

1938

The Life & Work of Ramon y Cajal

Address - University of Pennsylvania  
Medical Undergraduates, U43

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See P338  
+ P23

1a. notes & mss. (partial)

1. Life + Work Ramon y Cajal  
Phila 27-11-30

Americans - v Legués Spanish American War

Fragment. impressions of Mexico - Broad hats

Spain has not degenerated - stood still

16<sup>th</sup> Cent. splendor Phillip. ~~Relig~~ artistic

flowering - Goya El Greco, Master Velasquez

Relig. frenzy - prod. inquisition - moors jews

Since Phillip - Span. people - lack in political insight - Humboldt

Cajal - completely lack in inst. self pres.

Castile - <sup>1852</sup> <sup>2A</sup> deforested dry. hot. - catholic, own  
art, music architecture - the people proud, courteous  
static - Inquisit. → Bull Fight.

Sant. Ramon y Cajal - mount. v. Petilla

\* Aragoese peasant - inaccessible  
Ramon y Cassasus - mother Cajal

Struggle - Zaragoza

Father's shoulders - Age - Naturalist. Bind  
French

\* 8 yrs painting - Catholic Father Latin  
MANIAS  
Memory - Robinson C. - Painting - Apprentia.  
Desperate - Osteology - Univ. 3 yrs. anatomy

\* Manias - Athleticism - centers Imsc. activity



2.

Poor + rude intellect. Lic. at 21.

Military Serv. Spain - Malaria - later T.B.

Madrid Doctorate - Microscope.

Prof. Anat. Valencia at 32 <sup>Barcelona 35</sup> ~~Barcelon~~ 1887

Golgi - peroxid. silver - photography  
Retia Ital. annoyed

Criticism } Publish. } Germans now read - undigested  
                  } } Illustrated down

1889-90 Krause trans. - cerebellum

optic lobules birds retina, spinal cord.

1890 German Anatom. Soc. Berlin

Critical + derision

2 A.

Demonstration in bad French

\* Axons anastom. & Purk. like photos.

\* molec. layer

\* retina - sp. gang - bifurcation, spinal  
long + short collaterals coil

Kölliker -- Triumph - translation

Travel - Retzius, His, Waldeyer Krause, van Gehuchten

Man not Lab

Fury of word 1890 14 publications

Harvey 12 years of proof

Newton, Darwin over 20 years.

3

Cajal Dif. - Guiding hypothesis - method

\* Extended Golgi meth. ---- Book Histology of  
Nervous system -

~~Between~~ Between 1890 + 1909 - disproved reticular theory  
+ gave us neurone theory

\* 1908 - Regeneration + Degeneration Nerves

\*\* 1913 - Neuroglia method - function - Synaptism

1914 - Golgi apparatus

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\* 1892 - Prof. Madrid. Companion  
Chess

Tertulia - "3A.  
"warmth of friendship and  
confidence causes to bloom the variegated  
and spontaneous flower of genius."

S. Diastole as well as Systole - walks

Color Photographs,

Book on Coffee House chatter

Gen. Patrol.

Recognition - 19.

Rules + Council for Sc. Investigation

Read -



4.

Recognition 1

1894 Croonian Lecture. Roy. Soc.

Lady Sherrington

Clarke University.

Internat. Med. Congr. Med. 1903

Holmholz Prize 1905

Nobel Prize 1906.

Instituto Cajal —

Pupils.

\* \* Ortega

\* Residencia



\* Group

E. Y. A.

\* Own Lab.

\* Cafe

\* Photo Philosopher - #

Oster - filled 3 rooms in his house

Library Laboratory Nursery

Cajal has done all three.

Three Rich, Intellectual, honesty <sup>\* keeping</sup>

Pessimism - homo sapiens - peaceful  
tigers - harmless herbivorous animals.  
Arteriosclerosis.

# The Life + Work of Ramon y Cajal.

Introduction.

Life + back ground

Inheritance

Father.

Boy hood

# Scientific training

Family.

Work

School

Philosophy

Present.



Life + Back ground.

Spain = Fantastic tales to American ears - Spanish  
 American war, ~~present~~ legends, fragmentary impressions  
 of Mexico. - Broad hat.  
 Actually since 16<sup>th</sup> century splendor of Phillip  
 religious, ~~at~~ artistic flowering in <sup>Goya, El Greco, + mad,</sup> Velasquez.  
~~Goya~~ Extremity of religious frenzy producing  
 the inquisition which drove the moors across  
 into Africa and scattered the Spanish  
 jews throughout the world. Domination  
 of Phillip ~~is~~ discovered a Spanish people  
 who as Humboldt said ~~are~~ lacking in political  
 sense and as Cajal added are almost  
 completely lacking in the instinct of self  
 preservation. Disappearance of hardworking  
 moor the extensive irrigation system has  
 disappeared. Castile deforested, bare + hot



2.

intensely Catholic  
Modern Spain - interested in its own  
art, music and architecture - proud, static  
the inquisition replaced as a spectacle by its direct  
descendant the bull-fight.

