Santiago Ramón y Cajal and his father Justo Ramón Casasús: the Valencia years

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ABSTRACT

Santiago Ramón y Cajal was one of the pivotal figures in the development of the neurosciences. There is a large body of literature describing his life and his life's work. Nevertheless, the four years he spent in Valencia after being named Chair of Anatomy are less well-known; his father, Justo Ramón Casasús, had also earned his medical degree in Valencia in 1862.

In this article, we will first present the conclusive evidence that Justo Ramón completed his studies in Valencia during an exceptionally fruitful period for medicine in the region, a milestone that would later influence his son's career. Secondly, we examine both Santiago Ramón y Cajal's scientific and his social activities as the Chair of Anatomy in Valencia. It was in this city that he began the histological research for which he was subsequently honoured with the Nobel Prize in Medicine.

KEYWORDS
Santiago Ramón y Cajal, Valencia, Justo Ramón Casasús, scientific activity, Juan Bartual Moret, 19th century Spanish medicine

Introduction

The role of Santiago Ramón y Cajal as one of the leading figures in the development of the neurosciences is unquestioned. Much has been written about his life and work,[1,2,3] including more recent works published in celebration of the centenary of his Nobel Prize.[4,5] Furthermore, several of the author's own books describe the events and recollections of a long life dedicated to science.[6,7]

Until only a few years ago, the clinical and scientific activities of his father, Justo Ramón Casasús, were largely unknown, and so was the extent of his potential influence on his son's attraction to the histology of the nervous system. Similarly, Santiago Ramón y Cajal's four years of professional and personal growth in Valencia, following his first appointment as a department chair, have attracted little attention. As the author describes in his memoires, "I found myself in a country new to me, with a most genial climate, in the fields of which flourished the century plant and the orange tree, and among the people of which dwelt courtesy, culture, and intelligence. Hence is Valencia called the Athens of Spain".[6]

In preparing this article, we have drawn mainly from the monumental research project carried out by the Department of Medical History at the University of Valencia under Professor López Piñero, the author of what is possibly the best biography of Santiago Ramón y Cajal ever written.[1] We also refer to the excellent studies by Professor Francisco Vera Sempere, current Chair of Pathology at the University of Valencia, which conclusively prove that Cajal's father Justo Ramón studied at and graduated from the University of Valencia during a very fruitful period for medicine in Valencia, and that this may have sparked the future Nobel Prize laureate's interest in histology (Figure 1).[8,9]

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Figure 1. Santiago Ramón y Cajal's parents, Justo Ramón Casasús and Antonia Cajal

Before analysing the time spent by both Santiago Ramón y Cajal and his father in Valencia, we would like to establish the scientific and political context of that moment in history. Although the considerable strength of will exhibited by both father and son helped them overcome obstacles, their characters and decisions were also certainly shaped by the times in which they lived.

Politics and medicine in nineteenth-century Spain

Modern medicine and science were introduced in Spain at the end of the 17th century by the *novator* movement of modern thinkers, which flourished thanks to state support and to the country's socioeconomic conditions. Under Charles III (1759-1788), the government proposed reforms that were clearly intended to centralise services, including requirements for uniform practices at all universities. The reform project designed by Gregorio Mayans of Valencia stipulated that the king would name a chancellor, who would be responsible for presenting the programmes of study and proposing any necessary improvements. The Valencian reform project presented by Chancellor Blasco in 1786 granted the university financial independence from the municipal and ecclesiastic bodies on which it had previously depended; it ended the practice of taking dictation and ushered in yearly examinations. The study of medicine in Valencia was based on the works of the Valencian anatomist Piquer and emphasised practical classes: "the chair of practical medicine will be responsible for the care of twenty patients with a variety of ailments at all times".[10,11]

By the second half of the eighteenth century, three Spanish universities had developed their own approaches to the teaching of clinical medicine. They were the Chair of Practical Medicine, established at the University of Valencia in 1787 under Félix Miquel; the Royal School of Practical Medicine of Madrid, founded in 1795 and directed by José Severo López; and the School of Clinical Medicine of Barcelona, founded in 1797 and led by Francisco Salva y Campillo.

