
X-rays and technology as metaphor

Brian Lentle

Technology has an ambiguous relation with the human imagination. It is possible to trace developments in the use of x-rays in medicine over the century or so since their discovery by Wilhelm Conrad Röntgen.¹⁻³ It is equally possible to recognize that radiography and other technologies have provided a mirror for the society in which they have been used. In other words, although technology changes society, society, in its response to technology, reveals its values and preoccupations at certain places and times.

From the beginning, scientific interest in x-rays was at least matched, and may have been exceeded, by the fascination of the public with the new phenomenon. To understand this fascination we must leave behind the present and reflect on the society to which x-rays were announced in 1895. Radio had just been invented by Guglielmo Marconi and, with other then-modern inventions, seemed to indicate a boundless future of technological promise. In Britain and Canada, Queen Victoria was in the late years of her reign (1860–1907). Tannahill has noted of that era that the view of human sexuality that we associate with the Victorian period was in no way confined to Britain but was a worldwide phenomenon⁴ and one that was to conflict with the use of x-rays.

Different aspects of the public perceptions surrounding the discovery of x-rays can be categorized as follows:

- an immediate understanding of the potential for x-rays to change the practice of medicine
- an acceptance of x-rays as another aspect of technological mastery that was expected to relieve the human condition
- a prurient interest in the fact that these new rays might be used to see through materials, in particular clothing.

A further social consequence of Röntgen's discovery was that hospitals needed to deal with a new influence: that of coping with, and funding, expensive technologies, of which the use of x-rays in caring for the sick was the first example.⁵ This problem is with us still, in greater or lesser degree depending upon changes in the money supply. A uniquely Canadian dimension to the societal response to x-rays, described by Gingras⁶ and reflecting our national identity, is explored below.

A curious difference emerged in the reaction to the discovery of x-rays on one hand and that of radioactivity on the other, although these events took place within a year of each other. X-rays were immediately perceived as penetrating and thus to some extent threatening. Radium (isolated in 1898) and its associated radioactivity were, however, wel-

comed and believed to represent a panacea for all ills.⁷ Perhaps the fact that the discoveries came from 2 very different individuals of different sexes had something to do with this. X-rays were discovered by a man of forbidding aspect (Professor Röntgen),¹ whereas radium was isolated by a petite lady whose name is still rarely linked with the academic title that her university finally accorded her (“Professor [Mme.] Curie”) after the death of her husband.⁸

To Victorians, the ability of x-rays to “see through” the voluminous and confining clothing of the era seems to have been important. X-rays as a means of invading privacy were the subject of many cartoons and much comment in the popular press (Fig. 1).^{5,9} The apparel of a well-to-do Victorian lady seems to us today to have been used to deny the reality of flesh and blood. The idea that it might be made transparent by the use of x-rays may have been the first intimation of what we now consider the sexual revolution of the 20th century. The established social order, as well as public morality, had come under technological “threat.” Certainly, the great public interest in x-rays in the early years of this century appears to have been not a little prurient:

The public, though, were quick enough to seize on what they thought were certain other possibilities. They had read in the newspapers that [x-] rays could penetrate clothing. Thinking that the invisible ray would reveal the human form in all its naked ingloriousness, that the device was a kind of electronic peeping tom, they raised an outcry against this invasion of Victorian decency. According to Harvey Graham, “A London firm rose to the occasion, and made a small fortune from the sale of [x-] ray proof underwear,” and in New York there was an attempt to legislate against the use of x-rays in opera glasses. Evidently this aspect of x-rays was not lost on entrepreneurs. They were quick to offer for sale underclothing that supposedly afforded protection for affluent and delicate Victorian womanhood against this radiological invasion of privacy¹⁰ [Fig. 1].

Moreover, the early interest of physicians in using x-rays may have owed a lot to the fact that this was the first time much of the inside of the body was accessible to view without major surgery. Remember, physical examination was impeded by prudery in the Victoria era. Examinations of women — and in that sexist era almost all physicians were men — were done “under a sheet in a darkened room” (page 352).⁴ As Tannahill notes, these concessions to feminine modesty might lead to a modern physician losing his licence to practice.⁴ Nevertheless, such cultural factors may have influenced the reception of x-rays by physicians and the public alike, over and above the compelling nature of the technology itself. Certainly the use of technology tells us as much about the times as about disease.

By contrast, radium was actively peddled as a cure-all and even as the aphrodisiac of its day. The ability of radium to destroy tumours suggested that it was a panacea, and it was marketed as “Radithor” and in other ways. Several victims consumed enough radium to die of what was probably radiation-induced aplastic anemia, and the bones of others were still “dangerously radioactive” 50 years later.⁷

