Proliferation Pessimism and Emerging Nuclear Powers

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International concern about nuclear proliferation has rapidly increased since the end of the Cold War. A recent survey found that Americans believe that the nuclear danger facing them is actually worse now than during the Cold War itself.[1] Apprehensions over proliferation formed the backdrop for two occasions in the post–Cold War period when U.S. presidents have used or threatened to use large-scale military force. In 1990–91, fear of Iraqi nuclear ambitions and the U.S. justification of its stance against Baghdad made the Persian Gulf War seem as much an effort at forcible counterproliferation as a campaign intended to free Kuwait from foreign military occupation. In late 1993, President Clinton signaled U.S. willingness to thwart North Korea's nuclear program by means of war, declaring that Pyongyang "cannot be allowed to develop a nuclear bomb." His defense secretary shortly thereafter termed the president's statement an "ultimatum," adding "we will not let the North Koreans become a nuclear power. . . . nuclear weapons in the hands of North Korea is not acceptable."[2] The Clinton administration's "bottom-up" review of defense policy concluded that the spread of weapons of mass destruction posed the most direct threat to U.S. post–Cold War security interests. Declaring that the primary threat to U.S. security now stems from nuclear-armed terrorists and pariah states, U.S. Defense Secretary

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1. Hank C. Jenkins-Smith, Kerry G. Herron, and Richard P. Barke, *Public Perspectives of Nuclear Weapons in the Post–Cold War Environment*, SAND94-1265 (Albuquerque, N.M.: Sandia National Laboratory, April 1994), as cited in Pete V. Domenici, "Countering Weapons of Mass Destruction," *Washington Quarterly*, Vol. 18, No. 1 (Winter 1995), p. 150.
2. Quotations cited in Marc Dean Millot, "Facing the Emerging Reality of Regional Nuclear Adversaries," *Washington Quarterly*, Vol. 17, No. 3 (Summer 1994), p. 47.

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Les Aspin expressed his concern that "the new possessors of nuclear weapons may not be deterrable." His successor, William Perry, warned that the danger of a "rogue nation" acquiring nuclear arms was "one of the most serious threats facing the world today."[3] To counter such a prospect, the Pentagon has launched a major effort to protect military forces from nuclear or other weapons of mass destruction and to strengthen its capacity to destroy such weapons.[4] An additional concern is posed by the spread of nuclear capacities into regions of high tension. A nuclear conflagration between India and Pakistan is so routinely predicted by senior U.S officials that it has become a common example of the dangers of a proliferated world.[5]

With concerns about the spread of nuclear weapons increasing, scholars and policy analysts have turned in earnest to nonproliferation issues. Debate has renewed on whether nuclear weapons are a stabilizing factor in international politics, and on whether the U.S.-Soviet experience with nuclear deterrence during the Cold War can be taken as the archetype for all cases in which nuclear-armed adversarial states confront each other. A major point at issue concerns the prospects for replicating the Cold War's "nuclear peace" among regional nuclear antagonists. Since it is widely conceded that nonproliferation measures will ultimately prove insufficient in preventing the emergence of new nuclear powers, how the scholarly debate on proliferation is resolved has important consequences; it bears directly on the intellectual rigor with which scholars assess the dangers of proliferation, and on the quality of their advice to the policy community.

Two schools of thought, proliferation "optimism" and "pessimism," provide competing assessments on the likely hazards of spreading nuclear weapons.[6]

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3. Quotations in Michael Wines, "Aspin Orders Pentagon Overhaul of Strategy on Nuclear Weapons," *New York Times*, October 30, 1993, p. 8; and Kim Murphy, "'Rogue Nation' or Terrorist Poses Serious Nuclear Threat, Perry Says," *Los Angeles Times*, January 9, 1995, p. A4.
4. See Peter Grier, "In Nukes Strategy Review, U.S. Eyes 'Undeterrables'," *Christian Science Monitor*, November 9, 1993, p. 1; Michael R. Gordon, "Pentagon Turns Its Attention to Third World Arms," *New York Times*, December 8, 1993, p. A4; and Thomas W. Lippman, "If Nonproliferation Fails, Pentagon Wants 'Counterproliferation' in Place," *Washington Post*, May 15, 1994, p. A11.
5. Both R. James Woolsey, then director of the U.S. Central Intelligence Agency, and Robert L. Gallucci, then Assistant Secretary of State for Political and Military Affairs, have offered similar pessimistic assessments of the state of nuclear stability in South Asia. See Woolsey's comments in David Albright, "India and Pakistan's Nuclear Arms Race: Out of the Closet But Not in the Street," *Arms Control Today*, Vol. 23, No. 5 (June 1993), p. 12. Gallucci's assessment is in "Non-proliferation and National Security," *Arms Control Today*, Vol. 24, No. 3 (April 1994), p. 14. Also see "The Nuclear Edge," editorial, *Washington Post*, February 3, 1990, p. A24.
6. The schools can be identified by various names. The terminology employed here is adopted from Peter Feaver, "Proliferation Optimism and Theories of Nuclear Operations," in Zachary S.

This article offers a critique of the most recent wave of pessimistic literature to appear in the scholarly discussion on proliferation. I argue that these claims need to specify better why and how the spread of nuclear weapons is likely to have deleterious consequences, particularly between entrenched regional rivals. In the following section I present an overview of optimistic and pessimistic thinking, outline the innovations contained in the newest work by pessimists, and sketch the areas of contention between this group of pessimists and their optimistic counterparts. The next two sections examine in greater detail the pessimistic claims concerning the dangers of preventive war, crisis instability, and accidental use, and I offer specific criticisms of these claims in light of the behavior of regional nuclear powers. I then challenge the pessimistic assumption that the opaque arsenals possessed by the newest generation of nuclear states are intrinsically detrimental to deterrence stability. My critique is based on the argument that the analogies that pessimists draw from Cold War nuclear history are misleading and thus mischaracterize the context in which new nuclear states emerge and act. Relying too closely on a singular, ungeneralizable example, the deductive model offered by the new pessimists is unlikely to generate much insight into the pathways by which unwanted nuclear conflict could arise between proliferators.

The Proliferation Debate

Proliferation optimists hold generally reassuring views of the effects of nuclear proliferation on regional stability.[7] They contend that the traditional utilitarian

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Davis and Benjamin Frankel, eds., *The Proliferation Puzzle: Why Nuclear Weapons Spread (and What Results)*, special issue of *Security Studies*, Vol. 2, Nos. 3/4 (Spring/Summer 1993), pp. 159–191. As in any categorization of a broad and running debate, these schools should be viewed as ideal types that risk some oversimplification for the purposes of clarification. Optimists like John Mearsheimer and Stephen Van Evera hedge their arguments by couching them in terms of an orderly, "well managed" process of proliferation, while others, like Kenneth Waltz and Martin van Creveld, are much more absolute in their claims. Similarly, two general branches exist in the literature on proliferation pessimism. The arguments of a more established version take many forms, but are characterized by an emphasis on the incompatibility of Western rational deterrence concepts with the Third World's logic and behavior patterns. A more recent variant, articulated by Scott Sagan and Peter Feaver, has appropriated the established version's claims about the likely technical and organizational deficiencies of new nuclear forces and grounded them in a more explicit conceptual framework.

7. Proliferation optimism has largely come to be identified with the writings of Kenneth Waltz. See, in particular, *The Spread of Nuclear Weapons: More May Be Better*, Adelphi Paper No. 171 (London: International Institute of Strategic Studies [IISS], Autumn 1981); "Nuclear Myths and Political Realities," *American Political Science Review*, Vol. 84, No. 3 (September 1990), pp. 731–745; "The Emerging Structure of International Politics," *International Security*, Vol. 18, No. 2 (Fall 1993),

relationship between military force and political behavior by states was turned fundamentally on its head by the development of nuclear weapons. Rooted in Gaullist conceptions of deterrence strategy and in existential deterrence thinking, proliferation optimism is based on the premise that states behave with robust circumspection when confronted with even a modicum of nuclear risk.[8] Fearful of the prospect of nuclear engagement, states are dissuaded from acts that raise this risk. Kenneth Waltz, for example, argues that "the presence of nuclear weapons makes states exceedingly cautious. . . . Why fight if you can't win much and might lose everything?" Since war between nuclear-armed adversaries involves the possibility of reciprocal destruction, even annihilation, the prospects for a stable deterrent relationship between them—and by extension, within an international system composed of numerous nuclear powers—are alleged to be much greater than in a non-nuclear world. Waltz asserts that "whatever the number of nuclear states, a nuclear world is tolerable if those states are able to send convincing deterrent messages: It is useless to attempt to conquer because you will be severely punished."[9]

Although this school bases its claims upon the U.S.-Soviet Cold War nuclear relationship, it admits of no basic exception to the imperatives of nuclear deterrence. Nothing within the school's thesis is intrinsic solely to the superpower experience. The nuclear "balance of terror" is seen as far from fragile. Nuclear-armed adversaries, regardless of context, should behave toward each other like the superpowers during the Cold War's "nuclear peace." The reason

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pp. 44–79; and his writings in Scott D. Sagan and Kenneth N. Waltz, *The Spread of Nuclear Weapons: A Debate* (New York: W.W. Norton & Company, 1995). Also consult Bruce Bueno de Mesquita and William H. Riker, "An Assessment of the Merits of Selective Proliferation," *Journal of Conflict Resolution*, Vol. 26, No. 2 (June 1982), pp. 283–306; Shai Feldman, *Israeli Nuclear Deterrence: A Strategy for the 1980s* (New York: Columbia University Press, 1982); Dagobert L. Brito and Michael D. Intriligator, "Proliferation and the Probability of War: Global and Regional Issues," in Dagobert L. Brito, Michael D. Intriligator and Adele D. Wick, eds., *Strategies for Managing Nuclear Proliferation* (Lexington, Mass.: Lexington Books, 1983), pp. 135–143; John J. Mearsheimer, "The Case for a Ukrainian Nuclear Deterrent," *Foreign Affairs*, Vol. 72, No. 3 (Summer 1993), pp. 50–66; Martin van Creveld, *Nuclear Proliferation and The Future of Conflict* (New York: Free Press, 1993); Peter R. Lavoy, "Civil-Military Relations, Strategic Conduct, and the Stability of Nuclear Deterrence in South Asia," in Scott D. Sagan, ed., *Civil-Military Relations and Nuclear Weapons* (Stanford, Calif.: Stanford University Center for International Security and Arms Control, June 1994), pp. 79–109; Lavoy, "The Strategic Consequences of Nuclear Proliferation: A Review Essay," *Security Studies*, Vol. 4, No. 4 (Summer 1995), pp. 695–753; Devin T. Hagerty, "The Power of Suggestion: Opaque Proliferation, Existential Deterrence, and the South Asian Nuclear Arms Competition," in Davis and Frankel, eds., *The Proliferation Puzzle*, pp. 256–283; and Hagerty, "Nuclear Deterrence in South Asia: The 1990 Indo-Pakistani Crisis," *International Security*, Vol. 20, No. 3 (Winter 1995/96), pp. 79–114.

