

Nomination form International Memory of the World Register

Archives of Santiago RAMÓN Y CAJAL and the SPANISH NEUROHISTOLOGICAL SCHOOL

ID Code [2016-31]

1.0 Summary (max 200 words)

Give a brief description of the documentary heritage being nominated and the reasons for proposing it.

*This is the "shop window" of your nomination and is best written **last!** It should contain all the essential points you want to make, so that anyone reading it can understand your case even if they do not read the rest of your nomination.*

The archives of Santiago RAMÓN Y CAJAL and the SPANISH NEUROHISTOLOGICAL SCHOOL consist of a unique collection of scientific manuscripts, histological preparations (mainly of the nervous tissue), drawings (scientific and artistic), paintings (anatomical and artistic), photographs (scientific, artistic and portraits; mainly in black and white and some in color), correspondence (letters from and to several national and international scientists, as well as politics, writers, artists, etc.), books (both his publications and books from his library, with his own annotations and comments) and prizes and awards (including the Nobel Prize awarded to Cajal in 1906). These huge archives are essential to study the history of the more important discoveries and theories that conduct to the present comprehension of the human brain in its double aspect, anatomical composition (individual cells) and physiological properties (formation of circuits and nerve impulse propagation).

Santiago RAMÓN Y CAJAL (1852-1934) was a Spanish scientist that studied Medicine in the University of Zaragoza and taught as a full professor of Anatomy, Histology and Pathology in the Universities of Valencia (1883-1887), Barcelona (1888-1991) and Madrid (1892-1922). But the most prominent labour that Ramón y Cajal did was his research on the Nervous System with the capital discovery of the individuality of the nerve cells and their inter-relationship to propagate the nerve impulses, the so-called 'neuron theory'. Among the direct pupils of Santiago Ramón y Cajal, the most prominent were his own brother Pedro Ramón y Cajal (1854-1950), Pío del Río-Hortega (1882-1945), Fernando de Castro (1896-1967) and Rafael Lorente de Nó (1902-1990). The relevance of the discoveries of his School, that came to complement, confirm and extend the scientific performance of Cajal, as well as the original works, documents, drawings, etc., convert these archives in a unique treasure for current Neuroscience and the History of Science, in general.

2.1 Name of nominator (person or organization)

A Committee of scientists (The Cajal Legacy Group) has been created in order to prepare and present the candidature of the **Archives of Santiago RAMÓN Y CAJAL and the SPANISH NEUROHISTOLOGICAL SCHOOL** for The International Memory of the World Register. The members of this Committee are specified below:

- Juan Andrés de Carlos Segovia (President of the Committee. Instituto Cajal, Madrid, Spain)
- Ignacio Torres Alemán (in his condition of current director of the Instituto Cajal, Madrid, Spain)
- Laura López Mascaraque (Instituto Cajal, Madrid, Spain)
- José Luis Trejo Pérez (Instituto Cajal, Madrid, Spain)

- Fernando de Castro Soubriet (Instituto Cajal, Madrid, Spain; he is as well the only heir of Fernando de Castro)
- Juan Lerma Gómez (Instituto de Neurociencias, Alicante, Spain)
- Patricia Armati (Brain and Mind Research Institute, University of Sydney, Australia)
- John Pollard (Brain and Mind Research Institute, University of Sydney, Australia)

2.2 Relationship to the nominated documentary heritage

All The Cajal Legacy Group members are neuroscientists and very familiar with the archives presented to this nomination. Furthermore, Juan A. de Carlos has been the curator of the “Cajal Legacy” for more than ten years.

2.3 Contact person(s) (to provide information on nomination)

Juan Andrés de Carlos Segovia (President of The Cajal Legacy Group)

2.4 Contact details

Name	Address
Juan Andrés de Carlos Segovia	Instituto Cajal Avenida del doctor Arce, 37 28002 – Madrid (Spain)

Telephone	Facsimile	Email
(34) 91 585 4707 (34) 651612749	(34) 91 585 4754	decarlos@cajal.csic.es

3.0 Identity and description of the documentary heritage

3.1 Name and identification details of the items being nominated

If inscribed, the exact title and institution(s) to appear on the certificate should be given

In this part of the form you must describe the document or collection in sufficient detail to make clear precisely what you are nominating. Any collection must be finite (with beginning and end dates) and closed.

