



**Albert B. Sabin**

1906–1993

BIOGRAPHICAL

*Memoirs*

*A Biographical Memoir by  
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# ALBERT BRUCE SABIN

August 26, 1906–March 3, 1993

Elected to the NAS, 1951

Albert Bruce Sabin was an outstanding virologist, a prolific researcher, and the definition of a civic-minded scientist who constantly labored to ensure that his work was put to use, as he liked to say, “in the service of society.” He was quick to remind others that “a scientist who is also a human being cannot rest while knowledge [that] might reduce suffering rests on the shelf.” Sabin was the recipient of over 40 honorary degrees and numerous prestigious awards from countries worldwide, an active member of dozens of scientific societies, and the author of over 350 scientific articles. He is most commonly known for having developed the live-virus oral polio vaccine and the mass-vaccination strategy used to administer it, frequently called “Sabin on Sundays.” However, over the course of a career spanning more than six decades, he made a multitude of significant contributions both of a scientific and humanitarian nature. In addition to his research on poliomyelitis and the oral polio vaccine, Sabin conducted groundbreaking work on pneumococcal infections, encephalitis, ECHO viruses, sandfly fever, dengue, herpes, toxoplasmosis, and the relationships between viruses and cancer, arthritis, and measles.



*Albert B. Sabin*

By Marguerite Rose Jiménez

All photographs are courtesy of the author.

## Early years and education<sup>1</sup>

Sabin was born to Jewish parents in Bialystok (then part of the Russian Empire and now a city in Poland). At school in the town he received instruction in Hebrew and Yiddish (the language spoken at home) and studied Russian on the side with a tutor. Later, during World War I, Albert would attend a private school, where he received instruction in German. Bialystok was a town of roughly 100,000 people, 70,000 of whom were Jews. It also had a large contingent of the Russian army stationed there, and a history of pogroms carried out against Jews. One particularly violent episode occurred in June 1906, just prior to Albert’s birth.

<sup>1</sup> Unless referenced otherwise, the anecdotes about Dr. Sabin and his quotes come from unedited transcripts of oral interviews with him conducted by Dr. Saul Benison between 1973 and 1976.

Recalling memories from his childhood, Albert described mobs forming and ransacking homes in the town, starting fires, and committing terrible acts of violence against Jews, with the police standing by. In the aftermath of the 1906 Bialystok pogrom, the majority of Albert's surviving extended family immigrated to the United States, though he and his immediate family (including an older brother and two younger sisters) stayed behind to care for his maternal grandmother. The outbreak of World War I further delayed the Sabins' emigration.

In 1919 Albert and his family left Bialystok with plans to reunite with their relatives living in the United States, but they endured an arduous 18-month journey before reaching Ellis Island in early 1921. Their arrival was something "never to be forgotten," Albert recalled. One of his uncles had done well for himself in New York and had "friends who were influential at Tammany Hall" (a powerful local political organization). As a result of this connection, Albert and his family were well received when they disembarked, welcomed in a private reception, and then "whisked away in automobiles to meet the whole family."



Sabin as a young child.

Albert and his immediate family settled in Paterson, New Jersey, near relatives and close to a textile center where his parents could work. Albert was 15 at the time and eager to continue his education at Paterson High School. However, although he spoke Yiddish, Hebrew, Russian, and German, he didn't speak sufficient English, so he spent his first six weeks in the United States taking a crash course in English

from two of his cousins. The next potential obstacle for Albert was that he only had transcripts from his primary school in Bialystok (none of which were in English), making his matriculation a bit complicated. "What grade do you think you'd be in?" the school's administrators asked him. "Well, to be quite frank with you," Albert responded, "if I had not lost any time in traveling for months and being away from school, I would now be in my second year of high school."

To demonstrate his competencies, Albert requested to take the tests required of sophomore students, and "it seems I made out pretty well," he later recalled. "I continued not only as if I were a stranger coming to a new land and everything else, but as if I hadn't lost any time at all." Albert then made out "pretty well" at Paterson High, getting

superior grades, joining the Literary Debate Society, and graduating in 1923, just two years after arriving in the United States.

Right after finishing high school, Albert left Paterson for New York City with the hope of attending university. He initially wanted to study law (having been told throughout high school that he was a fine arguer), but there was no money for him to do so. There was money, however, to support an education in dentistry, thanks to Albert's uncle (by marriage to his father's sister) Dr. Sigmund Sidney, who had a successful dental practice in the city. Dr. Sidney and Albert's aunt had only one child (a daughter, Sylvia Sidney, who went on to become a famous film star) and offered to pay for Albert to study dentistry and let him live with them rent-free, with the assumption that Albert would join his uncle's practice once his education was completed. And so Albert set forth to pursue a career as a dentist, starting his pre-dental biology coursework at New York University in June 1923.

Several things happened during his early years of dental education that ultimately led him to forgo a career in dentistry and dedicate himself instead to the study of diseases. First and foremost, Albert was introduced to the worlds of anatomy, physiology, and bacteriology through his coursework. Second, he became acquainted with Dr. William H. Park, who was a leader in medical research and public health, a senior figure at New York University's Medical School, and Albert's professor of bacteriology. Through these early exposures, Albert explained, "I very quickly became attracted to the science of infectious disease." And third, he cited two key books, published during these early years of Albert's scientific education, that helped alter his path.

The first book was *Arrowsmith*, a novel by Sinclair Lewis, whose hero was an indefatigable young physician and bacteriologist. The next was *Microbe Hunters*, by Paul de Kruif, which became a sort of inspirational text for Albert (and many others of his generation). "Melodramatic as it may sound," he reminisced, "the book gave me a picture of what science meant to man." Albert realized that he didn't want to follow the course set for him by his uncle but rather aspired to be more like de Kruif's microbe hunters and the fictitious Dr. Martin Arrowsmith. Many years later, Albert recalled his first encounter with de Kruif's work:

*The significance of this kind of stimulation of young minds cannot be overemphasized. The reading of the biography of great achievement can play a very important role in the direction a person in the process of development takes. After the passage of now 47 years, I still believe that*

*of all the factors that turned the subsequent course of my life, that book played as much of a role as any.*

Convictions aside, Albert's change of heart was not without consequences. Because his uncle had agreed only to support his dental education, Albert suddenly was without tuition money or lodging. At first he was unmoved by the financial implications of his decision and pursued his medical education with the tenacity and resolve that would come to define his career. But he was also practical; funds for medical school fees and the basic admission requirements, and a place to live, were realities that had to be addressed.

So Albert sought out his former bacteriology professor, Dr. Park, who was also the director of the Public Health Laboratories of the City of New York. Albert described Park as "a great kindly man," fondly referring to him as "my patron saint" and "champion." Park not only helped him secure scholarships for medical school, but also arranged housing for him by way of a trade. Albert would receive lodging—a small room at the Harlem Hospital—in exchange for doing "chores" in the hospital's pneumonia laboratory, where he made his first significant scientific discovery.<sup>2</sup>

Albert's primary task in the laboratory was typing pneumococci viruses to determine which strains of pneumonia the hospital patients carried. During his first year working nights at the laboratory, he devised a way to dramatically speed up the typing task so that it took only three hours (a fraction of the previous time required to conduct the tests), thereby helping improve the survival prospects of pneumonia-ridden patients. Park was so impressed by his young mentee that he named the method after him and sent the results of his work to a journal for publication, thereby giving Albert a reputation as a strong scientist even before he'd finished medical school.<sup>3</sup> Ironically, after graduating in June 1931, when Albert took his medical licensing exam for the State of New York, one of the questions on the exam was: Describe the Sabin method of rapid typing of pneumococci.

### **Early career and research (1931–1933)**

Convenient timing was largely responsible for Sabin's entry into the world of poliovirus research. This timing, he explained, "changed my whole life." When Sabin graduated from medical school in June of 1931, he secured a prestigious internship at New York City's Bellevue Hospital. Due to issues of staffing and space, however, this internship

2 Benison, S. 1988. A shared vision: Creating an environment for medical research in New York. *Bulletin of the New York Academy of Medicine* 64(3):262–279.

