

# Neurosurgery in Romania in the centenary of the Great Union (1918–2018)

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*Motto:* "The people that do not know their history resemble children that do not know their parents."

Nicolae Iorga (1871–1940)

## Abstract

Neurosurgery is one of the newest medical specialties in the world, having less than 100 years since its definition as a stand-alone surgical specialty by Harvey Cushing (1869–1939). Its emergence required several special prerequisites, which were met only in the mid-19<sup>th</sup> century: knowledge of neuroanatomy, function of nervous centers and main cortical area topography, standard asepsis–antisepsis rules, neuroimaging, safe and longer general anesthesia, hemostasis and coagulation techniques and of course knowledgeable, skillful and bold surgeons. The emergence of neurosurgery in Romania has a profound bivalent origin: French and American. The first Romanian neurosurgical center was founded by Alexandru Moruzzi, in 1933, in Iași. He was a direct student of the first French neurosurgeon Thierry de Martel, in Paris. The other neurosurgical center in Romania was founded by Dumitru Bagdasar, in 1935, in Bucharest. He studied directly under the first neurosurgeon in the world: Harvey Cushing (Boston, USA). Considering their success and international recognition against tremendous odds, the founding fathers of Romanian neurosurgery represent an example of intelligence, skill, courage and dedication for all future neurosurgeons.

**Keywords:** history of medicine, neurosurgery, Romania.

## ☐ Neurosurgery – early steps

Neurosurgery became a stand-alone specialty at the beginning of the last century thanks to the golden age of medical pioneering, advances and discoveries of the 19<sup>th</sup> century. Newer, longer and bolder surgical procedures could be imagined and performed thanks to Joseph Lister's (1827–1912) definition of sepsis–antisepsis principles, Louis Pasteur's (1822–1895) progress in microbiology, Rudolf Virchow (1821–1902), Paul Broca (1824–1880) and Sir David Ferrier's (1843–1928) advancements in the knowledge of nervous centers functions and main cortical area topography. Crucial for the development of neurosurgery and surgery in general were the great advances in anesthesia techniques [1].

This historical context proved to be the perfect cradle in which neurosurgery could form, develop and flourish and in time, this era's defining attributes became this exact specialty's spirit: bold, cutting-edge, complex.

Equally important for neurosurgery were the advances

in technology and neurosciences, which allowed the emergence of a new type of paraclinical investigation: medical imaging. Some of the pioneers in neuroimaging were Walter Dandy (1886–1946) – first pneumoencephalography and ventriculography in 1919, Jean-Athanase Sicard (1872–1929) and Jacques Forestier (1890–1978) – first myelography with lipiodol in 1921, and Egas Moniz (1874–1955) – first cerebral angiography in 1927 [1].

Hemostasis saw significant advancements in the 19<sup>th</sup> century. Initially, neurosurgeons used moss – Sir Victor Horsley (1857–1916), in 1914. Later, Harvey Cushing (1869–1939) invented the metallic clips in 1911 and Walter Dandy used them for cerebral aneurysm clipping in 1937. The last advancement that is still in use today is represented by electrocoagulation, which was invented in 1926 by Harvey Cushing and William T. Bovie (1882–1958).

Although surgery on the nervous system was performed before, Harvey Cushing (Figure 1) was the one responsible for the individualization of neurosurgery, related significant technological advances and bold, new approaches in various

pathologies. He branched from the school of William Stewart Halsted (1822–1922), the father of modern surgery. Harvey Cushing was the first surgeon dedicated entirely to neurosurgery. In 1932, having operated over 2000 cases of cerebral tumors, he reported a mortality rate of 9.8% [2].

### ✚ Emergence of neurosurgery in Romania

The emergence and development of neurosurgery as an independent surgical specialty in Romania produced almost simultaneously two great University Centers: Iași and Bucharest. The Romanian pioneers were Dr. Alexandru Moruzzi (1900–1957) and Dr. Dumitru Bagdasar (1893–1946).



**Figure 1 – Prof. Dr. Harvey Cushing, in 1908; oil on canvas by Edmund Charles Tarbell (1862–1938).**

Notable Romanian names of pre-neurosurgery independence are those of great general surgeons of the era: Nicolae Bărdescu (1862–1937) – in 1895 performs resections of Gasser ganglia for trigeminal neuralgia, Thoma Ionescu (1860–1926) – first cervical rachianesthesia in 1919 (revolutionary anesthesia method at the time), Amza Jianu (1881–1962) and Iacob Iacobovici (1879–1959), who performed ablations of various cerebral tumors and Leonte Anastasievici (1853–1914), who performed surgeries on the spine (medullar compressions, anterolateral cordotomies for untreatable pain) [3].

In the pre-antibiotics era, neuroimaging investigations had serious risks (unacceptable high mortality rate) this forced doctors to diagnose neurosurgical pathologies using

mostly clinical data. Anatomy and neurophysiology research as well as clinical studies offered greatly needed data and contributed to the development of neurology and implicitly neurosurgery. In this direction, two Romanian doctors made significant contributions and were acclaimed worldwide: Gheorghe Marinescu (1863–1938) and Nicolae Paulescu (1869–1931).

