

Chapter 4

The Atomic Age and Public Health



*"It is with this world that we must deal, even as we strive and reach toward a better one. We must face reality, regardless of how desperately we wish for peace. The question of war or peace lies with the Kremlin, not with us. No one else can answer that question positively regardless of what the 'prophets' say. There is, however, one question we can answer: Is there a possibility of a third world war? Most certainly there is that possibility. This being true, we must prepare our citizenry for all of the implications in which we would be involved if that catastrophe occurs."*³⁴⁶

Col. Miller, Director of Civil Defense
State of Minnesota, 1951

Protecting the Population from a Nuclear Disaster

With the atomic age, new public health issues emerged. In the 1940s and 1950s the perceived threat of an atomic attack from Russia, the other major power with nuclear warheads, raised concern that the public must be prepared for and protected from a nuclear disaster.

Health had a new and highlighted role, recognized by Dr. Chesley, executive officer and secretary to the Board of Health: "The National Emergency with its special emphasis on civil defense has made health services extremely important."³⁴⁷

Dr. F. W. Behmler, retiring president of the Minnesota Public Health Conference in 1950 and member of the Board of Health, also called attention to the large role health plays in the peace process:

³⁴⁶ State of Minnesota, *Report by the Department of Civil Defense*, December 31, 1951, p. 23.

³⁴⁷ MDH, *Minnesota's Health*, Vol. V, No. 1, January 1951.

"In a world in which cooperation on the political level seems at present is an unrealizable dream, it is heartening to recall that it has existed for a long time in the field of health. Widespread public health is both an instrument and a condition of any lasting peace."³⁴⁸

Dr. F. W. Behmler, 1950

Minnesota Government's Response to Civil Defense Need

In response to this new danger, Minnesota state government began planning for the possibility of a nuclear attack. Essential governmental activities would be moved to Mankato, which was not expected to be a target for attack.³⁴⁹ The three Minnesota cities considered prime targets for a nuclear attack were identified by Dr. Chesley at the January 25, 1951, board meeting: "Rochester, where they would kill off all the men connected with medical care; the Twin Cities, where you change cars; and Twin Port, where you get all the iron. I don't think there is anything else 'Uncle Joe' would be interested in."³⁵⁰

Civil defense became a high priority. In a 1950 letter to section chiefs at the department, Jerry Brower, head of departmental administration, disallowed any new budget requests, with one exception: "...ask only for moneys sufficient to continue the present rate of operations plus any special needs incidental to the Defense Program."³⁵¹

The Minnesota Civil Defense Act, enacted by the Legislature in 1951, provided funding for state civil defense activities from July 1951 until July 1952. A total of \$30,000 to \$35,000 of the funding was earmarked towards a mobile health unit for use in the event of a disaster.³⁵²

While legislation was passed in 1951, Minnesota had begun civil defense preparations earlier. In October 1948 Gov. Youngdahl appointed Dr. Chesley a member of the Minnesota Civilian Defense Commission.

Dr. Chesley reported on the commission's activities at an April 25, 1950, board meeting:

Chesley: "At the present very little is going out to the public about it because until they set up these radar airplane detection centers we won't be in a position to go ahead. That is going on very well and Col. Miller is holding meetings in small towns and explaining what the situation is now. It is different than before we had A and H bombs, etc. He is doing what he calls his preliminary mass psychology proposal to the people. Then they will have meetings of the various professional groups as to the strength and action, if anything can be done about it, in case we should be bombed. Of course the Suez and Panama Canal rate 1 and 2. It is only 6 hours from

³⁴⁸ MDH, *Minnesota's Health*, Vol. IV, No. 10, October 1950, p.2

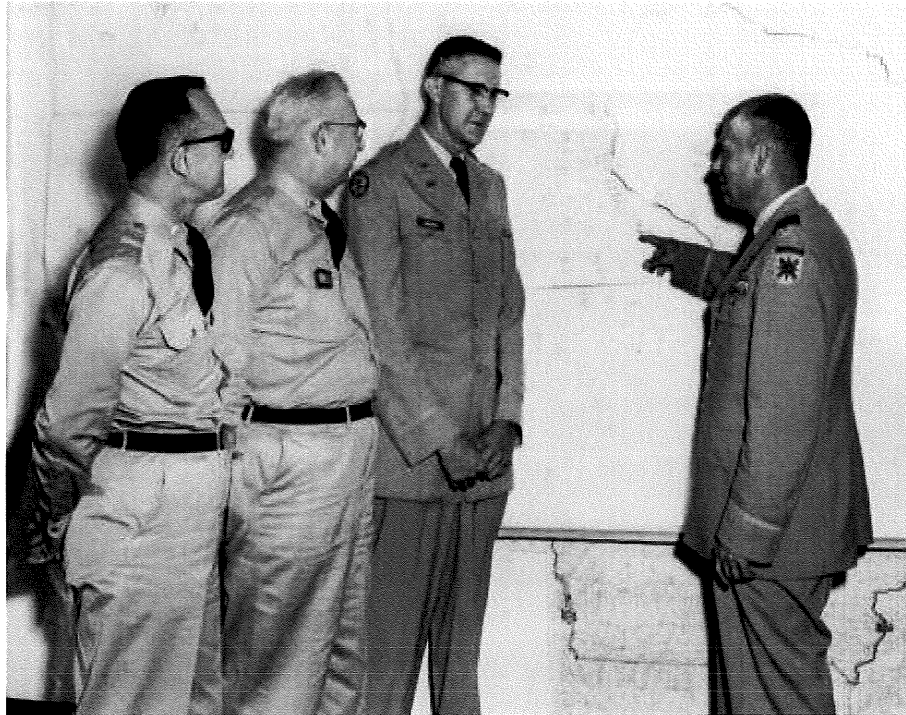
³⁴⁹ BOH, *Minutes*, July 10, 1954, MHC, pp. 171-172.

³⁵⁰ BOH, *Minutes*, January 25, 1951, p. 76.

³⁵¹ Letter from J.W. Brower to Health section chiefs, August 21, 1950.

³⁵² State of Minnesota, *Report by the Department of Civil Defense*, December 31, 1951, p. 3.

Alaska to Duluth, and all during the war we sent those big planes up there for Russia and they know how to get down there. . . From my personal contact with the representatives of the Hon. Bolsheviks, I have no faith whatsoever in anything they promise to do.”³⁵³



Dr. Henry Bauer and Dr. Robert Barr (two on left)

As Minnesota's chief health officer, Dr. Chesley directed the health section of the state's office of civil defense. He was chair of the civil defense medical advisory committee, organized to assist local civil defense councils in developing their health and medical programs.³⁵⁴ Other members of this committee were: R. R. Rosell, executive secretary of the Minnesota Medical Association; C.V E. Cassell, D. D. S., secretary of the Minnesota Dental Association; Ragna Gynild, R. N., executive secretary of the Minnesota Nurses Association; Glen Taylor, executive secretary of the Minnesota Hospital Association; B. S. Pomeroy, D.V.M., secretary of the Minnesota Veterinary Medical Society; W. J. Hadley, Ph.D., secretary of the Minnesota Pharmaceutical Association; and D. S. Fleming, M.D., executive secretary of the Minnesota Public Health Conference (now Minnesota Public Health Association).³⁵⁵

By executive order, the governor assigned the secretary and executive secretary of the Board of Health as Minnesota's chief of the health, medical and special weapons defense service. The mission of this service was to:

³⁵³ BOH, *Minutes*, April 25, 1950, MHC, pp. 231-232.

