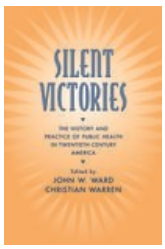

Silent Victories: The History and Practice of Public Health in Twentieth Century America

John W. Ward (ed.), Christian Warren (ed.)

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CHAPTER

5 Polio Can Be Conquered: Science and Health Propaganda in the United States from Polio Polly to Jonas Salk

Naomi Rogers

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Abstract

In the 1940s and 1950s, health officials in the United States regularly published popular guides to polio prevention, therapeutic manuals for the care of paralyzed patients, and inspirational tales of the disabled polio victims overcoming social stigma and achieving success. These tracts became a potent publicity tool to popularize faith in scientific research as the best weapon in the fight against disease. The popularized polio literature combined medical theory, philosophy, public health policy, and frequently a commercial message. Long before the polio vaccines were developed, health experts—especially those employed by the National Foundation for Infantile Paralysis (NFIP)—made scientific research a public enterprise, in which even obscure scientific questions could be laid out and debated.

Keywords: poliomyelitis, National Foundation for Infantile Paralysis, public health, consumer health literature, Jonas Salk, health pamphlets, March of Dimes, Elizabeth Kenny

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On December 13, 2002, President George W. Bush announced that, as a result of growing bioterrorist concerns since the September 11 attacks, his administration was "evaluating old threats in a new light." Bush proposed an ambitious new program to vaccinate as many as 10 million Americans, starting with mandatory vaccination for members of the U.S. armed forces, followed by voluntary vaccinations for "first re-sponders" such as police, firefighters and health workers, with access to the vaccine widening to members of the general public.[1]

Questions about possible side effects and contagion immediately consumed the mass media. For many reasons, Americans were not convinced that the Bush administration's new smallpox vaccination program made sense. To soften public resistance, the Bush administration coordinated a media campaign to call to the public's mind the collective fear of infectious disease that had been so widespread in the United States decades earlier. Both the popular press and public health journals retold the story of New York City's 1947 smallpox scare, illustrated with images of patients scarred by smallpox, and photos of long lines of anxious and impatient people waiting for their vaccine shots.[2,3,4,5] Health professionals revisited America's

smallpox history to assess likely fatality rates and compliance, the effectiveness of health intervention and education, and potential adverse reactions to the vaccine. For a brief moment, the medical past was alive and contagious.[6, 7, 8, 9]

p. 82 Despite this effort to revive memories of the "bad old days" of smallpox, even within the context of post-September 11, America did not embrace the Administration's pre-emptive defense against bioterrorism. Many professional organizations and hospital unions resisted implementing the vaccination program.[10] To an already skeptical public, this resistance made sense, and their doubts seemed validated in March 2003 with the deaths of a nurse, a nurse's aide, and a National Guardsman, and reports of numerous cases of medical complications. The result was the temporary suspension of the vaccine program in some states and the passage of the Smallpox Emergency Compensation Act in April 2003, which provided $42 million for workers and their families harmed by complications from the vaccine.[11, 12] By December 2003, only around 39,000 health workers had accepted the vaccine.[13, 14]

In the 1940s and early 1950s, health officials in the United States did not have to manufacture fear of infectious disease. Polio, although a minor cause of morbidity and mortality, was visible and frightening, a viral disease that crippled some but not all, and occurred in epidemics that could not be safely predicted or prevented. There was no vaccine or other certain preventive measure, and therapies were varied and controversial.[15, 16, 17, 18] The disease was widely discussed in newspapers, newsreels, and family magazines, and science writers like Paul de Kruif, Roland Berg, and Victor Cohn found eager readers for their reports on polio among both the lay public and health professionals (Fig. 5.1).[19, 20, 21]

Figure 5.1.

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This pamphlet from the National Foundation for Infantile Paralysis provided high school students with basic information about what was currently understood about the causes, prevention, and treatment of poliomyelitis, and offered hope for a cure through dedicated research. (From March of Dimes, used by permission.)

The case of polio prompts us to look at early audiences of popular science, for many sources crossed professional lines and were addressed not only to potential patients and their families but also to health professionals themselves. A didactic and prescriptive literature, this polio material sought to create consumers of science and medicine.[22, 23] Anticipating and shaping questions readers might have, polio guides provided information that patients and their families might take to their medical providers, and that nurses and physicians might use to reassure families and neighbors, as well offering optimistic insights into the workings of laboratory scientists and the implications of their research for private and public health practices. There were three main types of popular polio resources: guides to prevention, which suggested practical and reassuring hygiene techniques; therapeutic manuals for the care of paralyzed patients; and inspirational tales of the disabled overcoming social stigma and achieving success in school, the workplace, or romance. By 1940, the health education divisions of medium and large public health departments were regularly publishing and distributing popular polio tracts. During the next decade, however, a new and independent polio propaganda industry arose, spurred by the founding of the National Foundation for Infantile Paralysis (NFIP), a philanthropic organization that raised public funds to pay for medical care, rehabilitation equipment, and scientific research. Popularizing a fervent public faith in scientific research as the best weapon in the fight against disease, writers and designers from the NFIP turned the organization's investment in science into a potent publicity tool. As the title of one NFIP pamphlet proclaimed in 1949, "polio can be conquered."[24, 16, 17, 18]

