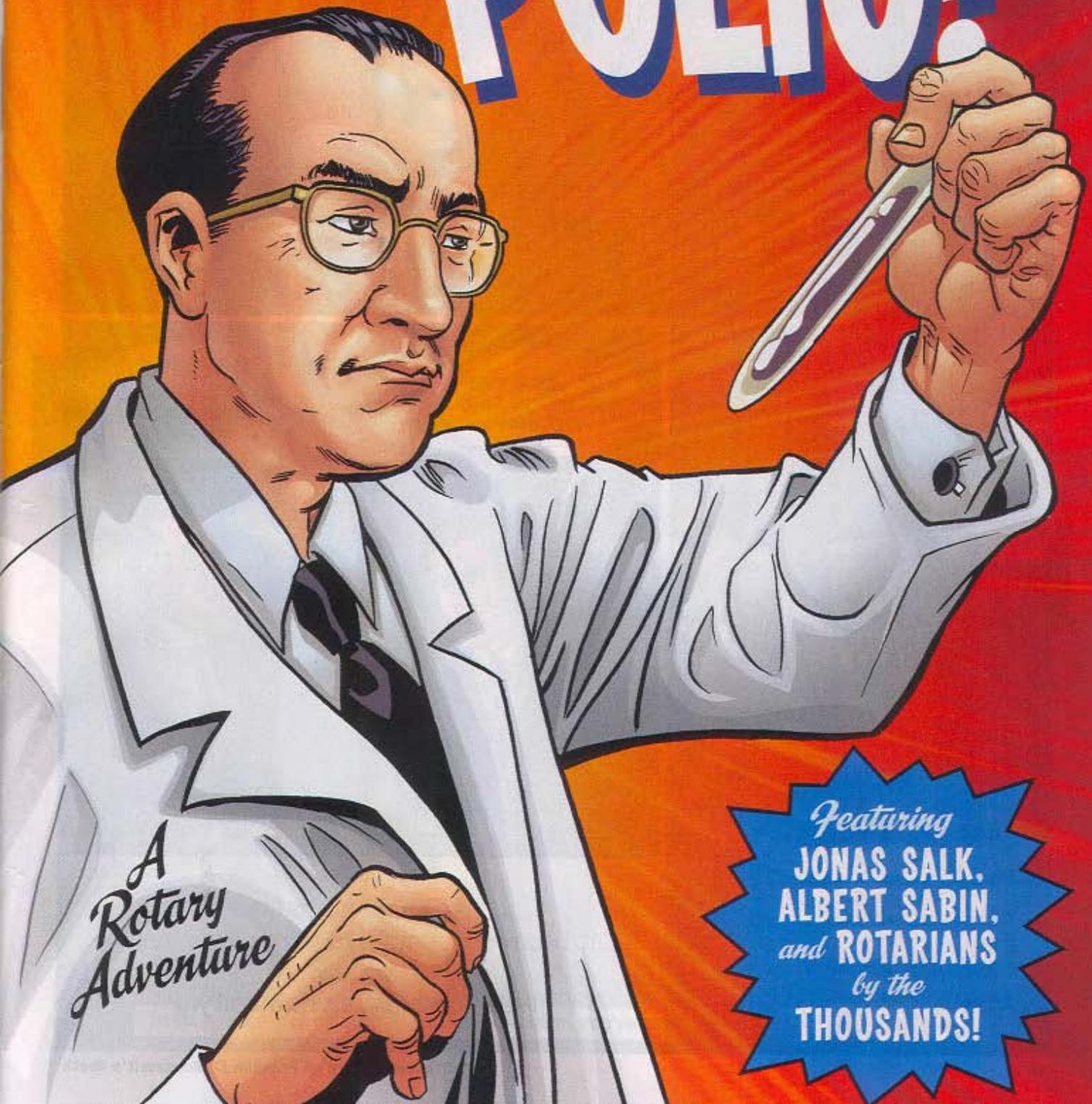


Amazing Stories of

POLIO!



*A
Rotary
Adventure*

Featuring
**JONAS SALK,
ALBERT SABIN,
and ROTARIANS**
by the
THOUSANDS!

Ann Arbor, Mich., USA. 12 April 1955.* Scientists gather to discuss the results of trials by Thomas Francis and Jonas Salk of a new polio vaccine.

THE NEW SALK VACCINE WORKS, IS SAFE, EFFECTIVE AND POTENT.

written by
DIANA SCHOBERG
illustrated by
STEVE BUCCELLATO

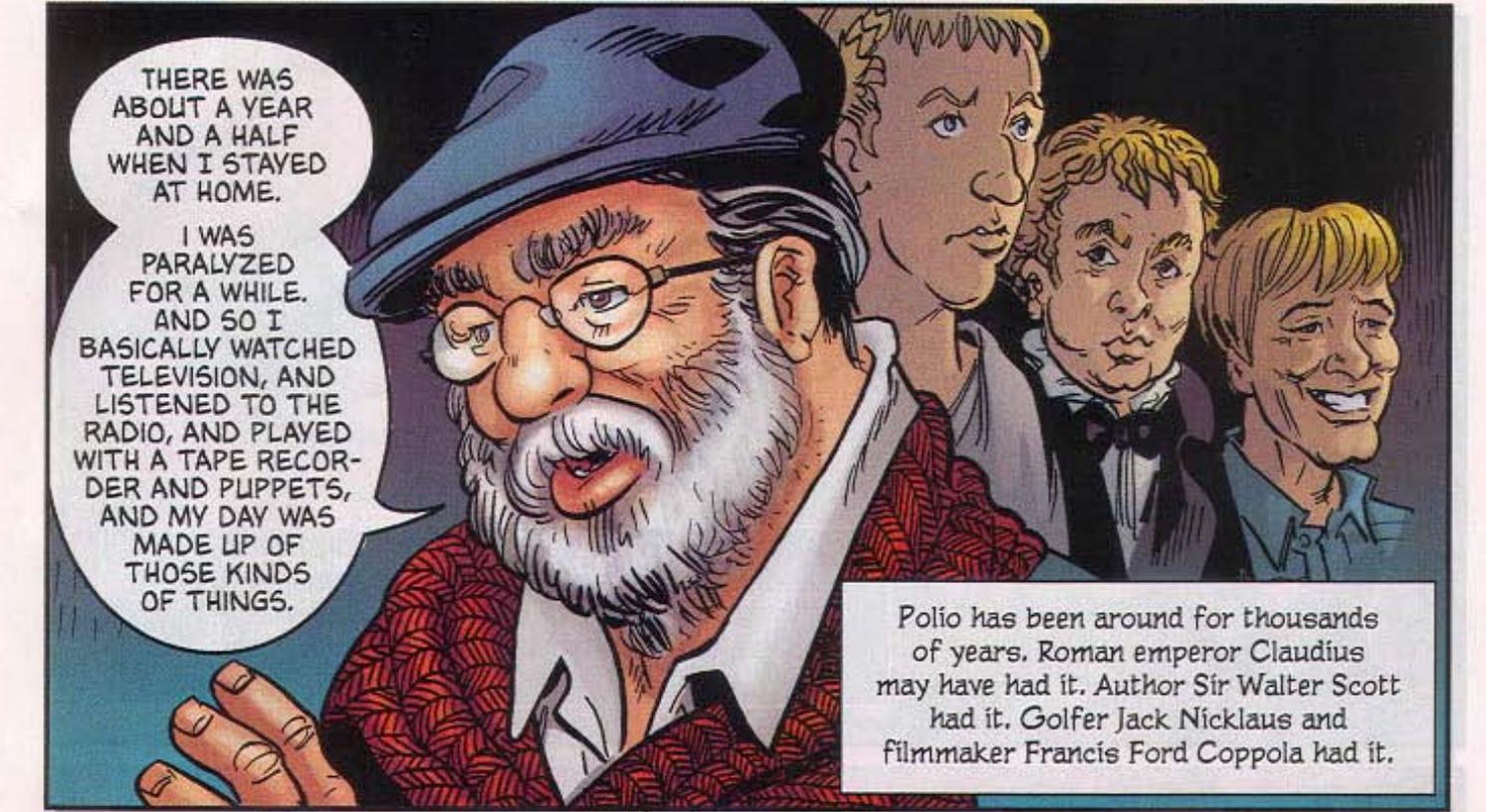


WHO OWNS THE PATENT ON THIS VACCINE?

THERE IS NO PATENT. COULD YOU PATENT THE SUN?

At that moment,
it became possible to purge the planet
of a disease
that has plagued humanity...

*10th anniversary of Franklin D. Roosevelt's death



THERE WAS ABOUT A YEAR AND A HALF WHEN I STAYED AT HOME.

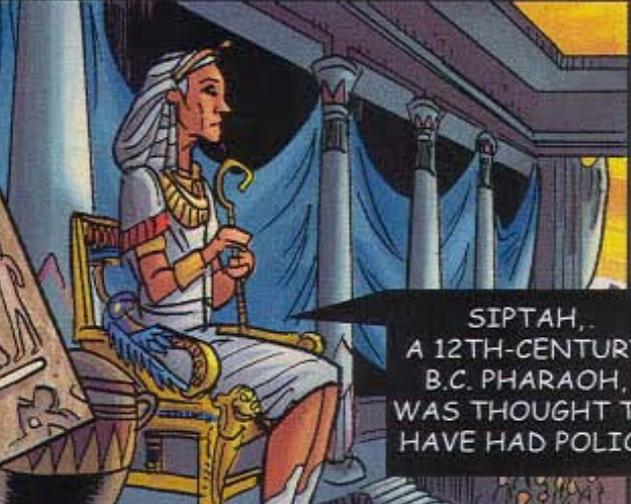
I WAS PARALYZED FOR A WHILE. AND SO I BASICALLY WATCHED TELEVISION, AND LISTENED TO THE RADIO, AND PLAYED WITH A TAPE RECORDER AND PUPPETS, AND MY DAY WAS MADE UP OF THOSE KINDS OF THINGS.

Polio has been around for thousands of years. Roman emperor Claudius may have had it. Author Sir Walter Scott had it. Golfer Jack Nicklaus and filmmaker Francis Ford Coppola had it.

