

Between 1916, when the worst outbreak occurred, and the mid-1950s, when the first vaccine became widely available, infantile paralysis, better known as poliomyelitis or simply polio, evoked alarm all across the United States. Hard to diagnose and impossible to cure, polio sometimes resulted in lifelong disability, or even death. Above, hundreds of people wait to receive the oral polio vaccine in San Antonio, Texas, in 1962, seven years after the injectable polio vaccine became available.

## ■ Montana Episode

# Fear in the Time of Infantile Paralysis

## The Montana Experience

by Volney Steele

**D**uring the early part of the twentieth century, poliomyelitis, also known as infantile paralysis, caused more widespread alarm than any other illness. At first thought to affect only babies, the disease—an acute viral illness characterized by fever, sore throat, headache, vomiting, stiffness and muscle rigidity of the neck and back, and paralysis—was later discovered to be just as common in older children and young adults. Transmitted through the ingestion of material contaminated by fecal matter, the disease first appeared in the patient between two and thirty-five days after infection. We now know that about 1 percent of polio patients experienced paralysis, and, in general, between 2 and 10 percent of those paralyzed died. Half of patients affected by paralysis eventually regained normal muscle function.<sup>1</sup>

Like that of most infectious diseases, polio's origins are obscure, but it appears to have a long history. Ancient Greek physicians Hippocrates and Galen described patients with polio-like symptoms; eighteenth-century medical literature includes reports of an illness characterized by fever followed by muscular weakness of the limbs; and both Louisiana and England witnessed polio outbreaks in the mid-nineteenth century. In 1894 doctors diagnosed 132 cases of polio in Vermont. Historically, polio outbreaks have always been more common in rural communities than in cities. In heavily populated areas, sporadic and subclinical cases exposed many people to the virus, resulting in a greater degree of individual immunity. In 1916 when the New York City Department of Health reported an all-time high of 28.5

cases per 100,000 people, largely rural Montana saw 34.2 cases per 100,000.<sup>2</sup>

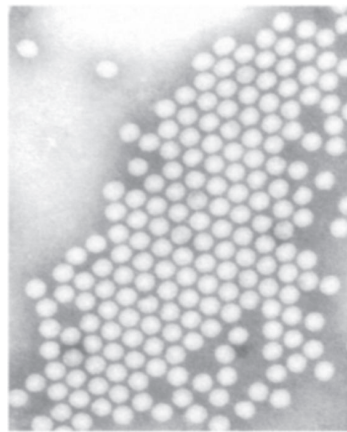
The best documented, and likely worst, polio epidemic struck the United States in the summer of 1916. Six thousand children and young adults died that summer, and at least twenty-seven thousand more were permanently crippled.

The headline of the July 9, 1916, *Helena Independent* read "Awful Scourge Creeping West, Baby Paralysis Yet Unchecked." The term "polio panic" quickly found its way into use.<sup>3</sup>

Although researchers identified the polio virus in 1909, theories about polio's origins continued to proliferate. Some frightened citizens blamed Italian immigrants, some suspected ice cream or automobile exhaust, while still others labeled cats the culprit. As late as 1952, just two years before Jonas Salk's vaccine became widely available, some scientists still denied that a virus caused polio. There is still no certain explanation for the prevalence of the disease in the

summer, although children and young adults often congregated in large groups during these months and swimming pools were probably a source of infection. Certainly, the common housefly played a part in spreading the virus through contact with water, milk, and other food sources.<sup>4</sup>

For the next thirty-nine summers after 1916, Montana parents lived in fear of their children's lives. In that fateful summer, the state reported 111 polio cases and 24 deaths scattered across twelve counties. During 1920–1921 there were 50 polio cases. In 1922 a polio outbreak, primarily in Yellowstone County, resulted in 41 cases and 4 deaths. Nineteen twenty-four was another terrible year. The virus affected 182 young Montanans that summer, killing 23.<sup>5</sup>



Negative stain image of the polio virus

J. J. Esposito and F. A. Murphy,  
Centers for Disease Control and Prevention, Atlanta, Georgia

1. Neal Nathanson and John R. Martin, "The Epidemiology of Poliomyelitis: Enigmas Surrounding Its Appearance, Epidemicity, and Disappearance," *American Journal of Epidemiology*, 110 (December 1979), 672–92. Karl Landsteiner and Erwin Popper are credited with the discovery of the virus.

