

# One hundred and fifty years since Santiago Ramón y Cajal's competitive examinations for the role of *practicante*

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## ABSTRACT

To date, the only document on Santiago Ramón y Cajal's time working on hospital wards was a letter conserved at the Cajal Institute (Spanish National Research Council), dated 17 May 1876, informing him of his appointment as *practicante de primera clase* (physician's assistant) at Hospital de Nuestra Señora de Gracia, in Zaragoza. Many of Cajal's biographers referred to this document, but none had been able to explain the circumstances of the appointment.

Thanks to unpublished documentation that we recently discovered in the archives of the Provincial Government of Zaragoza, we can now reveal the events during this historical period of Cajal's life and describe the complete process of the competitive examination through which Cajal was selected for the role of *practicante de primera clase*.

This is a hitherto unknown period of Cajal's life, which we may now reveal at the time of the 150th anniversary of the competitive examination.

Among the documents identified, three handwritten texts by Santiago Ramón y Cajal are of particular importance.

## KEYWORDS

Santiago Ramón y Cajal, competitive examination, *practicante*, nurse, nursing, 1876.

## Introduction

On the occasion of the 150th anniversary of Santiago Ramón y Cajal's participation in the competitive examination for the role of *practicante de primera clase* (physician's assistant) at Hospital de Nuestra Señora de Gracia in Zaragoza, we would like to reveal recently discovered unpublished documents that clearly describe the vicissitudes of the process.

With a view to clarifying the occurrences of this period of Cajal's life, we should take a historical perspective, accounting for both the socio-political situation of Spain at the time and the biographical period of Cajal's life, and comment briefly on the qualifications required for the position for which he competed.

With regard to the social and political context, Spain was passing through a convulsive time. With patriotic sentiment running high, Spain was in the midst of a civil war, the Third Carlist War (1872-1876),<sup>1(p79)</sup> between supporters of the Carlist pretender to the throne, Carlos de Borbón, and the governments of Amadeus I (1872), the First Republic (1873), and Alfonso XII (1874). Thus, there were three changes in the form of government (monarchy and republic) in just two years, coinciding with the Ten Years' War (1868-1878), in which Spanish creoles in Cuba fought for independence from the mother country.<sup>1(p79-81)</sup>

Santiago Ramón y Cajal, having received his degree in medicine in 1873, at 21 years of age, was called up for

military service under the conscription system of the republican government of Castelar. The same year, he successfully completed the competitive examination for the position of assistant physician of the army medical services at the military hospital on Calle Princesa in Madrid; after a brief period serving as medical lieutenant in the Burgos Infantry Regiment in Lleida, on the Carlist front, he was deployed to Cuba with the rank of captain in 1874.<sup>1(p79-81),2,4</sup>

There, he was posted to the field infirmaries of Vista Hermosa and San Isidro, located in areas of jungle and swamps. He contracted malaria and dysentery, and was diagnosed with severe malarial cachexia and declared unfit for service. After 14 months in the colonial territory, he returned to Spain in 1875, weakened and convalescing from his ailments.<sup>4</sup>

In March 1876, a position was advertised for the role of *practicante de primera clase* (physician's assistant) at Hospital de Nuestra Señora de Gracia, in Zaragoza.<sup>5</sup> The figure of the *practicante*, a male healthcare profession, was one of three professions (alongside matrons and nurses) that were unified in the 20th century, which constitute the predecessors to today's university-qualified nursing professionals.<sup>6</sup> The title had been created 19 years earlier by the Law of Public Instruction of 9 September 1857,<sup>7</sup> which unified numerous practical healthcare professions and titles that shared similar competencies: second-class surgeons, phlebotomists, ministrants, etc.

According to the various applications for entry in the competitive examination, these positions were made available to qualified *practicantes* in medicine and surgery, professionals with practical healthcare qualifications below the level of *practicante*, and individuals holding degrees in medicine. Santiago Ramón y Cajal belonged to the latter category.<sup>8-12</sup>

## Background and objectives

Starting from the simple fact that Cajal had been employed as a *practicante* at Hospital de Nuestra Señora de Gracia, we began searching for new data on his little-known time working on hospital wards for an article to be published in *Noticias de Enfermería*, the journal of the Official College of Nursing of Zaragoza.<sup>13</sup> In September 2024, we began a database search to establish the scientific basis upon which to develop the article. This initial information was published on the official website of the Cajal Institute (Spanish National Research

Council) and in the book *Ramón y Cajal, 1852-1934: expedientes administrativos y otros documentos* (Ramón y Cajal, 1852-1934: administrative records and other documents), which includes a reproduction of the document appointing Santiago Ramón y Cajal to the position of *practicante de primera clase* at the hospital.<sup>14</sup>

