The case for the defence

Rudolf Peierls

Better a Shield Than a Sword: Perspectives on Defense and Technology.

By Edward Teller. *Free Press, New York/Collier Macmillan, London:1987.*
Pp.257. \$19.95, £17.25.

EDWARD Teller has often been called the father of the hydrogen bomb. Today he deserves the additional title of grandfather of Star Wars, since he is believed to have originated the idea which was publicized by President Reagan. Readers who expect, from the title of his new book, to find a full account of Teller's views on Star Wars, will be disappointed. It is a collection of 33 essays, of which only five are concerned with that topic, including the one that gives the title to the book.

Thirty-nine pages is a short space in which to discuss a controversial subject in depth, and this is aggravated by the fact that the five essays were evidently written for different purposes (we are not told whether and where they were previously published), and there is much overlap and repetition. This section of the book therefore does not add much in the way of new arguments.

Teller makes much of the claim that the Soviet Union is well advanced in research on anti-missile defence, but does not give sources for this information. Presumably it comes from intelligence sources, but American intelligence has been known to exaggerate estimates of Soviet strength, presumably in order to support American defence projects.

The author is too good a physicist to claim that success in developing an effective defence is certain, and this is shown by his use of cautious phrases, for example: "Attempts to deploy a defense will be made only if there is a chance that defense will be less expensive than the compensatory deployment of aggressive weapons or the means to destroy the defenses" (p. 9); or "If we find real cost-effective ways for defense..." (p. 21). Yet in other places he sounds much more positive: "The genie that produced the sword of modern times can also produce the shield" (p. 22); or "Today there is increasing evidence that modern technology can produce successful defense measures" (p. 27). Perhaps the words "increasing evidence" are meant to convey a reservation, but this is not how the average reader will understand them. He is even more definite on page 31: "[the] development [of lasers] has produced the unexpected result of making defense feasible".

Many critics of the project have pointed out that the demands that the anti-missile defence make on computers far exceed in complexity anything so far achieved.

Teller disposes of this argument in rather a cavalier manner by claiming that the American telephone system is much more complex than the required defence management computer. It may be true that the 'phone system connects more subscribers than there are inputs and outputs in the defence system, but the computing functions in the latter are enormously more sophisticated. Moreover, the 'phone companies have to maintain an army of

Edward Teller — too good a physicist.

engineers to correct faults, whereas the defence computer would have to function reliably first time. All its parts could be tested separately, but the functioning of the whole can be rehearsed only in the real battle situation, when it is too late for corrections. There is no discussion of counter-measures, except for the use of decoys; none of the articles mentions the obvious response to laser beams against missiles of making the missiles spin.

I do not believe that these essays will convert any sceptic who doubts seriously whether the vast effort devoted to the Strategic Defense Initiative can make a contribution to anyone's security.

Several essays deal with the history of the atomic and hydrogen bombs, and it is interesting to have the recollections and reflections of someone so closely involved with both. During much of the wartime period at Los Alamos, Teller continued thinking about the hydrogen bomb, although this was not given any priority as it could make no contribution to the war. He explains the reason at one point (p. 53) by saying that Bethe asked him to take charge of the calculations on the implosion but "I refused. I knew there were others better at it. I also wanted to pursue more novel plans, including fusion".

This account agrees with my recollection; I took over that work instead, though I would not claim that I was better at it. However, in another essay (p. 71) we are told that Oppenheimer urged Teller to continue exploring the thermonuclear field, and he says "That was not easy advice for him to give or for me to take". In looking at recollections of events of some forty years ago one has to allow for uncertainties in human memory. Some little absent-mindedness is illustrated by his referring twice (pp. 45 and 205) to his stay at "City College" in London, when he means University College.

The essay "Seven Hours of Reminiscences" is a criticism of the BBC series on Oppenheimer (presumably written at about the time of the screening of that programme) which discusses Teller's view of Oppenheimer, whom he admires but finds hard to understand. It also outlines Teller's testimony at the Oppenheimer security hearings, where, in reply to the question whether he believed Oppenheimer to be a security risk, he explained that he often disagreed with him, and could not understand the basis of his actions: "In this very limited sense I would like to express a feeling that I would feel personally more secure if public matters rested in other hands".

In the essay he summarizes his "reluctant testimony": "I considered Oppenheimer loyal but because his actions appeared confused and complicated I would personally feel more secure if public matters would rest in other hands." At the time, his testimony caused indignation among many of Teller's colleagues, who felt that his reply to the very clearly understood question whether there was a security risk was confused and complicated, and hard to understand.

The essay about the hydrogen bomb stresses in its title "the work of many people" and makes polite references to the contributions of Stanislaw Ulam and others, but leaves no doubt that the important invention was Teller's. "A Ray of Hope" comments enthusiastically on a plan for international control of atomic energy proposed by "a board of consultants to the State Department", although Teller suggests some modifications. This essay must puzzle the reader, until he discovers by looking at the list of copyright credits that it was written in 1946!

Other essays, too diverse to summarize, always present original and unorthodox views, which are interesting to read, whether one agrees with them, as with Teller's view that excessive secrecy does more harm than good, or disagrees, as with his ideas on the possibilities of Civil Defence in a nuclear war. □

Sir Rudolf Peierls is Emeritus Professor of Theoretical Physics in the University of Oxford, Oxford OX1 3RH, UK.