

Stopping Sentinel

Sentinel is, among other things, an anti-ballistic-missile shield that everyone agrees could not stop a concentrated missile attack, a strictly defensive system that its critics consider more belligerent than our current policy of keeping enough offensive missiles to make any attack suicidal, a five- or ten-billion-dollar "thin" shield against the Chinese (who have no missiles) which many people think will grow into a fifty- or hundred-billion-dollar "thick" shield against the Russians (who have too many to be affected by a thick shield), a boondoggle according to Dwight Eisenhower, a sensible compromise according to Robert McNamara, a "pile of junk" according to the prevailing view among scientists, and a functioning national program by act of Congress. . . .

At public meetings, the Army has shown Lake County [Illinois] citizens color slides of the computer-operated nuclear-defense system designed to protect them and their loved ones from what are commonly referred to as "primitive Chinese missiles" (conjuring up visions of thousands of Chinese peasants laboriously carting the mud of the Yangtze to crude molds, creating out of the baked earth something that roughly resembles an intercontinental ballistic missile, straining together to pull it back on some enormous catapult, and launching it seven thousand miles over the Pole in an attempt to obliterate Chicago). But the same meetings have almost always included a scientist from the Argonne National Laboratory, a center for non-military nuclear research just west of Chicago; explaining that he is

speaking not as an official representative of the laboratory but as a private citizen who happens to be a nuclear physicist, he reminds everyone that an unauthorized explosion is possible, even though extremely unlikely, and that such an explosion would destroy from a hundred and fifty thousand to two million citizens, "depending on which way the wind is blowing."¹

—Calvin Trillin,
in *The New Yorker*

The Sentinel antiballistic missile (ABM) system was the Johnson administration's response to the threat of a new election year "missile gap," an application by the Republicans of the tactic that had helped elect John F. Kennedy in 1960.² The Sentinel system accomplished its prime political objectives: it successfully mollified the military establishment and blunted Republican criticism. But despite bipartisan Congressional support, Sentinel fell victim soon after the election to the powerful but largely unforeseen opposition of irate suburbanites across the country who wanted no nuclear bombs in their backyards. This chapter tells the story of the scientists who informed and helped organize the opposition to the Sentinel ABM system.

Defending the Cities

Had I known then what would occur, I never would have let it happen. I would have said [that placing ABM sites further away from] major cities would have been reasonable. I just didn't foresee the outcry of the cities.³

—Dr. Daniel Fink,
Deputy Director of Defense
Research and Engineering

The fifteen Sentinel ABM bases initially envisioned might have come into being if it were not for the impolitic enthusiasm of Director of Defense Research and Engineering Dr. John Foster and his deputy Dr. Daniel Fink, who decided to place several of these ABM bases in major American metropolitan areas. The threefold mission of the Sentinel ABM system announced by Secretary of Defense McNamara in 1967 was (1) to provide a thin "area defense" of the entire United States against missile attack by China, assuming that China would soon develop the capability of launching nuclear missiles against the United States; (2) to provide protection against a nuclear missile "accidentally" launched by the Soviet Union; and (3) to provide—"as a concurrent benefit"—a very limited defense of U.S. land-based Minuteman intercontinental nuclear

missiles against Soviet attack.⁴ None of these objectives tied missile sites to large cities, since the Sentinel ABM system depended primarily on the Spartan missile, with a range of some 400 miles. Indeed, the only rationale for placing ABM sites near cities was the possibility thereby provided of enlarging the system into a massive defense of population centers against Soviet missiles—a mission which Secretary McNamara had explicitly rejected as not feasible at any price.⁵ McNamara feared that any attempt to defend our cities against a major missile attack would only inspire the Soviet Union to further escalate the arms race. But McNamara's preoccupation with Vietnam and his transfer out of the Defense Department soon after the decision to deploy Sentinel left effective control of ABM deployment in the hands of Deputy Secretary of Defense Paul Nitze and research and engineering chief Foster. Both these men favored keeping open the option for a large ABM system,⁶ as did the Joint Chiefs of Staff and leading Congressional "Hawks".⁷ Consequently, when the army announced, on November 15, 1967, the first ten areas to be surveyed for ABM sites, it transpired that eight were near major cities: Boston, Chicago, Dallas, Detroit, Honolulu, New York City, Salt Lake City, and Seattle.⁸

The fact that the proposed Seattle ABM site was actually within the city limits seemed especially puzzling to Newell Mack, a graduate student of biophysics at the University of Washington in Seattle. Mack had been interested in strategic weapons issues for several years and had discussed the arguments for and against missile defense with the experts. He now wrote to one of them, Hans Bethe:

Newspaper reports say Sentinel sites may be placed near cities and these sites are to be protected by Sprint missiles. In Seattle, at least, the proposed site of the Sentinel base with accompanying Sprint missiles is five miles from the heart of the city. I don't know whether Sprints are to be placed so close to other cities "tentatively chosen as possible locations" for Sentinel bases. . . . [If so,] the "thin" defense begins to look like a destabilizing "thick" defense.⁹

The short-range, quick-accelerating Sprint had originally been designed for urban defense as part of the massive Soviet-oriented Nike-X ABM system, which was proposed in 1963 but never deployed. In the Sentinel system, the Sprint was relegated to the more limited task of defending Minuteman missile fields and the large and vulnerable ABM radars.¹⁰ The placing of the ABM radars and Sprints in major cities appeared to Mack and other observers as a regression to the old Nike-X population-defense concept, and, as such, an escalation of the arms race that would be likely to provoke a Soviet response.¹¹