Finding no additional data, in November and December we searched the archives of the Provincial Government of Zaragoza, which holds all documentation pertaining to Hospital de Nuestra Señora de Gracia. There, we discovered the 1876 minutes book, in which his appointment is recorded<sup>15</sup>; a few weeks later, in one of the Fondo de Beneficencia (Social Security Fund) boxes, we identified the 1875-1876 bundle with the title: "Files and documentation on the staff of the Hospital and Hospice of Zaragoza." This included the folder of the secretariat of the Provincial Government of Zaragoza for the year 1876, which contained part of the documentation on the competitive examination, with the selection of Mr Santiago Ramón y Cajal as "*practicante de primera clase* at Hospital de Gracia" (Figure 1). This discovery was soon followed by others, until we had located the complete documentation recounting the vicissitudes of the examination. Since then, we have worked to organise, transcribe, and analyse all the information discovered.

One hundred and fifty years later, this article aims to give the due attention to the documentation discovered within the biography of Cajal, describing the full circumstances surrounding the competitive examination he entered in the first semester of 1876. The article is also intended to commemorate the 150th anniversary of his hospital ward work and, as we shall see, to uncover Cajal's revelation about his interest in research and science, for the first time of his life.

## Material and methods

The documentation identified comprises 25 documents (Table 1), with 30 written submissions spanning 56 pages, recounting the entire process of the competitive examination for a *practicante de primera clase*. These include three documents hand-written by Cajal himself: an application to enter the examination; the written examination paper, comprising 13 pages and identified by the author with a premonitory motto; and the request to renounce the position obtained.

**Table 1.** The documents discovered, in chronological order.

|    |                                                                                                                                                                                            |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Proposal to advertise the vacancy for a <i>practicante de primera clase</i> at Hospital de Nuestra Señora de Gracia in Zaragoza, due to the death of the previous occupant of the position |
| 2  | Draft text for publication in the Official Provincial Gazette                                                                                                                              |
| 3  | Official Provincial Gazette of Zaragoza no. 149, dated 16 March 1876                                                                                                                       |
| 4  | Application of Pedro Aguado y Morales to enter the examination                                                                                                                             |
| 5  | Certificate of residency and profession signed by the mayor of the Zaragoza district of Santiago, in favour of Pedro Aguado                                                                |
| 6  | Application of Santiago Ramón y Cajal to enter the examination                                                                                                                             |
| 7  | Application of Pascual Puro y Olona to enter the examination                                                                                                                               |
| 8  | Application of José Alegre y Bravo to enter the examination                                                                                                                                |
| 9  | Draft document describing the composition of the examining board                                                                                                                           |
| 10 | Draft letter informing candidates of the place, date, and time of the beginning of the examination                                                                                         |
| 11 | Notice announcing the programme of examination exercises, displayed in the secretariat of the Provincial Government of Zaragoza                                                            |
| 12 | Handwritten examination of Santiago Ramón y Cajal                                                                                                                                          |
| 13 | Handwritten examination of José Alegre                                                                                                                                                     |
| 14 | Handwritten examination of Pascual Puro                                                                                                                                                    |
| 15 | Minutes of the examining board for the theory and practical examinations                                                                                                                   |
| 16 | Record of the submission of the minutes and of the examination papers to the Provincial Social Security Commission                                                                         |
| 17 | File nominating Santiago Ramón for the role of <i>practicante de primera clase</i> at Hospital Santa María de Gracia                                                                       |
| 18 | Draft proposal to appoint Santiago Ramón to the position                                                                                                                                   |
| 19 | Proposal to appoint Santiago Ramón to the position and text showing the official ranking of examination candidates                                                                         |
| 20 | Page 125 of the 1876 minutes book, appointing Santiago Ramón as <i>practicante de primera clase</i> at Hospital de Nuestra Señora de Gracia                                                |
| 21 | Draft letter informing Santiago Ramón and the director of Hospital de Nuestra Señora de Gracia of the appointment                                                                          |
| 22 | Handwritten letter, signed by Santiago Ramón, renouncing the position                                                                                                                      |
| 23 | Texts from the Social Security Commission accepting the renouncement on the part of Santiago Ramón and proposal to appoint José Alegre                                                     |
| 24 | Page 150 of the 1876 minutes book, reporting the acceptance of Santiago Ramón's renouncement of the position and the appointment of José Alegre                                            |
| 25 | Draft letters informing José Alegre and the hospital director of the former's appointment as <i>practicante de primera clase</i>                                                           |



**Figure 1.** File bundle from 1876, with the title “Files and documentation on the staff of the Hospital and Hospice of Zaragoza,” discovered in the Social Security Fund box, signature III, 122, in the archives of the Provincial Government of Zaragoza. The first documents were bundled together in a sheet of paper, rather than a folder, with the title “Appointment of Santiago Ramón as *practicante de primera clase* at Hospital de Gracia.”

