NUCLEAR CULTURE IN THE COLD WAR'S HIGH TIDE
As the 1940s ended, the raw shock of atomic menace that had burst on the scene in 1945 was wearing off. By the early 1950s, America's preoccupation with the bomb was less blatant, more subterranean. At the same time, however, nuclear weapons production and planning were burgeoning as the Cold War conflict between the United States and the Soviet Union moved into high gear. The Soviet A-bomb test in 1949; the superpowers' race to develop the H-bomb and an arsenal of nuclear weaponry; and the move toward new, highly sophisticated delivery systems—nuclear submarines, high-tech bombers, and intercontinental ballistic missiles—added new levels of complexity and menace to the arms race. Government civil-defense programs proliferated, drawing in educators, urban planners, media specialists, psychologists, physicians, medical researchers, and other professionals. Washington continued to hype the atom's peacetime uses, partly as a means of funding more weapons research and partly as a way of cultivating more positive public attitudes toward atomic energy. Much of the popular culture reflected the Cold War outlook. Such magazines as *Time*, *Life*, and *U.S. News & World Report* usually echoed official Washington's position on nuclear issues, as did radio commentators and patriotic movies like the stirring *Strategic Air Command* (1955), starring Jimmy Stewart.

But undercurrents of uneasiness persisted, especially as the hazards of radioactive fallout from nuclear testing gripped the public's awareness, and activist organizations campaigned for a test ban—
an idea supported by Democratic presidential candidate Adlai Stevenson in 1956. In the cultural realm, novels, poems, science-fiction stories, the parodies of song-writer Tom Lehrer, and the satirical Mad Magazine all in their various ways warned of possible cataclysm ahead.
Like chapters 1 and 2, this essay was written in 1985, as the fortieth anniversary of the atomic bombing of Japan focused the nation’s renewed attention on the nuclear threat. In the spring of that year, the editor of the Journal of the American Medical Association (JAMA) asked me to prepare an article dealing historically with U.S. physicians’ engagement with nuclear issues. In researching *By the Bomb’s Early Light*, I had already observed the way many professional groups, from sociologists to city planners to high school social-studies teachers, had concluded that their particular expertise had become absolutely vital in the new atomic era. (In February 1947, the University of Maine’s College of Agriculture published a pamphlet arguing eloquently that the college’s agricultural extension workers could play a key role in the quest for peace in the atomic age.) The JAMA invitation led me to several weeks of intensive research on a specific professional group whose members became especially involved with the nuclear issue—as radiation specialists, civil-defense advisers, and ultimately as antinuclear activists. Chapter 5 is adapted from the article that resulted. It appeared in the August 1, 1985, issue of JAMA. Reprint requests flowed in from many countries, suggesting broad interest in the issues that arise when professional expertise, political involvement, and activist engagement intersect.
IN THE RESURGENCE of nuclear-weapons activism that swept the United States in the early 1980s, physicians figured prominently. The pediatrician Helen Caldicott gained national visibility as president of the thirty-thousand-member organization Physicians for Social Responsibility. Dean Howard Hiatt of the Harvard School of Public Health, psychiatrist John Mack of Harvard Medical School, H. Jack Geiger of the City College of New York School of Biomedical Education, and Yale University psychiatrist Robert Lifton were prominent in the antinuclear cause. In *The Final Epidemic: Physicians and Scientists on Nuclear War* (1981) and *Last Aid: The Medical Dimensions of Nuclear War* (1982), medical leaders spoke out on this issue. The *Journal of the American Medical Association* published articles on aspects of the subject, including the role of the medical profession in preventing nuclear holocaust. This, however, was only the latest chapter in a long and decidedly checkered history.

**RADIATION STUDIES AND ISOTOPES: THE INITIAL MEDICAL RESPONSE TO THE BOMB**

American medicine's involvement with nuclear weapons began with the establishment of the Manhattan Project in 1942. The project's medical-research division, based at the University of Rochester and directed by Stafford L. Warren, M.D., a professor of radiology, studied means of protecting workers from radiation, tried to establish radiation tolerance levels, and conducted blood studies of more than 100,000 irradiated laboratory animals and genetic studies involving 277,000 mice and 50 million fruit flies.

But this wartime research was secret, and for most physicians, as for other Americans, President Truman's atomic bomb announcement of August 6, 1945, came as a stunning surprise. The *Journal of the American Medical Association* first mentioned the bomb in a brief note on September 22, dismissing "Jap propaganda claims" that people were still dying in Hiroshima and Nagasaki from "delayed radioactivity." Quickly, however, awareness dawned that this new weapon had profound medical implications, not only because it produced blast and burn casualties on an unprecedented scale, but also because of its unique additional property—radioactivity. The biological and physiological hazards of radio-
active substances had long been recognized, thanks to the turn-of-the-century studies of the Leipzig clinician Hermann Heineke, but until August 1945, this arcane byway of medical research had received relatively little attention.

All this soon changed. Within days of Japan's surrender, two American medical teams, one representing the military and the other the Manhattan Project, were in Hiroshima and Nagasaki studying the bomb's effects. For the military team, radiological studies were conducted by Dr. Shields Warren, professor of pathology at Harvard Medical School; the Manhattan Project team was led by Stafford Warren of Rochester. In March 1946, Shields Warren reported to the American Association for Cancer Research (of which he was president) on the delayed effects of radiation exposure on some fourteen thousand people in Hiroshima and Nagasaki, including hemorrhage, leukocyte destruction, bone marrow damage, anemia, sterility, and the suppression of menstruation. As for long-range somatic and genetic effects, he cautioned, “It will be necessary to follow the populations of Hiroshima and Nagasaki for many years.” In June 1946, JAMA published a study of twenty-one Japanese radiation victims admitted to the Osaka University hospital. At the American Medical Association (AMA) convention that July, Dr. George V. LeRoy of Northwestern University Medical School read a detailed report, “The Medical Sequelae of the Atomic Bomb Explosion,” which included extensive data on radiation disease. This report, copiously illustrated with clinical photographs, was later published in JAMA. The American Journal of Surgery published a report on “Trauma Resulting from Atomic Explosions” by the leader of the navy medical team that studied survivors in Nagasaki. (The author described prisoners of war in the city whose “names had been burned onto their chests or backs because the names had been stenciled in black on their white undershirts.”)