Mack was able to learn the exact sites being considered for the Sentinel bases in a number of other metropolitan areas by writing to the local newspapers and city officials. By early summer 1968 he was able to inform Representative Brock Adams (D.-Wash.) of Seattle that in at least seven of the first ten announced Sentinel locations, the proposed sites were indeed very close to population centers. Representative Adams inserted Mack's report into the *Congressional Record*, along with reports on other aspects of antiballistic missiles by several of Mack's colleagues at the University of Washington.¹²

Spreading the Alarm

The issue of ballistic missile defense was hardly new in 1968. Although the major ABM systems proposed after *Sputnik*—Nike-Zeus and Nike X—were opposed successfully by scientific advisors and others within the executive branch, enough of the controversy had spilled over into Congress and the press (especially journals like the *Bulletin of the Atomic Scientists*) for interested outsiders to follow the main arguments. Thus by the late 1960s there was widespread agreement among politically liberal and moderate scientists on the need for general arms-limitation agreements on offensive and defensive weapons, including ABMs. Indeed, a number of American scientists at the international "Pugwash" meetings¹³ on arms control found themselves explaining to their Soviet counterparts why the rudimentary Galosh ABM system around Moscow was not perceived in the United States as the Soviets professed to see it, namely as a purely defensive system. Instead, by threatening to diminish the population-destruction capability of the American offensive missiles ("threatening the deterrent" is the jargon), the Moscow installation, numbering less than 100 interceptors, had given the Pentagon an excuse to develop thousands of multiple independently targetable reentry vehicles (MIRVs) for Minuteman III and Poseidon missiles.¹⁴

By early 1968, a small number of scientists—ranging from prominent government advisors to graduate students like Newell Mack—had begun to present the case against Sentinel to their professional colleagues and to the public. The Council for a Livable World, a scientists' political fund-raising group founded in 1962 by physicist and author Leo Szilard, organized anti-ABM symposiums for Senators and their aides; and the Federation of American Scientists, a public-education and lobbying organization founded in 1946, adopted position papers against ABM. Probably the most influential document in convincing scientists to oppose the ABM, however, was an article on the subject by Hans Bethe and Richard Garwin published in the March 1968 *Scientific American*.¹⁵

Bethe, a Nobel Prize-winning Cornell physicist, had been advising the government on strategic weapons since World War II, during which he was a leading figure in developing the atomic bomb. He had long opposed ABM deployment in his advisory capacity. When he saw the pressures for deployment increasing within the Johnson administration, he decided to try to prepare scientists outside government for the public debate which was to come. In June 1967 he delivered a talk at the University of Wisconsin in which he pointed out the great technical difficulty of effective missile defense.¹⁶ After the Johnson administration's decision that fall to deploy Sentinel, Bethe reworked his talk and successfully sought permission from the Defense Department to include previously classified material. Bethe's revised talk was presented in a symposium at the annual meeting of the American Association for the Advancement of Science in December 1967. Richard Garwin, the IBM physicist who later played an important role in the SST debate, presented additional technical and

strategic arguments against ABM deployment. Gerard Piel, publisher of *Scientific American*, happened to be present, and he urged the two scientists to write up their talks for publication in his magazine. The Bethe-Garwin article, along with the writings on ABM by David Inglis, Ralph Lapp, Leonard Rodberg, Jeremy Stone, and others,¹⁷ provided essential background information for the scientists and laymen who organized to oppose the Sentinel sites in their own localities.

Seattle

In Seattle, the first inkling of the location of the Sentinel site came in April 1967 when the Army halted proceedings transferring title to Fort Lawton to the city. Seattle had long been planning to turn the old unused Army base, which is located in a heavily populated part of the city, into a civic park. Thus the Army's first opponents over the issue of Sentinel sites were the mayor and environmentally concerned Seattle citizens.

Scientists at the University of Washington decided to become involved when the Army's purpose in retaining Fort Lawton became clear in November 1967, a few weeks after Defense Secretary McNamara had announced the Sentinel deployment decision. In July 1967, Newell Mack had invited Hans Bethe to talk on ABM before the Graduate Conflict Studies Group, a seminar led by physics professor Gregory Dash. Bethe's talk generated considerable interest, and the group afterward discussed with him the possibility of assembling an anthology of pro- and anti-ABM literature. Bethe agreed to help, in the expectation that "next year [i.e., 1968] may well be the year of decision on U.S. deployment of an ABM system. It is essential that the public be informed and develop some opinion on it."¹⁸ The Johnson administration's deployment decision came even earlier than Bethe had expected. Instead of working on the anthology, the University of Washington group—by then organized as the ABM committee of the Seattle branch of the Federation of American Scientists—bent their efforts toward briefing the mayor and other officials and assisting local citizens' groups fighting against the use of Fort Lawton as an ABM base.

Besides arguing against the Sentinel system as a whole on the grounds that it could be easily circumvented, penetrated, or saturated, the Seattle scientists particularly emphasized that the Spartan's long range in any case permitted the Sentinel base to be located some distance away from Seattle.¹⁹ They also pointed out that the urban siting would make Seattle a particularly choice target—a "megaton magnet," to use Ralph Lapp's phrase—and in addition would needlessly expose a large population to the danger of an accidental nuclear explosion. The Army's local public relations people disputed these arguments, but the scientists stood their ground. They were reassured of the soundness of their position after Senator Henry Jackson (D.-Wash.) arranged a classified briefing for Edward Stern, a University of Washington physicist who happened

to have security clearance: Stern reported back that, while he could not give details, the scientists' arguments were right.

