Romanian contributions to the birth and development of world radiology - discovery to present -

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Abstract — To all radiologists worldwide: doctors, physicists, chemists, technicians, laboratory workers and nurses who have presented their lives to the battle against man’s illnesses. They have heroically prepared the path for the efficient and unhazardous use of the Radium and X-rays! It is only through sacrifice, that their works are immortal.

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Wilhelm Conrad RÖNTGEN made one of the paramount discoveries of the 19th century, if not perhaps the greatest yet, the discovery of the “X-rays”. It was first brought before the Physio-Medical Society of Würzburg, through the work: “Eine neue Art von Strahlen”.

The echo proved singular among scientists. Numerous such researchers throughout the world involved in various domains followed on Röntgen’s steps, towards the discovery of additional features and fields of application. As an English savant of the times said: “was enough Röntgen sparks, to lighten the inner human body”. The discovery occurred in the evening of November 8/9th 1895, following 7 weeks of unwearied, relentless work, as the discoverer did not leave the laboratory until the day his discovery was made public.

Alongside other world researchers, Romanian scientists of the time received and applied the information, as a few should be hereby cited:

D. HURMUZESCU (1865-1954): physicist, known as the father of Romanian radiophony and founder of the electro-technical education in Romania. Member of the Romanian Academy (1916) and the French and German Societies for Physics.

From 1887-1896 he was studying in Paris for his PhD in Physics, attending the research laboratory of Professor Lippman, alongside Louis Benoist and Maria Sklodowska, the future Marie Curie. Louis Benoist (b. 1856) continued to be his collaborator in the study of x rays.

At the age of merely 30 (b. 1865) he and Louis Benoist build the electroscope, as the first attempt to measure the rays. This electroscope will become known worldwide as “Hurmuzescu’s electroscope” and for over a quarter of a century, it will be acquired by all radiology laboratories, including the ones overseas.

Following this tremendous discovery, on December 10th 1901, W.C Röntgen was awarded the first Nobel Prize, on behalf of the Swedish Crown, at the Academy of Stockholm.
The electroscope functioned on the basis of an insulator substance, dielectrine (also discovered by Dragomir Hurmuzescu), “an electric insulator - a sulphur and paraffin mixture”, able to isolate electrically-charged gold sheets.

This apparatus involved an ignition coil (Heinrich Daniel Ruhmkorff 1803-1877) for the accelerating voltage, a cathode tube resembling the one employed by W.C.Röntgen, in his amazing discovery, a ionization chamber sheltering the actual electroscope and a galvanometer. This was the first apparatus for the production of “X rays” that was set in France in January 1896.

They electrostatically charged the electroscope while the gold sheets separated. Once the X-ray installation was turned on, it was pointed towards the electroscope chamber and the sheets gradually approached, directly proportional to the intensity of the radiation beam.

Therefore, Dragomir Hurmuzescu emphasized one of the most important X rays properties: “the ionization of the matter they ingress”. This is the basic property of radio diagnosis, as well as radiotherapy.

On the 17th of February 1896, Louis Benoist and Dragomir Hurmuzescu, define, before the French Academy, the concept of anti-cathode, namely the tube portion bombarded by the cathode ray beam (electron). Thus, a dissociation of the negative and positive pole is achieved, when making reference to an X rays production tube. The term was long employed by radiological language and was eventually transformed into anode, which is still employed nowadays.

On the 4th of May, Dragomir Hurmuzescu and Victor Chabaud present the first X rays tubes before the French Scientific Academy, under the name of Chabaud-Hurmuzescu. Unlike previous ones, these ones display a “platinum mirror”.

Previously, on the 27th of March 1896, D. Hurmuzescu submitted before Siemens-Halske, a patent for an ionic regulation tube.

Upon his return to Romania on the 10th of June 1896 he popularizes W.C.Röntgen’s discovery before the Physics Society in Bucharest. The presentation session was attended by Professor Doctor General Constantin Severeanu, a student of Carol Davilla. On this particular occasion, radiographies were performed on the hands of members of the audience.

G. MARINESCU (1863-1938), doctor, founder of the Romanian school of Neurology. Member of the Romanian Academy and several academies and societies worldwide.

A student of Victor Babeș, while the discovery of the X rays was taking place, he was in Paris under the guidance of Prof. Jean-Martin Charcot, PhD (1825-1893) serving for 8 years in the Pitié de Salpetriere Hospital (1889-1897).

Immediately following the X rays discovery, in the first months of 1896, he heads towards the Sorbonne to collaborate with his younger friend Dragomir Hurmuzescu, achieving the radiography of some interesting cases (acromegaly and polydactily) by means of the latter’s apparatus.

They achieve the first skull radiography in the world, and consequently Gheorghe Marinescu emphasizes the Turkish saddle enlargement, determining the role of the hypophysis in bone development. Furthermore, radiographies of the loins of acromegaly patients were performed.

Gheorghe Marinescu was not only the prestigious neurologist and endocrinologist, but also one of the promoters of clinical radiology.

Upon the anniversary of 100 years since the birth of Jean-Martin Charcot, Gheorghe Marinescu alone was chosen to evoke the personality of his great master.

Dimitrie NEGRU (1883-1955), Romanian physicist and doctor, the first professor of medical radiology in Romania. A graduate of the Medical School in Bucharest (1911), he activates as a secondary doctor at the Filantropia Hospital in Bucharest, under the guidance of Professor Nanu Muscel.

