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War Without Men: Robots on the Future Battlefield

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attention almost exclusively on the use of nuclear weapons in a war between the United States and the Soviet Union. There is another possibility of nuclear war which we largely ignore. This book is valuable in that it addresses that possibility; it deserves our attention.

Leonard Spector is a senior associate of the Carnegie Endowment for International Peace and has more than a decade's experience in the field of nuclear nonproliferation. He assisted in drafting the 1978 Nuclear Nonproliferation Act, the basic law governing U.S. policy today. This is the fourth volume in Spector's series on the spread of nuclear weapons among the countries that do not officially acknowledge their possession of such weapons. It is a yeoman work, demonstrating both familiarity with the material available on the subject and judicious interpretation of that material. It is probably the most authoritative unclassified source on this topic.

The book does more than simply catalogue the current status of nuclear weaponry in countries around the world. It also addresses trends in nuclear proliferation, the impact of other weapons (such as chemical munitions and long-range rockets) on national interest in nuclear weapons, and the state of nuclear control and safeguard mechanisms.

Spector has done a masterful job of presenting succinct summaries of masses of information about the emerging nuclear weapon nations of Argentina, Brazil, India, Iran, Iraq, Israel, Libya, North Korea, Pakistan, South Africa, and Taiwan.

He is concerned about the trends that he reports, and we should be also. More nations are moving into nuclear power status. Old control and safeguard mechanisms seem less capable today than in the past. The likelihood of combat nuclear weapon use by one of these countries seems to be increasing. Spector concludes that efforts to curb the spread of nuclear arms and to develop mechanisms to constrain undeclared existing nuclear arsenals will be an increasingly difficult challenge.

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Shaker, Steven M. and Wise, Alan R. *War Without Men: Robots on the Future Battlefield.* Washington, D.C.: Pergamon-Brassey's, 1988. 196pp. $19.95

This is the second volume of Pergamon-Brassey's Future Warfare Series. The purpose of the series is to provide policymakers with knowledge concerning emerging warfighting technologies and possibilities. Steven Shaker and Alan Wise have done a very creditable job in their survey of the emerging classes of robots for potential military uses. They have brought between the covers of their book descriptive material on scores of robotic and remotely operated vehicles. This feat alone must have been a herculean task, since much of the information is normally hidden away in obscure

project documents of very limited circulation.

The necessity to categorize and list the various types of vehicles and approaches makes this work more a catalogue than an analytical study. Furthermore, the authors and their editors seriously damage continuity of expression by adopting the practice of inserting in parentheses behind each organization, system or component title the military abbreviation. That is good practice if the object is going to be repeatedly referred to; but, since repeated reference is rare in the text, the practice is an annoyance. In like manner they insist in giving both English and metric units for all dimensions. A literate style should be an objective even in a technical volume.

The titles of the seven chapters demonstrate the scope and organization of the work and, given the recent date of publication, should convince the military professional or hobbyist that the book belongs in his reference library:

1. War Without Men?
2. The Evolution of Military Robotic Systems
3. Current Operational Use and Development of Unmanned Ground Vehicles
4. Current Operational Use and Developments in RPVs (Aircraft)
5. Current Operational Use and Developments in Unmanned Naval Vessels
6. Space-based Robotics
7. Robots on the Future Battlefield.

It seems to this reviewer that the last chapter expanded should be the book, and that the first six chapters should be relegated to the role of technical appendices.

It is important to note that the authors discuss these developments on a worldwide basis—not only American. Perhaps because of security restrictions, they avoid drawing comparisons among the various military establishments with regard to their receptivity to the use of these new military systems. There is brief mention of some ethical questions that arise when robotic systems are injected into the human battlespace, but there is another point that needs to be made in this review and possibly given more emphasis in the book. Shaker and Wise make clear distinction between RPVs—vehicles that are piloted remotely by wire or radio—and robots. The distinction that is not forcefully drawn is between those vehicles that are "rule based" as opposed to those that truly exploit "artificial intelligence." A system based on artificial intelligence is one that can synthesize inputs or data and develop a course of action for which it has not previously been programmed. When the era of these systems begins, it will become incumbent upon the systems designer to give careful thought as to whether man or his robot will be in charge in any given situation. This is one of the dilemmas that we are soon going to encounter in the Strategic Defense Initiative.

Steven M. Shaker and Alan R. Wise deserve our thanks for pre-

paring this useful and thought-provoking reference work.

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Andriole, Stephen J. and Hopple, Gerald W. ed. *Defense Applications of Artificial Intelligence: Progress and Prospects*. Lexington, Mass.: Lexington Books, 1988. 385pp. $65

Over the next few years, smart computer systems will become ubiquitous. They will impact all aspects of the defense world: policy and strategy, resource and force structure decisions, system design and production, and operational planning and execution. Thus, it is important that the entire defense community have at least some level of understanding of artificial intelligence (AI), a topic that many have hitherto relegated to the arcane domain of computer specialists.

Andriole and Hopple have provided us with an excellent introduction to AI as it pertains to defense and a succinct, yet surprisingly comprehensive, status report on defense applications of AI. Consequently, this book is a very valuable resource for both the uninitiated and the person with substantial AI knowledge. It is not AI hype, nor is it overly technical. It is a candid, balanced, well-written, and authoritative assessment. Its score of contributors come from several universities and major defense-related organizations as well as a variety of government R&D activities.

The book is divided into four main sections. The first provides a foundation for understanding AI and its tools and techniques. The second presents the technology-push side of AI's spread within the defense world by presenting a number of specific AI research areas that relate directly to military operations (such as intelligent training systems). The third (and largest) section focuses on the applications-pull of defense needs by presenting a number of AI defense applications, including management of the air-land battle, tactical planning and replanning, SDI, logistics, and tactical command and control. The final section of the book addresses future prospects for AI in defense.

Although the book is oriented toward Air Force and Army applications of AI, this does not diminish its importance for naval officers because its primary value lies in its presentation of the general principles and potential of AI rather than in its descriptions of specific AI applications.

Readers should find this book stimulating.

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Hampson, Fen Olser. *Unguided Missiles: How America Buys Its Weapons*. New York: W. Norton & Company, 1989. 370pp. $19.95