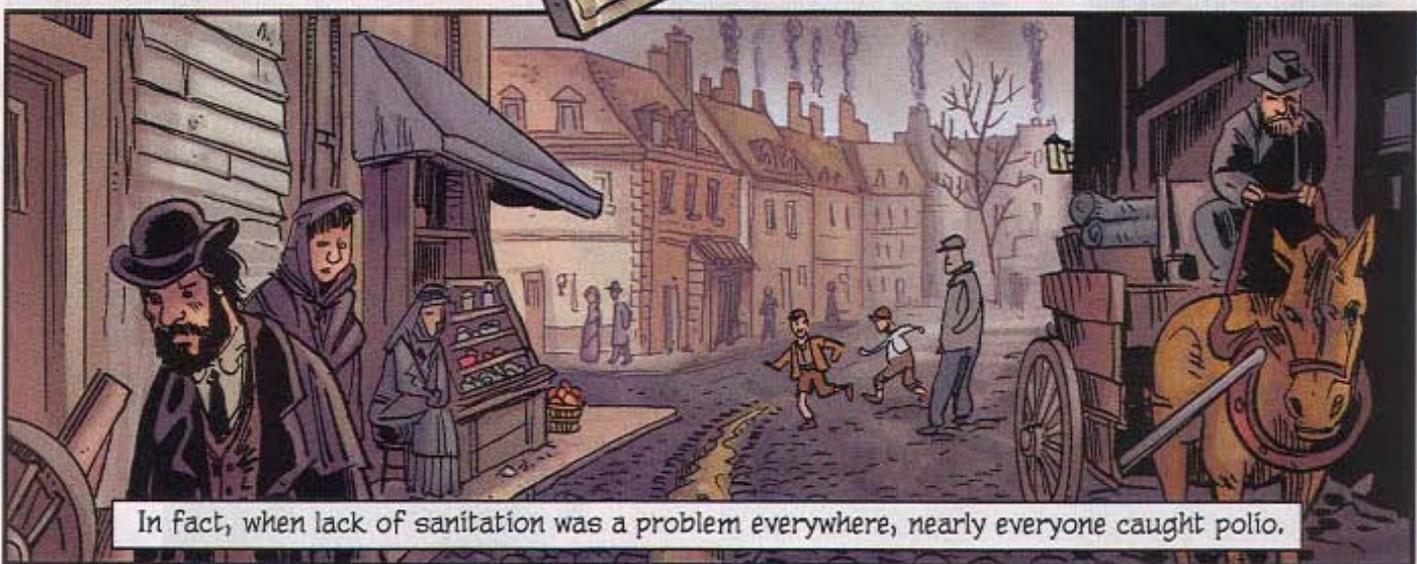
Even the ancient Egyptians had it.



A STONE TABLET FROM THE 15TH CENTURY B.C. SHOWS A PRIEST WITH AN ATROPHIED LEG.



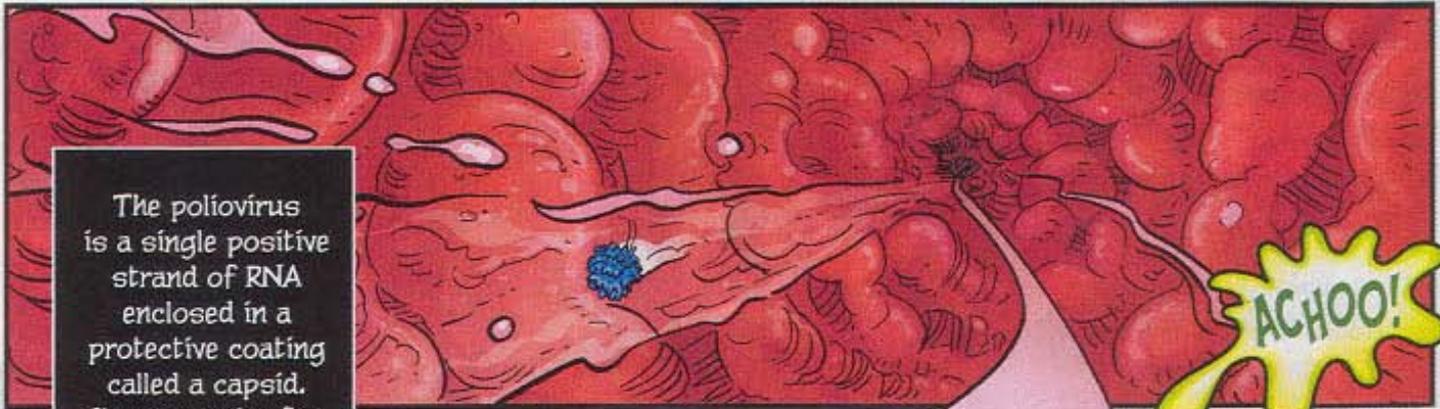
SIPTAH, A 12TH-CENTURY B.C. PHARAOH, WAS THOUGHT TO HAVE HAD POLIO.



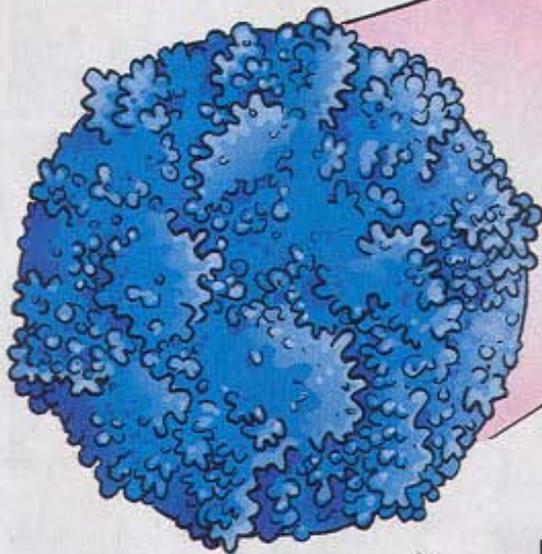
In fact, when lack of sanitation was a problem everywhere, nearly everyone caught polio.



Polio is an intestinal virus that enters the environment through feces. It's spread through person-to-person contact, especially in situations of poor hygiene, and enters the body through the mouth.



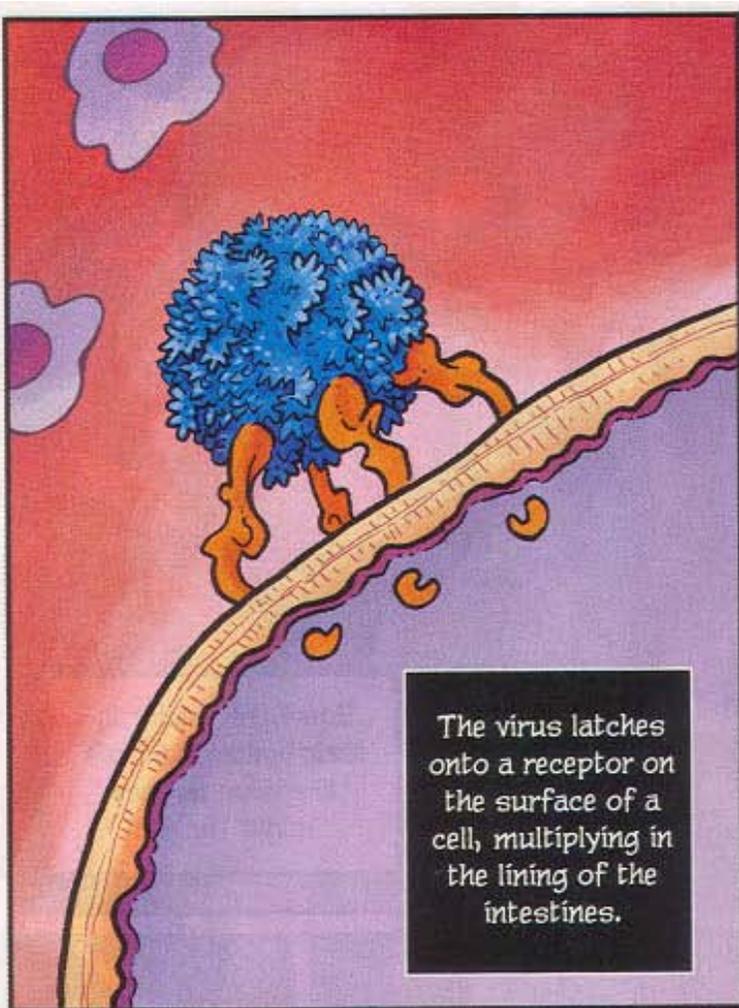
The poliovirus is a single positive strand of RNA enclosed in a protective coating called a capsid. It can survive for up to two months outside the body. It's in family Picornaviridae. So is the common cold!



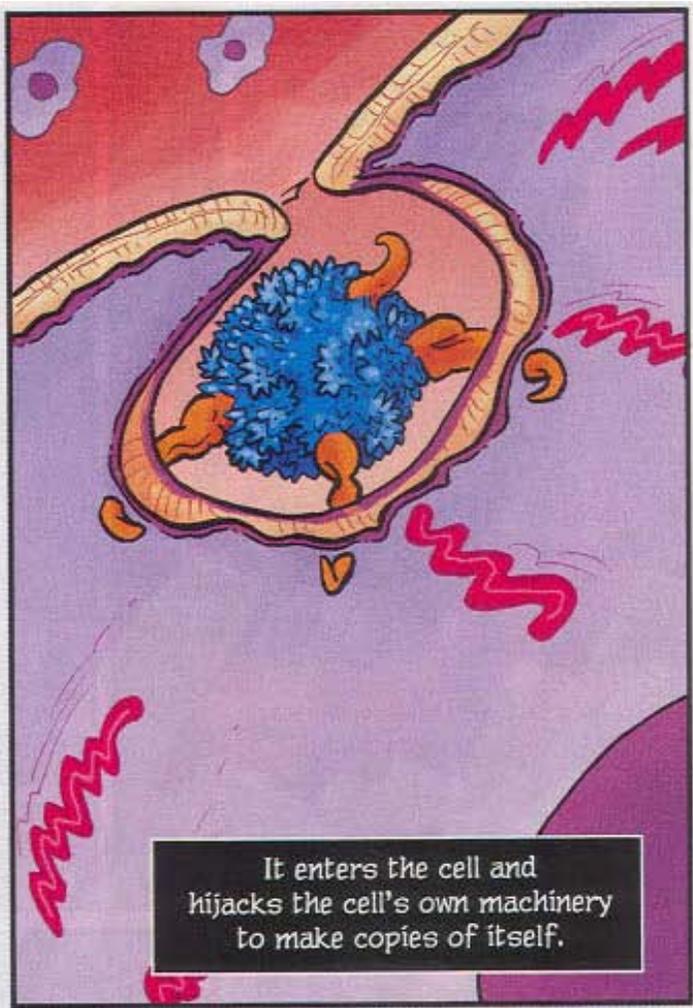
There are three variations, or serotypes, of the poliovirus. They differ in their outer coatings.

Type 2 has been eradicated since 1999.

