THE SPREAD OF NUCLEAR WEAPONS
1989–1990

NUCLEAR AMBITIONS

LEONARD S. SPECTOR

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Nuclear Ambitions

The Spread of Nuclear Weapons 1989–1990

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with Jacqueline R. Smith

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Foreword

This is the fifth in the Endowment's series on the spread of nuclear weapons. Through these reports, the Endowment seeks to increase public awareness of the fact and the danger of nuclear proliferation and to stimulate greater attention to this vital issue by policymakers, the media, and the scholarly community.

The series was initiated with the publication of *Nuclear Proliferation Today* (covering developments in 1984) and continued with the issuance of *The New Nuclear Nations* (covering 1985), *Going Nuclear* (covering 1986), and *The Undeclared Bomb* (covering 1987 and 1988). *Nuclear Ambitions* updates these prior volumes with an examination of proliferation trends as of the summer of 1990.

Much has changed in the field of nuclear proliferation since the Endowment began its surveys. In South Asia, Pakistan has emerged as a *de facto* nuclear power, ending the regional nuclear monopoly India had enjoyed since its 1974 test. Today, as U.S.-Soviet relations enter a new era of cooperation, India and Pakistan are near the brink of war. Indeed it is not far-fetched to suggest that in 1990 the Subcontinent replaced Europe as the most likely arena of conflict between nuclear-armed foes.

In the Middle East, Mordechai Vanunu's revelations in 1986 confirmed long-standing speculation that Israel possessed a sizeable nuclear arsenal. Though it remains the region's only nuclear power, the growth of its adversaries' chemical weapon and ballistic missile capabilities has made Israel's cities increasingly vulnerable and has dramatically reshaped the strategic balance in the area. As Iraq's bellicosity has increased in recent months, the threat of a war that could escalate to the nuclear level is becoming a palpable danger in this region, as well.

Since 1984, North Korea's pursuit of a nuclear weapons capability has also become a source of growing concern. If the North's nuclear advances continue, Seoul's now-dormant interest in nuclear arms will inevitably be rekindled.

Pressures would also mount in Japan for increased defense expenditures, and conceivably for a reexamination of the country's non-nuclear stance. Such developments could have consequences of global significance.

As unsettling as these trends may be, other developments suggest that the threat of nuclear proliferation can be reduced under the right circumstances. If South Africa soon joins the Non-Proliferation Treaty, as is widely anticipated, its decision will be the result of a combination of domestic political change, regional accommodation, and non-proliferation diplomacy and regime-building by interested outside parties. Similarly, in Latin America, a confluence of positive developments in the political and security arenas led Argentina and Brazil to initiate a series of reciprocal visits to nuclear installations in 1987, a confidence-building measure which has greatly eased the two countries' long-standing nuclear rivalry. In a related area, American efforts through the Missile Technology Control Regime led Egypt and Argentina to withdraw from the Condor II missile program, which they were pursuing with Iraq, a result that again illustrates that in some instances, the trend toward further proliferation can be arrested.

These accomplishments may prove impossible to replicate in some other settings. Nonetheless, they demonstrate the importance of active non-proliferation diplomacy and the value of international norms, during a period when extraordinary changes on the international scene may offer new opportunities for slowing the spread of nuclear arms and related capabilities.

Leonard S. Spector, the Director of the Endowment's Nuclear Non-Proliferation Project, has been the author of the previous volumes in this series. He prepared *Nuclear Ambitions* with the assistance of Jacqueline R. Smith, the project's Assistant Director. A Senior Associate at the Endowment, Mr. Spector has worked in the field of nuclear non-proliferation for more than ten years, first at the Nuclear Regulatory Commission, and then as Chief Counsel of the Senate Energy and Nuclear Proliferation Subcommittee. His writings on non-proliferation issues have appeared widely. Before joining the Endowment, Ms. Smith was a project manager at Science Applications International Corporation, where she supported the U.S. Commander-in-Chief, Pacific, on a number of projects related to nuclear issues in the region. She has also served as a congressional staff aide in both the House and Senate.

As always, Endowment sponsorship of this report implies a belief only in the importance of the subject and the credentials of the authors. The views expressed are theirs. Comments or inquiries are welcome and may be addressed to the Carnegie Endowment for International Peace, 2400 N. St., N.W., Washington, D.C. 20037-1153.