He decides for a specialization in radiology, which he studies in Vienna, under the great professor Guido Holzknecht (1872-1931), the inventor of the duodenal compressor or “Holzknecht’s spoon”

After 1919 he becomes a Radiology professor within the “King Ferdinand I Medical Faculty” in Cluj, and for a period the dean of this faculty.

In 1920/1921, with the help of Prof. Iuliu Moldovan, PhD who gave the first “sanitary law” in Romania, he sets the
foundations of the first Radiology Institute in Cluj, where a significant number of Romanian radiologists completed their education.

In 1922, he publishes the first “Medical Radiology Lecture”, followed by three of his paramount writings: “Medical Radiology” 1931; “Clinical Radio diagnosis” 1938 and “Clinical Radiotherapy” 1946.

Fig.7 Röntgen rays and radiological anatomy

He created numerous innovative techniques and procedures, involving the employment of Röntgen rays and radiological anatomy, which were recorded and published at that particular time:
- “The Dimitrie Negru Procedure for localizing adulterant metallic bodies, through radioscopy” 1919, Editura Cultura Bucharest;
- “Procedure for the evaluation of the dip angle in the case of the thorax, during the radioscopic heart examination” 1921, Clujul Medical;
- “The oval applicator Dimitrie Negru”, towards the increase of the profound dosis in the radiotherapy of the ovarian cancer, when compared to the perfunctory one”, 1924, Clujul Medical;
- “Einstein’s theory of relativity and its biological applications”, 1927, Editura Cartea Românească, Cluj;
- “Hypotheses regarding certain radiology issues”, 1930, Clujul Medical;
- “Chamber for the diffraction of Röntgen rays” 1931, vol.VI, pp. 54-63, presented before the Scientific Society in Cluj;
- “Means of protection against Röntgen rays” 1931, Editura Cartea Românească, Cluj.

Professor Dimitrie Negru, PhD was also a promoter of medical engineering, and thus, in 1919, he intervenes before the Ministry of Labour, Health and Social Provisions to approve the appointment of electrician Rudolf Stransky in Cluj, to attend to the instalment, maintenance and repair of radiology equipment, so that they should no longer depend on the medical equipment producers abroad.

In 1934, he sets the foundations of the first Romanian school called the “School for mechanical students” in radiological equipment. He conducts the lectures of “Radiation Physics” and “Radioprotection of Röntgen rays”, where he inferred:

“These precautions being taken, the Röntgen rays present no hazard whatsoever to their employers”.

Fig.8 Photo P. Manea

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Fig.9 Ion JOVIN

Ion JOVIN (1899-1994), doctor, born in Felnac, Arad. He started the School of Medicine in Budapest and finished it in Cluj, where he activated as a preparatory assistant within the chair of Pathological Anatomy of Professor Titu Vasiliu (1920), and ultimately at the Internal Diseases Clinic of Professor Iuliu Hațieganu (1921).

In 1924 he receives a scholarship at the Radium Institute in Paris, where his work is acknowledged by Marie Curie (1867-1934) and guided by Antoine Lacassagne (1884-1971), who advises him to approach the treatment of cancer through radiations.

He has also fortunately worked under the guidance of the great scientists: Claude François Regaud (1870-1940), who came from Lyon and assumed the lead of the direction for biological and medical applications of the Radium Institute; Lucien Mallet (1885-1981) from the Ivry Hospital in Paris, the president of the French Society for Medical Radiology (1952); Coutard and Robert Colliez.

Upon the completion of his studies in Paris and his graduation thesis “A new neoplasm variety, lymphoepithelioma” which sheds light upon the Regaud-Schimmke controversy, he was offered by Professor Claude Regaud to remain in Paris.
In 1926 he creates the first Anti-cancer Centre in Romania, within the Coltea Hospital, equipped with 150 mg Ra, two röntgen-therapy posts and six beds. The Centre was financed by engineer Mihai Constantinescu, director of the Mining Credit, whose mother had previously died of cancer. He was thus considered the **promoter of Romanian radiotherapy**.

In 1933, this centre is relocated from the Coltea to the Filantropia Hospital. It is the same year of Dr. Jovin’s election as the president of the Romanian Society for Radiology.

When dealing with contact and intra-cavity radiotherapy he directly collaborated with Prof. Henry Chaoul, PhD (1883-1964), also making the acquaintance of Georges Chicotot.

In 1973 he is awarded the “Antoine Beclere” medal, the greatest international distinction in the field of radiology, a ceremony performed by Robert Colliez who also held the laudatio for Prof. Ion Jovin, Phd. He concluded as follows: “It was not only the Francophone countries that benefited from French education, but France in its turn had to learn from the Francophone countries, through their elites”.

In 1948, he was arrested by the communists, alongside Iuliu Maniu, the godfather of his children who lived in the Jovin household. He served time in the communist prisons until 1954.

During the 1980s, while he and his friend Cornel Velțianu were in Paris, they entered a famous antique book-shop and learning that they were Romanian, the owner offered them an extremely valuable book, a medical treatise of a certain Romanian doctor, assistant of Marie Curie, namely, doctor Ion Jovin. Once the owner learned that the author himself was standing before him, he no longer wanted to sell them the book, but asked for an autograph to be signed and thus significantly increased the price of this book.

**REFERENCES**


[7] Oral and written sources of dr. Mihaela JOVIN, daughter-in-law of Prof. Ion JOVIN, PhD