The archives of Santiago RAMÓN Y CAJAL and the SPANISH NEUROHISTOLOGICAL SCHOOL presented are summarized in the following table:

	Scientific publications	Letters, documents & manuscripts	Drawings & sketches	Histological slides	Photographs & microphotographs
Legado Cajal	All the work of SRC (reprints and	Total amount: 4186	Scientific drawings: -From	SRC: 3000 School: 14150	Total amount: 2773

	books) + his personal library Publications of his School and of prominent scientist of the 19th century		SRC:1756 - From School: 889 Anatomical oil paintings from SRC:4		
Archive del Río-Hortega	35 scientific publications 1 manuscript book 4 manuscript conferences	Letters from Scientists (between 1910-1945):500 Letters, postcards and texts from artist, politics...250 Academic documents, courses programs, degrees and diplomas:50 Business cards with texts from scientists, politics, artists...:200	11 scientific drawings	60	30 plates Photographs of Pío del Río-Hortega at various stages of his life: 150
Archive Fernando de Castro	3 books 2 workbooks for practical classes 65 scientific publications (including 9 on the history of Cajal & the School)	Manuscript of Cajal & de Castro (1933) book (with hand-made corrections by SRyC & FdC) FdC: 11 documents & non-published manuscripts Aprox. 2000 letters	FdC: 531 SRyC: 68 NA: 7 PdR-H: 2 LSimarro: 1	4129 (FdC, SRyC, School)	SRyC, FdC & School: 555 plates SRyC: 11 photographs FdC: 48 photographs School: thousands of scientific microphotographs

		NA: 1 notebook			
Archive Pedro Ramón y Cajal	Pedro RC: 20 scientific publications	Manuscripts of Santiago RC: 2 Letters of Santiago RC: 2 Manuscript and Letters of Pedro RC: 8	Pedro RC: 50	Pedro RC: 125	SRyC: 350 stereoscopic plates
Archive Lorente de Nó			65 drawings	100	

The archive of El Legado Cajal is finite, well catalogued and comprises pieces generated from early 1870's to 1967 (death of F. de Castro). Regarding the other archives, their respective pieces were generated in 1888-1950 (Pedro Ramón y Cajal), 1914-1945 (Pío del Río-Hortega), 1915-1967 (Fernando de Castro) and 1921-1990 (Rafael Lorente de Nó).

3.4 History/provenance

Describe what you know of the history of the collection or document. Your knowledge may not be complete, but give the best description you can.

The archives of El Legado Cajal (Cajal Legacy) consist of a unique collection of scientific manuscripts, histological preparations, drawings, paintings, photographs, correspondence (letters from and to several national and international scientists, as well as politics, writers, artists, etc.), books and prizes and awards (including the Nobel Prize).

The history of this vast collection is as follow: Santiago Ramón y Cajal wanted that upon his death a series of his belongings were preserved at the Instituto Cajal, leaving it ordered by testamentary disposition. On his death, in October 1934, his Legacy was moved to the Institute. This consists of archives referenced herein and in a series of laboratory furniture and equipment (microscopes, microtomes, cameras, etc.) as well as several personal items. At the beginning, they were kept and preserved. During the Spanish Civil war (1936-1939) the Institute was bombed and partially destroyed, being Tello and de Castro who protected the Legacy from looting. After its reconstruction and set up of the new scientific departments, the Instituto was re-inaugurated and in 1945 it was open a small Cajal Museum for the exhibition of his belongings. This Museum always was care and preserved by scientists of the Institute without any founding from the Spanish government. The Museum joined the Institute in its movement to new headquarters but in the last one, in the summer of 1989, the spaces were divided into laboratories without thinking in the Museum. Then, the Cajal archives and collections were stored in a small room (19 m²); the same where it can be seen now. Although El Legado Cajal is properly preserved, under controlled temperature and humidity conditions, and stored in boxes and materials for conservations, there is no a real Cajal Museum for the last 27 years. In this location is very complicated its diffusion, becoming almost impossible to consult this archive for interested researchers. Moreover, it would be desirable that the archive was attended by highly qualified personnel with full-time dedication, and no by Cajal Institute scientific staff who must deal with their own laboratories and students. For this reason, a major improvement would have an institution devoted to the conservation of this legacy, as well as the legacies of other Spanish scientists.