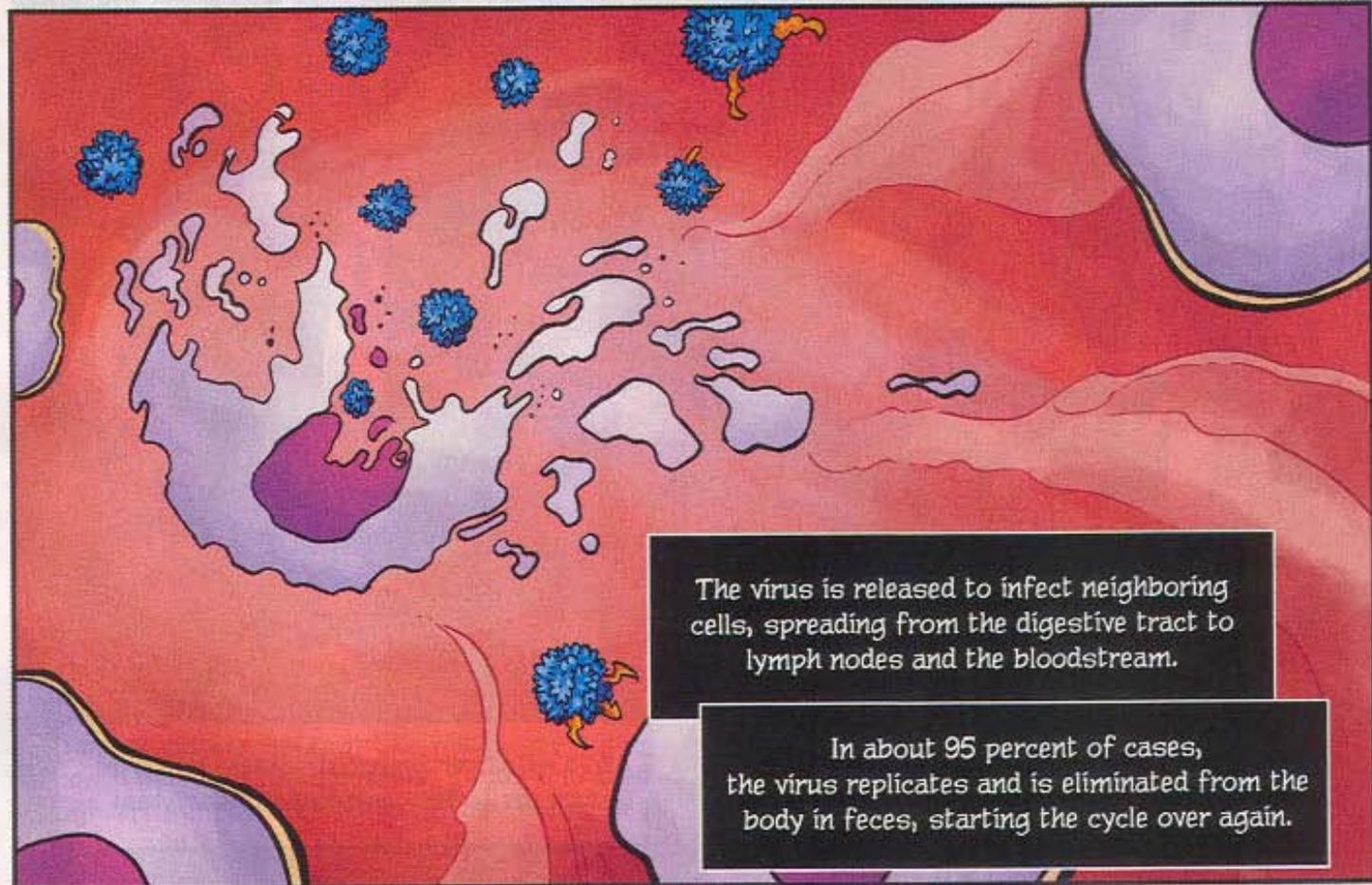
They infect only humans, mainly children under 5. There is no cure.



The virus latches onto a receptor on the surface of a cell, multiplying in the lining of the intestines.



It enters the cell and hijacks the cell's own machinery to make copies of itself.



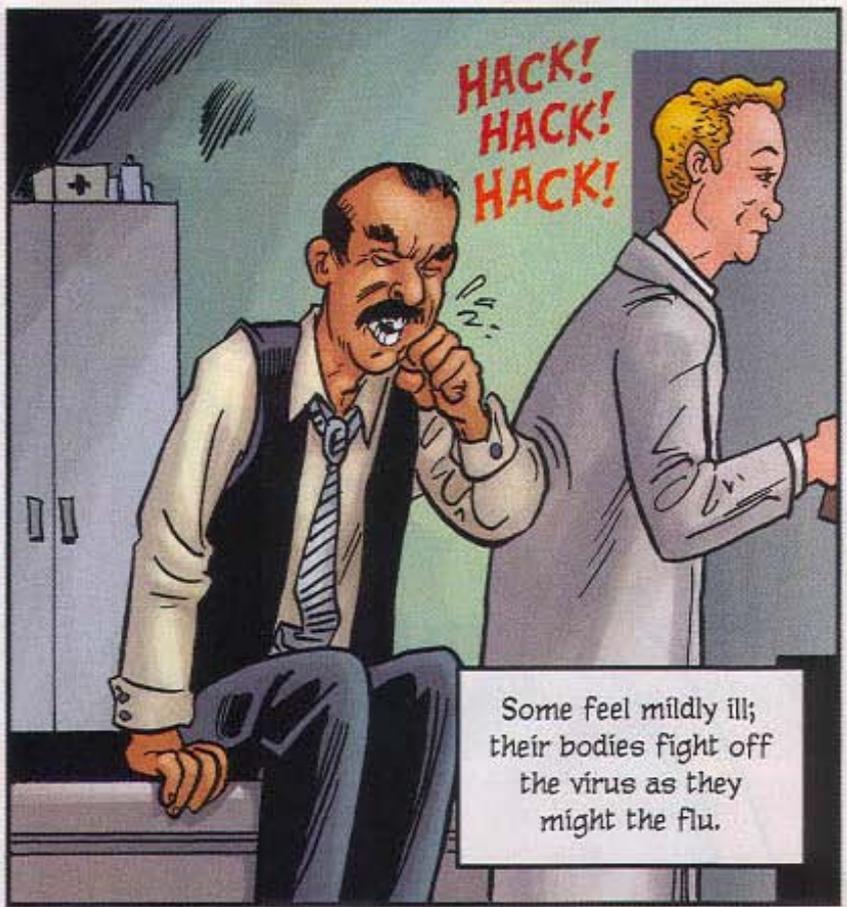
The virus is released to infect neighboring cells, spreading from the digestive tract to lymph nodes and the bloodstream.

In about 95 percent of cases, the virus replicates and is eliminated from the body in feces, starting the cycle over again.

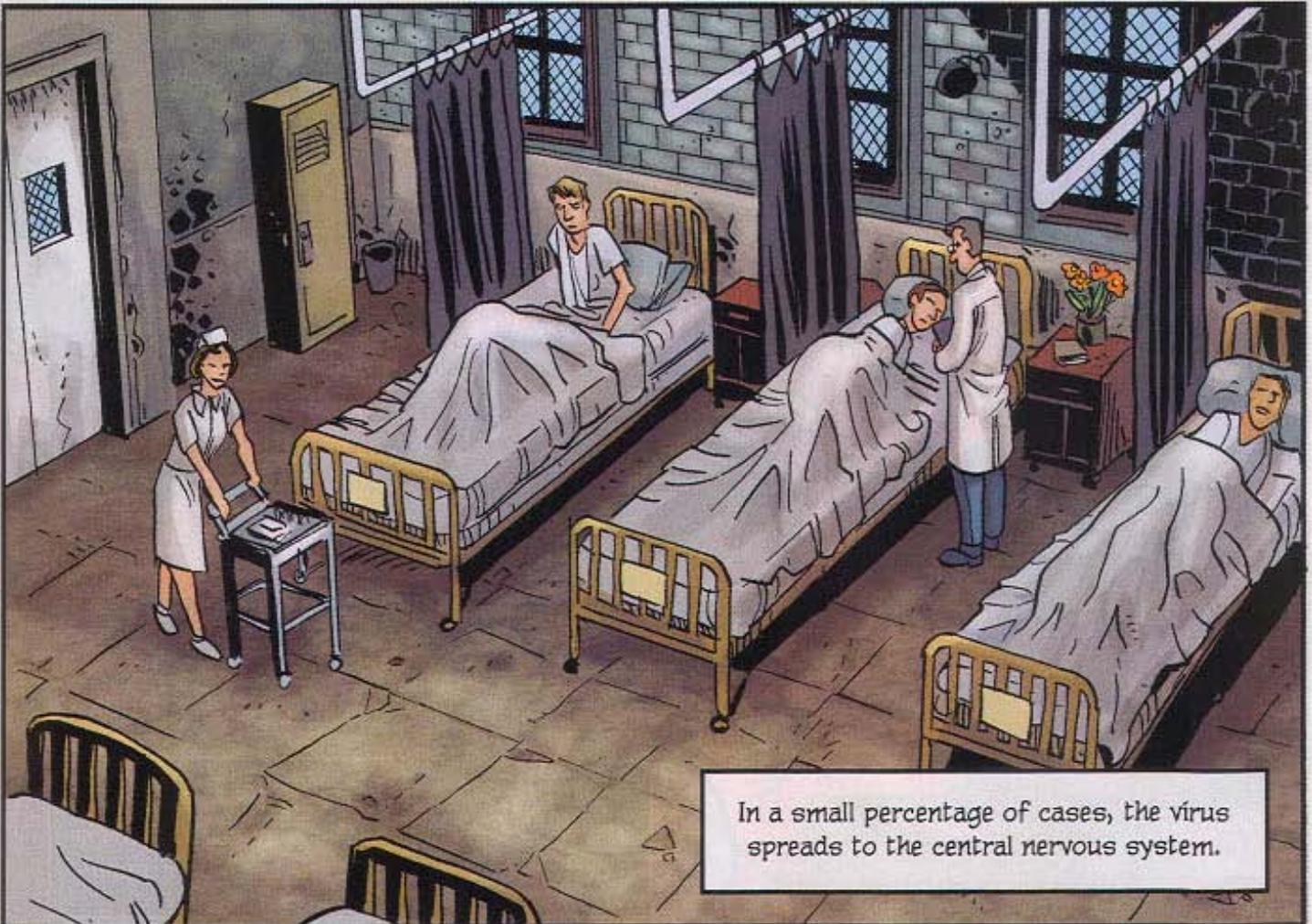
Most people don't have any symptoms and never realize they were infected.



