

# Demolition of the Ramón y Cajal mansion, and the Nobel laureate's final years: history, neglected

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## ABSTRACT

**Introduction.** Cajal built an elegant mansion near his Biological Research Laboratory in 1906. According to recent reports in the press, the mansion is to be converted into luxury apartments; the demolition of the building will entail the erasure of important events in Cajal's life and work.

**Development.** While Cajal was working in a cold, cluttered room ("the cave") in the basement of the house, the updated version of his *Histologie du système nerveux de l'homme et des vertébrés*, on which he had been working for over 40 years, disappeared. It is possible that Cajal's maid Dora and her teenage assistant may have mistaken the unbound pages for waste paper. Cajal modified his will three times, and shortly before his death, he wrote a codicil expressing his desire to be buried in Madrid's Civil Cemetery. Ultimately, he was laid to rest beside his wife at the Catholic Almudena cemetery. His burial was surrounded by conflict, with the police stopping his coffin being carried through the crowd.

**Conclusions.** The demolition of the interior of the Cajal mansion entails the definitive loss of tangible references that were an essential part of the life of the father of modern neuroscience.

## KEYWORDS

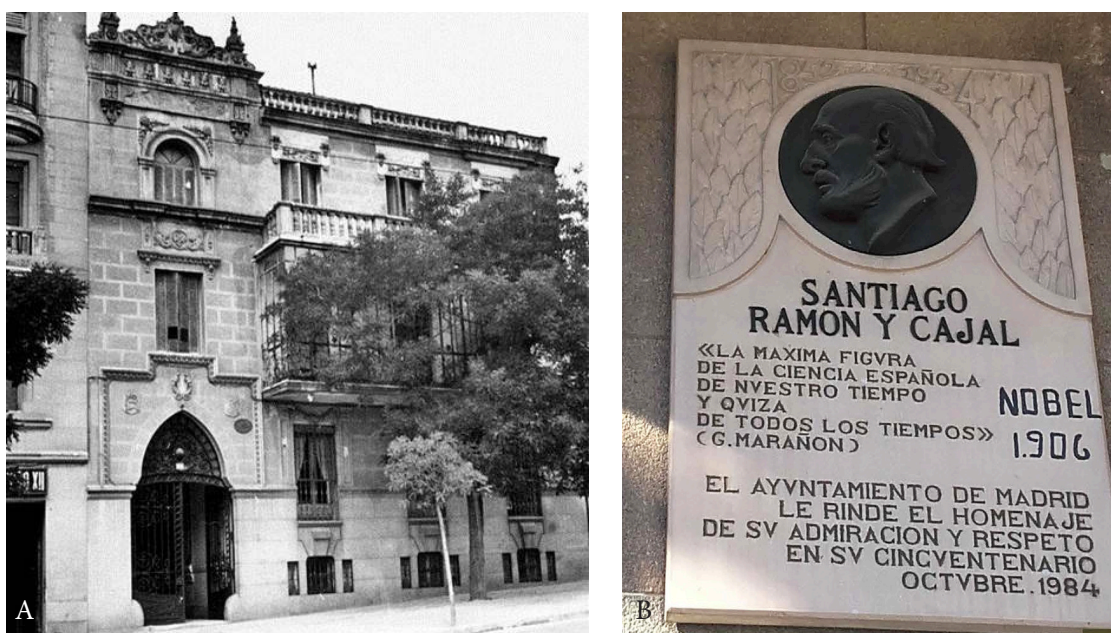
Burial, *Histologie du système nerveux de l'homme et des vertébrés*, Ramón y Cajal mansion, will, final home

## Introduction

The Ramón y Cajal *palacete* or mansion, at number 62, Alfonso XII street in Madrid, home to Santiago Ramón y Cajal (1852-1934) for the last 23 years of his life, is to be converted into luxury apartments.<sup>1</sup> Cajal and his wife moved into their new home as early as 1915, two years before the completion date marked on the façade. The couple lived with their two young children Pilar and Luis, two maids, and their chauffeur, the 30-year-old Madrid native Marcos Vallejo. Until recently the home was owned by the Nobel laureate's descendants; however,

its ornate façade has been choked by scaffolding since the summer of 2017.<sup>2</sup> The building is listed in Madrid's Register of Protected Buildings and recognised as an Asset of Cultural Interest; however, the regional government maintains that its only responsibility is to "preserve heritage, not the use of the building's interior." In any case, they explain, "the building has always been a home: Cajal's children and grandchildren lived there."<sup>3</sup>