³⁵⁴ MDH, *Minnesota's Health*, Vol. V, No. 1, January 1951, pp. 1-2.

³⁵⁵ *Ibid.*, pp. 2-5.

...provide emergency medical care and treatment of the local population, including Civil Defense personnel, emergency public health services to meet disaster conditions, and preventive and remedial measures to minimize the effects of plant and animal biological warfare and chemical warfare.³⁵⁶

Survival Plan

A civil defense survival plan was prepared by the military affairs committee of the Minnesota Medical Association, the civil defense committee of the Minnesota Hospital Association and the Department of Health and approved by Gov. Freeman.³⁵⁷ Under this survival plan, all medical supplies and equipment in the state were under the control of the health and medical service during a civil defense emergency.

Health professionals were under the control of the civil defense manpower service. If time permitted, the plan directed that health professionals could be requisitioned and relocated to target areas during a disaster. Emergency treatment stations were to be established on the periphery of the disaster; and non-targeted hospitals were expected to expand by ten times their licensed capacity. Medical treatment for casualties would be provided at the hospital facilities or expanded treatment service, whole blood would be collected by each hospital every day, and public health nursing services would be expanded. Emergency environmental health measures and plant and animal biological warfare and chemical warfare defense measures were to be established or expanded. Mobile medical personnel and equipment support were to be provided as needed.³⁵⁸

The survival plan designated 78 communities as the points at which definitive hospitalization and medical care would be provided. It directed that these communities organize to receive an overwhelming number of medical evacuees. The plan prescribed routes of evacuation from the disaster areas and asked that each community organize a team to control traffic and direct the overflow of patients along the evacuation route. It prescribed, in a general way, the medical responsibilities of each person in the state.

The survival plan clarified that the Health Department was responsible for emergency medical care, radiological defense and mortuary services during an emergency. A staff member from radiation and occupational health was assigned the role of state chief of the radiological defense service; and the chief of the mortuary science unit was assigned as the state chief of mortuary service.

A New Public Health Challenge

Many members of the board and the department staff brought skills and perspectives from their recent military experiences to address this new public health challenge –

³⁵⁶ BOH, *Minutes*, May 26, 1959, pp. 158-162.

³⁵⁷ *Ibid.*

³⁵⁸ *Ibid.*

preparing for an atomic attack and safeguarding the population from atomic fallout. Dr. Chesley, and board members Dr. Frederick Behmler and Dr. Theodore Sweetser had served in World War I. Dr. Robert Barr, Dr. Henry Bauer, and Mr. Jerome Brower, all heads of sections at the department, were veterans of World War II, as was board member Mr. Herbert Bosch. Others in the department had served in the Korean War, as well as World Wars I and II. They were familiar with the contingency planning needed in situations where the potential for mass destruction and a high number of human casualties exist.

To prepare for a national emergency, Dr. Chesley thought the local health service was extremely important. Every community needed to be able to establish health services which would include care of the wounded and sick civilians, protection of civilians against atomic, chemical, and biological warfare, maintenance of sanitation, provision of medical supplies, organization of emergency hospitals and mobilization of professional health personnel and trained helpers.

Like Dr. Chesley, Dr. John T. Smiley, director of the department's District Office No. 6, was an advocate of civil defense preparation by the population and wrote an article, "Our Part in Civil Defense," for the department newsletter in 1951:

"The enemy's strategic aim is not to kill civilians per se, but to put our productive capacity out of operation. The destruction of a plant that manufactures essential military equipment is much more important to the enemy than the killing or maiming of any number of civilian people. Our aim in civil defense, therefore, is to be so thoroughly prepared against possible attack that it will be unprofitable for anyone to attack us. Our principal interest is not in protecting individuals but in saving our nation. This may sound like a rather inhuman approach, but it is the only realistic one. In the present situation, we cannot allow ourselves to be primarily concerned with individual persons or individual places. We must concentrate our defense efforts on the protection of our country as a whole.

"We must prepare to save lives and minimize injuries--not just for the sake of the individuals concerned (which would in itself be proper) but also, and most important, for the protection of our entire population. We need to be so well prepared that the enemy will know he would gain little or nothing by attacking us. The more thoroughly we prepare, the less likely we are to be attacked. We can do much to forestall the danger that we fear if everyone of us does his full share in planning and carrying out civil defense measures."³⁵⁹

John T. Smiley, M.D.
1951

The department established a health mobilization program that had administrative responsibility for the department's civil defense activities. It was located within the local health administration division. Program responsibilities included recruiting, orienting and training staff for emergency duties; maintaining an inventory record and status

³⁵⁹ MDH, *Minnesota's Health*, Vol. V, No. 1, January 1951, pp. 2-5.

review of medical and radiological equipment and supplies; and keeping operational survival plans current.³⁶⁰

Marvin Tyson was civil defense coordinator in the department's division of local health administration. In 1958 he visited 25 county medical societies and met with regional hospital groups and district nurses organizations to explain the plan to them and garner their support. His promotion of the plan contributed to Minnesota's progress in the area of civil defense.³⁶¹

To safeguard the population, the department concentrated its civil defense efforts in education and training, stockpiling supplies, establishing blood donor lists, and establishing statewide distribution procedures. The department also began surveillance of radioactive materials.

Education and Training for Survival

In 1951, the department began educating the population about the atomic bomb and how individuals could better prepare themselves. The department responded to speaking requests from communities with a presentation that included: 1) a brief explanation of what happens during an atomic explosion; 2) overall emphasis of the point that there is no complete defense against the atomic bomb – to impress the necessity for participation; and 3) information on where individuals could get the supplies they needed.

The department paid special attention to one aspect, biological warfare. In 1951, 75 St. Paul citizens took part in the production of a film designed to explain germ warfare and what measures need to be taken to combat it. Produced by the federal civil service department, in cooperation with the Red Cross, local hospitals and the department, the 10-minute film, "What You Should Know About Biological Warfare," was distributed nationwide.³⁶²

"The importance of preparation for this is the grave possibility that germ and toxic attacks may be launched by the enemy weeks or months before the bomb attacks."

Howard Johnson
Federal Department of Civil Defense
St. Paul Dispatch, 1951

At the end of 1951, a report published by Minnesota's civil defense department included a description of biological warfare:

Biological Warfare. This is nothing more or less than germ warfare. It is a type of warfare as old as Man himself. We are continually engaging in biological warfare. The only thing that is new is the methods of bringing that weapon to humans, animals, plant life, and foodstuffs. It is an actual

³⁶⁰ MDH, Public Health Education Section, "Minnesota Department of Health Organization and Functions," April 1966, p. 21.

