books

"To promote global peace and nuclear disarmament"

Hiroshima and Nagasaki

The Committee for the Compilation of Materials on Damage Caused by the Atomic Bombs in Hiroshima and Nagasaki
706 pp. Basic, New York, 1981. $37.50

Reviewed by Edward P. Radford

In this report, now translated into English, Japanese scientists summarize the consequences of the bombings of Hiroshima and Nagasaki. They believe that everyone should become fully aware of the immediate and long-term effects of nuclear weapons on human life so that lessons learned in Hiroshima and Nagasaki can be transmitted to present and future generations. A major motivation for their preparation of this report was the wish of the survivors in the two cities to use their suffering of nuclear devastation to promote global peace and nuclear disarmament.

The book is a scientific assessment of the physical, medical and psychosocial damage resulting from the bombs. It is especially important because it brings to one place a mass of information. The authors have drawn extensively on books and reports previously published in English, such as Samuel Glasstone's series, *The Effects of Atomic* [later *Nuclear*] *Weapons*, Oughterson and Warren's 1956 Manhattan Project technical report "Medical Effects of the Atomic Bomb in Japan," the large number of papers and reports of the Atomic Bomb Casualty Commission and its successor, the Radiation Effects Research Foundation, and R. E. Lifton's 1967 book *Death in Life*. A large part of the bibliography, however, consists of publications in Japanese, not hitherto known to American readers.

The book is therefore a valuable reference source. It also reports current findings, for as the authors point out, the effects of the bombing are still becoming known. Possible genetic effects of radiation exposures are under continuing investigation; the lingering effect of radiation on cancer rates is yet to be fully assessed; and understanding of the psychological and social impacts of the devastating experience is still evolving. I estimate that as of the writing of the book (1977–78), only about one-third of the cancers that may eventually be attributable to radiation exposures in the two cities had occurred.

Hiroshima, Miyuki Bridge, 6 August 1945, 11 am. This photograph, taken by Yoshito Matsushige, and appearing in the book *Hiroshima and Nagasaki* reviewed here, shows injured people escaping from the city to this point located 2.2 kilometers from the hypocenter of the blast.

The book indicts both the US and Japanese governments. The authors indicate that the principal reason the US dropped the bombs was to demonstrate to the world, especially to the USSR, the power it had. They also criticize the occupation government under MacArthur for suppressing, in the name of military security, all mention of the effects of the atomic bomb even in the Japanese press. The ordeal of the survivors was not widely known at that time even in Japan. The policy of the occupation authorities also made it difficult for Japanese scientists to investigate many aspects of the consequences of the bombing. US military personnel appropriated data collected by Japanese physicists after the detonations and caused a loss of important information. US authorities blocked the production of a film of the aftermath of the bombing being shot by a Japanese team. In October 1945 one photographer was arrested and further filming was prohibited; later footage already prepared was confiscated. Only recently was the film returned to Japan. This policy accounts for the fact that many studies cited in the text were published after 1952, following the occupation. Indeed, it is surprising how much of the bibliography has been quite recently published.

The authors indict the Japanese national government for failing to provide relief to the survivors both right after the bombing and later. Although the occupation was responsible for some of this inactivity, survivors' efforts after the occupation to bring their special medical and social needs to the attention of the Japanese government brought little result. It is ironic that it was the exposure to the crew of the

fishing vessel *Lucky Dragon No. 5* to radioactive fallout from the US H-bomb test at Bikini in March 1954 and the death of *one* crewman caused by radiation that provided the political impetus for the government to accept a special responsibility for the thousands of A-bomb survivors, with promulgation of the A-bomb Victims' Medical Care Law in 1957.