Though we read numerous works to understand Cajal's life and the circumstances in which he applied to enter the competitive examination, this article is mainly based on the recently discovered unpublished documentation.

## Results

### *Opening of the vacancy*

The vacancy appeared after the death of the previous *practicante de primera clase* at Hospital de Nuestra Señora de Gracia, Luís Cerrada, on 12 December 1875. On 21 December, the president of the Social Security Commission, Mariano Pérez, notified the vice-president of the Provincial Commission of Cerrada's death: “This Commission proposes that, after declaration of the vacancy, the Provincial Commission advertise the same in order that it may be filled, in the manner required by the Provincial Government, according to the agreement of 11 November 1872.”<sup>16</sup>

The vacancy was announced in number 149 of the official gazette of the province of Zaragoza, on 16 March 1876:

Having arisen a vacancy for a *practicante de primera clase* at Hospital de Nuestra Señora de Gracia, with a salary of 625 pesetas, a competitive examination shall be held, whose programme may be consulted at the Secretariat of the Provincial Government, where aspiring candidates may lodge their applications within the term of fifteen days, counting from the publication of this notice.<sup>5</sup>

### *Applications for the competitive examination*

Four applications and one recommendation for the competitive examination were received: applications from Pedro Aguado, Santiago Ramón, Pascual Puro, and José Alegre, and a certificate from the mayor of the district of Santiago recommending Pedro Aguado.<sup>8-12</sup>





**Figure 2.** Application of Santiago Ramón y Cajal to enter the competitive examination (document 6).<sup>10</sup>

The application of Santiago Ramón y Cajal (Figure 2) is one of the most important of the documents discovered. The document, with writings on both sides, is a handwritten application letter, signed by Cajal:

Sir,

I, Santiago Ramón y Cajal, holder of a degree in medicine and surgery and resident in this city, hereby inform you:

that, having become aware of the notice printed in the official gazette of the province, advertising the vacancy for a *practicante* at Hospital Provincial de Zaragoza, and meeting the requirements listed therein of candidates for the position, I should be most grateful if you would approve my entry in the competitive examination on the day and at the time that you should specify at your convenience.

I remain your humble servant.

Zaragoza, 27 March 1876.

Santiago Ramón y Cajal

To the President of the Social Security Commission of the Provincial Government of Zaragoza.<sup>10</sup>

### *Lead-up to the competitive examination*

#### 1. Composition of the examining board

On 28 March, Liborio Loshuertos (chair), Antonio Escartín (speaker), and Jacinto Corralé (secretary) were informed that they had been selected to sit on the examining board for the position of *practicante de primera clase*, to take place at 11 o'clock on 4 and 5 April at Hospital de Nuestra Señora de Gracia. Furthermore, the four applications were sent to the chair of the examining board on 1 April 1876, together with the programme of exercises and a document requesting the examination papers be returned, following evaluation, "with the classification merited."<sup>17</sup>

#### 2. Communication to the applicants

The same day, a letter was sent to the homes of the four applicants to inform them of the place, date, and time that the examination would begin.<sup>18</sup>

#### 3. Advertisement of the examination

A notice informing candidates and the general public about the examination programme was displayed in the Secretariat of the Provincial Government, signed by the chair of the examining board, indicating the date, time, and place of the examination and noting that the sessions would be public and that the programme of the "competitive examination for the position of physician's assistant or *practicante de primera clase*" would include three exercises, as follows:

##### Programme of examination exercises

First: A written response, within a time limit of two hours, in which candidates must answer, in the greatest possible length, six questions about external pathology, drawn at random from a box placed in view of the public.

Second: Examination and diagnosis of a surgical patient, and treatment of the same, with the candidate indicating and preparing the dressings and bandages needed.

Third: Autopsy of a cavity, designating and describing the technique and the instruments to be used.

These exercises will take place on these premises, and will be open to the public, with no prior preparation, at the allocated time.

The written responses will be sealed without a signature, and candidates will sign their names on a separate sheet, which will also be sealed. Each envelope will be inscribed with the same motto prior to delivery to the examining board.<sup>19</sup>

#### First day (4 April)

The minutes of the examining board provide details of the entire process of the competitive examination.