³⁶¹ BOH, *Minutes*, May 26, 1959, MHC, p. 129.

³⁶² *St. Paul Dispatch*, "Film Shows Simulated Germ Warfare Attack on City," July 4, 1951, p. 19.

fact that Russia has conducted for a number of years, intensive research in this field and in perfecting methods of delivery, both from sabotage and from the air. Specially constructed bombs have been developed, as has apparatus for the spraying of crops by plane. This type of warfare, of course, effects the rural areas and food production centers tremendously.³⁶³

Despite voiced concerns about the threat of an atomic attack and despite promotion and education by the department, Dr. Chesley and Dr. Smiley were not satisfied with communities' interest. The seriousness with which Dr. Chesley took this new public health challenge was noted in an excerpt from a 1951 board meeting:

Chesley: "I admit that I considered the World War II blackouts etc., a farce, but now that you have the new gadgets on hand I don't consider it that way a bit. I have taken it seriously from the start."³⁶⁴

In 1957 the department, in cooperation with the U.S. Public Health Service, held a workshop on civil defense for the state's key health personnel in "target" cities. The three-day workshop at the University of Minnesota School of Public Health was the first training course of its kind in the state. Topics covered included health problems of modern war; mental health aspects of civil defense; chemical warfare; biological warfare; radiological warfare; control of natural epidemics; casualty care; and sanitation problems such as insect control and control of food, milk and water supplies.³⁶⁵

In 1961, the state's civil defense department and highways department built a civil defense training center on the New Brighton Arsenal grounds.³⁶⁶ Extensive training plans were made to train one million Minnesota citizens on how to take care of themselves in the event of a disaster. One person in each household was expected to be able to take care of the other people in that house.³⁶⁷ This medical self-help training program was offered to citizens for six weeks. Two nights a week during this period they studied radioactive fallout and shelter; hygiene, sanitation and vermin control; water and food; shock; bleeding and bandaging; artificial respiration; fractures and splinting; transportation of the injured; burns; nursing care of the sick and injured; infant and child care; and emergency childbirth. The program was based on the possibility that in an atomic attack, the services of physicians might not be available to people.

Training was also provided for health care professionals. In the early 1960s the department distributed the NATO handbook, "Emergency War Surgery," to key people, hospitals, and nurse training schools.³⁶⁸

In 1963, when civil defense activities began declining, the U.S. Public Health Service and the Department of Defense's office of civil defense asked each state to continue with the medical self-help training program and provided training kits. Training kits included 12 lessons, a projector, extension cord, screen and pointer, visual aids,

³⁶³ State of Minnesota Report, Department of Civil Defense, December 31, 1951, p. 22.

³⁶⁴ BOH, *Minutes*, September 29, 1951, pp. 292-293.

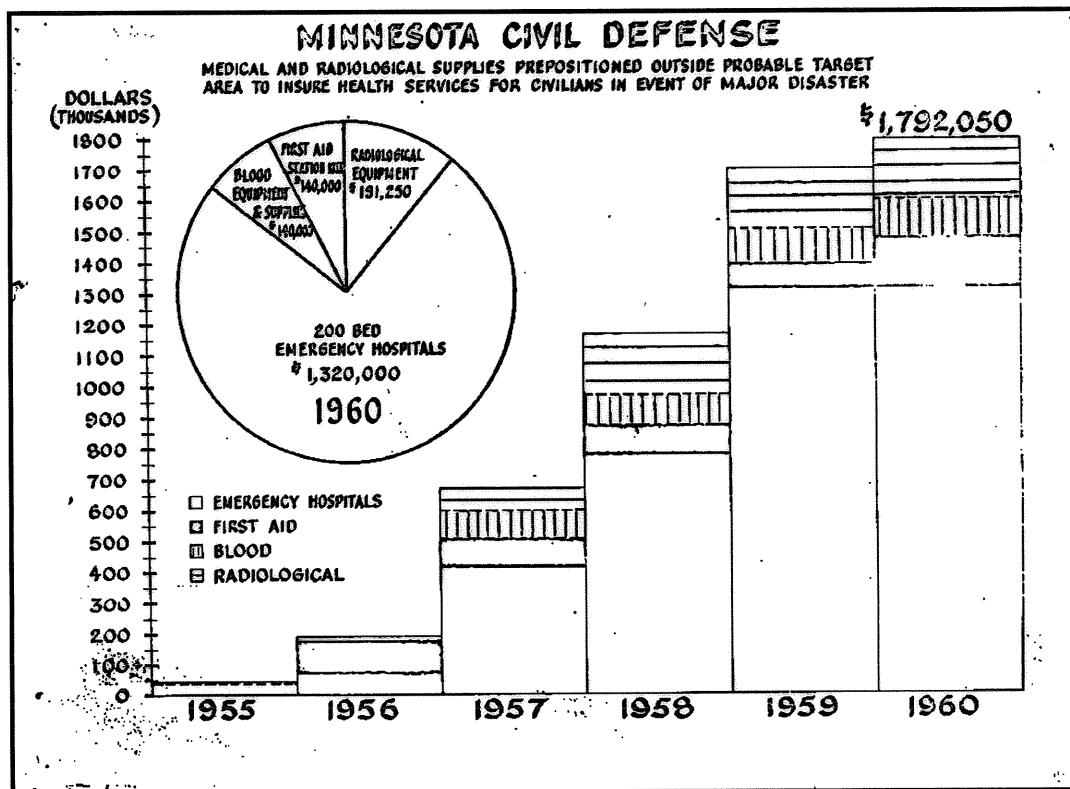
³⁶⁵ MDH, *Minnesota's Health*, Vol. 11, No. 2, February 1957, p. 1.

³⁶⁶ BOH, *Minutes*, July 11, 1961, MHC, p. 321.

³⁶⁷ BOH, *Minutes*, October 31, 1961, MHC, p. 380.

³⁶⁸ BOH, *Minutes*, January 31, 1961, MHC, p. 35.

instructor's guide, instructor's lesson folder, course introduction, student study handbooks, examination questions, answer sheets, examination grading template, reference manual, graduation certificates, and replacement materials for 100 students.³⁶⁹ Unfortunately, funds to ship the training kits to the communities were not available, so they were not used to their fullest capacity.