In November 1946, the National Research Council of the National Academy of Sciences sent five radiologists to Japan to survey possibilities for a long-term research project. In 1947, authorized by a formal directive from President Truman, the council set up the Atomic Bomb Casualty Commission (ABCC) to be funded by and operated under contract with the AEC. Work began in Japan in 1948, with blood surveys and collection of pregnancy data. In the years that followed, the ABCC and
its successor, the Radiation Effects Research Foundation, proved an invaluable source of knowledge about the long-term effects of atomic bomb exposure.

In contrast to the medical profession's considerable interest in the clinical aspects of radiation disease in the immediate post-1945 period, one finds little initial attention to the larger medical implications of an atomic bomb attack or to the profession's capacity to cope with such an event. Shields Warren's 1946 report to his fellow cancer researchers noted the "total disorganization" of the Japanese medical service after the bombings, and George LeRoy's address to the 1946 AMA convention mentioned that the bombing of Hiroshima and Nagasaki had presented "the surviving members of the medical profession . . . with an extremely large relief and rescue problem." "From medical and surgical points of view," wrote one early postwar American medical visitor to Hiroshima and Nagasaki in the *American Journal of Surgery* in 1948, "the confusion immediately after the bombing is difficult to imagine." But these passing observations were not elaborated or pursued. LeRoy ended on a cautiously hopeful note, stating, "In the hospitals of the western world where plasma, electrolyte solutions, whole blood and penicillin are available in adequate amounts, a much lower mortality rate could be achieved than was observed in Japan."

The profession's capacity for political activism and engagement with broader social issues in these years seems to have been totally exhausted by its single-minded preoccupation with the evils of "socialized medicine." After the Truman administration proposed a national health insurance plan in 1948, medical attention focused obsessively on this issue. In resisting "the creeping paralysis that is socialism," said *New York Medicine* in 1950, "the medical profession has found it necessary to undertake civic and political action, which a few years ago was remote from the thoughts of most physicians." Even in dealing with the clinical aspects of radiation disease, the AMA's position was sometimes colored by its ideology. In 1947, for example, reporting that British atomic-energy workers were complaining of lassitude, skin eruptions, impotence, and other symptoms, *JAMA* observed: "It has to be remembered that, with a Labour government in control of the country, workers have every opportunity to exploit real or alleged grievances."
It was not the medical profession but a journalist who first brought home to the American public the way an atomic bomb could devastate a city’s medical facilities. Two of the six atomic bomb survivors whose stories are told in John Hersey’s 1946 best-seller Hiroshima are physicians. The first, Masakazu Fujii, regains consciousness after the bombing to find his small private clinic “all around him in a mad assortment of splintered lumber.” The other, Terufumi Sasaki, was a surgeon at Hiroshima’s large, modern Red Cross hospital. After the blast, glasses lost and vision blurred, he wanders among the maimed and dying who have inundated the partially demolished hospital, “moving aimlessly and dully up and down the stinking corridors with wads of bandage and bottles of mercurochrome, . . . binding up the worst cuts as he came to them. . . . Ceilings and partitions had fallen; plaster, dust, blood and vomit were everywhere. Patients were dying by the hundreds, but there was nobody to carry away the corpses.”

There are a few exceptions in these early post-Hiroshima years to the medical profession’s general lack of attention to all but the narrowest clinical aspects of the atomic bomb’s medical implications. In 1946, JAMA published a letter from Dr. Edwin J. Grace, a specialist on radium poisoning, urging the medical profession to launch an educational program “to awaken the public to full realization that they cannot view indifferently this colossal missile of destruction.” And after the 1946 Bikini tests, Stafford Warren, the project’s radiological safety chief, wrote an article for Life Magazine (August 11, 1947), later condensed in Reader’s Digest, offering in laymen’s language a somber and frightening assessment of the test’s implications. The radioactive spray of Test Baker (the underwater explosion), he wrote, posed “an entirely new danger of atomic war.” It had so penetrated the target ships that scientists and military personnel could visit them only on hurried forays, to avoid radiation sickness. Radioactive algae had been eaten by larger fish, which had died, their decaying bodies then passing the radioactivity back to the algae. Algae-encrusted hulls on the task-force ships had become so radioactive that crew members’ bunks had to be shifted. If, under favorable meteorological conditions, a Bikini-type bomb were dropped in the harbor of a great city, he said, the radiological casualties would be ghastly. Warren concluded with a categorical political assertion of a kind exceedingly rare
among medical leaders in this period: “The only defense against atomic bombs still lies outside the scope of science. It is the prevention of atomic war.”

The physician dealing with the nuclear theme who reached the largest audience in these years was David Bradley, a 1944 graduate of the University of Wisconsin Medical School. A junior member of the radiological team at Bikini, Bradley was much impressed by Stafford Warren’s efforts to awaken the public to the hazard of radiation. Having some journalistic experience and an undergraduate degree in English from Dartmouth College, he readily agreed when a friend at *Atlantic Monthly* suggested an article about his experiences. The article turned into the best-selling book *No Place to Hide* (1948), which, condensed in *Reader’s Digest* and offered by the Book-of-the-Month Club, sold 250,000 copies by 1950. Reviewers were enthusiastic. E. B. White, in the *New Yorker*, praised Bradley’s “casual, personal” tone and added: “His laboratory was a paradise, and the experiment in which he was involved was an experiment in befouling the laboratory itself.” Christopher Morley heard in the book “the clock-tick of warning” (*Reader’s Digest, February 1949*). Bradley lectured widely, wrote numerous magazine articles, and appeared on the network radio program *Town Meeting of the Air*.

Written in the form of a journal, *No Place to Hide* is structured around the contrast between the edenic setting and Bradley’s awakening to the magnitude of the test’s radiological aftereffects. This awakening is conveyed through a series of impressions: the coral reefs gradually bleaching white as the algae that gave them color died off, the radioactive fish that took their own pictures when placed on photographic plates, the navy’s futile efforts to decontaminate the surviving ships, the pariah fleet of contaminated vessels anchored off Kwajalein atoll, physically unscathed but nevertheless “dying of a malignant disease for which there is no help.”

