

## Pioneers – The History of Musculoskeletal Radiology.

The contribution is about Wilhelm Conrad Roentgen who with the x-ray image taken from his wife's hand, was the first to show the human bones

*By Iwona Sudoł-Szopińska (radiologist) and Marta Panas-Goworska (culture expert)*

### To brighten the science – Wilhelm Röntgen

Wilhelm Röntgen once received an unusual letter. A patient, complaining of poor health and lack of time, asked for several x-rays to be sent to him with instructions on how to use them. Röntgen, who was known for his good sense of humour, answered that sending such a parcel would be complicated, and said that it would be easier if the patient sent him his chest instead.

Wilhelm Conrad Röntgen was born on 27 March 1845 in a small town of Lennep in Germany. At the age of three, he and his family moved to the Netherlands where he started school. Interestingly, biographers note that he did not shine in physics and obtained merely a pass grade in his exams. Workshops and labwork were his real “thing.” His further education was also unusual. In 1862, he started attending a technical school in Utrecht, but did not stay there long. As a fierce moralist (which would distinguish him from other scientists for the rest of his life), he refused to reveal the name of his classmate who had drawn a caricature of a teacher. He was blacklisted for this, which shut the door on further education in the Netherlands and Germany. Fortunately, he did not need any diploma to enter the Polytechnic in Zurich as entrance examinations were the basis of admission. Röntgen studied mechanical engineering there for three years and had almost no contact with physics. However, he accepted an assistantship under the auspices of his mentor, professor August Kundt, who introduced him to physics. Subsequently, he independently held positions in Würzburg, Strasbourg, Giessen and Munich.

His experiments with X radiation Roentgen started in 1895. On the evening of November 8, 1895, he found that, if the discharge tube is enclosed in a sealed, thick black carton to exclude all light, and if he worked in a dark room, a paper plate covered on one side with barium platinocyanide placed in the path of the rays became fluorescent even when it was as far as two metres from the discharge tube. The future Nobel Prize winner used the Crookes–Hittorf tube to investigate the penetration of then unnamed rays through different materials, or to be more precise, the transparency of these materials to these rays. He found that paper and zinc foil were more transparent, while wood had a slightly lower penetration, and lead alloys were the least penetrable. The last of the radiological experiments took place on 22 December when Röntgen asked his wife, Bertha, to place her left hand on the photographic plate to which he directed the lamp's light for a dozen or so minutes (at present, this takes milliseconds). When he finished the experiment, he presented the photograph to his wife. This photograph has become renowned in the history of not only medicine, but also physics and photography. Here it was, a human hand immortalised for the first time with all its anatomical

details plus something else... On the fourth finger, there was a ring, as gold is almost completely impenetrable for X rays. The scientific report on this phenomenon has become one of the fastest medical articles to have ever been published, taking only seven days! Interestingly, the inventor never decided to patent his invention.

In 1901, he became the first scholar to have been awarded a Nobel Prize in Physics. However, this never changed his habits. Until the end of his days, he led a humble life, never accepted any honours or titles, and refused additional food rations during World War I, since, as he explained, there were people in greater need than himself.

