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Gustav KAISER an early Austrian Röntgen Pioneer: A Late Appreciation

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Synopsis: In 1986 documents were discovered in the collection of manuscripts of the Institute of Medical History at the University of Vienna which leave no doubt that it was the Viennese physician Gustav Kaiser who first used X-rays for medical purposes in Austria an maybe worldwide. Today these radiographs are kept at the Department of Diagnostic Radiology at Innsbruck University and will be available on the Internet before long.

1. Historical Article:

In 1895, when Roentgen began experimenting with a Crookes' tube, he certainly did not have the discovery of a new kind of radiation in mind. In fact, Roentgen simply intended to reproduce Lenard's modifications of Hertz' experiments by means of vacuum tubes (GAGLIARDI 1992). How it was possible for roentgenography to spread so rapidly from Germany to Austria within a few weeks, is explained by Kaiser (Fig. 1) as follows (INST. F. GESCHICHTE D. MED. D. UNIV. WIEN – HANDSCHRIFTENSAMMLUNG Nr. 3650):

"It was in early December 1895 – probably around the eighth – when my friend Eduard Haschek, then still a student working with the assistants Dr. Schweidler and Dr. Bendorf at the 2nd Department of Physics [at the University of Vienna] told me (I was then a subintern of Hofrat Prof. Dr. Edmund Neusser) that the head of his department had received a letter from Prof. Dr. Röntgen of Würzburg, a former fellow student in Straßburg, where both had attended the physics lectures of Prof. August Kundt in the years 1872 and 1873. In this letter, in which a photograph was enclosed, Roentgen told his old friend that he had discovered a new type of rays, which are capable of penetrating black paper, wood, various kinds of metal, and even the human body (Exner was the first to learn about the discovery). These rays, which he called X-rays, caused many substances to flouresce. With the help of these rays, he had succeeded not only in visualizing invisible structures, but also in recording and documenting them on photographic plates. When Prof. Exner read the letter of his old friend, he immediately realized the vast historical significance of this discovery and instructed his assistants to reproduce and study Roentgen's experiment. My friend Haschek was well aware that I was involved in clinical electrotherapy and thus greatly interested in everything having to do with electricity. So he invited me to join him for the experiment".

The following day the X-ray they had obtained was presented to the Chemical-Physical Society in Vienna. Kaiser reports the events as follows (Inst. f. Geschichte d. Med. d. Univ. Wien – Handschriftensammlung Nr. 3650):

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Fig. 1: Portrait of Gustav Kaiser (1871-1954).

"He (Exner) contacted Hofrat Neusser, then my superior, and asked him to bring along a few patients to his brother at the Department of Physics for testing the method on the living body. The next day Prof. Neusser took Prof. Sigmund Exner, the surgeon Doz. Karl Ewald, the assistant Dr. Pöchand myself to the department. Since I was already familiar with the procedure, I was given the honor of taking these X-rays. The radiographs were of course blurred because they had been exposed between one and a half and two hours; nevertheless they were of great diagnostic value.

The first clinical X-ray shows the hand of a student forest ranger. He had sustained a shotgun injury to his palm but surgical exploration for the shot had been unsuccessful" (Fig. 2).

The better known second X-ray shows a girls right foot with an extra toe. The radiograph clearly demonstrates that the extra toe does not articulate with the terminal phalanx (Fig. 3).

The third X-ray demonstrates a poorly healed fracture of the forearm in a child (Fig. 4).

"With the help of these x-ray pictures the patients were successfully operated upon. It should be noted that the three radiographs I obtained in the old building of the Department of Physics

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Fig. 2: X-ray of a forest rangers hand; shotgun injury to his palm (28th Dec. 1895).

in Türkenstraße in Vienna on December 28, 1895 were the very first x-rays taken for medical purposes in history."

These X-rays were obtained by means of a 15 cm Rumkorff spark inductor and a Crookes' tube, which was mounted on a wooden tripod that was placed on a table. At a distance of about 30 cm below the tube was placed a photographic plate that was fixed in a wooden box.

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Fig. 3: X-ray of a girls extra toe showing that there is no articulation with the terminal phalanx (28th Dec. 1895).

On the X-ray showing the extra toe parts of the date of recording (28.XII.1895) can still be identified (PIRKER 1995).

That Kaiser had really obtained these x-rays at this day was doubted by E.R.N. Grigg (GRIGG 1965), who designated the images as "Röntgen-Märchen " and who alleged Kaiser that he may have mixed up the dates.

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Fig. 4: X-ray of a poorly healed fracture of the forearm (28th Dec. 1895).

But in 1985/86 documents were discovered (STELLAMOR-PESKIR 1986), namely the enclosed notes quoted above (Inst. f. Geschichte d. Med. d. Univ. Wien – Handschriftensammlung Nr.R.3650) and the letter to K. Weiss (WEISS 1955), which leave no doubt that it was really Gustav Kaiser, who obtained the worlds first clinical radiographs. Furthermore Pirker and Stellamor-Peskir, after years of research in cooperation with historians of the Austrian National Library, the Central Library of Physics in Vienna and the German Röntgenmuseum in Remscheid-

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Lennep, confirmed the correctness of the historical date. They published their results in February 1995 (PIRKER 1995).

Gustav Kaiser donated the first medical x-rays to Prof. Ruckensteiner, the former chairman of the Department of Diagnostic Radiology at the University of Innsbruck.

Since 1954 the three radiographs are kept at the University of Innsbruck. Shortly before Kaiser died he wrote a letter to his friend K. Weiss (WEISS 1955) dated September 2nd 1954, in which he admits that all his life it had hurt him that his pioneering work had never received proper recognition in the medical literature.

2. Literature:

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Artikel/Article: Gustav Kaiser an early Austrian Röntgen Pioneer: A Late Appreciation. 363-368