The building's façade will probably be preserved, as will the plaque installed in 1984 by the Madrid municipal government to mark the 50th anniversary of Cajal's death, which quotes Gregorio Marañón (1887-1960):



**Figure 1.** The Santiago Ramón y Cajal mansion. A) Above the magnificent wrought iron doors appear the initials RC (right) and the date of the building's completion in 1917 (left). B) The plaque placed by the Madrid municipal government to commemorate the 50th anniversary of Cajal's death

“the greatest Spanish scientist of our time, and perhaps of all time” (Figure 1). This is far from satisfactory: besides the loss of a nation's heritage, Cajal's last home will be reduced to little more than an empty shell; this represents the loss of invaluable references that shed light on the final period of the master's life and work. It would appear that it has not been possible to prevent this absurdity and that the mansion is condemned to be a hollow home, stripped of emotion and history.

The present review discusses important events that took place in the Ramón y Cajal mansion during the last stage of his life, tangible evidence of which will be lost following the destruction of the building's interior.

### Development

Olmet and Torres Bernal's<sup>4</sup> 1918 biography, perhaps the first written on Cajal, gives a general impression of his everyday life in his new home. Also interesting is an interview he gave Díaz Morales<sup>5</sup> for *Estampa* in August 1930, which includes photographs documenting Cajal's physical limitations at the age of 78. In 1952, on

the centenary of Cajal's birth, a group of exiled Spanish physicians in Mexico who had known him personally recounted a number of fascinating stories.<sup>6</sup> It would be almost 30 years before the members of the Spanish Royal National Academy of Medicine would dedicate a session to him, on 27 October 1981.<sup>7</sup> Enriqueta Lewy Rodríguez, who for eight years worked as Cajal's personal secretary and German-language translator, tells numerous anecdotes about his character.<sup>8</sup> Aged 86, Kety (as Cajal called her) spoke enthusiastically in an interview for Spanish National Radio about her memories of her employer and the unexpected turns of her own life in exile.<sup>9,10</sup> Durán Muñoz (1915-1994) and Alonso Burón authored two extensive volumes on Cajal's life and works, including unpublished texts; while it is of historical use, the biography contains glaring inaccuracies.<sup>11,12</sup> Durán had married Encarnación Ramón y Cajal Conejero (“Nana”), the underage daughter of Cajal's son Jorge, without the latter's permission. Later direct descendants of Cajal have repeatedly criticised Durán's dishonesty about how he appropriated documents belonging only to

the family (María de los Ángeles Ramón y Cajal, personal correspondence). An obituary of Durán Muñoz, who never personally met his father-in-law, notes that he was a member of the Royal Academy of Extremadura and published several books on the history of flamenco music and Andalusian song.<sup>13</sup> The illnesses Cajal suffered in the final period of his life are known through information from one of his personal physicians, Dr Santiago Carro.<sup>14</sup> Cajal's main biographers do not formally address the details of his funeral, perhaps intending to sidestep the conflict surrounding it.<sup>11,12,14-17</sup> However, the ceremony was analysed by contemporary newspapers of various political leanings (*ABC*, *Crónica*, *El Debate*, *La Época*, *El Sol*, and *La Voz*), available at the National Library of Spain's digital press archive.

#### From Atocha street to the Ramón y Cajal mansion

When he became a university chair in Madrid in 1892, Cajal was 40 years old and had faced seven competitive examinations for a university chair. Cajal, accustomed to a life of austerity and with a known disregard for money, had been content with renting modest rooms on Atocha street, near the Faculty of Medicine. His life was so closely linked to this popular thoroughfare that after he won the Nobel Prize, the municipal government began an initiative to rename it Ramón y Cajal street; the plan was frustrated by legal issues.<sup>18</sup>

Us poor students at San Carlos [...], but for a few exceptions, had no clients; we wore threadbare, almost prehistoric coats, stayed in cheap rooms [...]; it was full of melancholy and without an escort of admirers that we would set out up the abrupt slope of Atocha street.<sup>12</sup>

Over the years, Cajal lived at number 131 *duplicado*, almost opposite the Colegio de San Carlos, which features a plaque commemorating the Fuggers (the family of bankers that made their fortune financing king Charles I of Spain); at number 64, 2º *derecha*, the address Cajal gave when he joined the official college of physicians; and the second-floor flat at number 42, where he drafted his first will in 1903. Cajal also lived at number 41 *principal* 2ª, Príncipe street, on the corner with Huertas street, where he received a telegram from Emil Holmgren, who had opposed Cajal's nomination to the Nobel Prize by León Corral y Maestro, chair in Valladolid.<sup>19</sup>

A plaque on the building commemorates a renowned bullfighter.