I will explore several examples of printed polio health literature from the early 1940s to the early 1960s, a period bracketed by the founding of the NFIP in 1938 and the federal government's approval of the Salk

polio vaccine in 1955 and the Sabin oral vaccine in 1960. The polio vaccines appeared at a high water mark in
p. 83 the ↳ history of American biomedical sciences, and they became one of the great symbols of the impressive potential of modern medical research.[25]

Consistently throughout this literature, polio science was personified by two figures: the ordinary clinician and the white-coated scientist (often an MD as well). The popularized polio literature included a little medical theory, a little philosophy, some public health policy, and frequently a commercial message. The audience was urged to consume particular services or products or donate money to continue the process of scientific research and medical care. But the theories and products of science—even its authoritative voice—proved as unpredictable and complicated as polio epidemics themselves. Nonetheless, readers turned to these guides for every kind of information and advice. Following a brief overview of the assumptions and resources shaping the popular conceptions of polio, I will discuss a polio guide distributed by a state health department; two commercial guides produced, respectively, by Metropolitan Life and the manufacturer of
p. 84 Lysol disinfectants; guides representing ↳ the popularized science and professional philanthropy of the NFIP; and finally, a children's book about Jonas Salk, the great polio hero.

Crippled Children, Money, and Medicine

By the 1930s, the care and rehabilitation of crippled children had become part of the larger problem of polio.[26, 27] Polio epidemics were growing more frequent and more serious, and an accurate understanding of how and where polio affected the body became more crucial for both health professionals and the lay public. By 1940, there had been significant transformations in medical and lay interpretations of polio. In the popular imagination, the typical victim of the disease was no longer an impoverished child marked by the signs of institutional neglect but rather an alert, well-fed, mainstream American child. While elite scientists debated among themselves, ordinary physicians and nurses struggled to provide practical and comforting care, sometimes turning to the products and ideas of the most modern science of their day, sometimes rejecting it. The public, similarly, sought out popularized science, assessing for themselves current therapies and theories. We know something of these dynamics from the letters, oral histories, and photograph albums of families, and from articles, conference papers, and discussion sections in professional journals. From the polio guides themselves we see some of the ways elite and popular science, practical care, and reflective theory came together.

Polio had once been seen as a disease of immigrants and the poor, but with the 1932 presidential election of Franklin Delano Roosevelt—a wealthy lawyer from the Roosevelt clan whose bout with paralytic polio a decade earlier had become part of his admirable battle to return to public, political life—polio gained a new cultural importance. Until Roosevelt's New Deal administration established the 1935 Social Security Act, with its special provision to oversee the care of crippled children, polio care was charity care. Private welfare agencies provided some resources, but children crippled by polio jostled for priority with the agencies' other clients disabled by malnutrition, childbirth complications, tuberculosis, and syphilis. In 1938, however, polio philanthropy was transformed by a new kind of professionalized fund-raising with the organization of the National Foundation for Infantile Paralysis (NFIP), headed by Wall Street lawyer Basil O'Connor, Roosevelt's former law partner. Under O'Connor, the NFIP grew into a centralized and highly sophisticated philanthropic organization. Although local chapters were led by prominent businessmen and society women, O'Connor did not rely solely on well-meaning amateur volunteers. He recruited a national staff of professionals from public relations, health education, and science journalism, and he developed close connections with the elite of the medical profession through his friendship with Morris Fishbein, the powerful secretary of the American Medical Association (AMA) and an outspoken critic of socialized and alternative medicine.[28, 29, 30] Despite the use of *foundation* in its title, the NFIP had no endowment like the Rockefeller Foundation, and more like the National Tuberculosis Association, it relied on public funds raised

through its sophisticated March of Dimes campaigns. In the NFIP's modernized campaigns, polio
p. 85 philanthropy was no longer welfare, the crippled no longer the deserving ↳ poor. The propaganda of the NFIP personified polio as a well-dressed poster child, awkwardly leaning on crutches or getting out of a wheelchair. This child appeared defiantly alone—no charity case in an institution surrounded by hovering nurses or physicians, but someone who could be the son or daughter of any ordinary American family.

Until the 1950s, most health officials thought of potential polio victims as children, although epidemiologists had begun to point out the rising numbers of paralyzed adolescents and adults. The NFIP's publicity campaigns identified this fear, exploited it to some extent, and sought to shape it into what were considered appropriate health behaviors. This era of polio research was tumultuous and confusing. As Yale virologist Dorothy Horstmann admitted as late as 1948, "In spite of all the information collected by many investigators in many lands, we still cannot say why poliomyelitis suddenly became epidemic almost 60 years ago, why it is increasing rather than decreasing like other infectious diseases, why it is a summer disease with a preference for certain lands, how it is spread or how it may be prevented."[31] A "filterable virus" had been identified as the specific etiological cause of polio as early as 1909, but the other characteristics of the disease remained puzzling, and different theories of how the virus traveled through the body and the population rose and fell. In the 1910s and 1920s, scientists had believed that polio was a contagious, enteric disease, spread by coughing, spitting, and kissing or perhaps by some asymptomatic "Polio Polly";[20] by 1940, polio was considered a neuro-tropic and unpredictably infectious disease, its virus traveling primarily in central nervous tissue pathways and not in the blood. Only during the late 1940s was polio reconceived as an endemic disease with enteric features, in which blood played a crucial role in developing immunity. According to this new model—one largely accepted by scientists today—the polio virus invaded non-neurological tissues, spreading the disease from person to person by nasal and fecal matter and only rarely causing neurological complications. The theoretical and technical insights of this new model allowed virologists like Jonas Salk to develop a safe vaccine.[15, 32]

