The emergence of cooperation:
national epistemic communities and
the international evolution of the idea
of nuclear arms control
Emanuel Adler

An American epistemic community played a key role in creating the international shared understanding and practice of nuclear arms control, which gave meaning to and helped coordinate expectations of superpower cooperation during the Cold War.[1] In this study, I analyze how the community's theoretical and practical ideas became political expectations, were diffused to the Soviet Union, and were ultimately embodied in the 1972 antiballistic missile (ABM) arms control treaty.

In the late 1950s, when the idea of nuclear arms control was introduced, nuclear deterrence was only a concept that could neither be taken for granted nor ruled out.[2] However, having become aware of the vulnerability of U.S. nuclear weapons and concerned about the reciprocal fear of surprise attack, the strategists and scientists making up the U.S. epistemic community predicted that both the national security of the United States and the chances of avoiding nuclear war would be enhanced if the superpowers would collaborate

1. An epistemic community, as defined in this issue of *IO,* is a network of individuals or groups with an authoritative claim to policy-relevant knowledge within their domain of expertise. The community members share knowledge about the causation of social and physical phenomena in an area for which they have a reputation for competence, and they have a common set of normative beliefs about what will benefit human welfare in such a domain. While members are often from a number of different professions and disciplines, they adhere to the following: (1) shared consummatory values and principled beliefs; (2) shared causal beliefs or professional judgment; (3) common notions of validity based on intersubjective, internally defined criteria for validating knowledge; and (4) a common policy project.

2. Lawrence Freedman, *The Evolution of Nuclear Strategy* (New York: St. Martin's Press, 1983), p. 191.

to stabilize the nuclear balance through arms control. Energized by their shared epistemic criteria about the causes of war, the effects of technological change on the arms race, and the need for nuclear adversaries to cooperate, these strategists and scientists reached into the places where decisions are made and into the minds of the people who made them,[3] thereby turning their ideas into widespread national security policy and practice. They also were instrumental in diffusing this understanding to the Soviet Union. Indeed, after a time the Soviets agreed to negotiate with the Americans on the basis of this understanding, and it has formed the foundation of U.S.–Soviet cooperation over the last thirty years.

The relevance of my study of the arms control epistemic community for understanding international cooperation lies in the notion that *domestically* developed theoretical expectations which were created by a *national* group of experts and were selected by the U.S. government as the basis for negotiations with the Soviets became the seed of the ABM partial security regime.[4] Although many of these original expectations were later "renegotiated" at the bargaining table and the Americans came to follow a more political approach to arms control, it was the set selected by the U.S. government that became the regime's conceptual basis.[5]

Thus, the Americans and Soviets signed the 1972 ABM treaty and created a regime not only because the balance of power and technology had changed, nor because of any deep sharing of strategic cultural or political goals, but because they were able to converge on an American intellectual innovation as the key to advancing both their irreconcilable interests and their shared interest of

3. See Wesley W. Posvar, "The New Meaning of Arms Control," *Air Force Magazine,* June 1963, p. 38. For another study on intellectuals and nuclear weapons, see Roman Kolkowicz, "Intellectuals and the Nuclear Deterrence System," in Roman Kolkowicz, ed., *The Logic of Nuclear Terror* (Boston: Allen & Unwin, 1987), pp. 15–46.

4. Krasner has defined international regimes as "sets of implicit or explicit principles, norms, rules and decision-making procedures around which actors' expectations converge in a given area of international relations." Whether the regime concept applies to international security, however, has been debated. On the one hand, Jervis and others have argued that the anarchic characteristics of this issue-area tend to lower incentives for cooperation and regime building. On the other hand, Nye has shown that once we take the set of agreements, injunctions, and institutions as forming not just one comprehensive security regime but an incomplete mosaic of partial security regimes, the notion of security regimes makes sense. These partial security regimes have led to the creation of understandings about what it takes to negotiate security agreements, what type of norms and rules can be applied, and how. In some cases, they have helped to institutionalize rules of reciprocity, limit competition, transfer information needed to comply with the agreements, and enhance crisis stability by generating stable expectations, including the expectation that diplomacy and negotiations should not be interrupted in the event of international crises. Taken together, and regardless of their various degrees of success, partial security regimes have amounted to a discreet yet significant effort to limit and control autonomous action in the security area. See Stephen Krasner, "Structural Causes and Regime Consequences: Regimes as Intervening Variables," in Stephen D. Krasner, ed., *International Regimes* (Ithaca, N.Y.: Cornell University Press, 1987), p. 2; Robert Jervis, "Security Regimes," in Krasner, *International Regimes,* pp. 173–94; and Joseph S. Nye, Jr., "Nuclear Learning," *International Organization* 41 (Summer 1987), pp. 371–402.

5. Robin Ranger, *Arms and Politics, 1958–1978: Arms Control in a Changing Political Context* (Toronto: Macmillan, 1979).

avoiding nuclear war. Once nuclear arms control became conventional and was routinized in government practices, however, the superpowers saw it in their interest to conform with arms control agreements.

The political selection, retention, and diffusion at national and international levels of *new* conceptual understandings suggest an evolutionary approach. The mutually reinforcing national and international arms control games—two-level games, as it were—were structured not only by fixed interests and power but also by common understandings and practices. Such an evolutionary approach is at odds with explanations of international change advanced by structural realism and approaches based on it.[6]

For example, Steve Weber has used a modified structural realist analysis to shed light on superpower cooperation during the Cold War. He argues that "the condition of nuclear deterrence constitutes a structural change in the international political system" and that, beginning in the early 1960s, the superpowers became "socialized" to structural change and constraints in different ways.[7] Thus, in the ABM case, a lack of shared interests or compatible visions of the long-term goals to be achieved through agreement led the superpowers to learn different lessons, hence dooming the detente episode of the 1970s. Beginning in the mid-1980s, however, for reasons that Weber does not fully specify, expectations began to converge.

Weber's approach differs from mine in many conceptual and practical ways. Weber uses a conventional structural analysis to show how a new structural organizing principle, mediated by ideas, influences concepts of state interests.[8] In contrast, I use a structurationist approach to show how epistemic communities play a role in establishing interpretations of interests as practices that help

6. See Robert D. Putnam, "Diplomacy and Domestic Politics: The Logic of Two-Level Games," *International Organization* 42 (Summer 1988), p. 434. My approach is further developed in "Cognitive Evolution: A Dynamic Approach for the Study of International Relations and Their Progress," in Emanuel Adler and Beverly Crawford, eds., *Progress in Postwar International Relations* (New York: Columbia University Press, 1991), pp. 43–88. See also Emanuel Adler, *The Power of Ideology: The Quest for Technological Autonomy in Argentina and Brazil* (Berkeley: University of California Press, 1987). For other approaches dealing with the role of ideas in world politics, see Judith Goldstein, "Ideas, Institutions, and American Trade Policy," *International Organization* 42 (Winter 1988), pp. 179–217; John S. Odell, *U.S. International Monetary Policy: Markets, Power, and Ideas as Sources of Change* (Princeton, N.J.: Princeton University Press, 1982); John G. Ruggie, "International Regimes, Transactions, and Change: Embedded Liberalism in the Postwar Economic Order," in Krasner, *International Regimes,* pp. 195–231; and Peter A. Hall, ed., *The Political Power of Economic Ideas: Keynesianism Across Nations* (Princeton, N.J.: Princeton University Press, 1990). For key structural realist studies, see Kenneth N. Waltz, *Theory of International Politics* (Reading, Mass.: Addison-Wesley, 1979); and Robert Gilpin, *War and Change in World Politics* (New York: Cambridge University Press, 1981).

7. Steve Weber, "Realism, Detente and Nuclear Weapons," *International Organization* 44 (Winter 1990), p. 77.

8. The conventional structural analysis refers to the approach outlined by Waltz in *Theory of International Politics.* According to Weber, the new structural organizing principle "follows from joint custodianship, a function that was acquired by the United States and Soviet Union and which fundamentally differentiates them from other states." See Weber, "Realism, Detente and Nuclear Weapons," p. 77.

organize, structure, and coordinate international behavior.[9] In Weber's theoretical world, structural reality constrains behavior and then challenges agents to coordinate their behavior. In my theoretical world, agents coordinate their behavior according to common practices that structure and give meaning to changing international reality.

The epistemic community approach has some clear "comparative advantages." First, it allows us to understand why superpower cooperation was conceptualized via arms control in the first place. Second, it increases our sensitivity to domestic political factors, especially to the notion that within each national actor different interpretations of the national interest compete for the shaping of international agendas as well as international practices. Third, in ways that allow for empirical research, focusing on an epistemic community draws our attention to the impact of scientific knowledge on international cooperation processes. Fourth, the approach shows that states become socialized not only to structural constraints but also to each other's understanding of the world. Fifth, it helps us see that, in spite of or even because of superpower disagreement over political interests and visions, the fact that the "Soviets also seem to have understood and shared to some degree the American concerns about arms race and crisis instabilities that might be engendered by ABM deployments"[10] was not inconsequential for peaceful change. The outcome of a lack of such shared understanding might have been nuclear war, rather than the temporary demise of detente. Sixth, common epistemic understandings proved to be more lasting than disagreements over long-term goals. With the end of the Cold War, most of the divergent long-term goals are gone; what still remains, though, are an abundance of weapons and the practice of arms control.

On the basis of my theoretical approach, I have devised an evolutionary research framework to describe how arms control ideas were selected from the lot, carried into the power stratum, and survived to become reality in 1972. This framework consists of five variables: (1) *units of variation* (the "genetic stuff," as it were), consisting of tentative new conceptual variants, interpretations, and meanings based on expectations, which circulate within the academic and political communities; (2) *innovation,* or the processes by which intellectual communities package such units of variation and thereby create a collective understanding—as, in our case, about the nuclear predicament; (3) *selection,* or the political processes that determine which policies are effectively adopted by the government; (4) *diffusion,* or the spread of expectations, values, and other types of ideas to other nations; and (5) *units of effective modification,* or the

---

9. Structuration theory, as defined by Wendt, is "a relational solution to the agent-structure problem that conceptualizes agents and structures as mutually constituted or co-determined entities." See Alexander E. Wendt, "The Agent-Structure Problem in International Relations Theory," *International Organization* 41 (Summer 1987), p. 350. See also Anthony Giddens, *Central Problems in Social Theory* (Berkeley: University of California Press, 1979); and Anthony Giddens, *The Constitution of Society: Outline of the Theory of Structuration* (Cambridge: Polity Press, 1984).

10. Weber, "Realism, Detente and Nuclear Weapons," p. 69.

patterned normative behavior of two or more states that results in part from innovation, selection, and diffusion of expectations.[11] In the following sections of my article, I relate the concept of an epistemic community to the issue of nuclear strategy and offer an empirical description of the variables. First, however, let me state the working hypotheses that inform my approach:

(1) In a strategic relationship, expectations are not derived in some automatic and deterministic fashion from a structural condition but emerge from meanings and understandings or "theories" that show a relation between causes and effects and create interpretations of structure.

(2) When there is no prior experience with the phenomenon at hand, such as nuclear war, these theories are based on generalizable and abstract propositions and models.

(3) Because of the "scientific" and technical nature of these theories, they are most likely to be developed in academic circles, given validation there, and taken to the political system by academic communities.

(4) Through direct and indirect means, nations transmit to each other the content of their theories.

(5) This transfer of meanings and concepts from nation to nation allows decision makers of different nationalities and cultures to share historical experience, epistemic criteria, and expectations of proper action and to rationally calculate their choices according to an intersubjective understanding of the structural situation and of each other's payoffs.

(6) The sharing of strategic epistemic criteria induces decision makers to behave according to these criteria, thus helping to fulfill them in practice.

(7) International cooperation emerges, changes, and decays along with shared meanings and expectations and thus depends on whether or not decision makers will make the rational choice to learn.

Knowledge, power, and nuclear strategy

Epistemic communities

Both national and international epistemic communities may play roles in the evolution of international cooperation in fields characterized by technical uncertainty and complexity. But the political influence of transnational epistemic communities, such as the Pugwash group in the security field,[12] is most likely to rest on the transfer from the international to the domestic scene of the ideas that *national* scientists and experts raise at their transnational meetings. Pugwash, for example, can be best described as what John Ruggie calls a "switchboard" through which connections are "established and main-

---

11. This framework is partly inspired by Stephen Toulmin's discussion in *Human Understanding* (Princeton, N.J.: Princeton University Press, 1972), pp. 122–23.

12. J. Rotblat, *History of the Pugwash Conferences* (London: Taylor & Francis, 1962).

tained, rather than being a depository of activity and authority."[13] The decisive "customers," then, from both domestic and international political perspectives, are, first, national experts, and ultimately, national governments.

That is why we need to pay more attention to the international influence of *national* epistemic communities in various fields, including arms control. They may be able to affect international political processes and outcomes by binding present and future decision makers to a set of concepts and meanings that amount to a new interpretation of reality and also by becoming actors in the process of political selection of their own ideas. As international negotiation agendas are formulated on the basis of these ideas and as negotiation and diplomatic processes start to take place, diplomats act to advance not only a set of policies but also a set of ideas. They "communicate," as Michael Brenner puts it, "to the leaders of other states their 'theoretical' understanding about the military-political characteristics of nuclear weapons in addition to signalling their intent on the particular issue at hand. . . . This exchange of beliefs and images is especially significant in the area of nuclear weapons where the issues of perception and deterrent psychology bulk so large."[14]

The success of epistemic communities is historically contingent. Historical contingency is afforded by the state of technology, the distribution of power in the international system, domestic political and administrative structures and procedures, and political, economic, and military events. As the historical context changes, theories or policy proposals that previously did not make much sense to politicians may suddenly acquire a political (perhaps even urgent) meaning, thus becoming politically viable.

The field of military strategy is propitious for the emergence of an epistemic community because, as Wesley Posvar has argued, strategy is "formulated by the cumulative action of subordinate and outlying elements. Individual, piecemeal decisions add together and build upon one another, and the aggregate comprises the strategic posture of the nation."[15] Thus, although the government or state agencies are directly in charge of developing national

13. John G. Ruggie, "Changing Frameworks of International Collective Behavior: On the Complementarity of Contradictory Tendencies," in Nazli Choucri and Thomas W. Robinson, eds., *Forecasting in International Relations: Theory, Methods, Problems, Prospects* (San Francisco: Freeman, 1978), p. 403.

14. Michael J. Brenner, "The Theorist as Actor, the Actor as Theorist: Strategy in the Nixon Administration," *Stanford Journal of International Studies* 7 (Spring 1972), pp. 109–10.