Bradley also reports a September 1946 visit to Rongerik Island, where some 160 Bikini natives had been “temporarily” relocated. (Nuclear testing continued at Bikini until 1958, and in 1985, the atoll was still unsafe for human habitation. In March 1985, confronted by a lawsuit, the Reagan administration agreed to a $42-million cleanup, including the removal and replacement of radioactive topsoil, which would
The American Medical Profession

enable the people of Bikini to return.) Emphasizing the lack of any satisfactory protection against atomic radiation or of any effective means of decontamination, and warning of the devastating radiological effect of an atomic bombing attack not only on the immediate victims but on the land itself for centuries afterwards, Bradley insistently called attention to his book's larger implications: "Bikini is not some faraway little atoll pinpointed on an out-of-the-way chart. Bikini is San Francisco Bay, Puget Sound, the East River. It is the Thames, the Adriatic, Hellespont, and misty Baikal."

Despite the impact of No Place to Hide, one must emphasize that David Bradley, a young physician not in the top tier of radiological specialists, stood nearly alone among physicians in this period in his efforts to place the medical and environmental hazards of the atomic bomb in a larger social and political context. No medical groups invited him to lecture, he told me in a 1984 interview, and in medical and scientific journals his book was either ignored or dismissed. Austin M. Brues, M.D. (Harvard, 1930), a University of Chicago radiologist with ties to the AEC, responded with an essay in the Bulletin of the Atomic Scientists designed to "dispel some of the fear of radiation that is engendered by an unfamiliar natural phenomenon." The genetic risk of radiation exposure, he said, was "overrated," and the whole subject needed a "partial debunking." Certainly radiation could increase the likelihood of cancer—but so could sunlight and tobacco smoking. Radiation sickness was already treatable, and "further means of alleviation" would soon be found. Disposal of radioactive waste was "no cause for anxiety," since "we still have years in which we can settle upon one of a number of feasible methods." "Above all," he concluded, "we should develop a civilian defense organization to the point where we may rely on it to protect the population."

As one might anticipate, given the narrow clinical focus of its response to the advent of the atomic bomb, the medical profession did not play an active role in promoting the Acheson-Lilienthal plan for international control of atomic energy, which won wide public support in 1945–47 (even as the Truman administration distanced itself from the international control principle). Among the most articulate and effective proponents of international control were many scientists of the
Manhattan Project, who became intensely active politically just after the war through their lobbying organization, the Federation of American Scientists. Many religious and professional groups threw their support behind the atomic scientists' cause. For example, the American Psychological Association formed a Society for the Psychological Study of Social Issues, which in June 1946 issued a six-point manifesto that essentially endorsed the political program of the atomic scientists. The international control movement found little answering echo, however, in the leadership of the American medical profession.

**Promoting the “Peaceful Atom”: The Medical Promise of Radioactive Isotopes**

In somewhat deliberate counterpoint to grim reports about the atomic bomb's clinical effects, the American medical profession in the late 1940s focused much attention on the atom's potential medical benefits, especially the diagnostic and treatment value of radioactive isotopes. In the 1930s, Ernest O. Lawrence had predicted vast therapeutic applications for the isotopes he produced in his cyclotron at the University of California, but not until August 1945 did medicine's interest in isotopes really blossom. As even a casual perusal of the *Index Medicus* for these years makes abundantly clear, the medical journals were full of reports on the use of isotopes of phosphorus, iodine, and cobalt in the diagnosis and treatment of goiter, bone cancer, and other diseases.

These applications were indeed important. In the present context, however, it is noteworthy as well that the widespread publicity given to the medical promise of atomic energy was also culturally significant in shaping public perceptions of the new age that had dawned. Discussions of atomic energy in the early post-Hiroshima period often reflected a stark either-or approach: Either the atomic bomb would destroy civilization, or atomic energy would be harnessed to produce a utopia of unimaginable wonder. If a nuclear holocaust could be avoided, the atom would provide electricity too cheap to meter; fuel automobiles, airplanes, and ships for a lifetime; give mankind mastery of the environment and the weather—and banish disease from the earth. An editorial cartoon published in the *Dallas Morning News* within days of Hiroshima pictured
The American Medical Profession

a skeleton labeled “CANCER” fleeing lightning bolts of “Atomic Energy,” and this theme loomed large in the early popular writings about atomic energy in such magazines as Life, Collier’s, and the Saturday Evening Post.

The more euphoric of the post-Hiroshima utopian fantasies soon faded, but predictions of the atom’s vast medical promise became, if anything, rosier as the decade wore on. Radioactive isotopes were wonder-workers that would transform human existence! Isotope research, proclaimed Collier’s in May 1947, promised “cures for hitherto incurable diseases” and opened the door to “a golden age of atomic medicine.” As soon as hospitals were equipped “to offer atomic medicine to all who need it,” this article concluded, “much of the pain and premature death which now face so many of us may prove to be avoidable.” Writing in the American Magazine in December 1947, Chancellor Robert M. Hutchins of the University of Chicago predicted, “The atomic city will have a central diagnostic laboratory but only a small hospital, if any at all, for most human ailments will be cured as rapidly as they are diagnosed.” “The Sunny Side of the Atom,” a 1947 CBS radio special, credited isotopes with almost magical powers, artfully blurring the distinction between diagnosis and cure and implying that isotopes had actual healing properties.

Research on the medical applications of atomic energy was strongly encouraged by the U.S. government in these years. Thanks in part to the efforts of Shields Warren, first director of the AEC’s division of biology and medicine, the AEC funneled substantial funds to cancer research in medical schools and research institutes, financed construction of the Argonne Cancer Research Hospital at the University of Chicago, and underwrote some 175 pre- and postdoctoral fellowships in the life sciences. With this infusion of federal dollars, research in the field burgeoned. In the six months from January to June 1950, the Index Medicus recorded some 250 reports on medical research involving atomic energy.

While the AEC’s funding of medical research was legitimate and doubtless praiseworthy, it also had significant public relations value in shaping perceptions of atomic energy—a side benefit the government fully recognized. AEC chairman David E. Lilienthal tirelessly promoted the image of “the peaceful atom,” even as the AEC’s energies focused
heavily on bomb production. As the AEC celebrated the positive side of the atomic story through exhibits, radio programs, magazine articles, and speeches by Lilienthal and others, the atom's medical promise highlighted the propaganda campaign.

