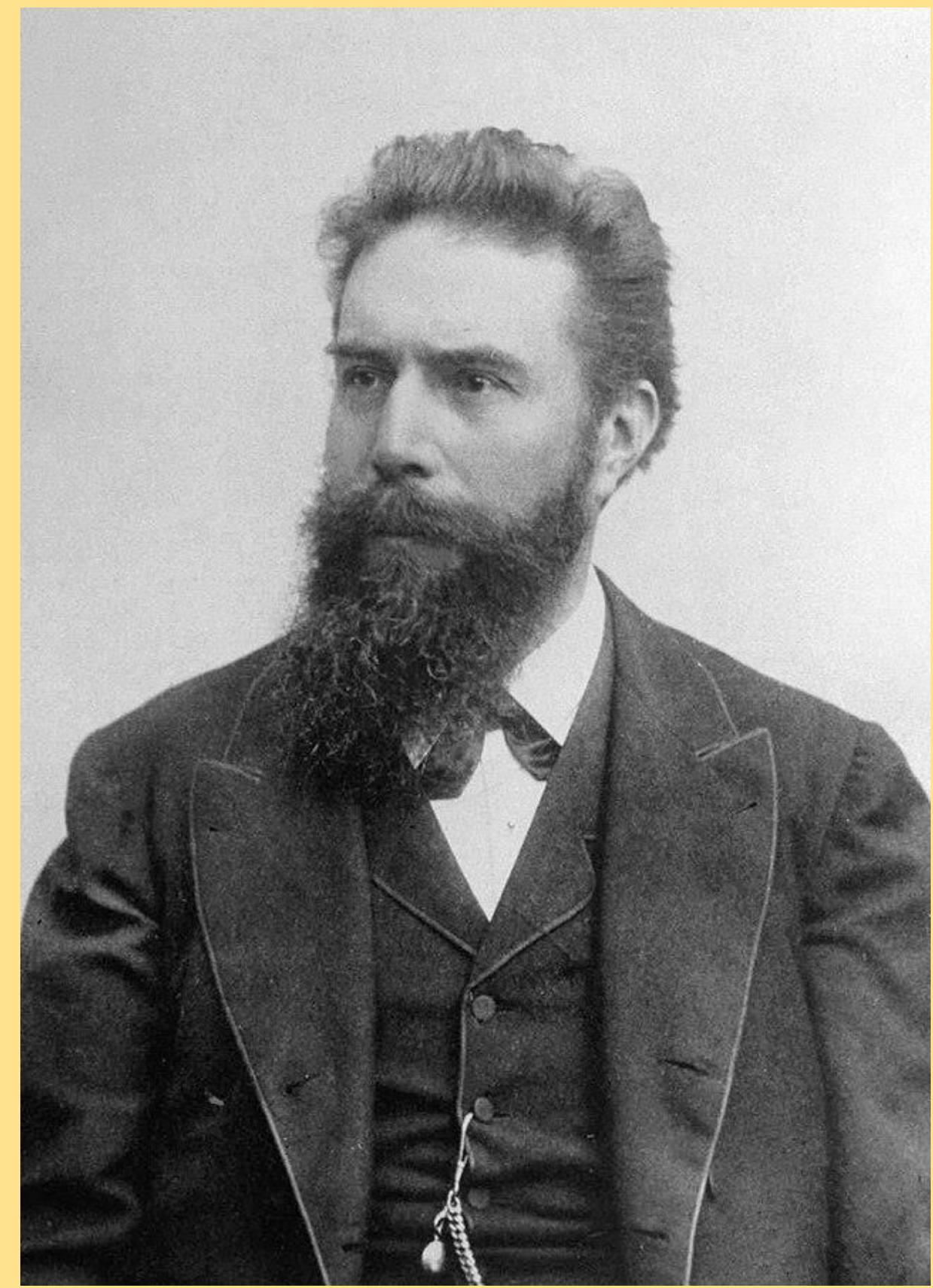


Objectives:

- Explain the early invention of x-rays
- Explain early victims and their symptoms
- Describe innovations that helped reduce radiation dosages over the years

The Invention of X-rays:



Wilhem Conrad Walkhoff

Wilhem Conrad Roentgen
Discovered x-rays in November 1895.

- X-ray is a form of electromagnetic radiation. It uses high ionizing radiation that passes through most objects and travels at the speed of light.

