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The History and Science of the Manhattan Project, Second Edition.

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BOOKS AND PUBLICATIONS

All interested medical physicists are encouraged to have their names added to a list of available reviewers. Please rank your interest among radiation therapy, x-ray, imaging, nuclear medicine imaging, ultrasound imaging, MR imaging, radiation injury, radiation protection, and others. Make your interest known to Dimitris Mihailidis, Ph.D., Books Review Editor (dimitris@charlestonradiation.com). Include your name and e-mail address in the body of the response.

The History and Science of the Manhattan Project, Second Edition. B. Cameron Reed, Springer-Verlag, NY, 2014. 472 pp. Price: $39.99. ISBN 978-3-642-40296-8 (hardcover).

This book review will deviate from the typical format of the book reviews published in Medical Physics. I decided to use a free style format here to present and recommend a book that, I know, a number of medical physicists will be interested to read. I was very pleased when the author asked the publisher to send me a copy for review. This is the second book[1] by Cameron that I am reviewing for Medical Physics.[2] I think of Cameron as one of the experts in the physics behind the Manhattan Project. It is a tremendous scientific and technological project that defined and shaped large-scale scientific experimentation, as we today know it. There is vast literature on the history of the Manhattan Project that has been published over the years by many well-known authors, like Richard Rhodes[3] and Jeremy Bernstein.[4] On the other hand, Cameron has managed to bring out the physics principles and methods behind the Little Boy and the Fat Man devices via numerous manuscripts, like his 2011 book entitled, "The Physics of the Manhattan Project."[1] He has also incorporated all that information into an undergraduate college course in Modern Physics.

This new text by Cameron successfully marries the science with the history of the Manhattan Project in 472 pages and 173 illustrations (most of them original). The text has a wonderfully didactic structure that allows for a comprehensive overview of the monumental achievements of science during World War II.

The book is composed of nine chapters. In the preface, the author gives the motivation for undertaking this project, which is supported by literature and web links for you to explore further. Then, we come to the introduction and overview chapter stating what is included in the book.

Chapters 2 and 3 cover the physics principles and scientific achievements since the discovery of radioactivity in 1896 to the current stockpiles of nuclear weapons.

Chapter 4 covers the governmental and military organization of the Manhattan project, strengthen with the possible military applications of nuclear fission.

Chapters 5–7 cover the Uranium and Plutonium bomb designs, the production facilities in the United States, the Los Alamos Laboratory role, the bomb transport, and its delivery. The author very eloquently gives the Trinity test, the Hiroshima Little Boy, and the Nagasaki Fat Man detonations, along with a brief tutorial on bomb effects.

Chapter 8 starts with the military selecting their target destinations. Then, it discusses the service personnel training for the devices delivery, the detail description of the two bomb deliveries with names of personnel involved, and their operations orders.

In the last chapter (Chapter 9), the legacy of the Manhattan Project, with a short discussion on the development of the fusion device and the Soviet program, is included. The book ends with a brief survey of nuclear tests that were performed up to current days, nuclear treaties, and stockpile stewardship.

Each chapter gives a handful of problems with answers and further literature to be read in the form of books, journal articles, reports, websites, and website documents, thus, making the reading experience more interactive. But, what impressed me the most about this book is the multiple historical photographs, letters, and commentaries that Cameron has very successfully embedded in the text.

I definitely recommend this book to anyone who is interested in learning about the history of the Manhattan Project and all the nuclear physics behind the project, which is written in a very approachable and educational way.

[1] B. C. Reed, *The Physics of the Manhattan Project*, 2nd ed. (Springer-Verlag, Berlin Heidelberg, 2011).

[2] D. N. Mihailidis, *The Physics of the Manhattan Project*, 2nd ed., Book Review by D. N. Mihailidis (Springer-Verlag, New York, NY, 2011) [Med. Phys. **38**(8), 1733–1734 (2011)].

[3] R. Rhodes, *The Making of the Atomic Bomb* (Simon and Schuster, New York, NY, 2012).

[4] J. Bernstein, *Nuclear Weapons: What You Need to Know* (Cambridge University Press, New York, NY, 2010).

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