Annotated Bibliography of Suggested Resources in Support of the Module


Colt, S. (Producer). (2009). *The Polio Crusade* [DVD]. Available from PBS Home Video. This program was part of PBS’s *American Experience* series. It closely follows Oshinsky’s book and gave me a way to provide students with background information to understand their assigned reading selection.


Other Supporting Materials

The two web sites I suggested students examine to find their own case studies were:
http://www.bioethics.iastate.edu/classroom/case_studies.html
http://www.onlineethics.org/Resources/Cases.aspx
“The Biggest Public Health Experiment Ever”

THE SALK VACCINE TRIALS OF 1954 HOLD A SPECIAL, almost reverential, place in the annals of American medicine. Even the most recent articles, written three, four, and five decades after the event, carry titles such as “Making History,” “The Shot Heard Around the World,” and “The Biggest Public Health Experiment Ever.” “The modern era of vaccine evaluation began with the landmark field trial of inactivated poliomyelitis vaccine,” said one. “The polio vaccine field trials ... are among the largest and most publicized clinical trials ever undertaken,” said another.1

The view from 1954 reflected the same sense of historical excitement. National attention was riveted on the vaccine trials, with news coverage rivaling the other big stories from that remarkable spring—Brown v. Board of Education, the Army-McCarthy hearings, and the fall of Dien Bien Phu. Salk’s likeness adorned the cover of Time magazine. A Gallup poll showed that more Americans were aware of the field trials than knew “the full name of the President of the United States.” By one estimate, two-thirds of the nation had already donated money to the March of Dimes by 1954, and seven million people had volunteered their time. Never before, it appeared, had Americans taken such a personal interest in a medical or scientific pursuit.2

From a managerial standpoint, the field trials were divided into three parts: operational planning, vaccine production, and statistical evaluation. Part one involved a mobilization reminiscent of a country preparing for war. “Our basic problem,” wrote Melvin Glasser, the man chosen to coordinate this herculean effort, “was to get three doses of [polio] vaccine or control solution into the arms of approximately 650,000 schoolchildren ... and keep accurate records on all involved in the trial.” Nothing like this had ever been tried before. There were no precedents to follow, no corporate donations to be tapped, no federal assistance. This was virgin territory, the biggest medical gamble in history. The National Foundation for Infantile Paralysis was completely—some thought distressingly—on its own.3

That, of course, was the way Basil O’Connor had envisioned it. Seeing polio as the exclusive territory of the foundation, he had fiercely opposed the “outside interference” of other groups, especially the government, which, he warned, would ensnare the polio crusade in a web of red tape and “socialist thinking.” Unlike the American Cancer Society and American Heart Association, which strongly endorsed federal funding for cancer and heart research, the foundation had always lobbied against such funding for polio research, describing it, in words reminiscent of Senator Joseph R. McCarthy, as part of a “Communist, un-American ... scheme.” So relentless was its message, so powerful was its voice, that others did step aside, leaving the foundation free to pursue its crusade as it, alone, saw fit. At a time when government support for science and medicine was becoming the norm, a top official at the National Institutes of Health told Congress: “We have felt for many years that [the foundation] supports research on such a scale that it would not be wise for us to direct our resources away from other important fields which are not so well covered to this one which is.” In that year—1953—the foundation spent about $2 million on polio research; the National Institutes of Health less than $75,000.4

O’Connor never doubted the foundation’s ability to run a major vaccine trial or the public’s willingness to support it. Volunteers could easily be mobilized, he thought, and the money could be raised. Indeed, despite a record-breaking $55 million March of Dimes campaign in January 1954, the foundation would conduct its first ever warm-weather appeal in August, raising an additional $20 million to meet the ballooning cost of the trials. There would be some bad blood over this, with a number of cities denying the March of Dimes a solicitor’s permit on grounds that it was siphoning too much money away from other worthy causes. O’Connor, naturally, was unmoved. Philanthropy was about choices, he would say. “The year the American people decide
they don’t want to give us what we need in order to do the job, we’ve
got to close our doors! That’s how democracy works.”

The vaccine trials would test the National Foundation as never
before. Because millions of parents would be asked to risk their
children in a potentially dangerous experiment they knew very little about,
educating them and easing their fears would be essential. County health
officials and school administrators would have to be involved; so, too,
medical societies, newspapers, and PTAs. Tens of thousands of vol-
unteers would have to be trained. The whole process “required infinite
care in planning and execution,” Glasser recalled. “We estimated that
approximately 14,000 school principals, 50,000 classroom teachers,
20,000 physicians and 40,000 nurses would be needed. [We also required]
somewhere between 200,000 and 250,000 active non-professional vol-
unteers.”

Each of the 211 participating counties held a two-day workshop to
plan for the trials. Doctors and nurses were briefed about running a
vaccine clinic; school principals and teachers about record keeping and
contact with parents; chapter volunteers about public participation,
including ways to interest “the Negro population.” The most delicate
issue by far concerned how aggressively children were to be recruited
for the trials. Or as the March of Dimes “Discussion Guide” aptly put
it, “What pressure should be exerted on parents to get them to sign the
request form?”

There was no formal answer. Local counties were expected to meet
their quotas with ease. On the one hand, recruiting children was not
expected to pose a serious problem in 1954, given the widespread ap-
prehension surrounding the disease. On the other hand, parents needed
to know that the trials posed little or no threat, that the risks paled in
comparison to the rewards. In the end, it came down to a contest be-
tween fear and faith. Americans had long supported the foundation in
its effort to end the scourge of polio. Did they trust it enough to put
their children on the line?

In a form letter to parents, O’Connor described participation in the
trials as a moral act, benefiting not just the volunteers but generations
to follow. “This is one of the most important projects in medical his-
tory,” he wrote. “Its success depends on the cooperation of parents.
We feel sure you will want your child to take part.” Volunteering, there-
fore, was cast as a privilege bestowed upon youngsters special enough
to be called “polio pioneers.” On the parental consent form, the stan-
dard phrase “I give my permission” was changed to “I hereby request,”
implying that not every child would be fortunate enough to be picked.

The potential risks were aired but quickly dismissed. The ominous-
sounding “human experiment” was dropped in favor of “vaccine field
study,” which had the ring of a benign academic exercise. Parents were
told that a killed-virus solution “cannot cause the disease,” that the
vaccine had been “used safely on over 5,000 volunteers, including Dr.
Salk, his wife, and three young sons,” that the placebo was a “harmless,
but ineffective solution,” and that the injections were “only slightly
painful” with “no unpleasant effects.” So confident was foundation that
it claimed the sole purpose of the trials was “to determine whether the
vaccine, already proved safe, will give adequate protection against para-
ylytic polio.”