Dr. Gheorghe Marinescu was the father of Romanian neurology. He is most famous for publishing the treatise “The Nerve Cell” (which is still relevant today), prefaced by Santiago Ramón y Cajal (1852–1934) [4].

Nicolae Paulescu was considered by Harvey Cushing the greatest researcher of hypophysis. In 1908, Paulescu published a “Treatise of Physiology”, in which he described possible methods of accessing the pituitary gland through the temporal bone. In 1921, Nicolae Paulescu published a paper describing his discovery of insulin. Dr. Nicolae Paulescu was the one who recommended Dumitru Bagdasar to study neurosurgery under the supervision of Harvey Cushing, in Boston [3, 5].

### ✚ Iași University Center

**Prof. Dr. Alexandru Moruzzi** (Figure 2) was a key Romanian medical personality who was formed by the French school of medicine. After completing his studies in Paris, under the supervision of first French neurosurgeon, Thierry de Martel (1875–1940) (Figure 3), he worked in Romania as a general surgeon in Prof. Amza Jianu’s clinic at Charity Hospital in Iași. In 1933, with the help of Prof. Dr. Leon Ballif (1892–1967), Prof. Moruzzi creates the first Department of Neurosurgery in Romania, at Socola Psychiatry Hospital in Iași (Figure 4) (the third psychiatry hospital in Europe after Stockholm and Sankt Petersburg). In seven years of neurosurgical practice in Iași, Prof. Moruzzi performed 329 surgeries, which involved a wide range of chronic and traumatic pathologies of the spine, brain and peripheral nerves. His neurosurgical techniques were improved constantly by regular visits to Prof. Herbert Olivecrona (1891–1980), at Karolinska University (Stockholm), the first professor of neurosurgery in Europe, in 1935 [3].

Prof. Alexandru Moruzzi died at the age of 57 following a plane crash. He left behind an unquestionable legacy [3].



**Figure 2 – Prof. Dr. Alexandru Moruzzi.**



**Figure 3 – Prof. Dr. Thierry de Martel.**



**Figure 4 – Socola Psychiatry Hospital in Iași, Romania.**



### ☒ Bucharest University Center

**Prof. Dr. Dumitru Bagdasar** (Figure 5) is considered the founder of the Romanian school of neurosurgery. He was a direct student of Harvey Cushing's school of neurosurgery (1926–1931). His activity in Boston was greatly appreciated by his mentor, being regarded as Cushing's Honorary Assistant [6].

In 1929, after returning from the United States of America and considering Romania did not yet recognize neurosurgery as an independent surgical specialty, he was employed as a neurologist by Jimbolia Neuropsychiatric Hospital. In 1931 was promoted to Chief of the Department of Neurology at Cernăuți Hospital. From 1929 to 1934, he performed over 200 surgical interventions on neurosurgical pathologies. After numerous pressures, in 1935 he succeeds in establishing the first independent Neurosurgical Department in Bucharest Central Hospital of Nervous Diseases – the second at a national scale, after Socola Psychiatry Hospital in Iași, in 1933 [6, 7].

He was the author of over 50 specialty monographies. His most important work “*Traité de Neurochirurgie*” (Figure 6), published postmortem in 1948, represented the main study book for neurosurgeons in Romania for over a quarter of century [8]. His prodigious work abruptly ended in 1946, after losing the battle with a pulmonary neoplasm.

Following in the steps of his mentor, Constantin Arseni (1912–1994) (Figure 7), at the young age of 34, becomes

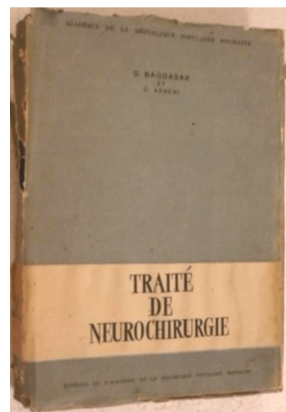
the Chief and Chairman of Department of Neurosurgery, Central Hospital for Mental Nervous and Endocrinological Diseases, Bucharest. With his remarkable energy succeeds in transforming the small Department of Neurosurgery in a real Neurosurgical Clinic. He expanded the Clinic to 80 beds and later to 220 beds in 1962 and covered the entire neurosurgical pathology. Under the leadership of Prof. Dr. Constantin Arseni, in 1975, the Clinic was moved into a new building entirely dedicated to nervous diseases, having 550 beds and 13 operating rooms. At the time, it was considered the largest neurosurgical clinic in the world. As an homage to his mentor, he named the new building “Prof. Dr. Dumitru Bagdasar Neurosurgical Clinic” (Figure 8) [8–11].

The intense scientific activity of this elite Clinic produced over 50 treatises and monographies of neurosurgery, covering the vast neurosurgical pathology in its entirety. The “crown jewel” of Clinic's the entire scientific work is represented by “*Treatise of Neurology*” in eight volumes, published in 1979–1981 in the Romanian Medical Publishing House.