After the doors of the hospital's boardroom had been opened to the public, in the presence of the "honorary president" Genaro Casas,<sup>20</sup> the four candidates were called to enter the room. Then, Mr Aguado y Morales expressed his intention to withdraw from the process, leaving three remaining candidates for the position.

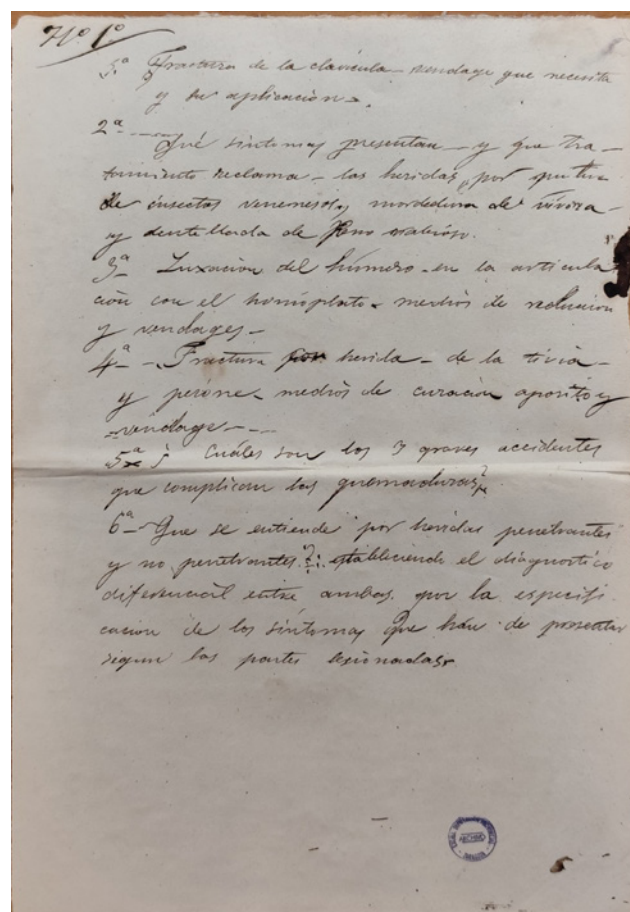
The next step was the drawing of the six questions for the written exercise. The questions were drawn from the box by the youngest candidate, Mr Santiago Ramón, who was just 23 years old at the time.

The questions selected were (Figure 3):

1. Fracture of the clavicle: what bandages are needed and how they are applied?
2. What are the symptoms of bites from venomous insects, snakes, and rabid dogs, and what treatment is required?
3. Luxation of the humerus in its joint with the scapula: how can the injury be reduced and what bandages are used?
4. Open fracture of the tibia and fibula: what non-penetrating methods, dressings, and bandages are to be used?
5. What are the three severe accidents that can complicate burns?
6. What is meant by penetrating and non-penetrating wounds? Specify the differential diagnosis between both, and the symptoms expected according to the body parts presenting injury.

Candidates noted down the questions and had two hours to write their responses, under supervision of a member of the examining board.

Once the two hours were up, they handed in their written responses in sealed envelopes together with



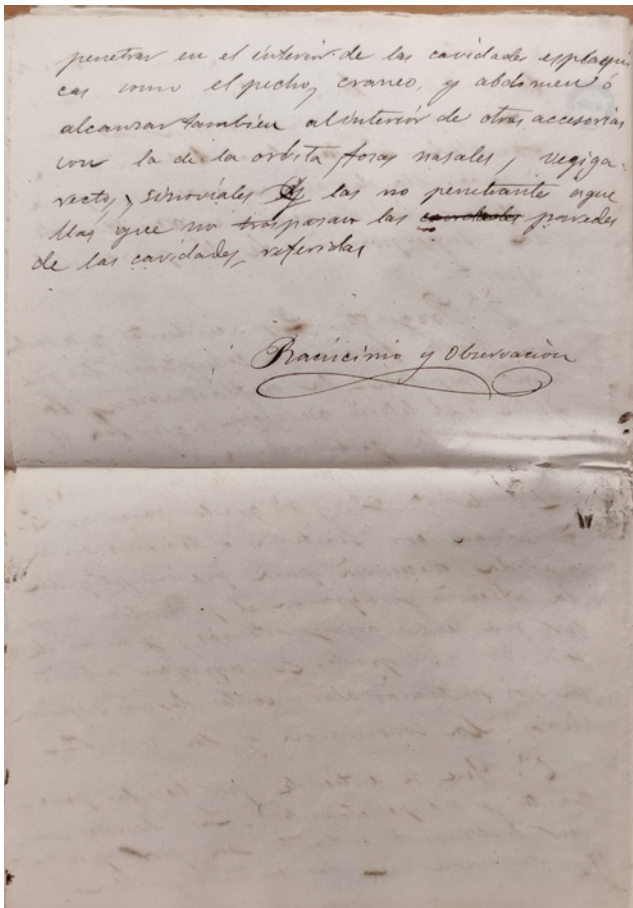
**Figure 3.** First page of Santiago Ramón y Cajal's handwritten examination paper, on which he noted down the six questions he would be required to answer.