In fact, the original Legacy of Ramón y Cajal was progressively enriched by other materials produced by his disciples and scientist of the Cajal Institute. In addition, certain private collections coming from prominent scientists of the Cajal school complete the collections and must be considered as a fundamental part of the Legacy.

The history of the private collections known is as follow:

- Pedro Ramón y Cajal: Younger brother and scientific collaborator of Santiago Ramón y Cajal. His scientific archives were preserved by his descendants in Zaragoza (Spain). At present, they are custodied by his relative Santiago Ramón y Cajal Agüeras.

- Fernando de Castro: He was one of the closest scientists to Santiago Ramón y Cajal. His archives were maintained by his only son, Fernando-Guillermo de Castro (1927-2014), and are currently custodied by his only grandson Fernando de Castro Soubriet, in Madrid (Spain). There are also three historical microscopes and different personal belongings.

- Pío del Río-Hortega: during the Spanish civil war, this prominent scientist was exiled to France, and Great Britain, finally gathering into Argentina, where he died. His archives were divided into two parts; one stayed in Argentina and the other in Valladolid (Spain) with some of his relatives. Part of the archives was brought from the Argentina to Valladolid by his disciples and is preserved in the University. The familiar archives in Valladolid are custodied by Juan del Río-Hortega Bereciartu.

- Rafael Lorente de Nó: He was one of the latest direct disciples of Cajal. He worked most of his life in the United States, where he first moved on 1931, and he died in Tucson (Arizona). One of his last disciples, Jorge Larriva-Sadh conserve part of his archives thanks to a donation of his master. He preserved these archives in Juriquilla (Queretaro, Mexico).

Needless to say, that all these collections comprise the most complete record of the discoveries of Cajal and his School, the foundation of modern Neuroscience and Neurology, and form an essential and un-extinct source of information for researchers and historians of Science.

Besides these collections, there are identified other institutions with numbers of documents related to Santiago Ramón y Cajal and/or the members of the Spanish Neurohistological School, like: Biblioteca Nacional, Madrid, Spain (the Spanish National Library –they acquired a collection of 2035 letters from Cajal some decades ago-), Universidad Complutense, Madrid, Spain (originals doctoral thesis of Cajal, Fernando de Castro and maybe other disciples) and the Neuroscience History Archives of the University of California at Los Angeles-UCLA, USA (that acquired bulk of letters and documents from Lorente de Nó years ago).

The components of the different legacies are diverse and contain both archives and laboratory equipment. Although the current section is generally spoken, including microscopes and personal belongings, it is only submitted for recognition to the International Memory of the World Register, the items described in table 3.1 and specified in 3.2, Annex 1 (scientific publications; letters, documents and manuscripts; drawings; histological slides; photographs and microphotographs).

4.0 Legal information

4.1 Owner of the documentary heritage (name and contact details)

Name	Address	
Instituto Cajal-CSIC Contact: Juan A. de Carlos	Avenida del doctor Arce, 37 E-28002-Madrid (Spain)	
Telephone +34 651 612749	Facsimile +34 585 4754	Email decarlos@cajal.csic.es
Name	Address	
Heirs of Pío del Río-Hortega Contact: Juan del Río-Hortega	C/ Miguel Iscar, 16-portal 4º, 3º dcha. E-47001-Valladolid (Spain)	
Telephone +34 670 083858	Facsimile	Email juandelrioh@hotmail.com

Name	Address
Heirs of Fernando de Castro	C/ Sacramento, 7; apt 3K
Contact: Fernando de Castro Soubriet	E-28005-Madrid (Spain)