2. John R. Paul, *A History of Poliomyelitis* (New Haven, Conn., 1971), 37–47, 79. As early as 1793 British scientists noted that the disease was "seldomer in London than elsewhere." *Ibid.*, 79.

3. "Montana's Polio Panic," *The Magazine of Shodair Children's Hospital*, (Spring 1987), 4–5; *Helena (Mont.) Independent*, July 9, 1916.

4. Paul, *History of Poliomyelitis*, 98–106; Ralph R. Scobey, "The Poison Cause of Poliomyelitis and Obstructions to Its Investigations," *Archives of Pediatrics*, 69 (April 1952), 56.

5. Montana State Board of Health, *Bulletin of the Montana State Board of Health*, Special Bulletin 30 (Helena, Mont., 1925), 3–77.

Sadly, though, in the 1910s and 1920s, before antibiotics and vaccines, scarlet fever, influenza, whooping cough, diphtheria, measles, and other diseases vied for the distinction of being the country's most deadly illness. In contrast to the national rate of incidence for polio, which ranged from a high of 14.3 cases per 100,000 people to a low of 1.3 cases, the infection rate for tuberculosis never fell below 78 cases per 100,000; scarlet fever and streptococcal sore throat reached a high of 211 cases per 100,000; and diphtheria fluctuated between 10.6 and 57.1 cases per 100,000. Still, polio, the paralyzing fever, was the most widely feared.<sup>6</sup>

Why this panic? In large part, fear stemmed from the stigma of being disabled. In some places in the early decades of the twentieth century, crippled children were not allowed to attend school, go to the movies, or travel on public transportation. Polio victims recalled that parents were sometimes afraid to let their children play with them for fear that paralysis was "catching." Crippled children were often the butt of jokes and ridicule. As polio victim Daniel J. Wilson explained, "The prevalence of polio, combined with the inadequacy or unavailability of rehabilitation, produced a growing population that feared the crippling of polio and the almost inevitable alienation, loneliness, pain, stigmatization and loss of income or earning potential that followed." Nowhere was the fear stronger than in the West, where everyone was expected to "pull his or her own weight." Even children had to carry out physical chores, especially in struggling families where children's labor contributed to income.<sup>7</sup>

Prior to 1916 and the intensive study of the disease, misunderstanding often surrounded the treatment of

6. Montana State Board of Health, *Bulletin of the Montana State Board of Health*, Special Bulletin 37 (Helena, Mont., 1928), 38-39; Daniel J. Wilson, "A Crippling Fear: Experiencing Polio in the Era of FDR," *Bulletin of the History of Medicine*, 72 (1998), 465-94; Montana State Board of Health, *Bulletin of the Montana State Board of Health* (1925), 3-7; United States Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970, Bicentennial Edition*, 2 vols. (Washington D.C., 1975), 1:77.

7. Amy L. Fairchild, "The Polio Narratives: Dialogues with FDR," *Bulletin of the History of Medicine*, 75 (2001), 488-534; Wilson, "Crippling Fear," 466.

polio. Polio struck Radersburg resident James "Mike" Sitton and his two siblings in the summer of 1911. "They thought I was going to die," Mike remembered in a 1983 interview. "My head and heels was almost together." The Sitton family was willing to try any treatment, including the recommendation of a Belgrade doctor named McCoy who apparently believed that starving the body "starved" the illness; he also prescribed a tablespoon of fresh slaughterhouse blood every two hours. Another doctor warned Mike's mother not to massage her son's painful paralyzed leg or "you will spread the poison." In the end, Sitton said simply, "I got over it" (whether he meant the illness or the treatment is unclear). In another Radersburg family, three children contracted polio, and two of them died, a tragedy that deeply affected the small community.<sup>8</sup>

Local Montana governments tried every means at their disposal to curtail the spread of polio. They closed swimming pools and admonished people to get rid of garbage and to only drink milk from "safe" sources, to clear away anything that attracted flies, and to instruct children in proper cleanliness. Churches closed their Sunday schools, and parents forbid their children to go to

the "picture show." In Anaconda, after both daughters of a prominent doctor contracted polio, the desperate city council ordered the only public swimming pool filled with dirt. When Buffalo Bill's Wild West show came to Billings on August 15, 1916, there were probably not many children in attendance.<sup>9</sup>

Every summer cold or mild case of catarrh caused an alarm bordering on hysteria. A nurse writing about the 1940s summed up polio's haunting presence, "Just imagine the fear in a mother's heart when her child complained of



Courtesy Tom Phelan Family

Because many illnesses shared the same symptoms, physicians often found it difficult to establish a diagnosis in cases where polio was suspected. Polio victim Tom Phelan (above, circa 1929) described being unable to draw away from the pain when his doctor diagnosed his illness in 1924 "using a pin to prick the bottom of my foot."