3 Oshinsky, D. M. 2005. *Polio: An American story*. New York: Oxford University Press, 139.

With the ink on his medical school diploma barely dry, no track record on virus research, and New York in the midst of a polio epidemic, Sabin had, without intending to, disproved the high profile and promising work of a senior scientist.

had a delayed start date of January 1, 1932. As a result, Sabin was set to have six free months to further hone his skills in Park's bacteriology laboratory. Just as he was settling into his own work in the lab, in July 1931, a severe polio epidemic broke out in New York (the worst epidemic on record there since 1916). Sabin recalled that if his internship had started immediately after graduation he would have been entirely consumed by his work as a Bellevue house physician when the

outbreak started. As a result, he would not have been working for Park and would not have been at liberty to follow his urging that Sabin become involved in polio research in the midst of the epidemic.

As it was, Sabin was at work in Park's laboratory when the epidemic began, and Park was a key figure responsible for the city's response. "I didn't know beans about viruses," Sabin recalled. "I never worked with a virus" [and] virology as a field was still in its infancy then." But Park was confident that what Sabin lacked in experience he would more than make up for with his superior analytical and laboratory abilities. Accordingly, Park had an important and potentially delicate task for Sabin.

Shortly before the polio outbreak, Dr. Claus Jungeblut, a professor at neighboring Columbia University, had published two papers suggesting that a skin test could be used to differentiate between those who were susceptible to polio and those who were immune to it. Although the Jungeblut studies had relied on poliovirus extracted from infected monkeys, he indicated that the findings were similarly applicable to humans. Given the potential scientific and practical significance of Jungeblut's results and the polio epidemic continuing unchecked in the city surrounding them, Park directed Sabin to attempt to replicate Jungeblut's experiments.

With the meticulous attention to detail for which he had already gained a reputation, Sabin set out to do exactly that, but to no avail. Try as he might, Sabin could not confirm Jungeblut's results. This put the newly minted doctor in a potentially awkward professional position. With the ink on his medical school diploma barely dry, no track record on virus research, and New York in the midst of a polio epidemic, Sabin had, without intending to, disproved the high-profile and promising work of a senior scientist.

Even at this early stage of his career, Sabin was not one to shy away from a scientific debate, so he decided to take his alternative findings directly to Jungeblut and get his perspective on the issue. Jungeblut had never met Sabin before, but he was appreciative of the courtesy Sabin had shown by coming to speak with him rather than quickly publish the conflicting data. The two researchers and Park arranged to conduct a series of tests together, in another effort to replicate the original experiment. When the work was completed, Jungeblut was in agreement with Sabin: his original studies could not be replicated. Illustrative of their shared commitment to scientific integrity, Park, Sabin, and Jungeblut joined together as coauthors to publish their revised conclusions. “It was wrong,” Sabin recalled. “No one was immune.”

This and other of Sabin’s work during the 1931 outbreak, and his corresponding publications, marked the start of what became his 60 years of contributions to the control of poliomyelitis.

A tragic accident in the laboratory, shortly after Sabin began his internship at Bellevue Hospital, became the foundation for his next scientific achievement: the identification of the “B” virus. On October 22, 1932, Dr. William Brebner, Sabin’s colleague in the lab, was bitten by a monkey he was handling as part of an experiment. Although the monkey was thought to have been healthy, Brebner became ill, with symptoms appearing on the skin surrounding the original bite and then spreading. After developing severe complications—including paralysis and, ultimately, respiratory failure—Brebner died at Bellevue Hospital on November 9, 1932. He was just 29 years old.

Intent on determining the cause of his colleague’s untimely death, Sabin obtained tissue specimens from Brebner’s autopsy, and with them was able to isolate a previously unknown virus. When he first submitted his findings to the *Journal of Experimental Medicine*, he called it the “Brebner virus,” however, at the urging of the journal’s editor, Peyton Rous, Sabin agreed to use only the initial B. Sabin explained his original motivation:

*I wanted to call the virus Brebner virus because I wanted...for his name to be attached to this virus in memory of one of the hazards of this kind of biomedical research and in memory of a man who, by his dedication to his work, was removed from this world before he was able to establish what he could do.*

Sabin described this particular “human element” of the scientific enterprise as having been formative in the early stages of his career. “When one discusses scientific matters,” he said, “sometimes one overlooks the individuals involved [and] the promise that they had at the time, and we hardly even remember their names.” But more than 40 years after the fact, Sabin’s memory of the two weeks leading up to Brebner’s death had not faded. “I remember this vividly,” he said in an interview in 1974.

### **The Institutes: Lister (1934–1935) and Rockefeller (1935–1939)**

After two years as a house physician and intern at Bellevue Hospital (1932–1933), Sabin was convinced that his future was in medical research rather than medical practice. This led him to apply for a National Research Council Fellowship, which allowed him to spend a year (1934) studying virology while in residence at the Lister Institute of Preventive Medicine in London. He then returned to New York and joined the Rockefeller Institute for Medical Research, working in the virus laboratory of Dr. Peter Olitsky.

Shortly before Sabin’s arrival on January 2, 1935, Olitsky recalled being “warned by several well-meaning persons” that hiring him would be a mistake. While few, if any, questioned Sabin’s intelligence or skills, the words of caution were linked to his personality, which some found wanting. Olitsky was unmoved. “I had my own opinion on his amazing genius, and having worked successfully with geniuses before I was anxious to have him as an associate.”<sup>4</sup> At the time, Olitsky’s laboratory was focused on issues of immunity related to virus infections, with particular emphasis on poliomyelitis and encephalitis. Given Sabin’s experience in Park’s laboratory, as well as his training at the Lister Institute, Olitsky’s enthusiasm was well founded. According to Olitsky, “the next few years showed the justification of my action, for what he produced was not just superior but brilliant.”<sup>5</sup>

Sabin worked tirelessly at the Rockefeller Institute, refusing to take even Sundays or holidays off. Olitsky described him as:

*Working with infinite patience and most careful technique, precise planning, detailed and elaborate recording of observations, accurate measurements, and, especially, an incisive analysis of a problem (and its corollaries) and skillful tests with rigid controls.*<sup>6</sup>

4 Rivers, T. 1967. *Reflections on a life in medicine and science: An oral history memoir*. Cambridge: MIT Press, 235–236.

5 Ibid.

6 Ibid.

When Sabin had arrived at the Rockefeller Institute in 1935, Olitsky and his colleague Dr. Harold Cox were already doing preliminary work on active immunization, with the objective of identifying principles that could be applied to polio. Beyond his work in the lab, Albert's interest in active immunization was nurtured by South African émigré and live-virus pioneer Dr. Max Theiler, who was then in residence at the Institute working for the Rockefeller Foundation's International Health Division. Theiler's research was focused on live-virus vaccines for yellow fever, for which he was awarded the Nobel Prize in 1951. In 1938, the first field trials with a live-virus yellow fever vaccine, developed on the basis of Theiler's work, were carried out by the Rockefeller Foundation in Brazil. "Theiler's work [also] had a profound impact on Sabin," historian David Oshinsky later wrote, "by strengthening his belief that lasting immunity to disease depended upon a natural infection with a living agent—in short, a live-virus vaccine."<sup>7</sup> This belief would become the driving force behind his poliovirus research in the decades that followed.

### **En route to 31 years at Cincinnati Children's Hospital**

In 1939, at the age of 33, Sabin was a rising star in the field of virology and infectious-disease research. That year he received the Theobald Smith Award, given to people under the age of 35 who had already made "distinguished contributions to medical science." Indeed, it had been less than a decade since he graduated from medical school, yet Sabin had to his credit more than 40 scientific papers in top journals. While the quantity of these publications was impressive, the scope of his inquiries was no less so. He had developed a rapid typing method for pneumococci, identified a new virus (the B virus), and was engaged in highly promising studies on toxoplasmosis and rheumatic fever. Additionally, Sabin had already made significant contributions to the field of poliovirus research, including helping to demonstrate (along with Olitsky in 1936) that the virus could be grown in human tissues within a laboratory setting. And so it was, in early 1939, that Sabin found himself at a crossroads, with three promising job offers presented to him in as many months.

In 1938 President Franklin D. Roosevelt established the National Foundation for Infantile Paralysis, with Basil O'Connor as its inaugural president. One of O'Connor's early moves as president was to recruit Dr. Thomas Rivers, a leader in the field of virology at the Rockefeller Institute, to join the National Foundation as its director of research. Rivers wanted to set a new tone in the field of polio research, and he urged O'Connor to prioritize recruiting like-minded scientists—one of whom was Sabin—to advance

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7 Oshinsky (2005), 141–142.

this objective.<sup>8</sup> In response, O'Connor reached out to Sabin—at first, as part of his getting the measure of the man, to get his assessment of the state of current polio-related research.