Telephone	Facsimile	Email
+34 91 5476175		fdecastro@cajal.csic.es
+ 34 639 358502		

Name	Address
Heirs of Pedro Ramón y Cajal	C/ Demestre, 8, esc B 6A
Contact: Santiago Ramón y Cajal Agüeras	E-08017-Barcelona (Spain)

Telephone	Facsimile	Email
+34 639 151554		sramon@vhebron.net

Name	Address
Jorge Larriva-Sahd	C/ Buenavista, 206
	Juriquilla, 76230-Qro. (Mexico)

Telephone	Facsimile	Email
01 (442) 234 0932		jlsneuro@servidor.unam.mx

4.2 Custodian of the documentary heritage (name and contact details if different from the owner)

Name	Address
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Telephone	Facsimile	Email
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4.3 Legal status

Provide details of legal and administrative responsibility for the preservation of the documentary heritage

	Owner	Custodian	Category of Ownership
Legado Cajal	State	Instituto Cajal	Public
Archive del Río-Hortega	Family	Family	Private
	University	Univ. de Valladolid	Public
Archive Fernando de Castro	Family	Fernando de Castro Soubriet	Private
Archive Pedro Ramón y Cajal	Family	Santiago Ramón y Cajal Agüeras	Private
Archive Lorente de Nó	Private	Jorge Larriva Sahd	Private

4.4 Accessibility

Describe how the item(s) / collection may be accessed

All access restrictions should be explicitly stated below:

PHYSICAL ACCESIBILITY

Only the Instituto Cajal and the University of Valladolid allow consult their archives regularly by

appointment. The main conditions for visitors to the current area housing the Cajal Legacy collection are necessitated by the limited area of the collection of 19 m²:

- Access is limited to less than 10 people at a same time
- Photographs can be taken without the use of a flash.

The other archives are in private houses and visitors must make special appointments with their respective owners.

Encouraging accessibility is a basic objective of MoW. Accordingly, digitization for access purposes is encouraged and you should comment on whether this has been done or is planned. You should also note if there are legal or cultural factors that restrict access.

DIGITALIZATION / ACCESS VIA WEB:

- El Legado Cajal is entirely digitalized but at present this is not accessible online and work is in progress to make it available in the future upon request on:

www.cajal.csic.es/ingles/legado.html

Meantime, images can be shared for publication and/or exhibition upon written request to the Comisión del Legado Cajal.

- Archive Pío del Río-Hortega is digitalized and partially available on-line at <http://archivoprh.sen.es>

- Archive Fernando de Castro is partially digitalized and a specific website is under construction (with selected documents and information available) www.neurodrawings.org. Parts of this archive has been temporary exhibited (2006, 2010) and have been requested to illustrate scientific and artistic publications.

- Archive Pedro Ramón y Cajal: Partially digitalized only as a photographic archive. This is not currently available to the public.

- Archive Rafael Lorente de Nó: This collection is not digitalized and currently not available to the public.

The recognition of the archives of Santiago Ramón y Cajal and the Spanish Neurohistological School in their totality by the UNESCO International Memory of the World Register will greatly help to increase the physical and on-line accessibility of all these collections.

4.5 Copyright status

Describe the copyright status of the item(s) / collection

*Where copyright status is known, it should be stated. However, the copyright status of a document or collection has **no bearing** on its significance and is not taken into account in determining whether it meets the criteria for inscription.*

	<i>Copyright Status</i>	<i>Responsible administration</i>
Legado Cajal	Legado Cajal. Instituto Cajal (CSIC)	Spanish Main Research Council (Consejo Superior de Investigaciones Científicas)
Archive del Río-Hortega		Dr. Juan del Río-Hortega Bereciartu
Archive Fernando de Castro	Archivo Fernando de Castro, Madrid, Spain	Dr. Fernando de Castro Soubriet
Archive Pedro Ramón y Cajal		Prof. Santiago Ramón y Cajal Agüeras
Archive Lorente de Nó		Prof. Jorge Larriva-Sahd

5.0 Assessment against the selection criteria

5.1 Authenticity

Is the documentary heritage what it appears to be? Have identity and provenance been reliably established?