Thomas L. Hughes
President
Carnegie Endowment
for International Peace

Preface

Like its predecessors in the Endowment's series on nuclear proliferation, *Nuclear Ambitions* surveys the status of nuclear developments in each of the emerging nuclear states, in a country-by-country format.

Every volume after the first—*Nuclear Proliferation Today* (New York: Vintage Books, 1984)—has also included an in-depth look at a particular facet of the nuclear proliferation problem. In the second volume of the series, *The New Nuclear Nations* (New York: Vintage Books, 1985), the thematic chapter described the many facets of clandestine nuclear trade under the title, "The Nuclear Netherworld." The lead chapter in the third volume in the series, *Going Nuclear* (Cambridge, Mass.: Ballinger Publishing Company, 1986), examined the risks of nuclear weapons or related nuclear assets being suddenly transferred from one regime to another as the result of war, revolution, or coup d'état. It used the rubric "nuclear inheritance" to describe this phenomenon, and reviewed relevant historical episodes in French Algeria, China, Vietnam, and Iran. The thematic chapter of the fourth volume, *The Undeclared Bomb* (Cambridge, Mass.: Ballinger Publishing Company, 1988), was devoted to the growing nuclear delivery capabilities of the emerging nuclear states. In the current survey, several of these themes are revisited in a new section entitled, "Global Trends," which also examines a number of additional topics, including the impact on nuclear proliferation of the dramatic changes in U.S.-Soviet relations.

Over time, the country-by-country studies have been expanded to give greater emphasis to domestic political developments in the emerging nuclear states and to the security concerns that give rise to their nuclear ambitions. In addition, the list of countries surveyed has grown. In *Going Nuclear*, a chapter on Iran was added after research disclosed that elements of Iran's Revolutionary Government had demonstrated an interest in acquiring nuclear arms. In the current volume, a chapter on North Korea has been included for

the first time, in view of that country's growing nuclear capabilities.

Some revision of the historical analyses contained in earlier volumes has also been necessary, as relevant new evidence has surfaced. The notes indicate instances in which new information has led me to alter conclusions reached in a prior volume.

A word concerning the methodology I have used in preparing these surveys is also in order. The nuclear capabilities and intentions of the emerging nuclear states are shrouded in considerable secrecy. To build up a picture of the nuclear status of many of the countries at issue has therefore required a considerable amount of interpretation on my part. Through footnotes and explanations in the text, I have attempted to be as clear as possible about the basis for my conclusions, which, broadly speaking, rely on press reports, official statements and publications, and interviews—both on- and off-the-record—with U.S. and foreign officials.

In several cases, I have given particular weight to investigative reports by well-known journalists. Before doing so, however, I have attempted insofar as possible to confirm the substance of the report with knowledgeable official sources. When I have not been able to obtain such confirmation, I have treated the report as more speculative; suggested it represents a minority view; or, in some instances, chosen not to rely on it at all.

In preparing *Nuclear Ambitions*, I have had the good fortune of sharing authorship with Jacqueline R. Smith, the Assistant Director of the Endowment's Nuclear Non-Proliferation Project. This volume has been greatly enriched by her insights, analysis, and independent research. While her contribution with respect to North Korea, the emerging nuclear suppliers, and the spread of nuclear submarine programs are particularly noteworthy, the entire manuscript has benefitted greatly, in both substance and style, from her critical judgment and deft editorial hand.

Nuclear Ambitions has been prepared under the auspices of the Carnegie Endowment for International Peace. The project has been sustained by grants from the Carnegie Corporation of New York and the Rockefeller Brothers Fund. I greatly appreciate their generous support for this endeavor. I would also like to thank the Endowment's President, Thomas L. Hughes, for his continuing commitment to this project.

I am also greatly indebted to Ms. Betsy Hamilton, who has served as administrative assistant to this project for the past three years and has endured the hardships of helping bring forth two volumes in this series. In addition to her organizational and editorial contribution, her generosity and good spirits sustained the rest of us working on this project through many a difficult moment.