In 2005, with the support of the Romanian Ministry of Health, Prof. Dr. Alexandru Vlad Ciurea opened the Center for Excellency in Neurology and Neurosurgery (Figure 9), with modern technologies: neuroimaging, high-end neurointensive care unit, five dedicated operating theaters and a Gamma Knife Surgery Unit.



**Figure 5 – Prof. Dr. Dumitru Bagdasar.**



**Figure 6 – First cover of “*Traité de Neurochirurgie*”, D. Bagdasar & C. Arseni, Romanian Academy Publishing House, Bucharest, 1948.**



**Figure 7 – Prof. Dr. Constantin Arseni.**



**Figure 8 – “Prof. Dr. Dumitru Bagdasar” Neurosurgical Clinic, Bucharest, Romania.**



**Figure 9 – Center for Excellency in Neurology and Neurosurgery, Bucharest, Romania.**

Other names closely tied to the foundation of Romanian neurosurgery are: Dr. Dem Vasiliu (1903–1971), a pupil of Walter Dandy (1886–1946), founder of Department of Neurosurgery, “Railroads Witting” Hospital, Bucharest; Dr. Sofia Ionescu-Ogrezeanu (1920–2008) (Figure 10), first woman neurosurgeon in the world; Gen. Dr. Mircea Iacob (1922–1997), founder of Department of Neurosurgery, Central Military Hospital of Bucharest. We mention the contribution of Romanian neurosurgeons abroad, such as Prof. Dr. Harden Askenasy (1908–1975) (founder of Israeli neurosurgery) and Prof. Dr. Ladislau Steiner (1920–2013) (pioneer of radiosurgery at Karolinska University) [9, 10].



Figure 10 – Dr. Sofia Ionescu-Ogrezeanu.

#### ☐ Romanian Society of Neurosurgery – past, present, future

The Romanian Society of Neurosurgery (RSN) was founded in 1982, having Prof. Dr. Constantin Arseni as the first President. The founding members were Prof. Dr. Alexandru Constantinovici (1929–2018) (Bucharest), Prof. Dr. Leon Dănilă (Bucharest), Dr. Ion Oprescu (Bucharest), Prof. Dr. Mihai Rusu (Iași) and secretary Dr. Alexandru Vlad Ciurea (Bucharest) [11]. The *Journal of the Romanian Society of Neurosurgery* was founded and is still active today.

After 1990, the presidency of the RSN was continued through vote by Prof. Dr. Alexandru Constantinovici (Bucharest), Prof. Dr. Alexandru Vlad Ciurea (Bucharest), Prof. Dr. Nicolai Ianovici (Iași), Prof. Dr. Radu Mircea Gorgan (Bucharest), Prof. Dr. Ion Poetă (Iași), Prof. Dr. Ioan Ștefan Florian (Cluj-Napoca) and Assoc. Prof. Dr. Horia Pleș (Timișoara) (President elect).

Currently, in Romania there are over 306 registered neurosurgeons in 25 centers covering the entire spectrum of neurosurgical pathologies and the whole country. In Bucharest, there are eight departments of neurosurgery in public hospitals, of which two are dedicated entirely to pediatric neurosurgical pathologies. All these centers have technology and devices according to European standards.

The private sector has invested as well in five dedicated departments of neurosurgery in Bucharest (Sanador Clinical Hospital, Monza Hospital, Queen Mary Hospital, Provita Neurosurgical Center, Medlife Hyperclinic). They are constantly supplying new technologies every day, Sanador Clinical Hospital and Monza Hospital achieving high European standards.

Today, outside of Bucharest, the highest efforts to acquire new technologies and devices are being made in the Neurosurgical Clinic of Cluj-Napoca and also in “Prof. Dr. Nicolae Oblu” Emergency Clinical Hospital of Iași, especially in the field of spinal neurosurgery (O-arm surgeries and the perspective of robotic surgery in the future).

RSN always had an important role, both regionally (Central Europe) and internationally. The remarkable energy, dedication, intelligence and skill of Romanian neurosurgeons were recognized by international personalities since the emergence of neurosurgery. The continuous relevance of Romanian neurosurgery on an international level can be seen in the nomination of Prof. Dr. Alexandru Vlad Ciurea as Vice President of World Federation of Neurosurgical Societies (2004–2009) and afterwards Prof. Dr. Ioan Ștefan Florian in the same function (2017–2021).

Modern Romanian neurosurgery has not let down its founding fathers and continued the progress. Prof. Dr. Madjid Samii (Figure 11) concluded during the Annual Congress of Romanian Society of Neurosurgery, Cluj-Napoca, September 2017: “The Romanian Neurosurgery has achieved without a doubt the European standards in the field” [12].



Figure 11 – Prof. Dr. Madjid Samii.

Its role continues to expand through the new generation of neurosurgeons, which practice this specialty in most European countries and even the United States of America.

#### Conflict of interests

The authors declare that they have no conflict of interests.

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