Polio Politics, Physicians, and the Public

Health departments had long treaded cautiously in order not to alienate local private physicians, a balance made more difficult during the Great Depression, when general practitioners saw free clinics and other government health services as threats to their dwindling paying patient clientele. Yet as municipal and state officials began closing hospital clinics and wards, with no money to pay medical staff or buy drugs and equipment, New Deal agencies in the 1930s began to venture further into medical arenas. In this desperate medical marketplace, federal officials found that some physicians appreciated the government relief checks that enabled patients to pay their medical bills, as well as the federal works programs that cleared mosquito-breeding swamps, renovated school buildings with fly-screens and toilets, and built hospital wings and laboratory buildings.[33]

In their efforts to stretch limited resources, American families facing sickness in the Depression years relied
p. 86 on domestic remedies, patent medicines, and alternative ↳ practitioners whose fees were lower than regular physicians.[34] But there were also broader forces behind the public's turning away from organized medicine. Although Roosevelt's New Deal advisors recognized the crucial role of sickness in contributing to a cycle of poverty and unemployment, pressure from the conservative leaders of the AMA kept any kind of government health insurance off the federal political agenda. Progressive physician groups like the Physicians Committee for the Improvement of Medical Care (founded in 1937) and the Physicians Forum (founded in 1941) lobbied in Washington to expand government-funded medical services, but they lacked the resources of Morris Fishbein, editor of both the *Journal of the American Medical Association* and the AMA's popular health magazine Hygeia[35, 36, 37]Americans continued to respect medical science and many of its individual practitioners—nurses had especially high status in many communities—but there was growing

anger and resentment among patients in rural areas, patients of color, and the poor, all forced to rely on the goodwill of individual doctors and all facing unequal access to health facilities segregated by class and race.[33]

Recognizing the tense medical politics of the 1930s and 1940s, the NFIP was careful to avoid designing any policies that appeared to value one kind of medical care or practitioner over others. It agreed to pay for any kind of polio care "if recommended by a physician." As some states struggled to determine who should be recognized by law as a licensed physician, the NFIP left the definition deliberately vague. Doctors, nurses, and physical therapists, who appreciated the funding that it provided for medical expenses, hospital bills, and rehabilitative therapy and equipment, extended their loyalty to the NFIP.[38] The NFIP's policies helped to smooth over tensions in the medical marketplace and yet at the same time continued to highlight awareness that polio therapy and research cost money.

The NFIP featured scientists in all their popular guides. Unlike the physicians of the AMA, scientists remained glorious in their white coats, untainted by medical politics and in-fighting, their heroic work dramatized by Hollywood in *The Story of Louis Pasteur* (1936) and *Dr Ehrlich's Magic Bullet* (1940). Insulin, sulfonamide, and later streptomycin and penicillin were hailed as miracle drugs, the products of ever-progressive scientific research. Despite the humanizing writing of science journalists like Paul de Kruif in *Microbe Hunters* (1926), *Men Against Death* (1932), and *The Fight for Life* (1938), scientists remained in the public mind more austere and distant than ordinary clinicians.[25, 39, 40] Writers did have to balance the exciting and inspiring search for scientific truth with the confused state of polio science, which until the early 1950s was unable to explain how polio spread through the body and through the community, or to offer an effective preventative or assessment of the array of therapeutic options. The public, thus, was expected to care about and admire the intricacies of polio science, to understand why scientists had no clear answers yet, and to contribute its faith through funding. Physicians in this literature were presented as reactive figures—ever hopeful, ever willing to try out the products of scientific research and to reassure their patients that polio science was closer to conquering the disease. Medical theories of polio were not restricted to the complex pages of professional journals, but were freely debated and interpreted in the popular press. Such guides played a crucial role in the development of what historians ↳ have called the Golden Age of Medicine. As a topic of popular science polio—so frightening and devastating a disease—had special powers to turn the difficulties of scientific explanation into assets for the consumers of science.

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No Doubt the Day Will Come

In 1941 the Department of Public Health of the state of Illinois published a pamphlet, "Things You Want to Know About Infantile Paralysis," and made it "available to Illinois residents without charge." In its opening section, "Facing the Facts," the public's fear of polio was acknowledged and then dismissed as irrational: "many people seem to have an unreasoning fear of anterior poliomyelitis or, as it is commonly called, infantile paralysis." The morbidity statistics for polio were compared to those of other diseases in order to show that deaths from polio were less common than deaths from diphtheria, pulmonary tuberculosis, or pneumonia. Nor, readers were assured, was polio so unusual in eluding the grasp of doctors and scientists; like polio, rheumatic fever, appendicitis, diabetes, and "a host of other illnesses" had no easy preventative.