8. See Pierre Gallois, *The Balance of Terror: Strategy for the Nuclear Age* (Boston: Houghton Mifflin, 1961).

9. Waltz, *The Spread of Nuclear Weapons*, pp. 5, 7.

for this near-absolute claim is the supposedly immutable quality of nuclear weapons: their presence is the key variable in any deterrent situation, because fear of their devastating consequences simply overwhelms the operation of all other factors.[10] Martin van Creveld alleges that "the leaders of medium and small powers alike tend to be extremely cautious with regard to the nuclear weapons they possess or with which they are faced—the proof being that, to date, in *every* region where these weapons have been introduced, large-scale interstate warfare has disappeared."[11] Shai Feldman submits that "it is no longer disputed that the undeclared nuclear capabilities of India and Pakistan have helped stabilize their relations in recent years. It is difficult to see how escalation of the conflict over Kashmir could have been avoided were it not for the two countries' fear of nuclear escalation." The spread of nuclear weapons technology is thus viewed by optimists as a positive development, so much so that some even advocate its selective abettance by current nuclear powers.[12]

In contrast, proliferation pessimists are profoundly skeptical of inferring an auspicious nuclear future from the Cold War's history, and worry instead that proliferation is likely to have pernicious consequences for regional security.[13] Drawing upon scholarship on the "*n*th-country" problem, this viewpoint stresses that important contextual variables differentiate the nuclear relationship between the superpowers from any others that are likely to arise. Rejecting claims for the prototypical character of the U.S.-Soviet nuclear relationship, pessimists warn against "transposing the argument of the war-preventing function of nuclear weapons to regions outside the East-West system." In their view, "the stability of nuclear deterrence between East and West rest[ed] on a

10. This assumption betrays proliferation optimism's affinity with neorealist theory. Despite initial reluctance to do so, neorealism has come to embrace nuclear weapons as a full-fledged systemic constraint on state behavior. For a critical discussion of the congruity between Waltz's structural realism and his nuclear optimism, see Peter D. Feaver, "Optimists, Pessimists, and Theories of Nuclear Proliferation Management," *Security Studies*, Vol. 4, No. 4 (Summer 1995), pp. 760–762.

11. *Nuclear Proliferation and The Future of Conflict*, p. 124 (emphasis in original).

12. Shai Feldman, "Is There A Proliferation Debate?" *Security Studies*, Vol. 4, No. 4 (Summer 1995), p. 791. For views on selective abettance, see Mearsheimer, "The Case for a Ukrainian Nuclear Deterrent"; and Bueno de Mesquita and Riker, "An Assessment of the Merits of Selective Proliferation."

13. Representative of the proliferation pessimism literature are Lewis A. Dunn, *Controlling the Bomb: Nuclear Proliferation in the 1980s* (New Haven, Conn: Yale University Press, 1982); Dunn, *Containing Nuclear Proliferation*, Adelphi Paper No. 263 (London: IISS, 1991); Karl Kaiser, "Nonproliferation and Nuclear Deterrence," *Survival*, Vol. 31, No. 2 (March/April 1989), pp. 123–136; Steven E. Miller, "The Case Against a Ukrainian Nuclear Deterrent," *Foreign Affairs*, Vol. 72, No. 3 (Summer 1993), pp. 67–80; and Yair Evron, *Israel's Nuclear Dilemma* (Ithaca, N.Y.: Cornell University Press, 1994).

multitude of military and political factors which in other regions are either totally missing or are only partially present."[14] According to pessimists, the stability of U.S.-Soviet nuclear deterrence was a function of the singular political and geostrategic character of the Cold War. The territorial separation of the superpowers, the absence of a previous legacy of hostility, the status-quo orientation of their leaderships, coupled with the simplicity of bipolar rivalry, made for a uniquely benign security environment with redundant sources of stability. Proliferation outside this context, however, would occur in regions of the world where politico-military conditions are acutely prone to conflict. With many Third World states being traditional enemies and in close proximity, conflict is endemic and quickly comes to engage critical interests. Because proliferation would occur within existing chronic patterns of conflict, one scholar contends that "leaders may be ready to risk nuclear confrontation, if not even to accept a surprisingly high level of nuclear damage, in pursuit of their objectives."[15] A tradition of inter-state conflict within these regions will also socialize states so that they consider military force, even nuclear weapons, in terms of waging war, rather than in terms of deterrence.[16] Because of these differences, pessimists doubt the near-absolute capacity for deterrence that optimists attribute to nuclear weapons in general.

Pessimism informs the conventional wisdom on proliferation issues and is the touchstone for U.S. nonproliferation policies. Despite its wide currency, it has traditionally suffered from two major problems, however. First, it relies mostly on deductive logic, with the historical record used more to illustrate arguments rather than to conduct rigorous empirical inquiry and theory-building. Indeed, a good deal of the proliferation debate remains a recitation of arguments already in circulation twenty years ago, with scholars continuing to focus on the U.S.-Soviet nuclear standoff while neglecting the study of the several past or extant bilateral nuclear rivalries in Asia. The Sino-Soviet and Indo-Pakistani rivalries, in particular, bring important evidence to bear on when and how nuclear weapons influence strategic interactions between states. Yet scholarship still offers, as one scholar noted fifteen years ago, "scant analysis of what happens when actual nuclearization takes place, especially in a region where states have a history of violent antagonism towards each other."[17]

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14. Kaiser, "Non-proliferation and Nuclear Deterrence," p. 125.
15. Dunn, *Controlling the Bomb*, p. 70.
16. Evron, *Israel's Nuclear Dilemma*, pp. 108–113.
17. Onkar Marwah, "India and Pakistan: Nuclear Rivals in South Asia," *International Organization*, Vol. 35, No. 1 (Winter 1981), p. 165. For similar views, consult Evron, *Israel's Nuclear Dilemma*, p. viii; and Hagerty, "The Power of Suggestion," p. 270.

Second, the contrasts that pessimists have drawn between the logic and behavior patterns in the U.S.-Soviet nuclear experience and those of other states, particularly in the Third World, have often been so stark that it seemed hard to acquit them of the ethnocentric bias with which their critics charge them.[18] This is especially true of arguments that the virulent ethnic and religious hatreds in Third World regions may not yield to fears of nuclear retaliation, or that leaders of Third World regimes possess personal value structures predisposing them to capricious and illogical acts from which not even threats of nuclear retaliation can dissuade them.[19]

THE "NEW" PESSIMISM

These deficiencies in the proliferation pessimism literature have been partly corrected by a recent wave of empirically based scholarship on the technical, organizational, and doctrinal problems that threatened the breakdown of nuclear stability during the Cold War.[20] Although the main focus of this new scholarship concerns the crisis-stability and accidental-war dangers posed by the U.S. and Soviet Cold War arsenals, an underlying theme is that such problems would not only be replicated but magnified in a world of more nuclear powers.[21] The fundamental argument is the contention that the mani-

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18. Despite his criticisms of the optimists' thesis, Peter Feaver admits that Waltz is right to reprove "the ethnocentrism implicit in some proliferation pessimism." Feaver, "Optimists, Pessimists, and Theories of Nuclear Proliferation Management," p. 755. One recent survey of Middle Eastern strategic trends censures proliferation scholarship for its "resort to hoary cliches about the irrationality and callousness of leaders and of peoples in the Middle East." Ahmed Hashim, "The State, Society, and the Evolution of Warfare in the Middle East: The Rise of Strategic Deterrence," *Washington Quarterly*, Vol. 18, No. 4 (Autumn 1995), p. 69.

19. This last point had its counterpart in certain arguments prevalent in the nuclear strategy debate in the United States in the late 1970s and early 1980s, particularly those asserting the insensitivity of the Soviet leadership to societal punishment. See the discussion in Charles L. Glaser, "Why Do Strategists Disagree about the Requirements of Strategic Nuclear Deterrence?" in Lynn Eden and Steven E. Miller, *Nuclear Arguments: Understanding the Strategic Nuclear Arms and Arms Control Debates* (Ithaca, N.Y.: Cornell University Press, 1989), esp. pp. 126–133.

20. See Peter D. Feaver, *Guarding the Guardians: Civilian Control of Nuclear Weapons in the United States* (Ithaca, N.Y.: Cornell University Press, 1992); Bruce G. Blair, *The Logic of Accidental Nuclear War* (Washington, D.C.: The Brookings Institution, 1993); Blair, *Global Zero Alert for Nuclear Forces* (Washington, D.C.: The Brookings Institution, 1995); and Scott D. Sagan, *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons* (Princeton, N.J.: Princeton University Press, 1994). For critiques of these works, see Bradley A. Thayer, "The Risk of Nuclear Inadvertence: A Review Essay," *Security Studies*, Vol. 3, No. 3 (Spring 1994), pp. 428–493; Thayer, "Nuclear Weapons as a Faustian Bargain," *Security Studies*, Vol. 5, No. 1 (Autumn 1995), pp. 149–163; and Lavoy, "The Strategic Consequences of Nuclear Proliferation." Also note the following comments to Thayer's article in *Security Studies*, Vol. 3, No. 3 (Spring 1994): Blair, "Nuclear Inadvertence: Theory and Evidence" (pp. 494–500); Feaver, "The Politics of Inadvertence" (pp. 501–508); and Sagan, "Organized for Accidents" (pp. 509–520).

21. For specific arguments in this regard, see Feaver, "Proliferation Optimism and Theories of Nuclear Operations," Feaver, "Optimists, Pessimists, and Theories of Nuclear Proliferation Man-

fold hazards entailed in the U.S.-Soviet nuclear experience serve as an useful model for all cases in which nuclear-armed adversaries confront each other.[22]

While the new pessimism contains many trenchant criticisms of the view that all will be well in a world of more nuclear powers, it curiously shares two points of common ground with the optimistic perspective it opposes. First, although offering opposing analyses of the effects of nuclear proliferation, each grounds its analysis on the assumption that the experiences of established nuclear states, particularly superpower nuclear history, yield generalizable inferences applicable to new proliferant countries. Bruce Blair says that "the U.S.-Soviet nuclear rivalry during the Cold War contains lessons that apply to the rivalries among the emerging nuclear states," and that new proliferators will confront "the same dilemmas as those faced by their predecessors during the Cold War. A similar evolution of their nuclear postures and an attendant increase in the risk of inadvertence are predictable."[23]

Second, with its focus on the ways in which *unintended* nuclear conflict might come about, the new wave of pessimism offers a more nuanced understanding of the problems of proliferation, especially since it parts with the traditional pessimistic concern that nuclear conflict could be brought about intentionally by irresponsible leaders. Both pessimistic versions, of course, attach catastrophic results to the spread of nuclear weapons. But instead of viewing new nuclear powers as initiating nuclear use in a deliberate, premeditated fashion, the new wave of literature sees them as probable victims of misperceptions, technical mishaps, and inadvertent actions they may neither fully anticipate nor be able to cope with. As Scott Sagan writes: "Nuclear weapons may well have made *deliberate* war less likely, but the complex and tightly coupled

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agement," and Feaver, "Command and Control in Emerging Nuclear Nations," *International Security*, Vol. 17, No. 3 (Winter 1992/93), pp. 160–187; Sagan, "The Perils of Proliferation: Organization Theory, Deterrence Theory, and the Spread of Nuclear Weapons," *International Security*, Vol. 18, No. 4 (Spring 1994), pp. 66–107; Sagan, "Sagan Responds to Waltz," in Sagan and Waltz, *The Spread of Nuclear Weapons: A Debate*, pp. 115–136; and Sagan, "Responses and Reflections," *Security Studies*, Vol. 4, No. 4 (Summer 1995), pp. 805–810.

