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Boskey & Willrich: Nuclear Proliferation: Prospects; and Willrich: Civil Nuclear Power and International Security

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NUCLEAR PROLIFERATION: PROSPECTS FOR CONTROL. Edited by Bennett Boskey and Mason Willrich. New York: Dunellen. 1970. Pp. xvi, 191. \$7.50.

CIVIL NUCLEAR POWER AND INTERNATIONAL SECURITY. Edited by Mason Willrich. New York: Praeger. 1971. Pp. xvi, 124. \$10.

The conclusion of the nuclear Non-Proliferation Treaty¹ was only a beginning. In some ways, this was apparent on its face. Article III called for the negotiation of safeguards agreements with the International Atomic Energy Agency (IAEA) to verify that nuclear materials were not being diverted from peaceful nuclear activities to nuclear weapons or other nuclear explosive devices.² Article IV

1. [1970] 1 U.S.T. 483, T.I.A.S. No. 6839 (effective March 5, 1970). The treaty is appended to both books. As of November 15, 1972, there were seventy-five parties and twenty-nine other signatories to the treaty, including several key countries that are expected to ratify it in 1973. For the official United States explanation of the text, see *Hearings on Non-Proliferation Treaty Before the Senate Comm. on Foreign Relations*, 90th Cong., 2d Sess. (1968). For a history of the negotiations, see U.S. ARMS CONTROL AND DISARMAMENT AGENCY, No. 48, INTERNATIONAL NEGOTIATIONS ON THE TREATY ON THE NON-PROLIFERATION OF NUCLEAR WEAPONS (1969). See generally M. WILLRICH, NON-PROLIFERATION TREATY: FRAMEWORK FOR NUCLEAR ARMS CONTROL (1969); Bunn, *The Nuclear Non-Proliferation Treaty*, 1968 WIS. L. REV. 766; Firmage, *Treaty on the Non-Proliferation of Nuclear Weapons*, 63 AM. J. INTL. L. 711 (1969); Willrich, *The Treaty on Non-Proliferation of Nuclear Weapons: Nuclear Technology Confronts World Politics*, 77 YALE L.J. 1447 (1968).

2. Guidelines for such negotiations were formulated in 1970 and 1971 by the Safeguards Committee of the IAEA (to which forty-seven countries sent representatives) and were published by that Agency as INFCIRC/153 (1971). See Eklund, *Disarmament and International Control*, 22 IMPACTS OF SCIENCE ON SOCIETY 263 (1972); Imai, *Nuclear Safeguards*, Adelphi Papers No. 86 (1972). A substantial number of safeguards agreements have been negotiated on the basis of these guidelines.

held out the prospect of increased international cooperation in the peaceful uses of nuclear energy. Article V contemplated future arrangements under which nuclear-weapon States would share any benefits of peaceful applications of nuclear explosions. Article VI called for good faith negotiations toward cessation of the nuclear arms race.³ Article VII encouraged regional agreements to exclude nuclear weaponry.⁴ And article VIII called for a conference of parties in 1975 to review the operation of the treaty.

Other matters whose subsequent occurrence was known to be vital to achieving the objectives of the treaty included: adherence to the treaty by the greatest possible number of near-nuclear powers, which involves satisfying such powers that their security, economic and political interests would not be impaired by joining the treaty;⁵ development of civilian nuclear power in ways consistent with the objectives and effective verification of the treaty;⁶ establishment of effective national safeguards systems;⁷ improvement in safeguards techniques and instrumentation; and adequate support of the IAEA and its safeguards activities.

3. The principal forums for such negotiations are the Conference of the Committee on Disarmament (CCD) in Geneva; the First Committee of the U.N. General Assembly; the SALT negotiations, now being conducted in Geneva; and the negotiations scheduled to begin on Mutual and Balanced Force Reductions in Europe. For texts of the agreements concluded to date, see U.S. ARMS CONTROL AND DISARMAMENT AGENCY, ARMS CONTROL AND DISARMAMENT AGREEMENTS, 1959-1972 (1972).

4. The one such agreement concluded to date is the Additional Protocol II to the Treaty for the Prohibition of Nuclear Weapons in Latin America, [1971] 1 U.S.T. 754, T.I.A.S. No. 7137 (effective May 12, 1971). For a history and explanation by its principal progenitor, see A. GARCÍA ROBLES, *THE DENUCLEARIZATION OF LATIN AMERICA* (1967). See Robinson, *The Treaty of Tlatelolco and the United States: A Latin American Nuclear Free Zone*, 64 AM. J. INTL. L. 282 (1970), for an excellent legal analysis. See also *Hearings on Additional Protocol II to the Treaty of Tlatelolco Before the Senate Comm. on Foreign Relations*, 91st Cong., 2d Sess. (1971).