In Sabin's response, he said there were "little or no direct data" available to "construct a picture of how the virus enters the body and by what routes and pathways it spreads to attack the particularly susceptible nerve cells in the spinal cord." [That is,] "we know next



Sabin with Basil O'Connor, president of National Foundation for Infantile Paralysis, 1949.

to nothing of the exact manner in which the disease is transmitted in nature, nothing of the factors [that] influence susceptibility and resistance, . . . and nothing of the causes of the special seasonal incidence of the paralytic disease." In short, he summarized, "we can still do nothing to prevent it and nothing to arrest its course in the stage before paralysis sets in. There lies the real challenge to future investigation."

Beyond providing a summary of the problem, Sabin, as was his tendency, also offered his opinion regarding a possible solution.

"Only a concerted, planned, systematic, and persistent attack on the problems [that] most

urgently beg for solution will bring the knowledge [that] may ultimately help to check or eliminate infantile paralysis."<sup>9</sup> O'Connor responded immediately to Sabin's informative letter, writing, "Thank you very much for the material [that] you sent. . . It's exactly what I wanted."<sup>10</sup> Shortly thereafter, Sabin was offered a five-year appointment to support a "full-time" attack on poliomyelitis within the National Foundation.

When Sabin arrived at the Rockefeller Institute in 1935, he had been focused on the progression of viruses in the nervous system from the point of inoculation. However, two "unexpected phenomena," occurring as a result of his research in Olitsky's lab, led to important scientific breakthroughs. In Sabin's work, which involved repeated inoculations, observations, and dissections of the nervous systems of mice and guinea

<sup>8</sup> Oshinsky (2005), 59–60.

<sup>9</sup> Letter from Albert Sabin to Basil O'Connor, president of the National Foundation for Infantile Paralysis, February 8, 1939. ABS Archives.

<sup>10</sup> Letter from Basil O'Connor to Albert Sabin, February 9, 1939. ABS Archives.

pigs, he observed that some animals became sick and died in surprising ways from the inoculations. His following up led to his identification and report of toxoplasma and launched his “side career in toxoplasmosis.” A decade later, Sabin and Dr. Harry Feldman would develop the Sabin-Feldman diagnostic dye test for toxoplasma, still the diagnostic method recommended today.

A second unexpected phenomenon during this period provided the foundation for Sabin’s work on rheumatic fever and rheumatoid arthritis. Broader import aside, Sabin’s rapidly expanding research portfolio and demonstrated versatility had the potential to interfere with the offer of employment that had been put forth by the National Foundation. In mid-March 1939, Rivers wrote to O’Connor to update him about Sabin’s ongoing work and changing employment prospects. Rivers explained that since the full-time polio position at the Foundation had been offered to Sabin, “certain striking things have transpired”—namely, Sabin’s “very important discovery” linked to rheumatic fever and rheumatoid arthritis, recently published in *Science*. Under the circumstances, Rivers was confident that the Rockefeller Institute would make a strong counteroffer in an effort to keep Sabin where he was. Rivers communicated this prediction, and his recommendation on what to do about it, should it come true, to O’Connor: “I believe in academic freedom to the extent of allowing every man to consider every offer. Therefore I suggest that we make Dr. Sabin a free agent so that he may be allowed to make a choice.”<sup>11</sup> O’Connor wholeheartedly agreed. Ultimately, Rivers was right; the Rockefeller Institute did indeed counter O’Connor’s offer, thereby putting Sabin’s second option—advancing where he was—on the table.

Sabin’s third offer came shortly thereafter from the Children’s Hospital Research Foundation at the University of Cincinnati. He was at work in his laboratory when the Rockefeller Hospital’s Dr. Oswald Avery (whom Sabin greatly admired) requested he come meet several of his guests. “I came down in my lab coat...and there I was confronted with superstars of medical research,” Sabin recalled. Among this group—all members of the Scientific Board of Advisors of the Children’s Hospital Research Foundation—were Dr. A. Graeme Mitchell and Dr. Glenn Cullen, two of the hospital’s leaders. The Children’s Hospital and Cincinnati medical school had already gained a strong reputation in the field of pediatric research and practice by 1939; successfully wooing Sabin would help to further elevate the institution’s profile.

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11 Letter from Thomas Rivers to Basil O’Connor, March 13, 1939. ABS Archives.

The correspondence that followed this first meeting between Sabin and his recruiters at the Children's Hospital were full of enthusiasm, warmth, and excitement about the prospect of Sabin joining its core group of researchers. Mitchell and his associates used all the resources at their disposal to court Sabin throughout the month of April. For starters, they offered him a significantly higher salary, any and all equipment he requested to furnish his own laboratories (he was offered a whole group of them), and Sabin's choice of departmental affiliations and professorial titles. They also offered to bring along his Rockefeller lab technicians and several junior colleagues to ensure that his current research was uninterrupted. Most important, they offered Sabin something that neither the National Foundation nor the Rockefeller Institute could match: the freedom and professional autonomy to establish his own research agenda as he saw fit. Moreover, at Cincinnati he would have both laboratory and clinical facilities at his disposal, allowing him to conduct his research any way he liked. This was Sabin's dream, and the opportunity to realize it was one he could not let pass. "I must say that I never regretted this choice," Sabin remarked on his decision to go to Cincinnati. "I had wonderful opportunities to do things that I couldn't have done elsewhere."

A decision either to stay at the Rockefeller Institute or go to the National Foundation would have meant limiting the scope of Sabin's inquiry. At the Institute he was almost entirely confined to the laboratory, without access to a hospital or other clinical work. At the Foundation, his research would have been focused exclusively on poliovirus. Either way, limitations in either the scope or conduct of his research were not things that Sabin tolerated well. He wrote to O'Connor to explain his decision:

*I slept with the idea for so many months, and had made so many plans for a 'full-time' attack on poliomyelitis, that it was only the pressure of other problems—which, at the moment, seemed more important and interesting—that made this difficult decision possible.<sup>12</sup>*

Although their relationship would famously sour during the polio vaccine battles in the 1950s, the earliest exchanges between Sabin and O'Connor were extremely cordial. After explaining to O'Connor his decision to go to Cincinnati, Sabin wrote,

*My short acquaintance with you was so stimulating and the prospects of further cooperation seemed so enticing that I shall feel a great loss in this severance of relations....I shall, however, continue to be interested*

<sup>12</sup> Letter from Albert Sabin to Basil O'Connor, May 11, 1939. ABS Archives.

*in poliomyelitis. If the occasion should ever arise when I might be of any service to you or to the National Foundation, I shall be most happy to do all in my power.*"<sup>13</sup>

The cordiality went both ways. O'Connor responded:

*Needless to say, we regret very much the fact that you cannot carry out the plan we had developed, but you are obviously doing the right thing. I'm sure you will continue your interest in poliomyelitis and that all of us will have the benefit of your work.*"<sup>14</sup>

Sabin began developing his polio research program in Cincinnati immediately after his arrival in 1939, based on his "state of the field" assessment provided to O'Connor earlier that year. In Sabin's view there was insufficient information available about the nature of poliovirus infection in human beings, with the bulk of previous work having been conducted on animal subjects (specifically, monkeys). Accordingly, Sabin and his small team in Cincinnati set out to begin filling this significant gap, in part by studying the nervous systems of people who had died of polio. To facilitate this research, Sabin established his laboratory as the go-to facility for autopsies within a 400-mile radius of Cincinnati. As a result of the work conducted during his first years in Cincinnati, Sabin and Dr. Robert Ward (who came to work for Sabin in 1939) were able to provide an answer to one of the central questions hindering further progress in poliovirus research at the time. Through the materials collected from autopsies, they were able to demonstrate that the



Sabin in his laboratory in Cincinnati, 1950s.

<sup>13</sup> Ibid.

<sup>14</sup> Letter from Basil O'Connor to Albert Sabin, May 12, 1939. ABS Archives.



Sabin in his laboratory in Cincinnati where he used monkeys to conduct his poliovirus research.

poliovirus was transmitted through the alimentary tract and was rarely found in the nasal passage (as giants in the field, such as Dr. Simon Flexner, had previously argued). This breakthrough in 1941 paved the way for subsequent research and ultimately helped provide the basis for the orally ingested polio vaccine.