15. See Wesley W. Posvar, "The Impact of Strategy Expertise on the National Security Policy of the United States," *Public Policy,* vol. 13, 1964, p. 39. See also Margaret Gowing, "An Old and Intimate Relationship," in Vernon Bogdanor, ed., *Science and Politics* (Oxford: Clarendon Press, 1984), p. 68. According to Gowing, "The scientists of the atomic era indeed became acutely conscious of phenomena which rule political life: the conflict of desires and aims, the conflict between the interests of different generations, the difficulty of calculating consequences. In the years of their ascendency they proved that they were not all-wise nor indeed all-wicked but infinitely human. They could change their minds with devastating speed. They could be both wise and foolish, both myopic and far-sighted, both judicious and ridiculous, both clear-headed and muddled. They turned out to be, indeed remarkably like the politicians."

strategies, institutions outside the structure of government may also be able to perform this function.[16]

The "imaginary" science of nuclear strategy

To prescribe an effective course of action, a community of strategists requires a theory that, as Charles Reynolds suggests, "show[s] a causal relationship between conditions, a governing principle, and a result. The [political] actor then has the choice, should he so wish, to procure the result by fulfilling the conditions."[17] For the most part, strategists arrive at their theories by inductive processes, as they look to the past for information, understanding, and inspiration. But when there is no prior experience, as in the case of nuclear war, strategic thinking must depend principally on theories that seek to explain human behavior on the basis of some generalizable propositions, such as rationality, and on the basis of abstract models, simulations, and games. Thus, because the science of nuclear strategy has no empirical reference points and data banks, it cannot be falsified and is, in this sense, "imaginary."[18]

This is especially true of nuclear arms control, since theory on this subject was developed in the absence of experience with nuclear war and at a time when there was little or no meaningful experience with nuclear disarmament and arms control. Theorizing about nuclear arms control requires assumptions about how weapons would operate in various hypothetical nuclear war scenarios and what might or might not deter conflicting powers from launching a surprise nuclear attack. These assumptions must rest partly on a theory of international behavior, arrived at mainly on the basis of conjectures, assumptions, and nonscientific expectations.

Arms control theory, therefore, cannot be a priori valid or true. Its validity and power as a conceptual basis for international cooperation will depend on the following: the temporary existence among the members of an epistemic community of shared expectations and of intersubjective and consensual meanings, arrived at via verbal communication; the domestic political selection of shared expectations as practices of governments, based on the fact that expectations meet the decision makers' criteria for advancing national interests; and the fulfillment of these expectations in practice, once they are diffused to other nations and become the epistemic criteria on which a strategic relationship between two or more nations is based. On all three levels—epistemic community, domestic political system, and international system—the

16. See Posvar, "The Impact of Strategy Expertise on the National Security Policy of the United States," p. 40. See also John Garnett, "Strategic Studies and Its Assumptions," in John Baylis et al., eds., *Contemporary Strategy* (New York: Holmes & Meier, 1987).

17. Charles Reynolds, *The Politics of War: A Study of the Rationality of Violence in International Relations* (New York: St. Martin's Press, 1989), p. 28.

18. I owe this insight to Hayward Alker. On the nonscientific basis of strategy, see Reynolds, *The Politics of War;* and Eugene B. Skolnikoff, *Science, Technology and American Foreign Policy* (Cambridge, Mass.: MIT Press, 1967), p. 110.

sharing of premises and expectations, or "theories," creates the "evidence" that confirms the validity of norms.

Because the superpowers are engaged in a strategic situation characterized by the interdependence of expectations, the sharing of deterrence, stability, and arms control expectations induces policymakers to behave *as if* they are true, thus fulfilling the theories' conditions in practice. Progress in arms control and the absence of war over time may then help reinforce the belief in stable deterrence and arms control expectations. In this manner, the science of nuclear strategy has an input in creating the reality it is supposed to explain and predict.

It also follows that the power of expectations as an explanatory variable is independent of the "instillation" of the expectations in any subjective mind. If arms control ideas succeeded in transforming the practice of deterrence and cooperation with the adversary, what mattered was not that the personal expectations of the people involved changed in the course of their careers, nor was it how preferences were first proposed. Instead, what mattered was how the preferences were ultimately disposed through the presence or absence of social validation.[19] Furthermore, the realization of communicable expectations and theories depends on whether their practical applications are readily perceived by policymakers. For example, Thomas Schelling's theory of interdependent decision seems to lead to important and striking political proposals and actions. And these proposals are striking and important not merely because of their content but also because they seem to be based on his theories.[20] Reality thus results from a collective redefinition of problems that carries first the clout of "scientific knowledge" and then the clout of political and institutional power.

Knowledge relating to arms control cannot be separated from values, for while values are backward-looking in their frequent appeal to past conduct for justification, they also guide anticipatory and goal-directed behavior and thus affect expectations. Human values affect action by influencing our definition of a particular situation and by directing our choice of relevant "facts" or "interests." The interdependence of facts and values implies a constant shifting between empirical and normative elements in decision making.[21] Thus, arms control expectations became a political practice, both within the United States and between the superpowers, only after arms control acquired (1) domestic political value; (2) foreign policy value (as a means of achieving foreign policy goals); (3) instrumental international value (as a means of preventing nuclear war); (4) intrinsic value (arising from the reasoned assumptions behind the

19. Aaron Wildavsky, "Choosing Preferences by Constructing Institutions: A Cultural Theory of Preference Formation," *American Political Science Review* 81 (March 1987), p. 9.

20. Probably the most succinct and best exposition of Schelling's arms control theory is "Reciprocal Measures for Arms Stabilization," in Donald G. Brennan, ed., *Arms Control, Disarmament, and National Security* (New York: Brazillier, 1961), pp. 167–86.

21. Adler, "Cognitive Evolution," p. 61.

theory); and (5) moral value (the consequentialist ethical standard wherein stable deterrence and arms control are temporarily good for avoiding nuclear war).

Units of variation: arms control expectations

Since the dawn of the nuclear age, two intellectual communities and two sets of collective understandings, values, and visions have had the crucial impact on national security policy making.[22] Embedded in these two worldviews are different expectations about war, cooperation with the adversary, and technology, the most important of which is probably the expectation of nuclear war and of its outcome.

Those who favored arms control shared a loose cause-and-effect mode of reasoning which was sufficient to qualify them as believers in a body of "knowledge" that was distinctively "theirs." Because they expected war in the nuclear age to break out as a result of crisis instability and misperception, as it had in 1914, and predicted that nuclear war could never be won yet would be likely without measures to avoid it, they placed the greatest relative value on forces and tactics designed to prevent a first strike (rather than on an American war-fighting capability); put a premium on cooperation with the adversary; and promoted the development of a high threshold of nuclear weapons use. They also predicted that technology would not be able to create the "magic bullet" with which to achieve superiority, but they valued technological changes that might help stabilize the nuclear balance.[23]

On the basis of this particular interpretation of war, cooperation, and technology, the arms controllers developed a distinctive set of assumptions

22. These two communities have been the most, though certainly not the only, influential ones from a policy point of view in the nuclear debate. Also involved were communities that strove for nuclear abolition and total disarmament and for solving the nuclear predicament through international institutions and world government. See Robert A. Levine, *The Arms Debate* (Cambridge, Mass.: Harvard University Press, 1963); Arthur Herzog, *The War-Peace Establishment* (New York: Harper & Row, 1965); and Robert E. Osgood, *The Nuclear Dilemma in American Strategic Thought* (Boulder, Colo.: Westview Press, 1988). For example, the peace movement, institutionally represented by the Committee for a Sane Nuclear Policy (SANE), promoted a vision of peace radically different from that of the arms controllers. On some occasions, however, SANE came to the help of arms control. And the peace movement also played a significant role in efforts to set aside disarmament ideas and make room for arms control during the period when scientists who were generally favorable to disarmament agreed nevertheless to support arms control as a temporary measure. On SANE, see Milton S. Katz, *Ban the Bomb: A History of SANE, the Committee for a Sane Nuclear Policy, 1957–1985* (New York: Greenwood Press, 1986).

23. Brodie augured this approach, arguing (for the wrong reasons, as it later emerged) that nuclear weapons should be used only to deter the adversary. In what is probably the most quoted sentence in the field of national security, Brodie summarized the message of his book: "Thus far, the chief purpose of our military establishment has been to win wars. From now on, its chief purpose must be to avert them. It can have no other useful purpose." See Bernard Brodie, *The Absolute Weapon* (New York: Hartcourt Brace, 1946), p. 76. See also Levine, *The Arms Debate*, p. 240.

about the reciprocal fear of surprise attack and crisis stability that became the backbone of arms control. Interpreting the state of the world in 1960 as being extremely dangerous because of the Cold War, they doubted that the political and ideological divide between the superpowers would be bridged in the near future, but they nevertheless expressed confidence in the Soviet ability to learn the secrets of deterrence and arms control and stressed that conflicting powers have common interests, which provide a basis for cooperation. The members of this community expected general disarmament to fail, although they reached no consensus about whether disarmament might be an option in the long run. They perceived arms control to be an integral part of national security policy, believed that arms control could include a variety of unilateral measures, and expected that in time arms control might help create a psychology of peace.

This set of views was challenged by an intellectual and political community that expected war to break out because of a premeditated attack by an aspiring world hegemonic power, as it had in 1939. The main cause-and-effect mode of reasoning of this community was, according to Robert Jervis, that wars "are caused by states failing to develop the military strength and credible threats necessary to dissuade others from challenging the status quo. Furthermore, threats are most likely to be believed when the state can carry them out at reasonable cost."[24] Thus, the community members regarded the use of nuclear weapons as quite possible and expected that if the right measures were taken, a nuclear war could be won. Expressing a preference for counterforce strategies, they emphasized a less restricted type of deterrence and maintained that cooperation with the adversary would lead to instability and was dangerous. While they were optimistic that military superiority and even victory could be achieved through technological fixes, they shared the view that their strategy would make nuclear war less likely over the long run.[25] Albert Wohlstetter, Herman Kahn, Richard Pipes, Eugene Rostow, Colin Gray, Fred Ikle, Keith Payne, Edward Teller, Richard Perle, and Kenneth Adelman, to mention just a few, have, more or less, held the above set of views, which also was prevalent in the military establishment.

Jervis is right in pointing out that the views which identify the two communities overlap and are partly compatible. The overlap over deterrence is more apparent than real, however, because the two outlooks are based on

24. Robert Jervis, "Arms Control, Stability, and Causes of War," *Daedalus* 120 (Winter 1991), p. 172.
25. William Borden's *There Will Be No Time* (New York: Macmillan, 1946) also made early references to the usability of nuclear weapons in war, to the expectation that nuclear wars could be won, and to counterforce targeting, active defenses, and intercontinental ballistic missiles (ICBMs). Borden did not expect nuclear weapons to revolutionize strategy; he expected them only to reinforce some of the oldest and most classic elements of strategy. Believing that the nuclear adversaries would spare each other's cities because of their vulnerability, Borden expected that nuclear weapons would be used against military installations. See Robert Jervis, "Strategic Theory: What's New and What's True," in Kolkowicz, *The Logic of Nuclear Terror,* p. 48; and Levine, *The Arms Debate,* p. 240.

different theories of war and therefore, in practice, their policy prescriptions contradict each other. "Arms control," suggests Jervis, "stresses the dangers that arise when reassurances and promises—especially the promise not to strike—are either not made or are not believed; deterrence stresses the dangers that arise when threats are absent or dismissed."[26] It is therefore not surprising that the arms control ideas met with challenge from those advocating nuclear superiority and that their challenge was as manifest in the 1960s, when they largely opposed a partial test ban treaty (PTBT) and supported ABM deployment, as it was in the 1980s, when they placed their prestige on the line in favor of the strategic defense initiative (SDI). Only recently, with the revolutionary events in Eastern Europe and the end of the Cold War, has this challenge begun to weaken and the conceptualization of the strategic debate to change.

Intellectual innovation

The arms control epistemic community

The arms control epistemic community was an informal association of scientists and civilian strategists who for intellectual, ideological, and political reasons adopted the arms control approach, in spite of all their differences over national security issues, including arms control itself.

Two subgroups constituted this community. One group of experts, whom Robert Levine characterized as "analytical middle marginalists," considered the underlying cause of international conflict to be the clash between the interests of nations as they pursue their separate goals. They stressed the futility of disarmament and the dangers of misperception and crises that get out of hand, and they expected that for the foreseeable future the world would have to depend for stability on the possession of nuclear weapons. The other group, whom Levine called "moderate antiwar marginalists," believed that armaments were indeed a serious cause of international tension and that therefore reducing weapons would reduce tensions. But they also believed that the intensity of mutual grievances as manifested in the Cold War made a transitional period, wherein peace was guaranteed by nuclear deterrence, unavoidable.[27] While they preferred disarmament to limited arms control measures, the latter were seen as much better than an unlimited and dangerous nuclear arms race.

These two groups converged into an epistemic community because, surprising as it may seem, they were in agreement about the short-term advantages and necessity of arms control and there was scarcely a member of either group who did not concede the validity of the recommendations of the other. As

26. Jervis, "Arms Control, Stability, and Causes of War," p. 173.
27. Levine, *The Arms Debate,* pp. 61 and 89–90.

Posvar wrote at the time, "One might even question whether the term 'schools' as applied to these groups should be abandoned in favor of something like converging points of view."[28]

Certainly some of the epistemic community's members did not get along well, and sometimes there were personal, career, and institutional conflicts.[29] Many of the arms controllers, having made original intellectual contributions in their own fields of expertise and in nuclear strategy, guarded their own ideas and interpretations. But their discussions, arguments, and mutual criticisms actually helped them in shaping a consensus over concepts, surmounting interdisciplinary barriers, and creating a common vocabulary.

Members of this community knew each other well: they frequently encountered each other on television and in round-table and debate performances, often were colleagues at the same or nearby universities, and regularly made use of each other's written and oral presentations. Thus, they learned from one another and together generated the standards by which they verified the validity of their ideas. In this way, they came to share expectations that set them apart from the experts and policymakers who had a strong faith in technological fixes, military superiority, and "victory" in nuclear war. Yet "admission" to the arms control epistemic community was based not only on the sharing of epistemic criteria but also on an active dedication to "the cause," collectively recognized expertise, and "the ability to come up with new proposals and arguments."[30] The result, as one member of this community put it, was a group of people who had experiences in common and were supremely confident in their ability to deal rationally and analytically with almost any problem.[31]

Several factors explain the ability of these people to prevail in many instances. To begin with, confident in their ability to use their scientific knowledge to solve problems,[32] arms controllers used their scientific prestige to gain legitimacy and authority within the political system. They were one community, yet they were everywhere: dispersed among government bureaus, research organizations and laboratories, profit and nonprofit organizations, university research centers, and think tanks. Such dispersion was important because their effectiveness depended on their relative autonomy from political power, their ability to keep separate from current critical pressures,[33] to retain their scientific integrity and authority, and to continue to innovate. At the same time, they were public figures who required a certain power legitimation, and this was achieved through personal links with policymakers or with individuals

28. Posvar, "The New Meaning of Arms Control," pp. 39–40.
29. Thomas Schelling, personal communication.
30. Herzog, *The War-Peace Establishment,* p. 4.
31. Donald F. Hornig, "Science and Government in the USA," in Harvey Brooks and Chester L. Cooper, eds., *Science for Public Policy* (New York: Pergamon Press, 1987), p. 20.
32. Ibid.
33. Posvar, "The Impact of Strategy Expertise on the National Security Policy of the United States," p. 49.

such as Paul Nitze, who linked the community with government institutions,[34] and through the fact that their arms control ideas, after being diffused to the political system, were in demand by Presidents Eisenhower and Kennedy and their advisers. In other words, power legitimation arose from the creation by the arms control epistemic community of a politically *viable* alternative both to disarmament and to military superiority.