The American medical profession willingly lent itself to this campaign. In December 1946, the District of Columbia medical journal published a lengthy article in which a government radiologist deplored the "wild fantastic talk" by "irresponsible" people that was exacerbating public fears of atomic war. Urging a more "common-sense viewpoint," he described the therapeutic possibilities of radiation in cancer treatment and concluded, "The romance which undoubtedly lies ahead for these fortunate investigators who enter this field has probably never been equalled in the past, certainly not in the field of biologic research." In 1947, after glowingly describing the vast medical promise of radioactive isotopes, *Hygeia*, an AMA-sponsored popular health magazine, noted that this dimension of atomic energy development was "not so depressing as the thought of an atomic war," and that while the development of atomic weapons was unquestionably "an unhappy event, . . . the power to learn about better health far outweights other considerations."

At the 1948 AMA convention, a special session on atomic energy featured a report by Shields Warren on the AEC's medical research program, a lecture by an AEC scientist on the medical value of isotopes, and a more general discussion of "The Medical Profession and Atomic Energy" by AEC commissioner Lewis L. Strauss. While some peacetime applications of atomic energy were as yet "hidden in the mists of the future," said Warren, its immediate implications for medical research were "as overwhelming as a streamliner rushing down on a grade crossing" (an image that may have been less reassuring than he intended). Strauss urged physicians to help in overcoming the unreasoning "prejudice against work on atomic energy, based on lack of detailed information" and the "widespread impression that atomic energy is a health hazard of monumental and enduring proportions." "Certainly persons can be injured by loose and restless atomic particles, and chromosomes can be damaged, with resultant mutations," acknowledged Strauss. "But we should remember that these changes can be produced also by any number of agents from sunlight down to the garden crocus. In other
The American Medical Profession

words, they are neither very new, nor very startling. It is simply that our attention is focused on them at the moment."

The implicit (and often explicit) message underlying much of this medical discussion of atomic energy—that the therapeutic promise far outweighed and even canceled out the atom's menace—penetrated the profession very deeply. "The effects of the atomic bomb may seem appalling to many persons," Dr. Harold C. Lueth told the West Virginia Medical Association in August 1949, but when the medical benefits of atomic energy were considered, he went on, "a much more hopeful aspect... is gained." "Out of the ashes of Hiroshima and Nagasaki," he concluded, "there will come a beneficial atomic energy that will rise phoenix-like to benefit the health and welfare of our nation."

THE FEDERAL MEDICAL BUREAUCRACY AND CIVIL DEFENSE

By the late 1940s, American attitudes toward the atomic bomb were changing rapidly. Hopes for international control had evaporated, the Cold War was under way, and fear of Russia was intensifying. Encouraged by the government and influential voices in the media, many who had earlier viewed the abolition or strict control of atomic weapons as the nation's top priority now concluded that atomic superiority was America's best hope. The Russian atomic-bomb test of September 1949, the arrest of atomic spy Klaus Fuchs in England in January 1950, and President Truman's decision that same month to authorize development of the hydrogen bomb sharply accelerated this profound shift in cultural attitudes. Public-opinion polls overwhelmingly supported the H-bomb decision.

With these developments came a heavy official emphasis on civil defense. In 1948, Defense Secretary James V. Forrestal created an office of civil-defense planning in the Pentagon, and in 1950 President Truman established the Federal Civil Defense Administration. Under its director, Millard Caldwell, the administration moved quickly to draw the medical profession deeply into the process of civil-defense planning and propaganda. A director for health services was appointed, with assistant directors responsible for medical care planning, public health, and the stockpiling of medical and mortuary supplies against the day of atomic
CHAPTER FIVE

attack. State and county medical societies were designated as advisers to local civil-defense offices. Dr. Howard A. Rusk, a professor at the New York University School of Medicine and a national leader in the profession, chaired the medical advisory committee.

Physicians in many branches and agencies of government rallied behind the emerging civil-defense campaign. The Public Health Service established a radiological health division. The Naval Medical Center at Bethesda, Maryland, organized a course on civil defense in atomic war for its reserve medical officers. The director of this program reported in 1950, “At the conclusion of these lectures our Reserve Medical Officers have told me repeatedly, 'Many of us came disheartened and with a helpless attitude on the atomic bomb. The casualties were just too staggering. The course has dispelled this defeatist attitude.’” In “What You Should Know about the Atomic Bomb,” the surgeon general of the army, R. W. Bliss, offered an equally optimistic message: Survival was possible; experts had the problem in hand. “Our population need not be defenseless,” he declared, “The trained combination of nuclear physicists, engineers, and medical men can operate to protect our Nation if it is ever attacked.”

Another government physician to put his expertise at the service of civil-defense planning was the psychiatrist Dale C. Cameron, M.D., assistant director of the National Institute of Mental Health from 1945 to 1950. In “Psychiatric Implications of Civil Defense,” read before the American Psychiatric Association in May 1949 and later published in the American Journal of Psychiatry, Cameron warned that an atomic attack could have serious psychological effects, ranging from “apathy” to “purposeless hyperactivity.” But such undesirable postattack behavior could be minimized, Cameron went on, if citizens were authoritatively assured that atomic attack was survivable, that alarmists were vastly overstating radiation hazards, and that civil-defense planning would protect the nation if atomic war came.

Cameron called for the organization of the population into small groups under psychiatrically trained leaders who would assist groups in “working through . . . fears and apprehensions” and “overcoming attitudes of futility . . . which would be disastrous in the event war should
Central to the government's civil-defense program was the effort to downplay the danger of radiation in an atomic attack and to emphasize protective measures citizens could take against radiation injury. Radiation was like taxes, wrote one government civil-defense staff member in 1949, not pleasant, perhaps, but you could learn to live with it. This is the central theme, too, of *How to Survive an Atomic Bomb*, a government handbook by Richard Gerstell, holder of a Ph.D. in radiology from the University of Michigan. Don't be taken in by "foolish stories" about radiation causing cancer, sterility, or genetic damage, Gerstell urged, "Learn not to be afraid of those words 'radiation' and 'radioactivity.'" A recurring theme in David Lilienthal's speeches of the late 1940s was that fearmongers were exaggerating the radiation hazard; radiation was like sunlight, Lilienthal insisted—to be treated with respect, but certainly not feared.