First Aid Stations and Stockpiled Medical Supplies

In the fall of 1952, 21 aid stations were established throughout Minnesota to provide medical care following an emergency. These were organized on the recommendation of the military affairs committee of the Minnesota Medical Association, on the approval of its house of delegates and the Minnesota Department of Health. The first aid stations were located in Anoka, Bemidji, Brainerd, Buffalo, Cambridge, Cloquet, Ely, Faribault, Grand Rapids, Hibbing, Hutchinson, Mankato, Northfield, Owatonna, Princeton, Red Wing, St. Peter, Stillwater, Virginia and Willmar.³⁷⁰

The medical team at each station was to consist of two physicians, two dentists, three nurses, eight nurse's aides, one administrative assistant, one pharmacist, seven first-aid technicians, three orderlies, one chaplain, three clerks, 103 litter bearers, six ambulance drivers, six ambulance orderlies, and one group leader. Physicians acted as team

³⁶⁹ BOH, *Minutes*, January 22, 1963, MHC, pp. 78-86.

³⁷⁰ BOH, *Minutes*, May 21, 1953, MHC, Exhibit VII.

captains, and each team received a complete set of medical equipment that was specially packaged to last for many years.³⁷¹

The department, responsible for planning and coordinating the stockpiling of emergency medical supplies throughout the state, began placing supplies in strategic locations in 1955. That first year the value of supplies was \$35,000, provided by federal defense funds.³⁷² By 1961, the value of stockpiled supplies was estimated at almost \$2 million.³⁷³ Supplies included 200-bed emergency hospitals, first aid station kits, cots, radiological equipment, blood donor kits and blood plasma expanders.³⁷⁴ Forty thousand World War II surgical bandages, compresses and dressings were also added to the emergency stores. The bandages were kept at the St Cloud Reformatory, because of its proximity to the St. Cloud Veteran's Administration Hospital, the relocation site for the University of Minnesota hospitals. In the event of a disaster, this 1,400-bed St. Cloud hospital would become a medical treatment center with a 14,000-bed capacity.

Establishment of Blood Bank System

In 2000, Dr. Henry Bauer, medical laboratories director from 1949 to 1976, reflected on the blood bank program that he helped establish in the 1950s:

There is no substitute for whole human blood. Any disaster in peace or war where there are injured people requires whole human blood. The recipient should feel secure that the blood has been processed by qualified personnel. (Lest we forget, human blood is needed for organ transplants and routine uses in the hospital.)

The atomic bomb dropped during World War II on Hiroshima and Nagasaki, Japan, brought into sharp focus the immediate devastating destruction on the environment and the horrendous number of deaths and horrible injuries experienced by the people of those two cities. Blood transfusions are required immediately for the injured who have lost blood and later for casualties resulting from exposure to atomic radiation.

The preceding statements attested to the need for the development of a Civil Defense and Disaster Blood Supply Program in Minnesota. Essentially, the program plan was proposed to help communities develop a statewide natural aid program supply in blood, when and where needed. In 1957, when this program was being developed, there were 118 hospitals, bleeding centers and blood banks expected to participate in the disaster blood program. The program covered four areas: stockpiling of blood collection supplies, training personnel to draw and process blood, expansion of blood donor lists and establishment of a coordinated method to distribute blood in the event of a major disaster or civil defense emergency. Stockpiled blood collecting supplies would be put into routine use to assure rotation and eliminate loss due to deterioration. Hospital and bleeding centers would assure the cost of replacing supplies, as they were used.

The second area of the program was to provide a large enough reservoir of personnel to draw and process blood in an emergency.

³⁷¹ BOH, *Minutes*, May 21, 1953, MHC.

³⁷² MDH, *Minnesota's Health*, Vol. 14, No. 7, August-September 1960, p. 1.

³⁷³ MDH, *Minnesota's Health*, Vol. 15, No. 1, January 1961, p. 4.

³⁷⁴ Ibid.

The State's plan proposed to assist in setting up a program to train bleeders to collect blood, as well as refresher training for blood technicians to type, cross match and prepare blood for use when indicated. It was hoped that eventually each blood collection center would have at least three trained bleeders certified by the National Institute of Health, who could draw blood in a major disaster. (There are strict regulations covering blood which is shipped interstate. It must be collected carefully to prevent contamination and only personnel certified by the National Institute of Health can collect and process blood for interstate use.)

Even if the State never faced a disaster which required a large volume of blood, the training program would help to improve the routine, daily collection of blood for treating the sick and injured. By training bleeders and by providing refresher courses for blood technicians, the program would allow for more efficient blood collection and processing, particularly in rural areas of the State.

In addition, it would supplement the third major aim of the program, expansion of the blood donor lists. To accomplish this, the State Health Department provided supplemental typing services to hospitals, blood banks and bleeding centers. Groups who participated in the program were required to keep the blood donor list current. To facilitate collection and distribution of blood in a disaster, hospitals, blood banks and centers informed the State Health Department of the total number of donors in each blood groups and the number of members in each RH type. With this information the Department could set up a central registry leaving the amount and types of blood available in all areas of the State. This is the fourth aim of the blood program – enabling the State, in the event of a major disaster, to coordinate and integrate systematically the blood resources into its overall Civil Defense Plan.

The American Red Cross Regional Blood Center, the Minneapolis War Memorial Blood Bank, and the University of Minnesota, in cooperation with the Minnesota State Medical Association, the Minnesota Hospital Association, the Minnesota Department of Civil Defense and the Minnesota Department of Health assisted in the training program. They participated in development of the disaster blood program and approved in principal.

In the 1950s an estimated 150,000 bottles of whole blood were collected annually in Minnesota. In 1951 the Minnesota Medical Association's committee on Red Cross and disaster raised concerns about the availability of blood in the event of a disaster. What developed, the Minnesota civil defense and disaster blood program, became a model for the nation.

The program, developed by the department in 1957, used a plan created by Dr. Henry Bauer, public health laboratory director. This program ensured that an adequate blood supply would be available throughout the state in case of an emergency. It provided for stockpiling of blood collection containers, training personnel to draw and process blood during an emergency, the development of donor lists, and the creation of a central registry.³⁷⁵ Coordinated methods for distributing blood in the event of a major disaster or civil defense emergency ensured trained persons would be able to make on-the-spot collections.³⁷⁶

The initiative to provide a safe margin of error by stockpiling blood collection supplies began in 1955. The department, in discussion with the Minneapolis War Memorial

³⁷⁵ BOH, *Minutes*, May 23, 1962, MHC, p. 216.

³⁷⁶ MDH, *Minnesota's Health*, Vol. 11, No. 1, January 1957, pp. 1-2.

Blood Bank, the Red Cross Blood Center, the Minnesota Hospital Association and the director of civil defense; recommended purchase of one year's supply of blood containers, donors and recipient sets.³⁷⁷ Federal matching funds were available, so a request for half the estimated cost was submitted to the Legislature for biennium 1955-57. State funds were allotted for the blood program, and Chapter 653, Laws 1957, invested power in the Board of Health to procure and arrange for storage in hospitals and other facilities of materials for collecting blood for transfusion.

More than 50,000 sets for drawing and distributing blood were distributed to 100 hospitals throughout the state in 1958.³⁷⁸ By 1966, 62,400 blood collecting containers, an equal number of donor kits, 48,200 recipient sets and 124,000 pilot tubes were placed in 129 hospitals and blood banks throughout the state.³⁷⁹ None were stockpiled in the Twin Cities, the expected target of an attack, where they would likely be destroyed.