The Nobel Prize, awarded by the Karolinska Institute on 25 October 1906, was worth 115 000 pesetas, a fortune at the time.<sup>20</sup> The fund enabled Cajal to build his wondrous mansion, designed in 1912 by the architect Julio Martínez-Zapata. "Beautiful, austere, replete with hygiene and sunshine, open, and bright," he wrote at the time. After Cajal won the Moscow Prize, the Museo Velasco, located near the Biological Research Laboratory, provided him with several rooms during the construction of a magnificent building at Cerrillo de San Blas, beside the Astronomical Observatory, proposed in 1900 by king Alfonso XIII.

#### Days of wine and roses

The year 1906 saw an unprecedented event in Spain: a Spanish scientist, almost unknown in his own country, was awarded the world's greatest scientific honour, the Nobel Prize. According to a famous anecdote, an unnamed member of the Royal Academy of Exact, Physical, and Natural Sciences of Spain was asked by Virchow about Cajal's activities and did not know who he was. The Academy's secretary, the astronomer and mathematician Miguel Merino Melchor (1831-1905), proposed that Cajal immediately be made a member.<sup>19</sup> At Madrid's Valverde street he gave his famous speech "Rational foundations and technical conditions of biological research" on 5 December 1897.<sup>21</sup> The Cuban urologist Enrique Florencio Lluria Despau (1867-1925), who specialised at the Necker hospital in Paris, paid for a second edition of the paper *Rules and recommendations on scientific research* to be distributed to students free of cost.<sup>22,23</sup>

Cajal enjoyed days of happiness in his palatial home. Every year on 1 May he would celebrate his birthday with colleagues in the mansion's charming drawing room (Figure 2); the room was finely furnished, despite his wife's tight-fistedness, which even affected the dissemination of Cajal's writing.<sup>24</sup> "The men drank cognac and the women Marie Brizard: a little glass doesn't hurt," recalls Kety. They also ate custard puddings from a patisserie on Pozo street.<sup>8</sup> Cajal had become a popular figure, even to the point of becoming overwhelmed. "They're always bothering him," said his wife: "everybody wants



an article, an autograph, a few lines of text, a portrait, an interview.”<sup>4</sup>

#### The consequences of a diagnostic error

When he was 66 and work on his new home was almost complete, Cajal began to experience what he referred to as “unbearable headaches.” Onset was usually at around 4 pm, after his animated daily gatherings at Café Suizo (held between 2 and 3 pm, according to the 14 September 1910 edition of *Correspondencia de España*). He described a burning sensation in his head, which he interpreted as “congestion.”<sup>25</sup> In addition to his excellent work at the Spanish Neurohistological School, Nicolás Achúcarro (1880-1918) treated neurological patients on the ground-floor ward of the Hospital General, which was unusual for a member of the School.<sup>26</sup> Following a new attack of headache after a photograph shoot in a cramped room at a temperature of 35°C, Cajal consulted “the wise and caring Dr Achúcarro.” “My friend, you have cerebral arteriosclerosis, but you must not be alarmed,” went the Basque’s concise diagnosis. And worse, he recommended that Cajal limit his writing and speaking, and avoid excessively warm places: a tragedy.<sup>27</sup>

Although Achúcarro’s diagnosis was correct according to the medical canon of the time, his mistake would condemn Cajal to spend the last years of his life in solitude, tortured by the fear of an impending cerebral haemorrhage. He forwent his gatherings in the stifling environment of the Café Suizo for the gloomy basement of Café de la Elipa at number 43, Alcalá street, beside the San José church, where he would peruse the press alone, protected from intrusion by the café’s waiters. Fleeing the heat, he sought refuge in a cramped room in the basement of his home, adding a library in a nearby room, housing over 10 000 volumes. In “the cave,” as his followers ironically called the study, he spent hours of his life in absolute solitude as he continued his work to complete unfinished pieces. An interior staircase led to a small terrace where he had installed a telescope. From a nearby window, the journalist José Díaz Morales would often see him “contemplating the heavens.”<sup>25</sup>

