JBR–BTR, 2010, 93: 267-270.

## HISTORICAL ARTICLE

# THE ROOTS OF RADIOLOGY IN GREECE

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**This article presents as reliably as possible the roots of the Radiology specialty in Greece, from the time of the discovery of X-rays by WC Roentgen. It mentions the most important dates relevant to the foundation of the specialty of Radiology in Greece.**

**Key-word: Radiology, history.**

Professor Wilhelm Conrad Roentgen (1845-1923) was the discoverer of X-rays and who first used the term "X rays", utilizing the Greek letter X - the Greek mathematical symbol representing the unknown. His discovery was initially presented to the Institute of Physics at the University of Wurzburg on December 28, 1895.

The present article reviews the first steps of Radiology in Greece. The first X- rays, which were taken in Athens in 1896 by Timoleon Argyropoulos, Professor of Physics at the National and Kapodistrian University of Athens. Two years later, in 1898, the first X-ray equipments were installed in hospitals in both Patras and Athens. The first Greek publication concerning the use of X-rays was written by Professor Timoleon Argyropoulos and was published in the French scientific journal "Comptes rendus Hebdomadaires des séances de l' Académie des Sciences" in 1896. The first Greek textbook by Konstantinos Maltezos, Professor of Engineering at the National and Kapodistrian University of Athens was published in 1897.

The present article recounts the establishment of the Hellenic Radiological Society as well as the developments in the field of Radiology in Greece up to the establishment of the first Chair of Radiology at the National and Kapodistrian University of Athens in 1947.

### The first X-rays in Greece

The father of Radiology in Greece is considered to be the Professor of Physics at the National and Kapodistrian University of Athens Timoleon Argyropoulos (1847-1912), who conducted experiments with X-rays as far back as 1896. In the Laboratory of Experimental Physics of the University of Athens, in the Chemistry Institute on Solonos street, on February 20, 1896*, he was able to "photograph" bones on radiological plates which were first reproduced on a negative plate and then reprinted on a positive plate. K. Basias and K. Botsis were his assistants in this successful experiment (1).

In reality, the first X-ray machine installed in Greece was a mobile radiological unit which was brought to Greece from Great Britain. It was part of the medical supplies provided to the Greek Army by the British people for those injured in the Greek-Turkish War of 1897. The radiological unit, manufactured by the London Company Miller and Woods, was sent to Greece in 15 packages with the HMS Prince Crown. The unit's power supply was provided by generators charged aboard the HMS Rodney, which had docked in the port of Piraeus. Head of the medical team was Francis Charles Abbott, a surgeon at St Thomas' Hospital in London and a member of the Royal College of Surgeons. F.C. Abbott departed from London's Victoria Station on April 30, 1897, and was accompanied by Mrs Bedford Fenwick (in charge of organizing the nursing staff) and Henry Alford Moffatt, a surgeon at Guy's Hospital. They arrived in Athens on May 4th of the same year. Robert Fox Symons, a surgeon at St Thomas' Hospital, was in charge of the X-ray unit (2).

The X-ray unit was housed in Faliro (Athens), in a building granted for this purpose by Queen Olga. In a written report, F.C. Abbott and R.F. Symons noted the fear Greek soldiers expressed when examination was required by this new machine, pointing out that the soldiers crossed themselves not only before but also during their examination, which lasted as much as 35 minutes. The patients' behaviour was based on fear because they considered the machine to be "the work of the devil" (2, 3). Abbott published a report based on his experience from Greco-Turkish War which was published in "The Lancet" in two issues, those of January 14 and 21, 1899 (4, 5). The German Red Cross sent X-ray equipment to a military hospital in Istanbul. This was listed as one of the first times radiological equipment was used worldwide during times of war.