8. James Franklin "Mike" Sitton interview, April 19, 1983, Oral History 605, Montana Historical Society Archives, Helena.

9. *The Magazine of Shodair Children's Hospital* (June-July 1985); *Billings (Mont.) Gazette*, August 4, 1916.

10. "Montana's Polio Panic," 4-5; Thomas H. Phelan, *See Tommy Run: Life on Polio Hill* (Philadelphia, 2002), 11.

11. State of Montana, *Bulletin of the Department of Public Health*, vol. 2, no. 5 (May 1919), 4-5.

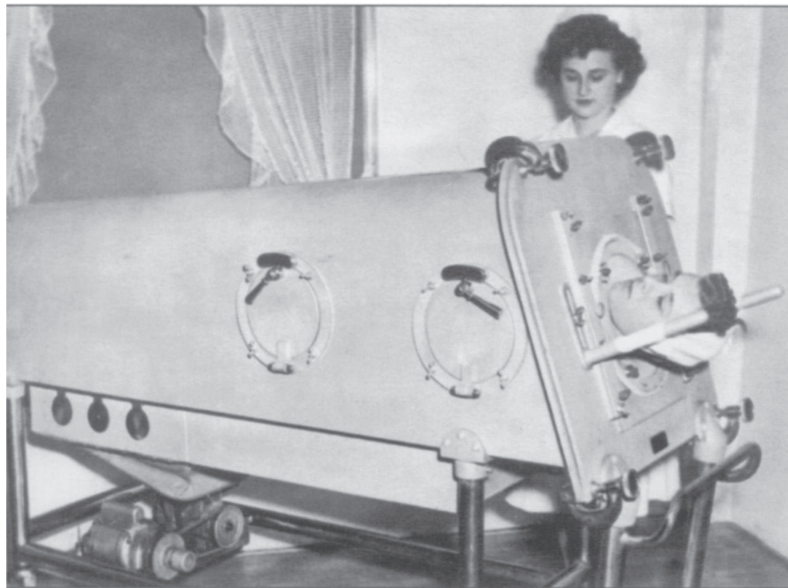
12. Paul, *History of Poliomyelitis*, 324-34.

Bulletin of the Montana Department of Health, 2 (December 1919), p. 7



In summer 1916 a virulent polio epidemic struck the United States. Isolation and quarantine proved unsuccessful in stopping the contagion. In Montana, physicians reported more than a hundred cases and twenty-four deaths.

a tummy ache. Or, a husband’s panicky reaction to his wife’s neck pain.” Doctors had no definitive laboratory test for polio, so they relied on physical examinations and past experience. Thomas H. Phelan of Missoula recalled his doctor established a diagnosis by “using a pin to prick the bottom of my foot. I would scream, but was unable to



MHS Photograph Archives, Helena

withdraw my foot from the pain.” At the start of an outbreak, doctors were often hard pressed to diagnose cases, or to rule out the disease in other instances. In the long, hot days of summer, anyone presenting a fever was suspect. Since subclinical infections could spread the virus widely, it was important to isolate patients as early as possible.<sup>10</sup>

Any effort to contain polio met wide approval. Although quarantine, a measure required by law, often seemed futile, isolation of the sick—and the confinement of everyone in the household—was firmly supervised and enforced, despite the often considerable resentment on the part of the quarantined. Quarantine rules included specific directions for laundry washing, food preparation, and the disposal of sputum and other bodily fluids. Nurses and doctors could come and go from the sick house, but they followed specific procedures for doing so.<sup>11</sup>

In the absence of a cure, doctors treated symptoms rather than the illness. During the acute period of the illness, physicians could offer sedation, splints, and hot packs to offset the painful cramps that invariably plagued the patient’s weakened muscles. As the disease progressed, constant skilled nursing proved extremely important, not only for the comfort of the patient, but to prevent life-threatening complications such as pneumonia, urinary tract infections, pressure ulcers, and assorted secondary infections.<sup>12</sup>

