. . . The restrictions of classification have unavoidably blemished our work on some topics. . . .

Atomic Shield, in spite of its limitations, is an important book. Those scientists who are troubled by young people's rejection of science and technology would do well to read it, for the history of the AEC reveals the roots of the discontent: secret research, the development of weapons, the military-university-industrial complex. Scientists were active in these affairs and not always reluctantly. In the shift from the ideal of the peaceful atom to the reality of nuclear weapons lies the painful story of the scientific community's involvement in the shaping of global power policies. This is a tortured history which touches the very condition of life in this country and elsewhere, and many young men and women are demanding that scientists face up to it.

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Rehearsing the Arguments

Preventing the Spread of Nuclear Weapons. First Pugwash Symposium, London, April 1968. C. F. BARNABY, Ed. Humanities Press, New York, 1969. xiv + 374 pp., illus. $9.50. Pugwash Monograph 1.

Implications of Anti-Ballistic Missile Systems. A Pugwash Symposium. C. F. BARNABY and A. BOSERUP, Eds. Humanities Press, New York, 1969. x + 246 pp. $7.50. Pugwash Monograph 2.

These two monographs are the first published proceedings of symposia organized by the Pugwash group for the purpose of exploring specific and well-defined topics in greater depth than is possible at the larger annual Pugwash Conferences on Science and World Affairs. In addition to the papers presented at the symposia, the editors have themselves provided in both monographs background papers and summaries which are useful in integrating the widely diversified and somewhat uneven contributions of the individual participants.

The first of these symposia, on Preventing the Spread of Nuclear Weapons, took place in the spring of 1968, when the Non-Proliferation Treaty (NPT) was in its final stages of negotiation. This treaty, which was originally worked out between United States and Soviet negotiators, had already been significantly modified as a consequence of the strong political objections of other nations to many of its discriminatory features. Many of the papers elaborate on the problems presented by the NPT, but in general the tone of the symposium was more favorable toward that treaty than were the attitudes of many of the governments from which the symposium participants were drawn. However, now two years later, when the NPT has come into force and the rhetoric has largely subsided, it is instructive to look back and refresh the mind about the argumentation of that time.

Mendl (United Kingdom) presents an interesting analysis of the motives for acquiring nuclear weapons, and reminds us that in every case the decision to acquire them was taken without giving any opportunity for public discussion. Several papers review the problems of maintaining safeguards against the diversion of nuclear materials from peaceful uses to weapons, and Prawitz (Sweden) makes a plea for reducing discrimination by requiring such safeguards for countries that have as well as for those that do not have nuclear weapons. Some of these discussions seem dated, with the treaty in force and anti-diversion safeguards being applied in the United States and the United Kingdom, but they are of continuing interest because they deal with what is still the major problem for many nations that have not yet acceded to the treaty.

The summary is particularly useful. It is interesting to see the words of caution against the excessive optimism expressed in many nations at that time concerning nuclear power programs, particularly the peaceful uses of nuclear explosives. Many of these warnings have been substantiated by sobering experiences since 1968. There are also useful reminders that, now that the treaty is in force, nations must push on beyond it if its objectives are to be realized. Perhaps of particular note is the suggestion that the few reactor-exporting countries, upon which most of the rest of the world is dependent, should adopt policies that will closely control the plutonium produced in those reactors, so that it could not easily be turned into weapons if the treaty were abrogated.

In sum, this monograph is a useful reference on the background of the negotiation of the NPT and brings together many of the pertinent documents. It also contains ideas that are still useful for those who are engaged in working toward restriction of nuclear weaponry.

The second monograph, *Implications of Anti-Ballistic Missile Systems,* is somewhat less successful, perhaps partly because of the unfortunate timing of the symposium. In July 1968 both the United States and the U.S.S.R. had just agreed to initiate talks at an early date on limiting strategic arms. During this interim participants from neither nation desired to make any statements that might upset the negotiations or be misinterpreted by the other. In fact Soviet participation was curtailed at the last minute and no papers were given by the Russians. Furthermore, the background material and papers suffer from having been written before the U.S. ABM Safeguard system had been conceived, and they seem scanty by comparison with the deluge of information, and misinformation, that inundated the U.S. public in 1969.

Perhaps of most interest in this volume is the material dealing with the ABM as a defense against a Chinese threat, the rationale which is again becoming popular this year to justify an ABM. D. Carlton from the United Kingdom has an original discussion favoring a limited ABM for the United States and the Soviet Union to protect against a spasm attack by a third nuclear nation. He argues that the capability for such an attack should be eliminated and in this connection urges the United Kingdom to give up its strategic nuclear force. He believes that other nations, which might not forego such a capability on their own, might be kept from an irrational act by a limited ABM. In making his case he categorizes the arguments of the opponents of ABM's as irrational, but neglects to consider that any leader who was so irrational as to order a spasm attack might not be deterred by an ABM of unknown capability. A number of other authors are less impressed with the usefulness of such an ABM system and point out its defects.