**HACK!
HACK!
HACK!**

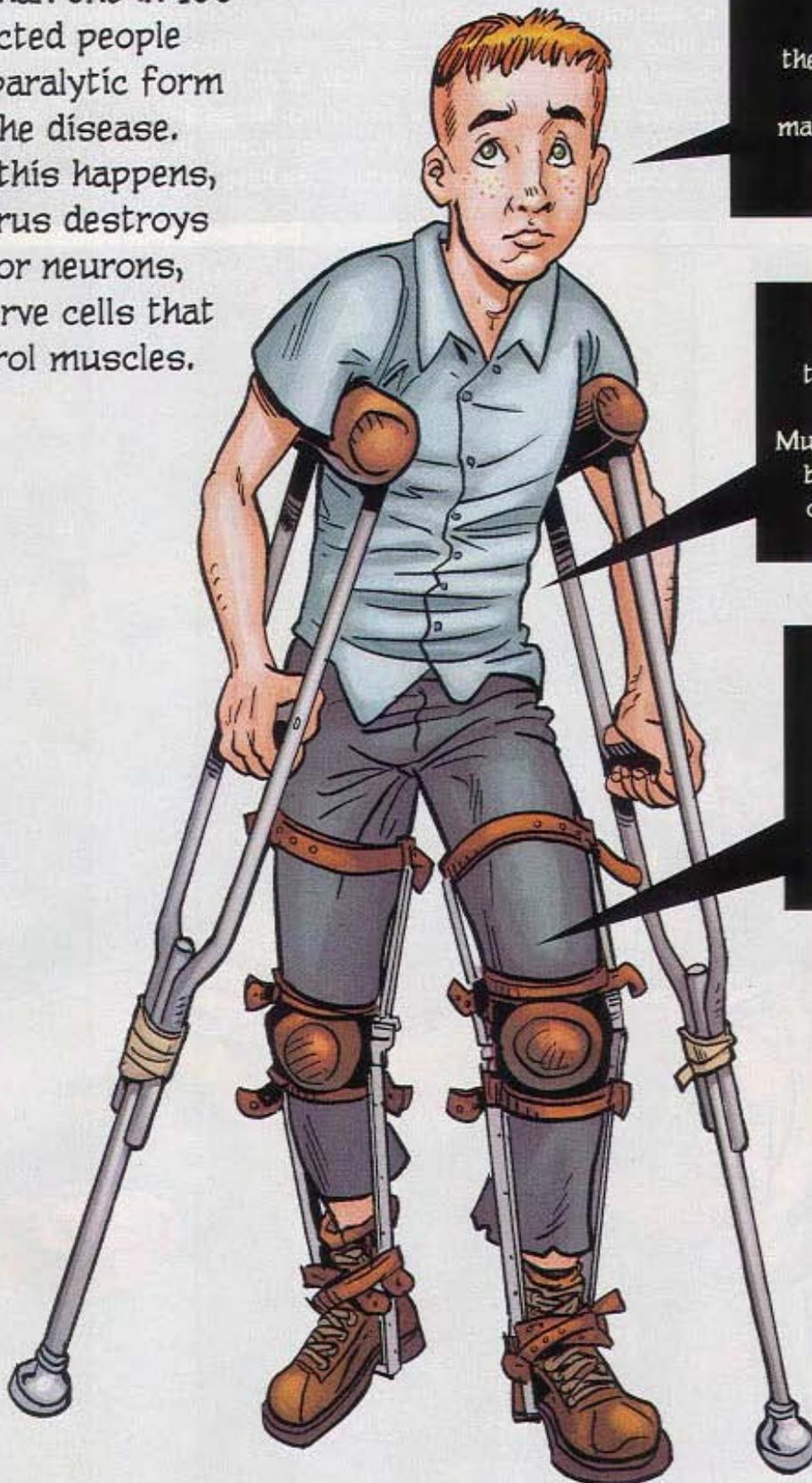


Some feel mildly ill; their bodies fight off the virus as they might the flu.



In a small percentage of cases, the virus spreads to the central nervous system.

Fewer than one in 100 infected people get a paralytic form of the disease. When this happens, the virus destroys motor neurons, the nerve cells that control muscles.



In bulbar polio, the virus destroys nerves in the brain stem, making it hard to breathe, swallow, or speak.

In spinal polio, the virus attacks nerves in the spinal cord. Muscles that were controlled by those nerves atrophy or become paralyzed.

Limbs (usually the legs) can become floppy and lifeless. This is known as acute flaccid paralysis.

IN THE 1950S, LEG BRACES used by polio victims were made of heavy iron or steel posts with padded leather straps. The metal posts connected to the heel of an adapted shoe. Each brace could weigh up to 15 pounds. Today's braces, made of plastics or high-quality metals, are much lighter; a metal full-leg brace can weigh as little as 4 pounds. And braces are still needed in the four countries where polio continues to claim victims, and in others where polio survivors live.

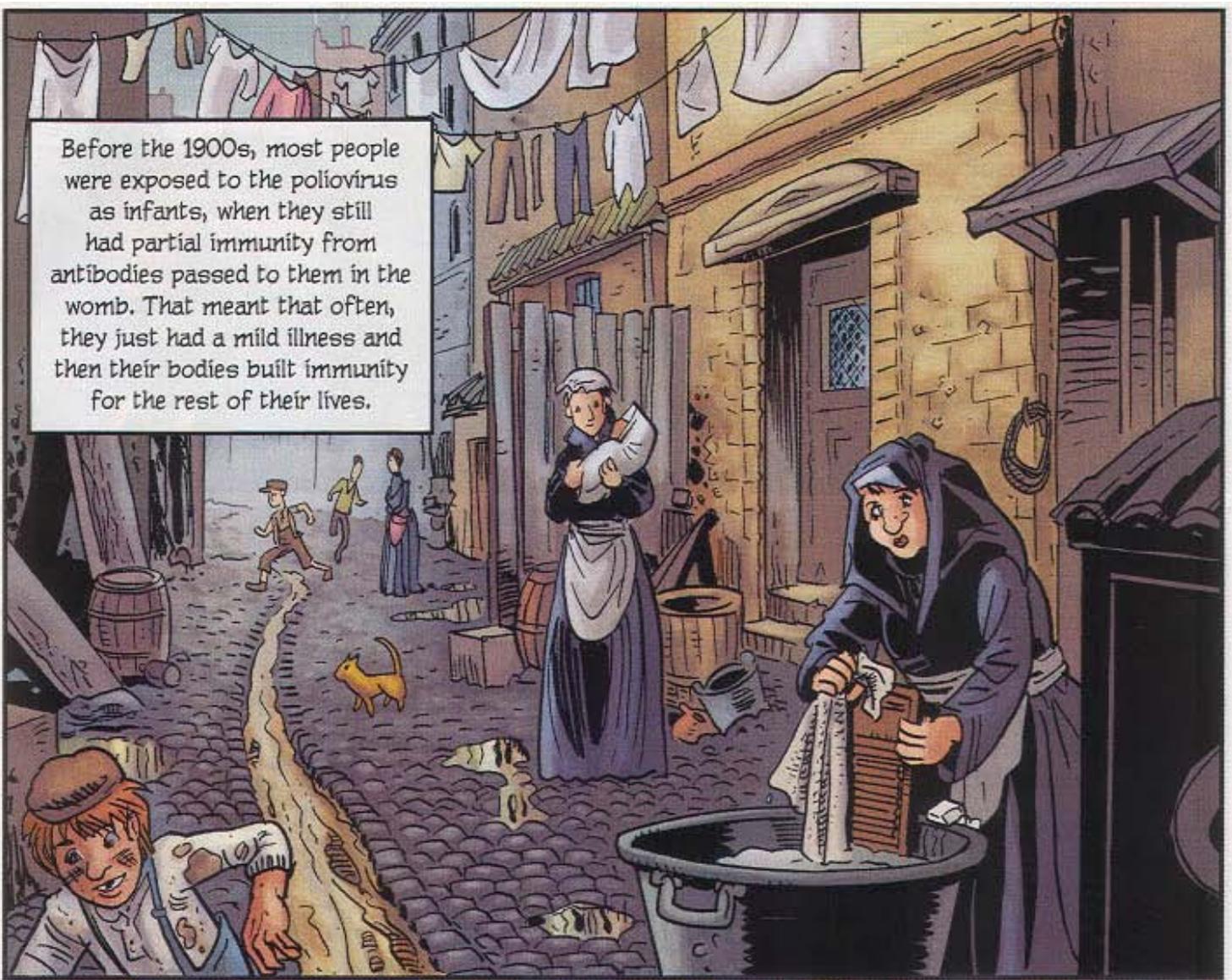
IRON LUNGS were used for polio victims whose chest muscles were paralyzed, leaving them unable to breathe on their own. An iron lung works by cycling air pressure. When the pressure inside the sealed iron lung is lowered, the chest expands and the lungs draw in air. When pressure is increased, the chest contracts and air is expelled, mimicking natural breathing. Mass distribution of iron lungs began in 1939, when they cost \$1,500 – the same as an average home. In 1959, 1,200 people in the United States used iron lungs. Today, other kinds of ventilators have largely replaced iron lungs.

The remaining nerve cells sprout new branches, called axons. Depending on how many were damaged, some muscle function can be regained. It might be the stress on these new branches that causes some people to develop a slow weakening of muscles, called post-polio syndrome, years later. It's estimated that 25 percent to 50 percent of polio survivors might be affected by post-polio syndrome.