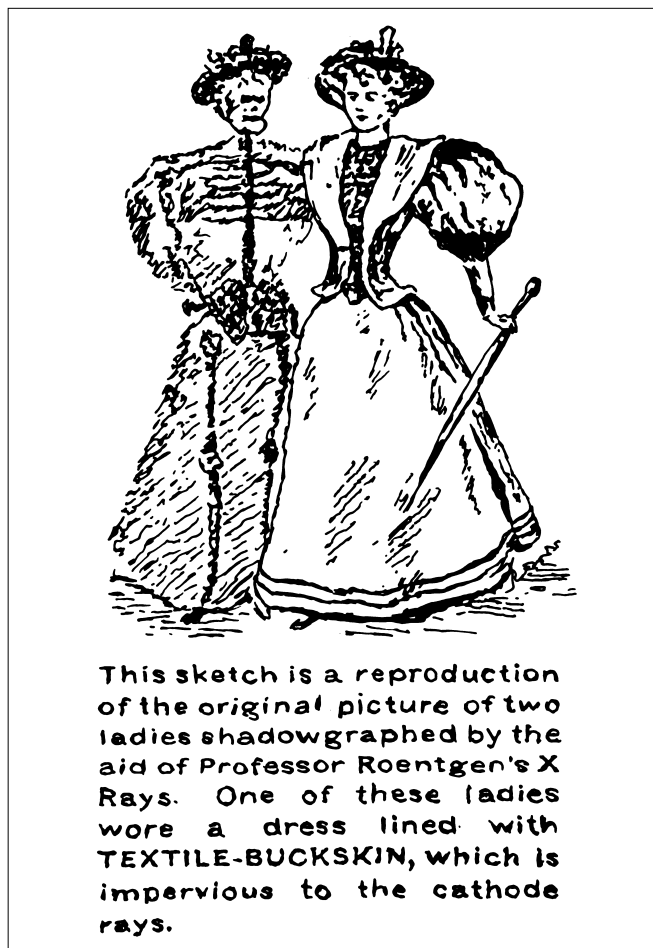


Fig. 1: Advertisement of “the perfect dress interlining” from *The Globe*, Toronto, Feb. 27, 1896.

The usefulness of x-rays as a metaphor has not entirely ceased. As recently as October 1994 *The Globe and Mail* used as its aphorism for the day the following instruction: “If you really want to get in touch with your inner self, have an x-ray.”¹¹ This thought is also a child of its time.

A uniquely Canadian aspect of the introduction of x-rays into the public consciousness derives from the insidious implications of empire and class, as well as the historic tensions between the English and French peoples who came to populate this land alongside its first nations.⁶ The first Canadian experiments with x-rays were done in Montreal, and their use took on particular social overtones there well before the Quiet Revolution.¹² Gingras⁶ has suggested that the introduction of x-rays in Quebec mirrored that province’s social structure. He contrasts the experimental approach to x-rays in the Department of Physics at anglophone McGill University with the approach of Quebec’s French universities, which at the time had a strong tradition of pedagogy but little tradition of knowledge generation and research. Gingras makes the elegant distinction, *en français*, between knowledge *production*, as exemplified by McGill, and knowledge *reproduction*, the approach of the French universities.⁶ Al-

though that social distinction may have been true at the turn of the century, it was rapidly reversed by the pioneering innovations of the Quebec school of radiologists, chiefly at Hôtel-Dieu and Hôpital Jean-Talon.¹³

The use of x-rays in medicine has also come to be symbolic, and much of that symbolism must have to do with the perceived power of technology and imaging. The “turf” skirmishes of our times often centre on imaging procedures, as radiologists seek to protect their specialties against the incursions of cardiologists, neuroscientists, obstetricians and other specialists. Radiologic images have become ubiquitous by 2000, but an indication of their power as perceived by an earlier society is to be found in the proscription of “graven images” in the second commandment of Moses (Exodus 20:4). Given the power of images, which extends to our own day, it is not surprising that although some physicians have only a basic understanding of how an x-ray film or scan is produced, many doctors choose to be photographed against the backdrop of illuminated scans or radiographs. A recent unscientific sampling of a dozen throwaway medical journals indicated that about 20% of the physicians photographed informally were shown in front of radiographic images, whereas only about 11% had books or bound journals as a background; other backgrounds were typically neutral. And this is often where we as individuals are rejecting the impersonality of technology yet both seeking the convenience and power it represents and identifying with that power.

The term “x-ray” is often used by physicians and patients alike to mean the films or radiographs produced by an x-ray exposure. It is usual to refer to a “chest x-ray” but most unusual to hear the term “chest radiograph,” which is the correct description. A patient may thus have an ambiguous relationship with his or her radiograph and may ask “What is the matter with the x-ray?” or “What does the x-ray show?” instead of “What is the matter with me?” Perhaps this is a way of distancing oneself from potential bad news — it is the x-ray that is abnormal, not the person. Using humour to heighten this ambiguity, the comedian Joey Bishop observed “My doctor is wonderful. Once in 1955, when I couldn’t afford an operation, he touched up the x-rays.”¹⁴ That observation is at once funny and poignant, recognizing as it does society’s problem of protecting itself from the economic implications of both maintaining health and treating disease.

X-rays may be intrinsically invisible. Nevertheless, they seem to have provided a penetrating commentary on the social fabric in Canada at the time of their introduction and since, just as their clinical use had offered a penetrating view of the skeleton.¹⁻³ X-ray technology, like every other technology, does not exist independently of the human imagination; rather, it both informs that imagination and becomes part of it, and thus ultimately changes human culture. To some extent medicine and technology exist in different spaces. One is warm and human, rooted in individual values, as it must be. The other may be seen as impersonal and re-

mote. A future challenge for physicians, equally in the radiological sciences as in medicine, will be to reconcile these valid but very different perspectives. Ultimately, both may serve our patients. The choices to be made will test our professional, ethical and humanitarian traditions.

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Dr. Lentle is former Head of the Department of Radiology, University of British Columbia, Vancouver, BC

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Correspondence to: Dr. Brian Lentle, Department of Radiology, Vancouver Hospital and Health Sciences Centre, 855 W 12th Ave., Vancouver BC V5Z 1M9; fax 604 875-4319; blentle@interchange.ubc.ca