Following a common trope that a poorly understood disease must be caused by something "invisible," the guide explained the polio virus in a section entitled "The Invisible Enemy." In terms that reflected the scientific consensus of the 1930s, polio was presented as a confusing kind of enteric disease, with its virus found "chiefly" in the nose, throat, and bowels. But this knowledge had not yet produced guidelines for prevention. "Scientists cannot yet say definitely" whether it is spread by direct contact, raw sewage, contaminated water, milk, other food "or even by summer insects." Drawing on the model of New York

City's department of health that employed bacteriologists and chemists as researchers, the Illinois guide portrayed scientists working not only in university laboratories but also in public health departments. "Scientists in laboratories and in public health work everywhere are constantly studying this virus," the guide explained, "and no doubt the day will come when they can say with certainty just how it is spread from person to person and how it might practically be kept from spreading."[41]

Families suspecting their children had polio were urged to contact their physicians. The phrasing made clear that many families would hesitate to go to a doctor first, preferring to try other initial remedies. "There is just one good thing about being deathly afraid of infantile paralysis," the guide said bluntly, "and that is that such fear may make people call the physician quickly." Readers were assured that timing was critical, for, according to prevailing theory, muscles in the early stages had not yet developed paralysis, and "the physician can do the most to help the patient and to prevent further trouble." Like appendicitis, cancer, pneumonia, syphilis, tuberculosis, and "the majority of diseases," polio could "usually be 'nipped in the bud,' and often cured,*if the physician is called in time*."[41] Care for polio patients in a hospital was neither assumed nor recommended. Indeed, as many readers may have recognized but this guide left unstated, most American hospitals refused to admit polio cases as they were considered too contagious. They were usually sent first to a contagious disease ward, a facility not available in private community hospitals but as
p. 88 a ↳ separate building or wing at the municipal or county public hospital, and later to a crippled children's home or back to their family.[42 – 45] It was, readers were reminded (perhaps because the authority for such decisions was rarely clear-cut), better "for the patient to remain quietly at home than to be moved to a hospital. *This should be decided by the physician*."[41]

Laboratory science, according to the Illinois pamphlet, could offer some definite hope for both families and practitioners. Although private physicians would probably know "what danger signs to look for, and what special tests to make" they could be assisted, for no additional charge, by a "consultant" from the Illinois Department of Public Health. This official not only had special diagnostic skills but could also give the patient polio serum "without charge."[41] Serum made from the blood of patients who had recovered from the disease, known as "convalescent" serum, had been first developed during the 1910s. Although discredited by elite medical journals, and contradicted by the work of scientists like Simon Flexner at New York's Rockefeller Institute for Medical Research, which suggested that the polio virus did not travel through the blood, such serum continued to be produced and distributed by many health departments during the 1920s and 1930s.[16] Further, drawing on another popular theory of adult immunity based on evidence that adults rarely developed the paralytic form of the disease during an epidemic, Illinois health officials also used "normal adult serum" collected by state officials from "healthy city-bred adults" who have usually "built up, in their own blood serum, a strong degree of resistance to the disease."[41] The use of serum no longer made scientific sense in 1941, but patients and their families could take comfort in the imprimatur of the public health laboratory.

Anticipating the future of a disabled person in 1941, Illinois officials recognized, could be disheartening for both child and parents. Yet should the child recover without paralysis, the pamphlet assured readers, a "single attack" usually conferred "lifetime immunity" to the disease. Even if there was significant paralysis, however, there could still be hope for a "normal" life. Families were urged to turn to the example of the nation's most prominent polio survivor—who had just been re-elected to an unprecedented third term—for comfort and inspiration: "even the unfortunate patient who is left physically handicapped by infantile paralysis may live to be a President of the United States of America."[41] Unconscious of the ironic yet powerful symbolism of a disabled president who hid his disability, these were words that parents and health professionals could use to reassure a child, relatives, and other members of the community.[26, 46, 47]

Keep Your Home "Hospital Clean"

By the late 1940s, rehabilitation medicine was reinvigorated as a professional specialty as it moved out of crippled children's homes and into veterans' hospitals.[48, 49] The war generation was returning to peace and suburbia, having experienced not only the impressive military medicine of skilled surgery and antibiotics, but also the constant propaganda of the Office of War Information's posters, movies, and pamphlets warning against enemy spies, venereal disease, mosquitoes, and mental disease. Both the tactics and
p. 89 personnel of the NFIP's impressive publicity facilities had ↳ been harnessed as part of these militarized health campaigns. During the war, Basil O'Connor had taken on an additional role as head of the American Red Cross, and Dorothy Ducas, from the NFIP's Public Relations Department, had run the Magazine Division of the Office of War Information.

In the economic boom of postwar America, more families were buying private health insurance and seeking health care at doctors' offices and hospitals.[50, 51] The medical marketplace was infused by the postwar economic boom. Even before the war the production of popular science and medical advice had been expanding beyond the work of health departments to include a mixture of voluntary agencies, commercial manufacturers, disease philanthropies, life insurance companies, and pharmaceutical industries. The first edition of pediatrician Benjamin Spock's best-selling *Baby and Child Care* appeared in 1946, and life insurance companies sought out the same market. In 1946, the Metropolitan Life Insurance Company came out with *Common Childhood Diseases*, a 35-page "reference book, for permanent use in the home" consisting of a compilation of the many health-education pamphlets that Metropolitan Life had been producing "for a long time."[52] Scientific investigation, readers were reminded, was an incontrovertible means of medical progress: "it is comforting to parents to know that many new ways have been found, through recent discoveries in medical science, to protect the life and health of babies and young children."[52] Although this pamphlet appeared 8 years before the development of a polio vaccine, immunization against smallpox and typhoid had become a standard part of middle-class pediatric practice, a crucial part of what historian Nancy Tomes has identified as the growing notion of health as a "luxury good."[22] Urging health consumers to expand their use of physicians for well-baby care and regular pediatric visits, the book included an "Immunization Timetable" and a model "Record of Immunization," as domesticated models of a doctor's office chart.[52]