a signature, also in a sealed envelope, with the same motto written on each envelope. The day's session was thereby closed.<sup>21</sup>

The written examination by Santiago Ramón y Cajal is the most important of all the documents discovered, not only because it is one of the only (if not the only) preserved example of an examination paper by Cajal, or due to the scientific knowledge he displays, but also for the scientific motto he chose to identify himself: "Reasoning and observation" (Figure 4).<sup>22</sup>

#### Second day (5 April)

On the morning of the fifth of April, at 11 o'clock, the examining board met behind closed doors, opened



**Figure 4.** Page 13 of Santiago Ramón y Cajal's handwritten examination paper, in which he identifies himself with the motto "Reasoning and observation," the two essential skills in the acquisition of knowledge since the birth of the modern scientific method.

the envelopes, and proceeded to mark the written examinations.

The board noted that:

All three merit a pass: Mr Ramón is overly extensive and highly scientific, without this implying the absence of important omissions, perhaps due to the haste and disquiet of writing under these circumstances. Mr Alegre is less extensive, but does not lack science or exact, complete knowledge of the subjects he describes. Mr Puro is extremely concise and specific, but commits no errors.<sup>21</sup>

They waited for the completion of the examination to report their conclusions, together with those of the other exercises.

Next, they called in the candidates and the members of the public who wished to observe the clinical case.

The practical examination was held in the S. Jacinto room of the hospital, where the examining board assigned a surgical case to each candidate. The minutes do not specify the cases that candidates had to solve, reporting only the examiners' consideration of their performance:

In this exercise, Mr Alegre merits first place due to the accurate diagnosis and his orderly examination, treatment, and bandaging of the ulcer, resulting in a perfectly placed dressing. Mr Ramón was less precise in his diagnosis, although the treatment was appropriate to the diagnosis established. Mr Puro misdiagnosed the patient, but was not incorrect in the treatment and dressing of the wound.<sup>21</sup>

### *Third day (6 April)*

The final test of the competitive examination was held in the anatomical theatre. There, members of the examining board and the candidates completed the third exercise before a large audience.

Mr Ramón was asked to open the cranial cavity; Mr Alegre was instructed to demonstrate the bladder, and Mr Puro was required to uncover the femoral artery at its emergence underneath the inguinal ligament.

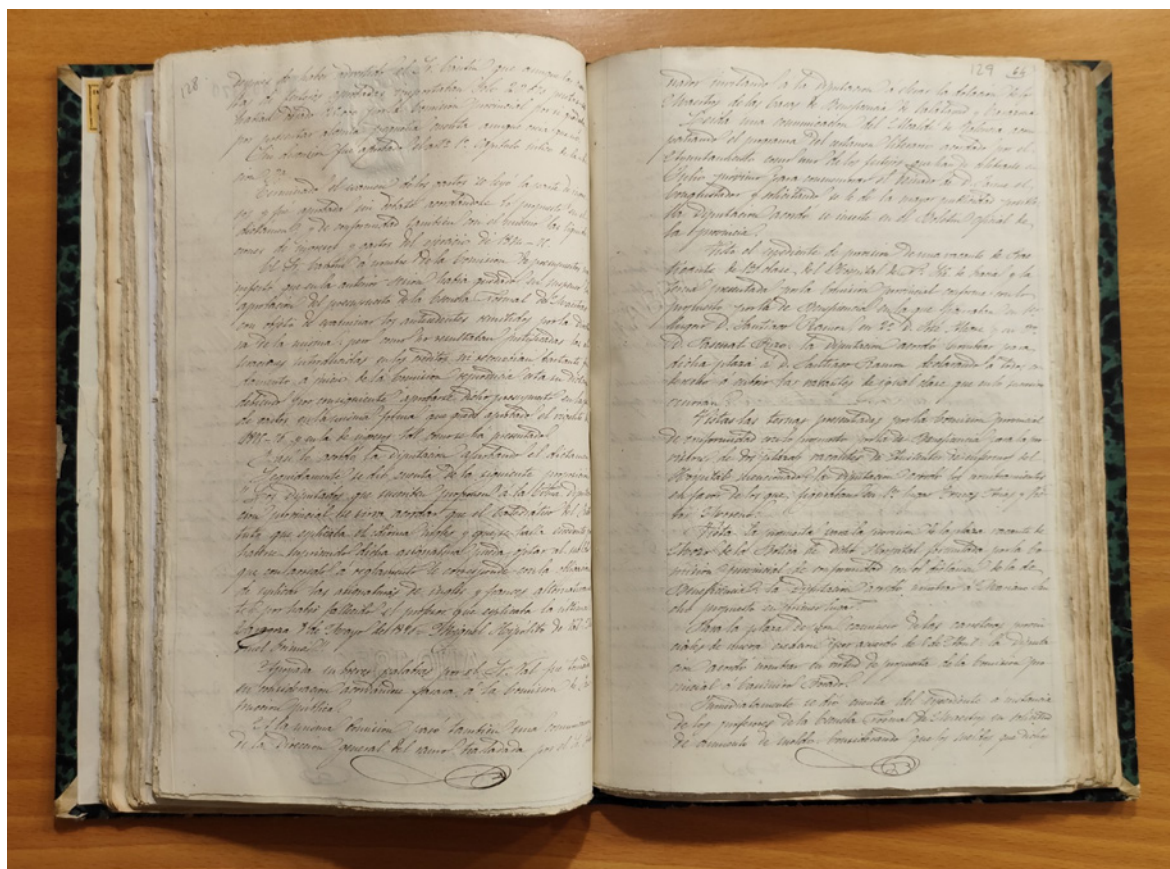
According to the minutes, the examining board considered that "Mr Puro was the least precise, as it took him a long time with somewhat inelegant operations to locate the vessel. The other candidates, with little difference between them, fully accomplished their objectives."<sup>21</sup>