### **World War II and the Armed Forces epidemiological board**

World War II and Sabin's advisory work, as well as active-duty service in the Army Medical Corps, interrupted Sabin's polio research in Cincinnati during the first half of the 1940s. However, his work with the armed forces provided the foundation for other discoveries that helped solidify Sabin's reputation in the field of virology and infectious-disease research.

Concurrent with his move to Cincinnati and the start of the war, Sabin became a civilian advisor to the Army Epidemiological Board (later renamed the Armed Forces Epidemiological Board) in 1939.<sup>15</sup> As the war raged

on, he wasn't content to continue as a civilian, preferring instead to join the war effort as a uniformed officer. Sabin wanted to be in the field and more actively involved in the research on which he was advising. "It was important to be in the line of command," he explained. "Secondly, there was a certain feeling that you were not doing the utmost if you were not in uniform. But besides that, I was losing a number of my people because of the draft." His solution was to enlist in the Army Medical Corps.

When Sabin joined the military as a commissioned officer (a major) in February 1943, it was as part of an elite group that was not assigned to any one unit in the field. At the end of 1942, the War Department had authorized this "special allotment" of commissioned officers (mostly prominent medical researchers of draft age) that would report directly

<sup>15</sup> The Armed Forces Epidemiological Board (AFEB) was established by the secretary of war during the first years of World War II. The AFEB's primary objectives were to advise the surgeon general on issues related to preventive medicine, provide laboratory and epidemiological support for the timely investigation of outbreaks and other infectious-disease concerns, and conduct research on the prevention, epidemiology, and treatment of "diseases of concern to the Army." For more information, see the AFEB archives available at <http://history.amedd.army.mil/booksdocs/itsfirst50yrs/fiftyyears.html>.

to the Surgeon General and whose work during the war would support the Army's Board for the Investigation and Control of Influenza and Other Epidemic Diseases. The officers, under the command of General Stanhope Bayne-Jones, were given a good deal of flexibility to carry out their assigned research projects. They could be stationed in university laboratories, in the field, or a combination of both, depending on what each project required. In Sabin's case, this meant dividing his time between overseas assignments, his Cincinnati laboratory, and laboratories linked to the Rockefeller Institute.

As a member of this elite group, Sabin conducted research on a range of diseases affecting American military men serving abroad. He was part of special missions in the Middle East, Africa, Sicily, Okinawa, and the Philippines. During the course of World War II Sabin isolated and identified the virus that caused sandfly fever, developed a vaccine to combat a variety of dengue fever affecting troops stationed in the South Pacific, and developed a vaccine against Japanese encephalitis.

### **Poliovirus research (1946–1961)**

When the war ended, Sabin returned full-time to his laboratory in Cincinnati with the intention of establishing strong research clusters focused on a range of diseases including, but not limited to, polio. This would require recruiting new scientists to work in his lab and securing a consistent stream of funding for his research, objectives that he set out to accomplish with his characteristic tenacity and purposefulness. But there was a complication regarding the first objective: Sabin was wary of having too many people in his laboratory, preferring to keep his staff small and highly selective. Sabin preferred to have things done his own way and, whenever possible, to do them himself. He was extremely detail-oriented, a perfectionist, and insisted on being in control of virtually every aspect of any project he worked on, both inside and outside of the laboratory.

Dr. Robert Chanock, who came to work for Sabin at the end of the 1940s and was anointed as one of his “scientific sons,” described Sabin as “the apotheosis of the solitary scientific giant.”<sup>16</sup> Chanock said:

*He was very severe and very demanding and the many, many people who came to his laboratory for training left after a few weeks or a few months. They just couldn't take it....He monitored everything. He knew everything that had happened during the day and you would hear about it the next*

16 Commentary of Robert Chanock, February 7, 1991, titled “Careers in Virology: A Good Beginning Is Usually Required for a Good Ending.” ABS Archives.

*morning if things weren't just right. He was just terribly rigorous. And if you didn't meet his standards, you were in for it.*<sup>17</sup>

Chanock also recalled:

*One day, I really screwed up terribly and his response will give you a small insight into Albert Sabin and the great confidence he had in himself. I was very depressed and he came into my laboratory and put his arm around my shoulder and said, "Bob, don't be depressed. You know, I made a mistake once."*<sup>18</sup>

Achieving the second objective was relatively straightforward. The Armed Forces Epidemiological Board would provide funding for Sabin's work on arthropod-borne viruses and encephalitis, while his polio research would largely depend on his prewar connections to the National Foundation for Infantile Paralysis, which had become the primary source of funding for polio-related research in the United States. Fortunately for Sabin, his reputation ensured that his resumption of polio research would be very well received. Harry Weaver, then in charge of the Foundation's funding and grant making, wrote to Sabin immediately upon learning of his return. "I would like to take this opportunity to tell you how happy we are to learn that you are planning again to direct your interest to problems of poliomyelitis."<sup>19</sup>

By the end of the 1940s, Sabin had come to the conclusion that a live-virus vaccine was needed to effectively combat and possibly eliminate polio. Sabin cited the historic experience with smallpox vaccine (a live-virus vaccine), recent experience with a live-virus vaccine to combat yellow fever (with his friend and colleague Max Theiler leading the way), and Sabin's own experience with dengue during World War II, as solidifying his position on the issue. He wrote:

*[This] led me to believe that it was worth the gamble. And that is all it was: a gamble. You did not know how it would turn out, and, according to some of my colleagues, that is the best definition of basic research.*

Sabin envisioned a systematic and comprehensive research program on polio that would not be completed quickly but would require persistence, precision, and patience. His communications with others in the field, as well as with his primary patrons at the National

<sup>17</sup> Transcript of interview with Robert Chanock conducted by Peggy Dillon, on January 11, 2001, at the National Institutes of Health.

<sup>18</sup> Ibid.

<sup>19</sup> Letter from Harry Weaver to Albert Sabin, May 13, 1946. ABS Archives.

Foundation, attest to his position in the late 1940s that the work ahead would necessarily be gradual, complex, and challenging. It would require the cooperation of multiple laboratories, significant amounts of funding over extended periods of time, and the efforts of a large cadre of seasoned scientists. Sabin explained his thinking at the time by quoting Sir Francis Drake, who said, “Grant us to know that it is not the beginning but the continuing of the same until it is thoroughly finished which yieldeth the true glory.”

Nothing about Sabin’s communications during this period suggests that he viewed polio research as a sort of “race to the finish line” to develop a suitable vaccine, as is often claimed in reference to the development of the inactivated polio vaccine and live-virus alternatives during the 1950s. Sabin did not view polio work as proceeding quickly, nor was polio his singular priority during this period. It is worth recalling here that, between the time when Sabin published his first article on polio in 1931 and the time when his live-virus vaccine was licensed for use in the United States in 1961, Sabin carried out an enormous amount of research on dengue, sandfly fever, herpes, encephalitis, rheumatic fever, rheumatoid arthritis, cancer, measles, and toxoplasmosis.

Sabin’s longtime colleague, Peter Olitsky, from the Rockefeller Institute explained:

*In a race one doesn’t stop to admire the scenery....Never was any time limit set for any experiment. Never did we consider ourselves as racing against others; we never mentioned who was in front, alongside, or in back of us. We often dropped work on polio to take up some new, more alluring subject—e.g., other viruses....Would any track tout call this a race?<sup>20</sup>*

The popular mythologies depicting a spiteful and personal grudge match between Jonas Salk and Albert Sabin, with their respective vaccines engaged in a highly public proxy war, warrant brief mention here.<sup>21</sup> A colleague and contemporary of the two remarked:

<sup>20</sup> Olitsky is quoted in Oshinsky (2005), 242–243.

<sup>21</sup> In an effort to honor Sabin’s position and preferences I am not spending more time on this issue than necessary. Sabin’s correspondence with myriad actors during this period in the 1950s, as well as interviews conducted years later by Saul Benison, suggest that Sabin’s primary issue was with the National Foundation and the conduct of its leadership, which he viewed to be in violation of basic principles of scientific research, rather than with Jonas Salk personally. For a truly outstanding and comprehensive account of this period in the history of polio in the United States, see Oshinsky (2005).

*I wouldn't have characterized [Sabin] as having a distaste for Salk. He was just another guy. There was nothing stellar about him, Albert simply didn't have a very high opinion of him as a scientist.<sup>22</sup>*

Indeed, that Sabin had little regard for Salk as a scientist is without question and was never kept secret. However, Sabin summarily rejected accusations that his quarrel with Salk was personal or petty. Sabin always maintained that his issue was with Salk's vaccine and was based on science and its proper application.

