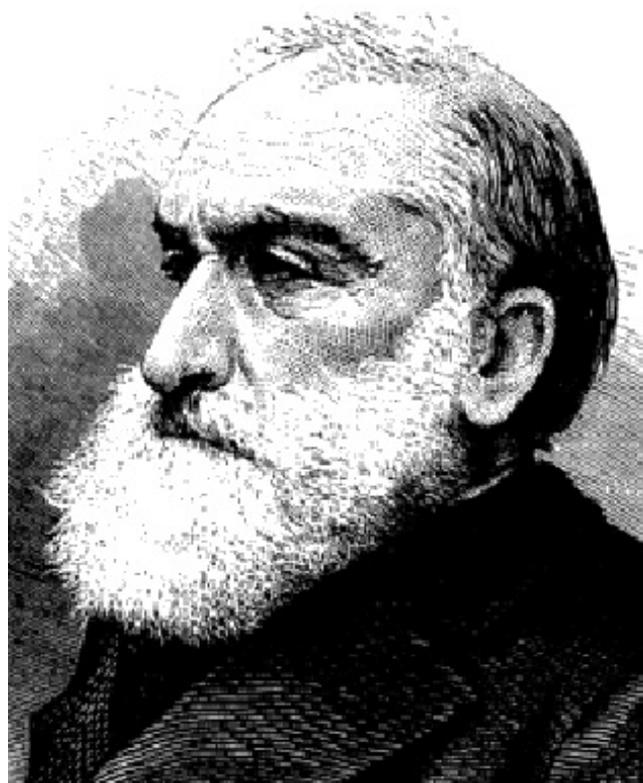


Figure 4. Mariano Cubí (1801-1875)

philosophy, and according to his biographer, he became convinced that the science of the soul did not exist. In 1828, he was consumed by his discovery of Combe's treatise on phrenology. Combe, a Scot, was one of the leading teachers of phrenology in Great Britain and he advocated the use of cranial measurements in criminology studies. As Cubí stated, "there is more truth in the nomenclature of this science than in everything on metaphysics written since Aristotle".<sup>20</sup>

His adventurous spirit would send him on to Cuba and Mexico, but he had to leave each of those countries due to political and health reasons, and so he returned to the United States. He later settled in New Orleans and remained there for seven years. It was in New Orleans that he would dedicate himself to the study of phrenology and write his first book on the topic. After 21 years abroad, he finally returned to his beloved homeland. He was forty years old on 1 October 1842, when he stepped off the ship in Barcelona ready to become the champion of the new doctrine.

#### The dissemination of phrenology in Spain

Miguel Arañó described Mariano's mood upon his homecoming:

On arriving in Barcelona, he began his labours with no rest or respite. In the constant company of intellectuals, he visited prisons and other correctional facilities, where he examined more than five hundred heads free of charge. He gave the press a copy of his book, *Manual de frenología*, and on 7 March 1843 he delivered his first speech before a large audience at the convalescent ward at Hospital de la Santa Creu.<sup>20</sup>

This 'skull-fondler' (as the French referred to phrenologists), or 'wise inspector of heads' in the ironic words of Menéndez Pelayo<sup>21</sup> travelled all over Spain with evangelical zeal to promote his phrenological doctrine. He had soon gained a degree of prestige and popularity; in Catalonia in particular, he found a receptive crowd willing to attend and pay for his classes, be examined, and purchase his books and porcelain phrenological heads. He also continued teaching French and English classes, and would do so all his life; this activity provided him with a little financial leeway for his intellectual pursuits.

Cubí presented his courses in Barcelona, Igualada, Manresa, Cardona, Vilanova i la Geltrú, Vilafranca del Penedès, Tarragona, and Reus to many younger participants who viewed phrenology as the cutting-edge

progressive discipline of their time. In the phrenologically-oriented town of Vilanova, Mariano gained many followers and founded an active phrenological association that included a women's chapter; "Villanueva-i-Jeltrú [*sic*] will always be exceptional for having been the only city in Spain in which I taught a ladies-only class".<sup>22</sup> It was also the hometown of Spain's second phrenologist, Magin Pers y Ramona, who frequently collaborated with Cubí. Pers was another world traveller and a tailor by trade. Upon returning to Spain, he published a phrenology textbook titled *Manual de frenología al alcance de todos*.