22. This view has been succinctly stated as follows: "The closest approach to nuclear stability between opposing societies is the traditional U.S.-Soviet model." Lloyd Leavitt and Paul Bracken, "Nuclear Proliferation: Neither Safe nor Stable," in Hakan Wiberg, Ib Damgaard Petersen and Paul Smoker, eds., *Inadvertent Nuclear War: The Implications of the Changing Global Order* (Oxford: Pergamon Press, 1993), p. 211.

23. Blair, *The Logic of Accidental Nuclear War*, pp. 2, 9. Likewise, Feaver writes that "new nuclear nations will face special challenges in developing command and control systems, but these hurdles are not radically different from the ones that confronted U.S. policymakers." Feaver, "Command and Control in Emerging Nuclear Nations," pp. 162–163.

nuclear arsenal we have constructed has simultaneously made *accidental* war more likely."[24]

Notwithstanding these similarities, proliferation optimists and the new pessimists fundamentally diverge on whether new nuclear powers can fulfill the theoretical prerequisites for stable deterrence. Optimists claim that the problems involved in creating situations of mutual deterrence are not beyond the capacity of many states. However, the new pessimists offer three challenges to this contention. First, they question the optimistic belief that nuclear-armed states will not strike preventively against a rival's nuclear potential. Second, they dissent from the assumption that new nuclear states will inevitably develop secure retaliatory arsenals. Finally, they argue that new nuclear forces will be dangerously prone to accidental or unauthorized use. The following two sections provide an assessment of these concerns.

Preventive War and the Perils of Transition

Optimists have relaxed views of the preventive-war dangers entailed in situations in which a nuclear power confronts a nuclearizing rival. The practical difficulties of ensuring a disarming strike to preclude any possibility of nuclear retaliation make preventive actions a military gamble that states are very unlikely to take. As Waltz explains, "prevention and pre-emption are difficult games because the costs are so high if the games are not perfectly played. . . . Ultimately, the inhibitions [against such attacks] lie in the impossibility of knowing for sure that a disarming strike will totally destroy an opposing force and in the immense destruction even a few warheads can wreak."[25] To optimists, states will have to learn to live with a rival's emerging nuclear armory.

Because strategic uncertainty is seen as having a powerful dissuasive effect, optimists usually view the very increase in the numbers of nuclear-armed

24. Sagan, *The Limits of Safety*, p. 264 (emphasis in original). Also see Sagan, "The Politics of Inadvertence," p. 516.

25. Waltz, *The Spread of Nuclear Weapons*, p. 17. The limited effectiveness of U.S. bombing operations against Iraq's nuclear infrastructure during the Gulf War may be viewed as validating this argument. Despite the bombing's magnitude and the advantage of air supremacy, a senior Bush administration official has written that "one still had uncertainty as to whether or not the capacity to possess a small number of nuclear weapons had been eliminated." In fact, Iraq's large calutron test facility escaped all damage from the air offensive. Quotation in Ronald F. Lehman, "A North Korean Nuclear-Weapons Program: International Implications," *Security Dialogue*, Vol. 24, No. 3 (September 1993), p. 270. Also consult Jill L. Jermano and Susan E. Springer, "Monitoring Road-Mobile Missiles Under START: Lessons from the Gulf War," *Parameters*, Vol. 23, No. 1 (Spring 1993), pp. 70–80.

states as an additional element of stability. Dagobert Brito and Michael Intriligator, for instance, argue that uncertainty over the reaction of other nuclear powers will make all hesitant to strike individually.[26] As an example, they point to the restraint the superpowers exercised on each other in the 1960s, when first the United States and then the Soviet Union contemplated military action against China's nascent nuclear weapon sites. The net effect of the uncertain reaction of others is that "the probability of deliberate nuclear attack falls to near zero with three, four, or more nuclear nations."[27] Similarly, Waltz reasons that even in cases of asymmetric proliferation within conflict dyads, nuclear weapons will prove "poor instruments for blackmail" because a "country that takes the nuclear offensive has to fear an appropriately punishing strike by someone. Far from lowering the expected cost of aggression, a nuclear offense even against a non-nuclear state raises the possible costs of aggression to incalculable heights because the aggressor cannot be sure of the reaction of other nuclear powers."[28]

Proliferation pessimists, on the other hand, are doubtful that new nuclear powers will remain immune to preventive-war temptations. Preventive-war thinking was a staple of Cold War history. Prominent U.S. military leaders advocated preventive action against the Soviet Union in the late 1940s and early 1950s, and both superpowers contemplated military action to prevent Chinese development of nuclear weapons in the 1960s.[29] By some accounts, the 1967 Middle East war was caused by Egypt's desire to thwart Israel's development of a nuclear weapon capability.[30] In the mid-1970s, Moscow may have also sounded out Washington on the preemptive destruction of South Africa's uranium enrichment plant, and the United States may have given serious thought to sabotaging Pakistan's fledgling nuclear program.[31]

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26. Brito and Intriligator, "Proliferation and the Probability of War: Global and Regional Issues," pp. 136–137; and Brito and Intriligator, "Proliferation and the Probability of War: A Cardinality Theorem," *Journal of Conflict Resolution*, Vol. 40, No. 1 (March 1996), pp. 206–214.
27. Brito and Intriligator, "Proliferation and the Probability of War: Global and Regional Issues," p. 137.
28. Waltz, *The Spread of Nuclear Weapons*, p. 13.
29. On U.S. planning to destroy the Chinese nuclear program, see Glenn T. Seaborg, *Stemming the Tide: Arms Control in the Johnson Years* (Lexington, Mass.: Lexington Books, 1987), pp. 111–112; Gordon H. Chang, *Friends and Enemies: The United States, China and the Soviet Union, 1948–1972* (Stanford, Calif.: Stanford University Press, 1990); and Shane Maddock, "LBJ, China, and the Bomb: New Archival Evidence," *SHAFR Newsletter*, March 1996, pp. 1–5.
30. For comments on this view, see Evron, *Israel's Nuclear Dilemma*, pp. 62–63.
31. David Albright, "South Africa and the Affordable Bomb," *Bulletin of the Atomic Scientists*, Vol. 50, No. 4 (July/August 1994), p. 42; and Richard Burt, "U.S. Will Press Pakistan to Halt A-Arms Project," *New York Times*, August 12, 1979, as cited in Mitchell Reiss, *Bridled Ambition: Why Countries Constrain Their Nuclear Capabilities* (Washington, D.C.: Woodrow Wilson Center Press, 1995), p. 197, n. 68.

The post–Cold War period also resonates with preventive logic, most fully exemplified by the U.S. "Counterproliferation Initiative." U.S. attacks against Iraqi nuclear development facilities in the Persian Gulf War and against the Zaafarniyah nuclear fabrication complex in early 1993, as well as the Clinton administration's threat to strike North Korea's nuclear installations, may prefigure a policy of preempting the emergence of nuclear weapon capabilities in the Third World.[32] In 1991 the Bush administration reportedly directed the Central Intelligence Agency to "develop plans, including covert action, to block proliferation of weapons of mass destruction."[33] Recently senior Israeli officials, in a reprise of the fears that brought about their attack on Iraq's Osirak nuclear reactor, were reportedly considering attacks against Iranian reactors.[34]

Given this record, proliferation pessimists doubt that new nuclear powers should prove any more resistant to preventive temptations than their historical predecessors. Indeed, they fear that the resistant properties of Third World nuclear states will prove even weaker, especially in countries with turbulent civil-military relations. Sagan, for instance, contends that military establishments generally have strong professional and organizational biases toward preventive options.[35] Drawing upon scholarship that applies organization theory to the behavior of military bureaucracies, he argues that professional socialization leads military officers to see war as inevitable and sometimes necessary, inclining them in turn to think in a "better now than later" logic and to favor offensive doctrines.[36] Military establishments, like all large enterprises,

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32. Although a high-ranking Defense Department official recently denied that the United States intended to strike preemptively at nuclear facilities, other officials have stated that the preemptive option has not been foreclosed. See Art Pine, "Preemptive Raids on Nuclear Sites Rejected," *Los Angeles Times*, March 12, 1994, p. A8; and Thomas W. Lippman, "If Nonproliferation Fails, Pentagon Wants 'Counterproliferation' in Place." For an admission by the U.S. defense secretary that the Clinton administration considered preventive air strikes against North Korea's reactors, see Steven Greenhouse, "Administration Defends North Korea Accord," *New York Times*, January 25, 1995, p. A4. Also consult the views in Mitchell Reiss and Harald Mueller, eds., *International Perspectives on Counterproliferation* (Washington, D.C.: Woodrow Wilson International Center for Scholars, Division of International Studies, January 1995).

33. See Robin Wright, "U.S. Efforts to Halt Arms Race Called Limited," *Los Angeles Times*, June 21, 1992, p. A1.

34. Chris Hedges, "Iran May Be Able to Build an Atomic Bomb in 5 Years, U.S. and Israeli Officials Fear," *New York Times*, January 5, 1995, p. A5. On Israel's continued pursuit of a preventive policy, see Shai Feldman, "Israel," in Mitchell Reiss and Robert S. Litwak, eds., *Nuclear Proliferation after the Cold War* (Washington, D.C.: Woodrow Wilson Center Press, 1994), pp. 82–83.

35. "The Perils of Proliferation," pp. 74–85.

36. Important works in this genre include Barry R. Posen, *The Sources of Military Doctrine: France, Britain, and Germany between the World Wars* (Ithaca, N.Y.: Cornell University Press, 1984); Jack Snyder, *The Ideology of the Offensive: Military Decision-Making and the Disasters of 1914* (Ithaca, N.Y.: Cornell University Press, 1984); Stephen Van Evera, "The Cult of the Offensive and the Origins of the First World War," *International Security*, Vol. 9, No. 1 (Summer 1984), pp. 58–107; and Jack S.

also possess strong autonomy-seeking proclivities. Sagan worries that these organizational pathologies, which he illustrates with evidence from the U.S. civil-military relationship, will dictate action in new nuclear states where institutional civilian controls over the military are weak.[37]

THE SOUTH ASIAN CASE

South Asia is a focal point for such concerns. In the early 1980s, as Pakistan's nuclear program gained momentum amid a sharp deterioration in Indo-Pakistani relations, rumors of impending Indian military action against the Kahuta uranium enrichment site near Islamabad circulated. Lewis Dunn at that time expressed his concern that a military confrontation over Kashmir might spur India to attempt to destroy Pakistan's rudimentary arsenal.[38] Currently, Sagan fears that the political strength of the Pakistani armed forces will allow preventive-war biases to come into play in that country's nuclear rivalry with India, while Gregory Giles warns that India may be driven to precipitous action in a crisis because of its lack of confidence in the ability of Islamabad's civilian leaders to restrain the Pakistani military from dominating the country's nuclear decision-making.[39]

Such arguments, however, ignore the considerable sources of nuclear restraint that operate in South Asia in spite of the strong political influence of the Pakistani army. Although the turmoil of the subcontinent's partition in 1947 and its history of endemic Hindu-Muslim communal strife evoke an apocalyptic view of Indo-Pakistani relations, their long military rivalry has been kept under relative control. In terms of military-expenditure levels and the number of soldiers maintained on a per-capita basis, both are among the less-milita-

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Levy, "Organizational Routines and the Causes of War," *International Studies Quarterly*, Vol. 30, No. 2 (June 1986). For a critical (and, in light of his most recent work, ironic) review of this scholarship by Sagan, see "1914 Revisited: Allies, Offense, and Instability," *International Security*, Vol. 11, No. 2 (Fall 1986), pp. 151–175.