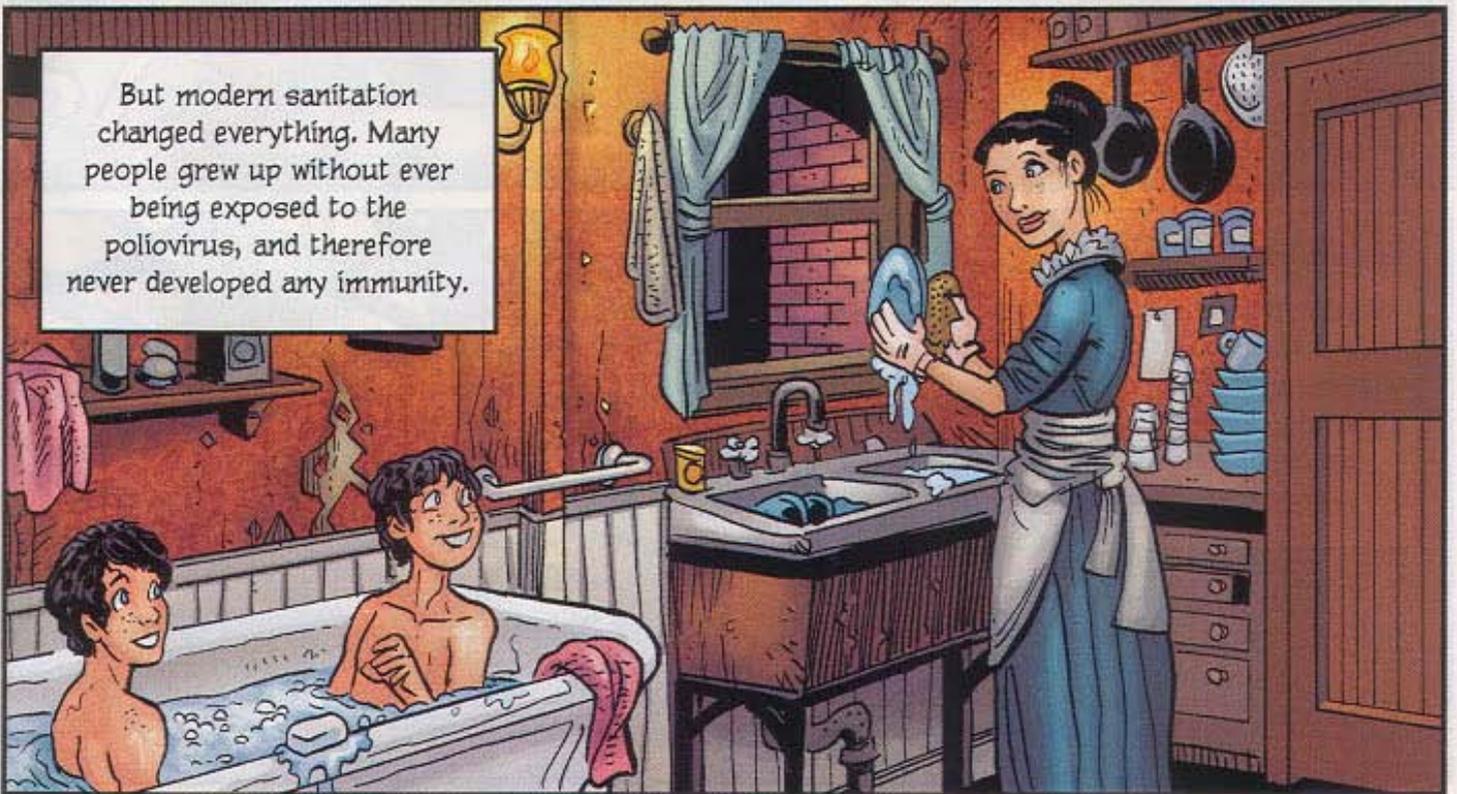


When the body is infected with a pathogen like the poliovirus or chickenpox, it creates its own defenses, called antibodies, to fight it. The next time that invader comes around, the body remembers and can quickly produce antibodies to fight back.

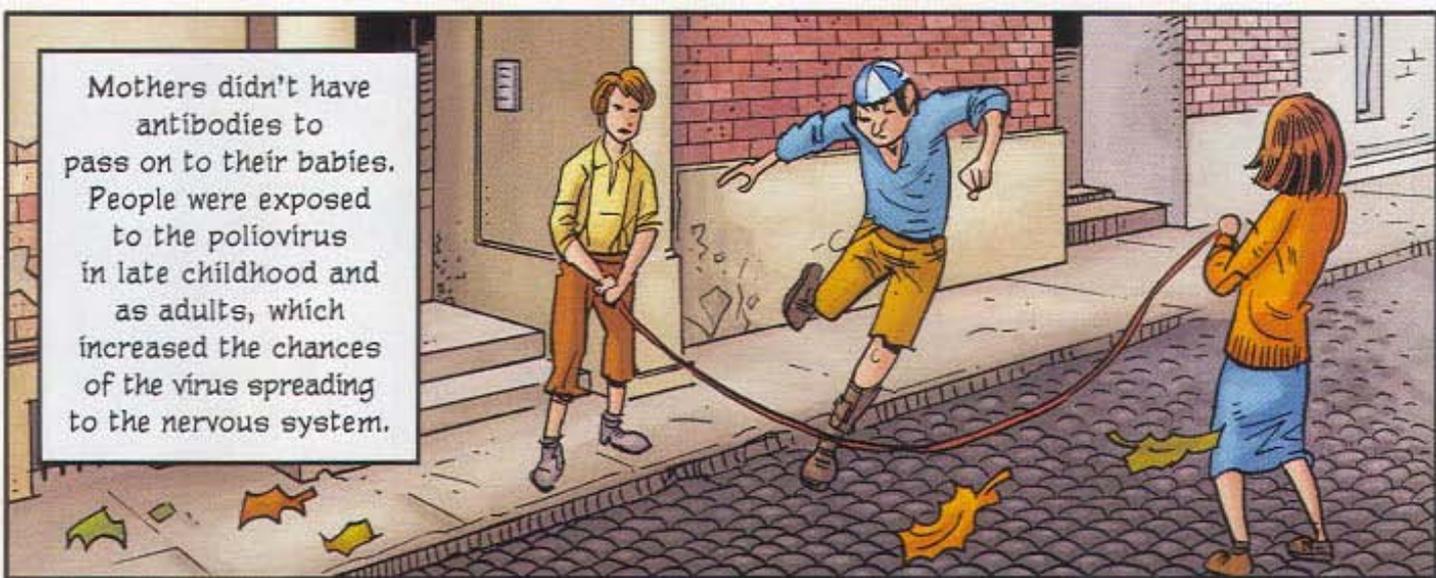
Before the 1900s, most people were exposed to the poliovirus as infants, when they still had partial immunity from antibodies passed to them in the womb. That meant that often, they just had a mild illness and then their bodies built immunity for the rest of their lives.



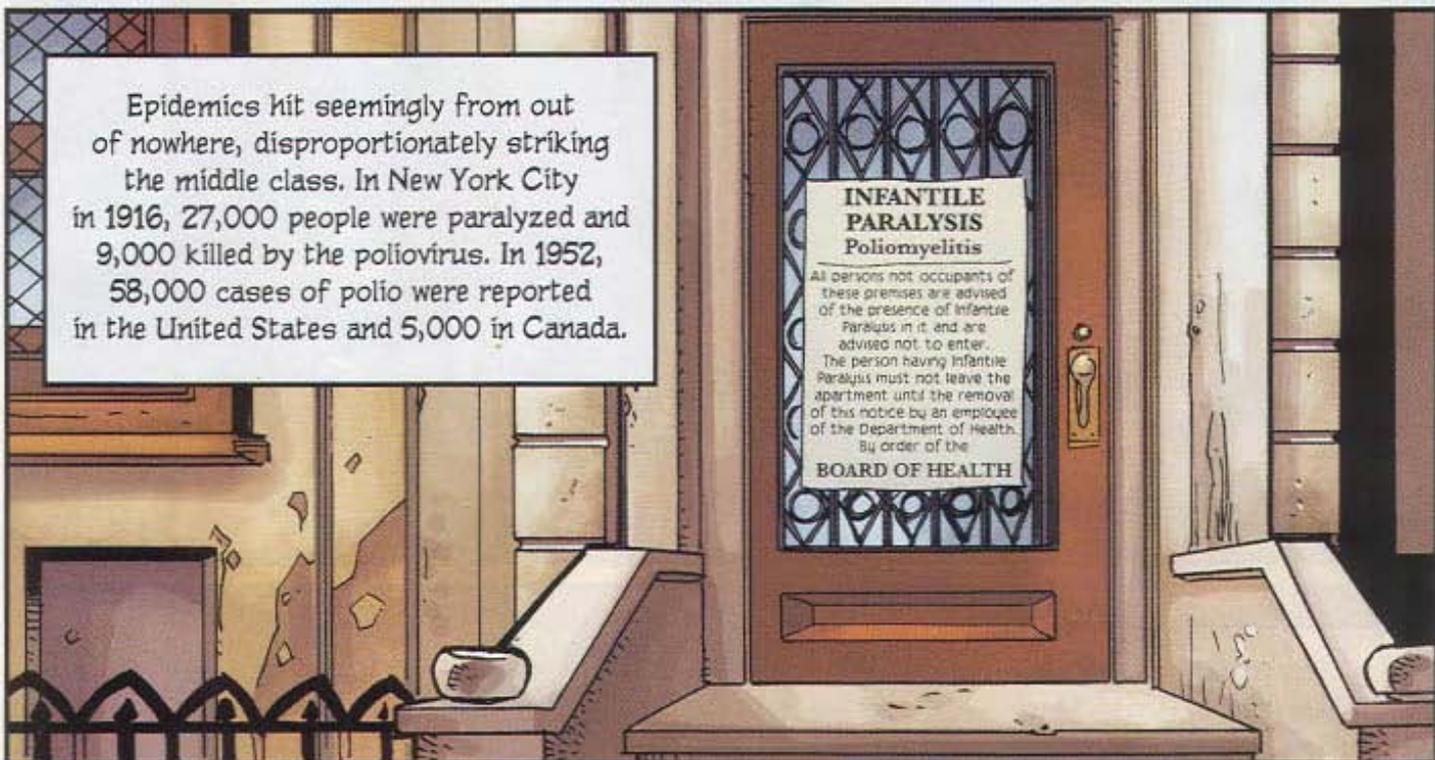
But modern sanitation changed everything. Many people grew up without ever being exposed to the poliovirus, and therefore never developed any immunity.



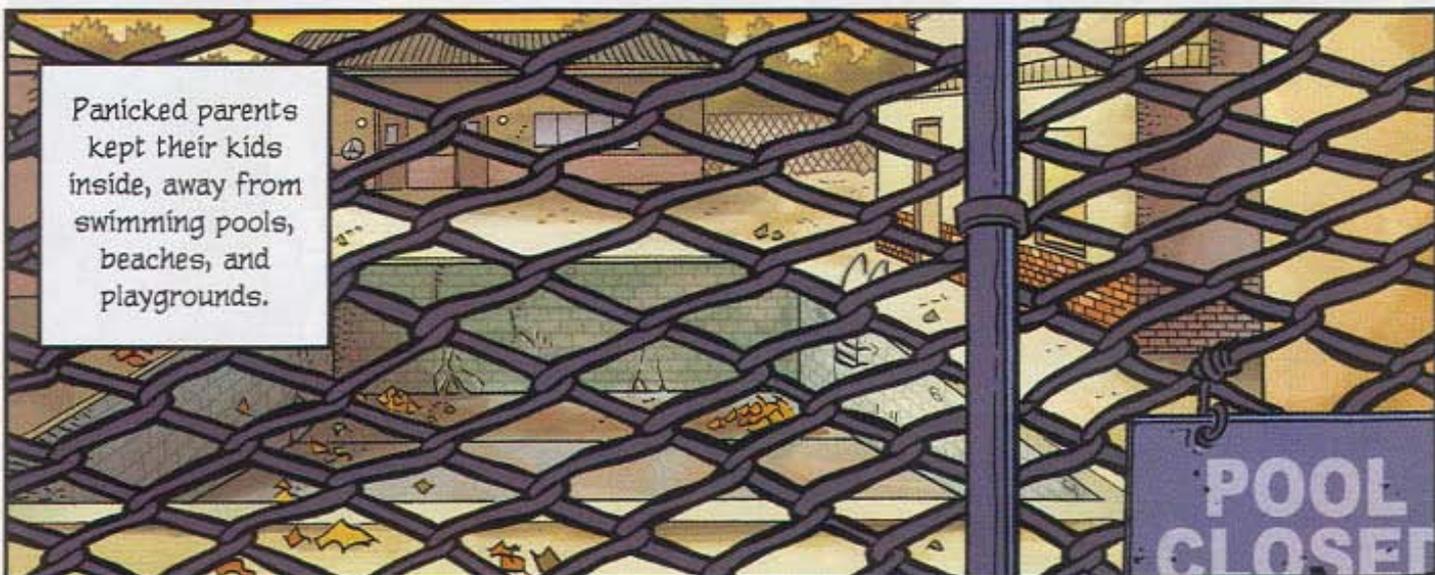
Mothers didn't have antibodies to pass on to their babies. People were exposed to the poliovirus in late childhood and as adults, which increased the chances of the virus spreading to the nervous system.