Physicians in the government's employ lent their authority to this campaign. In April 1948, clearly seeking to counteract the impact of David Bradley's *No Place to Hide*, the U.S. surgeon general issued a news release deriding the "sensational prophecies" of dire radiological consequences in an atomic war. In 1948, James P. Cooney, M.D., an official of the army medical corps attached to the AEC, told the American Public Health Association that while atomic radiation could indeed cause death and injury, it should be approached with a "practical attitude," not unreasoning fear. Cooney's central concern was not radiation itself, but "the fear reaction of the uninitiated." The potential victims of atomic radiation, he insisted, must be conditioned to think of it as simply another of the many acceptable risks of war. Americans must learn "to live with this piece of ordnance" and if necessary "use it again in the defense of our way of living." Cooney further disseminated his ideas in numerous medical articles of this period, of which "The Physician's Problem in Atomic Warfare" in *JAMA* (March 3, 1951) is representative.

Several physicians with links to the AEC, including Shields Warren and James P. Cooney, contributed to *The Effects of Atomic Weapons*, a technical report issued by the AEC in 1950. The chapter on the bomb's occur." After the bomb fell, these small neighborhood groups could then reassemble and provide mutual support.
radiological effects offered a detailed summary of current knowledge and cautioned that "the exact magnitude of the risk" of long-term genetic damage was not yet known. But this AEC report was intended as a handbook for civil-defense officials, and its overall theme is the value of informed advance planning in diminishing the bomb's destructive effects. Typical of this action-oriented emphasis is the claim (not in the medical chapter, it should be noted) that lingering radiological contamination from an atomic bomb exploded low in the atmosphere "might be an inconvenience, but it would not, in general, represent a real danger." A simplified AEC booklet based on the longer technical study went much further in downplaying the danger of radiation and stressing the value of preventive measures.

At a news conference introducing this booklet, an AEC spokesman insisted that the radiation danger had been much exaggerated, and concluded: "If an individual can stand up after the bomb goes off and look around and comment 'this place is really beat up' . . . , he has a pretty good chance of surviving." While acknowledging that there was "no specific therapeutic treatment right now" for radiation disease, he insisted vaguely but emphatically, "There is much that we can do about it. We don't have to sit back and say that 60,000 people are going to die because a bomb goes off, because that is not the way to look at it."

**THE MEDICAL PROFESSION AS A WHOLE AND CIVIL DEFENSE**

The medical profession's role in the early civil-defense campaign was not by any means limited to government physicians. With rare exceptions, all levels of organized medicine actively supported and lent credibility to the government effort to persuade the American people of the urgency and efficacy of civil-defense preparation for atomic war. At a time when American medicine was so vigorously fighting government proposals for national health insurance, enthusiastic support of Washington on the civil-defense issue may have appealed to the medical leadership as a means of demonstrating the profession's patriotism, social consciousness, and civic responsibility.

In these years *JAMA* published frequent and approving reports about the profession's civil-defense role, and it also promoted the expansion of
that role. In a 1949 issue of *JAMA*, for example, three veterans of the Manhattan Project's medical-research program, discussing the general question “Physicians in an Atomic War,” conceded “the enormity of the medical problem” and even admitted that at the moment American medicine was little better prepared “to cope with an atomic bomb attack on one of our major cities than the Japanese were at Nagasaki.” They insisted, however, that with more planning all this could change, and the profession could handle the medical challenge of atomic war, including blood transfusions, intravenous feeding, and pain sedation on a monumental scale. They recommended the construction of backup hospitals in suburban areas and insisted that “an essential part of a physician’s training” should be instruction in postattack medical practice, including the principles of triage (the tripartite division of casualties on the basis of survival probability). “The physician must play a role in the investigation of these problems during this period of peace,” they concluded bluntly. “That he will play a role in handling casualties in the event of an atomic war is inevitable.”

Organizational, too, the American medical profession cooperated fully with the federal civil-defense program in these years. In 1947, the AMA set up a Committee on National Emergency Medical Service, which met periodically to discuss a variety of post-nuclear attack problems. The AMA also cooperated with a Red Cross program to stockpile blood plasma for use in an atomic attack. At an AMA conference on medical education in 1948, Dr. George E. Armstrong, deputy surgeon general of the U.S. Army, urged medical schools to organize minicourses on radiation disease to “alleviate the worry which pervades the profession.” Such courses need take only a few days, he said, since “what every physician should know . . . can be mimeographed on one sheet of paper.” Armstrong cautioned, however, that in an atomic attack certain medical procedures customary in disaster situations would have to be delayed, for example, “until trained technicians consider it safe to enter the radio-contaminated areas.” Further, vast numbers of victims would be so heavily irradiated that no treatment or transfusions could help them, and “the profession must steel itself to make those persons comfortable and to concentrate every effort to save those who have some chance of survival.” Armstrong asked the AMA’s “assistance in ‘selling’ [these] two concepts
Accepting its assigned mission, the AMA cooperated fully in an extensive medical training program that was soon launched by the AEC and the Federal Civil Defense Administration. Under this program, physicians were brought to regional training centers at Rochester, Johns Hopkins, UCLA, and other universities for a brief but intensive course in the medical aspects of an atomic attack, including "the biological, pathologic and genetic effects of radiation" and "psychological factors such as mass hysteria." These trainees were then expected to cooperate with local civil-defense officials in their respective areas in the training of physicians, nurses, and other medical professionals. At a November 1951 conference in Chicago sponsored by the AMA's Council on National Emergency Medical Service, the American Hospital Association, and the Association of State and Territorial Health Officers, 250 delegates from all over the country heard lectures by federal civil-defense officials and discussed all aspects of medical and public-health planning for an atomic attack, from the stockpiling of blood and plasma to latrine policing, the control of hysteria, and the mass burial of radioactive corpses.