37. The optimistic perspective dismisses the notion that stable civil-military relations are necessary for nuclear deterrence, since the inextricable imperatives of the nuclear revolution are seen as operating equally upon civilians and military leaders alike. "Although one may prefer civil control," according to Waltz, "preventing a highly destructive war does not require it" because generals and admirals are as interested in avoiding self-destruction as civilians. *The Spread of Nuclear Weapons*, p. 12. Also consult Waltz, "Waltz Responds to Sagan," in Sagan and Waltz, *The Spread of Nuclear Weapons: A Debate*, esp. pp. 99–108. Proliferation pessimists also split on this issue. Feaver is less certain than Sagan of the relevance of civil-military factors on the nuclear behavior of small states, which he reasons may be more susceptible to systemic imperatives than larger nuclear powers. See "Proliferation Optimism and Theories of Nuclear Operations," pp. 172–173.

38. Dunn, *Controlling the Bomb*, p. 76.

39. Sagan, "The Perils of Proliferation," pp. 82–83; and Gregory Giles, "Safeguarding the Undeclared Nuclear Arsenals," *Washington Quarterly*, Vol. 16, No. 2 (Spring 1993), p. 178.

rized countries in the world. Moreover, their wars have been limited in the sense that they were brief, avoided attacks on civil society, and resulted in comparatively small casualties and material losses.[40]

The restrained character of South Asia's nuclear rivalry undermines pessimistic concerns about the danger of preventive war. Singular among the countries that then possessed a nuclear capability, India did not follow up its 1974 test explosion with a full-fledged nuclear weapon program. There are a multitude of reasons for this, but one of them—military resistance to nuclear weapons—does not easily tally with pessimists' concern for pernicious military biases. In the Indian case, while elements within the armed forces have long advocated the development of nuclear weapons, the desire for autonomy on the part of the military leadership has led it to reject the nuclear option, in part because this would create opportunities for civilian authorities to interject themselves more deeply into military decision-making and erode military prerogatives in the conduct of war operations.[41] As one proliferation pessimist recently admitted, "in numerous private discussions, top Indian military officers in all three services say the handful of outspoken retired generals and admirals who urge India to become a nuclear-weapon state are at the outer fringe and do not represent mainstream thinking in the Indian officer corps."[42]

Contrary to some fears, India has accepted Pakistan as a de facto nuclear state, a development that in some measure eroded the regional dominance New Delhi gained through its decisive victory in the 1971 Indo-Pakistani War.[43] Islamabad's nuclear capabilities have also not led to an unbridled arms competition between the two. In contrast to what on the surface appears to be a situation in which both sides "are careening along on a nuclear collision course," it is possible to identify a significant pattern of nuclear cooperation between New Delhi and Islamabad.[44] Both sides have pledged not to attack

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40. Robert G. Wirsing, *Pakistan's Security under Zia, 1977–1988: The Policy Imperatives of a Peripheral Asian State* (New York: St. Martin's Press, 1991), pp. 87–88.

41. George Perkovich, "A Nuclear Third Way in South Asia," *Foreign Policy*, No. 91 (Summer 1993), p. 91.

42. John J. Schulz, "Riding the Nuclear Tiger: The Search for Security in South Asia," *Arms Control Today*, Vol. 23, No. 5 (June 1993), p. 6. Also see Chris Smith, *India's Ad Hoc Arsenal: Direction or Drift in Defence Policy* (Oxford: Oxford University Press for the Stockholm International Peace Research Institute, 1994), pp. 189–190.

43. A decade ago, Leonard Spector thought the prospects were uncertain whether India would countenance Pakistan as a "de facto nuclear-armed neighbor." Spector, *Nuclear Proliferation Today* (New York: Vintage, 1984).

44. The quotation is in "The Nuclear Risk Shifts to Asia," *New York Times*, editorial, January 31, 1993, p. E16. For arguments that the Indo-Pakistani nuclear relationship is more stable than is

each other's nuclear installations—an accord explicitly initiated by New Delhi to lay to rest preventive-strike rumors—and have exchanged lists of these facilities for this purpose. As an Indian proponent of nuclear weapons explains:

> Military countermeasures against proliferation in a neighboring country, especially in the form of preemptive strikes on nuclear facilities, are a sure recipe for disaster in a densely populated region like southern Asia with numerous nuclear installations. A tit-for-tat retaliatory campaign between adversaries could wreak havoc, including radioactive fallout, in the region. It was this realization that prompted India to offer Pakistan a bilateral pact abjuring attacks on each other's declared nuclear facilities and storage sites.[45]

During the Indo-Pakistani military crisis over Kashmir in early 1990, the Indian minister of state for defense, himself long involved in New Delhi's nuclear program, again pledged his country to a policy of never initiating a nuclear attack.[46] The absence of preventive-war thinking among Indian national security elites is striking in comparison to the attitudes of their U.S. counterparts during the early Cold War.[47] Indeed, Indian nuclear hawks are more concerned with using the existence of Pakistan's arsenal to justify the need for an Indian one, rather than calling for its preventive destruction.[48]

Available evidence strongly suggests that Pakistan's military-controlled nuclear program allows for scant civilian oversight. No civilian leader has reportedly ever been allowed to visit the Kahuta facility, and Benazir Bhutto, the country's democratically elected prime minister during the 1990 Kashmir crisis, has alleged that she was never privy to important aspects of the nuclear

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commonly believed, see Neil Joeck, "Tacit Bargaining and Stable Proliferation in South Asia," in Benjamin Frankel, ed., *Opaque Nuclear Proliferation: Technological and Policy Implications* (London: Frank Cass, 1991), pp. 77–91; Hagerty, "The Power of Suggestion"; Hagerty, "Nuclear Deterrence in South Asia"; Reiss, *Bridled Ambition*, pp. 183–230.

45. Brahma Chellaney, "International Implications of the U.S. Counterproliferation Initiative: A View From India"; in Reiss and Mueller, eds., *International Perspectives on Counterproliferation*, p. 128.

46. K. Subrahmanyam, "Capping, Managing, or Eliminating Nuclear Weapons?" in Kanti P. Bajpai and Stephen P. Cohen, eds., *South Asia After the Cold War: International Perspectives* (Boulder, Colo.: Westview Press, 1991), pp. 182–183.

47. Feaver agrees with this assessment: "The South Asian case . . . is even more compelling for the *absence* of preventive war: India's striking refusal to destroy Pakistan's nuclear arsenal before it reached deterrent status." "Optimists, Pessimists, and Theories of Nuclear Proliferation Management," p. 763 (emphasis in original).

48. The views of K. Subrahmanyam and K. Sundarji stand out in this regard. See Subrahmanyam, "Pak Nuclear Programme: A Case for Indian Acceptance," *Times of India*, February 28, 1987; Subrahmanyam, "Nuclear Force Design and Minimum Deterrence Strategy for India," in Bharat Karnad, ed., *Future Imperilled: India's Security in the 1990s and Beyond* (New Delhi: Viking, 1994), pp. 176–195; and Sundarji, *Blind Men of Hindoostan: Indo-Pak Nuclear War* (New Delhi: UBS Publisher's Distributors Ltd., 1993).

program. Sagan points to reports that Pakistan undertook measures to ready its nuclear arsenal for possible use and even threatened India with nuclear attack had war erupted.[49] These reports, however, have been denied by knowledgeable officials in both Islamabad and the United States.[50] But even if they are credible, it should be noted that Pakistan's actions, namely its deterrent warning to India and its arming of F-16s with nuclear bombs, were defensive in nature. In other words, for all of their sensationalism, these accounts do not attribute aggressive or offensive intentions to Pakistan's military leadership. During the crisis, Pakistan probably resumed production of weapon-grade uranium, which it had reportedly discontinued in the late 1980s, but it is important that in the heat of a serious crisis, neither country—especially the one in which military influence was the strongest—behaved in the manner that proliferation pessimists would expect. Nor have they acted to significantly bolster their nuclear capabilities in the years since the crisis, despite ongoing tensions over Kashmir.[51] Contrary to the much higher numbers given in most open-literature estimates of the size of both India's and Pakistan's arsenals, information available to the U.S. State Department indicates that, as of 1994, New Delhi had enough fissile material for twenty to twenty-five nuclear weapons, while the material possessed by Islamabad was enough for six to eight weapons.[52]

One could argue that the presence of important constraining factors, such as Islamabad's military and economic dependency on the United States as well

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49. Highly disputed accounts of Pakistani nuclear behavior in the crisis are presented in Seymour Hersh, "On the Nuclear Edge," *New Yorker*, March 23, 1993, pp. 56–73; and William E. Burrows and Robert Windrem, *Critical Mass: The Dangerous Race for Superweapons in a Fragmenting World* (New York: Simon & Schuster, 1994), pp. 81–85. Also see James Adams, "Pakistan 'nuclear war threat,'" *Sunday Times* (London), May 27, 1990, p. A1, which reports that India increased its nuclear readiness in response to Pakistan's moves.

50. Personal interviews by author. Also see Michael Krepon and Mishi Faruqee, eds., *Conflict Prevention and Confidence-Building Measures in South Asia: The 1990 Crisis*, Occasional Paper No. 17 (Washington, D.C.: Henry L. Stimson Center, April 1994); and Reiss, *Bridled Ambition*, esp. pp. 188–192. Note that civilian satellite imagery of the area in southwest Pakistan where the Pakistanis were supposedly priming their nuclear arsenal showed no evidence of the existence of a high-security facility or thermal signatures indicating heightened activity during the period in question. On this point, see Harold Hough, "Pakistan's Nuclear Status—Confusion or Strategy?" *Jane's Intelligence Review*, Vol. 7, No. 6 (June 1995), pp. 270–272.

51. Islamabad reportedly terminated production of highly enriched uranium and froze its nuclear activities in 1991.

52. Information reported in Reiss, *Bridled Ambition*, pp. 185, 192. Also see James C. Clad, "South Asia: Buoyant Economics, Nuclear Weapons and Environmental Stress," in Howard J. Wiarda, ed., *U.S. Foreign and Strategic Policy in the Post–Cold War Era* (Westport, Conn.: Greenwood Press, 1996), p. 190.

as India's dire financial condition, make the 1990 Kashmir crisis a less than definitive test for proliferation pessimism. But the impact of these factors should not be exaggerated. The Muslim insurgency in Kashmir, and alleged Pakistani support for it, was perceived in New Delhi as a manifest threat to India's territorial integrity and national identity; there was growing temptation in government circles, as well as important political groups, to use military force to resolve the crisis.[53] U.S. security protection of Pakistan was bound to be seen as fickle by Islamabad, given the rocky history of U.S.-Pakistani relations. Moreover, whatever restraint U.S. military and economic assistance engendered in Pakistan's nuclear activities, it came to an end in late 1990, when this assistance was terminated due to Washington's proliferation anxieties. On balance, South Asia's nuclear dynamics lend greater credence to proliferation optimism than to its critics. Steven Miller argues that the Indo-Pakistani nuclear relationship to date is so temporally limited, compared to the span of the Cold War, that it does not provide conclusive data about the security and stability effects of nuclear proliferation.[54] But what this dyad lacks in a temporal dimension, it more than makes up for in terms of the overall intensity of the rivalry. South Asia's political-military circumstances give rise to a rather stark setting for deterrence encounters and epitomize the conditions many Western analysts fear will lead to catastrophe if proliferation increases in the world. Because of a surfeit of powerful and interlocking factors that are at work in pushing India and Pakistan toward military conflict, one would intuitively expect that the subcontinent is a "least likely" case for peaceful proliferation outcomes.