5. See UNITED NATIONS, *EFFECTS OF THE POSSIBLE USE OF NUCLEAR WEAPONS AND THE SECURITY AND ECONOMIC IMPLICATIONS FOR STATES OF THE ACQUISITION AND FURTHER DEVELOPMENT OF THESE WEAPONS* (1968); UNITED NATIONS ASSOCIATION OF THE UNITED STATES, *STOPPING THE SPREAD OF NUCLEAR WEAPONS* (1967); STOCKHOLM INTERNATIONAL PEACE RESEARCH INSTITUTE, *THE NEAR-NUCLEAR COUNTRIES AND THE NPT* (1972). See also UNITED NATIONS ASSOCIATION OF THE UNITED STATES, *SAFEGUARDING THE ATOM: A SOVIET-AMERICAN EXCHANGE* (1972).

6. For discussion of the implications of such developments as breeder reactors and controlled fusion, see M. WILLRICH, *GLOBAL POLITICS OF NUCLEAR ENERGY* (1971). For background on enriched-uranium technology, see Appendix 2 to *THE NEAR-NUCLEAR COUNTRIES AND THE NPT*, *supra* note 5. Continuously fueled natural-uranium reactors and reactors using highly enriched uranium are both alluded to in Mr. Gilinsky's portions of the books here under review.

7. The guidelines developed for the Nuclear Non-Proliferation Treaty safeguards presuppose an effective national system of materials accountability. International safeguards do not attempt to provide for the physical security of nuclear materials, which is the responsibility of national systems; but the IAEA recently issued some Recommendations for the Physical Protection of Nuclear Material. At the November meeting of the Atomic Industrial Forum in Washington, D.C., Professor Willrich made a provocative speech on the latter problem, foreshadowing a book to be published under his editorship in 1973, entitled *INTERNATIONAL SAFEGUARDS AND NUCLEAR INDUSTRY*. See also

Nuclear Proliferation: Prospects for Control is a good introduction for the general reader to these topics. In the opening section of the book, Adrian Fisher and George Bunn—two of the chief architects and negotiators of the treaty—explain its objectives and rationale, and assess the prospects for effectively limiting “horizontal” proliferation, the spread of control over nuclear weapons to additional countries. Balance is provided by George Rathjens’ chapter on controlling “vertical” proliferation, the nuclear arms race among the nuclear-weapon States. He introduces many of the basic issues in the SALT negotiations.⁸

Roughly one third of the book is devoted to safeguards. Victor Gilinsky’s chapter on the nuclear fuel cycle and the military potential of civilian nuclear power provides a lucid background on this subject. Herbert Scoville explains the technical capabilities of safeguards, and John Palfrey comments on the extent to which safeguards can be expected to provide assurance against cheating. A chapter by Lawrence Scheinman on the political hurdle of reaching a mutually satisfactory safeguards agreement between Euratom and the IAEA illuminates problems that since appear to have been successfully surmounted.⁹

Two chapters are devoted to the problem of peaceful nuclear explosions. Chapter 8, by David Brooks and Henry Myers, is a much-needed corrective to the overselling of the Plowshare program.¹⁰ For example, with respect to the stimulation of natural gas by nuclear explosives, it points out that, to produce five per cent of the current annual United States consumption of natural gas by this

PREVENTING NUCLEAR THEFT: GUIDELINES FOR INDUSTRY AND GOVERNMENT (R. Leachman & P. Althoff ed. 1972).

8. See R. McNAMARA, *THE ESSENCE OF SECURITY* (1968) (the chapter on “Mutual Deterrence” contains the seminal statement of the basic rationale for strategic arms limitation); G. RATHJENS, *THE FUTURE OF THE STRATEGIC ARMS RACE: OPTIONS FOR THE 1970’s* (1969) (for a full treatment of the topic); H. SCOVILLE, *MISSILE MADNESS* (1970) (for a popularized discussion).

9. After prolonged negotiations, an agreement between these two international organizations was reached and approved by the governing bodies of each in September 1972. Formal signature of the agreement by these bodies and by Germany, Italy, and the Benelux countries is expected in the near future.