The nineteenth century was a particularly turbulent time in Spanish history, with numerous social and political changes and upheavals.

At the beginning of the century, a series of poor decisions by Godoy, prime minister to Charles IV, added to the unravellings of the monarchy as the king and his son Ferdinand VII struggled for power. This climate favoured the French invasion in the context of the Peninsular War. From 2 May 1808 to 1814, the Spanish fought for their independence and with the help of the British eventually defeated Napoleon's troops. However, the country would become fragmented during this period. The small group of nobles and Enlightenment thinkers who cooperated with the new regime were criticised for their embrace of French thought with the derogatory term *afrancesados*. Most of the population at large, and most soldiers, fought against the invaders, but they too were divided between traditionalists and those espousing the enlightened, liberal ideals arising from the French Revolution. In 1812, the Cadiz Cortes drafted Spain's first liberal constitution, but it never passed into law.

In the nineteenth century, Zaragoza's Faculty of Medicine was also greatly weakened by central government.[3] In 1807, it ceased to exist by order of the reform project drawn up by the Marquis of Caballero; however, this did not become law given the more pressing concerns of the Peninsular War. In 1818, after Napoleon's troops had been pushed back, a petition to the Crown was sufficient to reestablish the credentials of the Faculty of Medicine in Zaragoza.

The new king, Ferdinand VII ("The Desired One") had been enthusiastically received by the people and Cortes alike in 1813, as it was believed that he would ratify the liberal constitution. But far from supporting the liberal constitution, he created an implacable absolutist regime that impoverished the country and viciously persecuted liberals, who were imprisoned or exiled. By 1823, a new French army, the "Hundred Thousand Sons of Saint

Louis" had invaded the country to restore the regime of Ferdinand VII; this event ushered in a period known as "the ominous decade" (1823-1833).

The reign of Ferdinand VII heralded a return to scientific dogma and traditionalism, as well as ideological repression. Universities were rocked by purges, censorship, and general incompetence.[10] Beginning with the coup d'état of 1814, any attempts at reform were crushed by a series of absolutist governments.

The king left behind a poor and backwards country in the grips of a severe succession crisis. The reign of Isabella II (1833-1868) was a new chapter in parliamentary monarchy in which some exiled politicians and intellectuals were able to return. Isabella II was only three years old when her father died and her mother Maria Christina of the Two Sicilies assumed the regency.

In 1840, the incessant governmental crises forced the regent to step down; this was followed by three years of authoritarian governance by General Espartero. Espartero was overthrown by another coup in 1843, while Isabella II, at the age of thirteen, was declared an adult and named Queen of Spain. The unstable political climate persisted under Isabella II, although there was also a period of economic growth in and around 1860, accompanied by the first steps toward industrialisation.