The work of four successive Carnegie Endowment interns, Felicia Wong, John Shields, Geoffrey Ritts, and Joel Kuester, was also essential to this effort. During their respective six-month stints, all four suffered the trials of maintaining the Non-Proliferation Project's ever-growing information base—the raw materi-

al for this book—and undertook research on a number of important topics. In addition, Messrs. Ritts and Kuester provided invaluable editorial assistance during the drafting and production phases. All of them have my sincere thanks.

I would also like to express my appreciation to Larry Fabian, Secretary of the Endowment, and to Pauline Baker, Mario del Carril, Gillian Gunn, Selig Harrison, Geoffrey Kemp, and Paul Kreisberg—all Carnegie Endowment Senior Associates—for their thoughtful comments on the manuscript and concerning the political and security questions confronting many of the countries discussed in this volume. And, once again, Jane Lowenthal and her assistants Lynn Meininger and Chris Henley at the Carnegie Endowment library proved that no research material, however obscure, could long escape their well-honed tracking skills. Thanks too to Mike O'Hare, the Endowment's chief administrative officer, for his help with staffing and for his infectious good cheer.

I would also like to express my thanks to Dr. Barry M. Blechman, who served as senior editorial advisor to the project and who first identified the need for a periodic survey of developments in this field.

In addition, *Nuclear Ambitions* has been greatly benefitted by an informal group of advisors that assisted in reviewing the manuscript. In addition to Dr. Blechman, the group included Dr. Joseph Nye, Director, Center for International Affairs, Harvard University; Dr. Albert Carnesale, academic dean, John F. Kennedy School of Government; and Mr. Charles Van Doren, former assistant director of the Arms Control and Disarmament Agency. I greatly appreciate their contributions in enhancing the text's balance and comprehensiveness. The judgments and views contained in this report, however, are my own and the participation of these individuals does not necessarily constitute an endorsement on their part of specific statements or conclusions.

In addition, a number of specialists provided important assistance that I would like to acknowledge, including David Albright, Joseph Bermudez, W. Seth Carus, Gary Milhollin, Harald Mueller, Randy Rydell, Warren Donnelly, and Peter Zimmerman.

My thanks also to the many investigative journalists whose work is cited throughout this volume. Without their contributions, this work could not have been written.

Finally, I wish to thank William Jackson for his fine copy-editing of the manuscript; Holly Horner, for her care in setting the manuscript into type; Diana Reganthal for her preparation of the index; and Brad Wye and Rick Clark, who prepared the maps used in the text.

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Carnegie Endowment for
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July 1990

Contents

Part I
Global Trends

As the 1990s began, dramatic changes were taking place within the international system, particularly in the area of U.S.-Soviet relations. A number of these developments will have an important impact on nuclear proliferation. At the same time, the spread of nuclear weapons and related capabilities has, itself, become an important engine of change on the international scene, recasting the strategic balance between rival states in several conflict-prone areas and redefining relations between the major powers and a number of their regional counterparts.

The country-by-country analyses that make up the bulk of this volume describe many of these developments from the narrow perspective of individual countries with demonstrated nuclear ambitions. In addition, however, certain common themes have emerged that warrant examination with a wider, more generic focus. This chapter adopts such a comprehensive global perspective to examine five important trends:

- The steady, though largely concealed, advances of undeclared nuclear weapon efforts in the developing world—efforts which increasingly involve countries hostile to the United States and through which new nuclear nations are now striving to progress well beyond rudimentary nuclear forces;
- The expected impact of changing U.S.-Soviet relations, in such areas as arms control and regional competition, on the spread of nuclear arms;
- Changing patterns in the proliferation of ballistic missiles and their impact on the spread of nuclear weapons;
- The critical dependence of undeclared nuclear weapon programs on clandestine nuclear commerce involving the industrialized nuclear supplier countries, and the growing potential of "second-tier" nuclear supplier countries to assist such programs; and

- The increasing interest of non-nuclear-weapon states in nuclear-powered submarines, a development likely to have an important long-term impact on the spread of nuclear weapon capabilities.

These trends are analysed separately in the five chapters that follow.

*

(Newcomers to the field of nuclear proliferation are encouraged to read Appendices A, B, and C at this point for a brief introduction to some of the technical concepts and institutions discussed throughout this volume.)