A small but key group of civilian strategists within the epistemic community had been affiliated with the RAND Corporation, which helped turn civilian strategy into a profession.[35] From RAND, the strategists absorbed an engineering approach and the methodologies, models, and assumptions that helped them articulate their ideas on arms control. By 1957 or 1958, noted Fred Kaplan, "a definitive strategic community had formed within RAND. It had reached—by dint of small numbers, a common outlook, a [mostly] common academic background in mathematics and economics, and the forcefulness of a few strong personalities—a fairly tight consensus on the major issues, the most solidly held of which was the not unlikely prospect of a Soviet surprise attack against the increasingly vulnerable Strategic Air Command."[36] While to some prominent RAND strategists the prospect of a Soviet surprise attack meant a redoubling of efforts to achieve military superiority through technological fixes, to others such as Thomas Schelling, Lewis Bohn, and Amrom Katz it meant the necessity of stabilizing mutual deterrence by means of arms control technical measures.

Schelling spent parts of 1957 and 1958 at RAND, where his work influenced and was influenced by theorists such as Bernard Brodie, Daniel Ellsberg, Malcolm Hoag, Herman Kahn, William Kaufmann, and Albert Wohlstetter.[37] Later, Morton Halperin, a Yale graduate student, attracted the attention of Schelling, and they decided to collaborate. Donald Brennan, another key member of the community in its early years, had worked for nine years at the MIT Lincoln Laboratory, had come into direct contact with the RAND strategists, and had developed a close relationship with Kahn, with whom he went to work at the Hudson Institute. (By 1964, however, Brennan became disenchanted with the idea of basing strategic stability on controlling defensive weapons and crossed over to the "other" community. The sense of betrayal that was felt by arms controllers suggests the strength of their feelings of communal cohesion.)

Schelling, Brennan, and other economists and mathematicians used game theory—at that time a relatively new methodology invented by John von

---

34. See Strobe Talbott, *The Master of the Game: Paul Nitze and the Nuclear Peace* (New York: Alfred A. Knopf, 1988).

35. Jennifer E. Sims, "The Development of American Arms Control Thought, 1945–1960," Ph.D. diss., Johns Hopkins University, Baltimore, Md., 1985, p. 284.

36. Fred Kaplan, *Wizards of Armageddon* (New York: Simon & Schuster, 1983), pp. 123–24.

37. Thomas C. Schelling, *The Strategy of Conflict* (London: Oxford University Press, 1960), p. vi.

Neumann and Oscar Morgenstern[38]—to make deductions and predictions about deterrence and arms control. Aided by the rapid advance in computers, game theory allowed the strategists to make all kinds of assumptions, construct imaginary situations and worlds, and deduce from their models the answers to the problems posed by Soviet nuclear weapons.[39] "What I got out of game theory," said Schelling, "was more of a conceptual framework, a way of organizing problems. . . . It helps one to see . . . whether some outcomes are better than others for both parties."[40] This formal approach certainly reflected the ascendance of behaviorism within academia during the 1950s.

The rationality assumption, the realist assumptions about the nature and resolution of conflicts, and the fear of communism, which was almost equal to the fear of nuclear war itself, were transmitted from RAND to the political structures that later formulated arms control policies. Strategists who worked in institutions other than RAND and were trained in a more classical and less behaviorist approach also made a contribution. Furthermore, intellectuals from various traditions had become acquainted with arms control ideas and methods in the universities, in think tanks, and in governmental institutions, and they played an active role, helping to train—through teaching and publication—security analysts who joined the community later on.[41]

The role of the scientists who joined the ranks was as important as that of the strategists. They were trained mainly in physics and engineering and had been involved since the 1940s in the making of weapons and other technological systems, such as air defenses. They had participated in government-sponsored projects[42] and had become disenchanted about the failure of disarmament negotiations as well as pessimistic about technological solutions to the nuclear weapons predicament.

The scientists were the first to participate in active discussions with policymakers on arms control. As members of the Presidential Science Advisory Committee (PSAC), they had access to President Eisenhower, who gave support to "his" scientists. They also had firsthand experience with arms control, as active participants in the test ban treaty talks, which were used as a

38. See John von Neumann and Oscar Morgenstern, *Theory of Games and Economic Behavior,* 2d ed. (Princeton, N.J.: Princeton University Press, 1947).

39. The economists tended to treat strategic problems in a formal, detached, and almost apolitical manner. This approach elicited a strong reaction and even led some writers to portray the nuclear strategists as lesser human beings. See, for example, Anatol Rapoport, *Strategy and Conscience* (New York: Harper & Row, 1964); Ralph Lapp, *The New Priesthood: The Scientific Elite and the Uses of Power* (New York: Harper & Row, 1965); and Irving L. Horowitz, *The War Game: Studies of the New Civilian Militarists* (New York: Ballantine Books, 1963).

40. Thomas Schelling, cited by Herzog in *The War-Peace Establishment,* p. 49.

41. Sims, "The Development of American Arms Control Thought," p. 286.

42. Twenty or more physicists were recruited from MIT to participate in Project Charles and work on continental air defense. The project's product was a three-volume report which concluded that a defense of the United States against Soviet bombers was feasible and should be undertaken promptly. Project Vista dealt with the nonnuclear defense of Europe. See Gregg Herken, *Counsels of War* (New York: Oxford University Press, 1987), pp. 61, 63, and 65.

testing ground for their ideas—a paradigmatic case, so to speak, that could be applied to other cases later on.[43]

Among the most prominent of these scientists were Jerome Wiesner, Herbert York, Isador Rabi, Jerrold Zacharias, James Fisk, Bernard Feld, Paul Doty, George Kistiakowsky, Hans Bethe, Eugene Rabinowitch, Jack Ruina, George Rathjens, Spurgeon Keeny, Wolfgang Panofsky, Harvey Brooks, and James Killian, president of MIT. That many of the scientists and a majority of the strategists were from either Harvard or MIT (and thus referred to as the "Charles River gang") was doubly significant. First, it was easier for them to interact on a daily basis, formally or informally exchanging ideas. Second, the institution with which a thinker was connected helped determine whether his or her ideas got a hearing where it mattered most—at the White House, the Pentagon, or the State Department.[44] And the fact that many members of this community had access to government secrets—whether through RAND, PSAC, or Pentagon research agencies—was important because it made them feel like "insiders" and provided them with information they thought reliable.

The scientists regarded their experience in handling major security projects as a model for organizing arms control. For instance, Wiesner, seeing no incentive for the development of special seismic detectors because they were not needed in the development of nuclear weapons and because no bureaucracy or organization existed to create a political stake in them, spoke of a need "to create a vested interest in arms control, to develop a cadre of people whose full-time occupation is research and development on means of arms control and on the analysis of the political and military problems of arms control."[45]

Peace research and conflict resolution were attaining academic legitimacy and were being fueled by a score of interdisciplinary programs, and many academicians, strategists, and scientists found the *Bulletin of the Atomic Scientists* to be a perfect medium for disseminating the emerging ideas of nuclear arms control.[46]

We should be careful not to confuse the arms control epistemic community with a profession.[47] The community cut across professions; its members were involved in arms control only part of their time; they shared responsibility for their decisions with political actors; and their ethical standards did not arise

43. Experience in one of the major wartime laboratories, especially the MIT Radiation Laboratory and the Laboratories of the Manhattan Project, or an apprenticeship with one or more of the military "summer studies" still appears to be a useful qualification for scientific advising. See Herken, *Counsels of War,* pp. 116–21; and Harold K. Jacobson and Eric Stein, *Diplomats, Scientists and Politicians: The United States and the Nuclear Test Ban Negotiations* (Ann Arbor: University of Michigan Press, 1966).
44. *Business Week,* Special Report, 13 July 1963, p. 75.
45. Jerome B. Wiesner, *Where Science and Politics Meet* (New York: McGraw-Hill, 1965), p. 176.
46. Sims, "The Development of American Arms Control Thought," pp. 303–4.
47. On the question of whether nuclear strategy is a profession, see E. Licklider, *The Private Nuclear Strategists* (Columbus: Ohio State University Press, 1971), chap. 7. See also Wesley Posvar, "Strategy Expertise and National Security," Ph.D. diss., Harvard University, Cambridge, Mass., 1964.

from a professional code.[48] Indeed, this community can be described as a functional, politically driven, ideologically self-contained, and distinct cross-section of the "scientific estate."[49]

The innovation process

Between 1955 and 1960, a group of civilian nuclear strategists, some of whom were associated with the RAND Corporation,[50] gave a new meaning to the concept of war, based on the assumption that nuclear deterrence had become unstable and that a catastrophe could now occur against the wishes of the adversary states. These notions were fueled by a string of events, including Wohlstetter's investigation of the vulnerability of U.S. strategic forces,[51] the Killian Committee's presentation of a report on "Meeting the Threat of Surprise Attack" in 1955,[52] the Soviet tests of an intercontinental ballistic missile (ICBM) in August 1957, the launching of the first Soviet satellite (Sputnik I) into space two months later, and President Eisenhower's establishment of the Gaither Committee which, by recommending an across-the-board military buildup,[53] alarmed Eisenhower and made him more receptive to arms control ideas.

James Killian argued that Sputnik I created a "crisis of confidence that swept the country like a windblown forest fire. Overnight there developed a widespread fear [unfounded, as it turned out] that the country lay at the mercy of the Russian military machine and that our own government and its military arm had abruptly lost the power to defend the homeland itself."[54] Indeed, after Sputnik, Wohlstetter's studies on the vulnerability of ICBMs caught the attention of some strategists from RAND and elsewhere, most notably Schelling, who opposed an indiscriminate quest for military superiority and the

48. Licklider, *The Private Nuclear Strategists,* pp. 119–22, 130, and 135.

49. See Don K. Price, *The Scientific Estate* (Cambridge, Mass.: Belknap Press, 1965). See also Robert Gilpin and Christopher Wright, eds., *Scientists and National Policy Making* (New York: Columbia University Press, 1964).

50. For a discussion of the group and a description of the RAND Corporation, see Kaplan, *Wizards of Armageddon,* especially pp. 51–73. See also Paul Dickson, *Think-Tanks* (New York: Atheneum, 1971).

51. Wohlstetter was a logician-mathematician at RAND. His studies prompted two important reports, R-266 and R-290, dealing with the vulnerability of bombers and the vulnerability of ballistic missiles, respectively. These studies expressed the triumph of quantitative economics-oriented study at RAND. As Kaplan noted, "Through Wohlstetter's own personal influence within RAND, vulnerability began to loom as the preoccupying issue, the virtual obsession, of strategic analysis." See Kaplan, *Wizards of Armageddon,* pp. 121–22.

52. Bundy recently characterized the 1955 report as "one of the most influential in the history of American nuclear policy." See McGeorge Bundy, *Danger and Survival: Choices About the Bomb in the First Fifty Years* (New York: Random House, 1988), p. 325.

53. For a discussion of the Gaither Committee report and its influence, see Morton Halperin, "The Gaither Committee and the Policy Process," *World Politics* 13 (April 1961), especially pp. 382–83.

54. James R. Killian, Jr., *Sputnik, Scientists and Eisenhower* (Cambridge, Mass.: MIT Press, 1977), p. 7.

belief in the possibility of winning a nuclear war on the ground that this orientation might, in fact, lead to such a war. So instead of planning how to regain—by means of a massive technological and rearmament leap—the invulnerability that had suddenly been lost, the strategists started to concentrate on ideas about how to regain invulnerability by means of unilateral stabilizing force deployments, as well as diplomacy. Thus, as noted by Strobe Talbott, "They began laying the conceptual foundations for negotiations that might limit the number of weapons with which the Soviet Union could carry out a preemptive attack. This was the enterprise of nuclear arms control."[55]

Some of the scientists who had helped draft the Gaither Committee report also became disenchanted with its recommendations and with the trend in U.S.–Soviet relations. Having become members of PSAC,[56] they made their ideas known to Eisenhower, who was receptive and supportive.[57] Spurgeon Keeny, a member of the arms control community, remarked in retrospect that the Gaither report represented "the high watermark of the belief that a technological solution could be found," a position the PSAC scientists increasingly came to see as unrealistic.[58]

Thus as the PSAC scientists started to offer Eisenhower reliable technical information with which he could counter those opposing a test ban treaty with the Soviets, they also began to transmit to him and other government officials a set of arms control assumptions, expectations, and values. They also proposed the creation of a "peace agency" to embody and empower them. President Kennedy later created this institution and called it the Arms Control and Disarmament Agency (ACDA). According to Saville Davis,

> It is an oversimplification, but a useful one, to say that the President [Eisenhower] now listened primarily to men whose information and judgment of fact indicated that a safeguarded arms-control agreement would be to the advantage of the national interest and security of the United States, whereas before that time he had listened chiefly to men who said such an

55. Talbott, *The Master of the Game,* p. 70.
56. The members of the first PSAC were Robert Bacher, William Baker, Hoyd Berkner, Hans Bethe, Detler Bronk, James Doolittle, James Fisk, Caryl Haskins, James R. Killian, George Kistiakowsky, Edwin Land, Emanuel Piore, Edward Purcell, Isador Rabi, H. P. Robertson, Jerome Wiesner, Herbert York, and Jerrold Zacharias. On the PSAC, see Killian, *Sputnik, Scientists and Eisenhower,* pp. 107–217.
57. In *Counsels of War,* p. 116, Herken quotes Eisenhower's reaction to the idea of a nuclear war: "You can't have this kind of war; there just aren't enough bulldozers to scrape the bodies off the streets."
58. Spurgeon Keeny, cited by Herken in *Counsels of War,* p. 117. Jerome Wiesner, another community member, offered the following view: "I first became involved in the disarmament problem as a member of the President's Science Advisory Committee. Prior to that I had been the Staff Director of the Gaither Study. The conclusions of this study convinced me that it was not really feasible to protect the American people if a global nuclear war occurred, and that both the Russians and ourselves would suffer terribly. In fact, I became convinced that as long as the Soviet Union was prepared, as it seemed to be, to attempt to match our military effort, there was no help of avoiding an enormous loss of life in the event of a major nuclear war, *regardless of the magnitude of our defense effort*" (emphasis added). See Wiesner, *Where Science and Politics Meet,* p. 174.

agreement would gravely damage national security. . . . Like most shifts in policy, this one will not be found in documents. Policy is determined by political momentums operating on the existing balance of forces in Washington. The arrival of the new group of presidential advisers set up such a fresh momentum.[59]

Many of the strategists and scientists who were drawn to arms control ideas met in 1958 at two conferences in Geneva—one dealing with surprise attack and the other with a nuclear test ban—to exchange ideas and try to reach an agreement with their Soviet counterparts over cooperative technical measures to avoid nuclear war. Neither conference produced any such agreement. But the Surprise Attack Conference, which was by far the most relevant one from a strategic arms control perspective, together with a preparatory conference held by Americans in Washington to formulate an American position for Geneva became a watershed in the consolidation of an emergent nuclear arms control approach.[60]

The Surprise Attack Conference and its preparatory conference, which brought together the PSAC scientists and the RAND strategists to discuss stable deterrence and arms control, consolidated the ranks of the emerging epistemic community. It can even be suggested that at the Surprise Attack Conference the arms control epistemic community was born.[61] In any case, at that conference an arms control seed was planted in the minds of many reluctant Soviet scientists and political officials. True, the Soviets reacted with dismay to the American technical approach that was presented, arguing that deterrence would only fuel the arms race. But the papers written for the conference suggested to the American and Soviet experts how a surprise attack could be prevented and how deterrence could be stabilized and managed by means of arms control. After a week, according to Johan Holst, deliberation changed into " 'cognitive negotiations' aimed at exploring the position of the adversary . . . and at conveying the Western thoughts and concerns."[62] Thus, in retrospect, one can agree with Bernard Bechhoefer that the talks served as a "catalyst for much of the serious rethinking of arms control and stabilized deterrence which took place in the U.S. between 1959 and 1961."[63]

59. Saville R. Davis, "Recent Policy Making in the United States Government," in Brennan, *Arms Control, Disarmament, and National Security,* p. 385.