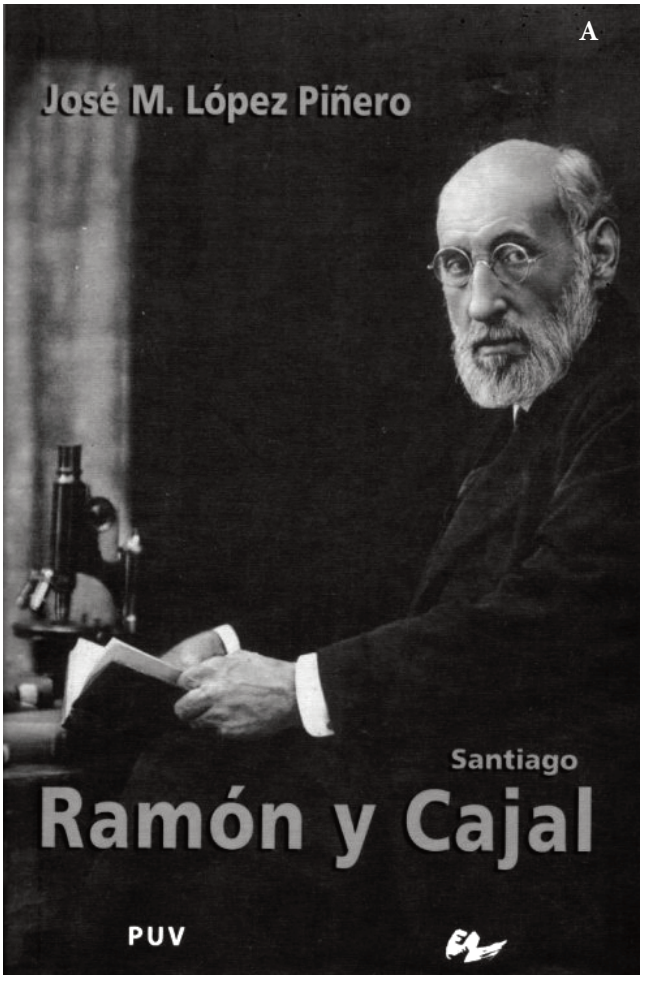
In 1868, a military coup in Cadiz deposed Isabella II, and she fled to France. This Glorious Revolution heralded the beginning of the "six democratic years" (1868-1874), which saw numerous attempts at alternative governments, including a new monarchy under Amadeo of Savoy and the First Spanish Republic. The Republic collapsed in less than a year, and yet another coup restored the monarchy of Alfonso XII (1875-1885). His reign was brief, and when he died he was succeeded by Alfonso XIII, with Maria Christina of Austria as regent. During these periods, the Carlist Wars drew to a close and Spain was transformed by such advances as universal male suffrage and the introduction of trials by jury. Nevertheless, the end of the nineteenth century saw the disastrous loss of Spain's remaining colonies, including the Philippines, Puerto Rico, and Cuba.

Ramón y Cajal's family of lived through these troubled times, which would leave their mark on the life and character of the future Nobel Prize winner and of his father. In 1822, the year in which Justo Ramón Casasús was born, Simón Bolivar brought about the independence for Ecuador.

In the middle decades of the nineteenth century (1834-1868), medical knowledge in Spain began to recoup its losses. Governments under Isabella II attempted to reform medical training programmes by making them more useful and practical. Medical schools unable to improve their programmes of study were eliminated. Likewise, clinical programmes were not allowed to start if there were not enough patients to sustain them. The programmes of study drawn up by Mata (1843) and Pidal (1845) represent the definitive version of the liberal reform which united the practices of medicine and surgery, incorporated the study of the physical sciences, extended the length of the programme, and provided additional resources for learning. At the time, this meant that Cajal's father was unable to continue studying in Zaragoza and had to journey on foot to Barcelona. Once there, he worked as a barber-surgeon while finishing his studies; he was awarded a second-class surgeon's diploma in 1847.[3,11]

In 1843, Mata's reforms demoted the Faculty of Medicine in Valencia to a 'College of the Practice of Curative Arts'. Such an institution was intended to offer four-year second-class degrees, only valid for practising minor surgery and assisting in childbirth. The Pidal plan (1845) and Moyano plan (1857) fully restored the high-level programme, converting the Faculty of Medicine of Valencia into a full-fledged medical school. Its programmes of study and budgets were drawn up by successive central governments, and its faculty members were also state employees. In 1857, the Moyano Law, a reform project aimed at reorganising educational institutions, approved only six universities to teach medicine and award licentiate medical degrees. One of the institutions to be eliminated was the Faculty of Medicine in Zaragoza. As stated in Article 134: "Faculties of Medicine awarding licentiate degrees shall be recognised in Barcelona, Granada, Santiago, Seville, Valencia, and Valladolid, as well as the Central University in Madrid". Once the Moyano Law came into force, Zaragoza's Faculty of Medicine ceased to exist. The Aragonese capital would remain without a medical school for nearly 15 years.[3]

In 1868, however, the State approved the creation of an institution for medical instruction in Zaragoza, the Free School of Medicine (*Escuela Libre de Medicina*). It was in this institution, funded by provincial and municipal budgets, that Santiago Ramón y Cajal began his studies in 1869, at the age of 16. The Zaragoza Faculty of Medicine would not be definitively reopened until 29



