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Obituary Notices Jorge Cervós Navarro (1930-2021): On the path of Don Santiago

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Editorial

After a long itinerary on the path of Santiago Ramon y Cajal, the prestigious Spanish neuropathologist Jordi (Jorge) Cervós Navarro passed away on the 14th of November, 2021 at the age of 91. Cervós Navarro was born on the 9th of January, 1930, in Barcelona, four years before Santiago Ramón y Cajal's death. During the Spanish civil war, he lived with his mother's relatives in Pallars Sobirá in Pyrenean Mountain and later he entered the college of Escolapios (Piarists) in Barcelona.[1]

In Petilla de Aragón, on the southern Pyrenean slope, Santiago Ramon y Cajal was born on the 1st of May 1852 and in his childhood, he was enrolled in the strict College of Aesculapian fathers in Jaca.[2] In 1946, Cervós Navarro started studying Medicine at the age of sixteen at the University of Barcelona for three years, and then he continued his studies for three more years at the University of Zaragoza. In the same university, Ramón y Cajal attended medical school and graduated in 1873, aged 21, and at the same time, he expressed an insatiable thirst for philosophy reading every available book of ancient and modern philosophers.

Cervós Navarro even from the years of his medical studies expressed a strong interest in Psychiatry and Philosophy. Thus, after his graduation started working in the Department of Psychiatry of the Hospital de Santa Engràcia, but very soon he decided to continue his studies in Innsbruck, Austria, where he remained only for three months, given that he realized that the psychanalytical approach of the mental disorders was rather speculative and theoretical than based on strong evidence. Cervós Navarro positively thinking, was wishing a definite and scientifically proved etiopathological and diagnostic approach to mental diseases. That was the main reason that he turned to the field of Neurosciences and particularly to Neuropathology.

In a parallel way, Cajal had also a strong interest in Psychology and Psychiatry and tried to find an interpretation in the psychological and psychiatric phenomena based on the functional or pathological declination of the nerve cells, which as instruments of the psyche, were called by him "butterflies of the soul" (mariposas del alma).

In 1952 Cervós Navarro started his training in Neuropathology in Bonn. In 1954 he was appointed as an associate lecturer and in 1961 full lecturer of Neuropathology in Bonn's University.[3] At the age of 38, Cervós Navarro became professor and head of the Institute of Neuropathology of the Free University of Berlin. He remained in the same post from 1968 to 1998 working with much enthusiasm and unique productivity.[4] Besides, he was also elected Dean of the Faculty of Medicine for the years 1974-1982 and President of the German Society of Neuropathology and Neuroanatomy.

In 1998 Cervós Navarro was appointed as Founding Rector (Rector Fundational) of the Catalonian International University (Universitat Internacional de Catalunya), returning to his country after 48 years abroad. He served as Rector and director of the International Relations in the same University from its foundation in 1997 until 2001.

In Barcelona, Santiago Ramon y Cajal served as a professor in 1887. At the University of Barcelona Cajal started applying the silver impregnation technique, introduced by Camillo Golgi (1843 –1926) in Padova, for the visualization of the nerve cells of the brain, the cerebellum, and the spinal cord, enabling him to study the morphology of the neuronal networks of the central nervous system, making numerous detailed marvelous drawings of the cytoarchitecture of the brain's structures.[4]

Santiago Ramon y Cajal after many years of histological study of the central nervous system in Golgi staining introduced the "Neuron theory" or "Neuron Doctrine" asserting that nerve tissue is composed of individual cells, which are genetic, anatomic, functional, and trophic units.[5] That doctrine was accepted by the majority of neuroscientists.[6] In 1906 Cajal and Golgi shared Nobel Prize in Physiology or Medicine "in recognition of their work on the structure of the nervous system".

Jorge Cervós Navarro worked continuously during his life on research, experimentation, education, philosophy, neurophilosophy, medical ethics, and religion. Initially, he worked in the field of encephalitis, then in the investigation of brain tumors, describing the structure and the biological behavior, the neoplastic proliferation, and the cell death of the majority of them and particularly of the medulloblastoma.[7]

Then, Cervós Navarro thought reasonably that it would be essential to study the morphological and functional consequences of brain hypoxia, a phenomenon which is closely related to stroke, post-stroke conditions, and brain death, which was raising a crucial medical and ethical issue. For this reason, he organized a close and very fruitful collaboration with NASA. In addition, he studied extensively the microcirculation of the Brain,[8] the blood-brain barrier, and the innervation of cerebral arterioles for a further and deeper analysis of the pathogenetic mechanism of the hypoxic alterations of the nervous system.[9] In his extensive neuropathological research, Cervós Navarro

combined both light and electron microscopy. Dedicating all his life to electron microscopy he used to say "The electronic microscope was a work tool throughout my professional life and the key that opened doors in my academic career".[10]

For Santiago Ramon y Cajal the light microscope, an old-fashioned simple monocular microscope in Zaragoza, was "an astonishing spectacle, an unforgettable event in his life" and soon he started subscribing to his first scientific journal, Lankester's Quarterly Journal of Microscopical Science. Cajal worked continuously in light microscopy, drawing with the aid of a camera lucida all the types of neurons in humans and vertebrates, becoming the greatest painter of the nervous tissue. In reality, he was a painter of high artistic talent. He underlined: "I am pursuing a goal of great interest to painters: appreciating line and color in the brain".[2]

Cervós Navarro in 1977, participating in Stockholm's symposium on neurogenic control of the blood supply of the brain, was asked to study the histological preparations (slides) of Lenin's brain, who had three debilitating strokes, and died in 1924 in Gorki, at the age of 54, suffering from severe seizures in the last hours of his life.[11,12] In 1982, Cervós Navarro was invited by the Japanese Society for the Promotion of Science to participate in research and teaching in Japan. The collaboration with the Japanese colleagues was characterized by high productivity and the opening of new horizons.[13]