THE SINO-SOVIET CASE

Evidence from the 1969 Sino-Soviet border conflict prompts a similar conclusion. Military action against China was contemplated by important elements in the Soviet leadership.[55] In theory, the temptation during the border conflict for Moscow to launch a preventive strike must have been great.[56] As one

53. See Hagerty, "Nuclear Deterrence in South Asia."
54. See Steven E. Miller, "Fateful Choices: Nuclear Weapons, Ukrainian Security, and International Stability," in Sagan, ed., *Civil-Military Relations and Nuclear Weapons*, p. 158, n. 3.
55. See Harold Hinton, *The Bear at the Gate: Chinese Policymaking under Soviet Pressure* (Washington, D.C.: American Enterprise Institute for Public Policy Research, 1971), p. 45; and the following analyses by Christian Duevel: "Disarray Among the Soviet Marshals," *Radio Liberty Dispatch*, May 22, 1969; "Marshal Zakharov's Position on the Sino-Soviet Conflict," *Radio Liberty Dispatch*, February 10, 1970; and "Tikhvinsky Denies Soviet Pre-emptive War Plans Against China," *Radio Liberty Dispatch*, February 23, 1970.
56. Soviet motivations to attack the PRC's nuclear assets should be seen in terms of preventive war, one designed to neutralize China before it developed a daunting nuclear threat. Richard Betts

scholar notes, Sino-Soviet political hostilities in the late 1960s came to a head just when China was most vulnerable to such an attack.[57] In light of the overwhelming quantitative and qualitative force asymmetries the Soviets enjoyed, the vulnerability of Chinese nuclear forces, the high stakes the Kremlin attached to the conflict's outcome, and China's internal turbulence arising from the Cultural Revolution, the border conflict should have been a relatively easy test for proliferation pessimism.

The reasons suggested for why Moscow took no preventive action against China vary. It is commonly asserted that, among other reasons, the prospect of an adverse U.S. reaction dissuaded Moscow from the nuclear bombing of China. Yet this explanation, which Sagan accepts, is more in line with the logic of proliferation optimists.[58] If U.S. opposition exerted a restraining influence on Moscow in 1969, it is unclear why, as optimists confidently expect, the possibility of hostile international reaction could not staunch preventive temptations by new or old proliferators in the future.

Concerns about Crisis Stability and Nuclear Accidents

Both optimists and pessimists agree that secure retaliatory capabilities are a *sine qua non* for stable deterrence but differ over whether new nuclear powers will be able to acquire such capabilities. For optimists, the problems involved in creating situations of mutual deterrence—once the hurdles of fabricating simple fission weapons are overcome—are not beyond the organizational, technological, and economic capabilities of many states, especially since only a handful of weapons is all that is necessary for deterrence to be in force.[59] Proliferators can be expected to field secure second-strike forces given the

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argues, "the gross imbalance in nuclear capability between the Soviets and Chinese . . . relieved either of the incentive for nuclear *preemption*, since it was obvious that Beijing lacked counterforce capability and could not limit damage to itself by striking first." "Nuclear Peace and Conventional War," *Journal of Strategic Studies*, Vol. 11, No. 1 (March 1988), p. 91 (emphasis in original).

57. For an interesting discussion of how the dynamics of crisis instability worked to induce restraint on both sides in this episode, see Harry Gelber, *Nuclear Weapons and Chinese Policy*, Adelphi Paper No. 99 (London: IISS, Summer 1973), pp. 20–21.

58. For Sagan's comments, see "The Perils of Proliferation," pp. 84–85. If strong U.S. opposition to Soviet military actions was a large factor in staying Moscow's hand, it is odd that neither Nixon nor Kissinger in their memoirs gives mention to this or takes credit for it. See Richard Nixon, *RN: The Memoirs of Richard M. Nixon* (New York: Grosset and Dunlap, 1978); and Henry Kissinger, *The White House Years* (Boston: Little, Brown & Co., 1979), pp. 183, 693.

59. Waltz, *The Spread of Nuclear Weapons*, pp. 14–18.

obvious incentives to protect expensive military investments and the difficulties an enemy faces in executing a successful first strike.

Disputing this assessment, pessimists believe that the important resource constraints faced by developing countries may prevent the emergence of stable deterrence between new nuclear powers. The technological and financial weaknesses of proliferating states would result in small and rudimentary force postures that are vulnerable to first-strike attack and operate under ramshackle safety measures and command and control structures, generating greater pressures on crisis stability and increased opportunities for accidents and unauthorized seizure.[60] Moreover, even if a state's resource base is ample, organizational biases may impede development of a secure second-strike arsenal. To the optimists' belief that states will successfully endeavor to protect their arsenals from attack because they have self-evident incentives to do so, pessimists counter that however much states prize their valuable military assets, they do not always take sufficient care in guarding them. "Imperfect organizations," Sagan submits, "provide an imperfect link between desires of political leaders and the outcomes of force postures. These organizations make predictable (but not always preventable) mistakes."[61] As pessimists see it, military services, owing to their strong offensive traditions, tend to lack sufficient professional incentives to make nuclear forces invulnerable, and will perceive pre-launch survivability measures to be unnecessary for deterrence or too costly to implement.[62] According to Sagan, "the transition to a secure retaliatory force [will] be especially prolonged in time and imperfect in implementation in states in which civilian control over military organizations is problematic."[63]

The shortage of critical resources and capabilities faced by emerging nuclear powers are, in the abstract, a bane for crisis stability, but in practice they may tend to operate as blessings in disguise. While constraints limit arsenal size and thus in theory create inviting targets for offensive action, they also restrict the number of weapons available for use in counterforce attacks. Unless counterforce attacks are executed with improbable accuracy and effectiveness—all the

60. Kaiser, "Non-proliferation and Nuclear Deterrence," pp. 126–127; and Dunn, *Controlling the Bomb*, pp. 71–75.
61. "Sagan Responds to Waltz," p. 128.
62. Sagan, "The Perils of Proliferation," pp. 85–93; Feaver, "Command and Control in Emerging Nuclear Nations," pp. 174–178. Nuclear deterrence readiness and crisis stability are theoretical constructs that in practice usually come into conflict. Cold War history suggests that the concern of military officers is on force readiness and that crisis stability is actually seen as a function of this readiness. Joseph Nye reports that one U.S. Air Force officer bluntly told him in the mid-1980s that, "Deterrence is more important than survivability." See Nye, "Arms Control and International Politics," *Daedalus*, Vol. 120, No. 1 (Winter 1991), p. 151.
63. Sagan, "The Perils of Proliferation," p. 90.

more improbable in view of the rudimentary intelligence capabilities possessed by new proliferators—they are impossible using the sparse arsenals that emerging nuclear states are likely to deploy against each other.[64] The paucity of resources may also force reliance on aircraft as delivery vehicles, against which reasonably good defenses could be affected, and may limit the number and sophistication of ballistic missiles that are fielded.[65]

The slow development pace and uncertain status of India's *Agni* intermediate-range ballistic missile, as well as its dependence on critical foreign technology, illustrate how resource scarcity can retard the development of counterforce-capable forces.[66] As an Indian commentator—himself a nuclear hawk—concedes, "much of the non-proliferation literature has presented an exaggerated portrayal of the nuclear technical capabilities of [India and Pakistan]. . . . [These capabilities] are more limited than what has been assumed."[67] Another Indian observer likewise notes that his country's missile program

still suffers from paucity of crucial component supplies, technology and doctrinal problems and, indeed, financial constraints. It would be rash to accept the official claims, ignoring the consistent failure of the Indian defence research establishment to put into production any significant weapons system that it develops.[68]

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64. Proliferation pessimists mistakenly assume that states lacking the resources to resolve force survivability problems will nonetheless have the wherewithal to execute full-fledged counterforce attacks. On this point, consult Feldman, "A Nuclear Middle East," *Survival*, Vol. 23, No. 3 (May–June 1981), pp. 112–113.

65. On the military value of ballistic missiles to regional nuclear states, consult Uzi Rubin, "How Much Does Ballistic Missile Proliferation Matter?" *Orbis*, Vol. 35, No. 1 (Winter 1991), pp. 29–39; Janne E. Nolan, *Trappings of Power: Ballistic Missiles in the Third World* (Washington, D.C.: The Brookings Institution, 1991), pp. 63–97; and John R. Harvey, "Regional Ballistic Missiles and Advanced Strike Aircraft," *International Security*, Vol. 17, No. 2 (Fall 1992), pp. 41–83.

66. Even in the case of the more successful development of the *Prithvi* tactical ballistic missile, the Indian army is reportedly concerned that the inability of the country's communications infrastructure to transmit targeting information limits the missile's military effectiveness. Moreover, the missile uses a fuel propellant that entails large problems in terms of ease and speed of fueling, does not incorporate the technical advancements developed in India's space program, and its guidance system probably cannot be upgraded to achieve a circular error probable (CEP) of less than 100 meters. See W.P.S. Sidhu, "Prithvi missile-tactical gap: army has yet to find a role for the weapon," *India Today*, September 15, 1992, pp. 84–85, as cited in Smith, *India's Ad Hoc Arsenal*, pp. 201–202; Reiss, *Bridled Ambition*, p. 194, n. 51; "User test no guarantee of deployment for Prithvi," *Indian Express* (New Delhi), May 28, 1994.

67. Brahma Chellaney, "Nuclear South Asia: Facing the Challenges," *Defence Today* (New Delhi), Vol. 2, No. 1 (February 1994), p. 35. While conceding that his country possesses some nuclear capabilities, a former head of the Indian Atomic Energy Commission notes that "we have not weaponized in any significant way." M.R. Srinivasan, "P.M. must admit, says ex-AEC Chief: India has nuclear capabilities," *Indian Express*, September 18, 1994, as cited in P.R. Chari, *Indo-Pak Nuclear Standoff: The Role of the United States* (New Delhi: Manohar, 1995), p. 212.

68. Shekhar Gupta, *India Redefines its Role*, Adelphi Paper No. 293 (London: IISS, January 1995), p. 44.

According to one well-informed estimate, development of a space vehicle that could eventually form the basis for an intercontinental-range ballistic missile was set back by a decade by the cancellation, under U.S. pressure, of Russian transfers to India of cryogenic booster engine technology.[69] One Indian official has noted that forty percent of the technology imported by New Delhi's space program comes from the United States, and a recent study conducted by the U.S. Department of Defense concludes that India remains deficient in several key technological areas in the missile field: guidance, navigation, computers, sensors, electronics, composites, and propulsion.[70] In this light, one wonders whether New Delhi's description of the *Agni* ballistic missile as a "technology demonstrator" is a clever deterrent ploy or a tacit admission of the limits of Indian capabilities. Although New Delhi and Islamabad have active ballistic missile development programs, aircraft are currently their only means of delivering nuclear weapons.[71]

For the last two decades, international nonproliferation norms have also inhibited proliferators from conducting full-scale nuclear tests, hindering efforts to reduce the size and augment the reliability and yield of warhead designs. For example, a comprehensive test ban treaty, if it enters into force, would greatly hinder efforts to develop thermonuclear weapons or miniaturize missile-borne warheads. China is considered an established nuclear power and has until recently conducted nuclear tests. But the discontent within its bureaucracy over the prospective constraints of such a ban is suggestive of the effect nonproliferation norms have on hindering evolutionary improvements in nuclear forces.[72] Normative constraints thus reinforce the difficulty states will face in an attempt to develop effective counterforce-capable weapons. The point here is not that the lack of wherewithal decreases the nuclear-strike capacities of incipient nuclear powers. Instead, it simply dictates that first strikes are ruled out as a practical option because of the difficulty of

69. Sandy Gordon, *India's Rise to Power in the Twentieth Century and Beyond* (New York: St. Martin's Press, 1995), p. 43.