60. See Johan J. Holst, "Strategic Arms Control and Stability: A Retrospective Look," in Johan J. Holst and William Schneider, eds., *Why ABM: Policy Issues in the Missile Defense Controversy* (New York: Pergamon Press, 1969), p. 282. On the test ban conference, see Donald A. Strickland, "Scientists as Negotiators: The 1958 Geneva Conference of Experts," *Midwest Journal of Political Science* 13 (November 1964), pp. 372–84.

61. Sims, "The Development of American Arms Control Thought," p. 302.

62. See Holst, "Strategic Arms Control and Stability," p. 268. "The Westerners," observed Holst, "frequently voiced the expectation that they should be able to convince the Easterners by logical argument" (p. 263). Regarding the Soviet reaction to the American technical approach, see p. 260.

63. See Bernard G. Bechhoefer, *Postwar Negotiations for Arms Control* (Washington, D.C.: Brookings Institution, 1961), p. 475. See also Holst, "Strategic Arms Control and Stability," pp. 261 and 282.

The ideas that the strategists and scientists took to the Surprise Attack Conference were a response to changes in technology and weapons systems, the balance of power between the superpowers, and American domestic politics.[64] Yet they also were rigorous theories which had been deduced from a set of hypotheses about technology and stability and which had evolved together with theories about strategic war, limited war, and escalation, and whose reference point was not past experience but only expectations of the future. Being a disciplined creation deriving from artificial worlds and speculations in the strategists' minds, these theories could not have been built-in or determined only by structure.[65]

It would be naive to suggest, however, that the arms control epistemic community created nuclear arms control from scratch.[66] Indeed, a great deal of thinking on arms control was produced in the United States starting immediately after World War II. (Leaving aside Hedley Bull's contribution to arms control ideas,[67] it can be argued that arms control was an American invention, as political economy was an invention of British and Scottish economists in the eighteenth century.)

Very few people were as influential in the intellectual development of the arms control approach as Leo Szilard, whom Norman Cousins described as "an idea factory."[68] Although Szilard remained an outsider to RAND and to the halls of government, his indirect influence was considerable because he affected those who had an impact on political decisions. About a decade before arms control ideas had gained prominence, Szilard anticipated the nuclear stalemate and the use of mobile ICBMs, called for intermediate steps of force reduction with different totals for different systems, considered that an overwhelming counterforce capability would cause instability, was one of the first people to oppose an ABM system, and pleaded for a no-first-use policy on nuclear weapons. Some of Szilard's proposals were unorthodox and visionary

64. Sims, "The Development of American Arms Control Thought," chap. 5.

65. In fact, the majority of the "brass" thought these theories to be quite "odd," since "it seemed to follow [from the theories] that Soviet forces should perhaps not even be targeted, and maybe American cities should not be defended, even if a defense of populations some day became feasible. For if the vulnerability of our forces made us more trigger-happy and was thus a danger to them, then by the same logic their vulnerability was a danger to us: we should therefore not threaten their strategic forces, either directly, by targeting them, or indirectly, by defending our cities and thus effectively neutralizing them." See Marc Trachtenberg, "Strategic Thought in America, 1952–1966," in Marc Trachtenberg, ed., *The Development of American Strategic Thought: Writings on Strategy 1961–1969 and Retrospectives* (New York: Garland, 1988), p. 456.

66. See Freedman, *The Evolution of Nuclear Strategy,* p. 197. The most comprehensive study to date on the intellectual basis of arms control is Sims's "The Development of American Arms Control Thought." This section builds substantially on her study.

67. See Hedley Bull, *The Control of the Arms Race* (London: Weidenfield & Nicolson, 1961); and Hedley Bull, *Hedley Bull on Arms Control,* selected and introduced by Robert O'Neill and David N. Schwartz (New York: St. Martin's Press, 1987).

68. Norman Cousins, "Foreword," in Helen S. Hawkins, G. Allen Greb, and Gertrud Weiss Szilard, eds., *Toward a Livable World: Leo Szilard and the Crusade for Nuclear Arms Control* (Cambridge, Mass.: MIT Press, 1987), p. xii.

and thus made people think hard about unorthodox solutions. For example, he proposed the relocation of populations to eliminate large urban targets, suggested that the superpowers should hold each other's cities hostage while forgoing war, and advanced the idea of a nuclear free zone in Europe. He also envisioned an international corps of scientists and engineers to report and investigate nuclear violations, pioneered the idea of meetings between U.S. and Soviet scientists, and pushed the still largely undefined concept of nuclear deterrence to the limit by suggesting to Herman Kahn the idea of a "doomsday machine."[69]

Edward Shils and William Fox, although to a lesser degree than Szilard, also anticipated the nuclear arms control approach by a decade. Shils made a strong case for integrating bilateral arms control negotiations and defense planning. Fox linked arms reduction to the decrease of vulnerability to nuclear attack. Concurrently, the Acheson-Lilienthal report (1946) stressed the need for unobtrusive inspection, improving continental air defense, and, most important, reducing incentives for surprise attack. While Hans Bethe called for superpower bilateral negotiations, a panel of consultants on disarmament, set up in 1952 by Dean Acheson, called for new ways of communicating with the leaders of the Soviet Union to discuss the arms race.[70] At about the same time, an emerging "realist" school of international relations challenged the rationalist approach of the postwar scientists—who placed their faith in scientific method, reason, and international organization and who expected world disarmament to occur once a world government had been created[71]—and argued instead that the nuclear predicament had no moral solution and could be mitigated only with the help of prudential behavior and diplomacy.[72]

---

69. See Barton J. Berenstein, "Introduction," in Hawkins, Greb, and Szilard, *Toward a Livable World,* pp. xvii–xxiv; and Leo Szilard, "Shall We Face the Facts? An Appeal for a Truce Not a Peace," *Bulletin of the Atomic Scientists* 5 (May 1949), pp. 269–73. See also *Counsels of War,* p. 206, in which Herken discusses the doomsday machine, a fanciful device to ensure peace by blowing up the world as the penalty for aggression.

70. See Edward Shils, "American Policy and the Soviet Policy Ruling Group," *Bulletin of the Atomic Scientists* 3 (September 1947), pp. 237–39; and William T. R. Fox, "Atomic Energy and International Control," in William F. Ogburn, ed., *Technology and International Relations* (Chicago: University of Chicago Press, 1949), pp. 102–25. See also Sims, "The Development of American Arms Control Thought," pp. 228 and 308. The Acheson-Lilienthal report is cited as U.S. Department of State, Committee on Atomic Energy, *A Report on the International Control of Atomic Energy,* March 1946. In *Danger and Survival,* p. 159, Bundy described this report as "the high water-mark of the American effort to grapple with the issue of international control." See also McGeorge Bundy, "Early Thoughts on Controlling the Nuclear Arms Race: A Report to the Secretary of State, January 1953," *International Security* 7 (Fall 1982), pp. 3–27.

71. See Robert Gilpin, *American Scientists and Nuclear Weapons Policy* (Princeton, N.J.: Princeton University Press, 1962), chap. 4. See also Bechhoefer, *Postwar Negotiations for Arms Control,* parts 2 and 3.

72. See Hans J. Morgenthau, *Politics Among Nations,* 5th ed. (New York: Alfred A. Knopf, 1978); Hans J. Morgenthau, *Scientific Man Versus Power Politics* (Chicago: University of Chicago Press, 1946); Reinhold Niebuhr, "The Illusion of World Government," *Bulletin of the Atomic Scientists* 5 (October 1949), p. 289; and Reinhold Niebuhr, *The Structure of Nations and Empires* (New York: Scribner's, 1959).

Early work on arms control intensified in the 1950s with the advent of behaviorism and mathematical techniques and the rise of the civilian strategists. For example, in 1951, David Inglis and Donald Flanders suggested limiting the nuclear capabilities of the adversary to a particular stable level. Three years later, James Newman suggested that inspection need not be comprehensive, only practical. And soon after, assuming an expected vulnerability to surprise attack and arguing that arms control verification could be undertaken by national technical means, Inglis proposed a test ban. In turn, Hornell Hart showed that expected increases in Soviet offensive capability could counter any expected improvement in passive and active defenses.[73]

By 1956, some of the most important distinctions between arms control and disarmament had been suggested. For example, Richard Meier had used game theory to deduce several propositions about arms control, including the principle of a high nuclear threshold. In addition, a ballistic missile builder for Convair had introduced the idea of achieving invulnerability by means of second-strike forces, an idea that was further developed by Warren Amster, who suggested the viability of mutual assured destruction. As Jennifer Sims points out, Amster's suggestion was subsequently noted in an article by C. W. Sherwin, which was in turn quoted by Schelling.[74]

Beginning in 1957, the Pugwash meetings that brought together Western and East European scientists to discuss disarmament also played an intellectual role in the "invention" of the nuclear arms control approach.[75] The dominant paradigm at the first Pugwash meetings was disarmament; arms control ideas were received with skepticism. Said Schelling: "I was almost expelled from a Pugwash Conference [1960] because of the belief by the Soviets and some Americans that anyone who thought about arms control wasn't interested in disarmament."[76] But discussions between Western and Eastern scientists had some impact on arms control ideas and policies. According to J. Rotblat, "In many instances the scientists from the West received, for the first time, reasoned objections to their views from scientists in the East and vice-versa. This confrontation of ideas, of prejudices, and of causes of mistrust, was in

73. See David R. Inglis and Donald A. Flanders, "A Deal Before Midnight," *Bulletin of the Atomic Scientists* 7 (October 1951), pp. 305–6 and 317; James R. Newman, "Toward Atomic Agreement," *Bulletin of the Atomic Scientists* 10 (April 1954), pp. 121–22; David R. Inglis, "Ban the H-Bomb and Favor the Defense," *Bulletin of the Atomic Scientists* 10 (November 1954), pp. 353–56; and Hornell Hart, "The Remedies Versus the Menace," *Bulletin of the Atomic Scientists* 10 (June 1954), pp. 197–205.

74. See R. L. Meier, "Beyond Atomic Stalemate," *Bulletin of the Atomic Scientists* 12 (May 1956), pp. 147–53; C. W. Sherwin, "Securing Peace Through Military Technology," *Bulletin of the Atomic Scientists* 12 (May 1956), pp. 159–64; Warren Amster, "Design for Deterrence," *Bulletin of the Atomic Scientists* 12 (May 1956), pp. 164–65; and Jennifer Sims, "The American Approach to Nuclear Arms Control: A Retrospective," *Daedalus* 120 (Winter 1991), p. 258.

75. See Rotblat, *History of the Pugwash Conferences;* Joseph Rotblat, "Movements of Scientists Against the Arms Race," in Joseph Rotblat, ed., *Scientists, the Arms Race and Disarmament* (London: Taylor & Francis, 1982), pp. 115–57.

76. Thomas Schelling, cited by Herzog in *The War-Peace Establishment,* p. 52.

itself very valuable, as it gave an opportunity for better understanding of the motivation of others and, in some cases, removed misunderstandings and dispelled fears."[77]

The main value of these discussions, however, lay in the fact that the lessons they generated were taken by American scientists back to the U.S. political system, where they became part of a collective understanding about what should be done to control the nuclear arms race. For example, Walt Rostow and Jerome Wiesner, who played key roles in the Kennedy administration, discussed matters of international security with the Soviets at a Moscow meeting of Pugwash in December 1960; and they came back from the disarmament meeting with the feeling that the Soviet Union might be ready for action in arms control.[78] Pugwash meetings that dealt with a test ban treaty played a similar, if not more important, role in developing some of the technical bases for arms control.

Several developments closer to the halls of government during the formative years of nuclear arms control ideas also had some influence on their evolution. First, the Baruch plan of 1946 left a legacy that was not overlooked by arms controllers.[79] Second, as Sims notes, the inconclusive disarmament negotiations of the 1950s "had a great impact on the evolution of ideas about weapons control. The ups and downs of the negotiations themselves inspired controversy and commentary: the Open Skies proposal [1955] stimulated thinking about limited agreements and bilateral negotiations; preparation for the Surprise Attack Conference generated studies—particularly at RAND—of the technical requirements of strategic stability; 'Atoms for Peace' [1953] inspired consideration of controlled information sharing as a stabilizing instrument."[80] Third, the center of interest in new ideas of arms control shifted from the State Department, where John Foster Dulles was no enthusiast of arms control,[81] to the White House; and President Eisenhower, with the aid of his arms control assistant Harold Stassen and of Nelson Rockefeller, "discovered" nuclear arms control before the academic strategists did.[82] And, fourth, the idea of a test ban treaty continued to evolve throughout the 1950s, and negotiations with the

77. Rotblat, *History of the Pugwash Conferences,* pp. 14–15.

78. Arthur M. Schlesinger, Jr., *A Thousand Days: John F. Kennedy in the White House* (Boston: Houghton Mifflin, 1965), p. 301.

79. See Bechhoefer, *Postwar Negotiations for Arms Control,* part 2; and Bundy, *Danger and Survival,* chap. 4. In June 1946, Bernard Baruch, the U.S. negotiator at the United Nations, proposed the following plan for the international control of nuclear energy: the United States would place its entire atomic weapons production under an international authority, and other nations would be barred from producing nuclear weapons and would allow their facilities to be placed under the international authority. The plan also promoted the peaceful use of nuclear energy.

80. Sims, "The Development of American Arms Control Thought," p. 244.

81. Dulles supported arms control only on the condition that the price was right and that American prestige abroad would be enhanced.

82. By developing plans for air reconnaissance, a nuclear freeze, nuclear arms reductions, and a set of objectives for arms control, Stassen augured the "golden era of arms control."

Soviets on such a ban were in fact initiated before the crucial events of 1958–60. Most of the policy proposals, however, were still in the disarmament mode, with the possible exception of Open Skies.

Creativity or innovation does not involve new ideas but new combinations of ideas—for example, that surprise attack and preventing nuclear accidents must be considered together or that arms control should not be separated from military and defense policy. For the first time, arms control theory was articulating the strategically crucial idea of the interdependence of expectations. Schelling's notion—"he thinks we think . . . he'll attack; so he thinks we shall, so he will, so we must"[83]—was in the air at the Surprise Attack Conference. Thus, as academicians and policymakers gradually began to reach a common understanding about war and peace, weapons and negotiations, and conflict and cooperation, their approach to international negotiations shifted from measures designed to remove nuclear weapons from world affairs to measures designed to make their presence more tolerable.[84]

Gerald Holton, editor of *Daedalus,* the journal of the American Academy of Arts and Sciences, argued that by 1959 an "enormously refined art and science of controlling war" had become "critical." The academy thus convened a summer session to deal with arms control, and this session resulted in the participation of more than fifty individuals and the publication of several books that became landmarks in the intellectual history of arms control.[85] In 1960, the academy also initiated two projects to study and formulate the ideas of arms control, thereby creating an opportunity for academicians, public officials, and journalists—many of whom had come to the arms control worldview—to strengthen their shared understanding about arms control.

