BOOK REVIEWS

Practical Radiation in Health Care
The Bunker (BBC Radio 4 programme)

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Practical Radiation in Health Care
C J Martin and D G Sutton (eds)
Oxford University Press

This publication is designed to be a practical guide for persons involved in ionising and non-ionising radiation protection in the healthcare environment. It consists of 407 pages comprising 22 chapters and is arranged into 4 parts.

The first part traces the history of radiation protection in healthcare including the development of radiation safety standards for both ionising and non-ionising radiation. It covers the underpinning physics and technology of ionising radiation protection including the interaction of radiation with matter, its biological effects and detection/measurement. The second part deals with the development of international standards and reveals progress with the implementation of these standards in a selection of countries. It introduces radiation protection principles, the management of radiation protection, risk assessment, practical control measures, monitoring and incidents/emergencies.

The third part deals with radiation protection within the applications of ionising radiations in hospitals. It begins with a valuable consideration of radiation risk and factors that need to be taken into account in the justification and optimisation of medical exposures. The following 7 chapters deal with the areas of application, namely diagnostic radiology (equipment, facilities, patient dosimetry), nuclear medicine (in vivo and in vitro) and radiotherapy (external beam and brachytherapy). Part 4 is concerned solely with non-ionising radiation protection. Within 4 chapters and 80 pages, the hazards (including the biological effects associated with any exposure), relevant guidance and equipment standards are all outlined for lasers, non-coherent optical radiations, electromagnetic fields and ultrasound. The control measures for all NIR modalities are well described. However, the otherwise excellent chapter concerning lasers would have benefited from more detailed description of techniques for measuring laser output and the calibration of instruments used for these measurements.

While the descriptions of the historical, scientific and legislative background to radiation protection described in this book make it a useful publication, its real value lies in the weight of practical experience contributed by 25 authors, many of whom are recognised and established members of the radiation protection community. Some subjects are covered by more than one author within related chapters, which serves to emphasise protection principles and methods and enables the reader to obtain alternative descriptions to improve understanding. Despite the number of authors, the book maintains a consistency of style and there is much useful cross referencing between chapters. Throughout the book, boxes are used to separate specific radiation protection scenarios, model calculations and descriptions of techniques from the text. Much useful data is also provided in tables to enable the reader to complete calculations without reference to further texts. The practical guidance is based on the implementation of ICRP recommendations with particular reference to UK legislation. However, as stated in the opening chapter of part 2, the guidance is generally applicable and can partly be used by radiation protection practitioners in other countries with only minor modification.

In summary, for a very reasonable price you get a great deal of well presented and well indexed information. Due to the breadth and depth of subject coverage, this book is likely to be of value to all persons involved in radiation protection in healthcare regardless of their existing level of knowledge or area of expertise.

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The Bunker
Radio programme in the series Document,
broadcast on BBC Radio 4 at 20.00 on 6th October 2003 (Presenter, Mike Thomson; Producer, Neil George)

Ray Fox is not a well man. He has deserted his house in Earley, a suburb of Reading, and now lives a few miles away. He is convinced that his home is contaminated with radioactive material and that this has made him seriously ill. Ray’s plight was the subject of the BBC Radio 4 programme ‘The Bunker’, part of the investigative series ‘Document’ presented by Mike Thomson.
But what exactly is wrong with Ray Fox and is it a condition that is linked to radiation exposure? Dr Josef Kees, a German physician ‘who specialises in treating victims of chemical and radioactive poisoning’, has examined him. Dr Kees told Mike Thomson that he had found ‘a lot of toxins like slightly raised dioxins ... like Lindane’ in fatty tissue, and ‘uranium in his bloodstream double as high as the accepted normal value’. According to Dr Kees, this seemed to have caused ‘Multiple Chemical Sensitivity’ syndrome, an ill-defined syndrome supposedly produced by environmental exposure to chemicals rather than radiation. We were to hear nothing further of the nature of Mr Fox’s ‘mystery illness’. A web-search reveals that Dr Kees runs a private clinic in Bad Homburg, Germany, specialising in ‘detoxification, induced self tissue repair and restorative medicine’, which probably speaks for itself.

What evidence is there that Ray Fox’s property is highly contaminated? Concerned that he could not grow any plants in his garden and the presence there of ‘white worms’, Ray contacted his insurance company, Sun Alliance, who sent ‘consultant toxicologist’ Dr Kartar Badsha to investigate. A ‘shocked’ Dr Badsha found ‘very high levels of uranium and plutonium, some 55 times background levels’. He advised Ray Fox to abandon his home (‘the worst house I [Dr Badsha] have ever been to’) and that young people should be prevented from entering the house until remediation has been carried out. No details of the measurements that had been conducted to allow Dr Badsha to arrive at this startling conclusion were presented on the programme. A web-search shows that Dr Badsha runs the Environmental Law Centre (‘specialising in protecting your human rights on issues that concern health and the environment’) and MCS (Multiple Chemical Sensitivity) International, both based in Southport.