In 1958 Dr. Mattson of the Minneapolis War Memorial Blood Bank presented Minnesota's blood bank plan to the American Association of Blood Banks at their 11th annual meeting, held in Cincinnati. The president of the association requested an outline of the program be sent to each of the 48 states.³⁸⁰ At the same meeting, the department received an award for its Minnesota civil defense disaster blood program exhibit.³⁸¹

The state's capacity to supply blood in an emergency was strengthened in 1959 when legislation directed all county civil defense directors to establish a blood bank committee for each hospital within a county that was not owned or operated by the federal government. The committee was charged with establishing a blood bank and donor list. The blood bank was to have complete blood transfusion service, including collection processing, storage and administration of human blood and its component parts. The committees were required to report the number of donors on the blood donor list, the respective blood groups and RH types to the department.³⁸²

Initially, the Red Cross was not fully supportive of the state's plan to have blood bank committees with donor lists. It questioned the propriety of doing this and believed its control over the hospital was gone.³⁸³ Meetings with the Red Cross assured officials there was no attempt to usurp their position, and a strong and cooperative relationship was established.

The structure of the blood program is still in effect in Minnesota. When established, it had been agreed that maintenance of supplies was the responsibility of the more than 118 hospitals, bleeding centers and blood banks receiving supplies. They would

³⁷⁷ BOH, *Minutes*, March 17, 1955, MHC, p. 54.

³⁷⁸ *Minneapolis Star*, "100 Hospitals to Receive Blood Donor Equipment," May 14, 1958, p. 1B.

³⁷⁹ MDH (public health education section), "Minnesota Department of Health Organization and Functions," April 1966, p. 22.

³⁸⁰ BOH, *Minutes*, January 7, 1958, MHC, p. 16.

³⁸¹ BOH, *Minutes*, January 13, 1958, MHC, p. 9.

³⁸² BOH, *Minutes*, August 11, 1959, MHC, pp. 225-227.

³⁸³ BOH, *Minutes*, November 10, 1959, MHC, pp. 256-257.

routinely draw and replace from the stockpiled blood collection supplies, assuring rotation.

Minnesota's civil defense medical program drew praise from outside the state. Harold W. Brunn, executive secretary of the Minnesota Medical Association, delivered a report on the state's survival medical plan at a 1959 meeting in Colorado of the American Medical Association's council on national defense and its disaster medical care committee. Dr. Harold Lueth, committee chairman, said Minnesota's program "demonstrated what can and should be accomplished." Dr. Laudeutscher, the Region VI medical officer, said, "In my opinion, Minnesota is one of the leaders, if not the leader, in medical preparedness in the nation." Further praise came from Dr. Robert Smith of the U.S. Public Health Service:

It must be evident that each state must obtain the coordination of public health and organized medicine as is evident in Minnesota's report, and each state department of health must both establish a medical plan and secure its implementation as Minnesota has accomplished.³⁸⁴

Decline of Civil Defense Activities

Civil defense activities started to wind down in the 1960s, as funding began to decrease. The 1961 Legislature did not approve continued state appropriations for two full-time department employees who had been developing a comprehensive civil defense plan for the medical aspects of an emergency.³⁸⁵

Gov. Karl Rolvaag continued to emphasize civil defense, even though funding had ended. He designated June 1963 as "Government Employees' Month." Employees at all levels of government – federal, state and local – were offered a 12-hour survival course. The course provided each employee with an understanding of the functions of government in an emergency, particularly a nuclear attack; a knowledge of the basic principles of personal and community protection; and the ability to assume the employee's responsibilities during such an emergency. The five lessons offered information on the nature of the Communist threat and American vulnerability; the characteristics of nuclear weapons; protective measures; principles of fallout shelter construction; and decontaminating the human body, emergency sanitary measures, foods, rationing, keeping a money economy, decontaminating streets, and other issues related to living in a shelter.³⁸⁶

³⁸⁴ Letter from M. D. Tyson to Harold Brunnat, Minnesota Medical Association, April 29, 1959, MHC, pp. 156-157.

³⁸⁵ BOH, *New Dimensions for Minnesota: Planning Guide for 1963-1973*.

³⁸⁶ BOH, *Minutes*, May 20, 1963, MHC, pp. 404-407.

By the 1970s, little was done at the department to promote civil defense. It was no longer considered a serious concern. While less attention was being paid to civil defense, more was being given radiation, nuclear power plants and other outgrowths of the atomic age.

Radiation and Radioactive Fallout

Radiation became a recognized public health problem of the 1940s and 1950s. A radiation program, began under the direction of Frank Woodward, director of environmental health and sanitation, concentrated on the four main sources of radiation: natural or background, fallout, nuclear wastes and radiation from the use of x-rays and radioisotopes.

Much of the early work by the department was done in the area of surveillance. In 1949 the department surveyed shoe-fitting x-ray machines, mobile x-ray units and x-ray equipment in hospitals and doctor's offices. Beginning in 1953 the department participated in a national network to gauge radioactive fallout from atomic explosions. In 1955 it began reviewing a proposal to construct the first nuclear power reactor in Minnesota. Two years later, in 1957, regulations for control of "sources of ionizing radiation, and the handling, storage, transportation, use and disposal of radioactive isotopes and fissionable materials were developed."³⁸⁸

By 1955 radioisotopes were in use for medical treatment in hospitals, research in colleges, measuring thickness gauges and static eliminators in paper plants, checking casting in preservation and other industrial needs.³⁸⁹ In 1957, Gov. Freeman, concerned about atomic energy's potential to affect the state, appointed a committee to study atomic development problems. The committee was to gather and make available for dissemination to the public reliable information on atomic energy; promote the utilization of atomic energy within Minnesota; control and protect the public from its health hazards; protect and conserve natural resources; and protect both users and possible victims of injury against loss through insurance or other means.

Surveillance of Radiation

The Minnesota civil defense radiological program began in 1951, under the leadership of Leon Schuck, with training courses for monitors and field visits. The program was

ID Tags

While there were a large number of civil defense activities, Minnesota, unlike many states, didn't require the wearing of metal identification tags that could be worn around the neck or wrist and the National Defense Administration urged everyone to wear one. In 1951, Dr. Smiley commented on these tags:

"We have all felt that it was a swell idea but a great many are highly dubious about how many tags will be found on the individual. They may be hanging in the bathroom at home or the boys may give the to their girl friends or something like that."³⁸⁷

³⁸⁷ BOH, *Minutes*, October 16, 1951, MHC, p. 336.

³⁸⁸ BOH, *Minutes*, May 22, 1958, MHC, pp. 143-144.