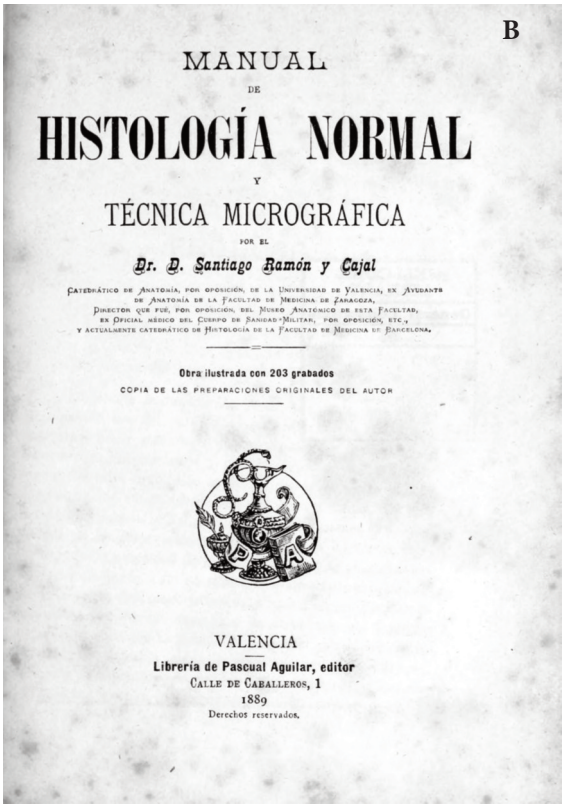


Figure 2a. Front cover of *Santiago Ramón y Cajal* by José María López Piñero (Madrid: Editorial Debate; 2000).

Figure 2b. *Treatise on normal histology and micrography techniques* published by Pascual Aguilar in Valencia.

September 1876. Under the new system, the institution was dependent on the central government.[3] After earning his baccalaureate degree in medicine in Madrid in 1860, and his licentiate degree in medicine in Valencia in 1862, Justo Ramón Casasús worked as a surgeon in Zaragoza's Hospital Provincial; he would also be made Professor of Dissection at the new Faculty of Medicine in that city.

Justo Ramón Casasús

Cajal's father was born in Larres, in the province of Huesca, on 6 August 1822. He married Antonia Cajal, also of Larres, and died in 1903 in Zaragoza. At the age of 16 or 17, he left home and apprenticed himself to a surgeon from the town of Javierrelatre. He taught himself to read the books in his master's collection. In 1843, he walked to Zaragoza to continue his studies while working in a barber shop. He was given a job at Hospital Provincial as a 'practitioner', and decided to earn a second-class surgeon's qualification.[3] However, all medical studies in Zaragoza were terminated in 1845. Offering more proof of his iron will, young Justo set out on foot once more, this time for Barcelona. Here he was also able to maintain his studies by working at a barber shop, and he was awarded his second-class surgeon's certificate from the University of Barcelona in 1847. Justo Ramón then returned to Zaragoza, where he worked as a second-class surgeon in Petilla de Aragón. He married Antonia Cajal in 1849, and their first child, Santiago, was born on 1 May 1852 (Figure 2a). After circulating between several towns in Aragón, he earned his secondary school certificate from the Institute of Zaragoza, followed by a baccalaureate degree in medicine from the University of Madrid on 10 January 1860. His subjects in Madrid for the 1859-1860 academic year included medical

pathology, public health, and legal medicine and toxicology. He applied to the University of Valencia for further studies in clinical medicine; since he could already show credit for attending medical school, he was permitted to enter at the licentiate level. As revealed by Dr Francisco Vera,[8,12] Justo Ramón sat and passed his licentiate exam on 18 March 1862. For his practical exam, he identified a case of "chronic pulmonary catarrh". The doctors Quintana, Gómez, and Morte were on his review board.