70. Amit Gupta, "Indian Security Planning in the 1990s: Learning to Live in a New World Order," in Marvin G. Weinbaum and Chetan Kumar, eds., *South Asia Approaches the Millennium: Reexamining National Security* (Boulder, Colo.: Westview Press, 1996), p. 187; and *Risk Report*, 1/95–2/95, as excerpted in *Nonproliferation Review*, Vol. 3, No. 2 (Winter 1996), p. 169.

71. The *Prithvi* missile is theoretically capable of delivering a nuclear weapon, but it is uncertain whether India has the resources to produce miniaturized warheads or even many of these missiles. A recent press item reports that rising costs have cut Indian army purchases of the *Prithvi* to only thirty. Raj Chengappa, "Boosting the Arsenal," *India Today*, February 29, 1996.

72. See Alastair Iain Johnston, "China's 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Vol. 20, No. 3 (Winter 1995/96), esp. pp. 39–40.

success.[73] In this sense, force vulnerability problems may not make much difference due to resource limitations or military indifference, since nuclear rivals are likely to lack the ability to exploit such vulnerabilities.

Some proliferation optimists concede the crisis-stability dangers posed by emerging nuclear arsenals, but contend that such dangers are transitory as postures develop in size and sophistication, and can be alleviated even more quickly by the transfer of command and control technology from established nuclear powers to newer ones. While Brito and Intriligator see the progressive increase in the number of nuclear powers as a factor of stability, they also admit that proliferation increases the statistical probability of accidental war because newer nuclear powers will be less able to develop adequate technical safeguards against accidental or unauthorized use. They, however, view this problem as "a relatively 'low'-probability event."[74]

But the resource limitations faced by Third World states make it questionable whether postures will evolve quickly or dramatically.[75] They lack both the wherewithal to expand like the superpowers and the doctrinal impetus, which in the U.S. case came from extended-deterrence commitments to cover an extraordinary range of targets under a variety of circumstances and with a high degree of redundancy. The centrality of extended deterrence in U.S. strategic policy had two principal effects. First, by tying force requirements in an implicitly open-ended manner to the size of the Soviet military establishment, it sanctioned the deployment of an extensive number and variety of nuclear weapons. It also had the consequence of reinforcing and rationalizing the long-standing preemptive impulses and emphasis on counterforce targeting in U.S. nuclear planning. As one scholar notes, the risk of preemptive war in the Cold War was a function of the counterforce doctrines the superpowers fol-

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73. Feaver agrees with this assessment of the difficulties of decapitation strikes: "Even a modest nuclear arsenal should have some existential deterrent effect on regional enemies, precisely because decapitation is so difficult." Feaver, "Command and Control in Emerging Nuclear Nations," p. 186. For research indicating that the stress on preemption as a path to war has been greatly exaggerated, and that fears of preemptive strikes against nuclear forces of new nuclear states in international crises might be misplaced, see Dan Reiter, "Exploding The Powder Keg Myth: Preemptive Wars Almost Never Happen," *International Security*, Vol. 20, No. 2 (Fall 1995), pp. 5–34.

74. Brito and Intriligator, "Proliferation and the Probability of War: Global and Regular Issues," p. 140.

75. Curiously in this respect, proliferation optimists may slip into the same pitfall as pessimists do, by mistakenly giving too much credit to resource-strapped new nuclear powers. On the extremely high investment costs involved in building a nuclear arsenal, see Brad Roberts, "From Nonproliferation to Antiproliferation," *International Security*, Vol. 18, No. 1 (Summer 1993), pp. 139–170; and Leonard S. Spector, "Repentant Nuclear Proliferants," *Foreign Policy*, No. 88 (Fall 1992), pp. 3–20.

lowed, and not of any inherent logic of nuclear strategy. "In this respect, the superpower nuclear arms competition was *sui generis:* without exception, every sub-superpower proliferant has embraced *countervalue,* not counterforce, nuclear doctrines."[76]

For an array of reasons, India and Pakistan seem content to rely on a "nonweaponized" type of nuclear deterrence, which derives from "the power of each to construct nuclear weapons quickly." Both countries, as a result, reject "the hyper-elaborate intellectual and technical apparatus of the U.S.-Soviet nuclear competition."[77] Reasoning that new proliferators will never truly come to believe that their arsenals are invulnerable to enemy attack, Peter Feaver however maintains that this "nonweaponized" disposition is only a temporary condition that will give way to pressures for greater weaponization as the likelihood of war mounts.[78] Giles makes a similar point, noting that in the early postwar years the United States customarily kept its nuclear weapons dismantled and their components stored separately until the pressures for greater military readiness led to the deployment of fully assembled weapons and to the predelegation of launch authority.[79] Likewise, a former Indian army general opines that it is "naive to expect India and Pakistan to settle for a minimum deterrence posture *vis-à-vis* each other. The momentum of 'weapon dialectics' will simply drive these countries inexorably toward expanding their nuclear arsenals."[80] But the lack of an extensive resource base will put the brakes on any plans to expand dramatically South Asia's nuclear programs and in the process belie fears that they are driven by technological momentum.[81]

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76. Hagerty, "Nuclear Deterrence in South Asia," p. 7 (emphasis in original). Brahma Chellaney concurs with this point: "New nuclear states are unlikely to fit into the traditional Western deterrence paradigm. The Indian, Israeli, and Pakistani nuclear-weapons programs and strategies, for example, cannot be easily explained with the aid of Western deterrence logic and theory." Chellaney, "Naivete and Hypocrisy: Why Antiproliferation Zealotry Does Not Make Sense," *Security Studies,* Vol. 4, No. 4 (Summer 1995), p. 781.

77. Perkovich, "A Nuclear Third Way in South Asia," p. 86.

78. Feaver, "Proliferation Optimism and Theories of Nuclear Operations," pp. 176–177. Also see Sagan, *The Limits of Safety,* pp. 266–267.

79. Giles, "Safeguarding the Undeclared Nuclear Arsenals," pp. 174, 178–179.

80. Kotera M. Bhimaya, "Nuclear Deterrence in South Asia: Civil-Military Relations and Decision-Making," *Asian Survey,* Vol. 34, No. 7 (July 1994), p. 657.

81. For critiques of the technological determinism explanation, see Graham Spinardi, *From Polaris to Trident: The Development of U.S. Fleet Ballistic Missile Technology* (New York: Cambridge University Press, 1994); Steve Weber, *Cooperation and Discord in U.S.-Soviet Arms Control* (Princeton, N.J.: Princeton University Press, 1991); and Donald MacKenzie, "The Soviet Union and Strategic Missile Guidance," *International Security,* Vol. 13, No. 2 (Fall 1988), pp. 5–54. Johnston, "China's 'Old Thinking,'" pp. 41–42, argues that technological determinism does not explain the evolving structure of Chinese nuclear forces.

Moreover, resource constraints may actually stimulate states to adopt innovative "low-tech" solutions to survivability problems that contribute to crisis stability. Chinese strategic forces, for instance, are deployed with as few as two missiles per launch unit. Missiles are stored in tunnels and caves, and deployed in valleys, mountainous terrain, and other concealed and camouflaged sites.[82] Although Western sources reported, at the time of the Sino-Soviet border conflict, that China lacked an operational ballistic missile capability, a limited number of medium-range missiles were actually deployed in such a slow and carefully camouflaged manner that they escaped detection by U.S. intelligence systems until about 1969.[83] Indeed, vulnerability concerns in the 1960s and early 1970s led China to undertake the mammoth "Third Front" program that involved the creation of a huge self-sufficient industrial base in remote areas of the country's vast hinterland. An entire nuclear weapons infrastructure was built at sites in southwestern China because its location would require much greater penetration of Chinese airspace than regions closer to the Soviet border.[84] In the time period that Sagan claims that military parochialism was abetting a dangerous vulnerability of Chinese strategic forces to Soviet attack, the U.S. Joint Chiefs of Staff were favorably commenting on the deterrence capability of these same forces, given their effective although relatively unsophisticated deployment schemes.[85]

Constraints on force development will also help to alleviate concerns about the adequacy of command and control arrangements fashioned by new nuclear states. The small size of their arsenals, as well as their low operational readiness, mandates a tight exercise of control.[86] The last three states to achieve a

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82. Robert S. Norris, Andrew S. Burrows, and Richard W. Fieldhouse, *Nuclear Weapons Databook*, Volume 5: *British, French, and Chinese Nuclear Weapons* (Boulder, Colo.: Westview Press, 1994), p. 374. Israel too reportedly bases part of its nuclear forces in caves. See David A. Fulgrum and Jeffrey M. Lenorovitz, "Israeli Missile Base Hidden in Hill," *Aviation Week and Space Technology*, November 8, 1993, p. 29, as cited in Thayer, "The Risk of Nuclear Inadvertence," p. 474.

83. See Harvey W. Nelsen, *The Chinese Military System: An Organizational Study of the Chinese People's Liberation Army*, 2nd ed., rev. and exp. (Boulder, Colo: Westview Press, 1981), p. 71.

84. Norris, Burrows, and Fieldhouse, *British, French, and Chinese Nuclear Weapons*, pp. 349–350; Barry Naughton, "The Third Front: Defence Industrialization in the Chinese Interior," *China Quarterly*, No. 115 (September 1988), pp. 351–386; and John Wilson Lewis and Xue Litai, *China's Strategic Seapower: The Politics of Force Modernization in the Nuclear Age* (Stanford, Calif.: Stanford University Press, 1994), pp. 88–102.

85. Sagan, "The Perils of Proliferation," pp. 90–91; and Norris, Burrows, and Fieldhouse, *British, French, and Chinese Nuclear Weapons*, p. 374.

86. This point is partly recognized by Feaver, who contends that "Third World proliferators are not necessarily predisposed against assertive control" and that unassembled arsenals constitute a highly assertive form of control. Feaver, "Command and Control in Emerging Nuclear Nations," p. 172. Elsewhere, however, he argues that rudimentary forces are more likely to be vulnerable to

nuclear arsenal of some kind—South Africa, India, and Pakistan—were "opaque" proliferators opting to maintain unassembled arsenals rather than integrate fully-assembled weapons into their armed forces.[87] Unlike the superpowers during the Cold War, they do not maintain force postures in which ready-to-use nuclear weapons and their associated delivery vehicles are co-located, or that emphasize the rapid launch of nuclear weapons even in peacetime conditions.[88] The six nuclear devices South Africa produced in the 1980s, for instance, were stockpiled in unassembled form in high-security vaults at a nuclear weapons manufacturing facility until they were dismantled in 1991. Nuclear and non-nuclear components for the devices were stored separately, and their assembly required the use of four different codes, one of which was held only by the prime minister.[89] While these devices were fabricated as aerial bombs, there is no indication that they were ever mounted on delivery platforms.