In the most dreaded form of the disease, bulbar polio, the virus attacked the anterior horn cells and medulla oblongata of the spinal cord, resulting in the paralysis of respiratory and diaphragmatic muscles. In such cases, doctors frequently found it necessary to aspirate the pharynx and esophagus to prevent obstruction of the airway and death by strangulation. When paralysis affected swallowing or respiration, surgeons performed a tracheotomy to provide an alternative airway. An iron lung, if available, could be lifesaving. Developed in 1929 at Harvard Medical School, the iron lung was a rigid cylinder large enough to accommodate a patient’s torso with rubber seals at each end that formed an airlock. Using an air pump, an attendant applied negative and positive pressure at intervals to assist the breathing muscles. In

Since there was no cure for the disease, doctors treated polio symptoms rather than the illness itself. If paralysis set in, an iron lung, like the one shown in this undated Montana Nurses Association photograph, could be lifesaving. An iron lung was a rigid cylinder with rubber seals at each end that formed an airlock. Using an air pump, an attendant applied negative and positive pressure at intervals to assist the breathing muscles.

In 1916 Sister Mary Arcadia Lea and Dr. Louis Allard started an evaluation and treatment program for crippled children from Montana and surrounding states at St. Vincent Hospital in Billings. The St. Vincent Hospital Orthopedic School ran in conjunction with the clinic from 1922 to 1939. Here students posed with their teacher-nurses Sister Mary Agatha McGranahan (farthest left) and Sister Mary Remi Gokey in 1923.



time, a more sophisticated airlock evolved, but the principle of alternating air pressure remained the same. It might require days or weeks for a patient to regain the ability to breath on his own.<sup>13</sup>

Almost everyone thought the application of heat an effective polio therapy, and in Montana many families took their crippled children to soak in hot springs. In 1918 four-year-old Mary Leffingwell, who lived on a ranch west of Clyde Park, suffered an attack of fever and paralysis. After spending a few painful days at her grandmother's house, Mary and her family continued on to Chico Hot Springs south of Livingston. Here, for two months, Mary soaked in the hot water, and her paralyzed legs were "twisted and massaged." "Most of the other children who had polio at

that time were put in casts and braces and ended up quite badly crippled. I was fortunate to have had hot water therapy. I was left only with bad feet and a weak leg," she later said.<sup>14</sup>

Eventually, most polio survivors regained some muscle strength, and doctors developed a number of orthopedic procedures to reconstruct tendons and stabilize joints, allowing victims to sit up in a wheelchair, use crutches, stand, or walk. For many years, treating these maladies was an orthopedic specialty in itself. Tom Phelan's memoir, which details his experiences from the time he was paralyzed at nine months to age fourteen, recounts a life of splints, casts, and painful surgeries. First treated in the "muscle retraining program" of Missoula osteopath Asa Willard, Tom traveled with other polio victims by special railcar to the Allard Clinic at St. Vincent Hospital in Billings in 1925. This clinic was the brainchild of Sister Mary Arcadia Lea, superintendent of the St. Vincent School of Nursing, and Dr. Louis Allard, a native of Laurel,

13. Before the National Foundation for Infantile Paralysis initiated the mass distribution of iron lungs in 1939, the medical profession was skeptical of its use, even though the iron lung had been first used successfully in 1929. Ibid. See also Amy L. Fairchild, "Polio Narratives," 488-534.

14. Mary Leffingwell and George Leffingwell, *Diamonds in the Snow* (Clyde Park, Mont., 1992), 36-37; Mary Leffingwell, interview by author, April 26, 2002, Clyde Park, Montana. On Montana hot springs as sanitariums, see Marilyn Johnson McMillan, "Taking the Waters: Montana's Early Hot Springs Resorts" (master's thesis, Montana State University, Bozeman, 1982).

15. Phelan, *See Tommy Run*, 1-2, 5; Sue Hart and Katherine A. Shandera, *The Call to Care, 1898-1998: Saint Vincent Hospital and Health Center, the First 100 Years of Service* (Billings, Mont., 1998), 33-34.

