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Private prescription:

A thought-provoking tonic on the lighter side

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Please note that these are the personal opinions of the author and do not necessarily represent those of AstraZeneca.

Röntgen rays revealed

One hundred and seven years ago, in January 1896, several eminent scientists in various countries received through the post a reprint of a publication accompanied by several photographs. Nothing unusual in that, except that this was a communication that, even before the end of that year, would revolutionize the practice of medicine.

The paper was entitled *On a New Kind of Rays, A Preliminary Communication* by Wilhelm Conrad Röntgen (then fifty years of age) and the photographs were actually X-ray pictures. In fact, Röntgen had first observed these rays some eight weeks earlier on 8th November 1895 while experimenting with electric current flow in a partially evacuated glass tube (a cathode-ray tube). Because the rays did not exhibit any of the properties of light, such as reflection and refraction, he mistakenly thought that they were unrelated to light and named them X-rays in view of their uncertain nature. In the succeeding eight weeks of intense, isolated research activity he methodically studied the phenomenon and produced his seminal paper.

Within a month, on 23rd January 1896, in response to appeals from his colleagues from the University of Würzburg (Germany), Röntgen had given a lecture on the subject. At its close Albert von Kölliker, the eminent physiologist and embryologist, told the applauding audience that in 48 years he had never attended a scientific presentation of greater importance. Leading the audience in a cheer, he proposed that, henceforth, the rays should be called Röntgen's Rays [1].

> 'A great discovery and a remarkable man.'

Exploitation

Röntgen's discovery amazed and excited scientists worldwide, and many repeated his experiments. Because he did not patent his apparatus, commercial equipment soon became available (the first was in January 1896). The first X-ray pictures were those of hands, copying Röntgen's original picture of his wife's hand showing its bones and two rings on her fingers but whole body pictures soon appeared later that year (exposure times were of the order of 30 minutes). Soon, X-rays were being used in clinics to detect foreign bodies in patients and to help in setting fractured bones. A perusal of entries in the X-ray records of 1896 for the Liverpool Medical Institution (Liverpool, UK) has revealed that between June and December of that year a total of 261 X-ray plates had been taken, including one to see if a set of false teeth had been swallowed [2].

It is not surprising that newspapers and periodicals showered the public with rumours, fanciful speculations and absurd claims. Even *Scientific American* published a doggerel on Röntgen in February 1896 [3]:

> O Röntgen, then the news is true
> And not a trick of idle rumour
> That bids us each beware of you
> And of your grim and graveyard humour.

Some newspapers were highly critical; the London *Pall Mall Gazette* reported [2]:

> 'We are sick of Röntgen rays… you can see other peoples bones with the naked eye, and also see through eight inches of solid wood. On the revolting indecency of this there is no need to dwell.'

Poetry was even composed as illustrated by some lines taken from a piece entitled *Lines on an X-ray Portrait of a Lady* published in *Life* in March 1896 [4]:

> She is so tall, so slender, and her bones-
> Those frail phosphates, those carbonates of lime –
> Are well produced by cathode rays sublime,
> By oscillations, amperes and by ohms.
> Her dorsal vertebrae are not concealed
> By epidermis, but are well revealed.

A doggerel sums up the public response at that time [5]:

The Röntgen Rays, The Röntgen Rays

> What is this craze,
> The town's ablaze,
> With the new phase
> Of X-rays' ways.

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I'm full of daze,
Shock and amaze,
For nowadays,
I hear they'll gaze,
Thro' cloak and gown – and even stays,
These naughty, naughty Röntgen Rays.

A more recently published limerick elegantly summarizes the discovery [6]:

The integument used so to hide
The organs and bones deep inside
'Till Röntgen discovered
Rays that uncovered
Whatever was wounded, save pride.

Nobel Prize

In 1901, Röntgen received 17 out of 29 nominations for the first Nobel Prize for Physics. He did not give a Nobel lecture and donated his prize money to the University of Würzburg both to advance science and promote scholarships. He refused all financial gain from his discovery, but this was in no way out of character for a scientist whose outstanding characteristics were his absolute integrity, honesty, sense of sacrifice for people, memories and ideals, and devotion to science [1]. He left a discovery that has proved to be invaluable, not only to medicine for diagnosis and for therapeutic use, but also to chemistry and material science where X-rays are used to investigate crystal structure. Truly a great discovery and a remarkable man!

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