Fourteen diseases were discussed in the Metropolitan Life guide, with three pages allotted for polio. By 1946 most scientists had rejected the enteric picture of polio, and they saw polio as a disease of the nervous system.[32, 16] Polio, readers were told, "is caused by a virus which attacks the central nervous system."[52] The decline of the enteric model, however, left the problem of how to protect a child from infection. There were no "specific means of preventing infantile paralysis," but Metropolitan Life urged parents to take "various precautions" like keeping children away from "movies, parties, crowded trains, and all public gatherings" and "from public beaches and swimming pools" during an epidemic. A brief reference to the enteric model surfaced with a warning to avoid playing in or near streams, lakes, or ditches into which sewage drained, for the virus "as well as the germs of other diseases" had been found in "sewage-contaminated water," a reference to the work of epidemiologist John Paul and his Yale Polio Unit. Most usefully, from a prescriptive standpoint, the neurotropic model of polio had reinvigorated an older view about the danger of focal infection. Thus, children should avoid having tonsil or teeth extractions or other operations "on and about the nose, throat and mouth," lest the polio virus enter the body "and come in contact with nerves."[52] The rest of this advice drew on familiar general arguments about private hygienic behavior. As the mechanism of polio's transmission was "still unknown," parents should, "to be on the safe side," "keep the home as clean as possible. Use plenty of soap and water, fight flies, mice, rats, and other
p. 90 vermin, ↳ and protect food from flies." Children should additionally be guarded "from overfatigue and

from sudden chilling." This advice, the guide tried to make clear, was not to be taken as a replacement for professional medical care: "do not delay" in consulting a doctor "for even minor upsets."[52]

The Metropolitan Life guide presented the greatest scientific progress as having occurred in the area of polio therapy. The care of paralyzed patients had never been made the subject of any elite scientific research program, so the guide derived its conclusions from an unconventional source, carefully disguised. As a yardstick of progress, parents were first reminded that only 15–20% of those infected by the polio virus developed permanent paralysis, and that many "show a complete and early recovery."[52] The American public had become more optimistic about healing polio's crippling effects with the publicized work of Sister Elizabeth Kenny, an Australian nurse who had set up her own polio institute in Minneapolis in 1942, and who traveled around the country propounding her method of early treatment by "hot packs" and specific physical therapies.[17, 26, 53–55] By the mid-1940s Kenny's methods were widely adopted by nurses, doctors, and physical therapists, although researchers still disagreed with her theories of the disease, and clinicians were not convinced that her methods must be practiced only by a formally trained Kenny therapist. Kenny's struggles to convince doctors of the worth of her method were dramatized by Hollywood in *Sister Kenny*, a 1946 RKO movie starring Rosalind Russell. Recognizing her popular appeal and the simultaneous controversy among health professionals, the writers of the Metropolitan Life's guide tried to have it both ways, not naming Kenny but nevertheless arguing that recovery would be speedier and that "crippling aftereffects" could be prevented or lessened with "early treatment under a skilled physician, nurse and physical therapist" who understood the importance of "proper controlled rest and motion of the affected muscles."[52]

The commercial implications of preventive techniques practiced at home were clearly spelled out in contemporary guides, such as a *Handbook on Infantile Paralysis* distributed by the manufacturers of Lysol disinfectants, in which advertisement was mixed with a condensed version of a 1950 article on polio by a *Good Housekeeping* science writer. As the manufacturer stated on the front cover—although in small print—the pamphlet's distribution was "a public service with no intention of suggesting that LYSOL will prevent or cure Polio." Nonetheless readers could easily be misled by the smiling family featured on the cover: a husband carrying a toddler and a mother with her hand on a teenage girl's shoulder, relaxed, healthy, and free of anxiety.[56]

At the center of the pamphlet, interrupting the text on polio, were two pages addressed to "MOTHERS!" The idea of scientific motherhood had by the 1940s become a standard part of both public health education and commercial texts, playing on the public's growing "germ consciousness" and rising consumer anxieties.[57, 58] "Do this to help keep your home *hygienically* clean—as many health authorities recommend," the explicit advertising section urged women. "No available household germicide—not even LYSOL—will kill the polio virus. Yet LYSOL, the world's largest-selling germicide, will help you keep your home 'hospital clean.'" This
p. 91 call ↳ was accompanied by a picture of a modern, safe hospital, reflecting the expanding use of hospital care by middle-class Americans, especially for childbirth,[56, 59, 61] and using the same arguments hospitals had developed to attract paying patients. And the places that Lysol's "*effective antiseptic* solution" would be especially useful recalled the enteric model of polio: it would clean the bathroom and kitchen, and disinfect baby's bed, playpen, diaper pail, and the sickroom.[56] Laboratory research was also part of what made this product safe and effective (and free from intrusive FDA labeling): "scientific research has developed an amazing new-formula 'Lysol' ... [so that it] needs no poison label, but it has the same germicidal power it always had."[56]

Despite the Lysol pamphlet's warnings of the dangers of intimate personal contact, towels, bathing, and kissing, the text borrowed from *Good Housekeeping* referred consistently to the neurotropic model of polio. According to *Good Housekeeping*, the virus of infantile paralysis "enters the intestinal tract usually through the mouth or nose," then travels "briefly through the blood stream" and then "attacks the nerve cells."[56] "People are inclined to believe that polio is a mysterious ailment about which very little is known. Actually,

doctors do know a great deal about it ... in the last two decades.... Much more has been learned."[56] Unlike the Illinois pamphlet, which had identified "city-bred adults" as the best source of serum, the public was now warned that infection could occur as frequently in the city as in the country. Health officials were starting to reject the most draconian quarantine measures employed during polio epidemics, and the public was assured that it was not necessary during epidemics to close schools, fairs, circuses, and swimming pools, although children should probably avoid the latter "during an outbreak."[56] In another change from the early 1940s, therapy was reconceived as best undertaken in a hospital. Cases with severe paralysis should be taken to a hospital "not because of the risk of contagion but because good care for this type of polio patient requires the services of a team of experts."[56]