Local and state medical societies, too, responded with alacrity to Washington's call for cooperation in civil-defense planning. The Massachusetts Medical Society's "Suggestions for First-Aid Treatment of Casualties from Atomic Bombing," published in the *New England Journal of Medicine* in 1950, was subsequently offered in pamphlet form to the general public. That same year, the Maine medical journal published a three-part series, "What Every Maine Doctor Should Know about the Medical Aspects of Atomic Weapons and Atomic Warfare," which began with a hopeful exhortation by the army's surgeon general, R. W. Bliss, and concluded with a call to every Maine physician to "measure his obligation toward the future," "accept his responsibility for the safety and . . . survival of the great masses of the population if a new conflict should come," and "cooperate wholeheartedly" with civil-defense planning designed to reduce casualties, "should these new atomic or hydrogen bombs ever be dropped . . . over our densely populated civilian centers."

In Colorado, Dr. Thad P. Sears, professor at the University of Colorado
Medical School and a member of the state medical society's Disaster Commission, became almost obsessed, according to a colleague, with a "deep-seated conviction . . . that the community in which he lived should be prepared for atomic warfare." Sears gave hundreds of lectures in the Rocky Mountain area, trying to "arouse civilians and his professional colleagues from their unrealistic complacency," and in *The Physicist in Atomic Defense* (1953), he reiterated his belief in the medical profession's vital civil-defense role.

Perhaps the most elaborate planning at the state level was by the Pennsylvania medical society's Atomic Energy Medical Steering Committee, set up in 1948 to design a program "to protect the public in event of disaster." Six subcommittees addressed such matters as radiation measurement, postattack epidemic control, and "strengthening public morale." Reviewing these plans at the society's annual meeting in 1949, a speaker reminded his colleagues that the prospect of atomic war "imposed grave responsibilities on the medical profession."

The annual gatherings of the nation's medical associations provided an important forum for government medical officials preaching the civil-defense message. Physicians must "be in a continual state of preparedness," the District of Columbia medical society was told in 1948 by Clarence J. Brown of the navy medical service, since in an atomic attack, responsibility would "rest squarely upon the shoulders of the civilian medical profession, whether or not they are in uniform." The Atlanta medical society was told in 1950 by another navy medical officer that a "sustained and orderly program of education and wise leadership" by physicians was essential to encourage civil-defense preparation and counteract the exaggerated radiation fears that had "captured the popular interest and beclouded the thinking of many imaginative minds."

In the same vein, an alumni-day audience at the Indiana University medical school in May 1950 heard Morton D. Willcutts of the Naval Medical Center denounce exaggerated and misleading reports that had "excited too much respect and fear of the radiation hazards in the wake of an atomic explosion." Willcutts acknowledged that, without advance planning, the casualties in an atomic attack would "swamp normally available facilities," but he insisted that civil-defense preparation could improve the picture dramatically: "There is a defense. We do not need
to hide or to become frightened out of our wits into hysteria. Forewarned
is to be forearmed.” Quoting a navy public-relations officer of his ac­
quaintance, Willcutts ended on a note of aggressive optimism, “We will
survive. Our country is young and very, very strong when angered or
attacked . . . . ‘Through the generations of our existence as a peace-loving
democracy, we have formed one excellent habit—we win wars.’”

A number of state medical societies heard the civil-defense message
from William W. Wilson, M.D., of the army medical corps. Physicians
were understandably feeling “temporary pessimism” as they contem­
plated the medical consequences of a nuclear war, Wilson told the Flor­
ida Medical Association in 1950, but with planning they could enhance
their “capabilities for overcoming the hazards attributable to atomic
bombing.” Such preparation could be relatively simple, he insisted. Pre­
1945 civil-defense plans need only be updated to take into account the
“vastly increased numbers” of casualties and “the new problems of radia­
tion.” Like Willcutts, Wilson ended on an inspirational note: “It has
been characteristic of our medical profession . . . to accept no defeats, to
know no fears, to withhold no service to victims of disaster.” With plan­
ing and cooperation, “there could be nothing but triumph if we should
ultimately be put to a critical test.”

Hospital administrators, too, participated in the officially inspired
preoccupation with civil defense. Discussing “Hospitals versus the Atom
Bomb” in the December 1950 issue of Modern Hospital, an army hospital
administrator urged his civilian colleagues to prepare at once for atomic
war. “We are not likely to have enough hospital beds for even a limited
atomic attack,” he warned, “unless we think now in terms of maximum
potentials.” Administrators, he insisted, should give thought to such mat­
ters as tattooing blood type on patients’ arms, “emergency morgue facili­
ties,” postattack “police and traffic control” at their hospitals, and means
of handling hysterical patients. Should beds run short, he noted, “an or­
dinary house door on a saw horse will suffice in dire need.” In an atomic
war, he suggested: “Improvisation will be the greatest asset the adminis­
trator can have.” In the same issue, an architect discussed the need for
more blast-resistant hospital design.

The leading civil-defense advocate among hospital administrators
was New York City hospital commissioner Marcus D. Kogel, M.D. “The
mounting tension in our population makes it imperative that we have a workable plan . . . as quickly as possible,” Kogel wrote in Hospital Management in 1950, “so that we can get rolling and do something constructive towards its implementation.” Recognizing that most urban hospitals would be wiped out in an atomic attack, Kogel advocated the training of mobile paramedical squads, modeled on the army’s battalion aid stations, to set up emergency medical centers around the perimeter of the bombed-out area “at intervals as close as a block or two.” Kogel’s staff even drew up a list of supplies for each emergency medical center, including a lantern, six sheets and pillowcases, a pint of whiskey, and a bottle of sodium bicarbonate. With atomic war looming, he wrote, it was “a matter of plain common sense” to develop “an entirely new concept of a civilian emergency medical service . . . capable of going into high gear the moment the disaster strikes.”