³⁸⁹ MDH, *Minnesota's Health*, Vol. 10, No. 5, May 1955, pp. 2-3.

somewhat limited until 1956 when the national civil defense organization provided guidelines for training and programming. The passage of the Ostertag Amendment in Congress provided funds for the purchase of radiological instruments. The recipients of the instruments were civil defense organizations, which would train at least 20 people in the use of the instruments. By 1960, an estimated 10,000 persons in Minnesota were trained to use the 502 Ostertag instrument sets.³⁹⁰ In 1962 there were 356 monitor stations throughout the state.³⁹¹

In 1953, the department became one of 44 agencies that were part of the U.S. Public Health Service's national surveillance of radioactivity in the air. A vacuum cleaner device for collecting daily samples was installed on the roof of the department's building on the University of Minnesota campus in Minneapolis.³⁹² F. C. Labernik, a public health engineer, measured the radioactivity using a Geiger counter.³⁹³ Daily samples indicated Minnesota was within the acceptable level at this time.

Rainwater was also collected on the roof of the Health Department building and analyzed for radioactive counts. In addition, a milk-sampling program and an extensive water-sampling program at about 70 statewide locations were regularly used to keep tabs of the levels of radioactivity in the state.³⁹⁴

In 1956, the department, in cooperation with the U.S. Public Health Service and the Atomic Energy Commission, became one of 27 stations in the country monitoring radioactive fallout.³⁹⁵ Following Pacific exercises involving the hydrogen bomb, the department took air samples seven days a week and sent them to the Atomic Energy Commission to determine the effects of the bomb.³⁹⁶

Expertise in the area of radiation was growing and developing within the department. One employee, Russell E. Frazier, chief of the engineering laboratories section, received a state merit award from Gov. Freeman in 1960 for designing an instrument for measuring radioactivity. The charger and counter were built using materials on hand, at a cost of approximately \$150. It was estimated that the equipment would have cost \$2,850, if built commercially.³⁹⁷

Radioactive Milk?

The department began sampling milk for radioactivity in 1958. Initially the program concentrated on the presence of strontium-90, but tests for iodine-131 were added in 1961 following an increase in fallout after Soviet nuclear tests. Minnesota was the only state that had its own network of radio-iodine stations and the only state that regularly

³⁹⁰ BOH, *Minutes*, January 12, 1960, MHC, pp. 54-59.

³⁹¹ BOH, *Minutes*, January 16, 1962, MHC, pp. 37-38.

³⁹² MDH, *Minnesota's Health*, Vol. 13, No. 1, January 1959, p. 2.

³⁹³ MDH, *Minnesota's Health*, Vol. 20, No. 1, January 1966, pp. 2-3.

³⁹⁴ MDH, *Minnesota's Health*, Vol. 13, No. 1, January 1959, p. 2.

³⁹⁵ MDH, *Minnesota's Health*, Vol. 20, No. 1, January 1966, pp. 2-3.

³⁹⁶ BOH, *Minutes*, April 19, 1956, MHC, p. 69.

³⁹⁷ *Capitol News*, June 1960, pp. 1 and 20.

ran strontium-90 as a network study. Minnesota did more testing to measure radioactivity than any other state during the 1950s.³⁹⁸

Reports indicated there was a large increase in radioactive fallout in September 1961, possibly due to testing by Russia and the United States. Because of concern over the levels of radio iodine in the milk, thought was given to stockpiling dried milk.³⁹⁹ Minnesota's milk was criticized throughout the country for being higher in strontium-90. The U.S. Public Health Service assisted the department in trying to determine why.⁴⁰⁰

Weather patterns of 1962 caused more fallout to the Midwest than other parts of the country. Reports from eight sampling stations throughout the state – Bemidji, Duluth, Fergus Falls, Little Falls, Mankato, Minneapolis, Rochester and Worthington – found an increasing amount of iodine-131 in milk.

Minnesota had the highest accumulated dose level of iodine-131 of any of the 50-some sampling points now operating in the United States. The Federal Radiation Council had established an accumulated dose maximum of 36,500 micromicrocuries for a one-year period. From September 1, 1961, to May 30, 1962, Minnesota had an accumulated dose maximum of 31,000 micromicrocuries. It appeared that Minnesota would exceed the maximum dose before the one-year period was over.

In July 1962, Dr. Warren Lawson, director of the occupational health and radiation control program, reported to the board that he had been working with the dairy industry to plan counter-measures that weren't too expensive or impractical. One option was to let the milk sit for several days before drinking. Dr. Lawson believed an explanation and warning to the public was needed, particularly for sensitive people, such as infants. A joint statement from the department and the dairy industry was planned to inform the public about the situation and recommend the availability of especially constituted milk for infants, nursing mothers and pregnant women.⁴⁰¹

Board members liked the way Dr. Lawson was handling the situation:

Mr. Herbert Bosch (member of the Board of Health): "I think Dr. Lawson is to be congratulated for what he has done with the milk industry, because potentially this thing could be very, very dangerous not only to the health of the people but also it could be extremely damaging to the industry. After all, we are tied in with this industry from the standpoint of the general economics of the State, and I think Dr. Lawson and Dr. Barr and Mr. Woodward should be congratulated on their wisdom in proceeding on this. As Dr. Lawson says, this State has gone much further in terms of radiochemistry than any other state health department in this area, and I think the State Board of Health's Advisory Committee on Radiological Health has been a big asset as a sounding board. I would like to express to you, Dr. Lawson, on behalf of the Board, congratulations on the manner in which you have carried this forward, because I think this is a very worthwhile contribution to the health of the people of this State, and also economically."⁴⁰²

³⁹⁸ MDH, *Minnesota's Health*, Vol. 20, No. 1, January 1966, pp. 2-3.

³⁹⁹ BOH, *Minutes*, October 31, 1961, MHC, pp. 382-383.

⁴⁰⁰ BOH, *Minutes*, January 16, 1962, MHC, p. 37, and attachment: "Report on Strontium-90 in Milk Produced in the Brainerd Milkshed."

⁴⁰¹ BOH, *Minutes*, July 10, 1962, MHC, pp. 327-329.

⁴⁰² BOH, *Minutes*, July 10, 1962, MHC, p. 329.

By August 6, 1962, accumulated levels of iodine-131 for the year had reached 33,700 micromicrocuries. Realizing the maximum level would soon be exceeded, the governor's advisory committee to the dairy industry recommended that dairy farmers voluntarily take measures to reduce the level of iodine-131 in the milk. The dairy industry voluntarily adopted control measures. Beginning August 23, until September 15, about 50 percent of dairy herds were not grazed on the open field. They were fed feed that had been stored under cover and aged at least 21 days. They did not do open field grazing. These measures were in place through September 10 and were successful in reducing the levels of iodine-131 in milk to an acceptable range.^{403 404}

X-ray Shoe-Fitting Machines

Radiation presented a number of new public health issues. In the 1940s and 1950s it was the practice of many shoe stores to determine the correct shoe size using x-ray machines. In 1950, the department conducted a survey of the approximately 200 x-ray shoe-fitting machines in the state. The study indicated many machines were operated somewhat carelessly or that control features were lacking. As a result of recommendations made by the department, some machines were taken out of service. The city of Minneapolis wanted to prohibit them entirely and asked the board to support this. Legislation would be necessary for such an action. While Dr. Frank Krusen, board president, believed it appropriate to discourage their use, Prof. Bosch thought the board should "be reasonably sure that we had our ducks set up in a row" before making any decision. The board was hampered by limited research to help make policy decisions related to radiation.⁴⁰⁵ When the board issued regulations on radiation in 1958, the shoe-fitting machines were outlawed.