Drama in “the cave”: disappearance of the revised edition of *Histologie du système nerveux de l’homme et des vertébrés*

The sole existing image of the “working cabinet,” as Cajal



**Figure 2.** The mansion’s bourgeois drawing room, with portraits of Cajal and his wife Silveria either side of the mirror. Photograph taken from Laín Entralgo and Albarracín<sup>15</sup>

called his study, gives an impression of the chaos in which he worked in the latter years of his life: a space crammed with folders and documents, with even the floor carpeted in a dense layer of papers (Figure 3). Ballester Escalas relates an anecdote of the master’s underground refuge.<sup>28</sup> Aware of Cajal’s unwillingness to give interviews, a journalist posed as a student, knowing that they were always admitted to greet him. The housekeeper, Dora, led the journalist to “the cave,” and after a brief discussion which exposed the journalist, Cajal switched off the lights, leaving them in total darkness.

He strictly forbade anybody from entering his study. The only exceptions were his eldest daughter Fe, who had moved to live with her father following the death of her husband, and Dora, when he asked her to clean; even his secretary Enriqueta Lewy was not permitted to enter. Dora, or Isidora Ballano Ramos, was bequeathed 2500 pesetas in one of Cajal’s wills, “on the condition that she does not marry and continues to provide me her services and assistance until my last days.”<sup>29</sup> She was sometimes accompanied by “la Pequeña,” the name by which Cajal knew Dora’s young assistant.



**Figure 3.** “The cave,” the study where Cajal sought refuge from the heat. From this chaotic jumble of papers disappeared the notes and drawings that would have become the update to his magnum opus, *Histologie du système nerveux de l’homme et des vertébrés*.

As mentioned above, it was in that icy room that the master laboured over his last works: *El mundo visto a los ochenta años: impresiones de un arterioesclerótico* (The world seen at eighty: impressions of an arteriosclerotic), published shortly after Cajal’s death; a final defence of the anatomical unity of the nerve cell; and a chapter for Bumke and Foerster’s *Handbuch der Neurologie*, summarising the neuron doctrine.<sup>25,30</sup> However, he was most enthusiastic about the updated version of his magnum opus, which he and his good friend Léon Azoulay had translated to French in 1911: *Histologie du système nerveux de l’homme et des vertébrés* (Histology of the nervous system of man and vertebrates), two volumes of nearly 1000 pages each.<sup>31</sup> Between 1899 and 1904 he had published the Spanish-language version of *Textura del sistema nervioso del hombre y de los*

*vertebrados* (Texture of the nervous system of man and the vertebrates) in two volumes (1800 pages and 877 images); however, decades had passed and Cajal wanted to update his research.

The newspaper *La Voz* (18 October 1934) provides some details of what could have been the culmination of his scientific work. Essentially, the first edition had sold out and Cajal needed an unbound copy of the book to annotate with new data and images. His students were able to procure a copy in a second-hand bookshop, which Cajal received with “a childlike joy.” According to Fernández Santarén,<sup>17</sup> “the loss of the book was an event of transcendental importance and very possibly hastened the end of Cajal’s life. [...] One of the greatest losses in the history of neurobiology.”

Effectively, the updated text to which Cajal had dedicated countless hours disappeared, together with new contributions of unknown scope. The lost work was never found. According to Laín Entralgo and Albarracín Teulón, the work was kept not in a folder, but on loose pages among thick, unbound tomes. Although the date of the disappearance is not known, in a letter he wrote to Ortega y Gasset on 13 July 1934, after complaining of his disillusionment and “increasingly weak attention,” Cajal commented that “I shall republish my exhausted work [...], the fruit of 40 years’ work taking form.”<sup>17</sup> Therefore, the book must have been lost during the final three months of his life.

The 1930 municipal register listing for the house includes a character whom nobody to date has examined. The real name of the girl Cajal knew as “la Pequeña” was Hilaria Melquinza Ramos, a 17-year-old girl who travelled to Madrid from her native Guadalajara and worked as an assistant to her aunt Dora, a maid held in great esteem by the family.