16. Hart and Shandera, *Call to Care*, 21-30.



St. Vincent Hospital, Billings, Montana

Montana, and a graduate of Rush Medical College in Chicago who had returned to the state in 1914 after completing postgraduate training in orthopedics.<sup>15</sup>

Although the “young cigar-chomping” Dr. Allard and Sister Arcadia Lea, a “tall nun in the black habit of the Sisters of Charity of Leavenworth,” made “an unlikely pair of ministering angels,” the partnership they formed led to a treatment regimen that attracted enthusiastic support from parents and doctors. By 1922, 467 children affected by polio or other disabling conditions had received treatment at St. Vincent Hospital.<sup>16</sup>

For help handling the heavy case load of crippled children, Dr. Allard contacted an orthopedic specialist in Massachusetts. This friend sent a physiotherapist from his own staff, Marian Fox, to assist. As soon as Marian Fox arrived in Montana, she began holding daily clinics at St. Vincent Hospital and the local public health office to train nurses and mothers in “simple muscle exercises.” Fox’s use of passive exercise combined with some form of heat, usually moist heat, was not very different from the popular method developed by Sister Elizabeth Kenny decades later. After much experimentation, Kenny, a charismatic and determined Australian nurse, worked out a therapy based



Montana Health, 7 (January-February 1952), p. 2

St. Vincent Hospital, Billings, Montana



St. Vincent patients spent summers at the hospital school's camp in Rock Creek Valley near Red Lodge. Dr. Allard (above, center row, third from left), pictured with campers circa 1935, called it the "greatest secondary development in connection with our orthopedic work."

In the 1920s St. Vincent Hospital physiotherapist Marian Fox taught techniques based on passive muscle movement and the application of heat to nurses and parents throughout the state. The same principles were still employed in 1954 when Vivian Devine (right) demonstrated the use of hot packs during a polio treatment workshop.



L. H. Jordt, photographer, MHS Photograph Archives, Helena

on three modes: hot wool packs, passive motion, and reeducation of muscles.<sup>17</sup>

Like Sister Kenny's therapy, Fox's treatments attracted a devoted and desperate following. Between twenty-five and forty children visited the St. Vincent clinic each day. According to Sister Arcadia Lea, "Most of these cases were the recently afflicted polio victims and were brought, by their sorrowing mothers, in baby carriages, children's little wagons and all sorts of conveyances, some carried for many blocks in mothers' arms, a truly pathetic procession, which never seemed to end." Fox, assisted by student nurses, also visited outlying communities to teach her techniques. Although history does not record her background, she brought to Montana an appreciation of physical therapy that had not previously existed. In 1921 she traveled to Helena at the request of the Montana State Board of Public Health. When she failed to return to Billings, Dr. Allard supposedly said, "Dr. Cogswell [the state health board director] borrowed Miss Fox and forgot to return her."<sup>18</sup>

Fox's departure did not end the Allard Clinic's work, as the case of fourteen-year-old Gwen Mitchell attests. Dr. Allard met Mitchell on an outreach visit to Butte and selected her for treatment because of her difficulty in walking. He performed surgery on Mitchell's right leg, lengthening the tendon so that she could comfortably wear a shoe. She also received massage, heat treatments, and hydrotherapy. In spite of the painful therapies, Mitchell, now in her nineties, recalled that she enjoyed the summer she spent at St. Vincent.<sup>19</sup>

Each summer brought new cases of the dreaded fever—some years only a few cases, but other years many more. One polio victim was ten-year-old Dick Lehfeltdt of Ryegate, Montana, a small railroad town on the Musselshell River. The boy developed a fever followed by paralysis in October 1952. Like many children who contracted polio, Lehfeltdt had recently engaged in strenuous physical activity; too young to carry a gun, he acted as a "bird dog" while hunting pheasants with his older brothers. St. Vincent doctors treated the boy, then referred him to the Shodair



Courtesy Gwen Mitchell

Dr. Allard performed surgery on Butte resident Gwen Mitchell in 1923, lengthening the tendon in the girl's right leg to allow her to comfortably wear a shoe. Here Mitchell is pictured after surgery, far right, sharing the hospital recreation area with friends.