Cubí continued spreading his message in Zaragoza and Madrid. In the capital, criticism came from the theatre rather than the church. Bretón de los Herreros wrote a satirical play in one act (*Frenología y magnetismo*) in which the main character, Lucas, is a phrenologist. On one occasion, he emphatically takes his leave of a person whose head he has examined.

Why do you dismiss him  
with such fury?  
He's a thief.  
Can it be? But how...  
His organ of covetousness is grotesque  
And shows the highest level  
of malice and perversion.  
Could you not be mistaken?  
Could I be mistaken! No.  
But if the poor man has had a bump  
to that organ, what then?  
(Scene 12)<sup>23</sup>

Cubí was celebrating his early triumphs in Barcelona, and soon after in Mallorca, when his clashes with the church began. In Barcelona, he came face-to-face with the most highly trained Catholic intellectual of his time, Jaime Balmes of Vich. Balmes was regarded as a veritable inquisitor of phrenology in Catalonia "with a very large head and an easy disposition".<sup>24</sup> Determinism and negation of mankind's free will were to lock swords with the concept of the immortal soul. A shocked Balmes asked "is there also an organ for faith?"<sup>25</sup> Although his arguments were largely doctrinal, he was able to sense how much of phrenology was based on speculation and attack it at its weak point; Cubí tried to avoid this so as not to be embroiled in a cryptic debate in which neither party would understand the other's arguments. The initial attacks by Balmes were published in the magazine *La Sociedad*; they were forceful, largely necessary, and they are still applicable today.

The natural sciences, which include this discipline, may not be founded on mere hypotheses and analogies that may be more or less credible; rather, they must be based on the observation of meticulously recorded events. It shall first be proved that the brain is divided into a set number of parts, each of which fulfils a specific function. Second, the localisation of each part must be determined, along with the corresponding faculty of the soul which guides the part. Phrenology must also show that it is possible to determine the presence or degree of these faculties by simple inspection or palpation of the cranium, and provide a precise list of causes that may induce error when practitioners attempt this conjecture. Fifth, the discipline must explain, based on factual examples, the development and changes induced by education, training, occupation, type of life in general, and any other causes. Sixth, the maps indicating the localisations of cerebral organs should indicate the rationale according to which the lines were drawn, specifying whether they apply to all heads in general or if they may have also developed in an exceptional and individual way by natural or artificial means.<sup>26</sup>

Cornered by these objections, Cubí's response was to cite phrenological authorities including Gall and Broussais, whose phrenological arguments "were irrefutably proved some time ago".<sup>27</sup>

In Mallorca, Balmes was joined by writer José María Cuadrado, who described phrenological texts as "anti-religious, immoral, and anti-social".<sup>28</sup> Cubí downplayed the debate and took a step back from the controversy once more; with his reputation as a materialist preceding him, he continued teaching his theories.

He undertook three major journeys around Spain. After visiting Catalonia, Zaragoza, and Madrid, he headed south to Seville where his courses met with tremendous success, drawing 129 students. In that city, the prestigious ceramics factory at La Cartuja crafted the porcelain phrenology heads that Cubí would sell after each of his courses. He continued on to Cádiz, Gibraltar (where he taught in English and Spanish), Ceuta (where he examined 17 prisoners), and Jerez de la Frontera. He then journeyed to the Basque Country and met with much less success all along northern Spain. On 20 March 1847, his travels brought him to Galicia, where the most intolerant currents in the Catholic Church would meet him head on. The Ecclesiastic Tribunal of Santiago de Compostela, which lacked Balmes' delicacy, brutally detained Cubí without bandying words. Mariano would remain under house arrest for almost a year. While it did not change his convictions in the least, this experience forced him to eliminate many pages from his doctrine.

Cubí's journeys grew less and less frequent, but he still visited London in 1851 for the Great Exhibition and Paris in 1852. During the latter visit, it seems that Napoleon III let him perform phrenological examinations of his own head and that of his wife, Eugénie de Montijo. They also recognised his efforts by promoting the two-volume edition of his book\*, published in French as *La phrénologie régénérée*. Cubí's thirst for knowledge led him from his craniological theories to physiognomy, which he regarded as a branch of phrenology. This discipline had become very prestigious through the efforts of Pastor Johann Lavater (1740-1801).