In the chaotic, dimly-lit study, with papers spilling across the floor and where Cajal was often left sitting in the dark, couldn’t a thick stack of papers accidentally fall from his desk?<sup>15,30</sup> As a hypothesis, it seems reasonable to consider that Hilaria might have found these pages on the floor and thought them to be no more than waste paper.

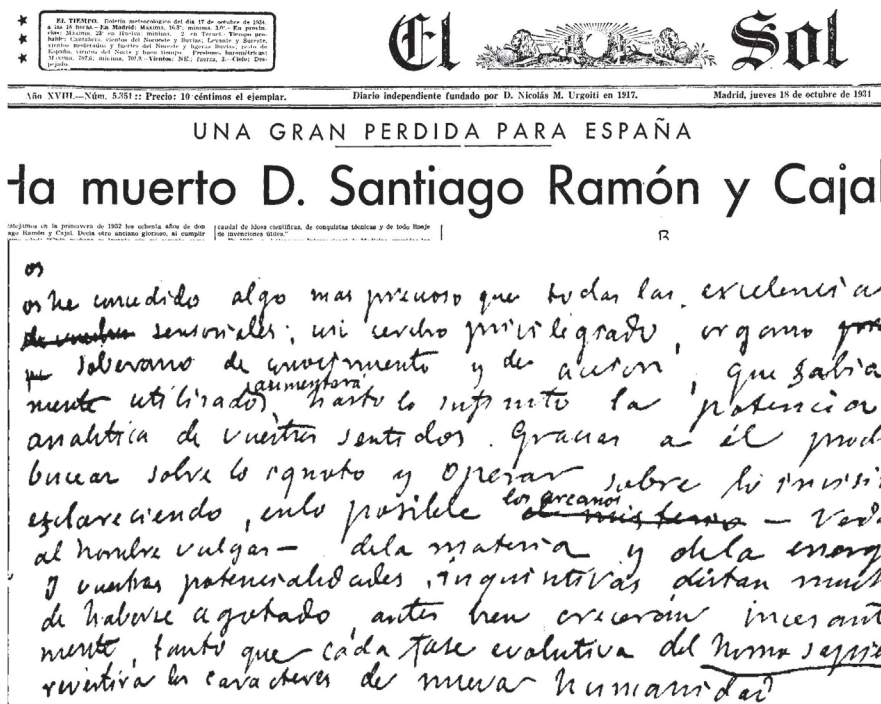


Figure 4. Cajal's last text, written hours before his death: a tribute to the power of the brain according to the theory of evolution

What is certain is that there is no evidence of what may have happened to this invaluable work.

#### Cajal's final hours and last writings

The gastroenterologist Santiago Carro García (1889-1966) treated Cajal for eight months for chronic diarrhoea. It was a challenge convincing him that the cause was not a gastrointestinal tumour, as he feared. Cajal self-diagnosed with "artificial hyperchlorhydria," which he attributed to the salicylates he was using and to "hydrochloric water."<sup>14</sup>

Contrary to medical advice, he tried to combat his illness by consuming kefir or Bulgarian yoghurt; on a reduced diet based on blended foods, he gradually lost strength and became dehydrated. In this critical state, he refused to be administered saline solution, as proposed by Jiménez Díaz. Durán Muñoz and Alonso Burón<sup>11</sup> include a photograph of Cajal's daily notes on his health, where he even recorded the time and colour of his bowel movements. He had hypochondria and depression, but remained lucid to the end.

#### Cajal's last written words

Displayed at the Official College of Physicians of Madrid is a famous letter in which Cajal advises Rafael Lorente de Nó (1902-1990), who had emigrated to the United States, on how to stain the mouse fascia dentata. The letter is dated 5 October 1934, 12 days before his death. Much later, he wrote a text of only 12 lines, which was printed the day after his death in *El Sol* (Figure 4; 18 October 1934). According to the newspaper, it was written "at 8 pm, three hours before he passed away" on 17 October 1934. His swansong was a reflection on the brain as a marvel of evolution.

I leave you something greater than any wonder of the senses: a privileged brain, governing behaviour and action, which used wisely will immeasurably improve the analytical power of your senses. It allows us to dive into the unknown and operate on the invisible, elucidating, insofar as is possible, the obscure questions (concealed from the common man) of matter and energy; your inquisitive power shall be far from exhausted; in fact, it shall expand interminably, so far that each evolutionary phase of *Homo sapiens* will clad the personality of new humanities.