The pamphlet did not mention polio serum, but did discuss the blood-concentrate gamma globulin, which had been used during World War II and had been tested as a polio preventive in the late 1940s.[16] Anti-polio gamma globulin "is not and could not be the final answer to the polio problem," for recent scientific evidence suggested "that paralytic polio could probably be prevented by vaccination."[56] Nevertheless, many of the techniques and therapies discussed were clearly intended to be used at home: bed rest to prevent deformities, a firm, hard bed, blanket rolls, pads or sandbags to keep limbs in proper position, and (without using Elizabeth Kenny's name) "intermittent hot packs" for relief from pain in order to "to get the muscles and joints moving as soon as possible."[56]

Polio Can Be Conquered

Polio Can Be Conquered was the bold title of a 1949 pamphlet written by science reporter Alton Blakeslee of the Associated Press (Fig. 5.2).[24] Like most polio writers in the 1940s and 1950s, Blakeslee had written this
p. 92 guide in cooperation with the ↳ NFIP, relying on its publicity department for images and scientific information. On the inside and back covers the publisher claimed the additional authority of public service: the New York Public Affairs Committee, which had been established a decade earlier "to make available in summary and inexpensive form the results of research on economic and social problems."

Figure 5.2.

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Alton Blakeslee's pamphlet "Polio Can be Conquered" exemplifies the NFIP's approach to promoting public confidence that scientific research was the best weapon in the fight against disease. (From March of Dimes, used by permission.)

In the 1940s, a new generation of American virologists had begun to find the virus in blood and in non-neurological tissue, thus undermining the picture of polio as primarily a disease of the nervous system. By the end of the decade John Enders's team at the Boston Children's Hospital had published their innovative demonstration of the way the polio virus (and therefore, in theory a vaccine) could be grown in safe, non-neurological tissue. This research won the Boston group a Nobel Prize in 1954, just at the time that Jonas
p. 93 Salk's polio vaccine was being tested in trials organized ↳ and funded by the NFIP.[16, 18] But while the pamphlet's opening sentence announced that "the conquest of polio now is in sight," Blakeslee's science was seriously outdated and did not reflect the most recent breakthroughs.[24] In Blakeslee's account blood played no role in spreading the polio virus through the body. Scientists knew that "antibodies are in the blood," he explained, but that the virus only "attacks the nerve cells. The two do not come into contact."[3, 4, 24] "We don't know yet how polio spreads," Blakeslee admitted, pointing to reliable standbys like coughing, sneezing, food, or airborne dust. "Certain kinds of filth flies" had been blamed but there was "no conclusive evidence," nor was there "proof" of the danger of catching polio by swimming in sewage-contaminated waters.[24]

Compared to the old-fashioned, general advice about polio's transmission, the therapy sections of Blakeslee's pamphlet were concrete and optimistic. Drawing on recent research on polio rehabilitation, Blakeslee was able to offer impressive specificity in his assessment of the likely impact of polio infection: 40–60% of cases would recover completely, 25–30% would be mildly affected, 15–25% severely, and 8% would die.[24] (According to the *Good Housekeeping* reporter, 50% of those infected by polio recovered "completely," 30% had a "slight handicap," 12% had "severe aftereffects," and 8% died.[56]) Reflecting the widespread integration of Elizabeth Kenny's methods, Blakeslee argued that affected muscles must be "stretched and exercised, even though the exercising caused mild pain." Kenny had little use for water therapy and believed any splinting was harmful, but Blakeslee suggested using a "warm pool" and bed rest, corsets, and splints.[24] In his discussion of therapy, Blakeslee referred to the heated debate over Kenny's theory of the disease. Polio, she had argued, was systemic rather than solely neurological, and those who employed her therapeutic methods but did not accept her theory would not be successful. Kenny had used these arguments as part of an attack against the monopolistic NFIP, but here Blakeslee relied on the familiar NFIP response to her claims that while "this question of *the nature* of the disease still remains open," irrespective of theory, polio treatment "is essentially the same" and "with trained personnel the results are similar."[24]

Kenny's criticisms of the NFIP had linked poor science to autocratic organization. Perhaps to defuse such attacks, Blakeslee was careful to remind a wary public that polio patients and their families did not receive "charity, in any sense. Rather, the funds from the March of Dimes are a trust fund to restore health, strength, and usefulness to polio victims."[24] These "dimes and dollars given by the American people" are also used to finance researchers who seek "to learn the habits of the polio virus and then to block its march along human nerves. They finance the search for the bullets of drugs or vaccines to end the insidious career of an unseen enemy."[24] In this story, doctors were portrayed as consumers of science like their patients, the simple recipients of scientific tools: "top scientists predict that a safe vaccine for humans will some day be found."[24] The popular fascination with the scientist in white, the drama of the laboratory, and the magical products possible from research were reinforced by new NFIP posters in the late 1940s that featured not only a child discarding braces or a wheelchair but also a scientist holding a test tube.[18, 45]

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Polio Survivors Tell Their Stories