Justo Ramón returned to Zaragoza, where he successfully bid for the position of doctor at Hospital Beneficencia Provincial. A few months later he was also named interim professor of dissection at the Free School of Medicine. In October, he was named head of osteology and dissection for first- and second-year classes of the licentiate degree in medicine.

Once the provincial Free School of Medicine had become a state-approved Faculty of Medicine, interim professors were compelled to repeat the competitive exam process. Don Justo was more than 50 years old at the time, and he was unsuccessful, leading to bitter protest from both himself and his son. When he resigned from teaching duties in 1883 at the age of 61, having reached the level of interim chair, he dedicated his time to a successful clinical practice. His wife died at the age of 76; under pressure from his daughters, he then married Josefa Albesa of Castellón, with whom he already had a child. Santiago was unable to forgive his father for the pain caused to his mother in her final years, and broke off all contact with him.

According to Francisco Morales,[3] "there can be no doubt that the most influential professor for Ramón y Cajal, Nobel Prize in Medicine, was his father, Justo Ramón Casasús". That being said, their father-son relationship was extremely complicated. Don Justo sent his sons to Huesca to complete their secondary studies when Santiago was 14, but he separated his younger son, Pedro, from the corrupting influence of Santiago. Since Santiago was prone to poor marks, he obliged him to work for a barber, and later for a cobbler. Santiago later began studying drawing, and Justo Ramón began giving him anatomy lessons in Ayerbe when he realised that Santiago was more of a visual than a verbal learner.[3] Once Santiago had entered the university preparatory course, in September 1869, his father arranged an apprenticeship with one of his friends, a surgeon. Santiago grew closer to his father during his years as a medical student. When Justo was obliged to take a competitive examination and subsequently removed from his position, Santiago protested energetically before one of the members of the review board. Others have also mentioned that Justo Ramón's doctoral thesis was submitted in his son's handwriting, indicating his active contribution to his father's efforts.[13]

Justo's interest in anatomical dissection may have initially been awakened by Antonio Menéndez Rueda, his professor in Zaragoza, Barcelona, and in Valencia.[3] While at the Faculty of Medicine in Valencia, he was instructed by José María Gómez Alamá, chair of anatomy and one of the founders of the Valencian Museum of Anatomy (with micrographist Elías Martínez Gil). Lastly, he was influenced by Sánchez Quintana, the chair of pathology, and Romagosa, the chair of clinical surgery. These two influential figures in the Valencia Faculty of Medicine were supporters of the anatomo-clinical method and often accompanied their clinical and surgical studies with autopsy reports. They both contributed large collections of anatomical pathology specimens to the museum, and even used microscopes in their studies of diseases. Each of these doctors, known collectively as the 'middle generation', may have guided Justo Ramón toward the fields of anatomical dissection and histology, thus helping him transmit his passion to his son. In fact, when Santiago Ramón y Cajal was named Chair of Anatomy at the University of Valencia 20 years later, the Anatomical Museum of Valencia was still under the directorship of Elías Martínez Gil.[9,14]

Santiago Ramón y Cajal in Valencia

Cajal attended medical school in Zaragoza from 1869 to 1873. Upon graduating, he entered the Army Medical Service, and was stationed in Cuba the following year. During the first months of his stay in Cuba, he contracted malaria and dysentery; as he mentions in his memoirs, he put his convalescence to good use by studying English.[6] In 1877, he completed his doctorate in Madrid with a thesis titled "The pathogenesis of inflammation"; his father achieved the same either that year or the preceding one. Cajal himself reported that he was drawn to the field of histology by the beautiful stains he saw in his doctoral-level courses with Spain's leading histology expert, Professor Maestre San Juan, and his assistants.[6] On returning to Zaragoza, he acquired a Verick

microscope and set up a micrography laboratory. In Cajal's words, "All this was provided by my modest salary as assistant and the meagre returns from private tutoring in anatomy; but the financial foundation of my laboratory and library was my economies in Cuba".[6] In 1879, he was awarded the directorship of the Anatomical Museum in Zaragoza; the position paid enough to allow him to marry.