Before leaving the National Foundation in the fall of 1953, Harry
Weaver had made a private deal. Plans for the vaccine field trial were
just getting underway. In Toronto, Connaught Laboratories was cul-
tivating large amounts of live poliovirus in a special solution known as
Medium 199; in Pittsburgh, Jonas Salk and his staff were busy improv-
ing their vaccine. The problem was that Salk had neither the time nor
the facilities to turn out the sheer volume needed for the sort of field
trial the foundation had in mind. This level of vaccine production would
require a commercial source.

In the spring of 1953, Weaver had asked Parke-Davis of Detroit, a
major pharmacological house, about its interest in manufacturing Salk’s
polio vaccine. Parke-Davis was a logical choice. Founded just after the
Civil War, it had a long list of credits, having isolated the first hor-
mone, epinephrine, in pure form (Adrenalin), marketed the first anti-
histamine (Benadryl), and produced the first antibiotic by chemical
synthesis (Chloromycetin). More important, it had a deep interest in
the development of viral and bacterial vaccines. Weaver’s understand-
ing with Parke-Davis did not bind either party. It was an oral agree-
ment, leaving the foundation free to pursue other options if it chose.

For several months, Parke-Davis had the polio vaccine market to
itself. Each week, Connaught Laboratories would send a station wagon
filled with bottles of live poliovirus across the Canadian border to De-
troit, where Parke-Davis had built a plant to manufacture the polio
vaccine according to instructions provided by Salk himself. The process was complex and problems soon arose. Given the urgency, Parke-Davis felt great pressure to move things along. This led to production mistakes that the company blamed on Salk’s faulty instructions, and that Salk, in turn, blamed on company error. To make matters worse, Salk was still refining his product, which meant that the advice he provided Parke-Davis was in a constant state of flux. “I [hadn’t] time to advance my work to the point of deciding what combination of virus, formalin, temperature, inactivation time, acidity, and so on would yield a vaccine most suitable for the field trial,” he said later, “yet I found myself . . . committed by Weaver to assist in the manufacturing process.”

It was a recipe for trouble. Lacking proper oversight, Parke-Davis found itself unable to reliably duplicate Salk’s results. Live poliovirus was discovered in a number of its early batches, leading the foundation to quickly change course. In the fall of 1953 O’Connor invited other pharmaceutical houses to join the vaccine production effort, including Eli Lilly, Wyeth, Sharpe and Dohme, Cutter Laboratories, and Pitman-Moore. Though Parke-Davis didn’t bow out of the process, its brief monopoly was gone.

What O’Connor offered these companies was hardly risk free. They would have to build expensive production facilities; the field trials could easily fail; and the vaccine they manufactured would have to be sold at no profit during the length of the trials. Of course, if everything worked out—if the field trials proved successful and the government agreed to license the Salk vaccine for commercial production—the companies would enjoy a financial windfall in the future. The choice was theirs.

Tougher quality controls were also introduced. Each batch of polio vaccine would be triple tested—by the drug firm, by Salk’s laboratory, and by the Public Health Service—to assure its safety and potency. In addition, O’Connor and Thomas Rivers prodded Salk to produce a set of concrete specifications for the manufacturers to follow. “You have to spell out everything and you can take nothing for granted,” Rivers recalled, “because if anything later goes wrong you can’t turn around and say to the commercial producer, ‘Why any damn fool knows that you should have done thus and so.’ Everything has to be put down, the i’s dotted and t’s crossed.”

But Salk kept procrastinating, overwhelmed by competing demands. As weeks turned into months, two government virologists, Joe Smadel and William Workman, agreed to draft the specifications from notes provided by Salk. Everyone was relieved. “It will be a big help to me,” Salk told them. “I can’t write specifications and do my own work at the same time.”

In the end, all of the polio vaccine used in the 1954 field trials was supplied by two pharmaceutical houses—Eli Lilly and Parke-Davis. The latter solved its production problems with the aid of more detailed specifications and more careful quality control. The four other companies—Wyeth, Sharpe and Dohme, Cutter, and Pitman-Moore—would enter the market in the following year, when the government gave the go-ahead for commercial licensing of the Salk vaccine.

That fall, on his thirty-ninth birthday, Salk received a telegram from the one person who had as much invested in the trials as he did. “You Connaught know life until you are one year older,” it teased.

Till then you have to rely on the sage of 120 Broadway and Albert (not Einstein) to see you through this adolescent period. Twenty years from now this will be Interesting But Good History and you will be a man. I’ll be back on my regular job then. Best wishes from one who knows—Basil O’Connor.

At the University of Michigan, meanwhile, the man who would judge these field trials had begun to set up shop. In February 1954, Thomas Francis opened the Vaccine Evaluation Center in the medical school’s old maternity hospital, a crumbling brick structure rendered obsolete by a new birthing facility a few blocks away. To Jonas Salk, it must have seemed like an omen. His vaccine, designed to save the lives of children, would be judged in the same building where two of his sons, Peter and Darrell, had been born.

Using foundation money, as promised, Francis went to work. His budget—a blank check, really—included line items for salaries, equipment, supplies, travel, communications, statistical operations, editing and coding, punching and tabulating, building alterations, and indirect costs to the university. Before long, however, Francis found himself confronting the very safety concerns that the foundation had considered—and rather cavalierly dismissed. Queries poured into the Evaluation Center from people who had seen reports or heard rumors about the “hidden dangers” of the Salk vaccine. Several health departments in California expressed concern about the inactivation process. Was Francis certain that there was no live virus in the vaccine? Perhaps
he could fly out and address this issue in person. (He did.) Health officers in Erie County, New York, worried about “the possible presence of other viruses,” unseen and untested, that might have entered the vaccine through the monkey kidney tissue used in production. (Francis sent them material about the sterilization process.) Officials in Michigan had heard that “a tuberculin-like reaction was encountered with one of the vaccine preparations.” Was this true? (“I told them,” Francis noted, “that it was one of those difficulties that nobody seemed to understand, and it was certainly unexpected.”).16

Few doubted the independence or integrity that Francis brought to the job. But a number of health officers, seeing him as part of the larger foundation apparatus, sought other opinions as well. And this meant going outside the circle now drawn tightly around Salk. A Utah official contacted two likely sources: Sabin and Enders. “We are about to begin [the] immunization program,” he wrote, and “your name has been associated with unofficial statements that there might possibly be some danger in this vaccine. Would you care to send us any information?”17

Sabin was blunter—hardly a surprise. He opposed “large scale tests on hundreds of thousands of children” and doubted whether the Salk vaccine, which used the virulent Mahoney strain, would ever be licensed in the United States. Enders was more diplomatic, though no less concerned. The vaccine should be “restricted to a relatively small number of subjects,” he thought, “until all the technical procedures [can] be standardized and absolute assurance of their safety determined.” In private, Enders went further. When a friend wrote to ask whether events were moving too quickly, he replied: “The question you raise about the polio vaccine is, of course, tormenting us all.”18

The “us” no doubt referred to the church of live-virus believers to which Salk did not belong. But as Francis discovered, the apprehensions surrounding a trial of this size were bound to surface and had to be addressed. Thousands of children were about to be injected with a barely known vaccine. To ignore the doubters, to pass them off as quacks or rivals or complainers, could put the entire project in jeopardy.