In the fall of 1960, *Daedalus* published a special issue that distilled the main insights and currents of thought on arms control and soon became known as "the Bible of arms control." With this publication, nuclear arms control came of age.[86] Intellectual consolidation and refinement of the arms control approach continued, however, within the framework of a Harvard-MIT

83. Schelling, *The Strategy of Conflict,* p. 207.
84. Freedman, *The Evolution of Nuclear Strategy,* p. 199.
85. See Thomas Schelling and Morton Halperin, *Strategy and Arms Control,* 2d ed. (New York: Pergamon-Brassey, 1985); Brennan, *Arms Control, Disarmament, and National Security;* Bull, *The Control of the Arms Race;* Louis Henkin, ed., *Arms Control: Issues for the Public* (Englewood Cliffs, N.J.: Prentice-Hall, 1961); David H. Frisch, ed., *Arms Reduction: Program and Issues* (New York: Twentieth Century, 1961); and Ernst W. Lefever, ed., *Arms and Arms Control* (New York: Praeger, 1962). See also Robin Ranger, "The Four Bibles of Arms Control," in Susan J. Shepard, ed., *Books and the Pursuit of American Foreign Policy,* special issue of *Book Forum,* vol. 6, 1984, pp. 416–32.
86. See Gerald Holton, ed., *Arms Control,* special issue of *Daedalus,* published in Fall 1960 and issued as vol. 89, no. 4, of the Proceedings of the American Academy of Arts and Sciences. The impact of the special *Daedalus* issue on arms control was so great that a revised and enlarged edition was rushed into print in early 1961. After this printing of 20,000 copies was sold out, it went into a second printing. Such sales were unprecedented for a specialized work of this kind. See Ranger, "The Four Bibles of Arms Control," pp. 417–18.

seminar on arms control that met more or less continuously throughout the 1960s.

Reflecting on the entire period, Schelling wrote:

> That 15-year period from 1957 to 1972 is a remarkable story of intellectual achievement transformed into policy.... Three books appeared in 1961 that epitomized an emerging consensus on what strategic arms control should be about. Each was a group effort, and each stimulated discussion even while being written.... A number of participants in the Harvard-MIT seminar took positions in the Kennedy White House, Department of State and Department of Defense; others from RAND and elsewhere, who had been part of this intellectual movement, moved into the government as well. So it is not completely surprising that those ideas became the basis for U.S. policy and were ultimately implemented in the ABM treaty.[87]

Political selection

A political selection process determined the epistemic community's success in translating its theories into policies. The policymaker, in principle at least, served as judge, jury, and, if necessary, executioner over the professional output of strategic theories. Many, though not all, of the community's aspirations were satisfied only through policy decisions.[88] It was not necessarily the best-fitted ideas that were selected and turned into policies, however, but those which best fit the interests of policymakers and which passed the test of domestic politics. This is why the epistemic community had to persuade other actors in the system of the validity of its ideas. The key was not only inventing new concepts but raising them to new heights of public awareness.[89]

87. See Thomas C. Schelling, "What Went Wrong with Arms Control," *Foreign Affairs* 65 (Winter 1985–86), p. 223. Schelling had made the following statement in 1969: "Whatever the prospects for successful negotiations with the Soviet Union during the coming months and years, on the subject of strategic weapons, there could not be a greater contrast between the serious and businesslike prospects for realistic negotiations in 1969 and all the fantasy and pretense about 'general and complete disarmament' that characterized the beginning of our decade.... We think differently now, partly because technological progress obliges us to but partly because we have been thinking and talking and writing and holding hearings and preparing budget justifications and negotiating with allies and enemies during this past decade.... [The] concern with vulnerability of retaliatory systems ... became the primary criterion for the selection of a weapons system itself [and] it has become also the primary criterion for the design of an arms *agreement* between the United States and the USSR.... The problem of 'accidental war' was recognized to be primarily one of information and decision rather than sheer mechanical accident, [and the] tradition of non-use, the somewhat self confirming expectations of non-use, grows stronger every year." See testimony of Thomas Schelling, in U.S. Congress, House Committee on Foreign Affairs, *Strategy and Science: Toward a National Security Policy for the 1970s: Hearings Before the Subcommittee on National Security Policy and Scientific Developments*, 91st Congress, 1st sess., March 1969, pp. 123–24.

88. Colin S. Gray, *Strategic Studies and Public Policy: The American Experience* (Lexington: University Press of Kentucky, 1982), p. 26.

89. According to Gray, "Contemporary arms-control theory was an invention of the strategic studies community in the period 1958–60." See ibid., p. 72.

The selection process started under Eisenhower, and by the time Kennedy entered office certain significant trends were under way. First, because the United States was actively engaged in test ban negotiations with the Soviet Union, Kennedy inherited a framework for negotiations and a policy on which to build. Second, because Eisenhower had been listening since 1958 mainly to his PSAC scientists, he helped legitimize the emerging arms control concepts as the focus of the policy debate. Kennedy, then, was aware of the positions of the various government agencies with an interest in arms control and inherited personnel and organizational structures to deal with it, including the scientific adviser, PSAC, and an interagency group called the Committee of Principals.[90]

The Eisenhower legacy is insufficient, however, to explain why ideas of stable deterrence and arms control were accepted so rapidly by the Kennedy administration. "Indeed," quipped E. Licklider, "the ideas no sooner became public than they seemed to become governmental policy."[91] Kennedy, who enjoyed close connections to many security intellectuals and had an innovative orientation,[92] played an important role. Certainly, presidential leadership was crucial in this area because arms control ideas were relatively new and seemed counterintuitive. They were rejected by some prominent strategists, such as Wohlstetter, and some prominent scientists, such as Teller; had little support in the military; and got only a mixed review in Congress. Moreover, because the concepts of disarmament and arms control had been used interchangeably, the latter was bound to be misrepresented and misunderstood as idealistic, pacifist, and disarmament-driven. And since arms control ideas lacked provisions for complete and effective verification, they were not likely to be accepted readily by parts of the bureaucracy, Congress, and the American public.[93]

Yet the content and quality of the ideas gave them broad political appeal and helped Kennedy build a political coalition on their behalf. Indeed, disarmament proponents, if they so wished, could regard arms control ideas as a first step toward disarmament. And conservatives could be reassured that arms control could mean more, rather than fewer, weapons. Thus, in every important aspect, as Colin Gray observed, the arms control community "found that the Kennedy administration and its brief era offered a permissive environment in which it could exercise influence."[94]

90. Firestone notes that the Committee of Principals was "a high-level interagency group designed to coordinate and ultimately ratify arms control policy. Founded in August 1958, the committee was initially composed of the secretary of state as chairman, the secretary of defense, the chairman of the AEC [Atomic Energy Commission], the director of the CIA [Central Intelligence Agency], and the president's special adviser on science and technology." See Bernard J. Firestone, *The Quest for Nuclear Stability: John F. Kennedy and the Soviet Union* (Westport, Conn.: Greenwood Press, 1982), p. 76.

91. Licklider, *The Private Nuclear Strategists*, p. 155.

92. Schlesinger, *A Thousand Days*, p. 104; and William W. Kaufmann, *The McNamara Strategy* (New York: Harper & Row, 1964), p. 1.

93. Firestone, *The Quest for Nuclear Stability*, p. 153.

94. Gray, *Strategic Studies and Public Policy*, p. 97.

The creation of ACDA provided a home for the arms control community, a political voice for its theoretical ideas, and a laboratory where policy ideas were first designed and developed. From 1961 onward, the ACDA members took part in most of the political deliberations on national security and arms control policy; still, the agency remained a weak bureaucratic player.[95] Being entrusted with the mission of controlling the arms race without undermining the military balance, the agency's power depended on the level of external threat, which usually was high, and on the force that the President personally put behind the arms control process, which was not consistently high.[96]

More significant, however, was the fact that many of the most prominent members of the arms control community had taken key positions in the Kennedy administration. At the White House, McGeorge Bundy (formerly of Harvard) became the adviser of the National Security Council (NSC) and brought along Carl Kaysen and Walt Rostow. Jerome Wiesner became scientific adviser, and James Killian, George Kistiakowsky, Paul Doty, and Harvey Brooks became members of PSAC. Abram Chayes went to the State Department, while Herbert York, Jack Ruina, and George Rathjens worked at the Pentagon in research and weapons development (with Rathjens also working for ACDA). Key positions in the Pentagon were filled by Defense Secretary Robert McNamara's "whiz kids": Roswell Gilpatrick, Henry Rowen, and Charles Hitch. And the office of assistant secretary of defense for international security affairs (ISA) was entrusted to Paul Nitze, who was then only at the beginning of a long career as the "master of the arms control game." These institutional and recruitment developments helped create a network of relations between political elites and the arms controllers. The arms controllers also affected political elites indirectly through op-ed articles in *The New York Times* and *Washington Post* and articles in *Foreign Affairs*.

While many of the community scientists affected the policymaking process through the PSAC and ACDA, the strategists had effectively taken over the ISA office. Nitze offered Schelling a job as his arms control deputy; Schelling declined but recommended the appointment of his Harvard colleague John McNaughton, who was a professor of law. According to Fred Kaplan, McNaughton told Schelling that he knew nothing about arms control, to which Schelling replied that he would teach him all there was to know.[97] Apparently he did: McNaughton was appointed assistant secretary of defense for ISA in

95. See Steve Weber and Sidney Drell, "Attempts to Regulate Military Activities in Space," in Alexander L. George, Philip J. Farley, and Alexander Dallin, eds., *U.S.–Soviet Security Cooperation: Achievements, Failures, Lessons* (New York: Oxford University Press, 1988), p. 388. On ACDA, see Paul F. Walker, "The U.S. Arms Control and Disarmament Agency: Policy-Making in Strategic Arms Limitations," Ph.D. diss., MIT, Cambridge, Mass., 1978.

96. Herbert F. York, *Making Weapons, Talking Peace: A Physicist's Odyssey from Hiroshima to Geneva* (New York: Basic Books, 1987), p. 119.

97. Kaplan, *Wizards of Armageddon*, pp. 332–33.

1963, became McNamara's "general counselor and chief aide on arms control," and had a hand in persuading the Pentagon of the merits of the PTBT.[98]

The ability of the epistemic community members to persuade and forge alliances with policymakers was crucial for their ultimate success. As soon as Kennedy became president, Wiesner "started to educate Kennedy on the limitations of the ABM," and Ruina and York were influential in persuading Kennedy to bag the Nike-Zeus antiballistic missile.[99] A committee on the level of forces which ACDA had appointed and which included Wiesner, Bethe, Doty, and Henry Kissinger apparently participated in preparing the 1965 defense budget and helped McNamara place a limit on Minuteman forces.[100] On the other hand, some policymakers used the arms control experts to rationalize and explain their actions, especially after the Cuban missile crisis of October 1962 demonstrated the need for arms control.

The hotline agreement of June 1963—the agreement to install a teletype line between Washington and Moscow to serve as an emergency communication link in case of crisis and to prevent unintended nuclear war—illustrates how various persons, institutions, and factors mentioned above played a role in determining arms control outcomes. The idea of a hotline had first been suggested by Schelling during a meeting of a task force set up by John McCloy, Kennedy's disarmament adviser. Schelling then told Henry Owen of the State Department about it, and he in turn passed the idea along to Gerard Smith, head of the State Department's policy planning staff. When journalist Jess Gorkin, who edited *Parade,* the *Boston Globe*'s Sunday magazine, picked up the idea, he wrote articles about it and sent open letters to Eisenhower and Soviet Premier Nikita Khrushchev outlining his proposals. He later was able to talk briefly with Khrushchev about the matter and tried to sell the idea to presidential candidates Kennedy and Nixon. He therefore created public awareness that led other individuals, periodicals, and experts to begin advocating the approach.

But it was Owen, working within government circles, who led the American government in April 1962 to finally accept the idea. The Soviets reacted favorably to the American proposal but tied their agreement to other general disarmament proposals. The idea might have died of "linkage disease" had it not been that the Cuban missile crisis, in a vivid and practical way, showed the superpower leaders what Schelling had in mind. Several months later, the idea had turned into reality.

With characteristic modesty, Schelling later remarked that "it was not a question of inventing the hotline, but simply of realizing that such an

98. Schlesinger, *A Thousand Days,* p. 494.
99. See York, *Making Weapons, Talking Peace,* pp. 222–26; and Kaplan, *Wizards of Armageddon,* p. 345.
100. Desmond Ball, *Politics and Force Levels: The Strategic Missile Program of the Kennedy Administration* (Berkeley: University of California Press, 1980), pp. 82–85.

elementary means of communication did not already exist." The hotline idea
arose from Schelling's interpretation of a structural condition, an interpreta-
tion that differed markedly from the "hard-liner" view that "Washington is
ideologically close enough to Moscow without making the White House a
branch office of the Kremlin."[101]

The transition from disarmament to arms control meant that the bureau-
cracy had to go through a process of adjustment and conceptual evolution. In
1961, Americans and Soviets were still formally negotiating "total and universal
disarmament" within the framework of the Eighteen-Nation Disarmament
Committee in Geneva. In practice, however, they had already started to
negotiate arms control but chose to refer to it as "first-stage disarmament."[102]
Also during this transition period, Kennedy and the arms control community
began to frame PTBT negotiations around the concept of nuclear deterrence
stability and around expectations that a technical agreement over tests could
amount to a first step in the thawing of the Cold War.

By the end of the Kennedy years, arms control had become an irreversible
factor in the domestic political game and a key consideration as agreements
were negotiated and even as new weapons systems were contemplated. Indeed,
the bureaucracy and the arms controllers who participated in the bureaucratic
process were constantly involved in preparing a position for negotiation,
defending an existing agreement, or carrying out bureaucratic guerrilla warfare
against military programs.[103] Thus, the institutionalization of arms control ideas
guaranteed that as bureaucratic battles flared up, institutions and individuals
who carried the arms control ideas would throw their weight in favor of their
selection by the President and his closest advisers. Domestic politics then
became the arena where national security and world order ideas were raised,
legitimated, and selected as policy choices and where they were tested once
they became national policies and had international effects.

"Educating" and persuading McNamara were vital steps in the movement of
arms control ideas from innovation to political action. Like Kennedy, McNa-
mara was well suited for arms control expectations and values. With his analytic
command of the nuclear weapons problem and his managerial and engineering
instinct to do something about an irrational situation,[104] McNamara came to see
in arms control the rational alternative to nuclear war. He trusted the RAND
strategists, whose techniques and analytic style he shared, and was instrumen-
tal in protecting the community's members from the wrath of the Joint Chiefs
of Staff.

101. My discussion of the hotline idea is based on William L. Ury's *Beyond the Hotline: How
Crisis Control Can Prevent Nuclear War* (Boston: Houghton Mifflin, 1985), pp. 142 and 144, and on
interviews.
    102. See Talbott, *The Master of the Game*, p. 79; and Schlesinger, *A Thousand Days*, p. 475.
    103. See Adler, *The Power of Ideology*. See also William L. Hyland, "Institutional Impediments,"
in Richard Burt, ed., *Arms Control and Defense in the 1980s* (Boulder, Colo.: Westview Press, 1982),
p. 101.
    104. Schlesinger, *A Thousand Days*, p. 504.