### *Classification of results*

As instructed upon his appointment, the chair of the examining board submitted the minutes and the examination exercises to the provincial Social Security Commission the same day.

Finally, Mariano Pérez, president of that commission, in accordance with the recommendation of the speaker and the honorary president that his decision account for the highest academic title, established the ranking of the candidates, assigning first place to Santiago Ramón, second place to José Alegre, and third place to Pascual Puro.<sup>23,24</sup> This classification was reported in the minutes book for the ordinary public session of 8 May 1876, as follows (Figure 5):





**Figure 5.** 1876 minutes book. The minutes for 8 May (page 129) report the ranking of candidates in the competitive examination and the appointment of Santiago Ramón to the position of *practicante de primera clase*.

In the light of the process to fill the vacancy for a *practicante de primera clase* at Hospital de Nuestra Señora de Gracia, and the shortlist of three candidates presented by the Provincial Commission, in accordance with the proposal of the Social Security Commission, in which Mr Santiago Ramón was assigned first place, Mr José Alegre second place, and Mr Pascual Puro third place, the Provincial Government resolved to select Mr Santiago Ramón for the position, considering all three candidates apt to fill any subsequent vacancy of the same class that may arise.<sup>15(p129)</sup>

#### Communication of the decision

The documents discovered include the drafts of letters informing the director of the hospital and Santiago Ramón y Cajal about the latter's selection. These drafts are dated 16 May.

Comparison of the original document preserved at the Instituto Cajal in Madrid and the draft discovered reveals only one difference: the date, 17 May on the former and 16 May on the draft. The letter reads:

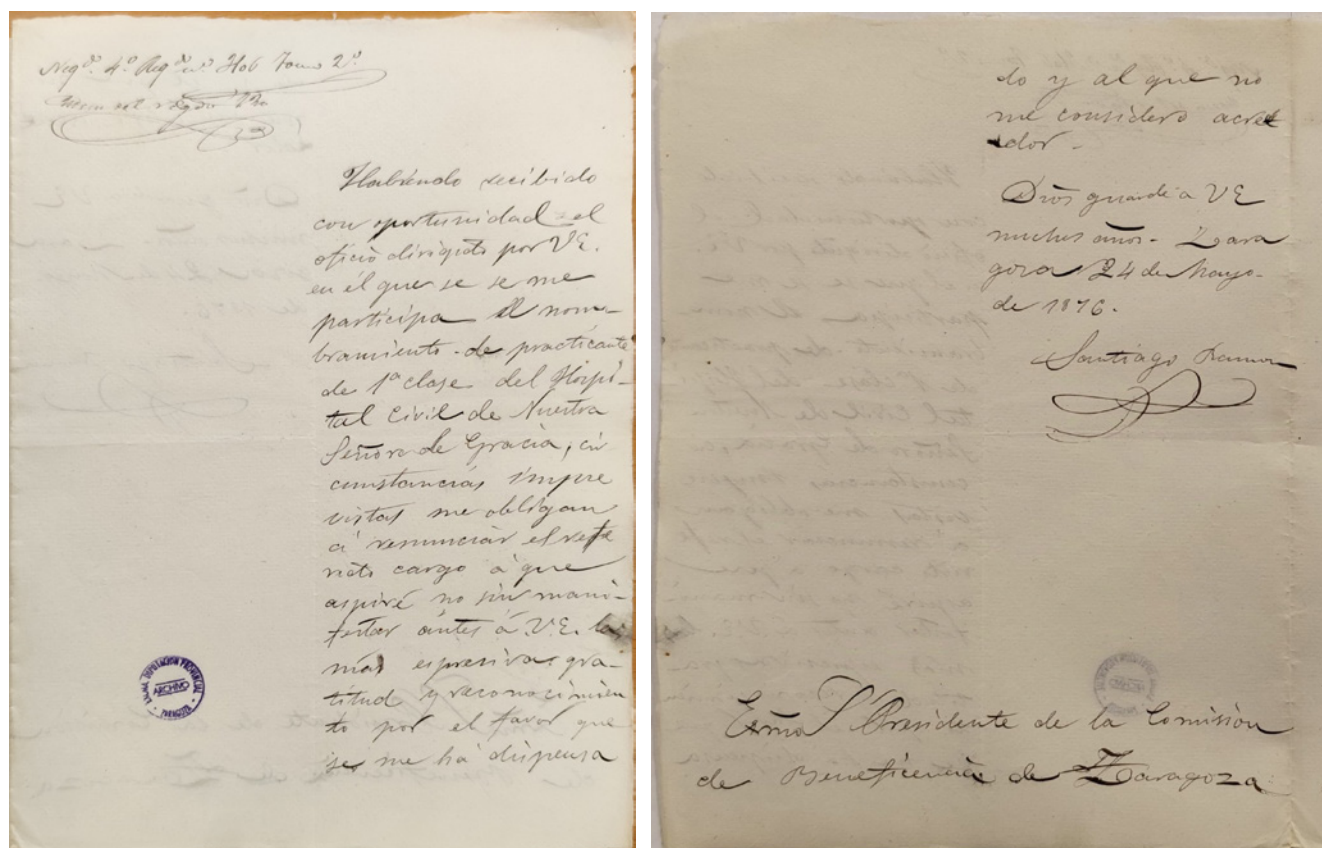
Mr Santiago Ramón

16 May 1876.

In the light of the shortlist of three candidates presented by the Provincial Commission, in accordance with the proposal of the Social Security Commission, the Provincial Government agreed on the eighth of this month, to appoint you to the position of *practicante de primera clase* at Hospital de Nuestra Señora de Gracia, with an annual salary of 625 pesetas.

Of which you are hereby informed.<sup>25</sup>





**Figure 6.** First two pages of document 22, a letter addressed to the president of the Social Security Commission, in which Santiago Ramón y Cajal renounced his nomination as *practicante*, citing “unforeseen circumstances.”<sup>26</sup> The second page shows the signature of Santiago Ramón y Cajal.

### *Renunciation of the position*

The next document clarifying this hitherto unknown episode is another of the most important discoveries: Santiago Ramón y Cajal’s handwritten letter renouncing the *practicante* position to which he had been appointed. The letter, written on both sides, reads as follows (Figure 6):

Having opportunely received your letter informing me of my nomination for the position of *practicante de primera clase* at Hospital Civil de Nuestra Señora de Gracia, in the light of unforeseen circumstances, I find myself obliged to renounce that position to which I had applied. I should like to express my profound gratitude and acknowledgement for the

favour you have granted me, of which I consider myself undeserving.

I remain your humble servant. Zaragoza, 24 May 1876.

Santiago Ramón.

President of the Social Security Commission of Zaragoza.<sup>26</sup>

In another document, dated 31 May, the president of the Social Security Commission informs the vice-president of the Provincial Commission of the renouncement of the position by Mr Santiago Ramón, and nominates Mr José Alegre, whom the Provincial Government had declared apt to fill the vacancy.<sup>27</sup>

In the public session of 2 June, in agreement with the Social Security Commission, the proposal was put to the Provincial Government that Jose Alegre, whom the same authority had already considered apt, be appointed to the role.<sup>27</sup>

In the ordinary public session of 7 June 1876, the Provincial Government resolved to accept Mr Santiago Ramón's renouncement and to approve the appointment of Mr José Alegre, as reflected in the minutes book for that session:

In accordance with the proposal of the Social Security and Provincial Commissions, it was agreed without debate that the renouncement of Mr Santiago Ramón of the position of *practicante de primera clase* at Hospital de Nuestra Señora de Gracia be accepted, and that Mr José Alegre be appointed to the vacancy, having been declared apt for the position in the session of 8 May.<sup>15(p150)</sup>

#### *Communication of the decision to José Alegre*

Finally, we identified a draft letter informing José Alegre of the decision of the Provincial Government to appoint him as "*practicante de primera clase* at Hospital de Nuestra Señora de Gracia, in the position left vacant after the renouncement of Mr Santiago Ramón." This draft letter is dated 23 June 1876.<sup>28</sup>

#### **Discussion**

With the discovery of these documents, we finally have a complete picture of the process of the competitive examination that Santiago Ramón y Cajal entered in 1876 and his subsequent appointment as *practicante de primera clase* at Hospital de Nuestra Señora de Gracia. This process began in December 1875, when the publication of a notice was requested to advertise the vacancy arising from the death of the previous *practicante*, and ended in June 1876, when Cajal's renouncement of the position was accepted.

The documents also demonstrate Cajal's short period working on hospital wards, from 8 May, when he was officially appointed, to 7 June, when his renouncement was accepted, both of which are reflected in the 1876 minutes book.

Cajal's memoirs, *Recollections of my life* (published in 1901), do not mention this episode: "Nothing worth relating happened in 1876 and 1877"<sup>2(p248)</sup>; he also neglects to mention his doctorate in medicine, awarded in 1877.

Cajal placed little emphasis on his qualifications and success in competitive examinations: he did not consider them accomplishments, but rather an administrative step, necessary formalities in the path to achieving the goals he set himself.

Cajal considered observation, critique, the scientific process, and original thought to be more important. Regarding these omissions, Benjamin Ehrlich suggests that: "The banality of professional life, as far as he was concerned, was unworthy of remembering."<sup>29</sup>

The value that Cajal attributed to his nomination at the time is demonstrated in the certificate of his file in an application to a new competitive examination, issued by the secretary of the university, Mr Vicente Santandreu, in 1882. Alongside Cajal's other titles, competitive examinations, and merits, the second page of the document notes that:

On the seventeenth of May, 1876, he was selected for the position of *practicante de primera clase* at Hospital de Nuestra Señora de Gracia, Zaragoza, with an annual salary of 625 pesetas.<sup>1(p143-4)</sup>

No documentation is available that conclusively demonstrates whether he did or did not work as a *practicante* in that period. In chapter 26 of his memoir *Recollections of my life*, he recounts that in 1876:

I remained in Zaragoza studying anatomy and embryology, and in my spare time assisting my father in the exacting service at the Hospital, supplying for him in the periods on duty and taking charge of the treatment of some of his private surgical patients.<sup>2(p248)</sup>

However, though he does mention having performed nursing tasks in that period, he does not describe this as regulated work but rather as assistance with his father's professional practice.

We also lack documentation clarifying the reasons for his renouncement of the position. One hint may be the fact that in November 1875, he was named Interim Anatomy Assistant by the Mixed Commission for Medical Study<sup>30</sup>; at the same time, he enrolled as an external student in "the three subjects that were obligatory at the time to obtain the coveted doctoral tassel (history of medicine, chemical analysis, and normal and pathological histology)."<sup>10(p107-8)</sup> If in addition to these occupations we also consider the time needed to prepare the doctoral thesis that he defended the following year,<sup>10(p107-8)</sup> a

fundamental objective among his priorities at the time, then he would have had little time to dedicate to the position of *practicante*.

Finally, we must not overlook the motto Cajal selected to identify his examination paper, “Reasoning and observation,” the two essential skills in the acquisition of knowledge since the birth of the modern scientific method.<sup>31</sup>

Consciously or unconsciously, the motto with which he identified himself expressed his growing desire for change in his professional life in 1876, a period that represents a bridge between clinical practice of medicine, which he abandoned in 1875, and the beginning of his teaching and research career, which he began after receiving his doctorate in 1877.

This identification with science anticipates the revelation he experienced during his time at the old Faculty of Medicine in Madrid, where he earned his doctorate under Aureliano Maestre de San Juan: “Inspired by some beautiful microscopic preparations which Dr Maestre de San Juan and his assistants (Dr López García, among others) were so kind as to show me, [...] I resolved to set up a microscopic laboratory upon my return to Zaragoza.”<sup>2(p250)</sup>

### Conflicts of interest

This work has not been presented at any congress or conference and has no commercial involvement. Images are original and were taken by the author.

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