By autumn 1968, a large coalition of Seattle citizens' groups, with members as diverse as the local Audubon Society and Junior Chamber of Commerce, had organized to oppose the Fort Lawton Sentinel site. Eventually, even Senator Jackson, who for years had been one of the staunchest supporters of ABM, was moved by the citizen pressure in Seattle to concede that perhaps another site could be found. With Jackson's assistance, the coalition persuaded the Army in December 1968 to shift its proposed missile site to a fashionable Seattle residential section, Bainbridge Island in Puget Sound. There, however, it again ran into determined opposition from local residents—fortuitously including another Congressional "Hawk," Representative Thomas Pelly (R.-Wash.)—who urged the Army to move the site someplace else.²⁰

The Argonne Scientists

*We felt like a mouse crawling up an elephant's leg with thoughts of assaulting the elephant. Well, maybe we didn't succeed in that, but we made the elephant twitch a little.*²¹

—Dr. Stanley Ruby,
physicist at Argonne National Laboratory
and president of the Chicago Chapter
of the Federation of American Scientists

In Seattle, the scientists were an essential auxiliary force in the citizens' coalition that opposed the local Sentinel ABM sites, but the main locus of the anti-ABM campaign was in the mayor's office. In Chicago the situation was reversed. There a few scientists at the AEC's Argonne National Laboratory, southwest of Chicago, were from the beginning at the center of the fight against the ABM.

In late October 1968, John Erskine, a physicist at the Argonne National Laboratory, was startled to read in his local community newspaper that

the Chicago base of the Sentinel Missile [sic] Air Defense System will be located either on a portion of the Healy farm land . . . or west of Westchester. . . . Both Spartan and Sprint missiles would be kept at the Chicago site, Col. H. G. Fuller, executive officer of the North Central Division, Army Corps of Engineers, Chicago, said. . . . Fuller added that residents surrounding the site would have no problem with excessive noise. . . . "These are not the type of missile with engines that can be warmed up," he said.²²

Erskine was a member of a small group of Argonne scientists, mostly nuclear physicists, who had for several years been meeting regularly over lunch for

discussions about the arms race and arms-control problems under the leadership of David R. Inglis, a former chairman of the Federation of American Scientists. The implications of ABM deployment had been discussed and dissected by this group for some time, so that when Erskine reported his news to them the more active members immediately understood its importance. Although some of the scientists were not opposed to deployment of a "thin" ABM defense, none of them believed that there was any justification for placing missiles with nuclear warheads within metropolitan areas. They all agreed that the citizens of Chicago should be given an opportunity to decide whether they wanted such neighbors.

Before taking the issue to the public, the Argonne scientists worked for two weeks to prepare themselves. They studied the available literature on ABM, including Congressional hearings; they even telephoned queries directly to the Sentinel System Command Base in Huntsville, Alabama. Finally, Erskine and Inglis contacted friends in the press and local television stations. And on November 15, 1968, the citizens of Chicago awoke to two-inch headlines warning of "A-Missile Sites in Western Suburbs."²³ Because the story had originated with the Argonne scientists rather than an Army press release, it was not written so as to allay fears about living in close proximity to hydrogen bombs.

Citizen protests began immediately. When Erskine returned home that evening, his telephone would not stop ringing: "People kept asking 'Hey, what can we do to help.'"²⁴

In the next few weeks, the Argonne scientists talked with newspaper editors, Congressmen, mayors, and village officials. More than a dozen television interviews helped them tell their story to the Chicago area. They prepared a position paper and an information packet, and they helped to arrange public meetings to discuss the Sentinel system. An example will indicate how their influence pervaded the debate: when the Army organized a briefing session for local Congressmen and government officials, the questions of safety that had been raised by the Argonne scientists prompted one member of the audience to ask how far from Chicago the missile site could be placed without reducing its effectiveness. The speaker, Colonel William Wray, chief of site operations for the Sentinel System Command, refused to answer the question "for security reasons."²⁵ The Argonne scientists were there, however, and pointed out to the press and television media afterward that the answer could be deduced from the well-advertised range of the Spartan missile.

"ANYWHERE EXCEPT NEAR US"

The residents of Westchester, one of the suburban communities west of Chicago, whose town dump had been chosen as a possible Sentinel site, were not enthusiastic.²⁶ "We'd rather have the dump," explained one housewife who was circulating a petition:

We all realize that the dump is a temporary thing. After 20 years or so they will turn it into a golf course. But the missile site is more permanent and it can't do any good to our property values. Besides its unattractiveness, there is also the

danger. They say that they haven't had an accident in 20 years, but if they have the first one here, we won't be around to tell about it."²⁷

The Westchester Village Board scheduled a special meeting on the issue on December 3, 1968, and invited the Army to send a representative. Army officials declined, however, claiming that their representatives could not attend because information about the sites was classified.²⁸ This strategy proved to be unsuccessful. At the meeting the local representative, Harold R. Collier (R.-Ill.), criticized the Army for making it difficult to present an evenhanded informational session. He added that he personally strongly opposed the Westchester site because of the danger of an accidental explosion, and he informed the citizens of Westchester that Congress had been "assured the system would be placed in sparsely settled areas."²⁹ Two scientists from Argonne, John Erskine and John Schiffer, also spoke at this meeting. At the end of the meeting the audience was convinced—all but about 25 of the nearly 400 people in attendance raised their hands to indicate opposition to the Sentinel site. The village board responded by unanimously adopting a resolution to the same effect.³⁰

That same day, after hearing Argonne physicist George Stanford describe the likely effects of the accidental explosion of a Spartan warhead,³¹ the Executive Committee of the DuPage County Board went on record opposing ABM sites anywhere in the Chicago area.³² Three days later, the York Woods Community Association passed an equally strong resolution after hearing from John Erskine and Roy Ringo (yet another Argonne physicist). Army officials had once again declined to appear.