The hardest blow, however, came from a bizarre and unexpected source. On April 4, 1954, Walter Winchell, the founding father of celebrity gossip, used his popular Sunday night radio show to attack the Salk vaccine, launching what one Winchell biographer described as his “most reckless charge yet”—no mean feat in a career like this one, spanning more than thirty years. “Attention everyone! In a few moments I will report on a new polio vaccine—it may be a killer!” he began in his dramatic staccato style. A commercial followed, and Winchell returned:

Good evening, Mr. and Mrs. America, and all the ships at sea. . . . Attention all doctors and families: the National Foundation for Infantile Paralysis plans to inoculate one million children with a new vaccine this month. . . . The U.S. Public Health Service tested ten batches. . . . They have found (I am told) that seven of the ten contained live (not dead) poliovirus. . . . That it killed several monkeys. . . . The name of the vaccine is the Salk Vaccine; named for Dr. Jonas Salk of the University of Pittsburgh.”19

Winchell had gotten the scoop from Paul de Kruif, the popular science writer who had worked for Basil O’Connor in the 1930s before losing his job in the wake of the Park-Brodie fiasco (see ch. 3). De Kruif had an obvious ax to grind; Winchell was probably looking for a headline. Together, they came close to sabotaging the trials.

Winchell’s story had some merit if carefully told. De Kruif had learned from sources inside the National Institutes of Health (NIH) that traces of live virus had been detected in four vaccine lots recently produced by Parke-Davis and Eli Lilly, and that tests on monkeys had turned up spinal lesions suggesting polio. In response, a worried William Workman, who had coauthored the specifications for these companies to follow, had recommended that the field trials be postponed until the vaccine, in his words, met “acceptable criteria for safety.” For the foundation, this was a nightmare come true. If the field trials were not up and running by the start of the 1954 polio season, they would have to be put off for a year, wasting all of the effort that had been expended and putting the nation’s children at risk.20

A week of tense meetings followed at NIH headquarters in Bethesda. O’Connor and Tom Rivers represented the foundation, NIH Director William Sebrell and his chief assistant, James Shannon, sat in for the government. Salk had been invited, along with David Bodian, the world’s leading expert on the pathology of polio. Having carefully examined the evidence, Bodian delivered his verdict. “That’s not polio,” he said “and that’s not polio. And that’s not polio. And that may be polio. We’d better do some additional tests.”21

It was a masterful presentation, and it wound up saving the trials. All agreed that the problems encountered by Parke-Davis and Eli Lilly were the result of a technical failure. The foundation was given a crackdown on the quality control, and the trials were allowed to proceed.
were fixable but that better safeguards were needed to insure consistent production of vaccine. The NIH representatives wanted to dramatically increase the size of the test sample, using several hundred monkeys for each vaccine lot instead of several dozen. The foundation people were furious. “Three hundred and fifty monkeys?” O’Connor shot back. “For every batch? Nobody in the country will have the money to buy a shot of the stuff.” Rivers went further. “I’ve been making vaccines all my life,” he said, glaring at James Shannon. “As far as I’m concerned, you can take your pencil and paper and shove them up your ass.” At that, Rivers recalled, O’Connor sent him back to New York.22

With Bodian playing peacemaker, the two sides reached a compromise. The triple testing would continue. No additional monkeys would be sacrificed, and the existing specifications would remain in place. The new wrinkle, however, was that the manufacturers would now be forced to produce eleven consecutive lots of safe vaccine before a single lot could be cleared for public use. If even one of the eleven failed a tissue culture test, or caused polio in a monkey, then the other ten lots would have to be destroyed. Furthermore, at Workman’s insistence, Salk would run a quick field trial on 5,000 children in the Pittsburgh area to make certain that the commercial vaccine was ready for mass testing. Both the NIH and the foundation’s Vaccine Advisory Committee would reserve final judgment until the results were in.

Winchell’s broadcast occurred a few days later. And it took a heavy toll. Local health officials started to have second thoughts about the field trials. In Michigan, the state Medical Society recommended against using the Salk vaccine “until we have further assurance . . . that it will not in any way damage our children.” When Thomas Francis phoned the society to complain, he was told that Winchell’s program “had caused a great deal of confusion and that many people had telephoned expressing great doubt re. willingness to proceed . . . There had been a great change in public opinion.”23

The foundation fired back. Yes, it admitted, several lots of commercially produced vaccine had failed to pass “the most rigid safety tests science has been able to devise.” But that was a good sign, showing how well the triple testing process really worked. Salk had already inoculated hundreds of children in the Pittsburgh area, including his three sons, without a single mishap. He now was running further tests to ensure the vaccine’s absolute safety. Asked for a comment by the press, Salk called Winchell a “sidewalk superintendent,” adding: “He was wrong in his statistics and wrong about the danger. If he had called me I would have been able to explain. But the guy was just interested in creating a bit of a sensation.”24

In mid-April, Salk reported the findings of his mini-field trial in Pittsburgh. Early results showed “no recognizable untoward effects” in any of the inoculated children. On April 25 the foundation’s Vaccine Advisory Committee voted unanimously to endorse the larger field trials. A few hours later the Public Health Service concurred. Most parents seemed ready to move ahead. Most, but not all. The foundation later estimated that perhaps 150,000 children—about ten percent of the pool—had been lost to the field trials through Winchell’s radio broadcast and the publicity surrounding it.25

On April 26, at the Franklin Sherman Elementary School in McLean, Virginia, six-year-old Randy Kerr stood first in line, sporting a crew cut and a smile. A nurse rolled up his left sleeve; Dr. Richard Mulvaney gave him the injection. “I could hardly feel it,” boasted America’s first polio pioneer. “It hurt less than a penicillin shot.”26

This procedure was repeated thousands of times in the coming weeks. Each participating school had been assigned a five-member vaccination team that included a doctor who gave the injection, a nurse, a clinic reporter, and two clinic aids. The children were taken to a holding area, where several volunteers (usually classroom mothers) were on hand to keep order. From there, the teacher walked each child to the vaccination room for identification. A clinic reporter entered the date of the shot, looked to see that a parental request form was on file, and checked the lot number of the vaccine. A clinic aide then prepared the child (“rolls up sleeve of left arm to expose triceps muscle; swabs site with an antiseptic on sterile cotton balls”), while the nurse opened the vials of cherry-colored liquid, filled the syringes (“5 cc. syringes will provide five inoculations”), and inserted a new needle after each shot. Before injecting the child, the doctor repeated the lot number to the recorder. A second aide was responsible for disposing of the used syringes, needles, and gauze patches. On the way out, a volunteer handed the child a lollipop.