Twenty years later Sabin remained irked by the whole debate and the ways in which he and his position on the matter were commonly misrepresented. Contrary to the accusations made (both ca. 1955 and in subsequent retellings of the history), Sabin insisted that he had not opposed the use of a safe killed vaccine in 1955. Sabin was explicit that his primary objection concerned the strain of killed virus (the Mahoney strain) used in the Salk vaccine, which Sabin (and others) argued was more virulent than needed and could have severe consequences, as the disastrous Cutter incident in the spring of 1955 had demonstrated.



Sabin and Jonas Salk, at Third International Congress on Poliomyelitis, in Rome, Italy, 1954.

Sabin further clarified:

*In 1955 there was no live vaccine to use and that is why, even if a killed vaccine was not the optimum thing, it should have been used. It should have been prepared differently, but it should have been used. Anybody who says that I opposed the use of a killed-virus vaccine when there was still no live-virus vaccine is wrong. That was not my position....What [also] was wrong, and unpardonable, was for the National Foundation to impede the test activity of live virus vaccine candidates.*

<sup>22</sup> Author interview with Dr. Samuel Katz, January 9, 2013.

Sabin had high praise for the World Health Organization (WHO), which, starting in 1957, recommended field trials of the different live-vaccine candidates on increasingly large numbers of people, noting that if it had not been for the WHO, “there would have been no live-virus vaccine.”

Beyond the WHO’s backing, the development of the live-virus vaccine was also made possible thanks in large part to Sabin’s collaborations with a range of scientists and public health officials in the United States and abroad. Indeed, the live vaccine was field tested on millions of people in other countries (10 million in the Soviet Union alone) before it was ever tested on any significant scale in the United States. Sabin was quick to point this out whenever he could. At an international conference on live poliovirus vaccines held in Washington, DC in June 1959, Sabin opened his presentation by stating:

*The past year may truly be referred to as the international live-poliovirus vaccine year, since never before have investigators from so many different parts of the world combined their efforts and facilities to obtain an answer to a question of international public health importance....Our colleagues elsewhere in the world, often in the face of great opposition, have made it possible to obtain the answer, which we in the USA, who developed and supplied the vaccines for international study, were unable to obtain ourselves.*<sup>23</sup>

Starting in 1954, Sabin collaborated with a young Mexican virologist, Dr. Manuel Ramos Alvarez, who he came to refer to as his “Mexican scientific son,” on a series of cross-national studies that compared virus circulation and polio incidence among children in Mexico and Cincinnati. Their studies demonstrated, first, that there were far higher numbers of children excreting poliovirus in Mexico compared to children in the United States, suggesting that the natural circulation of poliovirus in Mexico was more extensive; and second, that Mexican children had a greater variety of viruses and a higher frequency of other enteroviruses circulating within their intestinal tracts when compared to U.S. children.

Sabin and Ramos Alvarez expanded their collaborative research over the course of the next several years, culminating in the groundbreaking Toluca live-poliovirus vaccine field

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<sup>23</sup> Albert Sabin, paper presented at the First International Conference on Live Poliovirus Vaccines, Sponsored by the Pan American Health Organization and the World Health Organization, with the Cooperation of the Sister Elizabeth Kenny Foundation: Papers Presented and Discussions Held (PAHO, Washington, D.C., 22-26 June 1959)

trials of 1959. In a letter to the Mexican Minister of Health in 1959, Sabin explained, “The larger trials that are now being planned in Mexico are of importance for decisions about the future control and possible eradication of poliomyelitis, not only in Mexico but in the whole world.”<sup>24</sup> Indeed, the field studies in Toluca generated some of the most frequently cited data among polio researchers worldwide over the course of the following decades. These studies demonstrated that the oral vaccine could be successfully used to interrupt poliovirus transmission in the midst of an epidemic. They also provided evidence supporting the use of mass-immunization campaigns, and were the basis of guidelines for optimal vaccine administration in tropical and subtropical climates.

By 1959 Sabin had collaborated on field trials in a range of other countries, including Chile, Holland, Sweden, England, Japan, Singapore, and Czechoslovakia. However his collaborative work with the Soviet Union’s Dr. Mikhail P. Chumakov stands out for a number of reasons. Not only were the USSR field trials the largest ever conducted, involving over 10 million people in the first half of 1959, they were also conducted with the active participation of scientists from the United States and the Soviet Union at the height of the Cold War. Dr. Peter Hotez, president of the Sabin Vaccine Institute, notes, “Almost every American inoculated against polio after 1963 and prior to 1996 received a vaccine that was developed and tested through Cold War diplomacy.”<sup>25</sup> This collaboration on poliovirus research not only helped set the foundation for cooperative agreements between national academies of sciences in the two countries but also paved the way for the field trials and licensing of the oral polio vaccine in the United States.

Finally, after millions had received the live vaccine in foreign countries, the time had come for it to make its domestic debut. On the morning of April 24, 1960, more than 20,000 children in the greater Cincinnati area lined up to receive the Sabin oral polio vaccine in its first public distribution in the United States. An additional 180,000 children in the surrounding area received the vaccine during the next several weeks on what became known as “Sabin Oral Sundays” (or “Sabin on Sundays”). In a letter to Thomas Rivers at the National Foundation, Sabin wrote:

*To me, the most important aspect of this is to indicate what can be done in an American city, under a voluntary system of participation in an*

<sup>24</sup> Letter from Albert Sabin to Alvarez Amézquita, February 4, 1959. ABS Archives.

<sup>25</sup> Hotez, P. 2008. Reinventing Guantanamo: From detainee facility to center for research on neglected diseases of poverty in the Americas. *PLoS Neglected Tropical Diseases* 2(2):e201.

*attempt to get rid of poliomyelitis, when the doctors and the people are convinced that mass vaccination in a short time is the way to do it.*<sup>26</sup>

What Sabin was referring to in his letter to Rivers was the widespread speculation at the time that his proposed administrative strategy—involving mass-immunization campaign—was only viable in communist societies or within “socialist” public health systems. The countries that made the most dramatic progress combating polio during this period using Sabin’s vaccine were in fact communist, with the Soviet Union leading



Sabin giving the OPV to children, 1959.

the charge. The Soviet success in 1959 was immediately followed (in 1960) by Czechoslovakia and Cuba, which became the world’s first two countries to fully eliminate polio. Sabin argued in the 1960s, and would continue arguing until his death, that organization and leadership, rather than communism, explained this success.

Ultimately, the Sabin oral live polio vaccine (OPV) was licensed on a trial basis in the United States in August 1960. The following year, in July, the American Medical Association recommended that the Sabin vaccine be used instead of the Salk vaccine once sufficient supplies were available. The Sabin vaccine was formally licensed for production and use in the United States in August 1961 and became the polio vaccine of choice in the United States by 1963. Once it was licensed, Sabin retained the sole authority for granting permission (and supplying seed materials) to potential producers of

his vaccine in different countries. Sabin provided these permissions, as well as seed materials and his services, free of charge. This authority remained unchanged throughout the 1960s, with Sabin directly involved in OPV production in as many as 20 different coun-

<sup>26</sup> Letter from Albert Sabin to Thomas Rivers, April 25, 1960. ABS Archives.

tries by the early 1970s. However, in 1972, after a “brush with death” (linked to having undergone open-heart surgery), Albert explained that he had an epiphany about his vaccine: Neither he, nor any other individual, should be in charge of determining who should or should not be allowed to produce the OPV; rather, he needed to endow some institution or agency with that responsibility.

Sabin didn't feel that the United States, or any other single national entity, should have the power to decide who was “given the privilege” to produce the vaccine he had developed. If left up to one person or country, he reasoned, decisions might easily be shaped by the biases of that individual or nation. Given his history in vaccine development with his Soviet colleagues during the height of the Cold War, Sabin was wary that the United States might make decisions regarding OPV production in other countries based on political rather than scientific grounds. “I figured that the United States would have to make a decision against certain countries, particularly where diplomatic relations were not good,” he remarked.