**Figure 5.** A bronze death mask framed in a laurel wreath. Sculpted by Juan Cristóbal

The text contains three short crossings-out: two deletions and an amendment (*arcános* [obscure] instead of *misterio* [mystery]). However, it “preserves the known characteristics of his writing: large, well-spaced, very clear, completely sober, without a single superfluous element,” commented Dr Tomás Perrín from exile.<sup>32</sup> Cajal was accompanied in his final moments by his daughter Fe, Fernando de Castro, and Tello, who wept inconsolably. He was pronounced dead by his family physician, Teófilo Hernando; Carlos Jiménez Díaz signed the death certificate, with Hernando signing as a witness.<sup>31</sup> A very simple viewing was held in the room where Cajal had died, which accumulated a profusion of flowers sent by students of medicine. In place of the gloomy photograph of Cajal in his coffin, which was printed in large format by a certain newspaper of the time, I include an image of his death mask (Figure 5).

### Conflicting wills

According to the General Archive of Protocol in Madrid, Cajal altered his will three times. In the first will, drafted in 1903 after he moved to Madrid, he professes his Catholic faith and his wish to be buried in a place to be designated by his wife. In 1927, aged 74, he radically changed the content of his will. Not only does he omit all reference to religion, but he also specifies a “purely civil funeral without any kind of pomp and circumstance.” Regarding his tomb, he states that “my remains shall be laid to rest in a common grave, to dissolve with satisfaction among those of my humble compatriots in my beloved Spain.” Four years later in 1931, now a widower, he confirms the dispositions of the previous will, including details of his library, which he bequeaths to his sons Jorge and Luis.<sup>11</sup>

Unexpectedly, he drafted a codicil on 18 September 1934 (a month before his death), which included substantial modifications, including the following dilemma: “I wish, if possible, to be buried beside my wife; should this not be possible, I should be buried in the secular cemetery, beside Azcárate.” The day after Cajal’s death, Francisco Tello produced an envelope containing the codicil expressing Cajal’s final desire, making no mention of inheritance or testaments. Cajal wished to be buried in the Civil Cemetery, which housed the tomb of Gumersindo de Azcárate, a follower of the Krausist ideology, and those of five other members of the Institución Libre de Enseñanza (Free Institute of Learning). No space was available there; contrary to what one may expect, he was buried in the Almudena cemetery in Madrid. Beneath an enormous cross.

### A conflicted funeral

On 18 October 1934, Spain was in the midst of the “black two years”: the Asturian revolt and its brutal repression were at their height, at the same time as Gil Robles directed the Ministry of War. At 11 am, the Minister of Public Education Filiberto Villalobos visited the mansion to offer official condolences. At 4 pm that leaden afternoon, the end of Alfonso XII street was packed with a crowd not only of Cajal’s followers and students, but also members of the general public. As the procession prepared to set off, a senior Army official appeared, intending to preside over the proceedings. Tello, Cajal’s executor, stopped him, showing the will document expressing the



**Figure 6.** Cajal's coffin was carried a short distance upon the shoulders of his followers, accompanied by a crowd of people. Minutes later a group of assault guards obliged them to load the coffin into a van<sup>15</sup>.

master's wish for a purely civil funeral. With the coffin atop the shoulders of Cajal's students and disciples, the procession travelled barely 200 metres before assault guards and the *Guardia Civil* insisted that the coffin be carried in a van, flanked by motorcycle mounted officers with machine guns, as the renowned ophthalmologist Galo Leoz described at the age of 105 (Figure 6).<sup>32</sup> It was necessary to desecrate the simple tomb in order to place the coffin inside, with ornaments and mouldings being torn away. Tello looked through tears upon the sad scene and ordered that the ceremony be cut short. It was he who cast the first handful of dirt onto the grave.<sup>33</sup>

### Conclusions

This article provides new data from original sources, or at least details rarely mentioned by Cajal's main biographers, such as the disappearance of his book *Textura*, a tragedy reasonably interpreted as being of transcendental importance.<sup>34</sup>