In Lexington, Kentucky, dozens of children came for their first polio shot without a signed consent form. “Ignoring the rainstorms that blew up,” a witness noted, “[four] mothers put on overshoes and raincoats, tramped over hills and back roads, calling on parents until every
single child had been accounted for.” In New York City, volunteers comforted foreign-born children and their parents by explaining the experiment to them in their native tongue. In Montgomery, Alabama, black children received their Salk shots on the front lawns of white public schools, summoned by their first name only, as southern racial etiquette demanded, and forbidden to use the rest rooms inside. “They didn’t seem to be affronted by it. They expected it,” a foundation official recalled. “That was the thing that was terrible. They just thought this was how it had to be for them.”

There was no better barometer for what went right and what went wrong in these trials than the diary kept by Thomas Francis, which spoke of triumph and frustration—and the endless problems to be fixed. For example: a child was accidentally given two vaccine doses in the first injection. Should his next shot be cancelled? (No, stick to the plan.) A child received her first injection but missed the second one. Should she get the third? (Yes, two shots were better than one.) A child moved from one county to another. His parents wanted to continue the shots, but no one knew whether he had received the real vaccine or the placebo. Was it possible for local officials to be given the code? (Absolutely not; the code was sacred.)

Some problems defied solution. In Schenectady, New York, nurses carelessly reused syringes still wet with liquid, giving a “significant dose of immunizing vaccine to children supposed to receive the placebo” (and vice versa). In Davenport, Iowa, a school’s entire vaccination records were stolen from the principal’s unlocked office. In Guilford County, North Carolina, doctors “walked off with vials of vaccine and proceeded to give injections to their own children and to children of close friends.”

Each time an injected child took sick, suspicions arose. Had the placebo contained impurities? Had the needles and syringes been properly sterilized? Had the vaccine triggered an allergic reaction, or worse, a case of polio? Every child who showed the telltale symptoms of the disease was examined by a doctor and a physical therapist; blood and stool samples were sent to a regional laboratory, which rushed the results to the Evaluation Center in Ann Arbor. Whenever a death occurred, Francis was personally notified by telephone. On May 31, for example, Francis learned about “a boy named Lane, age seven, of Jackson, Mississippi,” who had been part of the injected study. Lane had entered a hospital the previous day with a “severe headache and projectile vomiting.” He died a few hours later. Francis spent hours piecing the story together. He phoned the boy’s doctor, the local health officer, and the pathologist who had performed the autopsy. Suspecting head trauma as the probable cause of death, the pathologist had not bothered to take stool samples or to remove the spinal cord for inspection. Now it was “too late to go back for them,” Francis noted bitterly. The body had been embalmed.

But Francis tracked down other clues. He learned that those who had witnessed the autopsy were satisfied that Lane had died of “edema of the brain.” And further, that the boy had been wearing a neck brace for a head injury suffered a few weeks before. From a medical standpoint, Francis saw this evidence as persuasive. Children died from many things, they took sick all the time. Perhaps the hardest part of his job, Francis realized, was separating the vaccine from the normal illnesses that might afflict a polio pioneer. A child died in Oklahoma, another in Iowa, yet another in West Virginia. All had taken part in the injected study; all had received their first and second shots. Were the inoculations responsible for their deaths?

Francis ran down everything, hoping, in his words, “to forestall another Winchell.” It was depressing, exhausting work. Of the more than 1,300,000 children who took part in the 1954 vaccine trials, several hundred would die—the leading causes being accidents, followed by cancer, pneumonia, and polio (at five percent of the fatalities). Each time a tragedy occurred, Francis got a call. He plowed ahead, case by case, knowing that public confidence in these trials might easily collapse under the weight of too many unexplained illnesses and deaths. In his gut, Francis believed the vaccine to be safe. He had trained Salk, after all, and devoted much of his own career to the inactivation of viruses, including the poliovirus. Still, the sound he dreaded most, Francis recalled, was the ring of his office telephone late at night, the ring of unspeakably bad news.

The field trials were over by late spring, just as the school year ended and the polio season began. And for all the problems encountered, the achievement was immense. More than 600,000 children were vaccinated at least once—two-thirds of whom were in the injected control design and one-third in the observed control design. The most striking statistic was that 95 percent of them had received all three vaccinations, a sign of the intense national publicity, the dedication of local communities, and the devotion of individual parents to this passionate crusade.
None of this would matter, of course, if the vaccine failed to work. So all eyes turned next to the cluttered Vaccine Evaluation Center in Ann Arbor, where Francis and his staff were busy collecting, processing, coding, and interpreting the data that arrived in bulging mail sacks twice a day. In our world of high-speed computing it is hard to imagine the magnitude of the task that lay before them. A record had to be created and maintained for every one of the 1,349,135 children in the trials. These records had to be updated each time a new piece of information arrived, and then checked and rechecked for mistakes. To help set up a working model, Francis recruited statisticians from the U.S. Census Bureau who were comfortable with high-volume studies. To edit and code the data, he hired dozens of Michigan graduate students at $1.25 an hour. Some of the data entry was done in longhand; some of it was put on punch cards and sent to IBM in Detroit, which tabulated the results on a “decimal, drum memory machine” that used a new programming language (soon to be known as FORTRAN). In all, Francis employed about 120 people, with the bulk of his budget going to salaries, tabulating expenses, and indirect costs to the university.\(^{32}\)

Francis was not about to hurried. The job, he said, would be “finished when it’s finished.” He would hold no press conferences, provide no periodic updates, and tolerate no leaks from his staff. Everything would be done in private. He must be left alone.\(^ {33}\)

While O’Connor had agreed to these ground rules, he had never expected to be fully shut out. It not only seemed unfair to him, given his deep personal stake in the outcome, but it also restricted his ability to make future plans. O’Connor didn’t want much; a hint or two from Francis would suffice. Instead, he got nothing.

What O’Connor did have, however, was confidence in Jonas Salk. As a result, he took a huge gamble that summer, betting that the polio vaccine would do well enough in the field trials to be licensed by the government and win wide popular support. In private meetings with six drug companies, O’Connor offered them $9 million of National Foundation money to manufacture the Salk vaccine at their normal markup, so that stockpiles would be available in 1955 if all went according to plan. For the companies, this was a win-win proposition. They stood to turn a profit regardless of how the trials came out. All six enthusiastically signed on.\(^ {34}\)

For Jonas Salk, these months of waiting were even worse. A perfectionist by nature, he kept tinkering with his vaccine. And what he noticed, with growing alarm, was that several of the lots he tested had lost their potency over time. Salk soon discovered why. On the eve of the trials, the NIH representatives had demanded that the preservative Merthiolate be added to his vaccine as a safety measure to prevent the possible growth of bacteria and molds. Salk had protested, to no avail, claiming that Merthiolate was only needed when a product sat in storage for long periods, which was not the case in these field trials, and—worse—that Merthiolate had the potential to ruin his vaccine.\(^ {35}\)

Salk had a point. The addition of Merthiolate appeared to reduce the effectiveness of killed Type I poliovirus. Salk wrote increasingly frantic letters to Rivers and Francis, listing the numbered lots that he knew to be seriously weakened by the preservative. He hoped that accommodations could be made, that Francis might either discard these lots or, at the very least, take note of this problem in writing his final report. But Francis remained noncommittal; the decision would be his alone to make. “The Merthiolate spoiled the vaccine,” Salk bitterly recalled. “The field trial would have been close to 100 percent effective if the Merthiolate hadn’t been rammed down my throat.” It was a lesson he would not soon forget.\(^ {36}\)

It took almost a full year for Francis to evaluate the vaccine trials. In early March 1955, he told O’Connor that the work was largely done; he was ready to sit down and write his final report. It would take him about a month, said Francis, who offered no clues about the contents.