Accordingly, Sabin turned to the WHO to assume responsibility for the seed materials and vaccine strains, in addition to their distribution for international production. He suggested that the WHO should determine which countries and producers had the necessary capacity and facilities to produce the OPV domestically, and the agency quickly accepted this suggestion. In return, Sabin donated his vaccine strains to the WHO, thereby guaranteeing wide access to his vaccine at the lowest possible cost. Thanks to Sabin's foresight and the WHO's stewardship, the oral polio vaccine became among the most accessible, affordable, and commonly used vaccines in the developing world, thereby contributing to a dramatic worldwide reduction in polio in the decades that followed.

### **An unquiet American: advocacy and political activism**

Sabin emerged from the polio vaccine drama of the late 1950s and early 1960s as a public figure and powerful advocate for expanding access to vaccines, both domestically and internationally. He was outspoken about the prohibitive costs of biologicals manufactured in the United States, outraged about unequal access to vaccines and basic health services in poor communities and countries, and hell-bent on ensuring that protection from preventable diseases was not merely a luxury for the wealthy but available to all. However, his advocacy was by no means limited to vaccines. He was adamant that greater collaboration between the United States and the Soviet Union (and other advanced

nations) was necessary to combat broader problems such as nuclear warfare, underdevelopment, and inequality.

“Unfortunately, nations are not guided by love and reason,” Sabin stated in 1963. “Consequently we must find a common enemy. That enemy is poverty, disease, and despair... Just like this nation learned 100 years ago that it cannot survive half free and half slave, the world must now realize that we cannot survive one-third fed and two-thirds starved.”<sup>27</sup> Early on, he championed recognition of the relationships between poverty and poor health—which are now studied as “social determinants of health”—calling for greater attention to the underlying causes of disease and misery worldwide.

Sabin’s activism increased throughout the 1960s as the Cold War persisted and active conflicts such as the war in Vietnam escalated. In fall 1965, he joined a group of prominent antiwar activists to organize and sponsor a “march on Washington for peace in Vietnam,” held on November 27. The following year, in December 1966, he collaborated with a group of prominent physicians, scientists, clergy, and intellectuals to establish the Committee of Responsibility (COR) to Save War-Burned and War-Injured Vietnamese Children. This committee, and Sabin’s advocacy in particular, helped convince U.S. policy makers to increase medical aid to South Vietnam.<sup>28</sup> The associated announcement, made by the Johnson Administration in April 1967, came only one day after Sabin was featured in a full-page advertisement in the *New York Times* making the COR’s case and calling on the American government to emulate the “basic humanitarianism of the American people.”<sup>29</sup>



Sabin with Lord Attlee signing the United Nations Manifesto of the Conquest of Hunger. Rome, Italy, 1963.

27 1963. Sabin gives warning on polio here. *Los Angeles Times*, November 18.

28 Ward, P. W. 1967. U.S. to expand medical aid in, outside Vietnam. *Baltimore Sun*, April 7.

29 Sabin, A. B. 1967. “An appeal from Dr. Albert B. Sabin on the problems of war-maimed civilians based on a clarification of the views of Dr. Howard A. Rusk. *New York Times*, April 5.



Sabin, with Hubert Humphrey and Moshe Dayan, at Sabin's inauguration as President of the Weizmann Institute, 1970.

Sabin was also extremely active in working to advance the cause of peace in the Middle East. In the aftermath of the Six-Day War in June 1967, he joined a group of prominent scientists, academics, and intellectuals to establish American Professors for Peace in the Middle East. Sabin served as the group's national chairman starting in October 1967, and in this leadership role he traveled frequently to Israel and a range of Arab nations, meeting with diverse leaders in an effort to generate support for high-level peace talks between Israel and its Arab neighbors.

In addition to the more overtly political advocacy that Sabin engaged in during the 1960s, part of his growing activism

then was on behalf of what he described as “research in the service of man.” He asserted that “a scientist who is also a human being cannot rest while knowledge [that] could be used to reduce suffering rests on the shelf,” and he linked this statement, and the overarching ethos guiding his career, to the work of Immanuel Kant. In *Dreams of a Spirit Seer*, Kant discusses the difference between pursuing knowledge for its own sake and pursuing knowledge to address and solve questions that are of particular importance to humanity. Sabin, throughout the course of his career, chose to focus on the latter.

He was always quick to speak out about what he viewed as an unproductive dichotomy between proponents of basic vs. more applied research. Sabin described the problem to a colleague in 1966:

*It seems to me that many of our colleagues are losing sight of the [fundamental] issue. No one denies the importance of the search for knowledge for its own sake as a most important endeavor that must continue to be supported and expanded if we are going to be able to use science for the solution of problems of importance to human welfare.*

The biggest issue in Sabin's view was that more wasn't being done to facilitate cooperative research to address these problems in a coordinated and proactive way.<sup>30</sup> It was this concern about putting science in the service of man that helped Sabin make his next career move at the end of the 1960s.

### The Weizmann Institute of Science

After 30 years of pioneering research at the University of Cincinnati and the Children's Hospital Research Foundation, Sabin left his laboratory in 1970 to become president of the Weizmann Institute of Science in Rehovot, Israel. A Tel Aviv newspaper reporter described his arrival at the institute:

*Tall, silver-haired, Dr. Sabin spreads excitement with each word. His enthusiasm for his new challenge, and his love for Israel, are immediately apparent.*<sup>31</sup> *Sabin explained to reporters, "I want to be a part of Israel. I am excited about this country."*<sup>32</sup>

Sabin's interest in the territory that later became Israel began when he first traveled to the Middle East in May 1943 as part of his work as a commissioned officer with the Army Epidemiological Board. The board's mission had begun in Cairo but ultimately took Sabin and his colleagues across the Sinai desert into Palestine. This experience was evocative of Sabin's childhood in Bialystok and the stories his grandfather had told him about ancient Egypt, the exodus of the Jews, and their wandering in the Sinai before ultimately arriving in the Promised Land:

*The fact that I was a Jew traveling in this area,...I had feelings that I am sure were quite different from those of [my Christian colleagues,] whose background was totally different...That was my first exposure and we came through the desert—not quite following the path of the children of [ancient] Israel—in eight hours instead of 40 years.*

Sabin recalled his arrival in Tel Aviv and his awe at the work carried out by the "Jewish pioneers" who had come to Palestine years before, and who had, in Sabin's view, cultivated green fields where once there had been only desert.

30 Letter from Albert Sabin to Maurice Visscher, November 19, 1966. ABS Archives.

31 Goldberg, M. 1970. Dr. Albert Sabin at the Weizmann Institute. *International Jewish News*, April 17.

32 *ibid.*

Clearly, Sabin's initial exposure to the work of Israelis in Palestine made an enormous impression on him. He recalled watching the rest of World War II unfold: "I lived through the various periods of the rest of the war, and the impact of the slaughter of 6 million Jews in a most barbaric way left its imprint....It was never without its effect on me." The next time Sabin traveled to Israel was in 1959 at the request of the country's Ministry of Health. Remarking on his trip, Sabin explained:

*They [the Israelis] were creating a culture and a life [that] really had a tremendous emotional impact on me....Although my whole cultural pattern was that of an American, I could not divorce myself from this association of what I would call 4,000 years of heritage....After this trip I became even more strongly influenced by the events [in] Israel than I ever was before...I wanted to help in whichever way I could.*



Sabin with Israeli Prime Minister Golda Meir at Weizmann Institute, 1971.

Over the course of the following decade, Sabin traveled to Israel on an annual basis and became increasingly involved in Israeli institutions of higher education and research—including, but not limited to, the Weizmann Institute, whose board of governors he joined in 1965. It was this history of involvement and advocacy surrounding the State of Israel that made Sabin a logical candidate when the institute began its search for a new president. He was first approached with the idea while in Washington, DC in January 1969 to attend the inaugural ball for President Richard Nixon. "My first reaction was one of uncertainty," Sabin said. "I had

never thought of leaving my work in the laboratory and leaving the country to go and live in Israel. But without too much hesitation, I said all right, put my name in. But I had no expectation."