Thus, largely as a result of the efforts of the Concerned Argonne Scientists, the ABM was "invited out" of the western Chicago suburbs. On December 12, the Army responded by announcing that it had decided to locate the Chicago-area ABM site in an abandoned Nike-Ajax base near Libertyville, a suburb north of Chicago.

LIBERTYVILLE, ILLINOIS

The Army is not here to debate the government's position to deploy the Sentinel Ballistic Missile [sic] in the Libertyville area. We cannot discuss the political aspects of the issue. We have been told what to do.

We are hopefully here to develop a meaningful dialogue on the Sentinel missile."

—Colonel R. J. Bennett,
Army information officer

Libertyville is a more conservative community than the towns west of Chicago where the Argonne scientists had hitherto campaigned. The Libertyville area residents reacted calmly to the news that Spartan missiles with their multi-megaton warheads were to be their new neighbors. Libertyville Mayor Charles Brown expressed the general reaction:

The almost miraculous technology of our world today has far surpassed our meagre ability to comprehend. Under these circumstances, it would certainly seem more prudent to place our confidence and security in the hands of those whose lives are dedicated to the profession of defending and protecting our lives, our loved ones, and our properties than to try to accumulate sufficient knowledge to make an independent decision.³⁴

But Clarence Pontius, supervisor of Vernon Township, a thirty-six-square-mile area which includes the missile site, said he wanted to know more about the project:

I've heard some of the Argonne scientists describe the dangers on television, but it seems to me there's insufficient information. They made flat statements and didn't back them up. I want to hear more from the Army Engineers.³⁵

This time the Army, anxious not to repeat its debacle in the western Chicago suburbs, dispatched its top team. On December 19, 1968, Lieutenant General Alfred Starbird, manager of the Sentinel system for the Army, and John S. Foster, Jr., Director of Defense Research and Engineering, flew out from the nation's capital to present the Defense Department's case in a briefing for officials of the northern Chicago area. The briefing was also open to the public. Both of the Pentagon representatives insisted that the Sentinel site had to be as close as possible to Chicago in order to protect the city from the threat of a Chinese Communist attack; and Foster even admitted that he expected the Sentinel ABM might "thicken" into a defense against Soviet missiles depending "on the nature of emerging technology."³⁶ Responding to the citizens' concerns, General Starbird insisted: "There cannot be an accidental nuclear explosion."³⁷

Meanwhile, in the audience, John Erskine and other Argonne scientists quietly handed out leaflets containing a map of the sixty-square-mile area that would be flattened and incinerated if one of the warheads nevertheless did explode. The leaflet also pointed out that, if the winds were right, fallout would kill much of the population of Chicago.

When invited to confront the Argonne scientists, Starbird and Foster replied that they had to leave immediately for Washington. The Argonne scientists then spoke to the remaining townspeople and newsmen. John Erskine pointed out that "the Army let the cat out of the bag" by admitting that Sentinel had become a city defense.³⁸ George Stanford labeled the Army's claim that a nuclear accident is impossible "a ridiculous statement. . . . They have circumvented a lot of possibilities, but they still have the human and mechanical components to consider."³⁹ The Argonne scientists then quoted from the government's official nuclear weapons handbook:

Nuclear weapons are designed with great care to explode only when deliberately armed and fired. Nevertheless, there is always a possibility that, as a result of accidental circumstances, an explosion will take place inadvertently. Although all conceivable precautions are taken to prevent them, such accidents might occur in areas where the weapons are assembled and stored, during the course of loading and transportation on the ground, or when actually in the delivery vehicle, e.g. an airplane or a missile.⁴⁰

The scientists emphasized that ABM warheads would be particularly difficult to safeguard against accident because they must remain ready to be launched and exploded on a moment's warning: a half trigger cannot simultaneously be a stiff trigger.

A few days after the Foster-Starbird briefing, local newspapers were quoting the previously "unconvinced" Vernon Township supervisor, Clarence Pontius, repeating the same arguments against locating an ABM site in the Libertyville area used by the Argonne scientists.⁴¹

With one village board after another voting to oppose the Libertyville ABM site, the army finally decided to try to counter the remarkable effectiveness of the Concerned Argonne Scientists by fielding a public information team of its own. The Army team, while it lasted, ordinarily consisted of

two full colonels (one of whom introduces the other), a lieutenant-colonel working the slide projector, and a civilian public-relations man with a pipe, a Sentinel tie clasp, and an elaborate tape recorder.⁴²

Both the scientists and the Army spokesmen toured Lake County, Illinois, "like old prizefighters staging exhibitions"⁴³—but after about a month the Army gave it up. The more the citizens heard, the more they organized to oppose ABM. In mid-January, one of these anti-ABM groups filed suit to stop construction on the Libertyville site pending judicial and Congressional review. A federal district judge, after agreeing to assume jurisdiction, warned the Army not to start construction until he rendered his decision; and on March 3 he denied a government motion to dismiss the suit.⁴⁴ Around the same time in March, coinciding with protests at MIT and other leading universities against the military's misuse of science, faculty members and students at Northwestern and other Chicago-area universities finally began to express opposition to the Sentinel ABM system.⁴⁵ Meanwhile, citizen protests in other metropolitan areas being considered for ABM sites also began to receive national attention.