Pervading these discussions was the conviction that to sustain civilian morale, the medical profession must cultivate an aura of mastery and total assurance regarding its ability to cope with atomic war. As William Wilson told the Florida Medical Association, it would be “impossible to exaggerate the benefits guaranteed by public confidence that prompt and skilled medical services” would be available in the postattack period. “What the public will believe, as soon as their physicians and health departments tell them at every opportunity,” he insisted, was that, with sufficient advance planning, “most of those resisting attack” would survive. Professionally acculturated always to appear hopeful and optimistic in dealing with patients, physicians tried to sustain this manner in their discussion of atomic war. “The task of the medical profession,” Dr. Harold C. Lueth told the West Virginia Medical Association, was to “reassure the population that steps can be taken to minimize the effect of the atomic bomb.” He acknowledged, however, that this task would become increasingly difficult as atomic war drew closer: “Those persons who have heard only the gruesome results of the bomb will be definitely depressed by the possibility of the threat of immediate death. Anxiety and fear will be kindled in the minds of those who do not understand the bomb . . . The possibility of lingering illness with no prospect of recovery constitutes a real anxiety.”

In this spirit of reassurance, Dr. George F. Lull, secretary of the
AMA, brought a message of both hope and challenge to the public in a 1950 article in *Today's Health*. Physicians were shouldering "the leading role in national preparedness for an atomic war," he wrote, but they needed "the help of every American." To provide that help, he went on, citizens must "treat the problem of possible attack with skill and foresight, and control fear with reason instead of exaggerating it into hysteria." The challenge of preparedness for atomic attack was formidable, said the aptly named Lull, but "the answer lies in a smooth-operating civil-defense setup within every community."

Only in muted, half-acknowledged ways did a few physicians—while ostensibly endorsing civil-defense ideology—hint that the entire approach might be misconceived. In some discussions, for example, the most nightmarish visions of total chaos were followed by the ritualistic insistence that "planning" and "preparation" were nevertheless essential. In *The Physician in Atomic Defense*, for example, Thad P. Sears, estimating (very conservatively) that an atomic attack on a city of half a million would produce 120,000 casualties, of whom 40,000 would die in the first twenty-four hours, wrote: "The remaining case load will therefore be 80,000. . . . Injured persons must be rescued and given first aid. They are then to be passed through a hospital chain and evacuated either to their homes or to off-target convalescent institutions. This service must be rendered in the presence of physical destruction, fire, confusion, rubble-filled streets, poor ambulance transport, disrupted communications, insufficient technical assistance and possibly lingering radioactivity." The disposal of corpses, too, would pose problems "almost bizarre in type and magnitude": "Refrigeration and embalming facilities are entirely inadequate for the care of numbers so great as these. . . . This may mean mass burial in a common grave." Despite these horrifying prospects, Sears insisted that the medical profession must be prepared to cope: "Such a prospect calls for a well-organized plan with careful attention given to every detail, including adequate rehearsal."

Despite its effort at optimism, the Maine medical journal launched its civil-defense series with extensive quotations from Hersey's graphic description of the utter destruction of Hiroshima's medical system—by a single bomb that was already puny by 1950. Every physician should read *Hiroshima*, it said, to learn "what the medical man will . . . face in
the event an atomic bomb is detonated over a large industrial area in his vicinity." A number of medical writers recalled how the several hundred burn victims of the 1942 Coconut Grove nightclub fire had swamped the medical resources of Boston. In a 1949 report on AEC-funded research on the effects of flash burns on pigs, two medical researchers at Rochester digressed to reflect on the "staggering" resources necessary to treat the burn victims in an actual atomic attack on a medium-sized city: 170,000 medical professionals; 8,000 tons of oxygen, plasma, drugs, gauze; and so forth.

But such cautionary notes were rare. In the later 1940s, the organized medical profession wholeheartedly lent its prestige and organizational strength to the government's civil-defense program, including the systematic effort to downplay the radiation hazards of atomic war and persuade the public that with sufficient preparation, American society could absorb a large-scale atomic attack with a minimum of disruption. The demands on the medical profession would be enormous, so the litany went, but it would rise to the challenge. As Everett Evans, a professor of surgery at the Medical College of Virginia and consultant to the ABCC, put it in a JAMA article, the very fact that the medical situation in an atomic war could easily degenerate into "complete chaos and panic" made it all the more urgent that physicians gird themselves for the eventuality. "Only free men with strong hearts and wills can accomplish the gigantic task of providing by training and discipline the necessary workers." Civil-defense planning must begin at once, said Evans, "lest contemplation of the magnitude of the task only encourage despair." Atomic war would be the ultimate challenge for the American physician, and he must steel himself for it, whatever the odds. Any other response would be unworthy and unpatriotic. Such was the message of America's medical leadership as the 1950s began.

THE ROOTS OF ANTI-NUCLEAR WEAPONS ACTIVISM IN AMERICAN MEDICINE

Beginning in the mid-1950s and increasing through the early 1960s, a few influential medical voices broke the pattern of uncritical support for official government positions on nuclear issues. This development
reflected a larger cultural shift in these years—a shift triggered primarily by fear of fallout from the atmospheric testing of thermonuclear weapons. Although the first thermonuclear test was conducted by the United States in 1952, it was the U.S. Bravo test series at Bikini atoll in March 1954, which spread deadly radioactive ash over nearly eight thousand square miles of the Pacific and brought illness and death to the crew of a Japanese fishing vessel, that first alerted the world to the fallout danger.

As American, Russian, and British thermonuclear tests continued, fear of global atmospheric fallout and its possible link to cancer and long-term genetic damage increased, focusing especially on strontium 90, a deadly radioactive isotope with a half-life of twenty-eight years and calcium-like properties. Pumped into the atmosphere by thermonuclear explosions, strontium 90 returned to earth in rain, entered the food chain, and concentrated especially in the bone marrow of infants and children. Geneticists took the lead in sounding the alarm. The Nobel laureate Hermann J. Muller of Indiana University somberly warned of threats to the human gene pool, man's "most valuable irretrievable possession." In a 1956 National Academy of Sciences report, a committee of prominent geneticists concluded that in terms of long-term genetic damage, "the concept of a safe rate of radiation simply does not make sense." The University of Wisconsin geneticist James E. Crow declared unequivocally in 1957: "There is no such thing as a safe dose of radiation to the population." Radiologists (including some physicians with AEC ties, such as Shields Warren and Austin Brues) tended to disagree, suggesting that a safe threshold did exist. Warren called the genetic risk from radioactive fallout "so slight in relation to other risks as to be disregarded" and dismissed the entire controversy as "more important as a symbol than it is as an actual health hazard." A 1958 study of irradiated mice at the AEC's Argonne Laboratory in Illinois seemed to confirm the "safe threshold" conclusion, although geneticists sharply challenged its relevance to human beings.