The first medical presentations of X-rays took place at the Athens Medical Society. On March 12, 1898*, the surgeon D. Kokkoris presented a case regarding: "The reproduction of a woman's hand, which was produced in the Physics Laboratory by Professor Argyropoulos using a Roentgen machine, and another X-ray of a stomach tumor (6, 7). On March 19 of the same year the physician G. Koromilas - gave a speech "On

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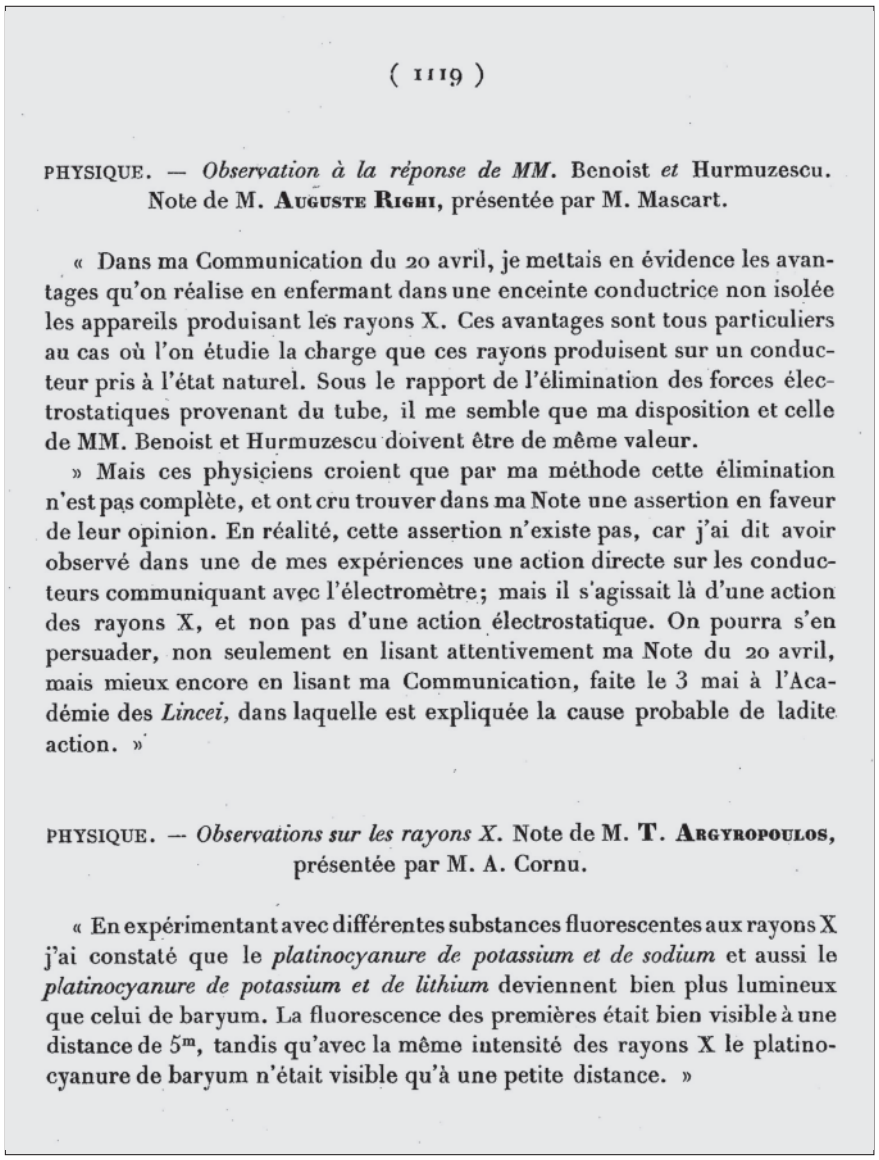
the subject of X-rays" (6) with three cases using X-rays - once again presented at the Athens Medical Society.

It was in 1898 that the first X-ray equipment was installed in Greek public hospitals. The first was installed at the General Public Hospital of Patras as a donation from Andreas Kollas. On March 31st 1898*, the use of the machine was demonstrated by Timoleon Argyropoulos, Professor of Physics at the National and Kapodistrian University in Athens, when he was able to show a foreign object (bullet) in the wounded leg of Efstathios Samartzis. Despite the capabilities of this new technique, due to the absence of a physician trained to use the equipment, it was rarely used over the next few years (8). The second X-ray machine was installed in the biggest hospital in Athens, "Evangelismos" (7). The equipment remained at "Evangelismos" Hospital up until 1923. The management of the makeshift radiology department was originally assigned to Professor Marinos Geroulanos. In 1912, Christos Kalantidis was appointed chairman, followed by Manos Karzis in 1918 and Isidoros Gounaris in 1922 (9).

The first private lab was set up in Athens in 1903 by Ioannis Chrisospathis as published in an advertisement in the Athenian newspaper "Akropolis" (7).