When should the announcement be made? Where should it be delivered? Polio season was rapidly approaching. If the Francis Report turned out to be positive, and the government moved quickly to license the vaccine, then the foundation might be able to release the lots it had stockpiled in time to do some good. O’Connor gave Francis four dates to consider—two in late March, two in early April. Francis naturally chose the last one. The date was April 12, 1955—the ten-year anniversary of Franklin Roosevelt’s death. O’Connor called it a coincidence; critics called it a publicity stunt. The truth likely fell somewhere in between.

Selecting the venue proved an equally demanding task. Francis lobbied for a scientific conference, or perhaps a medical convention, where he could deliver his report to knowing colleagues, free from the pressures of the outside world. O’Connor hoped for a grander pulpit, celebrating both the scientific achievement and the March of Dimes. There was no point trying to contain this, he believed. “If Tommy were to announce his findings in a men’s room, the reporters and cameramen would be there. This thing is bigger than us all.”\(^ {37}\)
Salk had his own preference. He pressed for the National Academy of Sciences in Washington, the distinguished body that counted Francis, John Enders, John Paul, Albert Sabin, and most other polio researchers except Salk among its inductees. The National Academy oozed scientific prestige; its location guaranteed major press coverage. And a positive report by Francis might speed up Salk’s nomination for membership. According to one Pittsburgh colleague, “Jonas ran around the lab like a little boy, smiling from ear to ear and telling us, ‘It looks like we may get the Academy.”"\textsuperscript{38}

No one else supported the idea. Foundation officials thought the notion too elitist, and the Academy shied away. When Salk next suggested the University of Pittsburgh, Francis intervened. If the report were to be delivered in an academic setting, it would have to be in his academic setting, where the evaluation itself had occurred. Officials at the University of Michigan were enthusiastic. They recommended Rackham Hall, an elegant structure, home to the graduate school, which contained an auditorium large enough for anything the foundation had in mind. Promises were made to accommodate the press and to maintain a proper sense of decorum. Ann Arbor it would be.

Donna Salk almost never traveled with her husband in these years. With young children to care for, she could rarely find the time. It seemed odd, therefore, that her husband asked her to come to Michigan with the boys. “We had no premonition, no idea of what was going to happen—and that includes Jonas—no idea whatsoever,” she recalled. “Here we are, a couple of parents taking three kids on their first plane ride.”\textsuperscript{39}

The Salks stayed at Inglis House, a former estate near the campus that served as a guest residence for VIPs. By this point, rumors about the Francis Report were flying in all directions. The New York World-Telegram had just asserted that the Salk vaccine was “100 percent effective,” adding (preposterously): “Not one child who received [it] during last spring’s nationwide tests contracted the dread disease.” In Pittsburgh, reporter John Troan learned that officials of the NIH had recently visited Salk’s lab to discuss plans for licensing the vaccine. “It isn’t perfect—no vaccine is,” Troan declared, “but the word in drug circles is that the vaccine is ‘terrific.’”\textsuperscript{40}

On the morning of April 12, over breakfast with O’Connor, Salk, and others, Tommy Francis broke his formal silence. The field trial results were positive, he said, and his report would be favorable. Salk, though not exactly surprised, heaved an audible sigh of relief. The men shook hands and headed for Rackham Hall, where more than 150 reporters were crammed into a makeshift press room on the third floor. The plan called for reporters to be handed a packet of information, including a summary of the Francis Report, at precisely 9:10; as part of a gentleman’s agreement, they had promised to withhold comment until Francis was scheduled to speak. It was, in retrospect, too much to ask. When aides from the University of Michigan press office fell slightly behind schedule, arriving at 9:17, a near-riot ensued. Fearing for their safety, the aides jumped onto nearby tables and began tossing the packets to the crowd below. A reporter likened it to “hungry dogs at a garbage pail.”\textsuperscript{41}

By 9:20, the verdict was out. The first to announce it to the world was Dave Garroway, host of NBC’s infant Today show, his sidekick J. Fred Muggs, the lovable chimpanzee, grinning appropriately at his side. “The vaccine works,” said Garroway, quoting the Michigan press release. “It is safe, effective, and potent.” The suspense was broken. Schoolchildren and factory workers got the word over public address systems. Office workers heard it while huddling around radios. In department stores, courtrooms, and coffee shops, people wept openly with relief. To many, April 12 resembled another V-J Day—the end of a war. “We were safe again,” recalled author Frank Deford, then a fourth grader in Baltimore. “At our desks, we cheered as if the Orioles or the Colts had won a big game. Outside we could hear car horns honking and church bells chiming in celebration. We had conquered polio.”\textsuperscript{42}

As Francis rose to speak, millions already knew his secret. The audience at Rackham that morning—five hundred dignitaries and fifteen camera crews—expected a short, crisp talk. What it got, instead, was a full-blown lecture, ninety-eight minutes long, delivered in numbing monotone, dotted with charts and slides. When the press took a friendly poke at Francis, comparing his performance to the sleep deprivation techniques of a torture squad, Basil O’Connor sent him a soothing note of concern. “Tommy, you did the right thing Tuesday morning,” it said. “The very fact that you took so much time . . . helped forestall questions which might otherwise have arisen. Your presentation only underlined the validity and the integrity of the data.”\textsuperscript{43}

Francis made it clear that the vaccine, while safe, had varied widely in quality; some lots were more effective than others in preventing the disease. Then came the findings:
If the results from the observed areas are employed the vaccine could be considered to have been 60–80 percent effective against paralytic poliomyelitis, 60 percent against Type I poliomyelitis, and 70 to 80 percent effective against Types II and III.