In sum, this monograph contains some interesting discussions, but it does not offer much that is new to those in

the United States who have become steeped in the subject as a result of the debates on the ABM here during the last year.

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Massive Investments

The Economy of Death. RICHARD J. BARNET. Atheneum, New York, 1969. vi + 202 pp. $4.95.

The Politics of Weapons Innovation. The Thor-Jupiter Controversy. MICHAEL H. ARMACOST. Columbia University Press, New York, 1969. xiv + 306 pp. $10. Institute of War and Peace Studies.

Barnet's compelling essay indicts the economy of a nation preoccupied with security and defense for a generation; Armacost gives us a study in miniature of the political process in the Thor-Jupiter missile controversy. The two books go together in a curious way. Armacost shows us good and sincere men seeking the best response to new strategic needs. Barnet, on the other hand, argues that such men have over 20 years created a grotesquely distorted society which is about to devour itself.

Barnet, a founder and codirector of the Institute of Policy Studies, Washington, served during the Kennedy administration in the Arms Control and Disarmament Agency. In this book he dismantles the basic assumptions of the defense budget. He sees the inevitable and early demise of the system, but only after a renewed climax of struggle. He draws up the battle plan to redirect American priorities away from military mysticism.

> There is no way to fix a rational limit to defense spending other than by the application of old-fashioned political judgment and moral insight. Unless the American people begin to ask and keep asking what real security they are buying, there is no hope of stopping the mindless expansion of the war machine.

For a generation no project of the military, no matter how massive the investment, roused any significant interest group to ask that challenging question. Every new weapon system has been presented to the public doubly wrapped, "an inside wrapping of baffling technical detail, and on the outside, the flag." But suddenly the opportunity for change is at hand. The reversals of Vietnam policy and the revolt of submerged social groups have suddenly made it possible to cast off "the economy of death." Barnet writes a powerful, staccato prose. The essays in this slim volume strike sure and terrible blows against the Cold War way of life.

Armacost's book is one of a series of studies sponsored by the Institute of War and Peace Studies of Columbia University. It is an excellent addition to the list. Although dealing with the early years of the missile race (mid-1950's), it is as fresh and topical as if the events were just happening—and in a sense the ABM controversy is reenacting the struggle.

The treatment in this study is unemotional and comprehensive. The process of policy making is skillfully recounted. The verbal and rhetorical dimension of policy represents a search for consensus among the power groups involved in formulation and execution. All participants have a high degree of autonomy and are summoned into combat by the necessity of responding to a new strategic need. All the agencies articulate demands and present them as programs to those legally and politically capable of authorizing action. They mobilize support for their programs through persuasion and bargaining. They seek to transform their recommendations into policy through the various channels of influence in the policy-making process. Like interest-group activity in any political system, inter-service politics is conditioned by the substance of existing policy, by the prevailing procedures for policy making, by the culture norms that constitute the political ground rules, and by the environment of policy making, that is, the external parameters to which the new policy must respond.

The struggle for operational control of the emerging missile systems is a classical drama of new technology and its painful assimilation into human affairs and national policy. The study delves into the incentives giving rise to the development of two separate intermediate-range missile systems, one by the Air Force, the other by the Army, and describes the struggle for operational control of both research and development and eventually deployment. It looks at and evaluates the dilemmas of collaboration and competition in the development of the system. Finally, it considers the international diplomacy of deploying the system and the impact of the learning process on both the strategic reformulation and the reorganization of the nation's space efforts in 1958.

The Thor-Jupiter controversy affords an excellent case study of public decision making under conditions of strategic indeterminacy. The goals and requirements of strategy and policy were not fully grasped and were themselves the subject of dispute. The facts were complex and poorly understood and the goals contradictory and multiple. The controversy offers an opportunity in microcosm to view the learning process forced upon the nation by new technology.

It is no secret that Washington is a jungle of quasi sovereignties in which conflict is continuous, necessary, and ubiquitous, although not total. The reality principle emerges from the process of political infighting itself, involving all kinds of institutions and individuals in and out of government. Thus there is no substitute for politics in the process of choice.

Both books are highly pertinent, and they are mutually illuminating. The Armacost study provides a humanistic insight—good men working to achieve legitimate purposes can, through fate and events, create a monstrously distorted set of values and institutions which ultimately—now, as Barnet so compellingly argues—requires reform and change.

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Living with Radioactivity

Biological Implications of the Nuclear Age. Proceedings of a symposium, Livermore, Calif., March 1969. Division of Technical Information, U.S. Atomic Energy Commission, Oak Ridge, Tenn., 1969 (available as CONF-690303 from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Va.). x + 342 pp., illus. Paper, $3. AEC Symposium Series, vol. 16.

When hydrogen bombs began to be tested in the Pacific in 1954, and reports of fallout started to appear, many scientists became increasingly worried about the possible long-term hazards to mankind, particularly because so little was known about the effects of