10. The most touted application of nuclear explosives for many years was the nuclear excavation of a new sea-level canal through the Isthmus of Panama. After intensive study by the Atlantic-Pacific Interoceanic Canal Study Commission, extending over four years and costing 22 million dollars (of which 17.5 million dollars were devoted to investigating two routes for which nuclear excavation had been proposed), the Commission recommended conventional excavation of another route. The original cost estimate for the most promising route for nuclear excavation was 750 million dollars. Based on its study, the Commission raised this estimate to 3 billion dollars, which was higher than its estimate for the conventionally excavated route. The report added, “Nuclear excavation is not yet a proven construction technique and there is no assurance that construction plans and cost estimates based on present knowledge are valid.” *REPORT OF THE ATLANTIC-PACIFIC INTEROCEANIC CANAL STUDY COMMISSION* 174 (1970).

means would require approximately 1,000 nuclear explosions—more than the total number of announced nuclear weapons tests conducted in the world to date. Again, for the creation of underground cavities to store natural gas, it suggests that another 1,000 nuclear explosions would be needed to meet twenty-five per cent of the estimated new storage capacity requirements. The second chapter on Plowshare—by Bernard Bechhoefer—discusses possible international arrangements to help implement article V of the Non-Proliferation Treaty.

The final section of the book addresses the troublesome problem of security assurances, including security guarantees, alliances, troop deployments, and dissemination of nuclear weapons (while retaining custody and control)—all of which look toward increased commitments by the United States at a time when this seems hardly in the cards. But the chapter by Joseph Coffey points out that shifts in perceptions of the threat and changes in emphasis in our military doctrine and programs could also help with this problem. In the final chapter, Richard Falk considers the potential of undertakings to preclude the initiation of the use of nuclear weapons.¹¹

All in all, this is a good, well-rounded, short work on the many-faceted non-proliferation problem. It is much meatier than *Civil Nuclear Power and International Security*, which is based on a three-day symposium held at the University of Virginia in May 1970. The three papers discussed there included one by Victor Gilinsky—basically the same as his paper in the earlier book—on the military potential of civil nuclear power; one by Douglas George and Ralph Lumb on international safeguards, which adds some fresh insights to the coverage of this subject in the earlier book;¹² and a somewhat pessimistic view by Leonard Beaton of the prospects for non-proliferation in light of the ever-increasing availability of weapons-grade nuclear material coupled with what he sees as the economic and political realities.

Thus, the subject matter of this latter publication overlaps, but is far less extensive than, that in the first book. What it does add is an edited paraphrase of the discussion of these papers by distinguished individual panelists from the IAEA, Euratom, the United

11. See also Ullman, *No First Use of Nuclear Weapons*, 50 FOREIGN AFFAIRS 669 (1972). The only existing treaty containing an explicit undertaking not to use or threaten to use nuclear weapons against certain other countries is Additional Protocol II to the Treaty for the Prohibition of Nuclear Weapons in Latin America, to which the United States and the United Kingdom are parties. See note 4 *supra*. In November 1972, the Chinese People's Republic issued and circulated to the U.N. General Assembly a declaration paralleling the undertakings in this Protocol.

12. It should be noted, however, that the safeguards documents set forth in the appendix have in large measure been supplanted by the guidelines referred to in note 2 *supra*. This also reduces the utility of ATOMIC SAFEGUARDS: A STUDY IN INTERNATIONAL VERIFICATION (1971) by Allan McKnight, former Inspector General of the IAEA.

Kingdom, the U.S.S.R., Germany, Japan, Canada, Sweden, India, and the United States. This record of their discussion may give the reader some feel for the various viewpoints represented, but it could not do so in anywhere near the depth of the remarkable negotiations held in Vienna in 1970-1971, which resulted in a broad international consensus on detailed guidelines for the safeguards agreements called for by the Non-Proliferation Treaty.¹³ While the latter was only open to official representatives (including some of the panelists), it was where the action was, and the Virginia symposium had no discernible impact on that action. Although the panelists' comments in this book do suggest a few lines of inquiry worth further pursuit, the first book is far more useful for most readers.¹⁴

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13. See note 2 *supra*.

14. For an interesting analysis of the full range of post-war arms control agreements, see E. STEIN, *IMPACT OF NEW WEAPONS TECHNOLOGY ON INTERNATIONAL LAW: SELECTED ASPECTS*, 1971-II *ACADÉMIE DE DROIT INTERNATIONAL, RECUEIL DES COURS* 223 (1971). Among foreign books relating to non-proliferation, G. DELCOIGNE & G. RUBINSTEIN, *NON-PROLIFÉRATION DES ARMES NUCLÉAIRES ET SYSTÈMES DE CONTRÔLE* (1970), presents some new perspectives on the subject. See also G. FISCHER, *THE NON-PROLIFERATION OF NUCLEAR WEAPONS* (1972); W. WENTZ, *NUCLEAR PROLIFERATION* (1968) (argument for selective proliferation, since outlawed by the treaty).

It should be noted that Professor Willrich was formerly a colleague of the reviewer in the U.S. Arms Control and Disarmament Agency, as were the following other authors cited herein: Adrian Fisher, George Bunn, Herbert Scoville, George Rathjens, Henry Myers, and Davis Robinson.