Francis had never trusted this part of the trials. He believed that the cultural and economic differences between the parents who volunteered their children for inoculation and the parents who didn’t would almost certainly skew the results. His own studies had shown that the families of “polio pioneers” had more education and higher incomes, lived in “better neighborhoods” and “better kept” homes—putting these mostly “middle-class” children at higher risk for polio than the mostly “lower-class” children in the observed controls. As such, said Francis, the Evaluation Center had “greater confidence” in the results obtained from the injected study areas, where the test populations receiving the vaccine and the placebo were “almost identical” to one another. “On this basis,” he went on,

it may be suggested that vaccination [in these areas] was 80–90 percent effective against paralytic poliomyelitis; that it was 60 to 70 percent effective against disease caused by Type I virus and 90 percent or more effective against that of Type II and Type III virus.46

The raw numbers broke down this way:

| Placebo Areas       | Observed Areas |
|---------------------|----------------
|                     | Vaccinated     | Placebo | Vaccinated | Observed |
| Number of Children  | 200,745        | 201,229  | 221,988    | 725,173  |
| Number of Paralytic Cases | 33           | 115     | 38         | 330      |

One point was clear: the positive results that Francis presented did not quite match the boldness of the press release that had spawned the celebrations. Questions had been raised about the vaccine’s consistency and overall power. “Indeed,” a writer noted, “a 60–70-percent effectiveness against Type I, the cause of most paralytic polio, promises no great cure-all; turned around, it means 30–40-percent ineffectiveness.”45

Salk, of course, had not seen the Francis Report in advance. As the next speaker up, he had a tough decision to make. How did he respond to a document that was clearly favorable to him on the one hand, yet filled with question marks on the other? Did he simply thank Francis for a job well done? Or did he try to answer the concerns? Was this the time and place for a defense of his work? Or only for celebratory remarks?

Salk tried both paths at once. Introduced to a standing ovation, he lauded Francis—“His kind of objectivity is rare, even among scientists”—and moved quickly down the list, thanking the departed Harry Weaver first (a loyal gesture), the scientists at Connaught Laboratories, Tom Rivers and the Vaccine Advisory Committee, the March of Dimes and Basil O’Connor (the “one person without whom all this would not have been possible”), the people at the D. T. Watson Home and the Polk School, and the various deans and trustees from the University of Pittsburgh. Salk seemed to recognize everybody that day—everybody, that is, except the people in his own lab. This group, seated proudly together in the packed auditorium, would feel painfully snubbed.46

Salk turned next to scientific matters, responding more aggressively, some thought, than the occasion required. In words that would come back to haunt him, he claimed that recent improvements to his polio vaccine had made it a different and better product than the one Francis had just tested—hardly a ringing endorsement of the trials. Salk emphasized two points that day: first, the removal of the preservative Merthiolate from the new vaccine had dramatically strengthened its potency; second, a wider spacing of the three injections had produced higher, more consistent, antibody levels, offering hope of long-term immunity. Where Francis had cautiously praised the Salk vaccine for being 60 to 70 percent effective, Salk himself seemed to be shooting boldly for the stars. “Theoretically,” he boasted, “[my] new 1955 vaccine and vaccination procedures may lead to 100 percent protection from paralysis of all those vaccinated.”47

Not everyone applauded Salk’s presentation that day. The crowd at Ann Arbor had many faces, some angry, some jealous, some confused. The first category included Salk’s coworkers from Pittsburgh, who had come expecting to be honored by their boss. A tribute seemed essential, and long overdue given the lingering tensions in the lab. Feelings were still bruised over the publication of Salk’s “preliminary report” about the polio experiments of 1953, which had listed “Jonas E. Salk, M.D.” as the sole author, and others, in smaller print, as mere collaborators. Julius Youngner already sensed a pattern of deception on Salk’s part to take undue credit for the discoveries of others. But now, standing before the bank of microphones and cameras in Rackham Hall, Salk appeared ready to make amends. “The world is listening to [him],” a staffer recalled. “The whole world is listening. He seems about to give us credit for our work. But it never comes. The other shoe never drops!”48
Why it didn’t is a matter of debate. Salk’s defenders insist that he acted in the finest scientific tradition—by prefacing his printed remarks with the phrase, “From the Staff of the Virus Research Laboratory by Jonas E. Salk, M.D.” If so, the gesture was too subtle to be appreciated. His staffers wanted an acknowledgment, name-by-name, of their contributions to a lifesaving vaccine—a minute of thanks to salute their grueling years of service. They felt more than ignored by Salk’s omission; they felt betrayed. That evening Byron Bennett took the train home to Pittsburgh “and wept most of the way.” Decades later, Julius Youngner still smarted from the slight. “Everybody likes to get credit for what they’ve done,” he said. “[Salk] hid us. It took me a long time to catch on to that. It was a big shock.”

Others, meanwhile, were offended by what Salk did say that morning. By claiming that his new vaccine was better than the one that Francis had exhaustively tested, Salk appeared to dismiss the 1954 trials as ancient history. Why focus on the Francis Report, he seemed to say, when its findings were already old news? “After Jonas finished talking,” Francis recalled, “I went over to him, sore. ‘What the hell did you have to say that for,’ I said. ‘You’re in no position to claim 100 percent effectiveness. What’s the matter with you?’”

Tom Rivers was furious. Having placed his formidable reputation on the line to get the polio vaccine tested, he could not believe that Salk, the major beneficiary of the trials, had the temerity to undermine the results. Rivers took the remark as a personal slap at himself and at Francis, who had devoted a year of his life to the project and deserved unqualified praise. “To my mind, it was an implied criticism of the way Francis had run the field trials,” Rivers told his biographer, “and nothing should have detracted from the kudos that Tommy received that day.” To another writer, Rivers was more explicit. “Salk,” he said, “should have kept his mouth shut.”

As the session broke up and reporters fled to file their stories before deadline, a number of the scientific dignitaries on hand were hustled off to a meeting that would seem a lot more consequential in retrospect than it did on this raucous April afternoon. Because the federal licensing of vaccines fell within the jurisdiction of the newly created Department of Health, Education, and Welfare (HEW), officials from the Public Health Service—now an arm of HEW—had come to Ann Arbor to seek the advice of the assembled polio experts about the immediate licensing of commercially produced Salk vaccine. There was no reason to suspect trouble, given the findings of the Francis Report. The six vaccine manufacturers were well established, and their production records—or protocols—seemed impressive. Furthermore, no medical product had ever been as widely tested as this one. A great deal had been learned in a remarkably short time. Since the 1954 trials had shown the Salk vaccine to be safe, one could logically assume that the commercial version, carefully prepared, would be safe as well.

Speed was essential. The experts rushed through the Francis Report and the company protocols knowing that the public was clamoring for the vaccine. No one there was satisfied with the thoroughness of the effort, least of all Albert Sabin, who found himself in the awkward position of having to sign off on a product he didn’t trust so as not to be seen as a jealous obstructionist. It was over in less than two hours. From Washington, HEW Secretary Oveta Culp Hobby endorsed the group’s unanimous recommendation to license the Salk vaccine. Nine million polio shots were ready for distribution, ordered and paid for by the National Foundation. “It’s a wonderful day for the world,” Hobby said. “It’s a history-making day.”