1
The Silent Spread of Nuclear Arms 1989-1990

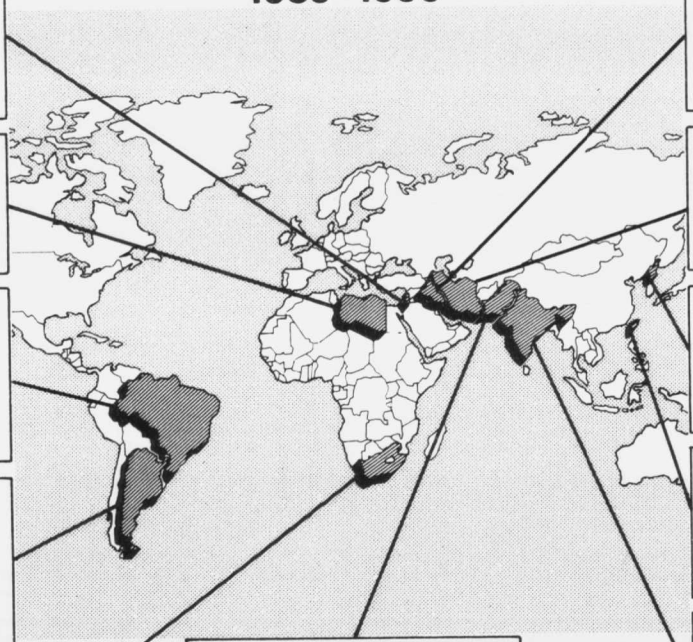
Nuclear proliferation poses a grave danger to the international community, but rarely receives concerted high-level governmental attention in the United States or in other concerned countries. In large measure, this inattention has persisted because for many years there have been few publicly visible and unambiguous indications that nuclear arms are, in fact, spreading to additional states. No new country, for example, has openly declared that it has acquired nuclear arms since 1964, when the People's Republic of China joined the United States, the Soviet Union, Great Britain, and France, as the fifth country to announce that it possessed such weapons.

Similarly, since India's single nuclear detonation in 1974, no country is known to have tested a nuclear device for the first time, nor has India, itself, conducted further tests.* Moreover, those countries that have sought to develop nuclear arms since the mid-1960s have attempted to shield their activities from external scrutiny by denying any interest in such weapons and shrouding their activities in secrecy. Indeed, even when exposed and well publicized, individual steps taken by these countries in their quest for nuclear arms, such as the start-up of a sensitive new nuclear plant or the pursuit of a nuclear smuggling operation, can sometimes appear inconsequential in themselves, and rarely trigger sustained international concern.

If nuclear proliferation has been unannounced, it is real nonetheless. Indeed, the years since 1964 have seen the advent of Israel, India, Pakistan, and South Africa as *de facto* nuclear weapon states, *i.e.*, countries that have deployed nuclear weapons or could do so rapidly in a crisis. The other countries

* As discussed in Chapter 9, Israel may have conducted a clandestine nuclear test in the South Atlantic on September 22, 1979, with the assistance of South Africa.

Emerging Nuclear Weapon Nations 1989–1990



ISRAEL
- Thought to have obtained first nuclear weapons in late 1960's.
- Probably has 50–100 undeclared A-bombs.
- Since 1982 allegedly built "boosted" weapons that rely on H-bomb principle.
- Thought to have deployed short-range nuclear-capable missiles; testing IRBM since 1987.
- Not party to NPT.

LIBYA
- Many years away from possibly building nuclear weapons indigenously.
- Attempted to purchase atomic bomb in early 1970's, 1981.
- Party to NPT.

BRAZIL
- Exchanging n-plant visits with Argentina.
- Civilian government opposed to nuclear arming, but military would keep option.
- Has built facilities necessary for nuclear weapons capability as part of nuclear energy and research program, but not under international inspection.
- Not party to NPT.

ARGENTINA
- Exchanging n-plant visits with Brazil.
- Civilian government opposed to nuclear arming.
- Has built facilities necessary for nuclear weapons capability as part of nuclear energy program, but not under international inspection.
- Not party to NPT.

SOUTH AFRICA
- Able to build nuclear weapons since 1980–81.
- Possible undeclared arsenal of 15 to 25 n-weapons.
- Developing IRBM.
- Not party to NPT.