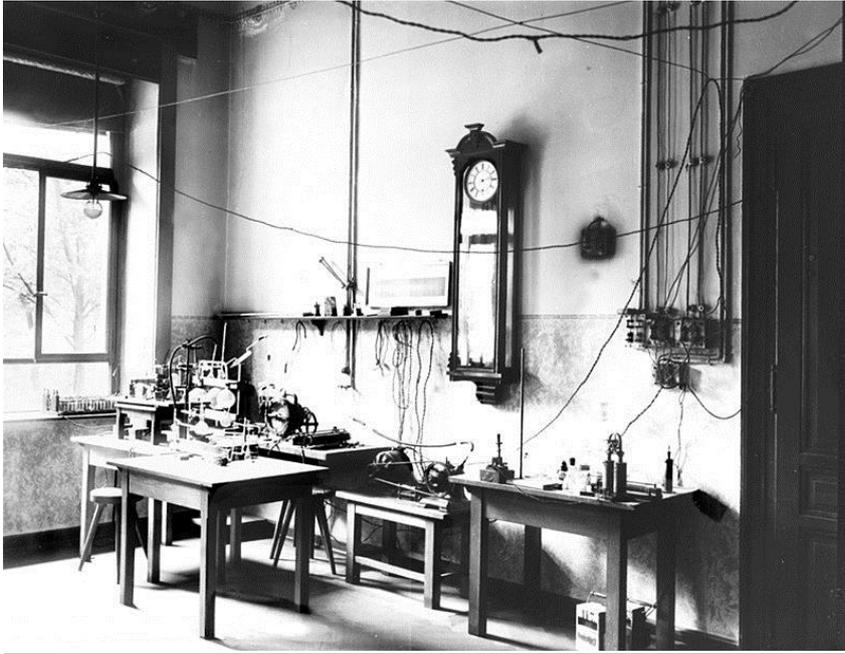
The experiments with X radiation, after Röntgen discovery in late 1895, were then repeated in Europe in 1896.

Wilhelm Conrad Röntgen died on 10 February 1923 in Munich from carcinoma of the intestine. Nevertheless, as Rudolf Grashey, another great radiologist, said:

*Life gave him much, but he gave us more than he ever received. The spark in his mind lit a light that brightened dark paths of science. Immortal is his work; he himself is immortal.*



[https://commons.wikimedia.org/wiki/Wilhelm\\_Conrad\\_R%C3%B6ntgen#/media/File:First\\_medical\\_X-ray\\_by\\_Wilhelm\\_R%C3%B6ntgen\\_of\\_his\\_wife\\_Anna\\_Bertha\\_Ludwig%27s\\_hand\\_-\\_18951222.gif](https://commons.wikimedia.org/wiki/Wilhelm_Conrad_R%C3%B6ntgen#/media/File:First_medical_X-ray_by_Wilhelm_R%C3%B6ntgen_of_his_wife_Anna_Bertha_Ludwig%27s_hand_-_18951222.gif)



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**Iwona Sudot-Szopińska (radiologist) and Marta Panas-Goworska (culture expert)****Biographical notes**

**Iwona Sudot-Szopińska** was born in Zwoleń, Poland, in 1970. She graduated from the Medical University of Warsaw, and obtained first-degree specialization in nuclear medicine in 1998 and in radiology in 2002. She defended her doctoral dissertation in 1998 and was awarded a habilitation degree in 2003. The title of a professor was conferred upon her by the President of the Republic of Poland in 2012. Since 1996 she has been working at the Medical University of Warsaw, and in 2010 she was appointed the Head of the Department of Radiology in the National Institute of Geriatrics, Rheumatology and Rehabilitation in Warsaw, where since 2015 she has been also working as the Director for Research. In 2015–2018, she held the function of a chairperson of the ESSR Arthritis Subcommittee. She is the author of 280 articles, 30 chapters and 5 monographs. She is an editor-in-chief of “Journal of Ultrasonography” and “Acta Historiae Medicinae. Journal of the History of Medicine, Ethics and Deontology.” She is interested in the history of women in science and in the history of radiology and rheumatology.

**Marta Panas-Goworska** was born in Lublin, Poland, in 1980. She obtained a university diploma in cultural studies. With her husband, Andrzej Goworski, she wrote four books on the history of Russia. In 2017, their book entitled "Scientists under the red star" (in Polish, PWN, 2016), which tells a story of scholars in the Soviet Union, was awarded in the competition for the best scientific book in 2016 year, organized by the Jagiellonian University and the Euclid Foundation of Science Popularization. Moreover, she is the author of several dozen articles about culture and art. She is most keen on telling stories of figures, including inventors and pioneers in medicine, who, despite their pivotal discoveries, have been forgotten for various reasons or remain unknown to the wider public.