Once McNamara was persuaded that there was no technical solution to the arms race[105] and that it had to be limited, he became a powerhouse for arms control ideas—an epistemic community's dream. He worked hard every year at budget time to prevent ABM deployment and helped persuade Lyndon Johnson to try arms control with the Soviets before deploying ABMs. To make sure Johnson would not change his mind on ABMs, McNamara assembled in the Oval Office all past and present PSAC chairmen, who made clear their opposition to it. And in a speech in San Francisco in 1967, he told the American people about the "mad momentum of the arms race." Indeed, Johnson's election in 1964 proved a victory for those who opposed ABM systems, if only because it ensured that McNamara would continue as defense secretary for four more years.[106] At the 1967 Glassboro summit meeting, McNamara lectured Soviet Premier Aleksei Kosygin about "the action-reaction phenomenon," explaining that should the Soviets proceed with the deployment of their own ABM system (nicknamed Galosh), all the United States had to do, really, was to increase its offensive forces, thus neutralizing Soviet defenses but fueling the arms race even more.[107]

Ideas about controlling ABMs had started in the late 1950s, roughly at the same time Defense Secretary Neil McElroy, under the influence of Sputnik and the Gaither Committee report, authorized the army to develop an operational ABM system called Nike-Zeus.[108] Also at that time, McElroy created within the Pentagon the Advanced Research Projects Agency (ARPA) and the Directorate of Defense Research and Engineering (DDR&E). The scientists at these institutions played an important role in the development of an American ABM technical capability, but some of them were among the first to raise doubts about the technical capability of ballistic missile defenses (BMDs) to fulfill their mission and therefore were among the first to promote their control.[109] York reports that Ruina was the first member of the community to seriously

105. John Newhouse, *Cold Down: The Story of SALT* (New York: Holt, Rinehart & Winston, 1973), p. 69.

106. In *Counsels of War*, pp. 197–98, Herken quotes some of McNamara's concerns: "There is a kind of mad momentum intrinsic to the development of all nuclear weaponry.... If a system works—and works well—there is a strong pressure from all directions to procure and deploy the weapon out of all proportion to the prudent level required." Herken points out that what McNamara termed "an action-reaction phenomenon" dominated and escalated the arms race.

107. In November 1964, the Soviets first paraded what appeared to be an ABM system. The system, called Galosh, "was believed to be composed of a network of radars and a two- or three-stage, solid-fueled interceptor missile designed for long-range, ex-atmospheric interception of incoming ICBMs." See Ernst J. Yanarella, *The Missile Defense Controversy: Strategy, Technology, and Politics, 1955–1972* (Lexington: University Press of Kentucky, 1977), p. 118.

108. On the politics of ABM control up to 1972, see Yanarella, *The Missile Defense Controversy;* Benson D. Adams, *Ballistic Missile Defense* (New York: American Elsevier, 1971); Morton Halperin, *Bureaucratic Politics and Foreign Policy* (Washington, D.C.: Brookings Institution, 1974); Newhouse, *Cold Down;* Gerard Smith, *The Story of SALT,* 2d ed. (New York: Pergamon-Brassey, 1989); Kaplan, *Wizards of Armageddon;* and Herken, *Counsels of War.*

109. See David N. Schwartz, "Past and Present: The Historical Legacy," in Ashton B. Carter and David N. Schwartz, eds., *Ballistic Missile Defense* (Washington, D.C.: Brookings Institution, 1984), pp. 332–33.

study an ABM moratorium and to get the Pentagon interested in the idea.[110] In 1962, Schelling, Charles Hertzfeld, Thomas Wolfe, and Daniel Fink participated in task force discussions about controlling ABMs.

During 1964, as Americans learned about Galosh, the battle positions for and against ABMs were drawn and the epistemic community was called to defend its turf. One of the first shots in the ideological and political battle was fired by Wiesner and York in 1964 in the pages of *Scientific American,* where they argued that it was their "professional judgment" that the nuclear dilemma had "no technical solution," a clear reference to the ABM system.[111] Other arms controllers started to work more quietly within ACDA to formulate practical arms control ideas about banning ABMs. Five years of intense involvement by members of the epistemic community followed. This had less to do with intellectual innovation and scientific analysis than with politics, political alliance formation, and lobbying and rallying the support of bureaucrats, Congress, and public opinion against BMDs. By 1967, a new "thin defense" system, called Sentinel, which was aimed at protecting American cities against a Chinese attack and against an accidental Soviet attack, was being approved for deployment by the Johnson administration.[112] Nevertheless, in 1968 the Soviets were persuaded to negotiate a strategic arms control agreement, and ISA's Morton Halperin (who was coauthor with Schelling of *Strategy and Arms Control*) succeeded in producing an agenda for the ABM and strategic arms limitation talks (SALT) and in getting the Joint Chiefs of Staff to give their reluctant approval to it.

Halperin's success was due partly to ISA, which provided an institutional home to arms control ideas and their carriers. ISA's power came from the fact that policymakers such as Defense Secretary Clark Clifford were willing to listen to its people. And because Halperin was the first to generate a strategic arms control negotiating agenda, he could benefit from the bureaucracy's uncertainty and lack of experience. Knowing that the Chiefs would never accept an agenda developed at ACDA, Halperin took the action to the Pentagon, where he involved military personnel in the agenda-making process in a skillful manner that allowed him to retain his political alliance with the State Department and ACDA but at the same time enabled him to put pressure on the Chiefs to reach a quick decision.[113]

Congress was another battlefront where the epistemic community did well. During the Eisenhower and Kennedy years, arms controllers managed to engage Senator Hubert Humphrey and his Disarmament Subcommittee in the business of arms control. Hearings held by this subcommittee diffused arms control ideas to the public; Humphrey himself made a contribution to the

110. York, *Making Weapons, Talking Peace,* pp. 222–23.
111. For a discussion of Wiesner and York's article, see Herken, *Counsels of War,* p. 193. Herken notes that Paul Nitze called the article "outrageous, an incitement, an example of dirty pool."
112. Sentinel was a light area missile defense system set to be deployed in fifteen sites in the continental United States, one site in Hawaii, and one in Alaska. The system consisted of various radars and either a Spartan missile or a Sprint missile, depending on the site. See Adams, *Ballistic Missile Defense,* p. 177.
113. Newhouse, *Cold Down,* pp. 50 and 115–16.

special 1960 *Daedalus* issue. But relations between the epistemic community and Congress were cemented mainly during the 1968–69 congressional ABM debate.

This debate was aided and even fueled by the intervention of arms controllers. In a June 1968 letter to *The New York Times,* Wiesner argued that the ABM system was a waste of resources. One month later, Senator Eugene McCarthy released a position paper that was written by Wiesner and Kistiakowsky and recommended a unilateral freeze on Sentinel and on offensive nuclear weapons deployment.[114] Indeed, at that time an alliance between the arms control epistemic community and powerful senators began to take shape.

When reporters picked up the story about the technical controversy in Congress regarding the deployment of BMDs in the vicinity of major American cities, their media coverage helped close the ranks between scientific associations and a variety of peace and grass-roots groups that had formed around the ABM issue. Some of these groups were directly mobilized by the scientists, who also organized popular committees and public rallies in major U.S. cities.[115] In fact, the political environment—the Vietnam War, campus unrest, the exceptionally low prestige of the American military—was very conducive to the creation of an anti-ABM coalition.

During the ABM debate, Senator J. William Fulbright was alerted to the fact that government-based scientists who opposed Sentinel were the only scientists called to testify before the Armed Services Committee. As Sentinel's fate was being decided by Nixon's new Republican administration, Fulbright's Foreign Relations Committee decided that Senator Albert Gore's Disarmament Subcommittee would begin holding educational hearings on ABMs and, breaking with an old tradition, would invite nongovernmental scientists to testify. "The real purpose," wrote Benson Adams, "was to provide a means to counter the influence of the Armed Services Committee and to oppose BMD."[116] Arms controllers such as Wiesner, Ruina, York, Kistiakowsky, Bethe, Rathjens, and Panofsky were summoned to these hearings and, using the ABM system as their showcase, diffused the arms control paradigm to the senators, the media, and the American public. So impressive was the epistemic community's anti-ABM pressure that prominent scientists such as Wohlstetter and Kahn, who favored ABMs, became involved in the debate only to counter it.[117]

114. Adams, *Ballistic Missile Defense*, p. 186.
115. Yanarella, *The Missile Defense Controversy*, pp. 144–47.
116. Adams, *Ballistic Missile Defense*, p. 193.
117. Kahn said that the public debate had been one-sided because about "ninety percent of the scientists who normally speak in public, or who consult part-time for the government on defense issues, as well as the vast preponderance of the public literature on the subject, opposed ABM." See Herman Kahn, "The Missile Defense Debate in Perspective," in Holst and Schneider, *Why ABM,* p. 285. For a good source on the involvement of pro- and anti-ABM scientists in the ABM debate, see Anne Hessing Cahn, *Eggheads and Warheads: Scientists and the ABM* (Cambridge, Mass.: MIT Center for International Studies, 1971). In the "battle of books," the counterpart to *Why ABM* was the anti-ABM work edited by Abram Chayes and Jerome B. Wiesner, *ABM: An Evaluation of the Decision to Deploy an Antiballistic Missile System* (New York: Signet, 1969).

Arms controllers lost the ABM battle in Congress by one vote, and a new system called Safeguard, aimed at defending American land-based ICBMs against a Soviet attack, was approved by Congress.[118] Nevertheless, the epistemic community had won the war, because by educating both Congress and the public on deterrence and arms control it had managed to put the Nixon administration, as well as the ABM supporters in Congress and in the scientific community, on the defensive.[119] Furthermore, the community created a more or less permanent, broad political constituency in favor of arms control by instilling concern about the issue among a much wider public than before—grass-roots, labor, and religious groups, professional associations, and peace organizations.

It is true that the success of arms control ideas was directly related to the public insistence that military self-restraint accompany policies of nuclear rearmament,[120] but the meaning, direction, and content of self-restraint were provided by the epistemic community, which helped make the public aware that ABM policy was one example in which self-restraint was required. By the end of the 1960s, arms control had become one of the dominant interpretations of national security—so dominant, in fact, that decision makers and negotiators in the Nixon administration, who had long believed in American military superiority, were now endorsing nuclear parity and taking stable deterrence and arms control for granted.[121] National Security Adviser Kissinger, however, was no stranger to arms control ideas; he had been one of the contributors to the 1960 *Daedalus* issue and had kept close links to arms controllers in Cambridge all along.

The Nixon administration appears to have signed the SALT and ABM treaties because of a diminished fear of surprise attack following the attainment of invulnerability, as well as the awareness that a ceiling on offensive weapons would constrain the Soviets more than it would the Americans (the United States was not then building any new ICBMs, Polaris submarines, or bombers) and would limit the Soviet SS-9s, which the Americans feared the most. Soviet insistence on a treaty was also instrumental, and certainly the public uproar over ABMs that the epistemic community and its allies helped

---

118. Safeguard incorporated both area and terminal defense capabilities, using the same components as Sentinel but deploying these components with the aim of defending Minuteman silos. For command and control reasons, Washington, D.C., would be defended as well. Adams, *Ballistic Missile Defense,* p. 200.

119. According to Brenner, "Each testimony [before Congress] delineated the technical and political aspects of the issue while assiduously drawing the necessary distinctions between those questions amenable to scientific judgment and those requiring subjective estimates. By stipulating the logical connections between acceptance of ABM and its multiple consequences, these analyses heightened awareness of the issue's subtle interdependencies. They discredited the Administration's casual use of the syllogistic argument that in the past had relied successfully on faith (in the simple equation that more arms means more security) and fear (of Soviet aggression)." See Brenner, "The Theorist as Actor," pp. 115–16.

120. Sims, "The Development of American Arms Control Thought," pp. 13–14.

121. Firestone, *The Quest for Nuclear Stability,* p. 150.

bring about put the Nixon administration on notice that the American people did not want ABMs in their backyards. Questions of linkage and detente also played a role.

All of these factors would not have had any meaning—indeed, would not have been rationally considered or even relevant—had not the ideas of stable deterrence and arms control become a salient paradigm of national security and been diffused to government institutions, where they were instrumental in shaping an arms control agenda and a political coalition to carry it out. During the ABM debate process, the arms control epistemic community and its allies convinced the American people that the superpowers had a mutual interest in avoiding nuclear war and that this interest should be symbolically, politically, and practically manifested in an ABM arms control treaty.

Intellectual diffusion to the Soviet Union

The diffusion of American arms control ideas to the Soviet Union was necessary for the creation of the ABM regime. Helping to create an international negotiation agenda and provide the epistemic framework for negotiation and agreement, these ideas structured not only the American domestic but also the international political game. According to Marshal Shulman, the transfer of ideas had "a residual educational effect that you cannot always measure but which may be terribly important. There is a kind of diffusion of conceptions that goes on, there is an educational process . . . because we are just . . . beginning to have insights into what makes for stability."[122]

The international diffusion of nuclear arms control ideas began in the 1950s and continued throughout the 1960s. Direct means were negotiation proposals, bargaining and negotiation positions, summit meetings, technical conferences (such as the Surprise Attack Conference), and scientific forums (such as Pugwash and the "Doty," "Dartmouth," and "Panofsky" groups).[123] Indirect means included Western statements and strategic debates, congressional hearings and debates, press reports, and academic books and articles.

122. See testimony of Marshal Shulman, in U.S. Congress, Senate Committee on Foreign Relations, *The Strategic and Foreign Policy Implications of Anti-Ballistic Missile Systems: Hearings Before the Subcommittee on International Organization and Disarmament Affairs,* part 1, 91st Congress, 1st sess., March 1969, p. 154. See also the testimony of Vincent P. Rock, in U.S. Congress, *Strategy and Science: Hearings,* p. 224, which included the following argument: "In terms of aid, in terms of weapons . . . there is a great deal of copying, of action and reaction, reciprocal action of a kind, between the nations of the world. . . . As we know, all nations collect each other's basic and applied scientific output. There is a tremendous interaction going on as a result of having to read and cope with the ideas the other fellow is putting out."

123. The Soviet–American Disarmament Studies Group, referred to as the Doty group, started to meet in 1965 and met for ten years. The first conference of the Darmouth group took place in 1959. An official collaboration between the American and Soviet academies of sciences has taken place under the guidance of W. Panofsky and S. Sagdeev.