Crippled Children's Hospital in Helena, where an up-to-date physical therapy department made it one of the region's best hospitals for pediatric polio care. Now a retired radiologist, Dr. Lehfeltdt remembers hearing a rumor during his hospital stay that a polio vaccine was in the experimental stage.<sup>20</sup>

When Lehfeltdt returned home, some well-intentioned friends and neighbors urged the young boy and his family to attend religious healing services since paralysis was a condition that many felt could be cured by prayer. The family attended the revival of a famous faith healer who was visiting Billings, but when the attendants saw how paralyzed the boy was, they refused to allow him on the stage. Dick recalls how guilty he felt because after all the prayer and attention he was still paralyzed. He said with a touch

17. *Ibid.*, 26–27; John F. Pohl, "The Kenny Treatment of Anterior Poliomyelitis (Infantile Paralysis, Report of the First Cases Treated in America)," *Journal of the American Medical Association*, 118 (April 25, 1942); Mary M. I. Daly, "The Early Treatment of Poliomyelitis, with an Evaluation of the Sister Kenny Treatment," *ibid.* The Women's Club of Billings paid Marian Fox's travel and living expenses and salary, while other civic groups helped with expenses incurred by polio victims. The Billings Rotary Club, for example, raised a thousand dollars to help with the cost of orthopedic appliances.

18. Hart and Shandera, *Call to Care*, 26.

19. Gwen Mitchell, interview by Michelle Mandic and the author, August 2, 2003, Butte Montana.

20. Dick Lehfeltdt, telephone interview by author, May 10, 2002. Called the Montana Children's Hospital when it was founded in 1898, Shodair Crippled Children's Hospital was renamed in honor of Louis Shodair, a former Butte resident who donated one hundred thousand dollars to build a special wing to treat crippled children. Shodair Children's Hospital webpage, Genetics, <http://www.bozemanobgyn.com/genetics.html>, accessed November 15, 2004.



L. H. Jorud, photographer, MHS Photograph Archives, Helena

Established through the generosity of Louis Shodair (pictured below with his wife in 1890), the Shodair Crippled Children's Hospital operated a modern physical therapy department that made it one of the region's best hospitals for pediatric polio care. The Montana Nurses Association held a polio workshop at the hospital in 1954.

of humor, "I let them down, I guess."<sup>21</sup>

Another young Montanan who contracted the virus just before the Salk vaccine became available was Kalispell athlete Ken Sutherland. Ken was eighteen years old in summer 1952. Just a day or two after he played in the annual East-West Shrine football game, the young athlete developed a fever, the worst headache he could remember, generalized muscle stiffness so bad he could not touch his knees, visual disturbances, and breathing and swallowing difficulties. These



A. B. Hower, photographer, MHS Photograph Archives, Helena

symptoms spelled bulbar polio. Knowing that if Sutherland's diaphragm failed he would need an iron lung, the boy's physicians had him flown by private plane to St. Patrick Hospital in Missoula. Ken, who later attended medical school at the University of Oregon and practiced cardiology in Spokane, remembered that an iron lung stood just outside his hospital room for several days. He stayed at St. Patrick for several weeks under the care of internist Dr. Sam Trenough. His treatment included daily soaks in a hot-water tank followed by a passive-movement physical therapy. The complete

paralysis of his anterior neck muscles prevented Ken from ever moving his neck normally, but all the other affected muscles regained full usefulness.<sup>22</sup>

21. Ibid.

22. Ken Sutherland, telephone interview by author, May 5, 2002.

23. H. T. Ricketts, *Infection, Immunity and Serum Therapy* (Chicago, 1908), 218–56. See also Paul, *History of Poliomyelitis*, 393–94; Lindsey "Mac" Baskett, personal communication with author.

Over the years, polio's random cruelty sparked a number of attempts to curb the disease. Since the turn of the century, doctors had known that the use of immune serum, or antitoxin, sometimes prevented measles, tetanus, and whooping cough, but by 1920 doctors had realized that this method did not work with polio. In the years after World War II, however, injections of gamma globulin manufactured from blood plasma showed promise in preventing the onset of polio. In field trials in the early 1950s, gamma globulin "greatly reduced the incidence . . . when administered within a suitable period preceding exposure." Montana State Board of Health and other doctors used gamma globulin whenever possible. Livingston physician Dr. Lindsey "Mac" Baskett said he feels sure he prevented the illness in some of his exposed patients with the use of prophylactic gamma globulin injections.<sup>23</sup>

In 1954 the first polio vaccine, a killed-virus vaccine developed by Jonas Salk, was tested in a series of field trials. Over two hundred thousand American children received the Salk vaccination and as many more were given a placebo. In Montana 3,130 children in Gallatin, Mineral, Missoula, and Park Counties took part in the field trials. Few complications arose in the vaccinated children, and immunization programs began in earnest in 1955. The polio vaccination could not have come at a more propitious time: Montana reported over 100 polio cases annually between 1950 and 1954. Given that both private and



Montana Health, 11 (January-February 1956), p. 13



MHS Photograph Archives, Helena

In Montana, 3,130 children participated in field trials of the Salk polio vaccine. Here Dr. William H. Sippel administers the vaccine to children at Emerson School in Bozeman in June 1954.