**The first scientific medical papers and textbooks and training in Radiology**

The Professor of Physics at the National and Kapodistrian University of Athens, Timoleon Argyropoulos, published the first foreign language article in France, which was presented on May 18th 1896 at the French Academy of Science by the Academic A. Cornu and published in the weekly scientific journal "Comptes rendus Hebdomadaires des séances de l' Académie des Sciences" in the January-June 1896 issue, page 1119, and titled: "Observations sur les rayons X" Note de M.T. Argyropoulos présentée par M.A. Cornu (Fig. 1). The following are mentioned in the publication: "En expérimentant avec différentes substances fluorescentes aux rayons X j' ai constaté que le platinocyanure de potassium et de sodium et aussi le platinocyanure de potassium et de lithium deviennent bien plus lumineux que celui de baryum. La fluorescence des premières était bien visible à une distance de 5 mètres, tandis qu'avec la même intensité des rayons X le platinocyanure de baryum n'était visible qu' à une petite distance" (10, 11).



( 1119 )

PHYSIQUE. — *Observation à la réponse de MM.* Benoist *et* Hurmuzescu. Note de M. **Auguste Righi**, présentée par M. Mascart.

« Dans ma Communication du 20 avril, je mettais en évidence les avantages qu'on réalise en enfermant dans une enceinte conductrice non isolée les appareils produisant les rayons X. Ces avantages sont tous particuliers au cas où l'on étudie la charge que ces rayons produisent sur un conducteur pris à l'état naturel. Sous le rapport de l'élimination des forces électrostatiques provenant du tube, il me semble que ma disposition et celle de MM. Benoist et Hurmuzescu doivent être de même valeur.

» Mais ces physiciens croient que par ma méthode cette élimination n'est pas complète, et ont cru trouver dans ma Note une assertion en faveur de leur opinion. En réalité, cette assertion n'existe pas, car j'ai dit avoir observé dans une de mes expériences une action directe sur les conducteurs communiquant avec l'électromètre; mais il s'agissait là d'une action des rayons X, et non pas d'une action électrostatique. On pourra s'en persuader, non seulement en lisant attentivement ma Note du 20 avril, mais mieux encore en lisant ma Communication, faite le 3 mai à l'Académie des *Lincei*, dans laquelle est expliquée la cause probable de ladite action. »

PHYSIQUE. — *Observations sur les rayons X.* Note de M. **T. Argyropoulos**, présentée par M. A. Cornu.

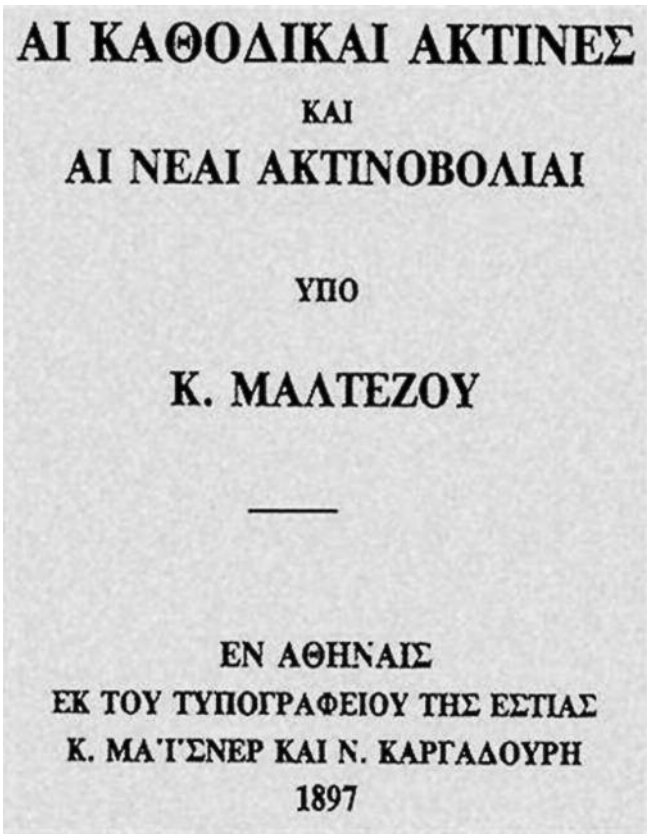
« En expérimentant avec différentes substances fluorescentes aux rayons X j'ai constaté que le *platinocyanure de potassium et de sodium* et aussi le *platinocyanure de potassium et de lithium* deviennent bien plus lumineux que celui de baryum. La fluorescence des premières était bien visible à une distance de 5m, tandis qu'avec la même intensité des rayons X le platinocyanure de baryum n'était visible qu'à une petite distance. »

*Fig. 1.* — M.T. Argyropoulos: Observations sur les rayons X. *Comptes rendus Hebdomadaires des séances de l'Académie des Sciences*, 1896, 122: 1119.