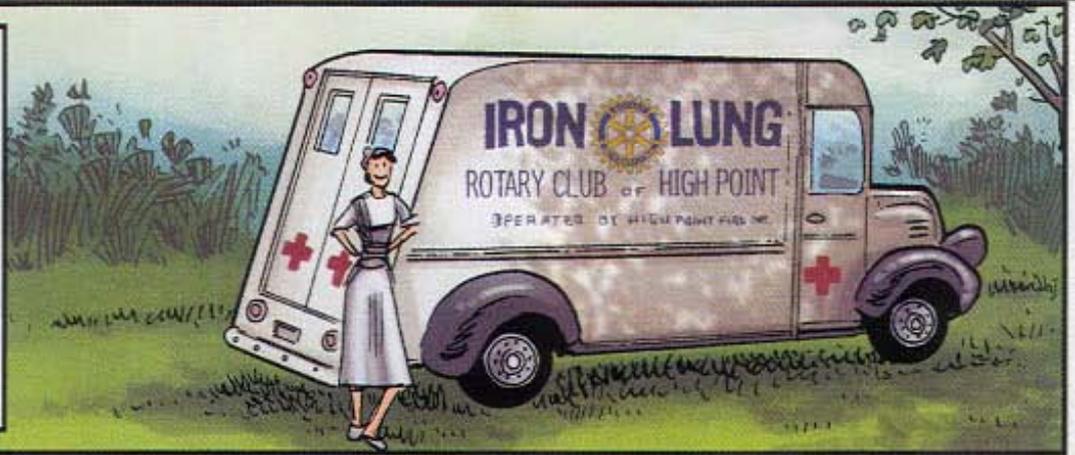
Epidemics hit seemingly from out of nowhere, disproportionately striking the middle class. In New York City in 1916, 27,000 people were paralyzed and 9,000 killed by the poliovirus. In 1952, 58,000 cases of polio were reported in the United States and 5,000 in Canada.



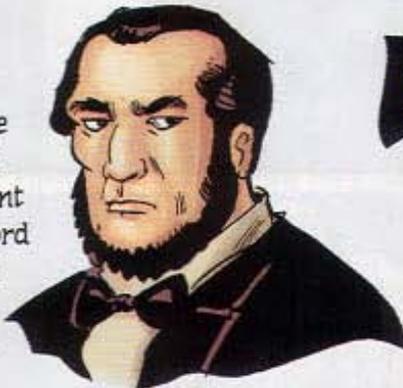
Panicked parents kept their kids inside, away from swimming pools, beaches, and playgrounds.



Rotary clubs worked closely with the National Society for Crippled Children (Easter Seals), which was founded by Rotarian Edgar Allen, to help the victims of the polio epidemics.

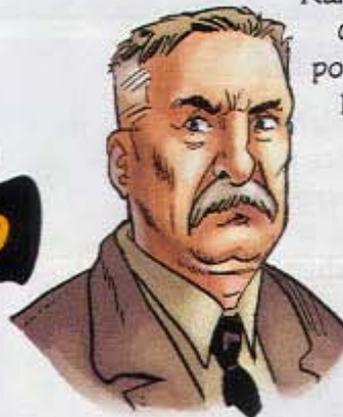


Jacob von Heine first describes polio's involvement with the spinal cord and the clinical features of the disease.



1840

Karl Landsteiner determines polio is caused by a virus.



1909

A big break comes when a team led by John Enders figures out how to grow the poliovirus in a test tube, providing the ability to mass-produce the virus for research.



1938

Franklin D. Roosevelt founds the National Foundation for Infantile Paralysis (March of Dimes). The organization supports research into polio prevention.

The team later wins a Nobel Prize for its work, the only Nobel ever awarded for polio research.



1949

1950

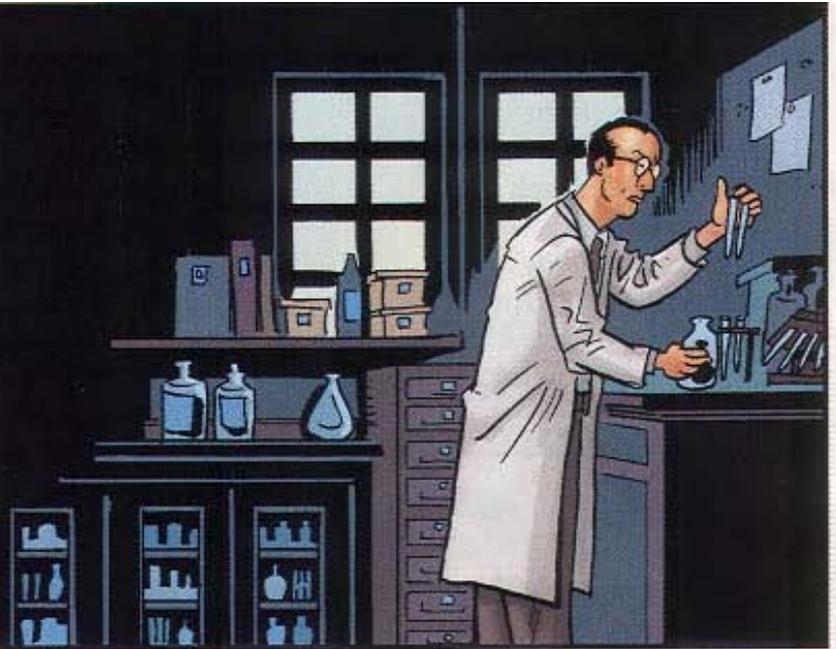
Hilary Koprowski conducts the first trial of a polio vaccine.



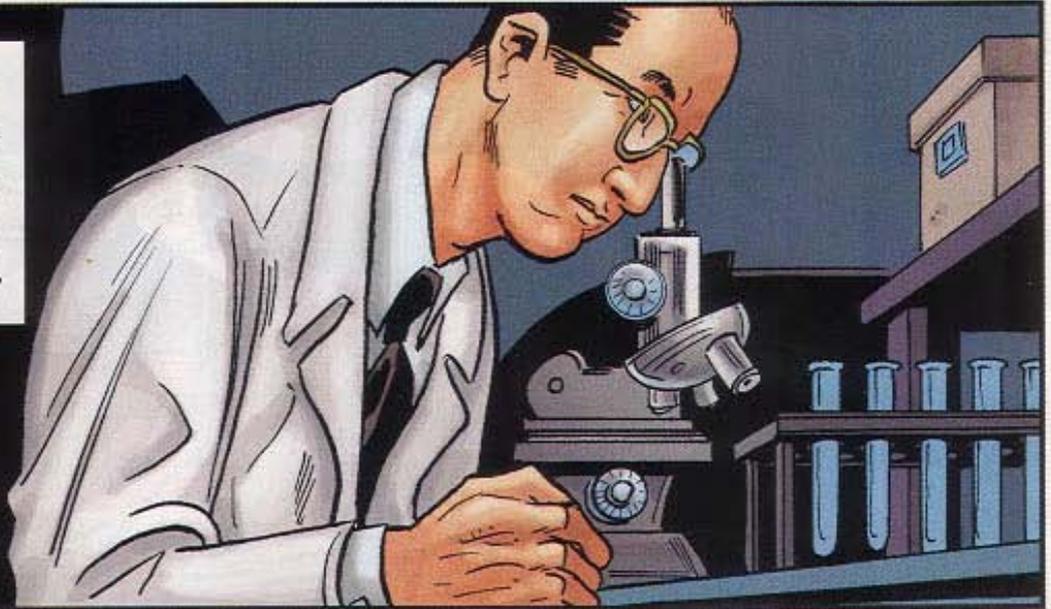
In the meantime, researchers were working furiously to find a way to stop polio's spread.

Jonas Salk worked in the 1940s with Thomas Francis at the University of Michigan to develop a flu vaccine for the U.S. Army during World War II.

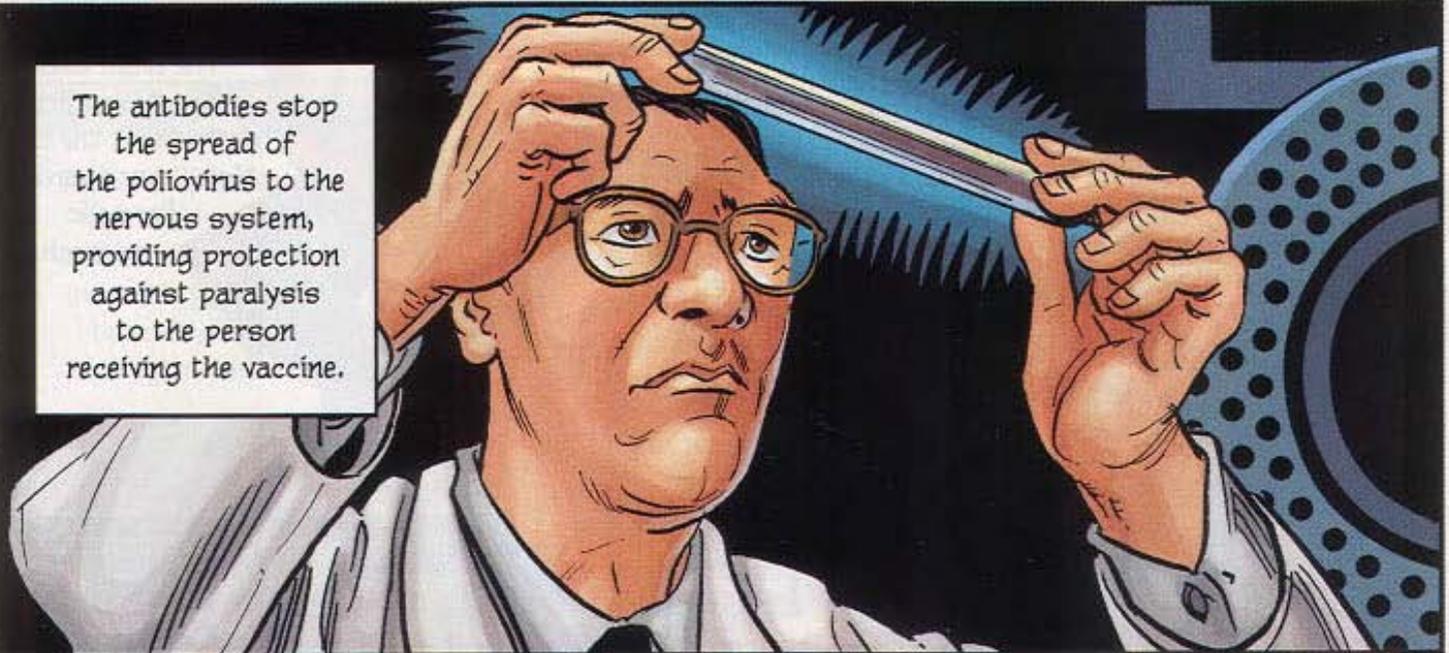
In 1947, Salk moved to the University of Pittsburgh to head its virus research lab, where he began his work on a polio vaccine with funding from the National Foundation for Infantile Paralysis.