While scientists debated, public alarm mounted. Under growing pressure, the Public Health Service began monitoring the nation's milk supply in 1958. A full-blown fallout scare gripped the nation early in 1959, when tests showed a sharp rise of strontium 90 in St. Louis and other cities. A study of strontium 90 in the bones of children under the
The American Medical Profession

age of four, conducted at Columbia University and published in *Science* in May 1959, showed that the level doubled in 1957. The *Saturday Evening Post* in 1959 ran a feature entitled “Fallout: The Silent Killer.”

Across the cultural spectrum—from sermons, symposia, poems, and novels to movies, television series, and mass magazines—the fallout scare led to the articulation of more general nuclear fears submerged since the 1945–47 period. Politically, it spawned a campaign to stop nuclear testing. The idea of a test ban, advanced by the Democratic presidential candidate Adlai Stevenson in the 1956 presidential campaign, was broached again by Minnesota senator Hubert Humphrey in the 1960 Democratic primaries. Nearly two thousand scientists signed Linus Pauling’s 1957 petition calling for an international test ban agreement. Of the many test ban organizations, the best known, founded in 1957, was SANE, the National Committee for a Sane Nuclear Policy.

Within this sharply altered cultural and political climate, some influential American physicians became politically active on the nuclear issue. Psychiatrist Jerome Frank of Johns Hopkins University, for example, in a November 1958 *Atlantic Monthly* article, drew parallels between society’s responses to the nuclear threat and the behavior of mental patients: denial, compulsive repetition, paranoid suspicion, and so on. Frank became a SANE director in 1963 and in 1967 published *Sanity and Survival: Psychological Aspects of War and Peace*.

In St. Louis, meanwhile, Dr. Walter Bauer, a pathologist at the Washington University School of Medicine, joined with physiologist Barry Commoner and others in 1958 to found the Committee for Nuclear Information (CNI) to publicize the fallout danger. The committee’s best-known publication, a fictionalized but scientifically accurate account of the effects of a nuclear attack on St. Louis, appeared in the CNI newsletter in 1959 and was reprinted in *Saturday Review* and elsewhere. Another CNI project was the “Baby Tooth Survey” to measure strontium 90 levels. The brainchild of Dr. Alfred Schwartz, a St. Louis pediatrician and CNI vice president, the study accumulated more than eighty thousand teeth by 1962. (Each contributor received a button proclaiming “I Gave My Tooth to Science.”) The deans of the Washington University and St. Louis University dental schools sat on the project’s scientific advisory board. The results, released in 1962, showed a fourteenfold increase
in the level of strontium 90 in the teeth of children born in 1957 compared with those born in 1949.

This first wave of medical involvement in the nuclear issue crested in 1962–63. In 1962, SANE's executive director, Homer Jack, recruited Benjamin Spock to the cause. In a full-page advertisement in the New York Times, the famed baby doctor gazed with furrowed brow at a little girl under the headline “Dr Spock Is Worried.” In 1963, Spock became SANE’s cochairman.

In 1962, an important series of articles in the New England Journal of Medicine (which in 1950 had published “Suggestions for First Aid Treatment of Casualties from Atomic Bombing”) explored “The Medical Consequences of Thermonuclear War” and “The Physician's Role in the Post-Attack Period.” Supplemented by essays by Gerard Piel, publisher of Scientific American, and Bentley Glass, professor of biology at Johns Hopkins University, these articles were published in 1963 in a work arrestingly entitled The Fallen Sky. In sharp contrast to the earlier exhortations to physicians to prepare for atomic war, these articles insisted that a thermonuclear attack would be a medical catastrophe so enormous and so devastating in its effects on the structure of medical service that physicians should focus their energies on preventing such an event, not preparing for it. “No modern society can survive a full-scale thermonuclear attack,” the authors asserted unequivocally, and any civil-defense program that suggested otherwise was “a vast and scientifically unsupportable gamble with human life.” A “limited” nuclear attack on metropolitan Boston, the authors concluded, would kill one million of the three million inhabitants outright and another million from injuries and delayed effects. Of the city's 6,560 physicians, 4,850 would die at once, and only 640 would escape unscathed. If each of these 640 worked a sixteen-hour day and spent only fifteen minutes with each casualty, they calculated, it would take about three weeks for all the victims to receive minimal attention.

This influential series, published in one of the nation's most prestigious medical journals, was one of the early projects of a new organization, Physicians for Social Responsibility (PSR). Founded in 1961 by Dr. Bernard Lown, professor of cardiology at the Harvard School of Public Health, PSR served as a rallying point for the growing number of physi-
The American medical profession's surge of involvement with the issue of nuclear war was not sustained. In common with the rest of the culture, medicine's engagement with this issue diminished sharply after the ratification of the Limited Nuclear Test Ban Treaty in November 1963. This treaty did not stop all nuclear testing, but it did halt atmospheric testing,
the source of the dreaded radioactive fallout. This development, plus a series of arms-control agreements, such as the Strategic Arms Limitation Treaty of 1972 (SALT I), an apparent easing of Cold War tensions during the period of détente), and the emergence of the Vietnam War as an issue of compelling urgency all combined to diminish anti–nuclear weapons activism. Groups like SANE and the St. Louis Committee on Nuclear Information, in which physicians had played a prominent role, faded away or turned to other issues. PSR went into eclipse.

Nevertheless, a profound shift had occurred. The narrow clinical focus and uncritical identification with official policy that had characterized American medicine's initial response to the atomic bomb was fundamentally undermined during the period of fallout worry and test ban activism (1954–63). When the cultural and political climate shifted in the late 1970s and early 1980s, bringing the nuclear issue once more to the fore, men and women of the medical profession played a leading role. PSR revived with phoenixlike vitality; old themes were rediscovered; and leaders from the earlier period of activism, reinforced by articulate newcomers, again conveyed the grim tidings to a newly attentive public: If nuclear war comes, organized medicine will be of scant help, for it, too, will be sucked into the all-consuming maelstrom.