Based on the accounts of Laín Entralgo and Albarracín<sup>15</sup> and the *La Voz* newspaper (18 October 1934), we may speculate as to the involvement of the maid Dora and

her assistant. According to this theory, amidst the chaos of the dimly lit "cave," the unbound book to whose pages Cajal tirelessly added new data and images may have fallen accidentally to the floor. As mentioned above, only Cajal's daughter Fe and his faithful maid Dora were permitted to enter the lugubrious room. This list surely must also have included the teenage Hilaria, the housekeeper's assistant. She may well have thought that her master's magnum opus, spilt across the floor among his discarded pages, was no more than waste paper.<sup>15</sup> In any case, thanks to Fernández Santarén's<sup>34</sup> invaluable *Epistolario*, we know that the tragedy took place in the last three months of Cajal's life. Until 2007, no Spanish-language translation of the original work was available.<sup>35</sup>

The Nobel laureate's ideology fluctuated surprisingly, as shown by the three wills drafted between 1903 and 1931 and the unexpected codicil written shortly before he died: from conventional Catholicism in the first will, he took a surprising turn in the 1927 document, in which he expressed his desire to be buried in a common grave. As chair of descriptive anatomy at the Valencia Faculty of Medicine, Cajal was full of idealism, gradually moving





**Figure 7.** The current appearance of the tomb housing the remains of Santiago Ramón y Cajal, his wife Silveria Fañanás García, and another family member. The bunch of wild flowers in a supermarket bag are a humble and moving anonymous tribute. Photograph by the author

to a materialist, positivist mentality, before eventually adopting the more conciliatory formula of Krausism in 1931.<sup>36</sup> In this conflicted, final-hour codicil, Cajal allows others to resolve the quandary of whether he should be buried in the Civil Cemetery with his esteemed Krausists or be laid to rest beside his wife Silveria Fañanás García, who died three years earlier on 22 August 1931. He was eventually buried in a ground-level tomb at the Almudena cemetery in Madrid.

We should pause to consider the political context of the conflict surrounding Cajal's funeral. Although he never wanted to become involved in politics, he was known to be a supporter of the Second Spanish Republic, according to his grandson.<sup>37</sup> Barely a month after the Republic was proclaimed, he publicly supported the left-wing University Student Federation (FUE) at the unveiling of a statue in his image at the Faculty of Medicine.<sup>38</sup> In this context, the attempt by a military officer to lead the

funeral procession, frustrated at the last moment by Francisco Tello Muñoz (1880-1958), merits a detailed study. It is feasible that public safety may have motivated the police order for Cajal's coffin to be carried in a van flanked by armed motorcycle officers.

However, it seems reasonable to consider that political motives may have been at play. It is striking that before the end of the Franco dictatorship in 1975, very little reference was made in Spain to Cajal and his Neurohistological School. Spanish physicians in exile in Hispanic America<sup>6,22,23,30</sup> were years ahead; their work was followed by biographies by such foreign authors as Cannon<sup>39</sup> and Williams.<sup>40</sup> Shortly after the transition to democracy, the historians Pedro Laín Entralgo and Agustín Albarracín Teulón<sup>15</sup> wrote the following enigmatic lines about Fernando de Castro Rodríguez (1896-1967): "Day by day, he suffered a symptomatic attempt to put an end to the Cajal school, for reasons completely unrelated to research." Professor de Castro, perhaps Cajal's favourite student, was only able to win the chair of histology in 1951, and while he was permitted to participate in research in the 1940s,<sup>41</sup> he was obliged to obtain the approval of the director of the Cajal Institute. The Spanish Civil War had essentially put an end to the Madrid school of neurology.<sup>42</sup>

When I visited Cajal's tomb, the official on duty gave some rather confusing directions: quarter 1, block 112, letter A, body 2. Five million bodies anchored in the ground constitute a vast sea of names. As I was about to give up, thinking the morning was wasted, an affable headstone maker got out of his truck; after searching for a while, we eventually found the spot. "Can you believe I had no idea where Cajal was buried after 34 years working here?" A melancholic air of oblivion hangs over the tomb, which lies beneath an ancient cypress a few metres from the wall. Resting upon the tomb was a bunch of daisies, now withered, in a plastic carrier bag, laid down as an anonymous tribute to our wisest ancestor (Figure 7). Nobody has taken the trouble to restore the headstone, which is missing several letters after years of neglect.<sup>43</sup>

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### Conflicts of interest

The author has no conflicts of interest to declare.

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