In 1882 selection processes opened for the chairs of anatomy at the universities of Madrid and Valencia. The selection did not go smoothly; an independent panel had to be convened to award the Madrid chair to Olóriz and the position in Valencia to Cajal.[9] This was Cajal's third attempt at being appointed department chair after making unsuccessful bids in both Granada and Zaragoza in 1878, and again in Granada in 1880. He was 31 years old on 5 December 1883 when he became Chair of Descriptive and General Anatomy.[9] Cajal arrived in Valencia on 13 December 1883 and would remain until 12 December 1887. While this was quite a short period, Cajal's prowess as an instructor and researcher would leave a mark on the university that remains to this day.[5] These four years were also very important in Cajal's personal and professional life, and it was in Valencia that he began the studies that would lead him to the Nobel Prize for Medicine in 1906.

When Cajal took up his position, the medical school in Valencia had been rejuvenated by the new current of laboratory science in medicine, a school of thought based on experimental research.[9] The chancellor was Enrique Ferrer Viñerta, a pioneer of antiseptic surgical technique in Valencia. His style was compatible with Cajal's, since his department of clinical surgery emphasised anatomical knowledge on both the macroscopic and microscopic levels; in fact, this was one of the first departments to perform histopathology studies of surgical specimens. Curiously enough, Ferrer Viñerta clashed with Luis Simarro Lacabra, apparently for his political ideas[15]; although Lacabra was the most brilliant student of his year, he failed his exams and had to finish his medical and scientific training in Madrid. Years later, he would be the one to teach Cajal the Golgi silver staining technique. Other professors in the faculty included Crous y Casellas, internist and author of a textbook on normal and pathological neurophysiology; Amalio Gimeno, who taught experimental pharmacology; and Peregrín Casanova, who held the other chair in anatomy. Like, Cajal, Casanova had also applied for the directorship of the Anatomical Museum in Zaragoza; a fervent supporter of Darwinism, he introduced Cajal to the studies of phylogeny and comparative anatomy. The faculty members formed a dynamic group that produced a copious amount of scientific literature. They also had the support of Valencian editor Pascual Aguilar, who published the first edition of *Tratado de Histología*, and of an expert engraver from Alicante, who provided the 203 engravings for the first edition (Figure 2b).[5]

It was also in Valencia that Cajal, somewhat ironically for a new chair of anatomy, definitively relinquished his study of descriptive anatomical morphology in favour of histological research, thereby launching his meteoric scientific career.[9] It is common knowledge that Cajal was an excellent artist, and his sketches on the blackboard lent interest to his classes. He was the first to request the amphitheatre lecture halls that can still be seen in Valencia and Madrid.

Cajal showed extreme determination in the face of constant adversity, as he had shown before in the rounds of competitive examinations. His combination of genius, hard work, and determination yielded tremendous scientific output in Valencia; considering that it was all completed in only four years, it remains impressive to this day.[5] According to Francisco Vera,[9] Cajal's scholarly writings in Valencia constitute the first two editions of his histology textbook[16,17] and a total of 16 articles appearing in Valencian journals; ten of these were published between 1884 and 1888.[9] To the above, we may add the 27 micrographic engravings with their captions that appeared in the Spanish-language edition of Emile Littré's *Dictionnaire de Médecine*, published by Pascual Aguilar in 1889. As Cajal mentions in his *Recollections*,[6] two of his writings from the Valencia years were published at a later date: *Vacation Stories* (science fiction stories, first published in Madrid in 1905) and Cajal's first article to be published in an international journal: "Contribution a l'étude des cellules anastomosées des épithéliums pavimentaux stratifiés" (International Monatschrift für Anatomie und Histologie. 1886;3:250-64).

His first article of all appeared in 1884, in a Valencian medical journal. This article, offering an explanation of the basic underlying functions of the cell, had already been published in a shorter version in *La Clínica*, a journal based in Zaragoza.

In 1885, *Ciencias Médicas* published his article on "the involutional and monster forms of the Koch bacillus".