At that time Sabin was invested in a series of new studies on the potential linkages between viruses and cancer. Leaving his laboratory and his research to take up an entirely different activity was not a decision to be taken lightly. However, he concluded that if

elected he could perform a useful service to the institute, helping to place it on more solid footing and supporting its mission to solve “some of the important problems of Israel” using science as the vehicle. And so, when Sabin was offered the presidency of the Weizmann Institute in April 1969, he accepted, moving to Israel to assume his new post at the end of the year.<sup>33</sup>

In many ways the Weizmann Institute embodied Sabin’s convictions about the need for science in the service of mankind. The institute’s original founder had viewed science as a means for Israel’s development and survival, a perspective that was particularly salient to Sabin. He explained:

*I was always a person...acutely sensitive to the need for seeing that knowledge that becomes available through research not remain something beautiful on the shelves of libraries or like the works of art hanging in museums, but that it be used, as far as possible, to solve basic and human problems.*

However, Sabin’s time at the Weizmann Institute was briefer and less fruitful than he’d hoped. Health troubles would ultimately contribute to his premature departure in 1972, after having served only two of his contracted five-year term as president.

During his second year in Israel Sabin suffered his first attack of coronary ischemia. He was taken to the hospital, placed under observation, and instructed to make changes in his diet and lifestyle. The timing was inconvenient for him, as he had a very busy schedule in mid-1971, including testimony before the U.S. Congress and a range of international speaking engagements. Not surprisingly, Sabin did not listen to the advice of his doctors and refused to slow his typically taxing pace. Also not surprisingly, Sabin’s coronary ischemia did not improve and he wound up in the hospital for open-heart surgery in early 1972.

His time away from the Weizmann Institute and the opportunity to reflect on the challenges that lay ahead of it, and those ahead of Israel more generally, resulted in Sabin’s decision to step down as president. In his opinion, a non-Israeli, even an American Jew, could not achieve the things that the institute needed. Only someone more intimately connected to the surrounding population and its priorities could fulfill the institute’s purpose. And so Sabin resigned from his post and returned to the United States, where

<sup>33</sup> Sabin’s decision was not without fallout in his personal life—specifically, the dissolution of his second marriage.

he was appointed fellow at the National Institutes of Health's Fogarty International Center for Advanced Study in the Health Sciences.

Sabin continued, however, to serve as a member of the Weizmann Institute's board of governors for another two decades. His belief in its mission to put science in the service of humanity remained firm throughout the rest of his life. Ultimately, Sabin would donate more than \$620,000 to support the institute's solar energy research, and he left the institute the bulk of his estate upon his death in 1993.

### **A softer side of Sabin**

Upon his return from Israel, and arguably for the first time, at the age of 66 Sabin seemed to make his personal life a priority. In an extraordinarily productive career like his, perhaps the best indicator of this change was his publication record during the 1970s. With the exception of several articles on the relationship between viruses and cancer, authored during his one-year consultancy with the National Cancer Institute in 1974, Sabin all but disappeared from the scientific journals between 1972 and 1980. He published fewer scientific articles in this eight-year period than he averaged annually between 1931 and 1969. What he did publish was a mix of opinion pieces, editorials, commentaries on science and society, and a handful of articles on measles, hepatitis, influenza, and polio immunization campaigns.

While a number of explanations might be offered, one very probable factor entered Sabin's life when he traveled to Brazil in November 1971. Much to his good fortune, while in Brazil he attended a reception where, in a receiving line, he met Heloisa Dunshee de Abranches.



Sabin with Heloisa.

The niece of a prominent Brazilian newspaper owner, Heloisa was a strikingly beautiful 54-year-old divorcée with two grown children. She and Albert were immediately taken with each other, in spite of having shared only a few minutes together. The next several months were filled with the makings of a compelling romance novel. A constant stream of love letters flowed back and forth, with one letter hardly opened before the next one arrived. Heloisa liked to point out (with a mischievous smile) that it was she who pursued Albert, although the contents of their amorous correspondence leave no doubt that the feelings between them were quite mutual.

In one of his earliest letters to Heloisa, dated December 13, 1971, Albert described himself as “a hopelessly romantic dreamer in my personal affairs, and as a spinner of very methodical dreams that can be translated into action in practical affairs.” In this letter he confessed that he was having heart problems and had been urged to make certain changes in his life. Heloisa responded, already concerned for his well-being: “My dear Albert, I would like to remind you to please take good care of yourself, but really good care. You are too precious for humanity.” Albert and Heloisa reunited in Geneva several months later—after, according to both, having fallen in love with each other through their letters. After only their second meeting there, they swore that they would be married and in their subsequent correspondence referred to each other as “secret husband” and “secret wife.” Their secret was formalized and publicized by their April 1972 marriage in Palm Beach, Florida.

By 1974, after recovering from open-heart surgery, serving for two years in appointed positions within the National Institutes of Health, and marrying the lovely Heloisa, Sabin seemed to have burned out on his laboratory work and was ready to try something new. This led him to the University of South Carolina Medical School, where he became a sort of “elder statesman type of university professor of biomedical research.” Sabin explained that what the medical school lacked in prestige it made up for in the freedom, flexibility, and salary it offered him. During his residence in South Carolina, he continued his advisory work for numerous organizations and agencies, including the U.S. Department of Health, Education, and Welfare, a research commission on hepatitis for the U.S. Army, the World Health Organization, and the Pan American Health Organization’s Advisory Committee on Medical Research.

After nearly 10 years in South Carolina, Albert and Heloisa moved back to Washington, DC, in 1983. A friend of the couple noted that they “shared an enormous affection and love for one another, one that created an atmosphere for Albert to pursue his work with

vigor and with dedication, particularly in his later years. Heloisa was the force behind Albert.”<sup>34</sup> This became increasingly so in 1983, when Albert became gravely ill.

In May 1983 he began developing mysterious symptoms, ironically reminiscent of the paralytic diseases he’d spent the past 50 years studying. His legs grew increasingly weak, causing him to fall down and have trouble walking. Ultimately, Sabin was diagnosed with a rare disease that caused the ossification of a ligament running along his spinal cord, resulting in extreme pressure being placed on the cervical canal and spinal cord itself. He spent more than a month in a metal brace, walking very cautiously with a cane, and in severe pain. After undergoing surgery at Johns Hopkins University Hospital, things appeared to be looking up. He regained function in his legs, was able to walk again, and in mid-August 1983 returned home to the apartment he shared with Heloisa in northwest Washington, DC. Unfortunately, this improvement was short-lived. A week later Sabin was in agony again. He described it as the most severe pain he’d ever experienced, making him want to die. “Just like a bolt, I became paralyzed from the waist down,” he recalled. “My feet, legs, and hips felt just like wood. I had no medication for the pain. The doctors were afraid it might interfere with my respiration.”<sup>35</sup> But his breathing faltered anyway. His lungs filled with fluid, his body shut down, and a hospital attendant ran into the hallway shouting, “Dr. Sabin is dead!” Fortunately, doctors arrived in time to resuscitate him, shocking his heart and getting a tube down his throat to clear the mucus in his lungs. Sabin’s recovery after this brush with death was excruciatingly slow, especially for a man known for his tireless work ethic and seemingly superhuman schedule. His plight did not go unnoticed, however, thanks in large part to *Chicago Tribune* reporter Bob Greene.

In his weekly column, Greene reported on Sabin’s condition and suggested that people write to him in the hospital, expressing their thanks and assuring him that they had not forgotten “Sabin on Sundays.”<sup>36</sup> In the days following Greene’s initial column, Sabin received more than 45,000 letters from people all over the country (this number would grow to 100,000 over the following weeks).<sup>37</sup> Heloisa, his consummate caretaker, sat by Albert’s side every night and shared many of these letters with him. “When I read them to him, I cry,” she said. “All the people thanking him, . . . telling him that they have not

34 Remarks made by Joseph A. Bellanti during Sabin’s memorial service held on March 18, 1993, at Georgetown University.

35 Bowen, E. 1984. Albert Sabin: The doctor whose vaccine saved millions from polio battles back from a near-fatal paralysis. *People Magazine*, July 2

36 Greene, B. 1983. RX: Don’t forget Sabin on Sunday. *Chicago Tribune*, December 4.

37 Greene, B. 1983. 45,000 readers say “Thanks, Dr. Sabin.” *Chicago Tribune*, December 21.



Sabin in his home still walking with a cane after his illness in 1983.

forgotten what it was like when parents lived in fear of polio.” Heloisa promised that she would keep the letters forever “to show my husband how loved he is.” Sabin admitted,

“I don’t know how to thank the people who wrote to me.... You always have a feeling of doubting whether what you have done with your life is truly worthwhile; I suppose every medical researcher feels that way. But from these letters, the evidence is very good that people consider my work worthwhile.”<sup>38</sup>

In the 1984 interview with *People Magazine*, Sabin reported that the most reliable proof that he had recovered was his revived outrage at the injustices in the world around him and his renewed energy to complete his unfinished work. In Sabin’s view, this unfinished work had much to do with global polio and measles eradication. Although in his late 70s and still slowed by his recent illness, he spent much of 1984 mobilizing political support for polio eradication, working in large part through Rotary International. In addition to his polio crusade, Sabin also pursued new collaborative studies

with scientists and public health officials, particularly in Mexico and Brazil, on an aerosol vaccine to combat measles. He explained his motivation to continue working: “I’m not like the scientist who quits when he gets the knowledge. I’m concerned with human welfare. I’ve got to go from the beginning to the end.”<sup>39</sup>

<sup>38</sup> Ibid.