Pessimists may insist that the South African example is anomalous and that one should not expect a similar pattern in more conflictual strategic milieus. Blair surmises that "it is reasonable to expect that emerging nuclear states will in the name of deterrence equip, or prepare to equip on short notice, [delivery systems] with nuclear weapons . . . if the history of the nuclear superpowers is a reliable guide and the classical dilemmas of nuclear security come to bear as strongly on regional dynamics."[90] Based on the impact that the Cold War's strategic environment had on the evolution of the superpowers' arsenals, Feaver predicts that relatively weak powers in war-prone regions will adopt time-urgent force postures.[91] Pakistan typifies such a description, yet its behavior up to now simply does not accord with this logic.

The actual sizes of the Indian and Pakistani arsenals are subject to speculation, but the U.S. intelligence community estimates that they consist of components that require some time for assembly and deployment on delivery vehicles. In 1993, the U.S. director of the CIA testified that "both India and

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enemy attack, thus spurring proliferators to rely on delegative command systems to ensure quick operational response. "Proliferation Optimism and Theories of Nuclear Operations," pp. 167–168.

87. On opaque proliferation, see Avner Cohen and Benjamin Frankel, "Opaque Nuclear Proliferation," in Frankel, ed., *Opaque Nuclear Proliferation*, pp. 14–44.

88. For a well-researched review of the dangerous evolution to hair-trigger settings in the arsenals of both superpowers, see Blair, *The Logic of Accidental Nuclear War.*

89. Albright, "South Africa and the Affordable Bomb," p. 44; and J.W. de Villiers, Roger Jardine, and Mitchell Reiss, "Why South Africa Gave Up the Bomb," *Foreign Affairs*, Vol. 72, No. 5 (November/December 1993), p. 100.

90. Blair, *Global Zero Alert for Nuclear Forces*, p. 9.

91. Feaver, "Proliferation Optimism and Theories of Nuclear Operations," pp. 167–169.

Pakistan have the capability to assemble the components of nuclear weapons, a small number of nuclear weapons within [a few days]. . . . They can be assembled, the few that each could put together, quite quickly."[92] The two countries practice existential deterrence in its most literal sense, and the consequent time-lag between decisions to assemble their weapons and actually to detonate them helps safeguard against inadvertent nuclear conflict.[93]

Pessimists readily admit that deterrence between new nuclear powers may work well enough in peacetime, and that their concerns are dormant as long as proliferators' arsenals remain non-operational. But they insist that their apprehensions will be fully justified when the exigencies of a war-threatening crisis impel proliferators to field ready-to-use nuclear forces. The dangers of nuclear weapons accidents and even accidental war will be high as weapons lacking safe design features are hurriedly assembled and deployed by military personnel unskilled in their handling. Important crisis-stability dangers may also be at work. Dispersal of arsenals to launch areas is likely to touch off a corresponding alert of rival nuclear forces, with the nuclear establishments of both sides coming to interact in volatile and unpredictable ways, especially if the arsenals' warning systems are vertically integrated with the nuclear command systems. The interplay of mutual expectations of the possibility of surprise attack, compounded by the lack of reliable early-warning capabilities and the short time-to-target distances involved, may force the adoption of "attack-on-warning" postures that are liable to precipitous overreactions to ambiguous attack warnings. The reciprocal fear of impending attack could thus become a catastrophic, self-fulfilling prophecy. Moreover, the operational deployment of these forces will dilute the assertive control leaders exercise over unassembled nuclear inventories, and raise the specter of unauthorized use by nervous or reckless military commanders.

Having found the superpowers' diverse and complex nuclear operations to be faulty and liable to dangerous breakdown, especially in times of crisis, pessimists maintain that it is unreasonable to believe new nuclear powers can avoid the same pitfalls. Concerned about the effect deficient warning systems will have on crisis behavior, Blair points out that

the United States and the Soviet Union, two wealthy and technologically advanced nations, each spent many billions every year on the infrastructure of

92. See the testimony of CIA Director R. James Woolsey in *Proliferation Threats of the 1990's*, Hearing before the Committee on Governmental Affairs, U.S. Senate, 103d Congress, 1st session, February 24, 1993 (Washington, D.C.: Government Printing Office, 1993), p. 29.

93. On this logic, see Perkovich, "A Nuclear Third Way in South Asia," pp. 99–100; and Hagerty, "The Power of Suggestion"; and Hagerty, "Nuclear Deterrence in South Asia."

intelligence and warning. And still they did not fully satisfy the severe operational demands imposed on the warning process. The proliferating states are bound to cut corners in their pursuit of warning. . . . The operational postures of these nuclear rivals are virtually certain to become accidents waiting to happen.[94]

The validity of the arguments made by proliferation pessimists cannot be dismissed, but their strength may be vitiated by the fact that new proliferators will be fielding small, even rudimentary, arsenals. The ability to analogize from Cold War nuclear operations and make inferences applicable to new proliferators is thus quite limited due to the different character of the arsenals in question. Superpower nuclear establishments, precisely because of their technological sophistication, exhibited the structural characteristics—high degrees of interactive complexity and tight coupling—that rendered them more susceptible to catastrophic malfunction. The superpowers' nuclear weapons infrastructures were exemplars of the scholarship on organization theory that informs the latest wave of proliferation pessimism.[95] The sheer magnitude and tempo of crisis operations, involving numerous, ready-to-fire units simultaneously executing complicated, pre-planned routines, made for quite intractable organizations. To provide maximum military effectiveness, nuclear units were dependent on rapid warning of attack and operated under strict time-lines once warning was received. With the warning process so tightly integrated with the direct control of nuclear forces, warning errors could ramify rapidly throughout the entire arsenal, setting off an unstoppable train of actions that could lead to a nuclear calamity. The lack of time buffers involved in the decision-making process raised the likelihood that false warnings could have led to the inadvertent mass firing of weapons.[96] Being complex high-technology systems, U.S. and Soviet arsenals were particularly subject to a version of Murphy's law that even individuals unfamiliar with the details of nuclear operations would intuitively understand: the possibility of breakdown disproportionately rises as the number of things that must interact perfectly increases.[97] Given the relatively high statistical probability of dangerous breakdown intrinsic to super-

94. Blair, *The Logic of Accidental War*, p. 254.
95. This scholarship, particularly the literature on "normal accidents," is reviewed in Sagan, *The Limits of Safety*, pp. 28–52. Also see Feaver, *Guarding the Guardians*, pp. 67–70.
96. See Ashton B. Carter, "Sources of Error and Uncertainty," in Ashton B. Carter, John D. Steinbruner, and Charles A. Zraket, eds., *Managing Nuclear Operations* (Washington, D.C.: The Brookings Institution, 1987), p. 636; and Paul Bracken, *The Command and Control of Nuclear Forces* (New Haven, Conn.: Yale University Press, 1983), chap. 2.
97. As Bracken writes, "There is a latent fear, almost an intuitive or folk wisdom belief, that any high-risk, tightly-coupled military system built to control nuclear forces just cannot be all that safe, that something just has to go wrong in anything that complicated." Ibid., p. 49.

power systems, the wonder is that the accidents Blair and Sagan chronicle did not actually lead to nuclear disaster.

Emerging nuclear arsenals are just the reverse of the superpower model, however. Small and relatively simple and undeveloped, they possess the structural attributes that, according to "normal accidents" principles, lower the probability of accident. This is most clearly true in peacetime. But even if the arsenals were weaponized and deployed in the heat of crisis, it is unlikely that they would be tightly integrated with early warning capabilities, if new nuclear states have even made provisions for such integration, or if the deployed forces would be configured to execute such rigid, time-sensitive launch plans that the superpowers developed during the Cold War. Spurious indications of attack may thus not generate the risk of inadvertence that inhered in U.S. and Soviet force postures.[98] Strangely enough, Sagan himself makes this point when he pleads against attempts to

> make new proliferators become like the superpowers during the Cold War, with large arsenals ready to launch at a moment's notice for the sake of deterrence; instead, for the sake of safety, the United States and Russia should try to become more like of the some of the nascent proliferators, maintaining very small nuclear capabilities, with weapons components separated and located apart from the delivery systems.[99]

Pessimists are correct to point out that the exigencies of crisis can transform the character of nuclear operations, increasing the possibilities of accidents and inadvertence within force postures. Blair, Feaver, and Sagan amply demonstrate this point with regard to the United States and the Soviet Union during the Cold War. And few would suggest that emerging regional nuclear powers are *a priori* exempt from this condition. The abstract risks of nuclear accident and inadvertence may not be reducible beyond a certain minimum, regardless of whether states possess large and sophisticated, or small and crude force postures.[100] But accounting for the synergistic effects of numerical size, complexity,

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98. Thayer, "The Risk of Nuclear Inadvertence," p. 474, suggests that the absence of robust warning capabilities precludes the preemptive or launch-on-warning use of emerging nuclear forces. For a partial rebuttal of this argument, see Blair, "Nuclear Inadvertence: Theory and Evidence," p. 496.

99. Sagan, "The Perils of Proliferation," p. 107. Sagan makes a similar point in "Sagan Responds to Waltz": "States that develop complex arsenals and command systems, and operate their weapons on high-alert levels in order to permit rapid launches, will be more accident-prone than states that do not adopt such force structures" (p. 120).

100. Classical deterrence theory has tended to view this irreducible risk as a virtue that actually reinforces deterrence stability by providing yet another reason why nuclear powers should not enter into hostilities with one another. Paul Bracken, for instance, has argued that "some degree of accident proneness in nuclear forces encourages stability and prudence in political leaders," and

widespread dispersal, and doctrinal compulsions, the relative probability of nuclear accidents or inadvertence for superpower arsenals in crisis may actually be greater than for emerging nuclear arsenals.[101] By misapplying the "normal accidents" paradigm, proliferation pessimists may thus have overestimated the risk potential intrinsic to minor nuclear powers. Accidents may well occur in these arsenals, but most likely not for the organizational and technological reasons pessimists advance.

The thought of multiplying the probability of this risk through an increase in the absolute number of nuclear states, even if the risk is low in particular emerging arsenals, surely calls for a coherent nonproliferation policy. But it is difficult to avoid the impression that an implicit anti-nuclear bias underlies proliferation pessimism, at least among some of its proponents, causing them in turn to presume that all proliferation is inevitably dangerous.[102] Yet, this bias leads pessimists to overlook a simple remedy to the risks of inadvertence or accident that they fear in new nuclear states. Having acknowledged the basic rationality of decision-makers whenever they are in the shadow of nuclear weapons, the entire logic of their case about technological handicaps and organizational pathologies supports a policy of providing assistance to fledgling nuclear arsenals. Indeed, they are hard pressed to argue against the wisdom of such a policy response.[103] That they have chosen not to advocate

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that "eliminating accidents and the possibility of inadvertent actions in regard to nuclear forces in *principle* would be undesirable." "Do We Really Want to Eliminate the Chance of Accidental War?" *Defense Analysis*, Vol. 4, No. 1 (March 1988), pp. 85, 88 (emphasis in original). It is thus puzzling why proliferation pessimists, including Bracken himself, have ignored this source of nuclear stability in their analyses. For a discussion of the stability induced by the "autonomous risks" of nuclear disaster, see Avery Goldstein, "Robust and Affordable Security: Some Lessons from the Second-Ranking Powers During the Cold War," *Journal of Strategic Studies*, Vol. 15, No. 4 (December 1992), esp. pp. 485–491.