Reading, Massachusetts

The people against the site are playing a game of Russian roulette with the survival of this country. . . . Scientists at M.I.T. have apparently accepted the Boston site, which is closer to the central city area than the Vernon Hills [Illinois] site. There has been no disapproval from M.I.T.⁴⁶

—Representative Roman Pucinski (D.-Ill.)

In Detroit, two physicists from local campuses conducted an anti-ABM campaign much like that of the Argonne group, although on a smaller scale.⁴⁷ But politically active scientists in the Boston area—home of Harvard, MIT, and a dozen other academic centers—were too busy commuting to Washington to concern themselves with the ABM site construction that had already begun north of Boston. There the local citizens led the opposition from the beginning.

One community went so far as to appropriate \$2,500 for "appraisal, engineering, legal and other expenses" to conduct a study of the implications of the proposed ABM site "for the purposes of protecting the interests of the town."⁴⁸

The Boston-area Sentinel opposition culminated in a confrontation in Reading, Massachusetts, the site of one of the two Massachusetts ABM installations. The New England Citizens Committee on ABM had responded to the Army's announced briefing by drumming up a large crowd and recruiting a distinguished anti-ABM panel, including ex-Presidential science advisor Jerome Wiesner, former high-ranking Defense Department weapons analyst George Rathjens, and Kennedy aide Richard N. Goodwin. Patrick J. Friel, former Deputy Assistant Secretary of the Army for Research and Development, attended the meeting. The next morning he wrote to John Foster:

I was very impressed with the fact that the audience was extremely well informed and would not accept weak answers on either the technical or policy aspects of the system. It is fairly clear to me that a substantial fraction of the people present (over 2,000) fully intend to prosecute the issue further with their congressmen and senators. . . . If this is the typical reaction throughout the country, and if the information exchange continues to be as inadequate as last night's presentation in Reading, it seems to me that there is a very good chance that the Congress would have to act to cancel the system.⁴⁹

Senator Edward Kennedy (D.-Mass.) responded to the Reading meeting by firing off a long letter to incoming Defense Secretary Laird, calling on him to stop Sentinel deployment pending a complete review.⁵⁰ And Massachusetts Representative William H. Bates, the ranking Republican on the House Armed Services Committee, pressured the committee chairman, Mendel Rivers (D.-S.C.). Surprisingly, Rivers obliged by writing Laird suggesting that Laird's recent statements had indicated uncertainty about Sentinel. "If such is the case," Rivers wrote, "I think that before we proceed any further you should indicate to me what your probable course of action will be."⁵¹

Legislators in other parts of the country were also feeling the political heat; even Senate minority leader Everett M. Dirksen (R.-Ill.), who had been a stalwart defender of Sentinel, conceded that "perhaps the time has come to take a cooler and more deliberate look at this proposal."⁵² Dirksen must have been getting a lot of mail on this issue: his junior Senatorial colleague Charles Percy (R.-Ill.), an early opponent of ABM, was receiving 750 to 1,000 letters a week on this issue from constituents—almost all of them expressing opposition to ABM. And Representative Chet Holifield (D.-Calif.), chairman of the powerful Joint Committee on Atomic Energy, also expressed doubts about the Sentinel system. (One of the proposed Sentinel sites was in a Los Angeles suburb only half a mile from Holifield's home.)

At the end of February 1969, Defense Secretary Laird announced that all work on the Sentinel system would be halted pending review. Two weeks later Sentinel was officially dead: on March 14, President Nixon announced that the ABM missile and radar sites would be removed from the cities to more remote

locations, and he rechristened the system "Safeguard." The official rationale was changed along with the name: the primary purpose of Sentinel had been a light area defense against anticipated Chinese ICBMs (intercontinental ballistic missiles); the primary purpose of Safeguard was to be defense of the U.S. Minuteman ICBMs against a preemptive Soviet attack.

Postscript

Secretary of Defense McNamara had warned, in his 1967 speech announcing the decision to deploy the Sentinel ABM system, that "pressures will develop to expand it into a heavy Soviet-oriented ABM system."⁵³ That these pressures were successfully resisted was largely due to the rebellion of the suburbanites against bombs in their backyards. However, to the many scientists who opposed deployment of the Sentinel hardware in any location, this victory seemed rather hollow. They feared that by moving the missiles away from the cities, the Nixon administration would succeed in making an expensive and unnecessary ABM system politically practicable.

In retrospect, the campaign against Sentinel appears to have been much more significant in influencing ABM politics than was initially supposed. The potent citizen resistance to the Sentinel system made the whole subject of ABM a national issue and convinced both politicians and scientists that the ABM was an issue on which Congress should make an independent decision.

Let us briefly review the post-Sentinel ABM developments. Once the Nixon administration made the decision to move the ABM sites away from the cities, the focus of the debate turned to a question with which the technical experts were more comfortable: Would the proposed ABM system in fact provide a cost-effective missile defense? Defense Department officials, of course, argued uniformly in Congressional hearings that the answer to this question was affirmative, sometimes citing independent experts to buttress their arguments. But, as we have seen in Chapter 5, many of these experts were actually opposed to ABM, and in appearances before Congressional committees they followed Bethe and Garwin in outlining a variety of relatively inexpensive techniques that an attacker could use to penetrate the Safeguard system. ABM opponents also emphasized the vulnerability of ABM radars, the system's unprecedented complexity, the impossibility of testing it, and the limited nature of Safeguard's capabilities even if it should actually work as designed. ABM proponents meanwhile asserted that the continued Soviet offensive-missile deployment required some response and that any technical problems with the ABM could be overcome once a commitment to the system had been made. Thus there was less a debate than a standoff, with the ABM opponents concentrating on the system's technical limitations and the proponents concentrating on the potential Chinese or Soviet threat.⁵⁴