Retired GP Dr Dick van Steenis, ‘who has dedicated himself to investigating various chemical and radioactive anomalies’ then informed us that the $^{238}\text{U}/^{235}\text{U}$ ratio of the uranium found in the house was 24.5, i.e. 4% $^{235}\text{U}$ enrichment, ‘and this proves that the uranium is actually weapons grade and the plutonium is reactor grade’. How this isotopic ratio was determined and how Dr van Steenis managed to arrive at this staggering conclusion remained a mystery for listeners, but he went on to infer that this indicated the presence of an underground reactor nearby. Dr van Steenis appears to be a campaigner against general industrial pollution, but, as far as I can gather, has no expertise in radiological protection.

The story then developed of a covert underground nuclear reactor at the former Shell site behind Ray Fox’s house. Professor Asef Durakovic, ‘a colonel in the US Army’ and ‘a key speaker at a conference in London on the effects of low level radiation’, briefly told us of his experiences with military reactors and underground bunkers in the USA. Professor Durakovic is now the Medical Research Director of the Uranium Medical Research Centre, an organisation based in North America that specialises in conducting research on depleted uranium. It may be relevant that Drs Kees, van Steenis and Durakovic have all been speakers at London conferences (the most recent being this September) on Multiple Chemical Sensitivity and environmental illness organised by none other than Dr Kartar Badsha.

Enter Dr Christopher Charles Busby, this time in the guise of an ‘environmental physicist’. Dr Busby carried out radiation measurements down a drain in Ray Fox’s garden, and also collected samples for analysis. He was uncharacteristically restrained in his interpretation of the results: the levels were not especially high, but higher than they should be for the outskirts of Reading. Undeterred, Dr Busby returned to the matter raised by Dr van Steenis: ‘The earlier samples showed uranium ratios which contained enriched uranium from a reactor or from a bomb, and that’s it in a nutshell really.’ Again, no details of this surprising isotopic ratio measurement were given.

The presenter, Mike Thomson, seemed to have some difficulty in distinguishing between a nuclear bunker, designed to keep radiation and radioactivity out, and a nuclear reactor, with containment designed to keep them in. (Indeed, the programme might have been better entitled ‘The Reactor’. ) Mr Thomson became increasingly more confused about this distinction and why Shell should have secretly operated an underground reactor at their Earley site. Unfortunately, Shell did not make anyone available for interview, a questionable decision under the circumstances.

Dr Mike Clark of NRPB explained that the reported levels of radioactivity in samples originally taken from Ray Fox’s garden were unusual, although not remarkably so, but that permission to take further samples for analysis had, rather surprisingly, been refused. However, surveys in the vicinity of the Fox residence found nothing anomalous. Dr Clark was highly dubious about the inference that the monitoring results indicated the presence of a covert nuclear reactor.

The only piece of real evidence presented by the programme for the existence of a reactor at
Earley was from an anonymous ‘medical physicist’ who said that he had visited the Shell site regularly and seen the reactor. However, he recalled that bedrooms were situated ‘adjacent to the actual reactor chamber’, which seems a rather odd layout for a nuclear facility. The programme-makers had failed to find anyone to verify this account, and one can only wonder whether this man was mistaken in his understanding of what he had seen at Earley.

Despite the less than persuasive evidence for contamination by a secret nuclear reactor, Green MEP Dr Caroline Lucas suggested that the European Commission should investigate. Let us hope that the results of any investigation by the Commission are given as much publicity as the somewhat diaphanous material that formed the basis of this radio programme. If a nuclear reactor did operate covertly at Earley and caused contamination of Ray Fox’s home it is a very serious matter indeed; but it is not a trivial issue that 30 minutes can be devoted to on national radio to claims of radiation-induced illness based upon information that can only be described as exceptionally thin.

What is to be made of this programme? That the programme-makers were gullible in allowing a band of zealots with little relevant expertise to speak to the central issue of radioactive contamination making Ray Fox ill probably goes without saying. I suspect, however, that laziness played a large part in the programme. Here was a topic that would attract attention without undue effort being expended, and a number of ‘experts’ were conveniently on hand to build the story. Provided no one created problems by asking them any searching questions it was not difficult to fill half an hour with suitably superficial material—an easy way to produce the last programme of the Document series. Disappointing journalism, though.

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