In the same way, we can deduce the mental qualities of the living naturally, using pure science and the appearance of the head and face. Do we not say that one man has a poet's face, while another looks like a fool and another must be a rogue...? (Sixth principle).<sup>29</sup>

Cubí also found himself powerless to resist the speculations about magnetism that had become so popular in Europe thanks to Mesmer, and despite fierce opposition from scientific societies, and so he often added 'magnetic induction' sessions to his phrenology courses. Although he taught fewer courses during the last ten years of his life, he continued travelling around Spain and Europe offering consultations and searching for thermal baths to relieve his aches and pains. He honed his linguistic skills and kept his language school running in order to remain solvent in Barcelona. With his death on 5 December 1875, Cubí's numerous linguistic projects and explorations of sociological topics in Spain were cut short. Eight days before, an attack of apoplexy had robbed him of language, one of his greatest strengths. Miguel Araño, one of Cubí's contemporaries and the author of a hastily prepared biography (Cubí's family paid 25 *duros* to have it done) provided the following phrenological diagnosis.

Very active temperament, rather large head, small organ of Circumspection, large Approbation, exceptional Ideality, that is, progressive thought. Language highly developed, especially the part referring to the nature of languages. Little Imitation; colossal organ of Comparison, which is the major component of oratory. However, his predominant feature was the intellectual area.<sup>30</sup>

\* The Spanish copy maintains the grammatical idiosyncrasies proposed by Cubí, who always used 'i' instead of 'y' and 'z' to indicate the phoneme /θ/. He also showed an interest in body language ('natural language') and included numerous illustrations in his books.

The works and views of Mariano Cubí

Although his dominant role was that of the tireless communicator (or perhaps incessant speaker) and champion of phrenology in Spain, Cubí's written contributions are numerous and described with passion. In terms of clarity, substance, and rigour, they equal any of the major phrenological texts available in Europe or the United States. *El sistema completo de frenología* [The complete system of phrenology] is a basic textbook from 1844 providing a systematic summary of his reflections. Its revealing subtitle –with applications to the advancement and improvement of individual men and human society– clarifies the ambitions of the discipline of phrenology.<sup>21</sup>

From a more mature perspective, but without the editorial freedom we observe in his first textbook, Cubí wrote *La frenología y sus glorias* (1853),<sup>5</sup> a lengthy study that was approved by the vicar general. Included in its more than a thousand pages and hundreds of engravings, we find a good summary of the religious controversy surrounding the practice. Cubí sold his books at 152 reales each, as well as very expensive porcelain phrenology heads, and as a teacher he charged 60 duros per course. He also performed phrenological examinations (50 reales per consultation) to inform clients of their professional aptitudes. At the apex of the phrenology movement in Spain, just when the practice was losing prestige in Europe, he edited a journal called *La Antorcha* (1848) that survived for two years. This was one of only three phrenology journals published in Spain, and *Eco Frenológico* and *Revista Frenológica* were equally short-lived.

While Cubí remained faithful to the phrenological model proposed by Spurzheim, he would continue to list more faculties and additional organs to achieve a total of 47 in his book *Lecciones de frenología* (Figure 5). He proudly counted certain faculties as his own discoveries, such as ‘mimicry’ in organ 36 (the tendency to exhibit mental activity by means of miming or pantomiming), and ‘deductiveness’ in organ 47 (the logical desire to make deductions). He grouped his list of faculties and organs into several classes. Class I contained the ‘contact-related’ items such as ‘tactile sense’, ‘visual sense’, ‘auditory sense’, ‘gustatory sense’, and ‘olfactory sense’. Class II contains ‘knowledge-related’ items, such as ‘language ability’ and ‘sense of location’. Class III includes 26 faculties and organs described as ‘action-related, of perception and moral action’; examples include ‘destructiveness’ or ‘benevolence’. Lastly, class IV includes three faculties and

organs known as ‘intellect-related’. Cubí coined a wealth of Spanish neologisms for phrenological areas, and they reflect his philological leanings. Each faculty and organ in turn could display different degrees of development, which Cubí reflected on a scale of one to ten (from ‘small’ to ‘very large’).<sup>31</sup> He was also shrewd enough to recognise negative cases, a topic that would be of great interest after Broca’s discovery of the language centre. Take the example of the gatekeeper at the Monastery of La Cartuja in Seville, a site that was transformed into a sumptuous china factory under Pickman and Co. The story goes as follows:

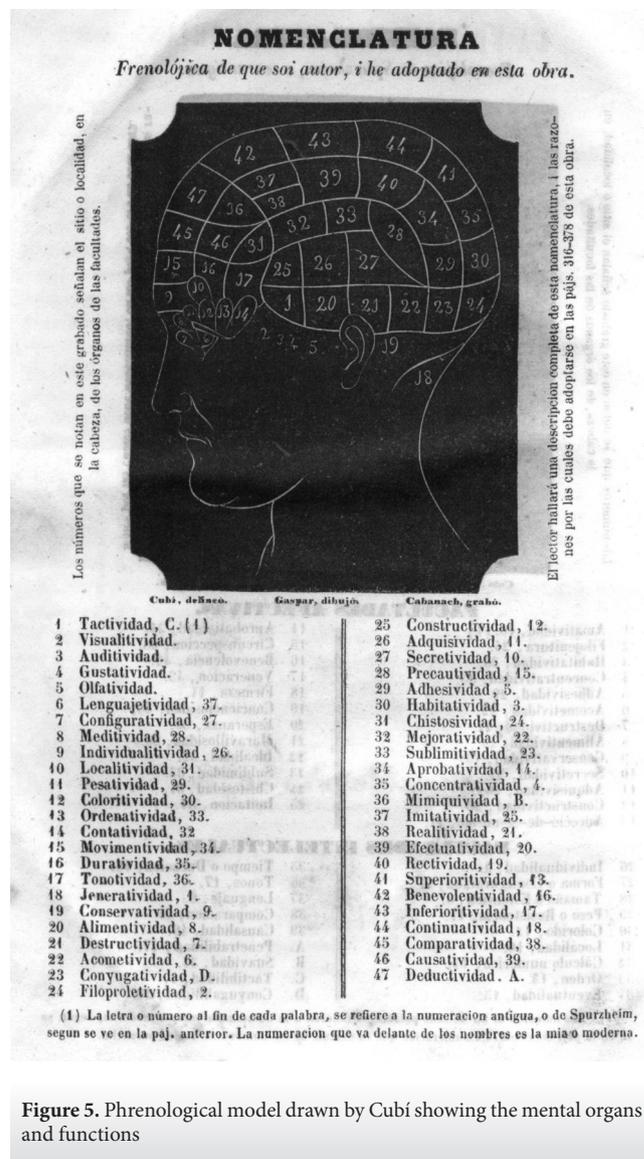


Figure 5. Phrenological model drawn by Cubí showing the mental organs and functions

Judging by the sunken appearance of his temples, we would say that this person does not possess the organ (of tactile sense). After I had completed a thorough investigation of the man's head, I warned Mr Pickman not to place his trust in this gatekeeper, as his intentions were harmful. "What sound advice you gave me about my gatekeeper!" were his first words to me when we met again. "He's in prison now for having tried to shoot me with a pistol".<sup>32</sup>

Additional books by Cubí demonstrate his commendable love of teaching, his passion for enriching his work with research related to the still undeveloped fields of neurology, psychology, and psychiatry, and a combination of imaginative ideas that were devoid of any factual basis. Cubí displayed an exemplary and constant intellectual honesty, although loyalty to his teachers was the motive underlying his voluminous treatises. He mainly cited original references, and worked using a body of literature that was quite extensive for his time. Cubí's pedagogical approach was characterised by his insistence on clarity and comprehensibility, which distanced his courses from the mystical tendencies that were also rampant in the field of phrenology. Cubí was inspired by a healthy and powerful dose of patriotism and the moral obligation of promoting his knowledge with a view to modernising his beloved country.

Gall pointed to capacities, such as 'orderliness', which would probably manifest as specific organs, but he recognised that he had not discovered their locations. Cubí and some of his followers believed that they had found this faculty in the internal part of the superciliary arch through isolated and anecdotal observations in a Spanish general (by Cubí), Napoleon (by Broussais), and a young lady who never deviated from her habits (Spurzheim).<sup>33</sup> Such were the foundations of phrenology.