First Nuclear Reactor

In 1957 the board learned plans were in place to install a nuclear reactor in Elk River. It was to be constructed by the Atomic Energy Commission for the Rural Cooperative Power Association. The board wondered if it should consider a regulation that would force the Atomic Energy Commission and others involved to work with the department.

A hearing was scheduled for March 7, 1958, to determine if there was any substantial evidence to prevent the Atomic Energy Commission from issuing an operating license to Elk River. Board member Dr. Ruth Boynton referred to the public's expectation that the board would protect them:

⁴⁰³ MDH, *Minnesota's Health*, Vol. 16, No. 7, Aug-Sept 1962, pp. 1-2.

⁴⁰⁴ BOH, *Minutes*, October 3, 1962, MHC, pp. 391-397.

⁴⁰⁵ BOH, *Minutes*, July 30, 1957, MHC, p. 123.

The public is going to expect the State Board of Health to take some part in the hearing and either say that we have assurance from the Atomic Energy Commission and that we will get reports from them, or else we say we haven't been able to arrive at any agreement with them.⁴⁰⁶

While the board's role in addressing communicable disease and sanitation issues was much clearer by comparison, there was limited guidance as to the department's role with atomic energy. Minnesota had no laws governing the use of radioactive materials. It had not been clarified which agency had responsibility for this new area. The department's involvement was based on its authority to regulate practices that were a menace to public health. Frank Woodward, environmental sanitation division director, described the situation: "We're having to live with a new item in our environment, one which requires new tools and techniques to safeguard the public's health. However, by adapting our sanitation practices to meet this problem, there is no reason to think that we cannot protect against hazards from nuclear reactors, radioisotopes, and other sources of ionizing radiation."⁴⁰⁷

Dr. Robert Barr thought the state needed to be cautious in adopting regulations until adequate evaluation had been done. Dr. Boynton agreed, but also said:

I think that is very true, but on the other hand I think we as the State agency which has been designated by the Legislature to be responsible for the supervision of the health of the people in relation to this, should certainly offer our cooperation. We will want to work closely with an industrial group of this sort that will be expanding. We should be in close touch with what they are doing.⁴⁰⁸

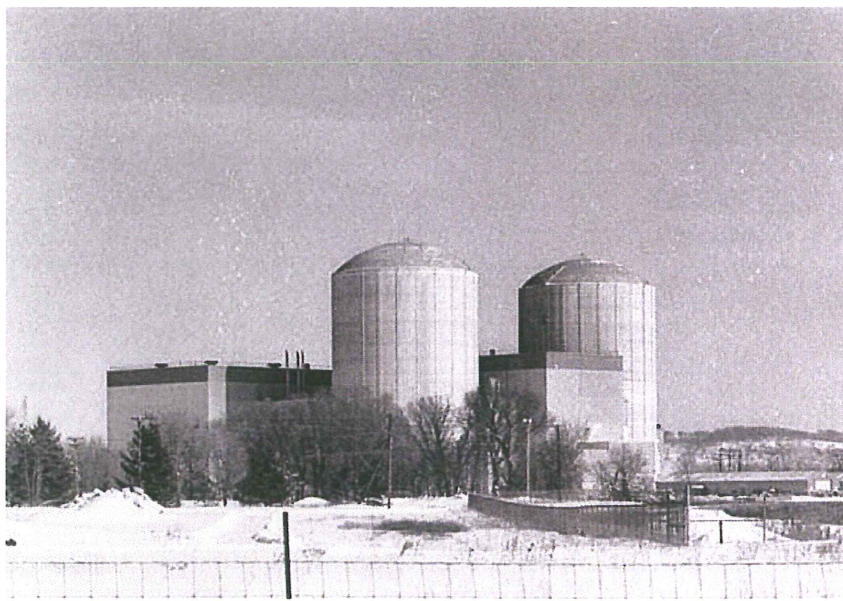
The board, led by Herbert Bosch, who had been the department's environmental sanitation division director and the World Health Organization's first chief of its environmental sanitation section in Geneva, Switzerland, thought the whole issue of atomic energy critically important. It involved broad issues and policy making with long-range effects, whether or not control of radiological hazards remained in the department. The board was concerned that the Legislature did not view radiological health as a serious public health matter.⁴⁰⁹

⁴⁰⁶ BOH, *Minutes*, January 31, 1961, MHC, p. 22.

⁴⁰⁷ MDH, *Minnesota's Health*, Vol. 10, No. 5, May 1955, pp. 2-3.

⁴⁰⁸ BOH, *Minutes*, July 30, 1957, MHC, p. 123.

⁴⁰⁹ BOH, *Minutes*, May 22, 1958, MHC, pp. 143-145.



Nuclear Plant at Prairie Island, 1975

First Ionizing Regulations Passed

The department's role in ionizing radiation was significantly changed in 1957 when the Legislature granted it authority to adopt regulations for the control of "sources of ionizing radiation, and the handling, storage, transportation, use and disposal of radioactive isotopes and fissionable materials." Regulation 1153, developed in cooperation with the state's atomic development problems committee, with Lee Loevinger as chair and Dr. Robert Barr as member, was adopted by the Board of Health on December 4, 1958, and approved by the attorney general on December 17, 1958.⁴¹⁰

Regulation 1153 affected 6,000 to 7,000 users of ionizing radiation equipment and radioactive material in the state. These individuals and institutions had to register with the board by April 1, 1959, and were required to register annually thereafter. They had to provide information on the owner, the source of radiation, as well as what safety precautions they were undertaking to insure unnecessary radiation.⁴¹¹

There was a lack of interest by some doctors in registering as required by the new regulations. Dr. Donn G. Mosser, member of the Minnesota Medical Association's radiation and radioactive isotopes committee and the Board of Health's radiologic safety advisory committee, requested the department's help in urging physicians to register.⁴¹²

⁴¹⁰ BOH, *Minutes*, January 13, 1959, MHC, p. 10.

⁴¹¹ MDH, *Minnesota's Health*, Vol. 13, No. 1., January 1959, p. 1.

⁴¹² BOH, *Minutes*, May 23, 1961, MHC, p. 165.