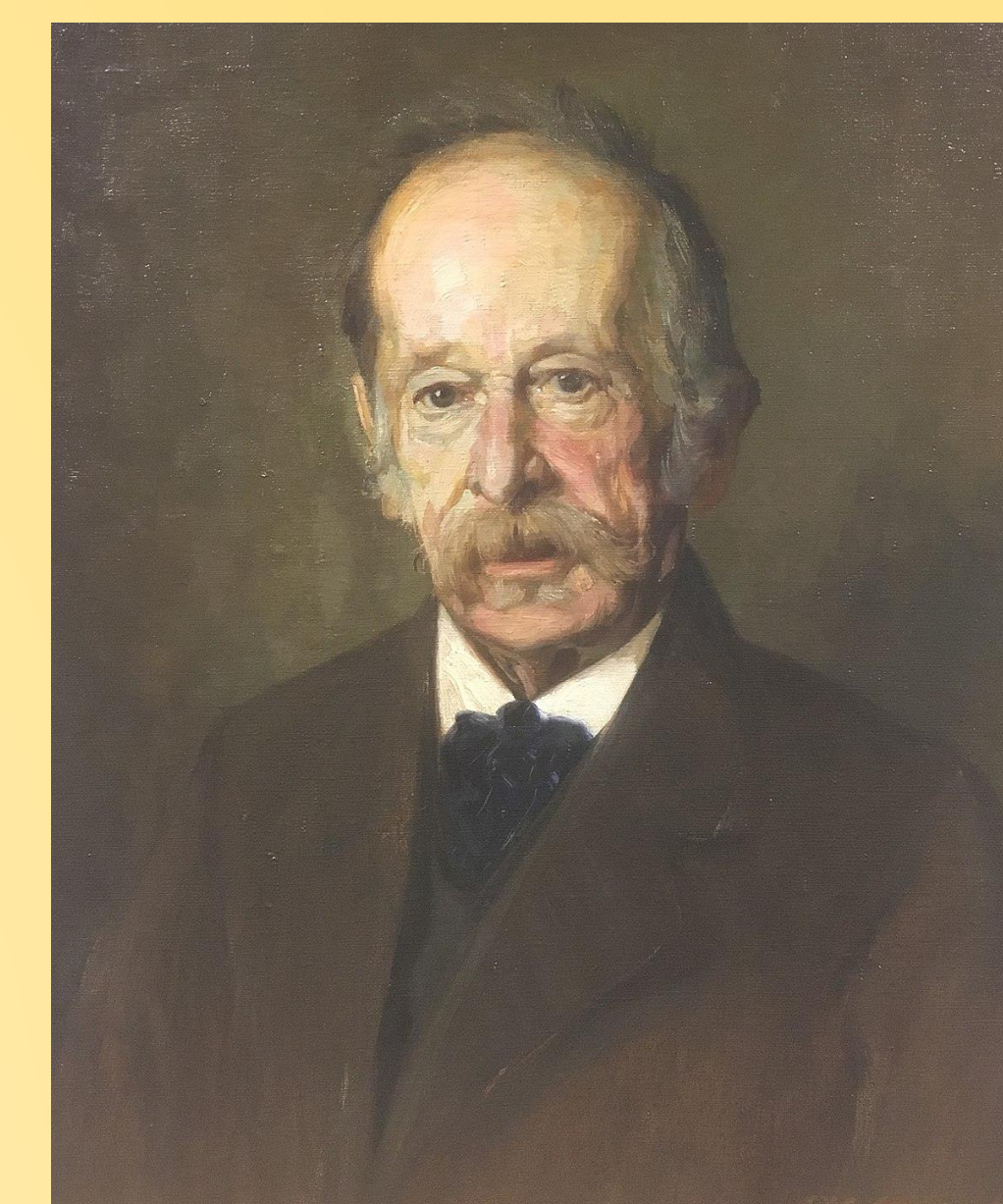
Early Victims:

Fredrick Otto Walkhoff and Fritz Giesel

- Walkhoff was the first to take a dental radiograph 14 days after Roentgen's discovery and noticed hair loss
- Both Walkhoff and Giesel worked together to develop the first dental radiography room.
- Giesel died in 1927 of metastatic carcinoma from heavy radiation doses to his hands