Figure 3. Oil painting by Joaquín Sorolla showing Luis Simarro working in his laboratory surrounded by his students. A bottle of potassium dichromate can be seen in the foreground; this product is used in Golgi's silver staining method. Museo Sorolla, Madrid

Here, he indicates that he based his drawings on observations under a Zeiss microscope nicknamed 'El Zaragozano' (it had been a gift from the provincial council of Zaragoza in recognition of his studies into cholera). In 1885, during a raging cholera epidemic, he wrote to Ferrán to provide a summary of a lecture he had recently presented in Zaragoza, titled "A study of the comma bacillus of cholera and prophylactic vaccinations". In December, it was published in *Crónica Médica*, a Valencia-based journal. Cajal also published four studies in *Boletín del Instituto Médico Valenciano*, which examined bone tissue, the texture of mammalian muscle fibre, the texture of muscle fibre of wings of insects, and the texture of muscle fibre of the legs of insects. A new publication in 1887, based on an earlier conference titled "The anatomical study of blood", critiqued Ranvier's theories. Many years later, he recognised that both he and Ranvier were incorrect; Cajal regarded platelets as fragments of red blood cells, whereas Wright believed them to originate in the bone marrow.[18]

The high point in Cajal's Valencia years was in 1887, when he was made part of a review board entrusted with selecting a department chair in Madrid. He made good use of his time by visiting different laboratories, including those under Maestre San Juan and Luis Simarro Lacabra. While some authors describe Luis Simarro as Valencian with no further details, he was actually born in Rome; his

Figure 4. Santiago Ramón y Cajal and Juan Bartual Moret in their laboratory at the Faculty of Medicine in Valencia. Juan Bartual Moret as Dean of the Valencia Faculty of Medicine

Valencian father, Ramón Simarro Oltra, was a painter. Orphaned at an early age, he was taken in by a maternal aunt who gave him an exceptional education. His radical republican ideals led him to contribute to the Open University of Valencia, an institution organised by Vicente Blasco Ibáñez. He counted many artists among his friends, including Joaquín Sorolla.[15] Ramón y Cajal and Luis Simarro seem to have had acquaintances in common. While Simarro was only three years older than Cajal, he was already a leading figure in histology. Between 1880 and 1885, he had been working in Paris with Louis Antoine Ranvier and Jean Martin Charcot; here, he improved his micrography technique and explored neurohistology while also doing clinical work as a neuropsychiatrist.[9] As Cajal wrote, "I owe to L. Simarro (...) the unforgettable favour of having been shown the first good preparations made by the method of chromate of silver (...), and of his having called my attention to the exceptional importance of the book of the Italian scientist [Golgi]"[6] (Figure 3). On returning to Valencia, Cajal set about developing Simarro's version of the Golgi silver chromate stain with the help of his student Juan Bartual Moret, who would later become Valencia's Chair of Histology and Anatomical Pathology (Figure 4). Between that time and his departure to assume the chair in Barcelona, he accumulated micrographic images obtained using different silver techniques ranging from Golgi's method to his own reduced silver nitrate method, which permitted selective impregnation of the neuron. The resulting evidence of that cell's composition and existence as an individual, independent entity led Cajal to rule out the reticular theory that had been widely accepted before that time.[5] Some time after that, Nicolás Achúcarro from Luis Simarro's laboratory joined his research team.

The most important result of Cajal's Valencia years came to light in 1891 in the form of an oral presentation entitled 'Pathophysiological significance of protoplasmic and nervous ramifications of grey matter cells' (his student Vicente Guillem Marco read it before the First Regional Medical and Pharmaceutical Congress of Valencia, since the author was in Barcelona preparing his candidacy for a position in Madrid). This constitutes the first explanation of the theory of dynamic polarisation of the neuron and of the neuron's content; at present, it is considered the most pivotal and ground-breaking of the classic neuroscience texts.[19] Cajal attached great importance to this presentation, describing it as the first determined defence of the theory of dynamic polarisation, that is, that "the transmission of the nervous impulse is always from the dendritic branches and the cell body to the axon or functional process" (Figure 5).[6]

