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Military Technology, Armaments Dynamics, and Disarmament

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Clark, Asa A., IV, and Lilley, John F., eds. *Defense Technology*. New York: Praeger Publishers, 1989. 304pp. \$49.95

This book is the result of the 22nd Annual Senior Conference of the United States Military Academy, an informal seminar designed to facilitate an open exchange of ideas on important defense issues. Those experienced in military research and development (R&D) will find this book largely tutorial and remedial, but others may find very valuable its brief, cogent descriptions of how weapons research and procurement have evolved in this country, and how military, technological, and political interests interact with military R&D.

The book provides definition of and context for defense technology, treats the implications of technology on both strategic and conventional forces, (including those of the Nato alliance), and then addresses management of defense technology. Abundant notes and an excellent index will prove valuable for students, but the selected bibliography contains a large amount of old material (apart from the historical classics) and nearly omits all of the contemporary (i.e., mid-1980s and later) work on advances in military technology.

The editors of the book and some of its authors are current or former members of West Point's faculty. The book is therefore oriented toward Army interests, although it attempts to treat defense technology as a generic entity instead of focusing

upon individual service R&D. Surprisingly, few of the book's 18 contributors could be classified either as technologists or senior R&D managers or advisors. The flavor of the book is that cautious perspective of the military operator or strategic planner who knows the repeated disappointments from only partially fulfilled technological promises.

Although those intimately involved in defense technology will be familiar with much of the material covered in this book, even they will find their thinking stimulated and deepened by Colin Gray's chapter on the implications for defense technology of the United States' strategic culture. It is far too easy for technologists and defense planners to ignore the bigger picture within which they work. In the changing world in which we live, this may no longer be a viable way of doing business. As Gray puts it, "the United States has only recently perceived the necessity to live by its wits in an unforgiving security environment." The entire defense community must come to appreciate this reality.

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Brauch, Hans Gunter, ed. *Military Technology, Armaments Dynamics, and Disarmament: ABC Weapons, Military Use of Nuclear Energy and of Outer Space and Implications for*

International Law. New York: St. Martin's Press, 1989. 569pp. \$55

This book is "the first result" of the International Peace Research Association (IPRA) Study Group on Weapons Technology and Disarmament that was established after the IPRA's Eleventh General Conference in 1986. Much of it consists of revised versions of papers presented at that conference. The IPRA is a global scientific organization associated with the International Social Science Council and supported by UNESCO. The book's fourteen authors come mainly from Great Britain and West Germany, with one or two each from the United States, the Soviet Union, Hungary, Japan, Norway, and Barbados. Their formal training draws from six main academic disciplines: physics, aerospace engineering, chemistry, history, international relations, and international law. All have impressive academic backgrounds and have published extensively, and several of them have held important positions within their countries, such as science advisors to their heads of state.

This book is interesting, but it tries to cover so many topics that it left me somewhat frustrated. It focuses on relationships among military technology (one of several driving forces in the arms race), armaments dynamics (a set of hypotheses to explain both national and international aspects of the armament process), and disarmament (a goal of containing arms races among nations). Military technology is

viewed as a stimulus to the arms race and an impediment to arms control and disarmament. The presuppositions of several of the authors, if not most of them, and their general world view seem representative of those associated with various "peace" movements. Although only two of the authors are from the United States, the majority of the book deals with U.S. military technology and the U.S. approach to armaments and disarmament.

The book is organized into five parts. The first develops the context for analyzing military technology in terms of armaments dynamics. The second provides three case studies of military technology developments: third generation nuclear weapons, biotechnology and genetic engineering, and chemical armaments. The third part of the book addresses the history of the nuclear-powered bomber, and the fourth considers ballistic missile defense, especially SDI. The final part contains the views of three lawyers concerning the implications of the military use of outer space on international law.

The book is designed to serve as a resource for university courses in international security, peace, and conflict studies, and probably will be of more interest to students than to other readers since it tends to be a bit pedantic. It contains a number of valuable and useful insights, especially for those who have not yet experienced the complexities of how military and other governmental establishments really work. For example, not only is military tech-

nology advanced by the familiar twins of "technology push" and "requirements pull," but it also is impelled forward by the financial and institutional interests of both industry and the military R&D community. This insight is reflected in the editor's analysis of the SDI program, which addresses political, military, technological, and philosophical factors, including the geographic and organizational distribution of SDI contracts.

For me, the primary value of this book was its stimulation to think more deeply about the relationships among the varied forces and factors that drive armament dynamics. I also found a number of its anecdotes fascinating.

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Garden, Timothy. *The Technology Trap: Science and the Military*. New York: Brassey's Defense Publishers, 1989. 148pp. \$31.50

The title of this book intrigued me. I had hoped it would be a hard-hitting, candid, rigorous examination of those instances in which the military had bought operational concepts based upon faulty technological premises, from which insights could be gained about how to avoid such traps in the future. But that is not the book the author intended. Instead, he explores the past importance of science for the military and suggests some areas in which technology may influence future

warfare. Instead of the lion I had hoped to meet, I encountered only a rather tame pussycat.

Air Commodore Timothy Garden appears well qualified to write a book on science and the military. A pilot with degrees in both physics and international relations, he was Director of Defense Studies for the Royal Air Force from 1982 to 1985. Garden begins the book with lessons from the past about science and warfare. He then discusses science today: high energy physics, computing science, nuclear physics, space technology, chemistry, materials science, biotechnology, and electronics; and concludes with a consideration of warfare in the future: the sea-air battle, the land-air battle, and the aerospace battle.

Although *The Technology Trap* covers a lot of topics and has a number of useful insights, the book is bland. It lacks the detailed discussions which one expects in a serious treatment of the interactions between science and the military. Instead, it reads more like a newspaper article filled with platitudes.

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Spector, Leonard S. *The Undeclared Bomb: The Spread of Nuclear Weapons 1987-1988*. Cambridge, Mass.: Ballinger Publishing Company, 1988. 499pp. \$12.95

Many in the defense community are concerned about the possibility of nuclear war, yet we focus our