Courtesy Gwen Mitchell

Thanks to Dr. Allard and other dedicated Montana health-care providers, children like Gwen Mitchell and her friends (left) could look forward to productive lives. Thanks to vaccine developers Jonas Salk and Albert Sabin, American families no longer live in fear of the dreaded disease, and the worldwide eradication of polio became a genuine possibility.

Montana Public Health Service physicians distributed and administered the polio vaccine, it is difficult to explain why two hundred thousand Montanans under the age of forty were still not immunized by the end of 1958.<sup>24</sup>

Browning physician Dr. Edward King helped administer the Salk vaccine to residents of the Blackfeet reservation in 1955 and vaccinated Starr School students during the summer of 1957 after ten or twelve cases occurred on the reservation. According to King, the vaccine was not “widely

accepted by the indigenous people of the reservation,” an observation supported by a 1959 U.S. Public Health Service publication that reported substantially fewer nonwhite people participating in the nationwide Salk vaccination program.<sup>25</sup>

Today, the eradication of poliomyelitis stands as a parable of medical science triumphing over contagion. In the U.S. the number of polio cases fell from 13.9 cases per 100,000 people in 1954 to 0.5 in 1961, the year the attenuated live-virus oral vaccine developed by Albert Sabin first came into use. With such evidence of success, the World Health Organization set 2000 as the target date for global eradication. Sadly, this goal has not been met. During the first half of 2000, there were only 678 cases of polio worldwide, all of them in thirty countries in south Asia and west and central Africa. In 2002, however, over 1,500 cases occurred in India alone, a country where religious belief led many to refuse the oral vaccine. By 2004 the number of cases had dropped to 109 in India and 1,047 worldwide. With continued vaccination programs throughout the world, we may yet see the disease eliminated.<sup>26</sup>

When the U.S. Postal Service asked Americans to choose the most important scientific advancement of the 1950s, they selected Jonas Salk’s polio vaccine.



24. Paul, *History of Poliomyelitis*, 426–40; Montana State Board of Health, *Biennial Report of the Montana State Board of Health, July 1, 1954–June 30, 1956* (Helena, Mont., 1956), 25; Montana State Board of Health, *Biennial Report of the Montana State Board of Health, July 1, 1956–June 30, 1958* (Helena, Mont., 1958), 47–49; Thomas Francis et al., *Evaluation of the 1954 Field Trial of Poliomyelitis Vaccine, Final Report* (Ann Arbor, Mich., 1957), 347, 355.

25. Dr. Edward King and Elizabeth King, telephone interview by author, July 1, 2004; Monroe G. Sirken and Berthold Brenner, “Population Characteristics and Participation in the Poliomyelitis Vaccination Program,” *Public Health Monograph No. 61* (Washington, D.C., 1960), 11–13.

26. T. Jacob John, “The Final Stages of the Global Eradication of Polio,” *New England Journal of Medicine*, 343 (September 14, 2000); *Tucson (Ariz.) Daily Star*, January 19, 2003.

27. Stanford University Medical Center, “Polio and the Era of Fear” webpage, accessed October 30, 1996. Post-polio syndrome, a condition characterized by fatigue, pain, and weakness, develops decades after the original illness. There is no treatment. Today, thousands of recovered polio sufferers wait for the “other shoe to drop.” Lauro S. Halstead, “Post-Polio Syndrome,” *Scientific American* (April 1998), 42–47.

Most physicians who remember the polio epidemics and the terrible feeling of hopelessness they evoked would agree with the family doctor who in 1960 said, “Seeing polio go away was like witnessing a major miracle.”<sup>27</sup> *M*

VOLNEY STEELE is a retired doctor who served in the United States Navy during World War II and the Korean War. He ran a family practice in Colorado and completed several years of residency in pathology before moving to Montana in 1959. During his medical career, Dr. Steele was involved in several polio epidemics and witnessed first hand the fear and helplessness that these outbreaks produced. As a member of the Gallatin County Medical Society, he participated in the first widespread distribution of the Sabin vaccine. Dr. Steele received an honorary Ph.D. from Montana State University this spring.