Cultural activities and cooperation with other institutions

Santiago Ramón y Cajal received a warm welcome in Valencia and participated actively in social events and research projects alike. He always made it clear that he was

Figure 5. Photograph of attendees at the First Regional Medical and Pharmaceutical Congress, held in Valencia from 26 to 31 July 1891.

more interested in doing research than in competing with others. During his first year, he became a member of the Valencia Medical Institute; a very active contributor, he was chosen to direct the history and philosophy section. But the force of his personality won out over time such that his work at the Institute began to focus increasingly on biological and experimental studies. His proposal to illustrate the Institute's published texts with engravings was successful, although this would have been a very difficult undertaking at the time.[9]

Santiago Ramón y Cajal's modest budget obliged him to stay at a boarding house near the Central Market upon arriving in Valencia. He was soon able to move to better lodgings and he started to give private lessons; some of these students, such as Bartual Moret and Jesuit biologist Antonio Vincent, would become his long-time followers and colleagues. He moved another four times and was at last able to set up an entire room as a laboratory. In his last dwelling in Calle Colón, he set up a hypnotic psychotherapy practice that was also used as a meeting place for a psychological research group.

He also joined the Royal Academy of Medicine, in addition to local institutions such as the Agricultural Society and the Scientific, Literary, and Artistic Athenaeum. Within this network, he struck up close acquaintances with Narciso Loras and medical historian José Rodrigo Pertegás, among others. Members of these institutions also came together to form a gastronomical and leisure society jokingly referred to as the Gaster Club. As Cajal wrote, "The purposes of this gathering of congenial people were simply to make Sunday excursions to the most attractive and picturesque regions of the kingdom of Valencia; to take photographs of interesting scenes and landscapes; to give specially intensive play, from time to time, to muscles and lungs by walking among the carob trees, palms, pines, and rose-bay trees; and finally, to enjoy the tasty and famous Valencian paella. The constitution, which I drew up, prohibited, as a heinous and abominable thing, anything resembling politics, religion, or philosophy...".[6]

Cajal began his stay in Valencia with two children, Fe and Santiago, and left four years later with a total of five. The three born in Valencia were named Vicenta, Jorge, and Pilar Enriqueta.

After settling in Barcelona, he became a corresponding member of the Valencian Medical Institute, but remained active; in 1889, he submitted three articles for publication in the Institute's journal. The two describing the Golgi technique also appeared in *Gaceta Médica Catalan*a.

Figure 6. The Gaster Club, the gastronomic and leisure society. Its statutes prohibited "as a heinous and abominable thing, anything resembling politics, religion, or philosophy".

Throughout his life, Cajal remained on friendly terms with many of his Valencian friends, including Juan Bartual Moret,[20] the University of Valencia's first Chair of Histology, to whom Cajal gave the dissertation submitted with his application for department chair; and medical historian José Rodrigo Pertegás, a member of the Gaster Club and one of his frequent chess rivals at the Agricultural Society. Cajal liked to say that chess was his only vice, and that his social activities "did me a great deal of good, preventing in my brain those dreadful compensatory atrophies of professional specialisation".[6]

Valencian sculptor Mariano Benlliure minted a medal in Cajal's honour. In response to the making of this medal, Cajal sent a letter, dated 4 May 1922, to Dr Ramón Gómez Ferrer, Dean of the Faculty of Medicine at the time; in it, Cajal gratefully receives "these congratulations from the Valencia Faculty of Medicine, where I taught my first classes as a chair, and where my first modest efforts began to awaken in its atmosphere of scholarship and assiduity." In 1926, Cajal also dedicated the eighth edition of his treatise on histology to the Faculty of Medicine "where I am proud to say I was once professor, with my affectionate regards" (Figure 6).[14]

Santiago Ramón y Cajal was such a beloved figure in Valencia that in 1901, Dr Moliner nominated Santiago Ramón y Cajal to serve on the university senate when no consensus could be reached for a Valencian candidate.

Conflicts of interest

The author has no conflicts of interest to declare.

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