When ideas of strategic nuclear arms control were first raised by Americans in the 1950s, they were interpreted by the Soviets to mean inspection without disarmament and evoked suspicions of espionage and a capitalist plot. (In Russian, *kontrol* means to count, audit, or inspect and does not share with the English concept of control the meaning of regulation and management.[124]) At the Surprise Attack Conference, the Soviets insisted that they could not envisage a technical solution to the nuclear predicament.[125] They argued instead that "any technical device may fail, but a technical failure may lead to disaster only in a climate of artificially heightened tensions."[126] But the conference was nevertheless a turning point because even this formal and ostensibly "unsuccessful" discussion had a constructive effect on the superpowers' continuous dialogue over strategic issues.[127]

By the early 1960s, the Soviets had begun to move unilaterally to make their strategic weapons invulnerable and to recognize the value of reconnaissance satellites. Moreover, their military writings started to mention that accidents could be a *casus belli* in times of international tension,[128] and eventually they adopted an American device to prevent accidental war, the permissive action links (PALs).[129] They went along with the idea of the hotline and were finally persuaded to sign the PTBT. "Thus, by 1963," wrote Robin Ranger, "the Soviet Union's adaptation of the concepts of arms control to meet its political objectives had produced an implicit theory of political arms control."[130] Aware that the American perception of strategic problems was primarily technical and that, to engage Americans, they would have to discuss political problems within the American technical framework, the Soviets also recognized the benefits of negotiating political agreements without appearing to do so. According to Ranger, one of the unintended consequences of this process was that as "the bilateral Soviet–American relationship became more clearly defined through

124. Walter C. Clemens, Jr., *Can Russia Change? The USSR Confronts Global Interdependence* (Boston: Unwin Hyman, 1990), p. 67.

125. Holst, "Strategic Arms Control and Stability," pp. 258, 264, and 268.

126. The Soviet views were cited by Bruce J. Allyn in "Toward a Common Framework: Avoiding Inadvertent War and Crisis," in Graham T. Allison and William L. Ury (with Bruce J. Allyn), eds., *Windows of Opportunity: From Cold War to Peaceful Competition in US–Soviet Relations* (Cambridge, Mass.: Ballinger, 1989), p. 188.

127. Holst, "Strategic Arms Control and Stability," p. 282.

128. See Allyn, "Toward a Common Framework," p. 188; and John L. Gaddis, *The Long Peace* (Cambridge: Cambridge University Press, 1987), p. 204.

129. See Peter Stein and Peter Feaver, *Assuring Control of Nuclear Weapons: The Evolution of Permissive Action Links* (Cambridge, Mass.: Harvard Center for Science and International Affairs, 1987).

130. See Ranger, *Arms and Politics,* p. 7. Dinerstein and his colleagues at RAND noted in the early 1960s that the technical arms control approach seemed to hold no interest for Soviet military planners. According to Dougherty, however, "Some change was noticeable after the Cuban missile crisis. . . . During the past decade [1963–1973], there have been signs that the Soviets have begun to take more seriously the Western ideas of 'arms control.' " See Herbert S. Dinerstein, Leon Goure, and Thomas W. Wolfe, "Introduction" to the English translation of *Soviet Military Strategy,* ed. by Soviet marshal V. D. Sokolovskiy (Englewood Cliffs, N.J.: Prentice-Hall, 1963), p. 77; and James E. Dougherty, *How to Think About Arms Control and Disarmament* (New York: Crane, Russak, 1973), p. 71.

agreements that were couched in terms of the explicit theoretical framework of technical arms control . . . the Soviet leadership became increasingly explicit about its approach to strategic stability."[131] Americans, conversely, increasingly became involved in political arms control.

The PTBT and hotline agreements reached in the early 1960s, the space and nonproliferation treaties signed in the late 1960s, and three agreements negotiated and concluded concurrently with SALT/ABM negotiations in the early 1970s—the seabed treaty of February 1971, the nuclear accidents measures and direct communications link agreement of September 1971, and the biological weapons convention of April 1972—were important steps toward strategic agreements because they indicated to Soviets and Americans alike that cooperation by means of arms control agreements was indeed possible. Moreover, these treaties became a testing ground for some of the provisions of the SALT agreements, such as the use of "national technical means of verification," postagreement evaluation conferences, and provisions for withdrawal from agreements.[132] Both sides saw that some intermediate goals were being achieved and some progress was being made. The Soviets came to realize that, as Arthur Schlesinger put it, "arms control might be a means of approaching rather than avoiding general and complete disarmament."[133]

The ABM treaty was the culmination of a decade-long process of diffusion of American arms control ideas to the Soviets. The pattern usually began with an American proposal, followed by a Soviet response, a new set of American suggestions based on that response, and engagement in a new round of negotiations.[134] Much of the official discussion of strategic doctrine and force position consisted of such "talking to Moscow at a distance," including the education of the Soviets in the requirements of a safe and secure second-strike force during the Kennedy and Johnson years.

Part of this education took place by means of direct contacts between American and Soviet scientists, such as in Pugwash meetings or in the meetings of a committee organized by Doty and the American Academy of Arts and Sciences. These meetings, argued Frank von Hippel, "often provided an opportunity to investigate new experimental ideas that government agencies have been loath to explore for fear of reducing political maneuvering room."[135] For example, during the twelfth Pugwash meeting, in 1964, Jack Ruina told his Soviet counterparts about the idea of controlling ABMs. Herbert York recalls that "after Jack's presentation the head of the Soviet delegation approached him and said there must have been something wrong with the translation. He

131. Ranger, *Arms and Politics,* p. 209.

132. Samuel B. Payne, *The Soviet Union and SALT* (Cambridge, Mass.: MIT Press, 1980), p. 75.

133. Schlesinger, *A Thousand Days,* p. 505.

134. See Michael Mandelbaum, "Western Influence on the Soviet Union," in Seweryn Bialer and Michael Mandelbaum, eds., *Gorbachev's Russia and American Foreign Policy* (Boulder, Colo.: Westview Press, 1988), p. 364; Holst, "Strategic Arms Control and Stability," p. 245; and Yanarella, *The Missile Defense Controversy,* pp. 197–98.

135. Frank von Hippel, "Arms Control Physics: The New Soviet Connection," *Physics Today,* November 1989, p. 39.

explained that he actually heard the interpreter say Jack proposed to limit defensive weapons." Ruina and Murray Gell-Mann then drafted a paper on the subject and submitted it to the conference. The Soviets "still considered it a strange notion but agreed to think more about it." In later years, some of the Soviet scientists who had participated in the meetings with American arms controllers helped persuade Soviet policymakers. Von Hippel reports that "Lev Artsimovich (who was head of the Soviet fusion program) and Mikhail Millionshchikov (who was vice president for applied physics and mathematics of the Soviet Academy of Sciences) subsequently helped bring their government around . . . thereby contributing to the achievement in 1972 of the ABM Treaty." In turn, Doty adds that "it is widely thought that the willingness of the USSR to negotiate an ABM Treaty arose from the seminars that this group held."[136]

Before 1968, the Soviet leaders gave every indication that they could not or did not want to understand why defenses were "bad." At the Glassboro meeting, Kosygin rejected McNamara's initiative to ban defenses. Beneath the surface, however, not only the Soviet perceptions but also the Soviet political-strategic game had started to change. Referring to the relatively long time it took the Soviets to react to McNamara's proposals, a Soviet diplomat said, "Don't think we weren't studying the problem. It was just too soon. We didn't think we were ready."[137] In fact, as David Holloway pointed out, both "the ambition to attain superiority and the recognition of mutual vulnerability were present in Soviet thinking in the 1960s. But a choice became necessary only with the attainment of parity [and was] forced by the practical consideration that the pursuit of superiority might prove extremely costly, and ultimately unsuccessful."[138]

Two important new premises that the Soviets had already adopted made the acceptance of strategic arms control possible. According to Michael MccGwire, "One was that a war in Europe would not inevitably lead to massive strikes on Russia, except in retaliation for an attack on North America. The other was that the size and diversity of the U.S. strategic arsenal meant that a preemptive strike on the United States would do little to limit the devastation of Russia."[139] In any event, Samuel Payne argues, in 1968 "an era ended for Soviet arms

136. See York, *Making Weapons, Talking Peace,* p. 223; J. P. Ruina and M. Gell-Mann, "Ballistic Missile Defense and the Arms Race," in *Proceedings of the Twelfth Pugwash Conference on Science and World Affairs,* Udaipur, India, 27 January to 1 February 1964, pp. 232–35; Von Hippel, "Arms Control Physics," p. 39; and Paul Doty, "Arms Control: 1960, 1990, 2020," *Daedalus* 120 (Winter 1991), p. 40.

137. Regarding the Soviet reactions, see Newhouse, *Cold Down,* p. 102.

138. David Holloway, *The Soviet Union and the Arms Race,* 2d ed. (New Haven, Conn.: Yale University Press, 1989), p. 44.

139. See Michael MccGwire, "Why the Soviets Are Serious About Arms Control," *Brookings Review,* Spring 1987, p. 11. In a review of MccGwire's book, *Military Objectives in Soviet Foreign Policy* (Washington, D.C.: Brookings Institution, 1987), Bluth argued that the changes which MccGwire said occurred at the end of 1966 actually started in 1964 and 1965. Bluth's point was indeed proved by a flurry of Soviet articles discussing the possibility of doctrinal change in the 1964–65 period. See Christopher Bluth, "The Evolution of Soviet Military Doctrine," *Survival* 30 (March–April 1988), p. 149.

control policy and a new era began. Before 1968 strategic arms limitation was simply not on the agenda for discussion in the Soviet Union."[140]

By 1968, a faction of the Soviet political and academic establishments had already started to oppose the view of the Soviet military. Payne suggests that those who first raised ideas of strategic arms control were mainly "academic specialists and commentators on foreign affairs who write for the scholarly journals in the field and also for the central press."[141] These Soviets were well aware of what the members of the American arms control epistemic community were writing and saying and shared some of their expectations.[142] Andrei Kokoshin remarked that "at the beginning, the Americans had a larger pool of ideas of arms control and we borrowed some of them."[143] In fact, noted Payne, the majority of the Soviet arms controllers' attacks on ABMs "were direct or indirect quotations from statements made by American opponents of ABMs": Iu. Arbatov, for example, quoted George Rathjens as someone who believed that "with the present relationship of forces the strategic position of the USA basically would not change if the Soviet Union had twice as large or half as large a strategic force."[144] V. V. Larionov, echoing an American statement, argued that "from the point of view of national security the effort to have quantitative superiority in rockets and bombers has lost its significance, because at any realizable level the other side, spending sufficient energy and resources, can also reach that level."[145]

Although Soviet arms controllers were well aware of the ideological divisions on nuclear issues in the United States, they drew confidence from the fact that a strong group of arms control lobbyists existed in the United States and used this fact to persuade reluctant Soviet actors.[146] According to Payne, the Soviet leadership

> apparently accepted the SALT I agreements for some of the same reasons that the [Soviet] arms controllers had advanced for strategic arms limitation over the previous several years. As the negotiations gathered momentum and, even more, after the agreements were signed, members of and spokesmen for the supreme leadership increasingly echoed arms controller arguments. Ideas that had previously been aired in *SShA* and *Mirovaia ekonomika i mezhdunarodnye otnosheniia* now appeared in Brezhnev's speeches and in authoritative editorials in *Pravda, Izvestia,* and *Kommunist.*[147]

140. Payne, *The Soviet Union and SALT,* p. 18.
141. Ibid., p. 7.
142. Georgi A. Arbatov and William Oltman, *Soviet Viewpoint* (New York: Dodd, Mead, 1981), p. 130.
143. Andrei Kokoshin, personal communication.
144. Payne, *The Soviet Union and SALT,* pp. 46 and 59.
145. See ibid., p. 126. V. V. Larionov made the statement in "Transformatsiia kontseptsii 'strategicheskoi dostatochnosti,' " *SShA,* November 1971. Gromyko later made this same point, as did the minister of foreign affairs. It was almost an official statement of the Soviet government's position.
146. Payne, *The Soviet Union and SALT,* pp. 40–41, 47, and 76.
147. Ibid., p. 76.

For example, in the summary report of the Central Committee to the Twenty-Fourth Party Congress, arms control strategic negotiations were portrayed as aiming to prevent a new round in the arms race while protecting Soviet security and releasing significant resources for creative objectives.[148] Schelling and Halperin could not have explained arms control's purposes better. Thus, even if the Soviet leadership started the negotiations without a clear picture of their end result or without a definition of the political battle between arms control supporters and opponents, the fact that it eventually chose arms control shows that the bureaucrats who opposed it suffered a temporary defeat.[149] By placing the ABM agenda at the highest levels of the Soviet government—thus circumventing the bureaucracy—American policymakers helped Soviet arms control supporters prevail in the Soviet policy game. At the same time, once the top Soviet leaders threw their weight in favor of arms control, they put pressure on the American policy game, helping to break the political impasse between American ABM supporters and opponents.[150]

One cannot avoid noticing the hegemonic quality of the process involving the diffusion of U.S. arms control ideas to the Soviets. Some light is shed on this phenomenon by Scott James and David Lake's notion of the "three faces of hegemony."[151] The first and second "faces" are only tangentially related to the diffusion process. According to the first face or process, the hegemon uses positive and negative sanctions as a means of directly influencing the policy choices of other states. Thus, the United States was able to affect Soviet behavior by means of "linkage politics" and the "China card," but only after the superpowers had already been negotiating arms control for some time on the basis of an American agenda. According to the second face, the hegemon pursues a sort of rational-choice Trojan-horse strategy in order to alter the incentives and the political influence of societal actors in foreign countries. In the case of strategic arms, the United States used its superior technological power to persuade Soviet actors that a defensive weapons race would not be in the Soviet interest. Later, these actors did have some influence on the Soviet political game. But this face of hegemony only explains how the United States

148. Ibid., p. 66.

149. Other reasons that led the Soviet leaders to sign a Soviet–U.S. strategic arms control treaty included the following: they perceived that the Americans held a strong edge in the technological race; they realized that multiple independently targetable reentry vehicles (MIRVs) were entering into the strategic equation; they wanted to institutionalize parity with the United States and, if possible, improve their strategic situation in areas unrestricted by SALT; they wanted to project power; they wished to strengthen detente with the West; and they hoped that the resulting economic savings could be directed back to the civilian sector.

150. See Raymond L. Garthoff, "Mutual Deterrence and Strategic Arms Limitation in Soviet Policy," *International Security* 2 (Summer 1978), p. 126; and Morton Halperin, "The Decision to Deploy the ABM: Bureaucratic and Domestic Politics in the Johnson Administration," *World Politics* 25 (October 1972), p. 95.

151. The faces refer to complementary and mutually reinforcing processes. They are ideal types, and "the distinction between 'faces' tends to break down at the margin." See Scott C. James and David A. Lake, "The Second Face of Hegemony: Britain's Repeal of the Corn Laws and the American Walker Tariff of 1846," *International Organization* 43 (Winter 1989), p. 4.

was able, in the bargaining process, to raise the cost for the Soviets of not controlling defenses; it does not explain the "sudden" Soviet interest in controlling ABMs.

The third face of hegemony is directly linked to diffusion processes and may help us understand why certain ideas "diffuse" better than others. In this face, the hegemon "uses ideas and ideology to structure public opinion and the political agenda in other countries so as to determine what are legitimate and illegitimate policies and forms of political behavior."[152] On a closer look, however, this face too provides only a limited explanation. For obvious reasons, affecting public opinion was almost irrelevant in the Soviet case. Moreover, James and Lake's description of the third face gives us few clues as to how U.S. ideas managed to control the Soviet agenda and helped to structure policy preferences in the Soviet Union.