In the face of strong opposition in the Senate, the marketing of the Safeguard system in 1969 was definitely softsell. In addition to moving the ABM sites out of the suburbs, the Nixon administration offered to finance the Safeguard system on the installment plan. Congress was asked only to authorize funding for two ABM sites to defend Minuteman ICBM bases in Montana and North Dakota. Authorization of additional sites was to be contingent on the demonstration to Congress that the ABM technology was indeed advanced enough to be effective. Defense Secretary Laird presented the argument as follows:

To those who are concerned about whether the Safeguard system will work, I would say let us deploy phase 1 and find out. Only in this way can we be sure to uncover all of the operating problems that are bound to arise when a major weapons system is first deployed. Since it will take five years to deploy the first two sites, we will have ample time to find the solutions through our continuing R&D [research and development] effort to any operational problem that may arise. And only then will we be in a position to move forward promptly, and with confidence, in the event the threat develops to a point where deployment of the entire system becomes necessary.⁵⁵

With this assurance and partially persuaded by the administration that the Safeguard system was an essential "bargaining chip" in the strategic-arms limitation talks (SALT) with the Soviet Union the Senate in 1969, as a result of a tie-breaking vote cast by Vice President Agnew, decided to let the deployment proceed.⁵⁶

The following year, however, the Nixon administration was back asking for funds to begin ABM deployment on a third ABM site in Missouri and to acquire land and do preliminary work on another five sites. There was widespread anger in the Senate at the administration's abandonment of its commitment of the year before, and even the hawkish Senate Armed Services Committee began to find some merit in the arguments of technical experts who appeared before it opposing further deployment. These witnesses pointed out that none of their technical criticisms of the Safeguard system design had been answered in the intervening year.⁵⁷ They also pointed out that the Chinese had still not tested a missile which could deliver a nuclear warhead to the United States,⁵⁸ whereas the imminence of such a Chinese capability had been the primary justification put forward for immediate deployment by Secretary McNamara three years before.

Thus in June 1970 the Senate Armed Services Committee, while approving ABM sites to defend two additional Minuteman bases against possible Soviet attack, refused to approve another four sites whose primary purpose would have been to defend against a Chinese attack.⁵⁹ The approval of even the two additional sites barely passed the Senate after a White House aide showed wavering Senators a telegram from the chief U.S. negotiator at the SALT talks claiming that ABM expansion was essential to the success of the talks.⁶⁰

In 1971 the Nixon administration asked Congress for the option to build an ABM site to defend Washington, D.C., instead of one of the four sites defending Minutemen bases. But the Senate Armed Services Committee refused even this

limited request—giving as its reason the fact that schedules in the rest of the program had slipped by almost an entire year and that the army was not yet ready to proceed with additional bases. Finally, in May 1972, the United States signed the SALT-I agreement with the Soviet Union limiting ABM deployment in each nation to a total of 200 ABM missiles deployed at two sites—one to be located near the capital of each nation (the Soviets had already deployed the primitive Galosh ABM system around Moscow) and one other site (corresponding in the United States to one of the sites defending Minuteman bases). In Congressional testimony Defense Secretary Laird indicated that he had gone along with this agreement because he had concluded, after three-and-a-half years of trying, that the administration would not succeed in getting Congress to authorize the full national Safeguard deployment.⁶¹

The battle over the ABM sites in the suburbs had served effectively to raise the entire issue of missile defense to a level of visibility where Congress was able to act for once as an equal branch of government in setting national defense policy. The outcome was quite different from what it might have been had the decisions made inside the executive branch been final.

Stopping Sentinel: An Analysis

The activities of scientists all across the country were important in stopping Sentinel. In fact, the geographical coverage of the opposition was perhaps its most important source of strength, particularly in its impact on Congress. But the greatest credit for Sentinel's demise must go to the indefatigable scientists from Argonne National Laboratory. In fact, a special Defense Department analysis of national editorial reaction found that in late 1968 newspapers which had previously supported the Sentinel program began opposing it, "when the major protest movement started last mid-November in Chicago, led by a group of nuclear physicists."⁶²

What accounts for the Argonne group's success? Dedication, certainly. George Stanford estimates that he personally participated as a speaker or debator on at least thirty occasions and that three others—David Inglis, John Erskine, and Stan Ruby—were about equally active. In all, ten Argonne people made one or more speeches against the ABM. This activity was not without personal sacrifice: several used vacation time for their anti-ABM activities and spent hundreds of dollars each for transportation and telephone bills.

Another essential element in the Argonne scientists' effectiveness was their excellent relations with the press. They were the first to reach the key local media with the news of the planned missile sites in the Chicago suburbs. They maintained their good press relations by doing their homework, so that they could not be caught in careless errors, and by preparing clear and well-written statements of their views for public distribution.

Finally, the most important reason for the success of the Sentinel opposition lies in the fact that the arguments against “bombs in the backyard” struck such a responsive chord with the public. Ironically, however, the fact that this issue was the key to obtaining public attention for the ABM controversy has been a source of some disillusionment to anti-ABM scientists. Most of them considered the dangers inherent in an uncontrolled arms race to be much more serious than the danger of an accidental nuclear explosion in the suburbs. But the public has been largely silent during the quarter-century since the destruction of Hiroshima and Nagasaki while the military in both East and West has stockpiled enough nuclear weapons to destroy civilization in the next total war. Only when the nuclear arms race threatened to become a concrete local reality were suburbanites prodded into action.