By the late 1940s, there was an expanding audience for polio literature: the adult polio survivor.[62] Disabled men and women began to play an active part in the polio industry as the writers and designers of polio guides. In 1949, Turnley Walker, a public relations consultant, was paralyzed by polio and entered New York's Hospital for Special Surgery, his care paid for by the NFIP. He had been considering a professional writing career, and while in the hospital he began to write about his experience as a "polio," a newly popular term, usually applied to adults. Walker saw this effort as a way of producing "something for use in the March of Dimes. My only thought was that I might be able to do something to help repay the Foundation for saving me and my family from total financial disaster."[63] When the North American Newspaper Alliance syndicate published Walker's material in newspapers around the country, the great popular response led him to write a book, *Rise Up and Walk*, which was chosen by the Book of the Month Club in 1950.[64, 65]

One section in *Rise Up and Walk* describes Walker and other polio survivors reading and responding to popular polio tracts. It was hardly a critical view, as the book was distributed by the NFIP, but Walker conveyed something of the emotional and intellectual appeal of this kind of literature in the late 1940s. For disabled adults, especially men who were the main economic resource for their households, the experience of paralysis was fraught with emotional and financial worries, as few standard private health insurance plans covered polio's extensive therapy and rehabilitation costs. Walker described his own "overpowering worry" about "the costs of the hospital and your treatments," for "the medical equipment and attention

which surround you indicate the terrific expense of polio."[64] The financial side was ameliorated first, he recalled, when his wife appeared at his hospital bedside "carrying a miracle in the shape of a brisk white business envelope." As she read it, "gratefulness at what it says makes you weep together." The NFIP pamphlet explained that the organization "will stand behind you, taking care of all your medical and hospital expenses if need be, until you are able to go to work again ... it lets you *know* that you are not lost forever, but only out of circulation for a while because of a dreadful accident."[64] Walker and his fellow patients discussed the NFIP later among themselves and began to see the organization "suddenly become a personal and powerful friend of yours."[64] They also found the NFIP view of polio as an "accident" that would not necessarily lead to total dependence for disabled adults facing life out of the hospital useful to counter the therapeutic pessimism of hospital staff. "It is strange and interesting how completely the Foundation has become the final authority for all of you. You have come to know that it is your great ally in your fight, stronger than the hospital, as wise as all the doctors."[64]

The second NFIP pamphlet that Walker encountered while in the hospital addressed polio as a puzzle of science. The guide became not just a source of personal revelation but a social tool as other patients asked him read it out loud. "You begin to read, intending to skip along the highlights. But the book holds your attention, line by line ... polio is no longer simply the strange numbness which grips your leg but a coolly
p. 95 insane murderer crawling through your neighborhood with sub-microscopic ↳ stealth.... You glance up, and see the other faces riveted upon your own."[64] The book's dark and dramatic presentation of polio had great emotional appeal for these men. "You are reaching some understanding of the terrifying virus which slithers its way into the brains and spinal cords of children and grown men by pathways not yet discovered ... the sole deadly epidemic still at large."[64]

The book that so riveted Walker and his hospital companions was Roland Berg's *Polio and Its Problems*, funded, published and distributed by the NFIP in 1948.[20] Following the familiar preface, which stated that "*polio is an uncontrolled disease*," Berg presented scientists as the single source of hope for conquering polio; medical practitioners, by comparison, were weaker men, sometimes diverted from the path of scientific truth by a desire to comfort.[20] Berg explained that the neurological theory of polio made therapies based on blood-borne immunity obsolete. Thus, doctors who still resorted to the use of polio serum ignored "the adverse results of experimental and clinical study" that had shown "virtually no evidence that the virus passes through or remains in the blood stream."[20] "It is often difficult," Berg acknowledged, "for the physician who may not value its use to withhold it. If he should do so, and his patient should develop paralysis or die he may be blamed by the parents or relatives for neglecting to take all measures possible."[20] Such a situation was "unfortunate" for "it is not consistent with medical ideals." Later he reminded both medical and lay readers that "serum has a protective quality but no therapeutic value."[20]

Berg's account of the fight against polio discussed only one practicing physician, the "prominent New York pediatrician" Philip Stimson, who could detect even the smallest signs of illness which "may mean infantile paralysis."[20] Using the NFIP's typically dramatic term for polio, Berg warned "Don't take a chance with the Crippler. Play safe; put the patient to bed and don't delay calling a physician." In an aside that contradicted March of Dimes campaigns, Berg also warned his readers against the "popular misconception ... that any disease can be conquered if sufficient money and skill are gathered for the purpose"; unfortunately, "progress in medical science cannot always be thus purchased." But some pages later, without irony, he referred to the time when "scientists discover the golden pill for polio that will forever remove the menace." In an effort to counter the popular belief in polio as a disease that baffled scientists, Berg argued that "it is surprising how large a store of knowledge has been built up—especially in the last 10 years of concerted research." His final sentence, with a flourish, made firm the link between polio and science, for "only in the laboratories of medical scientists still seeking the absolute cure or prevention, can the problems of polio finally be answered."[20]

At Home in the Privacy of His Laboratory

With the massive publicity around the Salk vaccine trials of 1954, the clinical professional in popular polio literature was transformed fully into a science consumer. Now, both physicians and nurses were pictured as skilled technicians, applying the new scientific technology developed by great research heroes who had
p. 96 conquered ↳ polio. During the 1950s, children became a new audience for this kind of polio literature, which was now framed as a children's science story. In Dorothy and Philip Sterling's *Polio Pioneers: The Story of the Fight Against Polio* (1955), polio history was remade into the story of virus hunters alone. Doctors, when they appeared, gratefully received the insights of scientific researchers who were the ones who actively discovered "how to hunt a germ" and "how to fool a germ."[66]