Fredrick Otto Walkhoff



Fritz Giesel

S15 Early Victims to Radiation Exposure

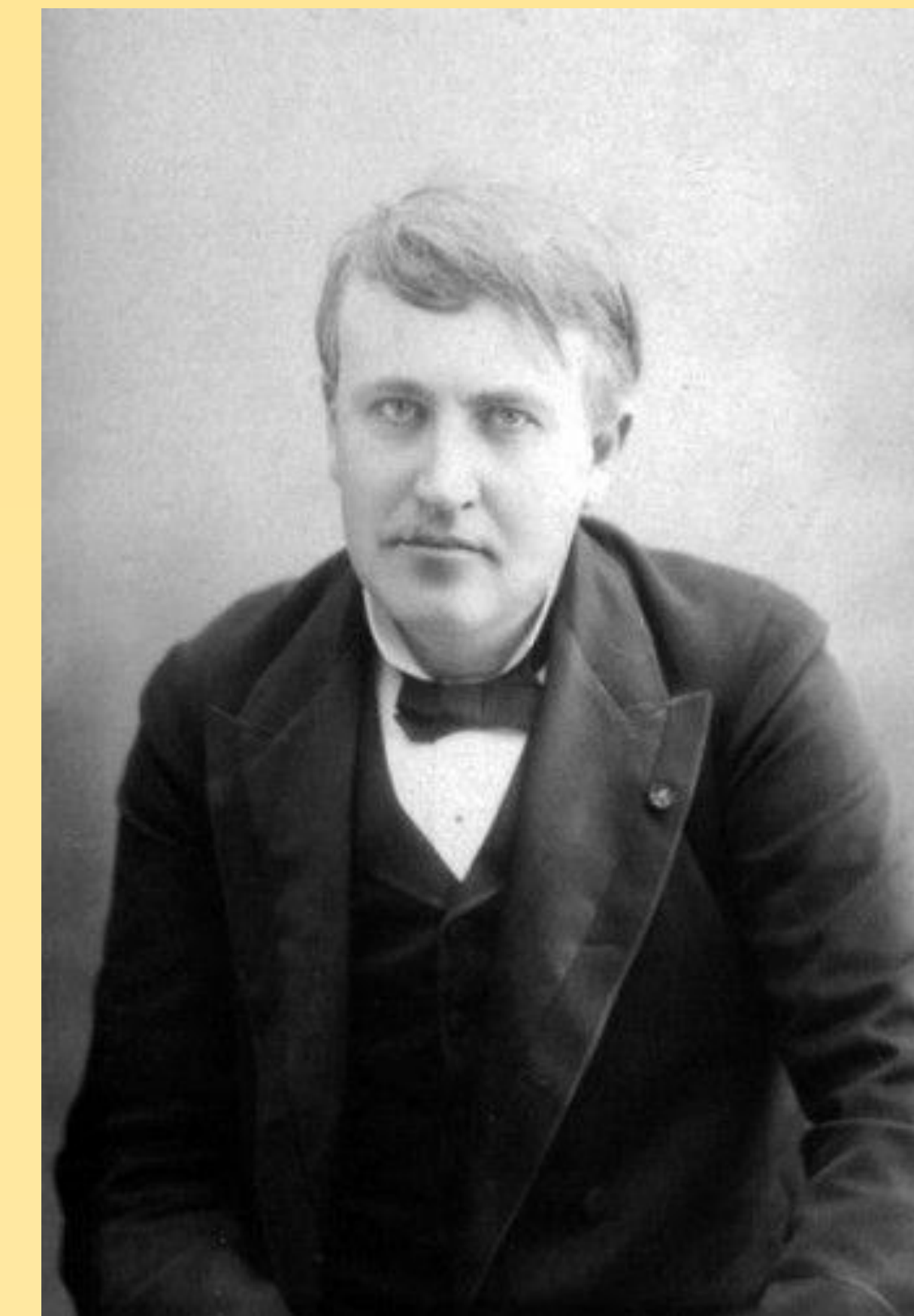
Early Victims (continued):

Dr. HD Hawks

- Gave a demonstration of the x-ray tube on August 12, 1896.
- After 4 days, he noticed: dry skin, swelling and blistered hands to which eventually the skin came off, sore knuckles, his fingernail growth stopped, hair on his hand fell out, vision impairment and chest burns.

Clarence Dally

- Was an assistant to Thomas Edison and was exposed to high doses of radiation that led him to amputate his arm.
- At age 39, he was the first person to die from metastatic cancer.



Clarence Dally

Other Deaths from Radiation Exposure

Elizabeth F Ascheim (1859–1905)
Wolfram C Fuchs (1865–1907)
Dr William Carl Egelhoff (1872–1907)
Dr Walter James Dodd (1869–1916)

Tube Manufacturers:

Rome Vernon Wagner (1869–1908)
Thurman Lester Wagner (1876–1912)
Burton Eugene Baker (1871–1913)
Henry Green (1860–1914)
John Bawer (unknown year of birth–1908)
Robert H Machlett (1872–1926)

Innovations:

William Rollins recommended

- Protective tube housings
- Use of lead shields
- Collimated and shielded tubes
- Positive pulsed fluoroscopy
- Selective filtration



Guiding Principles:

- 3 Cardinal Rule of Radiation Protection: Time, Distance, and Shielding
- Justification, Optimization, and Dose Limitation
- ALARA (As Low As Reasonably Achievable)
- Technological Advances: improving tube manufacturing and protective devices



1 TIME
Minimize time spent near radioactive source



2 DISTANCE
Maximize distance to radioactive source



3 SHIELDING
Use shielding between yourself and the radioactive source

Conclusion:

The discovery of x-rays back in 1895 revolutionized the healthcare industry. In the early years of x-rays, there were many victims who suffered various symptoms like burns, soreness, hair loss, itchy and dry skin, and death.

Although the use of x-rays caused the lives of people in the early years, these experiences led to the various innovations to reduce radiation dose that are still implemented today.