In the last years of his clinical and experimental enthusiastic research Cervos Navarro turned to the investigation of the neurodegenerative conditions of the central nervous system, endeavoring to approach the etiopathological background and the pathogenetic mechanisms of dementias.[14]

Cervós Navarro's scientific contribution is enormous. He published 15 books and 607 scientific papers, which gained high international recognition. His thesis entitled "Encefallitis Granulomatosa Reticulohistiocitaria" (in Spanish) was accepted with the highest honors and obtained the Leonardo Torres Quevedo prize.[15,16]

The majority of his publications concern the Degeneration of the Central Nervous System, the cerebellar disorders including the spinocerebellar degenerations, the disorders of the Lipid metabolism, disorders of carbohydrate metabolism, the peripheral and autonomic neuropathies with involvement of the Central Nervous System, the disorders of the mineral and protein metabolism, the microcirculation of the brain, the morphology and the fine structure of brain tumors, the brain edema, and epilepsy in the spectrum of the Neurodegenerative Disorders. Among his books are (a) Pathology of Cerebral Microcirculation (Ed. de Gruyter, Berlin-New York, 1974), (b) Estudio al microscopio electrónico del ganglio raquídeo normal y después de la ciaticotomía (Ed. CSIC, Madrid, 1979). (c) Metabolic and Degenerative Diseases of the Central Nervous System: Pathology, Biochemistry, and Genetics (Ed. Academic Press, 1995, San Diego) (d) Cerebral Microcirculation and Metabolism, (e) Brain aging: neuropathology and neuropharmacology (New York: Raven Press, 1983), (f) Stroke and Microcirculation (1987 Raven Pr) (e) Degenerative und metabolische Erkrankungen, (1991, Springer), (g) Metabolic and Pathology of Cerebral Microcirculation (Ebook ISBN-13: 978-3-11-150685-2, ISBN: 3-11-150685-1) (h) Brain edema: pathology, diagnosis, and therapy, (New York: Raven Press,1980).

Being in advanced age, Cervós Navarro published two books of autobiographic character (a) Memòries : Berlín i Barcelona, anada i retorn (Memories. Berlin and Barcelona, There and back" 2013 (In Catalan)[10] and (b) Cuzando el muro : recuerdos sobre los inicios del Opus Dei en Alemania 2016 (in Spanish).[1] In those two precious biographic references, Cervós Navarro has described in simplicity, accuracy, and eloquence, in his native languages Catalan and Spanish, all his laborious life, characterized by enthusiasm, realms of fantasy, persistence and perseveration, patience, continuous hard work, hope, and illumination. Cervós Navarro used also to write articles on science, philosophy, and religion in the Spanish newspaper "El Pais".[17]

In a parallel way, Santiago Ramon y Cajal has published more than 100 scientific papers in Spanish, French, and German. He wrote also his autobiography during the last years of his splendid life on the title (in Spanish) "Recuerdos de mi Vida" (Recollections of my life).[2] In 1987, he also wrote the precious instructing Book, which includes the Philosophy of his life in harmonization with his vision and experience, entitled "Reglas y Consejos sobre Investigación Cientifica: Los tónicos de la voluntad" . The book was Translated by Neely Swanson and Larry W. Swanson on the title "Advice for a Young Investigator" (MIT Press, 1999).[18] The philosophy and the message of that valuable book are that the young investigator should work continuously and constantly, with enthusiasm, strong will, patience, perseveration, deep love for the science, mastering new techniques, respecting his reputation and the reputation of his country. Cajal encouraged always the gentle and beneficial ambition of each investigator, who endeavors to enlarge the horizons of science, introducing new ideas and offering new data for the good of humanity.[19]

Jorge Cervós Navarro was honored as Doctor honoris casa from the University of Madrid (Universidad Complutense de Madrid), the University of Zaragoza (1984), Barcelona, Tokushima (Japain), Saransk (Russia), Leibniz University of Hannove (Germany). In 2009, he was honored as doctor honoris causa from the Aristotelian University of Thessaloniki, Greece, and released an excellent very stimulating lecture on research and medical ethics, during his inauguration. Among the many high distinctions that he was awarded for his extensive scientific contribution was the St. George Cross, the Grand Cross of the Federal Republic of Germany, the cross of Alfonso X of Spain. He was also an honorary member of seven professional societies in Europe and overseas as well as a member of the Moscow Academy of Sciences. On the 14th of November at 18:50 Jorge Cervos Navarro "gave his soul to God peacefully and accompanied by his family".

Santiago Ramon y Cajal "the painter of the neuronal forest"[20] was awarded The Prix Fauvelle of the Societe de Biologie of Paris, the Nobel Prize for Medicine (1906) in conjunction with Camillo Golgi, the Prussian Order of Merit. The Royal Society in England in 1909 elected him a Foreign Member. In Latin America, the physicians offered substantial financial support to secure the publication of his work on nerve degeneration and regeneration. In Madrid, his statue was erected and the Cajal's Institute was established on the hill of San Blas by a royal decree by King Alfonso XIII.

Jorge Cervós Navarro and Santiago Ramon y Cajal passed away peacefully in advanced age. During their long life, they became paradigms of wisdom, the strength of intellect and character, honesty, purity of the heart, kindness, dedication in science, research, and men of high moral values. They have honored "in maximum" the Neurosciences and the Neurophilosophy by their scientific contributions and inspired many young investigators all over the world in following their illuminated paths.

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Legend

Jorge Cervós- Navarro with the author in the main hall of the Aristotelian University of Thessaloniki in 2009.

Acknowledgments

None.

Conflicts of interest

The authors declare no conflicts of interest.

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