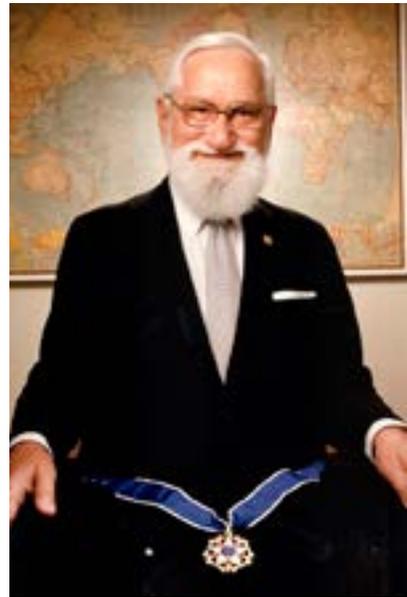
<sup>39</sup> Op. cit.

## Unfinished business: global polio eradication

Controlling polio was never good enough for the uncompromising Dr. Sabin. He sought its total global eradication, arguing that the administrative simplicity and low cost of his vaccine made it possible for every country in the world to effectively eliminate polio. The task that consumed much of his life starting in the late 1950s was to convince everyone else he was right. As early as 1961, Sabin had begun agitating for eradication: “In oral poliovirus vaccine we now have a simple tool with which we may attempt to rid large parts of the world of both paralytic poliomyelitis and the virulent viruses that cause it. I hope that public health authorities everywhere will now provide the necessary leadership for its use and show us the extent to which poliomyelitis can really be eradicated and stay eradicated.”<sup>40</sup>

Sabin’s crusade had an almost messianic fervor during the final decade of his life, with him insisting that any country on Earth could effectively combat polio so long as his recommendations were followed. While never known for his tolerance when it came to competing perspectives, Sabin’s confrontations with those who did not share his views on polio eradication became the stuff of legend during the 1980s. He notoriously called for the dismissal of Brazil’s Minister of Health in 1980 over a disagreement about the way in which the country’s public health officials reported polio surveillance data and about the individuals tapped to lead Brazil’s national immunization days. He also wrote unsolicited to Paraguayan dictator General Alfredo Stroessner to offer his critique of Paraguay’s immunization-campaign plans. And these are but two examples. Sabin told numerous presidents, health ministers, and heads of international organizations who they should appoint to direct their efforts to eliminate polio, writing often-vitriolic responses to those who did not heed his advice.

By Sabin’s own admission, he grew less and less tolerant of inaction as time went on. “I was impatient as a young



Sabin displaying the Medal of Freedom in 1986.

<sup>40</sup> Sabin, A. B. 1961. Eradication of poliomyelitis. *Annals of Internal Medicine* 55(3):357.



Sabin with Fidel Castro in Cuba to receive the Carlos Finlay Order, Cuba's highest honor awarded to a scientist, 1987.

man," he explained in his speech upon receiving the Rotary Award for World Understanding in 1985:

*But I am still more impatient as a 78-year-old man because I don't have much time left. My impatience is aggravated by the realization that for each day that passes without action, more than...1,000 children are crippled by polio [and] more than 7,000 die of measles and its complications.*

His impatience, and the work unavoidably left undone at the end of his life, ultimately helped launch the Albert Sabin Vaccine Institute.

In October 1992, Sabin received a letter from Dr. H. R. ("Shep") Shepard, then the chairman of Armstrong Pharmaceuticals, in which Shepard wrote, "It is my belief that your extraordinary achievements should not only be recognized but institutionalized." Shortly thereafter, he visited Sabin to discuss the idea for the Albert Sabin Vaccine Institute in person. But

by the end of 1992 Sabin's health had declined significantly and Heloisa was less than enthusiastic about her husband taking on anything new. After Shep left, she expressed her concerns to Albert. Heloisa recalled:

*He listened attentively and replied in his pragmatic style: "My dear, I need an institute as I need a hole in my head, but I need Shep's help. He has the approach, the means, and the determination to help me to finish my unfinished business: the eradication of measles by aerosol....And, quite frankly, I like the guy."*

Over the next several months, Shep became a frequent visitor, discussing plans for the institute with Sabin along with other visitors, such as Robert Chanock. The institute would ultimately become a world leader in neglected tropical-disease research, education,

and advocacy, ensuring that Sabin's legacy was indeed institutionalized. With its Product Development Partnership focused on expanding access to life-saving interventions through international collaboration and dedication to the diseases of the poor, it is exactly what the uncompromising Sabin would have wanted.

### Remembering Albert Sabin

After an outstanding career spanning more than six decades, Sabin died of congestive heart failure on March 3, 1993. He left behind two daughters, Amy and Debbie, his wife Heloisa, nine grandchildren, and two great grandchildren. He was buried in Arlington National Cemetery. A newspaper editorial published the day after his death described him as “a kind of statesman of health, always ready to show, especially to the poor, that good intentions must necessarily be complemented [by] political actions [that] transform scientific formulae into measurable social goods.”<sup>41</sup> In a letter of condolence to Heloisa, UNICEF executive director James Grant wrote of Sabin:

*He was as tenacious in the pursuit of his goals for the betterment of humanity as was his forthrightness on ethical issues—a rare but essential human characteristic....The world has lost a giant, but the fruits of his labor will continue to benefit future generations.*<sup>42</sup>

Sabin was one of the most decorated scientists in history. He was the recipient of numerous honorary degrees and titles from universities throughout the world. He was elected to the National Academy of Sciences in 1951. He was awarded the Presidential Medal of Freedom by President Ronald Reagan in 1986, the same year that the Soviet Union bestowed its highest civilian honor upon him. The list of other honors and awards that Sabin received throughout his career is almost as long as his list of publications, no small statement about a man who published over 350 scientific papers, on a broad range of diseases, during a 60-year time span.

Beyond his scientific contributions he was also a powerful advocate, using his stature and professional and personal connections to help expand access to vaccines and generally to advance medical research for the benefit of mankind. In paying a final tribute to Sabin and his remarkable life, it is perhaps most appropriate to let one who knew him personally and knew him best have the final word. Robert Chanock, Sabin's “scien-

<sup>41</sup> Editorial that appeared in the *Jornal do Brasil* on March 4, 1993, kindly loaned to the author by Heloisa Sabin.

<sup>42</sup> Letter from UNICEF executive director James Grant to Heloisa Sabin (March 18, 1993), which she loaned to the author.

tific son” and an outstanding scientist in his own right, honored his longtime mentor, colleague, and friend in a eulogy delivered on March 8, 1993:

*He was a towering presence in our midst and an extraordinary seeker of truth about the human condition. I will sorely miss him, but I am certain that if there is an afterlife, Albert will have already begun his campaign to seek solutions to its outstanding problems.*

#### **AUTHOR’S NOTE**

In writing this biographical memoir, I made every effort to let Dr. Sabin speak for himself, allowing his eloquent and forthright manner to come through whenever possible. Additionally, I have supplemented Sabin’s own words with those of the colleagues and friends who knew him best. Although I was never fortunate enough to have met him personally, I am extremely grateful to Mrs. Heloisa Sabin, who spent several months sharing personal stories of her husband—the “uncompromising Dr. Sabin”—with me. I also relied heavily on unedited transcripts of countless hours of interviews conducted by Dr. Saul Benison between 1973 and 1976, on extensive documentation from Dr. Sabin’s files at the Albert Sabin Archives at the University of Cincinnati, and my own interviews with Sabin contemporaries. I am indebted as well to Stephanie Bricking, the Sabin archivist at the University of Cincinnati, and Stephen Marine, the executive director of the Archives, without whom this project would not have been possible.

All photographs are courtesy of the author.

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