The first presentation concerning X-rays at a Greek medical convention was made on April 16th, 1906*, within the framework of the 5th Panhellenic Medical Convention by Ioannis Chrisospathis. The convention was held in the lecture hall of the National and Kapodistrian University and the speaker presented the subject of X-rays in his speech entitled "Roentgen's rays in medicine", which was held on the 7th day of the convention (12, 13).

The first textbook of Radiology written in Greek was a monograph by the Professor of Engineering at the National and Kapodistrian University of Athens, Konstantinos Maltezos (1869-1951), entitled: "Cathode rays and new forms of radiation" published in 1897 by "Estia" Publications (Fig. 2). It contained an introduction and three chapters, totaling 55 pages (14).

In 1917, the book entitled "Determining doses in Radiotherapy" was written by Manos Karzis and was published by I. Vartsos Publications, followed two years later by a 114 page book by the same author entitled "Radium and its properties", by "Ermou"


ΑΙ ΚΑΘΟΔΙΚΑΙ ΑΚΤΙΝΕΣ
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ΑΙ ΝΕΑΙ ΑΚΤΙΝΟΒΟΛΙΑΙ
ΥΠΟ
Κ. ΜΑΛΤΕΖΟΥ
ΕΝ ΑΘΗΝΑΙΣ
ΕΚ ΤΟΥ ΤΥΠΟΓΡΑΦΕΙΟΥ ΤΗΣ ΕΣΤΙΑΣ
Κ. ΜΑ'Ι'ΣΝΕΡ ΚΑΙ Ν. ΚΑΡΓΑΔΟΥΡΗ
1897

*Fig. 2.* — The first textbook of Radiology written in Greek by the Professor Konstantinos Maltezos, entitled: "Cathode rays and new forms of radiation" published in 1897.

Publications. In 1919, the prolific writer Manos Karzis wrote a chapter which was included in the book "Guide to Medical Surgery by the Medical Department at the Ministry of the Military" entitled "Defining and determining a foreign object in the body using X-rays" (15).

The first Greek medical journal dealing with Radiology was titled "Deltion Karkinologias" and circulated in Athens from 1929 to 1932. Its Chief Editor was Radiologist Athanasios Lambadaridis. It was published every two months and contained articles by Athanasios Lambadaridis, as well as translated articles on extremely specialized subjects for that time period by distinguished University Professors as well as heads of hospitals from abroad (16, 17). "Hellenic Radiology", the official radiological journal of Greek radiologists, was published much later, in 1968, which is to say 36 years after "Deltion Karkinologias" stopped being published (18).

Unfortunately, the subject of Radiology was taught at a much later date in Greece. The first official classes in Radiology began to be taught at the "Andreas Syggros" Hospital in 1923 by Felix-Eftyhios Hart, who was to become the first Professor of Radiology at the National and Kapodistrian University of Athens, and more specifically to fifth year students of the University's Clinic in Skin Diseases (7).

**The establishment of the Hellenic Radiological Society and the first University Chair in Radiology**

The Hellenic Radiological Society was established on September 20, 1933. Its memorandum of association consisted of 38 articles. It was signed by its first President Dimitrios Vasilidis and the General Secretary Athanasios Lambadaridis, and was approved by the Athenian Court of First Instance with the number 8266 ruling of October 31st, 1933. The first Executive Board of the Society consisted of the following people, in alphabetical order: Vasilidis Demetrios, Vidalis Evangelos, Georgakopoulos Andreas, Gounaris Isidoros, Grigoratos Panagiotis, Throuvalas Antonios, Kalantidis Christos, Karzis Manos, Kontopoulos M., Kratsas Georgios, Kiniras Michael, Lambadaridis Athanasios, Lapatsanis Panagiotis, Kope Joseph, Petrohilos Stefanos, Prapopoulos Takis, Tsaggaris Konstantinos, Tsarouhas Vagias, Farmakidou Lia, Hart Felix-Eftyhios (19, 20).