PAKISTAN
- Apparently obtained material for first atomic weapon in 1986.
- Probably has essentials for 5–10 undeclared A-bombs.
- Attempting to develop "boosted" n-weapons.
- Tested nuclear-capable short-range missile in 1989.
- Not party to NPT.

IRAQ
- 5–10 years away from possibly building nuclear weapons indigenously.
- Attempting to build plant to produce n-weapons material.
- Earlier n-weapon effort thwarted in 1981, when Israel destroyed Osiraq reactor.
- Party to NPT.

IRAN
- 5–10 years away from possibly building nuclear weapons indigenously.
- Some nuclear installations and weapons research inherited from Shah; reactivating n-research program.
- Party to NPT.

NORTH KOREA
- Has built large research reactor and may be building plutonium plant that could soon allow n-weapon production.
- Party to NPT (1985), but above plants not under IAEA inspection since safeguards agreement with IAEA not yet signed.

TAIWAN
- Has sizeable nuclear power program, but lacks facilities to produce material for n-weapons.
- Built secret lab to extract plutonium in 1987, but dismantled unit under US pressure before plutonium obtained; (made similar attempt in mid-1970s, also thwarted by US).
- Party to NPT.

INDIA
- Tested nuclear device in 1974.
- Has essentials for 40–60 A-bombs and may be building undeclared nuclear arsenal.
- Has greatly expanded nuclear weapons production capability in recent years; reportedly designing H-bomb.
- Tested nuclear-capable short-range missile in 1988; tested IRBM in 1989.
- Not party to NPT.

NPT—The Nuclear Non-Proliferation Treaty. Requires all nuclear installations in a signatory country to be placed under International Atomic Energy Agency inspection.

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discussed in this book have also taken important steps toward nuclear arms, though none has yet reached this level. (Map 1.1 summarizes the current status of these programs.)

During 1989 and the first half of 1990, the pattern of slow, steady expansion of nuclear weapon capabilities in the developing world continued. First, based on what is known about its nuclear program, Israel must be presumed to have added a significant quantity of nuclear weapons material free from international non-proliferation controls to its pre-existing stockpile; in 1989, for example, it may have added enough new material for 5 to 10 nuclear weapons.

India, similarly, must be presumed to have augmented its stocks of such material at a roughly comparable rate. In addition, in 1989, it expanded its ability to produce such weapon-grade material, with the opening of a new nuclear power reactor not subject to International Atomic Energy Agency (IAEA) inspection.

Pakistan may have temporarily ceased production of weapons-grade nuclear material in early 1989, but even if it did so, it is thought to be adding to a stockpile of material that could be rapidly improved to the level needed for nuclear arms. Pakistan has also been expanding its overall weapons-material production capabilities and is thought to have taken steps toward the production of complete nuclear devices using its existing stocks of weapons-grade material.

South Africa, too, presumably added to its stockpile of unrestricted weapons-grade material during 1989—perhaps enough for 2 or 3 devices—and in mid-1988, opened a new non-IAEA-inspected uranium enrichment plant that could greatly increase its output of such material. In early 1990, however, under its new state president, Frederik W. de Klerk, Pretoria shut down a key production installation and may be preparing to relinquish its nuclear weapons option by joining the Nuclear Non-Proliferation Treaty.

Evidence also emerged during 1989 and the first half of 1990 that three additional countries—Iraq, Iran, and North Korea—had launched nuclear weapon programs. Iraq has begun a program to build a uranium enrichment plant and to acquire components for nuclear arms, steps which could permit it to manufacture nuclear weapons within the next five to ten years. Iran is also "actively pursuing" a nuclear weapons program, a senior U.S. intelligence official has declared,[1] and leaders of Iran's revolutionary government have openly called for the development of nuclear arms. North Korea, finally, is believed to be building a plutonium extraction plant, which, used in conjunction with other existing facilities, could permit it to manufacture its first nuclear device by the mid-1990s.[2]

In addition, in Latin America, Agentina and Brazil announced that they had produced 20-percent enriched uranium free from international non-proliferation controls, thereby demonstrating a mastery of the enrichment process that would enable them to produce weapons-grade uranium relatively quickly, if they chose to do so. The advent of civilian rule in the two countries and their implemention of a series of reciprocal visits to each other's nuclear installa-