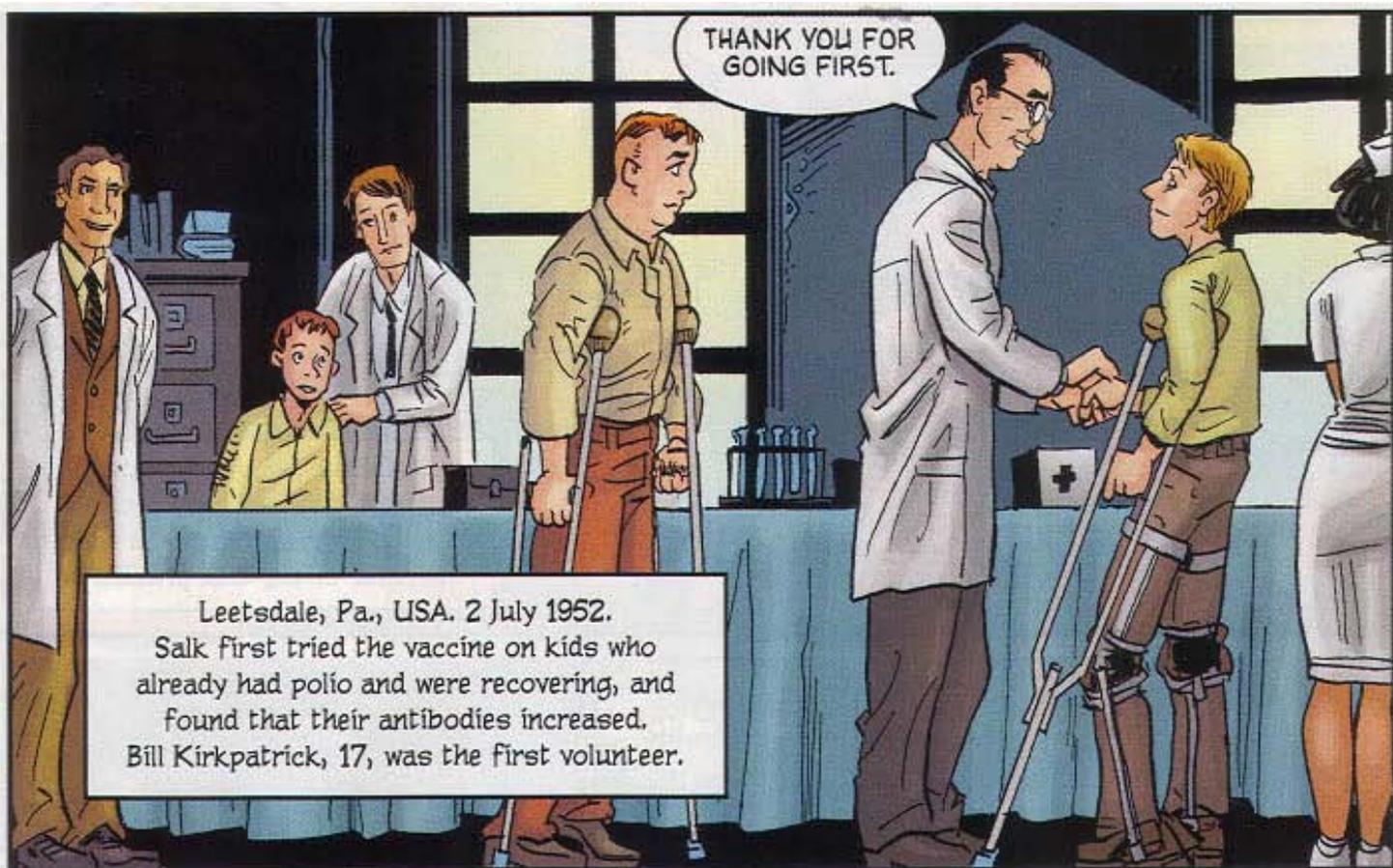


Salk used formaldehyde to kill the poliovirus used in the vaccine, keeping it intact enough that it still triggered the production of antibodies in the blood.



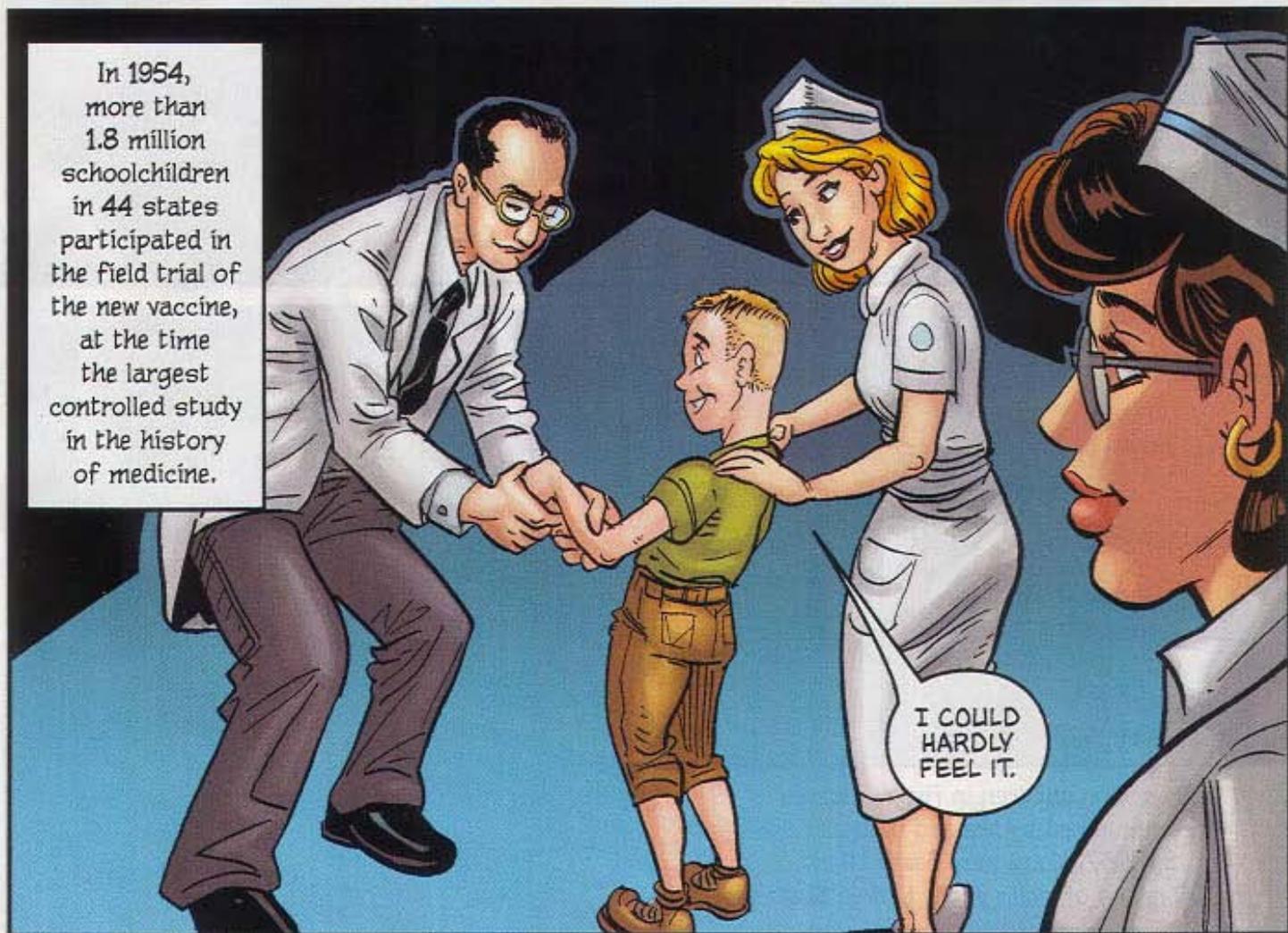
The antibodies stop the spread of the poliovirus to the nervous system, providing protection against paralysis to the person receiving the vaccine.