Santiago Ramon -- R y Cajal born 1852  
<sup>mountain</sup>  
in village of Petilla of Aragonese peasant  
"top of bare hillside occasional vineyard - approached only by Donkey  
road."  
Stock. Father Ramon y Cassasus - Surgeon  
& Second Class. Mother's name Cajal.

Move to Larri' - Degree of Doctor of Med. in  
Saragozza. - Professor of anatomy.

Some one has said "the son should  
take off from the fathers shoulders." True  
of Ramon y Cajal

The boy Cajal - at 6 - French + arith-  
metic from father, naturalist + birds egg  
collector.

L.S.

At 8. painting - novel + reading Stopped  
School Catholic fathers for Latin + Medicine



3.

~~Two~~ Child no memory. Twice apprenticed

Novel reading - Robinson Crusoe.

Painting on quiet.

Desperation - Osteology.

Bones to Gray, Drawing, Bookkeeping

3 years dissecting w father.

L.S. <sup>Mamas.</sup> Under graduate Zaragoza -  
Literature - athletics + Philosophy.

Physical training - Combat - Venues

Mental activity slowed. ~~Less~~ Higher <sup>level</sup>

associative activity replaced by  
superceded by activity of the centers of <sup>control</sup>

being Muscular activity. - Explains why  
young men with unusual muscular  
development ~~have as a rule~~ are not as  
a rule talkers & possess a poor &  
rud. intellect. Lic. Med 24 yrs.

Military service Spain - Malaria  
Instructor Zaragoza - Madrid Doctor  
Saw first microscope



4

Bought Mic. Microtome + German books

First in Zaragoza. ~~Published~~  
Prof. anatomy University of Valencia

Golgi method - Heber called Golgi  
period. - uses silver in photography -  
made own plates - modifications.

Publications - - Rapid.  
Germans never read Spanish - Avic  
underground. attacked reticular  
theory of nerves.

1889+90 - Cajal 38  
Krause translated - work on  
cerebellum, optic lobes of birds,  
retina and spinal cord.

German anatomical Soc. -

Doubt + expecting fiasco. -  
in bad French  
Perfect clear demonstration like photo  
of the axones of cells in granular  
layer, pericellular anastomosing  
fibers. Bifurcation of the axones  
of the posterior root fibers ascend +  
descend

L.S. Cerebellum

L.S. " diagram  
nervous fibers to ~~Park~~  
~~cell~~ mol. cells to ~~Park~~  
cells + out.

L.S. Retina - Rods →  
bipolar cell → ganglion  
all → Ext. Gen. B.  
Cones → 80000.



Long + short collaterals of  
axones. Termination of  
retinal fibers in <sup>geminate bodies</sup> optic lobules.  
Optic nuclei  
Triumph.

Kölliker - discovered pain + touch  
Travel first time. Retzius,  
His, Waldeyer, Krause, van  
Gehuchten

Return 1890 - <sup>Fury</sup> 14 publications  
plus translations.

1892. Madrid

Wider culture. - Tertulia of cafe  
where "the warmth of friendship and  
confidence caused to bloom spont  
aneously the ~~flowers~~ varying and  
spontaneous flowers of genius.



L.S.

Waltz country  
Photography — color  
Chess — or

Book coffee house chatter  
" " Color Photo

L.S.  
L.S. Golgi  
L.S. astr. — 1913  
L.S. Golgi astr.

Work — nerve cell connections  
1908 Studies new regeneration  
1909 Histology of Nerve System.  
Croonian Lectures — Royal Soc.

Clarke Univ. U.S.A.

Internat. Med. Congr. Med. 1903  
Helmholtz Prize 1905  
Nobel Prize 1906

Pupils. Series Spaniards.

L.S.  
L.S.  
L.S.  
L.S.

Hortega

Today.

L.S. Cafe  
L.S. Lab.  
L.S. Self



Philosophy

Research.

Comb. & practice

Marriage. — Osler — Thom. Brown

Pessimism — War, Arteriosclerosis.

78 useless to have illusion,  
living last year of life.  
Wife dying.

Sam told

If homo sapiens will decide all  
his quarrels peacefully I will be  
as surprised as though some  
one told me tigers had become  
peaceful harmless herbivorous  
animals.

Osler. — Fill 3 rooms in the  
House — Library, laboratory + nursery.  
Browne, p 99



1

Rules + Council for Scientific Investigation

It is important to recognize that the most brilliant discoveries are due, not to knowledge of written logic but to that living logic which man possesses in his spirit, with which he elaborates ideas with the same perfect unconsciousness with which you draw ~~it~~ writes prose. ~~It is hardly enough to read the~~  
<sup>Reading,</sup> <sup>the</sup> works of the great scientific discoverers such as Galileo, Keplers, Newton, Lavoisier, Geoffrey Saint-Hillaire, Hilaire, Faraday, Ampere, Ch. Bernard, Pasteur, Virchow, Liebig etc. brings one ~~on~~ of necessity to the conclusion that if we lack a spark of the splendid light that burns in such minds and at least an echo of the fine passion which impelled such towering personalities, <sup>it is possible that</sup> erudition may ~~it~~ convert us into enthusiastic or fastidious critics, perhaps into worthy teachers, but it will not create in us the spirit of scientific investigation.



For scientific work the means is almost  
nothing and the man is almost every thing.