These collections of documents consist of exclusively authentic material. In most cases, hand-written documents and by-hand sketches and original drawings. Many of the books of these archives have handwritten annotations by his owners (Cajal and another scientist) and are first editions.

5.2 World significance

Is the heritage unique and irreplaceable? Would its disappearance constitute and harmful impoverishment of the heritage of humanity? Has it created great impact over time and/or within a particular cultural area of the world? Has it had great influence (positive or negative) on the course of history?

These huge archives are important because they are the foundation and cornerstone of many important discoveries and theories that have led to today's understanding of the human brain both in its anatomical organisation composed of individual cells and functional aspects such as the formation of circuits and nerve impulse propagation. Cajal described many different types of cells in the nervous system, their mode of connection (synapses), different central nervous system structures, the defining of the axonal growth cone as essential for interneuronal connectivity, the chemotactic hypothesis to orient growth cone pathways and the dendritic spines among many other aspects of nervous system function. He also established the so-called 'neuron polarization theory', which explains the main directions followed by the nerve impulse along the peripheral and central nervous systems. In fact, his contributions corrected many previous concepts, thus enriching our understanding of that previously unexplored part of our anatomy. His discoveries have had and still have worldwide influence. These pioneer studies were complemented by those from his main disciples, in which the frontiers of knowledge and 'neuronism' were expanded to discover new cell types – oligodendroglia and microglia by Pío del Río-Hortega (1882-1945)-, functional concepts like the existence of arterial chemoreceptors –by Fernando de Castro (1896-1967)- and the columnar organization of the brain cortex –by Rafael Lorente de Nó (1902-1990) and/or their implications for neuropathology including neural origin of brain tumours by Nicolás Achúcarro (1880-1918) and Pío del Río-Hortega, to state but few.

Besides these, among the direct pupils of Santiago Ramón y Cajal were also prominent his own brother Pedro Ramón y Cajal (1854-1950), Jorge Francisco Tello (1880-1958), Domingo Sánchez y Sánchez (1860-1947), Gonzalo Rodríguez Lafora (1886-1971) and José María Villaverde (1888-1936).

5.3 Comparative criteria:

Does the heritage meet any of the following tests? (It must meet at least one of them.)

1 Time

Is the document evocative of its time (which may have been a time of crisis, or significant social or cultural change? Does it represent a new discovery? Or is it the "first of its kind"?

Santiago Ramón y Cajal belonged to that breed of independent explorers-creators who were

responsible for substantial progress of our knowledge and improvement in understanding our world. Embedded at the cutting edge of Science in his time and with a remarkable capacity for work, observation, imagination and synthesis, Cajal introduced new biological concepts to interpret the structure of the nervous system. Clearly ahead of his time, the countless discoveries of Cajal provided the fundamental basis for the work of new researchers: without his seminal contributions, the progress of neurology would have been significantly delayed in time.

Another important achievement as scientist was Santiago Ramón y Cajal's ability to recruit a plethora of brilliant young researchers and to transmit them his brave and singular spirit for science and knowledge. The most brilliant of his disciples (Achúcarro, del Río-Hortega, de Castro, Lorente de Nó) were responsible for a number of other outstanding discoveries and concepts that helped to model our current conception of the structure and functioning of the nervous system. The importance of these major discoveries by Cajal and his School is underlined by the fact that more than one century they remain fully relevant to this day: this represents an achievement in the History of Science.

2 Place

Does the document contain crucial information about a locality important in world history and culture? For example, was the location itself an important influence on the events or phenomena represented by the document? Does it describe physical environments, cities or institutions that have since vanished?

The collection of documents, thousands of histological slides, drawings, manuscripts and correspondence are an example of the influence of Spanish science to the world achieved by this pioneer initially working in isolation. Cajal placed Spain on the international map of Science in the last decade of the 19th century. Madrid and the Instituto Cajal became a place of scientific pilgrimage for researchers worldwide, interested in the nervous system. And although there had been no previous neurological tradition, Cajal's disciples to continue this ground-breaking neurological research until the devastating event of the Spanish Civil War in 1936.