In 1960, science writer John Rowland, already the author of *Ernest Rutherford: Atom Pioneer* (1955) and *The Penicillin Man: The Story of Sir Alexander Fleming* (1957), turned polio history into the saga of one man, Jonas Salk. In *The Polio Man: The Story of Dr. Jonas Salk*, Rowland ignored the work of Salk's rival Albert Sabin and Sabin's live virus vaccine, which would shortly be approved by the U.S. government as the official American vaccine.[68 – 69] Salk was the public's favorite, and as an NFIP grant recipient, he had the entire NFIP publicity department behind him. Salk's vaccine had been quickly made a symbol of the culmination of the years of public donations to the March of Dimes. Rowland made Salk's identity as a trained physician part of the story and called him "Dr. Salk" throughout. Working with patients had helped, in this version of his biography, to humanize Salk and distinguish him from chemists and other laboratory researchers distanced from the human consequences of disease. As a boy the young Salk had told his father "I don't really want to be an ordinary doctor. ... I want to find out something of the causes of the disease."[69] His experience as a "medical research man" at New York's Mount Sinai Medical Center taught him clinical priorities and "gave a sense of urgency to all that was being done, since there was always the knowledge that a research task done in a few days, instead of a few weeks or months, might save lives.... The task of the ordinary doctor is to fight disease when it shows itself," Salk learned, but "even more important and even more valuable ... is the medical research workers who tried to stop the illness from coming at all."[69]

As a scientist Salk was made to embody all the ideal virtues of the Cold War researcher: self-effacing, uncomfortable with the press and publicity, interested not in worldly honor and glory but only in further pursuing his scientific work. In this post-*Sputnik* era, science writers who wrote inspirational stories of great scientists as a means to attracting young people to the scientific professions were conscious that they were performing a distinctly patriotic duty. Character, as the well-publicized travails of Robert Oppenheimer, Julius Rosenberg, and other "atomic science spies" demonstrated, was a crucial element in securing American democracy and global harmony. Thus, according to Rowland's depiction of the famous April 1955 meeting where results of the year-long assessment of the Salk vaccine trials were announced, "the press conference was a trying business for Dr. Salk, who still felt much more at home in the privacy of his laboratory than he did facing a battery of newsreel cameras and a crowd of reporters from newspapers."[69] After the announcement, although reporters pleaded with him, Salk "would give no hint" of his next research projects. As Salk explained it, "The scientist isn't a politician, and isn't a propagandist. He observes and classifies facts, and then he reaches conclusions on the basis of the data at his disposal. He must avoid being influenced by the pressures on him, or even by the bias of his hypotheses."[69] Salk's single
p. 97 breach of scientific ethics occurred in his relationship with the NFIP, "that great charitable ↳ body" which had "helped the work with substantial grants—for such a piece of research on such a large scale is an expensive business." Salk had kept NFIP authorities "informed" of the progress of the vaccine trials, for "after all, the Foundation had provided the large sum of money that was necessary to launch the trial, and it was only fair that they should be given what information was available." Nonetheless these officials were "sworn to secrecy."[68] Thus Salk was praised for his awareness of the importance of patronage in the marketplace of science, yet he was also the epitome of the cautious scientific researcher who "would never

take all the credit to himself, as many a lesser man would have tried to do" and who "never thought of himself as an inventor, a patentee of something out of which money could be made," replying to reporters, in a widely repeated remark, "Can you patent the sun?"[68, 69]

Conclusion

By 1960, as the tone of Rowland's book suggests, the messy horror of epidemic polio was beginning to fade into history, to be replaced by the cleansing certainty of the laboratory. The drama of medical and scientific battles, the dashed hopes of families struggling with a paralyzed child, the desperate effort to keep houses and streets clean enough to halt the unpredictable and unstoppable—these stories now can be captured only in memoirs or in some of the images so useful to American officials in their recent bioterrorism mobilization campaigns. The contradictory therapeutic prescriptions and explanatory versions of the disease were probably visible to an educated public then, as now. But even before the polio vaccines were developed, health experts—especially those employed by the NFIP—made scientific research a public enterprise, in which even obscure scientific questions could be laid out and debated. The assumption that public funding of science was an appropriate civic activity would be developed later in much greater political sophistication by HIV/AIDS and breast cancer activists.

Polio is still a frightening disease. In 2004, global health protests emerged over the Nigerian government's suspension of its vaccination program and the World Health Organization's warning that travelers to West and Central Africa should be fully immunized against the disease. These events may prompt new therapeutic investigations of polio and focus public health policy once again on polio-vaccination education and enforcement.[70] Whatever historical parallels are drawn on in the case of Nigeria, it is clear that the history of disease remains a powerful and constant tool for government officials, medical professionals, the mass media, and the public. During the first SARS outbreaks in 2003, newspapers and television news programs displayed old photos of passengers riding trolley cars and police directing traffic, all in face masks to ward off infection during the 1918–19 influenza pandemic—pictures eerily matched by contemporary images in Hong Kong, Beijing, and Toronto. In both epidemics, health professionals and the lay public were dying; in both epidemics, people wanted scientific tools to predict, prevent, and heal. Calling on history, even when its stories were horrifying and deadly, still in a way had the power to clarify and reassure.

p. 98 ***Acknowledgments***

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