Were the Argonne scientists irresponsible in using the possibility of an accidental explosion to “wake people up,” as David Inglis put it?⁶³ It is true that the possibility of an ABM warhead exploding accidentally or as a result of human error or sabotage is remote. But the Argonne scientists asserted that the possibility existed—and that it indeed might well be as great as the possibility of a missile attack on Chicago. They felt that even a small chance of a great catastrophe should not be taken lightly, especially when they could find no counterbalancing benefits, and they saw to it that the citizens who were asked to bear such a risk were informed and had a voice in the decision.

NOTES

1. Calvin Trillin, “U.S. Journal: Lake County, Ill.,” *New Yorker*, February 15, 1969, pp. 100-106.
2. For more on the history of antiballistic missile programs, see Chapter 5.
3. Quoted in Anne Hessing Cahn, *Eggheads and Warheads: Scientists and the ABM* (Cambridge: Center for International Studies, MIT, 1971), p. 188. We found Dr. Cahn’s dissertation to be very helpful in researching this chapter. An abbreviated version appears in *Science and Public Affairs*, ed., Albert H. Teich (Cambridge, Mass.: MIT Press, 1973).
4. Speech to United Press International editors and publishers, San Francisco, September 18, 1967, quoted in the *New York Times*, September 19, 1967, p. 18. See also Henry L. Trewhitt, *McNamara* (New York: Harper & Row, 1971), esp. pp. 123-132.
5. *New York Times*, September 19, 1967, p. 18.
6. See Cahn, *Eggheads and Warheads*, particularly the statement of former Deputy Assistant Secretary of Defense Martin H. Halperin quoted on pp. 187-88.
7. For example, in the secret Senate ABM debate of October 2, 1968, Senator Richard Russell (D.-Ga.), chairman of the Senate Armed Services Committee, said: “It was my own view that [Sentinel] was a system that could, of course, be used against any Chinese threat, but I considered it to be—and I want to be frank...and not deceive anyone—the foundation stone of a missile defense system...to protect the people of this country against a Soviet missile atomic attack... If we have to start over again with another Adam

and Eve, then I want them to be Americans and not Russians, and I want them on this continent and not in Europe.” [*Congressional Record* 114 (1968): 29170-29175.]

8. The other two sites were Albany, Georgia, and the Grand Forks, North Dakota, Minuteman base. Five additional sites were announced later: Los Angeles; San Francisco; Cheyenne, Wyoming; Great Falls, Montana; and Sedalia, Missouri.

9. Letter from Newell Mack to Hans Bethe, December 19, 1967.

10. See the testimony of Dr. Daniel Fink in U.S. Congress, Senate, Committee on Foreign Relations, *Strategic and Foreign Policy Implications of ABM Systems*, 91st Cong., 1st sess., March 6, 1969, pp. 22-30.

11. After the Nixon administration had decided to substitute Safeguard for Sentinel, Secretary of Defense Melvin Laird attacked Sentinel as follows: “In the discussions which preceded the authorization of this Sentinel system by the Congress, it had been publicly stated that the system did not have a capability of defending our cities against a heavy attack of the kind the Soviets could launch... It was obvious, however... that the Sentinel system was ambiguous, at best. It was interpreted by some as the beginning of a ‘thick’ defense of our cities against Soviet attack. In fact, it could have been used for precisely that purpose. It could also have been construed as a system designed to protect our cities from surviving Soviet missiles after a surprise attack by the United States. Our review, therefore, convinced us that the original Sentinel was potentially provocative. As such, it appeared to us to be a step toward, rather than away from, an escalation of the arms race.” *Strategic and Foreign Policy Implications of ABM Systems*, March 21, 1969, p. 168-69.

12. *Congressional Record* 114 (1968): 20699-20704. The other reports were prepared by J. Gregory Dash, Philip A. Ekstrom, Diane M. Hartzell, and Edward A. Stern.

13. For more on Pugwash, see Chapter 11, note 11.

14. Early generations of intercontinental ballistic missiles (ICBMs) and submarine-launched ballistic missiles (SLBMs) carried single-bomb warheads. The most advanced generation of American ICBMs (e.g., Minuteman III) and SLBMs (e.g., Poseidon) are equipped with multiple independently-targeted re-entry vehicles (MIRV) warheads, in which from three to a dozen nuclear weapons can be individually dispatched to pre-selected targets. The Soviet Union first tested MIRVs in 1973.

15. Richard L. Garwin and Hans A. Bethe, “Anti-Ballistic Missile Systems,” *Scientific American*, March 1968, pp. 21-31. Our description of the events leading up to this article is from Cahn, *Eggheads and Warheads*, pp. 90-91.

16. This talk was the first lecture in an annual series on the impact of science on society established in memory of Professor Julian E. Mack of the University of Wisconsin Physics Department (Newell Mack’s father).

17. There were numerous articles by these and others in *Bulletin of the Atomic Scientists* and elsewhere, including books by Jeremy Stone, *Containing the Arms Race* (Cambridge: MIT Press, 1966), and Ralph Lapp, *The Weapons Culture* (New York: Norton, 1968; Baltimore: Penguin, 1969). Anti-ABM anthologies include Eugene Rabinowitch and Ruth Adams, eds., *Debate the Antiballistic Missile* (Chicago: Bulletin of Atomic Scientists, 1967), and Abram Chayes and Jerome B. Wiesner, eds., *ABM* (New York: Harper & Row, 1969). Pro-ABM anthologies include Johan J. Holst and William Schneider, Jr., eds., *Why ABM? Policy Issues in the Missile Defense Controversy* (Elmsford, N.Y.: Pergamon, 1969), and William R. Kintner, ed., *Why the ABM Makes Sense* (New York: Hawthorne, 1969).