In his 1970 book, A History of Poliomyelitis, Dr. John R. Paul noted his disgust at the circuslike atmosphere in Ann Arbor. “The information that had been gathered so painstakingly at the Evaluation Center, and at such an expense of time, money, and energy, did not deserve to be so cheapened by the outburst that ensued.” Paul was not alone. “The bedlam was disgusting,” a scientist recalled. “It was as if four supermarkets were having their premieres on the same day. . . . It was a souring experience and a black eye for us all.”

Privately, Paul expressed a deeper resentment, involving the elevation of one man at the expense of those who had done the pioneering research. In a letter to Nobel laureate John Enders, who had declined to attend the Ann Arbor event, Paul uneasily described the “thunder of applause” that had greeted Salk alone, as “flash bulbs popped away.” Though Paul blamed the press and the foundation for these excesses, he did wonder if Salk had done enough to move the spotlight off himself. “I need not dwell on your stake in this,” he told Enders. “I wish there had been a little more emphasis on placing credit where credit is due.”

Some went further, blaming the foundation for creating a “celebrity-scientist”—and Salk for acting the part. As Paul Clark wrote his good friend Tommy Francis: “I am deeply concerned, as are many others,
with all the hysterical publicity—Polio is licked, Salk the miracle man stuff. The public is gullible. . . . There is so much anti-intellectualism . . . rampant today that the reaction is something to be feared . . . I am tempted to get out my sharpest pen and stick it into the balloon as far as I can.”

In fact, Salk’s triumph had begun a process now impossible to reverse. It was part of the expanding world of public relations and mass communications from which even the drones of laboratory science were no longer automatically immune. Anointed by the foundation, acclaimed by the press, Salk was handed a role virtually guaranteed to offend his colleagues and ensure his ostracism from their ranks. The nation needed a special hero, it was felt, someone to thrill the public that had supported polio research for so long. It needed a uniquely American story about individual grit and ingenuity, about a brilliant scientist using the tools of modern medicine to work wonders in the lab. It needed, above all, a single recognizable benefactor of mankind.

To scientists, inevitably, Salk became a figure of derision, an example—if one were really needed—of how America’s new huckster class went about recklessly bending the truth. Since respect for Salk inside the academy had not been very high to begin with, the adulation suddenly showered upon him was bound to cause a stir. What had he done to deserve so much attention? Who was he to reap all these rewards? Some claimed later to have known what was coming—the proverbial train wreck, eerily preordained. “We could see that success . . . would make a public god of him,” recalled a foundation insider, “distorting the meaning of his work, crediting him with achievements that belonged to Enders and Bodian and so many others, and lousing him up with other scientists. We could see . . . but it was not our headache.”

Salk, in truth, was more than an innocent bystander. Chosen early on by the foundation as the perfect scientist for its public relations campaign, he did all that was asked of him without appearing to revel in the process. One of his great gifts was a knack for putting himself forward in a manner that made him seem genuinely indifferent to his fame, a reluctant celebrity, embarrassed by the accolades, oblivious to the rewards. This was clear from his first major photo shoot in 1950, when he sat through a grueling all-day session for a national magazine and then modestly requested anonymity, so as not, he said, to bring undue attention upon himself. (“For some foolish reason I would prefer that you indicate these pictures as having been taken at the labora-

tory of a ‘grantee.’”) Thereafter, reporters and photographers would always find Salk grudging but available. He would warn them not to waste too much of his time; he would grouse about the important work they were keeping him from doing; and then, having lodged his formulaic protest, he would fully accommodate their needs.

The reporter closest to Salk, John Troan of the Pittsburgh Press, saw his reluctance as genuine. “Salk was very private, very shy,” he said. “He dealt with us because he had to, not because he wanted to. He’d much rather have been left alone.” But others knew a different Salk, a man who cultivated the press with the same care he cultivated viruses, crafting his image with a film director’s eye. Here was a new breed of scientist, Julius Youngner recalled. “All the photographs of Jonas ‘in the laboratory.’ All the shots of Jonas in his white coat, surrounded by lab equipment, microscopes; Jonas intently holding up and looking at culture bottles—all were set up either in his office or an empty room before the photographers came.” No reporter ever left the laboratory without a story, Youngner said, though Salk used reliable favorites, John Troan included, for his more important scoops. “Jonas was his own press agent,” Youngner added. “He leaked like a sieve.”

Among the dignitaries at Ann Arbor had been Edward R. Murrow, the father of modern broadcast news. Intense, chain-smoking, fearless, Murrow looked the part of the quintessential trench-coated foreign correspondent reporting live from faraway hot spots and battlefields—all of which he had done. His wartime broadcasts from Europe and his ability to spot new talent had made CBS News, his long-time employer, the leader in its field. All the big networks were represented that April day in Ann Arbor. But Murrow’s particular presence there, covering a scientific conclave as if it were a national party convention or a major military campaign, spoke volumes about the event.

Murrow’s credits included a nightly radio newscast and two weekly television shows—See It Now, a news documentary devoted to the “hard” issues of the day, and Person to Person, a popular though frequently awkward visit to the homes of celebrities such as Milton Berle and Marilyn Monroe. Murrow never much liked television. As a reporter, his strength lay in the power of his words. (He opened his first broadcast of See It Now in 1951 by admitting, “This is an old team trying to learn a new trade.”) Murrow’s jump to television reflected the enormous growth of the medium; no invention had ever reached American
homes this quickly. In 1946 there were 17,000 TV sets in the United States. Three years later, the Sears, Roebuck catalogue advertised its first television—$149.95 with indoor antenna. By 1955 there was one set for every two households in the country, forty million in all. The Nielsen ratings now showed more Americans watching television than listening to the radio in the hours between 9 p.m. and midnight, what the networks called “prime time.”

Murrow’s trip to Ann Arbor was due largely to Salk. The two had met a few months before, when Murrow took the overnight train to Pittsburgh to ask Salk to appear on See It Now. It hadn’t taken much convincing. Murrow was a giant, after all, and See It Now, was television’s most influential public affairs program, airing subjects that others instinctively avoided, such as the impact of Red-hunting Senator Joseph McCarthy, the security problems of atomic scientist J. Robert Oppenheimer, and the morale of U.S. soldiers in Korea. Salk was not just flattered by Murrow’s attention, he was star struck, seeing the renowned journalist’s interest in him as proof of his own importance in the larger world. Here, at last, Salk believed, was someone with the sensitivity and worldliness to understand the journey he had undertaken. “I had come to discover a trivial manner in so many journalists,” Salk remembered. “Ed Murrow was not trivial. I found myself responding at the level I like to respond to. I found him introspective, meditative, with a purity of thought. He had true pitch.”