The specialty of Radiology was established five years later in 1938 by mandatory Law 1461 (21).

In 1947, the newly-established, although temporary, Chair of Radiology and Physiotherapy was established at the National and Kapodistrian University of Athens, and the following year Felix-Eftyhios Hart (1885-1954) was promoted to full Professor of Radiology in Greece (22). And so, 50 or so years after the discovery of X-rays, the National and Kapodistrian University of Athens acquired a full Chair and full Professor of Radiology and the opportunity was finally given to young doctors who wanted to specialize in Radiology to do so in their own country instead of going abroad for this purpose. It was not until 1972 that the first Panhellenic Radiological Convention took place in Athens, 39 years after the establishment of the Hellenic Radiological Society (23).

(*It must be pointed out that the Gregorian calendar is used throughout most of Europe, while the Julian calendar was still used in Greece. It wasn't until March 1st 1923 that Greece switched over to the Gregorian calendar, which means that 12 additional days must be added to European dates).

**References**


1. Livadas G., Tsachalis A.: Timoleon Argyropoulos, the unknown father of Greek radiology. *Hellen Radiol*, 1996, 27: 207-210.
2. Ramoutsaki I.A., Giannacos E.N., Livadas G.N.: Birth of battlefield radiology: Greco-Turkish War of 1897. *Radiographics*, 2001, 21: 263-266.
3. Livadas G.: The first medical radiographs in Greece. *Hellen Radiol*, 1995, 26: 347-348.
4. Abbott F.C.: Surgery in the Greco-Turkish War. *Lancet*, 1899, 14: 80-81.
5. Abbott F.C.: Surgery in the Greco-Turkish War. *Lancet*, 1899, 14: 152-156.
6. Pournaropoulos K.G.: Radiology in the Athens Medical Society during its first twenty years (1835-1934). *Hellen Radiol*, 1979, 12: 167-173.
7. Vrakatselis Th.: Chronology. *Hellen Radiol*, 1995, 26: 335-337.

8. Zavras G.M.: The first stages of Radiology in Patras. *Hellen Radiol*, 1995, 26: 387-389.
9. Damilakis J.E.: The first stages of the evolution of medicine of the ionizing radiation in Greece. *Hellen Radiol*, 1995, 26: 349-353.
10. Argyropoulos M.T.: Observations sur les rayons X. *Comptes rendus Hebdomadaires des séances de l'Académie des Sciences*, 1896, 122: 1119.
11. Baltas C.: The History of Greek Radiology. PhD thesis, University of Thessaly, Department of Radiology, 2006, pp 46.
12. Chrisospathis I.: Roentgen's rays in medicine. Minutes of the 5th Panhellenic Medical Conference, Athens, April 10-18, 1906.
13. Baltas C.: The History of Greek Radiology. PhD thesis, University of Thessaly, Department of Radiology, 2006, pp 48-49.
14. Papadaki P.J.: *Hellen Radiol*, 1996, 27: 403.
15. Papadaki P., Vrakatselis Th.: The first Greek publications on Radiodiagnostics and Radiotherapy. *Hellen Radiol*, 1995, 26: 382-386.
16. Deltion Karkinologias. Years 1929, 1930, 1931, 1932, Hellenic National Library.
17. Baltas C.: The History of Greek Radiology. PhD thesis, University of Thessaly, Department of Radiology, 2006, pp 87-89.
18. Baltas C.: The History of Greek Radiology. PhD thesis, University of Thessaly, Department of Radiology, 2006, pp 89-90.
19. Book of Minutes of the Hellenic Radiological Society.
20. Baltas C.S., Balanika A.P.: Evangelia Farmakidou (1890-1982): the first female Greek radiologist. *J Med Biogr*, 2010, 18: 41-43.
21. Pappas A.: The mysterious X-rays. The first years. Athens, Al Pappas (eds), 2002, pp 107.
22. Livadas G.: Felix Hart. The first teacher of Radiology in Greece. *Hellen Radiol*, 1995, 26: 362-366.
23. Baltas C.: The History of Greek Radiology. PhD thesis, University of Thessaly, Department of Radiology, 2006, pp 94-98.