### Closing remarks

Phrenology rested on a foundation which, while partially intuitive, was factually correct and less speculative than that of magnetism. The brain does indeed contain specific areas that are innately dedicated to specific functions. The question is how to define these functions and locate their corresponding areas. This theory was taking shape in Paris, and Broca was aware of the debate in 1861 when he opened Monsieur Leborgne's skull and in doing so discovered the localisation of articulate speech at the base of the third frontal gyrus of the left hemisphere.<sup>34</sup> The paradigm shift brought about by direct observation of a brain lesion give rise to the rapid ascent of neurology as

a new type of phrenology. Developing a brain lesion locator map was of particular interest for clinical medicine. A brilliant generation of neurological semiologists took up the challenge and created a new doctrine for brain functions that was to surpass the proposals made by Gall and his followers in all areas. This approach to functions relied on negative cases, meaning that researchers attempted to identify the deficient functions based on the symptom resulting from brain injury (Goldstein). This delivered a map of aphasias, apraxias (Liepmann), and agnosias (Freud), as well as indirectly providing maps of phasias, praxias, and gnosias. Maps of cortical locations of the cerebral convexity or the internal face of the hemisphere (Kleist) would soon follow. But nothing is ever easy, and the novel topographies would be called into question with every discovery of a new case that did not conform to the rules. Negative cases or lesions near established areas were once again instrumental in the formulation of such concepts as hemispheric dominance (Broca) and the emergence of anti-localisationism (Pierre Marie). These concepts would be joined by associationist theories (Wernicke), methodological criticism (Von Monakow), the English school's dynamic theories about lesion complexity with destructive and irritative lesions, and the symbolic uncouplings of consciousness and levels of dissociation in automatisms (Jackson). We then find contributions from neurosurgeons such as Penfield (ablation, stimulation) and the position that specific localisations can only be firmly assigned to projection areas.

At the same time, traditional Catholicism, which had taken such umbrage to Huarte, Gall, and Cubí, remained silent on the new furore for locating brain functions, which provided another method of dividing up the mind. As explained by Pierre Marie,

The localisation of language has become a political issue. The conservative old school maintains that the brain functions like a single machine. On the other hand, young liberals and republicans are convinced that the two hemispheres of the brain host different parts responsible for specific functions. The authorities took sides. The battle has begun with the spiritualists on one side and the materialists on the other. The students' political passions have been aroused just as thoroughly as if brain localisation were part of a republican dogma.<sup>34</sup>

Craniological phrenology subsided in the late 19th century; in the end, it only occupied a tiny part of the history of another major emerging specialty, neuropsychology.<sup>35</sup> It also continued as a marginal discipline

(Société Française de Morphopsychologie). It was in these early days of psychiatry and neurology that Giné y Partagas, a pioneer in both specialties and the author of the first pivotal treatise of neuropsychiatry, used the term 'phrenopathology' in that book (*Tratado teórico-práctico de Freno-Patología o estudio de las enfermedades mentales fundado en la clínica y en la fisiología de los centros nerviosos*, 1876).<sup>36</sup>

Cognitive psychologists have recently restored Gall's good name, in part because of his belief that mental faculties are innate (a position supported by Chomsky) and his list of selected mental faculties. The mind is partially modular (Fodor), with 'vertically arranged' mental faculties (each with its own dominion and instruments, as phrenologists claimed), and these differ from the classic 'horizontal' or 'cross-sectional' faculties.<sup>37</sup>

The newest development in phrenology, which continues to gain ground despite its share of difficulties and controversy, makes use of functional magnetic resonance imaging (fMRI). Based on blood-oxygen-level-dependent (BOLD) contrast, this technique measures real-time oxygen consumption to determine the area of the brain that is active in order to link the area activated at a specific time to a particular behaviour. However, this subject falls outside the scope of our article.

With these remarks, the curtain falls on Cubí, the internationally recognised son of Catalonia and a prime example of a Spanish scientist in the turbulent 19th century. Like a travelling salesman, he went from town to town promoting a new and promising theory with passion and conviction, with the aim of modernising Spain's scientific wasteland in the face of opposition by both Catholic and academic authorities. While his contributions were just as important as other classic phrenology texts, they had little impact in Spain after his death and no influence whatsoever beyond that country's borders. It would be fitting to recall his comment upon reading Spain's first anonymous treatise on phrenology, published in 1806:

Today, at a time when these (phrenology) texts are worth their weight in gold and kept like religious relics, and regarded as monuments to the truth, Spanish books are neither bought, nor kept, nor held in regard, nor read...<sup>17</sup>

In Barcelona, a street named in honour of Mariano Cubí happens to intersect another named after his famous rival, Jaime Balmes. Our predecessor certainly deserved such a fitting remembrance.

## Conflicts of interest

The authors have no conflicts of interest to declare.

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