18. Letter from Hans Bethe to Newell Mack, August 21, 1967. Much of the information in this and the following paragraph comes from interviews with Mack. See also Cahn, *Eggheads and Warheads*, pp. 42, 50, 242.

19. *Congressional Record* 114 (1968): 20701f.

20. *Congressional Quarterly Weekly Report*, December 13, 1968, pp. 3275-77. *New York Times*, February 9, 1969, p. 1. Thomas A. Halstead, “Lobbying Against the ABM,” *Bulletin of the Atomic Scientists*, April 1971, p. 23.

21. Quoted in "ABM Furor: Four quiet men at Argonne Lab started it all," *Chicago Sun-Times*, August 7, 1969, p. 38. Argonne National Laboratory is an AEC installation for research on nuclear reactors, basic research in physics, chemistry, and biology and other non-military subjects.
22. (La Grange, Ill.) *Suburban Life*, October 26, 1968. Quoted in Cahn, *Eggheads and Warheads*, p. 71. It was later indicated that the Chicago site would house only Spartans, not Sprints.
23. *Chicago Sun-Times*, November 15, 1968, p. 1.
24. Quoted in *Chicago Daily News*, February 7, 1969, p. 6.
25. *Chicago American*, November 20, 1968. Quoted in Cahn, *Eggheads and Warheads*, p. 73.
26. One local headline read: "'Anywhere Except Near Us': Westchester Fights A-Base." *Chicago Daily News*, December 4, 1968.
27. Quoted in *Suburban Life*, November 23, 1968, pp. 1-2.
28. *Chicago Daily News*, December 4, 1968.
29. *Ibid.*
30. *Chicago Sun-Times*, December 4, 1968, p. 16.
31. The standard reference for such calculations is S. Glasstone, ed., *The Effects of Nuclear Weapons* (Washington, D.C.: Government Printing Office, 1962).
32. *Chicago Sun-Times*, December 6, 1968.
33. Quoted in the *Waukegan* (Ill.) *News-Sun*, January 10, 1969, pp. 1,4.
34. Trillin, "U.S. Journal," p. 106.
35. Quoted in the *Chicago Sun-Times*, December 13, 1968, p. 40.
36. *Chicago Sun-Times*, December 20, 1968, p. 6.
37. Quoted in the *Waukegan News-Sun*, December 20, 1968, p. 1; see also *ibid.*, p. 20.
38. Quoted in the *Chicago Daily News*, December 19, 1969.
39. Quoted in the *Waukegan News-Sun*, December 20, 1968, p. 35.
40. Glasstone, *The Effects of Nuclear Weapons*, Appendix A, Section 1, p. 664.
41. *Waukegan News-Sun*, December 27, 1968, Regional Page.
42. Trillin, "U.S. Journal," p. 102.
43. *Ibid.*
44. *Chicago Sun-Times*, March 4, 1969.
45. *Chicago Tribune*, March 3, 1969, p. 22.
46. *Libertyville* (Ill.) *Independent-Register*, January 16, 1969.
47. The physicists were Drs. Alvin M. Saperstein of Wayne State University (Detroit) and William Hartman of Michigan State University. Saperstein alerted the local press, which responded with scare headlines: e.g., "Nuclear Missiles Slated for Suburbans, Peril Seen for Entire Metro Area," *Detroit Free Press*, December 1, 1968, p. 1. The two physicists were later joined in voicing opposition to the local ABM site by Detroit Congressman John Conyers (D.-Mich.).
48. Irving H. Shen, "The Anti-Anti-Missile Movement," *North Shore (Mass.) Weekend Supplement*, June 8, 1968. Quoted in Cahn, *Eggheads and Warheads*, p. 191.
49. Letter from Patrick J. Friel to John Foster, January 30, 1969. Quoted in Cahn, *Eggheads and Warheads*, pp. 192-193.
50. *New York Times*, February 2, 1969, p. 42; February 9, 1969, p. 1.
51. Quoted in the *Chicago Daily News*, February 7, 1969, p. 1.
52. *New York Times*, February 9, 1969, pp. 1, 64.
53. *New York Times*, September 19, 1967, p. 18.
54. See, e.g., Paul Doty, "Can Investigations Improve Scientific Advice? The case of ABM," *Minerva*, April 1972, Vol. 8, pp. 280-294. The primary forums in which these arguments were aired were the hearings before the Senate Foreign Relations Committee and Senate Armed Services Committee in 1969 and 1970.
55. Before the Senate Armed Services Committee, May 22, 1969; quoted by Senator Proxmire, *Congressional Record* 166 (1970): 25934.

56. Nathan Miller, "The Making of a Majority: Safeguard and the Senate," *Washington Monthly*, October 1969, p. 60.
57. *Ibid.* See also U.S. Congress, Senate, Armed Services Committee, *Authorization for Military Procurement, Research, and Development, Fiscal Year 1971*, 91st Cong., 2nd sess., March-June, 1970, Part 3.
58. *Ibid.*
59. *New York Times*, June 18, 1970, p. 1.
60. *New York Times*, August 14, 1970, p. 2.
61. *New York Times*, June 6, 1972, p. 1. See also U.S. Congress, House Committee on Appropriations, *Department of Defense Appropriations for 1973—Part 8*, 92nd Cong., 2nd sess., June 5, 1972, p. 379.
62. *Waukegan News-Sun* (AP), February 7, 1969, p. 1.
63. *Chicago Sun-Times*, August 7, 1969, p. 38.