101. James G. Blight and David A. Welch, "Risking 'The Destruction of Nations': Lessons of the Cuban Missile Crisis for New and Aspiring Nuclear States," *Security Studies*, Vol. 4, No. 4 (Summer 1995), pp. 811–850, argue that proliferation optimism fails what is a critical case for it: the 1962 missile crisis. But many of the historical examples they use to illustrate their argument actually demonstrate how inadequate the pessimistic case is when it is applied to minor nuclear powers—a point which Blight and Welch occasionally seem to recognize (see pp. 832, 848).

102. Sagan, *The Limits of Safety*, pp. 274–275, writes that complete nuclear disarmament "*appears* to be a natural outcome of any argument stressing that nuclear accidents are inevitable in the long run," though he acknowledges that this is not a feasible option for the foreseeable future (emphasis in original). But his attitude is much less qualified in "Sagan Responds to Waltz," p. 135.

103. I thank Benjamin Frankel for raising this point. One pessimist, Steven Miller, does argue in favor of such a policy, but only under highly circumscribed conditions. See Steven E. Miller, "Assistance to Newly Proliferating Nations," in Robert D. Blackwill and Albert Carnesale, eds., *New Nuclear Nations: Consequences for U.S. Policy* (New York: Council on Foreign Relations Press, 1994), pp. 97–131. Feaver, "Command and Control in Emerging Nuclear Nations," pp. 181–187, is another exception.

this method of resolving their particular fears about proliferation points up an underlying normative assumption that skews their entire analysis.

Doctrinal Double Standards

Is it better for emerging nuclear powers to possess inchoate use doctrines or to develop full-fledged strategic concepts that integrate nuclear arsenals into their armed forces? On this issue, proliferation pessimists seem to want to have it both ways. Opaque nuclear programs compartmentalize nuclear decision-making within a small coterie of officials.[104] By constraining discourse on the political and military utility of nuclear weapons and impeding the development of sound strategies for their employment, Feaver argues that the opaque status of new nuclear states hinders the effective management of nuclear activities in times of crisis as arsenals are haphazardly weaponized and deployed. He underscores this point by referring to the reported confusion and haste with which the Israeli leadership decided to arm and target its nuclear arsenal in the 1973 Arab-Israeli War.[105] Not only would national leaders resort to *ad hoc* and panicky alert and targeting decisions, but the potential for accidents would be high, as military personnel untrained in the safe handling of nuclear weapons were called upon to assemble, transport, deploy, and, possibly, employ them hurriedly.[106] Pessimists further fear that the lack of well-developed doctrines will inhibit establishment of a robust dialogue between nuclear states that could result in mutually understood rules of nuclear behavior.

But would pessimists really approve of detailed strategies as a sign of nuclear maturity that bodes well for stability between new proliferators, or would they be horrified if proliferators shed their existential deterrence concepts and began to contemplate the possible use of nuclear weapons? The assumption that focused strategic thinking within new nuclear states will necessarily engender doctrines that reinforce nuclear stability (by eschewing the options of preemption and prompt retaliation, for instance) is in basic

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104. Cohen and Frankel, "Opaque Nuclear Proliferation."
105. See the account in Seymour M. Hersh, *The Samson Option: Israel's Nuclear Arsenal and American Foreign Policy* (New York: Random House, 1991), pp. 225–227. For a rebuttal of Hersh's claims, consult Evron, *Israel's Nuclear Dilemma*, pp. 71–72. However, Sagan quotes a senior U.S. policymaker who corroborates the rudiments of Hersh's account. See "Sagan Responds to Waltz," p. 122, n. 13.
106. Feaver, "Proliferation Optimism and Theories of Nuclear Operations," pp. 177–178.

conflict with pessimistic logic, since it is in the formulation and implementation of nuclear strategy that one would expect pernicious military organizational biases to come to the fore.

New nuclear states may well see no particular reason to develop a full-fledged use doctrine. The amorphous contours of Chinese nuclear strategy stand in contrast with the superpower pattern of elaborate doctrinal pronouncements, even though the pressing strategic threats Beijing faced in its early nuclear years arguably should have attracted it to a more rigorously defined doctrine. Scholars have noted the foreign policy incentives that favor the maintenance of an opaque nuclear posture, since it provides the cover to escape international censure, but proliferation pessimists fail to appreciate the military benefits deriving from a deliberate policy of doctrinal ambiguity. Because of the small and rudimentary nature of its nuclear inventory, doctrinal reticence may well suit a nascent nuclear power. Harry Gelber has written that the vagueness of China's deterrence theories, by maximizing uncertainty about Beijing's likely actions in a nuclear conflict, was an important component of its deterrent posture against the Soviet Union in the late 1960s and early 1970s.[107] Additionally, attempts to define strategic doctrine may generate two unintended but destabilizing consequences. First, by highlighting deficiencies in force posture and spurring the allocation of resources toward their correction, the development of formal use doctrine would aggravate security dilemma pressures between otherwise stable nuclear rivals. By proclaiming to minimally weaponized nuclear powers that deterrence can only be effective under the conditions of copious second-strike capabilities and appropriate use doctrines, the message pessimists deliver could bring about exactly this kind of pernicious environment. Second, the prescription for formal doctrine would greatly compound possibilities of inadvertent nuclear escalation in the event that war breaks out between new nuclear countries. Integrating a proliferant's nuclear assets into its regular armed forces carries the risk of having them come into direct contact with conventional military operations, thus compelling a hasty decision to expend them for fear they are about to be captured or destroyed.[108] In contrast, this danger is mitigated for opaque, unassembled arsenals. Given these risky prospects, it is perhaps better to let sleeping dogs lie.

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107. Gelber, *Nuclear Weapons and Chinese Policy*, pp. 21–22. Also see Avery Goldstein, "Understanding Nuclear Proliferation: Theoretical Explanation and China's National Experience," in Davis and Frankel, eds., *The Proliferation Puzzle*, pp. 234–238.

108. See the analysis in Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Ithaca, N.Y.: Cornell University Press, 1991).

Conclusion

This article has focused criticism on a number of assumptions of the newest wave of proliferation pessimism; however, this literature has made important contributions to social science research. Conceptually and empirically, it represents a marked advance over the old school of pessimism. The work produced by Feaver, Sagan, and Blair is founded on first-rate historical accounts of Cold War nuclear behavior and the attention they pay to theoretical explanation sets a high and much-needed standard for proliferation scholarship. It is the coupling of impressive historical research and explicit concern for building theory that enables the new pessimists to slough off the ethnocentrism that blinded an earlier generation of work. But in their quest to jettison ethnocentric biases, the new pessimists have gone so far in the opposite direction that they have unwittingly acquired the myopia of what might be called "superpower-centrism." Instead of assuming, as their predecessors did, that the logic and behavior patterns of new nuclear states will be radically different from the putatively "stable" superpower experience, they assume that emerging nuclear powers will inevitably conduct themselves in ways that only too closely resemble the Cold War's dangerous nuclear practices. Much of nuclear history beyond the superpower example does not sustain this assumption, however. For a complex set of disparate reasons, the nuclear behaviors of China, India, and Pakistan are not congruent with expectations derived from the U.S.-Soviet experience.[109] Nor is the deductive foundation for the pessimistic case all that strong. The supposition that emerging nuclear forces will acquire the baleful characteristics of superpower arsenals is suspect, partly because it is based on a model of nuclear operations that is peculiar to the Cold War. Likewise, it is unwarranted to presume, as Sagan does almost solely on the basis of the U.S. civil-military experience, that the armed services of proliferants will necessarily tend toward offensive action and preventive war. Indeed, the assumption that the behavior of military institutions is generic across all cases has been shown to be unjustified by recent empirical work.[110]

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109. On this score, Western analysts would profit from a close reading of Ken Booth's *Strategy and Ethnocentrism* (New York: Holmes & Meier, 1979).

110. For a view that military organizational culture—beliefs and norms about war-fighting—may lead to instances of military restraint that are not predicted by traditional organization theory, see Jeffrey W. Legro, *Cooperation Under Fire: Anglo-German Restraint during World War II* (Ithaca, N.Y.: Cornell University Press, 1995). See Elizabeth Kier, "Culture and Military Doctrine: France between the Wars," *International Security*, Vol. 19, No. 4 (Spring 1995), pp. 65–93, for an argument that military organizations do not inherently prefer offensive doctrines. Feaver, otherwise sympathetic

The superpower-centric view of proliferation articulated by the new pessimism is unproven at best and flawed at worst. The U.S.-Soviet experience is in many ways so anomalous that scholars should not be too quick to assume its generalizability. Ironically, the old pessimists were probably correct in their suspicions that important aspects of the superpower case were indeed singular. The new pessimism may be too closely tied to a single empirical example to be of much use in explaining and predicting behavior in other nuclear dyads. That the central characteristics of behavior between nuclear rivals will vary with the nature of the states and regions involved is a sounder assumption. In particular, the likely pathways by which inadvertent-war and crisis-stability pressures could arise in proliferators should be treated as an empirical question that requires ongoing investigation.[111] Breaking free of the idiosyncracies of the Cold War and developing a corresponding sensitivity to the contextual differences that shape behavior in various nuclear rivalries will be the next great challenge for proliferation scholarship.

The focus of this article has been on scholarship rather than on policy, but a research program aimed at enhancing the theoretical robustness of the pessimists' case will yield important practical results too. By specifying more precisely how organizational and technological hazards within proliferant countries operate to promote or reduce the likelihood of unwanted nuclear use, scholars would help to correct the shortcomings of present policy by suggesting what exactly needs to be done—or, more probably, what does not need to be done—after a country proliferates. This article has suggested that a critical evaluation of the logic underlying proliferation pessimism would likely lead scholars to conclude that the best policy for dealing with newly established nuclear powers is simply to do no more harm: providing proliferators with command and control assistance or encouraging them to adopt formal use doctrines is unnecessary and runs the serious risk of creating dangerous self-fulfilling prophecies.

Although the new pessimism, by stimulating the search for solid historical evidence and the building of cogent theory, has enlivened and contributed to the debate about the consequences of proliferation, in the end it must be

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to Sagan, comments that "the further he pushes the argument, the more Sagan must argue that salient features of the American military organization are in fact inherent in all military organizations. . . . Absent such evidence, it seems just as plausible that different military organizations will confront similar situations in different ways." Feaver, "Optimists, Pessimists, and Theories of Nuclear Proliferation Management," p. 763.

111. In fairness to Feaver, he is sensitive to this need. See ibid., p. 754.

admitted that the current debate will be inconclusive. The evidentiary base is small, particularly as it concerns the newer nuclear-weapons states. Whether pessimistic concerns or optimistic faith is borne out in reality must await future empirical research. The task now before scholars is to go beyond rote arguments over whether proliferation is good or bad and undertake empirical investigations into the actual behavior of new nuclear powers. To the extent that the latest generation of proliferation pessimism has provided us with outstanding examples of the kind of hard historical spadework that needs to be done, as well as a cache of hypotheses ready for testing, it has positioned us well for this challenge.