3 People

Does the cultural context of the document's creation reflect significant aspects of human behaviour, or of social, industrial, artistic or political development? Or does it capture the essence of great movements, transitions, advances or regression? Does it illustrate the lives of prominent individuals in the above fields?

The discoveries of Cajal and his school are definitive for understanding the structure and function of the nervous system. After the death of Cajal, a leading Italian scientist, Professor Ernesto Lugaro, wrote that the work of Cajal had been immense, having produced by himself the same output as all the neurologists of that time put together. From a medical and scientific point of view, humanity is indebted to Cajal. We in Spain know this; for one of the memories that the government has given Ramón y Cajal is that there is no city or town in Spain, no matter how small it be, that does not have his name on a street or square.

4 Subject and theme

Does the subject matter of the document represent particular historical or intellectual developments in the natural, social and human sciences? Or in politics, ideology, sport or the arts?

The manuscripts, drawings, photographs and histological slides comprising the collection reflect the starting point in the history of modern Neuroscience and represent the original source of important scientific concepts that remain fully in force today. In fact, Cajal is internationally considered as "the father of the modern Neuroscience".

5 Form and style

Does the document have outstanding aesthetic, stylistic or linguistic value? Or is it a typical exemplar of a type of presentation, custom or medium? Is it an example of a disappeared or disappearing carrier or format?

These collections provide an excellent insight into the working methods and style of Cajal and his main disciples.

Histological drawings are made on paper of very low quality, but they are small works of art for their fidelity to the structures they represent. Graphite painted and inked with Indian ink represent, in one plane, three-dimensional structures that make us understand the complexity of important brain structures such as the hippocampus, different thalamic nuclei or the organization of the cerebral cortex. Only a few of these drawings are polychrome. A jewel for any scientist or scholar of the brain. Further, non-scientific people see in these drawings, not anatomical structures, but artistic similarities with nature (trees, forests...). Scientific drawings from Cajal and school have been requested to international exhibitions of modern art, on several occasions.

Cajal was a lover of the various photographic techniques. He made his own photographic emulsions and became a pioneer of colour photography in Spain. Great connoisseur, he even wrote a "Treatise on Colour Photography" in 1912. Also, pioneered the photomicrograph in his laboratory. That is, photos taken using a microscope. A part of science, portraits, travel and family photos still call the attention of photographers and museums.

The histological preparations preserved of Cajal and many of his disciples are another of the wonders of these files. Perfectly utilizable today are true windows to the microscopic world of nerve tissue. In them we can see the anatomical structures that these Spanish scientists saw and used to describe and masterfully establish the Neuronal Theory and to describe the different brain structures than other histologists of his time were unable to discern.

6 Social/ spiritual/ community significance:

Application of this criterion must reflect living significance – does documentary heritage have an emotional hold on people who are alive today? Is it venerated as holy or for its mystical qualities, or revered for its association with significant people and events?

(Once those who have revered the documentary heritage for its social/ spiritual/ community significance no longer do so, or are no longer living, it loses this specific significance and may eventually acquire historical significance.)

6.0 Contextual information

6.1 Rarity: The collections of Cajal and the most distinguished members of his School comprise a body of manuscripts, scientific drawings, microphotographs and histological slides all of which are unique and irreplaceable: truly, a heritage for Humanity.

6.2 Integrity: The collections as a whole if collected in one place together will ensure we preserve most of the original production by Cajal and his main disciples. This is especially worthwhile taking into consideration the vicissitudes of History: the Instituto Cajal was bombed during the Spanish Civil War (1936-1939); his many disciples suffered from political prosecutions, including exile to foreign countries, like del Río-Hortega, or the interior exile in Spain, like Tello and de Castro. The inclusion of the total collection housed as one, as part of the UNESCO International Memory of the World Register would undoubtedly ensure their protection for the future.