There seems to be a fourth face of hegemony that goes a long way to clarify what the other three faces fail to explain. The United States was able to diffuse its ideas to the Soviets and "gently" impose its agenda on them because the U.S. arms control epistemic community had undergone the process of ramification, thereby gaining adherents in the Soviet Union. This expansion of the community's base allowed arms control understanding to flow to the Soviet polity, thus becoming an integral part of the Soviet domestic political game. It also endowed Soviet arms controllers with a legitimate claim to a new interpretation of the Soviet national interest, which became the basis on which political coalitions were created and, ultimately, policies were made. In the fourth face of hegemony, then, hegemonic ideas structure not only the political agendas but also the political games of other countries. They also play a reflexive role by increasing the propensity of other countries to learn.

Once strategic negotiations were under way, the United States expressed its willingness to scrap ABMs entirely if the Soviets would limit their SS-9s and eliminate their ABM system poised around Moscow. Eventually, in 1972, both sides settled for limiting ABMs to two sites, and a few years later they agreed on a one-site limit. "The signing at Moscow in May 1972 of the SALT treaties," wrote Gregg Herken, "seemed an occasion of barely restrained joy for those who had come to identify themselves collectively and sometimes self-consciously as 'the arms control community.' . . . The treaties seemed to represent, therefore, a substantial—if not yet final—acceptance of the idea that there could be no victor in a nuclear arms race."[153]

In the long run, the diffusion of arms control ideas to the Soviet Union had profound effects. Since the late 1960s, the Soviet political system has carried an understanding embodied in political and academic institutions—and perhaps even, recently, in military institutions—wherein defenses are seen as detrimental to, and arms control as beneficial for, national security. This understanding,

---

152. Ibid.
153. Herken, *Counsels of War,* p. 247.

similar to the U.S. case, helped balance and moderate pressures arising from an opposing and also very powerful understanding, carried mainly by military elites, that a protracted nuclear war could be fought and won and that arms control might prevent a victory on the battlefield.

When Mikhail Gorbachev came to power, he not only adopted some of the classic arms control assumptions, which by then some American elites had forgotten about or did not want to remember, but also pushed them further. And he managed to affect American and international political games by creating favorable conditions and opportunities for arms control. Helping this trend was a group of Soviet civilian strategists who had acquired their defense expertise in the West with Western strategists and were now enjoying direct access to power. Even high Soviet military officers admitted that their new ideas of unacceptable damage could be traced back to McNamara.[154] Thus, once arms control ideas became embodied in domestic and international procedures and institutions, the domestic and international games were irrevocably changed. Each new generation of leaders now had to make its (rational) decisions on the basis of an inherited intellectual code of arms control ideas which, with the passage of time, was enlarged, refined, and taken for granted.

The political road for arms control ideas was, however, full of obstacles arising in part from the international game but in even larger part from the domestic game. Setbacks included the SALT II treaty and the lack of support for arms control during the first years of the Reagan administration. President Reagan, aided by Edward Teller, Richard Perle, and other members of the "deterrence" community, devised the SDI not as a complement but as an alternative to arms control. Nevertheless, the practice of and national interest in arms control not only survived and kept the superpowers busy talking rather than fighting, but with Gorbachev's coming to power became, once more, a key factor in superpower relations. And since the revolutions of 1989 in Eastern Europe, arms control has also become a means for enabling the transition to a new European order.

Conclusions: the arms control epistemic community and the emergence of prudential regimes

The role played by the arms control epistemic community in the emergence of nuclear arms control cooperation between the superpowers was significant and multifaceted:

First, the community created an intellectual climate favorable to arms control. Decision makers need not have read Schelling to understand arms

---

154. Edward L. Warner III, "New Thinking and Old Realities in Soviet Defence Policy," *Survival* 31 (January–February 1989), pp. 18–20.

control; the ideas were in the air as part of the vague but historically important "spirit of the times."[155]

Second, the members produced the technical knowledge required to deal with nuclear arms control. This knowledge, in turn, was used by the arms controllers to gain political legitimation and authority.

Third, the community focused attention on cooperative phenomena and helped provide the superpowers with reasons why—despite all their ideological and political differences and despite the fact that in the past disarmament negotiations had never been taken very seriously—it was important that they cooperate.[156]

Fourth, it paved the way for the creation of vested interests in arms control, including government agencies such as ACDA and a large number of nongovernment interest and pressure groups. ACDA, even if leading what Paul Walker described as "a rather precarious existence with a history of very mixed success,"[157] was important because it institutionalized arms control ideas and procedures and provided the bureaucracy with an institutional counterweight to the Joint Chiefs of Staff. Because arms control ideas were also institutionalized in the Pentagon and the White House, they could more easily find their way into policy agendas. The epistemic community also helped foster new areas of research and development and other arms control activities, with the result that additional communities sprang up around these activities at universities, think tanks, arms control associations, academies of science, and the meetings of the American Association for the Advancement of Science.

Fifth, the epistemic community helped generate an awareness about arms control that eventually led to public support for it. Acting to influence the media because of the opposition encountered in some inner policymaking circles, the community was able to convey to people the national security quality and value of arms control ideas. By suggesting how arms control ideas might be related to U.S.–Soviet relations and by creating in people's minds an almost instinctive analogy between arms control and avoiding nuclear war, arms controllers were able to shape public attitudes well into the future.

Sixth, arms controllers helped persuade Congress about the value of specific arms control agreements. Thus, during the ABM debate, they acted as a

---

155. Robert Jervis, "Realism, Game Theory, and Cooperation," *World Politics* 40 (April 1988), p. 325.

156. This awareness of the value of cooperation for national security was essential. According to Davis, "As the naive type of unsafeguarded arms control of the 1920's became clearly inappropriate to the problems of the next three decades, there developed a relatively harmless tradition in politics of paying it lip service, so as not to offend the gentler elements of public opinion, and of ignoring it in practice. This tradition of the white lie [was] carried over into the nuclear age. . . . For several critical years the habit of pretending to work for disarmament served to mask the fact that the political leadership of the United States did not want disarmament. More specifically, those in Washington who considered arms control undesirable or impractical clearly had the upper hand in the process of making and administering policy, with the help of others who thought the Russians would never sign anyway, or would sign and cheat." See Davis, "Recent Policy Making in the United States Government," pp. 379–80.

157. Walker, "The U.S. Arms Control and Disarmament Agency," p. 13.

counterweight to government scientists who advocated the deployment of defenses.

Seventh, members were able to propose a logically coherent arms control negotiation agenda and helped think through the bargaining positions to be taken in the ABM negotiations. Armed with arms control theory, they suggested the winning bargaining tactics and called the negotiators' attention to focal points of cooperation such as BMDs, space, the bottom of the sea, and so on. They also pointed to the need for confidence-building measures to prevent accidental wars. And they explained the political consequences that would follow from technological changes and from various alternative bargaining positions.

Eighth, the community helped formulate specific norms and rules, researched and proposed verification means, and suggested posttreaty reviews and conditions for withdrawal from agreements.

Ninth, arms controllers in many cases became what Robert Gilpin called "full partners with politicians, administration, and military officers in the formulation of policy."[158]

Finally, the community was instrumental in transmitting arms control ideas to the Soviet Union.

The fact that many members of the arms control epistemic community were brought into the halls of government, where they persuaded and worked together with policymakers to institutionalize the arms control paradigm, explains in part why arms control expectations were politically selected by the American government. The pluralistic nature of the American political system and the relatively decentralized process by which policy agendas are determined actually helped the epistemic community create an arms control agenda within the government. By providing community members with several alternative sources of political power, the political system helped protect them against political, ideological, and personnel changes at the top. When they were not able to count on the direct support of the President and his immediate advisers, they could turn to other government institutions, including Congress. In addition, government institutions such as ACDA, ISA, and, at times, the NSC protected arms controllers from opposing interests and points of view.

The ideological affinity between the arms controllers and the Kennedy cadre smoothed the transition of arms control ideas from the intellectual to the political realm. These ideas also had some inherent advantages. In one stroke, they addressed the two most important concerns of the time—enhancing national security and avoiding nuclear war—and they expressed a middle-of-the-road position, appealing to both prodisarmament and conservative political groups who were nondogmatic. Thus, they produced a balance, indeed a temporary consensus, between competing trends within the government and society.

158. Gilpin, *American Scientists and Nuclear Weapons Policy,* p. 299.

President Kennedy's backing of early arms control measures played an important role in the political selection process. Even more important, however, was the fact that he gave the arms controllers a chance to get established within government institutions, where they could spread their influence throughout the political system.

The education of McNamara by arms controllers also played a critical role; indeed, he was the national security "czar" for most of this crucial period. Convinced that there was a mad momentum in the arms race that could be mitigated only by arms control, McNamara fiercely opposed ABM deployment and persuaded Johnson to engage the Soviets with an arms control agenda before the momentum could take another turn for the worse. Although McNamara had left the government by 1968, the task of "selling" an ABM treaty to the government was continued by the arms controllers.

By that time, however, public consciousness had changed and strategic arms control had gained wide support among the American people. This was not only because at the beginning of the 1960s a group of experts within the government had championed arms control ideas, which McNamara then helped to institutionalize, but also because these ideas were validated in later years by structural changes, such as the attainment of strategic parity by the Soviet Union. As the two superpowers started to act both independently and in coordination on the basis of arms control ideas, they generated domestic and international tendencies that would induce future generations of leaders to continue with the arms control process.

The Soviet political elites, for their part, had been affected by the diffusion of arms control ideas for over a decade and, for their own reasons, agreed to leave aside rhetorical demands for total disarmament and negotiate arms control on the basis of an American agenda. We should be careful, however, not to conclude from this that the Soviet leadership simply saw the light, dropped classic Soviet military doctrine—best exemplified by V. D. Sokolovskiy's writings[159]—and adopted American strategic doctrines and political beliefs and goals. But after the Soviets achieved strategic parity with the United States and after the American arms control movement grew in size and power, the idea of stabilizing the arms race through technical arms control began to make more sense to the Soviets, if only because arms control negotiations and treaties could be used to achieve Soviet political and strategic objectives.

Sharing with the United States the desire to avoid nuclear war and encouraged to turn the achievement of parity into political power, Soviet leaders—not unlike their American counterparts—saw arms control ideas as an obvious focal point for pursuing both shared and divergent interests. Indeed, all the Soviets had to be persuaded about was that arms control would help deter the West and limit its weapons, that having achieved parity with the United States and having built an invulnerable nuclear force it was in the Soviet interest to keep the situation stable, and that arms control could be used to

159. See Holloway, *The Soviet Union and the Arms Race,* p. 40.

further Soviet political interests.[160] But the ABM regime depended also on Soviet willingness to negotiate on the basis of the American arms control paradigm and on the sharing of some meanings and concepts about stability, deterrence, the use of force, and cooperation with adversaries.

Terry Nardin's distinction between "purposive" and "practical" association is useful for illustrating why, contrary to what Steve Weber suggests,[161] security regimes need not necessarily depend on the parties' learning the same lessons, adopting similar military doctrines, and sharing political beliefs and goals. According to Nardin, purposive association is "a relationship among those who cooperate for the purpose of securing certain shared beliefs, values, and interests, who adopt certain practices as a means to that end, and who regard such practices as worthy of respect only to the extent that they are useful instruments of the common purpose."[162] An international regime based on purposive association—or what can be called instrumental association— assumes that two or more nation-states have indeed learned the same lessons and developed common political beliefs and goals and are acting together to achieve those goals. The further we get from power politics, the higher the likelihood for the emergence of instrumental regimes.[163] The ABM regime, however, was clearly not instrumental: power politics was essential, and the parties shared neither political beliefs and goals nor objective or scientific knowledge regarding how to avoid war.

Practical association, on the other hand, is "a relationship among those who are engaged in the pursuit of different and possibly incompatible purposes, and who are associated with one another . . . only in respecting certain restrictions on how each may pursue his own purposes."[164] An international regime based on practical association—or what can be called prudential association—may result from the recognition by two or more states that it is in their separate interests to cooperate. In other words, the parties converge on a recognition of what has to be prevented rather than of what has to be mutually achieved; each side constrains itself in order to constrain the other. A prudential regime emerges, however, only after governments share some epistemic criteria about why and how they should cooperate, how to start negotiations, what to include in the agenda, and how to conceptualize norms and rules for particular tasks.

Because this type of "knowledge" will most likely be developed by national institutions and politically legitimized by national governments, an international regime will emerge only after meanings and understandings are diffused and, based on them, a negotiation agenda is created, agreed upon, and acted upon. Writ large, then, arms control practice became an institutionalized way

160. Raymond L. Garthoff, "On Mutual Deterrence: A Reply to Donald Brennan," *International Security* 3 (Spring 1979), p. 198.

161. Weber, "Realism, Detente and Nuclear Weapons," p. 72.

162. Terry Nardin, *Law, Morality, and the Relations of States* (Princeton, N.J.: Princeton University Press, 1984), p. 14.

163. I owe this insight to Craig Murphy. See Craig N. Murphy, "Color It Mitrany: Two Patterns of Progress in International Relations," working paper, Wellesley College, Wellesley, Mass., 1989.

164. Nardin, *Law, Morality, and the Relations of States,* p. 9.

to "know"; that is, it became a means for generating and diffusing "information" about a common interest in avoiding nuclear war. Thus, an overlapping set of epistemic criteria, together with convergence on a common practice, enabled the superpowers to develop a coordination game and to discover the extent to which its symbolic contents suggested compromises, limits, and regulations. I cannot improve on Schelling's pertinent observations: "The players must *bargain* their way to an outcome. . . . They must find ways of . . . communicating their intentions. . . . The fundamental psychic and intellectual process is that of participating in the creation of *traditions,* and the ingredients out of which traditions can be created, or the materials in which potential traditions can be perceived and jointly recognized, are not at all coincident with the mathematical content of the game."[165]

The countries at the receiving end of ideas, which become the target for strategic persuasion during the prenegotiation and negotiation processes, will allow themselves to be constrained by mutual injunctions only to the extent that three conditions are met. First, the policy proposals and the normative and epistemic understandings being diffused must be interpreted as advancing a shared interest in avoiding a particular outcome, such as a nuclear war or an environmental disaster.[166] Second, the proposals must create opportunities for advancing other national, political, military-strategic, and economic interests. The positive expectation of furthering all these interests will tend to increase the value of cooperation, affect the calculation of risk, and, overall, induce cooperation. Third, the parties must become conscious of their interdependence and its implications. An awareness of limits on independent behavior stems naturally from changes in technology, the balance of power, and political and economic conditions. But it also results from the interpretations that people give to these changes.

Those, then, who develop the original expectations, who really "create" the political interests that spur motivation toward the forging of a regime, are creating a regime potential. The expectations created by the arms control epistemic community were thus a necessary condition, though certainly not the only condition, for the forgoing of the ABM regime, and they preceded rather than followed the units of effective modification—namely, the creation of normative behavior patterns and the formal creation of the regime.[167] Indeed, international norms, rules, and decision-making procedures express only tacit or explicit collective understandings and the theoretical expectations that are transformed into practices of government and externalized to other nation-states.

165. Schelling, *The Strategy of Conflict,* pp. 106–7.
166. See Arthur A. Stein, "Coordination and Collaboration: Regimes in an Anarchic World," in Krasner, *International Regimes,* pp. 125–27.
167. See Roger K. Smith, "Explaining the Nonproliferation Regime: Anomalies for Contemporary International Relations Theory," *International Organization* 41 (Spring 1987), pp. 253–81.