Dr. Barr responded by supporting the regulation as a standard approach in public health:

The accumulation of such information will help determine the future direction of control efforts. Regulation is extremely important in the development of a program to evaluate the potential hazard to health of the population as a result of radiation exposure. The acute effects of massive doses of radiation are well known. What are not as well known are the effects of low-level, long-continued exposures to radiation.⁴¹³

Regulation 1153 established a standard radiation symbol to indicate radioactive materials. Rules were made for the handling and transport of these materials. With Regulation 1153, Minnesota became the first state to require submission and approval of plans for any nuclear reactor, nuclear fuel reprocessing plant, or any permanent or temporary nuclear waste disposal facility. As part of this, no nuclear reactor could begin operating without the approval of the Board of Health.⁴¹⁴

The Atomic Energy Commission held a hearing in Germantown, Maryland, in November 1959, to consider health and safety questions involved in construction and operation of the nuclear reactor at Elk River and invited Gov. Freeman to attend. He wrote back that the federal government must be aware of Minnesota legislation that gave the Health Department responsibility for monitoring the safety of nuclear reactors. He objected that construction permits were issued by the federal government without official prior or concurrent assurances that the federal government, as owner of the reactor, would comply with Minnesota laws and regulations relative to nuclear reactors and water pollution. He asked that compliance with state laws and regulations be a condition of issuance of the construction permit.⁴¹⁵

In 1959, a proposal was made to transfer the Atomic Energy Commission to the state. Dr. Warren Lawson, then chief of radiation and occupational health, supported such a transfer. He thought it was a logical next step in development of the department's radiological health program. He believed the staff was competent to do this. Dr. Barr thought the department should be cautious with such a move. He didn't want the board to become subservient to the Atomic Energy Commission. He wondered if it shouldn't be discussed with the U.S. Public Health Service.⁴¹⁶

Feeling a greater need for expert opinion to advise it on the difficult decisions related to radiation, particularly those of the Elk River plant, the board established a radiologic safety advisory committee. Members included: Dr. Maurice Visscher, physiology department chair, University of Minnesota; Dr. Richard Caldecott, associate professor of plant genetics, University of Minnesota; Dr. Herbert F. Isbin, professor of chemical engineering, University of Minnesota; Dr. Donn G. Mosser, associate professor of radiology, University of Minnesota; Dr. Sheldon C. Reed, director of the Dight Institute of

⁴¹³ MDH, *Minnesota's Health*, Vol. 13, No. 1, January 1959, p. 2.

⁴¹⁴ *Ibid.*, p. 1.

⁴¹⁵ BOH, *Minutes*, attachment: letter (11/2/59) from Gov. Orville Freeman to secretary of the Atomic Energy Commission, November 10, 1959, MHC, pp. 318-320.

⁴¹⁶ BOH, *Minutes*, November 10, 1959, MHC, p. 252.

Genetics, University of Minnesota; Dr. Cyrus Hanson, radiologist, Minneapolis; Dr. Marvin Williams, radiation physicist, Mayo Clinic in Rochester; and Dr. Finn Larson, Honeywell Company.⁴¹⁷

The advisory committee, headed by Dr. Maurice Visscher, saw no compelling reason to oppose putting in a reactor in provisional operation at Elk River. It thought the board should receive full information concerning the radio-nuclide composition of waste gases from the Elk River reactor; and the Department of Health should receive information on the operating records of discharge of radioactive materials into the environment, as a result of the operation of the Elk River reactor, as a right, not a courtesy. Dr. Visscher said:

We are not happy about one thing: namely that the Atomic Energy Commission isn't really willing to give the State Board of Health access to operational information as a matter of right rather than as a matter of courtesy. We have not the slightest doubt that the Atomic Energy Commission is going to give you that information. It may be months late, unless something untoward happens, but you are going to get this information. The question that bothers us is whether as a matter of principle the State Board of Health should not have such information on installations being put up within its domain as a matter of right rather than as a matter of courtesy. There are many points that can be made in this connection. It is a hornets' nest and it involves the prerogatives of the Atomic Energy Commission generally, because they may feel that although it is appropriate to do this sort of thing for the State Board of Health in Minnesota it might not be appropriate somewhere else under somewhat different circumstances. They may not want to establish precedent. But in summary, I would say that your committee can find no reason to believe that every precautionary measure that is humanly possible is not going to be taken. We would say that the engineering seems to members of our committee, like Herbert Isbin, who is involved in this thing, to be adequate, and since power reactors of this type are in the public interest so far as development and operation are concerned, we feel that the reactor should be approved and should not be opposed, but we are not happy about the fact that you will not get day-to-day information about how much Iodine-131 is going into the atmosphere, and we just leave it to you to decide what you think ought to be done about that aspect of the problem. We throw it in your lap with the recommendation that you do not oppose the operation of the reactor, because we think it is as safe as it is possible to make it, but that you should think very seriously about the question of whether you should not have the operating information as a matter of right rather than as a matter of courtesy.

The State had a right to the information legally but didn't think it would be a wise political move to make a legal demand. They feel a legal demand would essentially be fighting a battle for all states.

They feel the first step is to directly ask the Atomic Energy Commission to authorize their subordinates to release data to the Department. They feel it is better to send the request to the top level in Washington, DC, by-passing the Chicago Operations Office. The Department intends to establish a long-term monitoring program and hopes to work cooperatively with the Atomic Energy Commission. I feel that there is no use bumping your head against any more walls than are necessary, and I would give the Atomic Energy Commission a chance to play ball.⁴¹⁸

The first untoward incident with radioactive materials occurred September 26, 1959, when a vehicle owned by the X-Ray Engineering Company of California was involved in

⁴¹⁷ BOH, *Minutes*, November 10, 1959, MHC, pp. 253-254.

⁴¹⁸ BOH, *Minutes*, December 19, 1960, MHC, pp. 409-412.

a collision in Coon Rapids. Radioactive material was dislodged from its protective lead cask and presented a serious hazard to everyone in the area. It was returned to its cask, and no excessive exposure was known to have occurred, but it did serve as an alert to the potential for accidents of this type and the board's need to aggressively demand that regulations be followed.⁴¹⁹

Dr. Barr stressed that the solution to the problem of ionizing radiation could not be done individually. He advocated community action, with education and participation in the planning and developing of preventive programs.⁴²⁰

Though the department was quite progressive in its efforts to monitor and regulate radiation to safeguard the citizens, not everyone shared that feeling. In 1962 one citizen wrote:

I had hoped that the State Health Department would cooperate in protecting the people from the hazard of radioactive materials and radiation. Since the Board of Health does not agree in my contention that it is necessary, I am obliged to ask for the resignation and removal from office of all those in the State Health Department who are responsible for this negligence. Your cooperation in accomplishing this will be appreciated.⁴²¹

(Note: Additional material on the history of radiation and nuclear power at the department is continued in Chapters 8, 9, 13 and 17.)

⁴¹⁹ BOH, *Minutes*, November 10, 1959, MHC, p. 309.

⁴²⁰ MDH, *Minnesota's Health*, Vol. 13, No. 1, January 1959, pp. 1-3.

⁴²¹ BOH, *Minutes*, October 3, 1962, MHC, p. 389.