The book begins with a survey of the physical damage caused by the blasts and their aftereffects that incorporates some new information from Japanese sources. The discussion of prompt radiation, responsible for the most serious human radiation exposures in the two cities, is out of date as a result of the revised dosimetric estimates recently made by US physicists. These new results indicate that radiation from the two bombs was quite similar and neutron exposures were much lower than those given in this chapter. The interpretation of neutron-induced residual radiation in the vicinity of the hypocenters (the locations immediately under the detonations) which may also have to be reevaluated, is significant because of the controversy surrounding the radiation exposures of "early entrants" (the thousands who came into the cities within 2 km of the hypocenter in the two weeks after the explosions); it is interesting in view of the recent reevaluation to learn that the neutron-induced radioactivity in the soil and in the bones of human victims measured soon after the bombing indicated clearly that the neutron fluxes for the two bombs were not greatly different.

The second part of the book, the longest, deals with injuries to the human body. The number of casualties produced by these very primitive bombs will probably never be known precisely, but the most recent and authoritative estimates indicate that about one-third of the people in Hiroshima were killed outright, and well over half of those within 2 km of the hypocenter were dead by the end of November 1945. The toll in Nagasaki was less, mainly because severe damage was confined to the Urakami valley by the relatively high hills on either side. Out of the 600 000 people in the two cities at the time of the bombing, total fatalities through the end of 1945 numbered well over 200 000, and probably another 200 000 were injured to various degrees. This proportion of dead and injured greatly exceeded that resulting from incendiary bomb raids previously carried out with even hundreds of planes.

The book continues the overemphasis on leukemia as a radiation-induced cancer that has typified the ABCC-RERF position, even though by 1974 it was obvious that other cancers, including nonfatal cancers, are much more numerous. The analysis of data relating radiation dose and cancer response presented here will also have to be reevaluated in the light of the new dosimetric information. Although radiation-induced cancers are far fewer than early deaths and injuries, the psychological impact of these long-deferred consequences of the bombs should not be underestimated.

Ruins of the Sei Hospital and the Atomic Bomb Dome located directly beneath the epicenter. This photograph by Shigeo Hayashi appears in *Hiroshima and Nagasaki.*

The third part of the book provides much new information on the bombs' impact on society and daily life. These chapters document the breakdown of the social and community services and the extent of casualties among health professionals and city administrators. A somewhat incongruous section on the economic cost of the destruction of property follows. Subsequent sections describe the bombs' long-term psychosocial effects on survivors, including their work experience, economic status and marriage, and the problems of those who lost their families.

In a chapter on the psychological impact of the bombing, the detailed clinical evaluation that is characteristic of earlier chapters gives way to a more subjective exposition. Although the information here consists of a restricted number of summaries of personal histories, the evidence vividly depicts the psychological ordeals of the survivors, individual and collective.

The final chapter in the book describes the development of citizens' groups concerned with the special problems of survivors, such as the microcephalic children irradiated *in utero*, or the "A-bomb maidens," women with disfiguring keloid scars of the face, and the governmental or administrative responses to these problems. The book describes the evolution of groups devoted to abolition of nuclear weapons, sometimes split apart by cold-war politics active in the world at large. Finally, it recounts the efforts of citizens' groups to provide educational materials for presentation in schools, with often discouraging lack of success, even in Japan.

Today, as the Reagan Administration prepares to "modernize" our arsenal of nuclear weapons—incomparably more destructive than the two small bombs dropped on Hiroshima and Nagasaki—and as the Russians deploy their nuclear missiles, these weapons seem to have a malign life of their own, not subject to rational control. For physicists, who invented nuclear weapons and continue to "improve" them, this book—even though it is technically detailed and its material is sometimes confusingly presented—should be required reading. The voices of the A-bomb survivors remind us vividly that a nuclear war today would probably end civilized human life.

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Many-Particle Physics

G. D. Mahan
1003 pp. Plenum, New York, 1981. $85.00

The Physics of Elementary Excitations

S. Nakajima, Y. Toyozawa, R. Abe
332 pp. Springer, New York, 1980. $49.80

Condensed-matter physics is regarded by many, particularly theorists, as the study of interacting many-particle systems. Vigorous development of the field in the last three decades has yielded so many concepts, phenomena and theoretical techniques that graduate students who are about to specialize in condensed matter, or their instructors, face the problem that it is easy to overlook something important. Help has appeared in the form of two new