Salk’s first appearance on See It Now—a full half-hour on February 22—had been a publicity bonanza, defining Salk, over his mild protests, as the focal point of the polio crusade. When Murrow, who had seen friends and family battle the disease, asked how the vaccine actually worked, Salk had responded with an explanation so carefully scripted as to include an “on-camera demonstration” of monkey kidney tissue being ground up like malt powder in a Waring blender. Murrow was impressed. A successful field trial, he thought, would transform this modest scientist into “a minor god.”

On April 12, at 10:30 p.m., Murrow hosted his live broadcast from the Vaccine Evaluation Center in Ann Arbor, seated next to Francis and Salk. “Today,” he began, “a great profession made a giant step forward and the news that came out of this room lifted a sense of fear from the homes of millions of Americans.” Exactly how giant a step was still unclear. When Francis, ever cautious, described the vaccine as having “a protective effect of no insignificant level,” Murrow pressed him for specifics, something the public could understand. “Your figures go from sixty to ninety percent in effectiveness, depending on the type of polio. What about going to ninety-five or a 100 percent? What are the prospects?”

Here was the nub of the debate—the difference between the results that Francis had reported from the vaccine of the moment and the results that Salk had predicted for the vaccine of the future. Francis stood his ground. Improvements were inevitable, he replied, “but when you talk about ninety-five to a hundred percent, there is no vaccine that really . . . reaches that point, except under very ideal conditions.”

Salk didn’t argue the point. There was no sense stirring the pot again. “Well, this may be so,” he said, simply, but “I think [it’s] one of the things that would be very interesting to try to do something about.” It was a good answer, signaling his determination to keep improving the vaccine. And the night would soon get better, as Murrow shifted gears.

**HOST:** Who owns the patent on this vaccine?

**DR. SALK:** Well, the people, I would say. There is no patent. Could you patent the sun?

No remark Salk ever made would be as cherished or widely quoted as this one. Here, truly, was the people’s vaccine, spearheaded by a charitable foundation, driven by the spirit of voluntarism, subsidized by millions of small contributions, aided by numerous scientists, tested on enthusiastic volunteers. Birthday balls, theater drives, fashion shows, marching mothers, poster children—all had played a role. Developed in the public interest, this particular vaccine belonged to everybody.

It was, as one writer noted, “a noble and generous answer,” reflecting the highest values of laboratory science. What Salk didn’t mention that night—and really wasn’t obliged to—was that both the National Foundation and the University of Pittsburgh had seriously considered seeking a patent for the vaccine before finally abandoning the idea, and that a key reason for not doing so was Salk’s own skepticism, as laid out in a frank meeting with patent attorneys who had visited his Pittsburgh laboratory in 1954. Initially, Salk had refused even to sit down with the lawyers, claiming he didn’t have the time. “I know that [he] is carrying a terrific burden,” the lead attorney had complained, but “I cannot do much more useful work . . . until he can spare a few
hours for discussion.” When the meeting finally took place, Salk readily acknowledged that his vaccine quest, like so many scientific endeavors, had been built on the ideas and techniques of others. As the attorney noted:

One of the purposes of our visit to Dr. Salk was to get his views as to exactly what features of the processing were new and possibly patentable. Even before meeting Dr. Salk, it seemed very clear from his published articles that, as usual in such cases, much of what he had done was based on prior work by others, and this was readily confirmed by Dr. Salk. He disclaimed any novelty, as far as he was concerned, in tissue culture or the preparation of the virus . . . and I gathered that the use of formalin was an old technique which he had merely adapted to the particular requirements of the polio virus. If there were any patentable novelty to be found in this phase, it would lie within an extremely narrow scope and would be of doubtful value.63

In a sense, Salk was validating what his critics had been (and would be) saying for years: there was nothing really novel or dramatic about his vaccine. It was old science—a stopgap measure to be used until something better came along. To Salk, of course, this badly missed the point. He had never claimed to be charting a completely new course; his objective was to show that an inactivated vaccine, a well-established but heretofore limited commodity, could be made to induce long-term immunity against a viral disease. And in doing so, he had used the work of others to demonstrate a principle that most virologists, especially those involved in polio research, were loath to admit: that durable immunity did not depend exclusively upon a natural infection.

For the moment, the critics stood silent. Salk’s vaccine had clearly exceeded their predictions. “I must confess that I was not surprised that [it] could be effective,” John Paul wrote Basil O’Connor in a tepid letter of congratulation, “but I was surprised at the degree of effectiveness. My guess would have been that it would have been about 50–60% effective.” Salk had good reason to be optimistic. The Francis Report had legitimized his vaccine, and the 1955 version looked even better. As a new summer approached, edgy parents had cause to feel relieved.64

At a party following the See It Now broadcast on April 12, Murrow put a fatherly arm around Salk. “Young man, a great tragedy has just befallen you,” he said. “What’s that, Ed?” Salk asked. “You’ve just lost your anonymity,” Murrow replied.65

Actually, that process was well under way. Ann Arbor had dramatically raised the stakes, validating the potential of this gentle young scientist and his lifesaving vaccine. “When we got home [to Pittsburgh], the world had changed,” Donna Salk recalled. “And I must say, from our point of view, not for the better. It started with us being met at the airport with a limousine [and a police escort]. The first thing that happened was that Jonathan, who was five at the time, walks into the house . . . goes over to the phone and calls his friend Billy. And both Jonas and I hear him saying, ‘Hi Billy, I’m back from my vacation and I’m famous and so is my dad.’ We thought, well, that just about says it.”66

Tommy Francis spent the next few weeks decompressing from the tumult. He wrote to thank Ed Murrow: “I want to tell you in retrospect that what I had looked forward to with dread had a much more pleasant ending . . . owing to your staff and yourself.” He wrote to thank Basil O’Connor: “It was a pleasure to have enjoyed the benefits of your integrity and firmness in supporting the independent character of the Center, thus removing anxieties and annoyances which otherwise might have arisen.” Above all, he welcomed the peace and quiet that had returned to his life and to his campus, claiming that he had “expected the show [to] move on promptly,” and comparing his role to that of “the boys in the small town who after the circus has left are still holding on to the bucket [they carried behind] one of the elephants.”67

Truth be told, Francis had rather enjoyed his day in the sun. To friends who wrote him to complain about the circuslike atmosphere, he replied that what had happened was inevitable and not altogether bad. Everyone involved knew that “an emotional hailstorm” would erupt. The fact that “hucksters had a heyday” didn’t really diminish the achievement. People had waited a long time for this moment. There was reason to celebrate—and room for a hero. Speaking for himself, Francis admitted, “it was a great experience.”68

In New York City that April 12, a nine-year-old girl in a crowded hospital ward, paralyzed from the neck down by a polio attack the previous October, watched the televised images of a world celebrating the Salk vaccine through a mirror perched above her iron lung. The child’s distraught mother sat nearby, weeping. “Seven months,” she said. “Couldn’t you have waited seven months?”69

For so many like them, the vaccine had come too late.