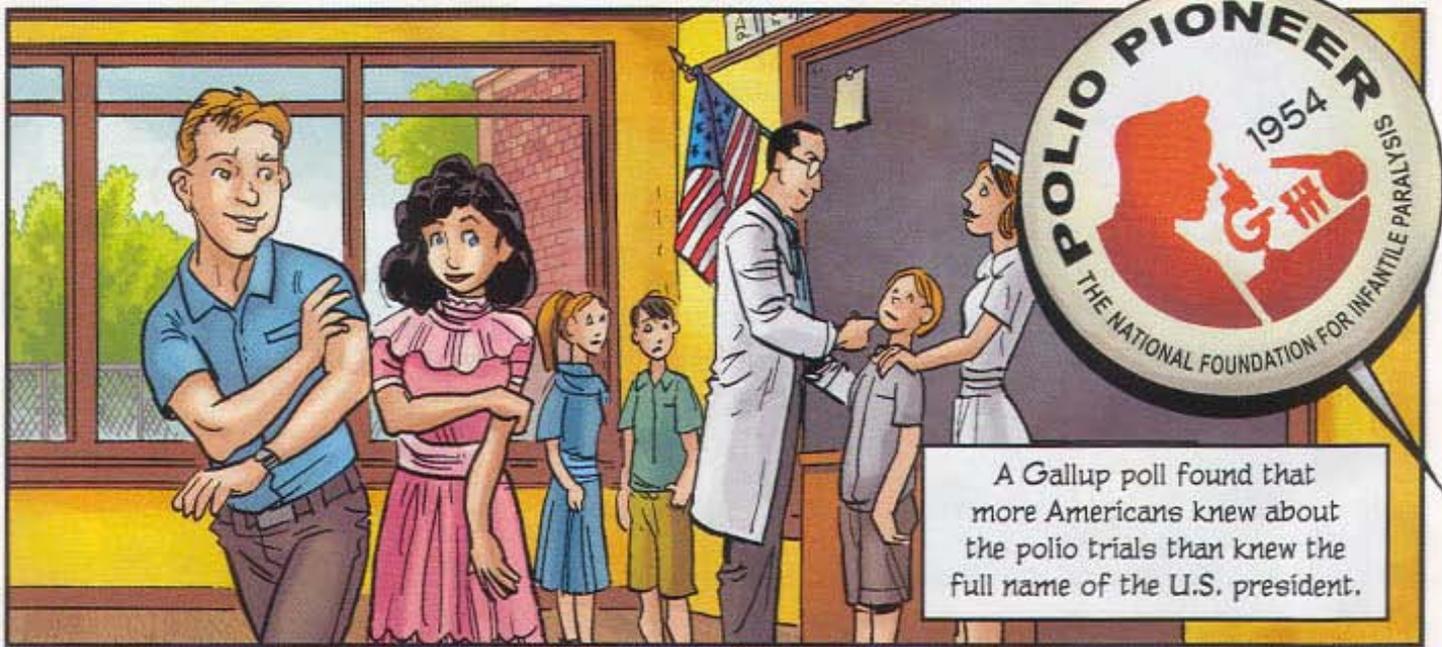
THANK YOU FOR GOING FIRST.

Leetsdale, Pa., USA. 2 July 1952.
Salk first tried the vaccine on kids who already had polio and were recovering, and found that their antibodies increased. Bill Kirkpatrick, 17, was the first volunteer.



In 1954, more than 1.8 million schoolchildren in 44 states participated in the field trial of the new vaccine, at the time the largest controlled study in the history of medicine.

I COULD HARDLY FEEL IT.



A Gallup poll found that more Americans knew about the polio trials than knew the full name of the U.S. president.

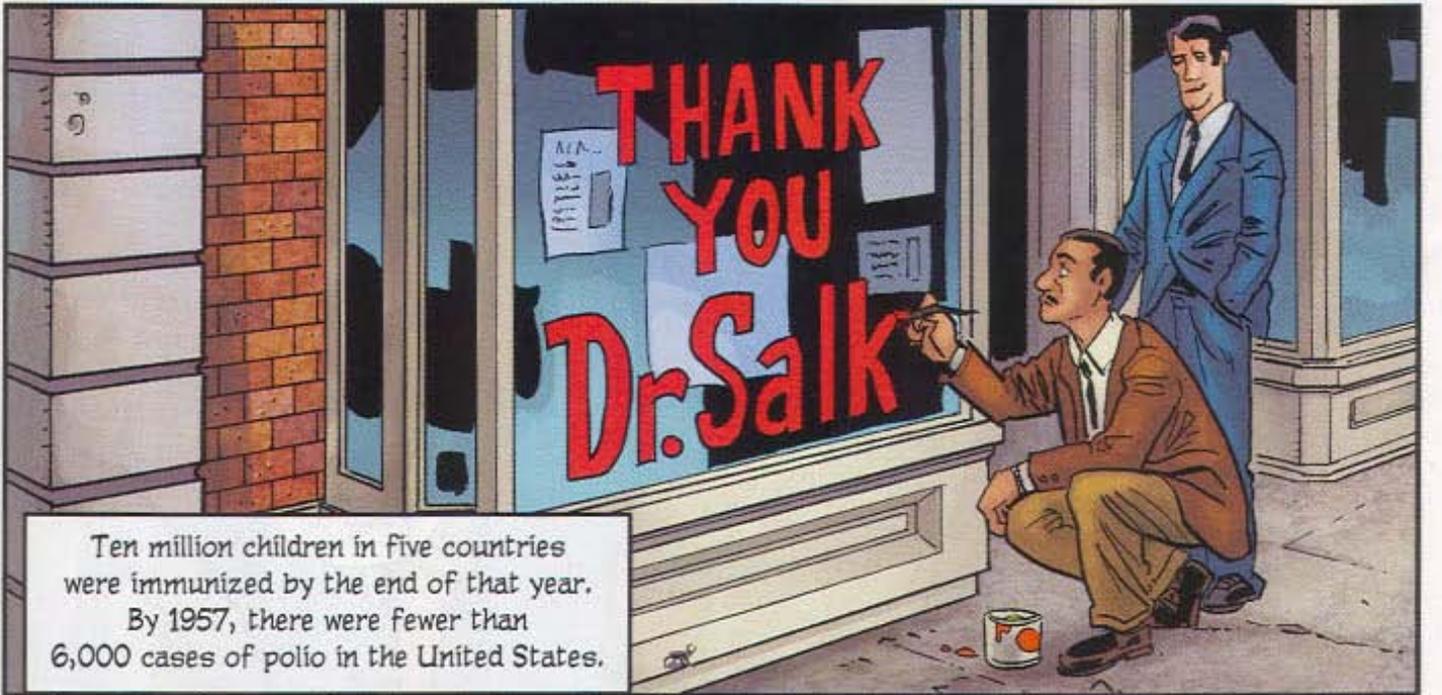


YOUNG MAN, A GREAT TRAGEDY HAS JUST BEFALLEN YOU.

WHAT'S THAT, ED?

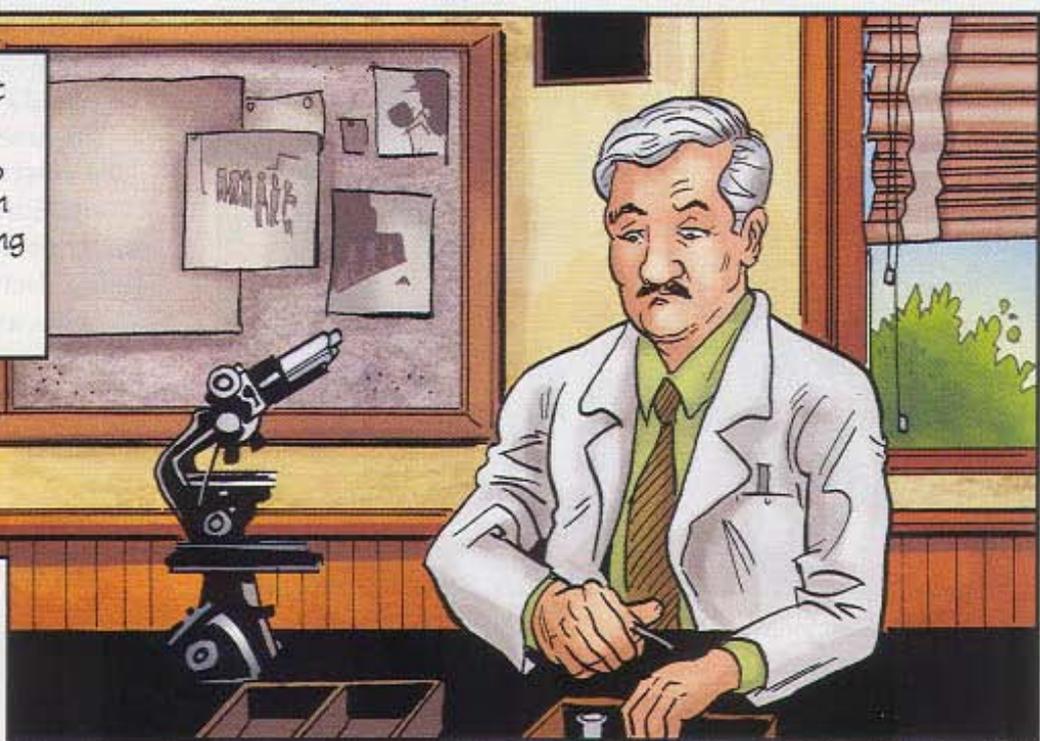
With the announcement of the success of the trial in April 1955, six companies immediately began manufacturing the vaccine.

YOU'VE JUST LOST YOUR ANONYMITY.

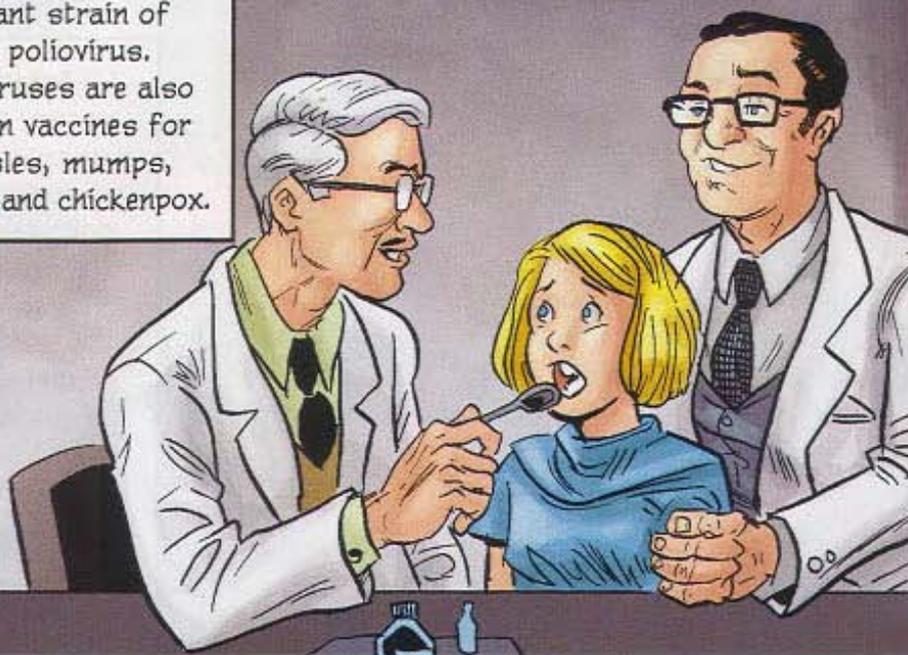


Ten million children in five countries were immunized by the end of that year. By 1957, there were fewer than 6,000 cases of polio in the United States.

While Salk was the first to the finish line in the race for a polio vaccine, others, like Albert Sabin in Cincinnati, were working on a different method to fight the disease.



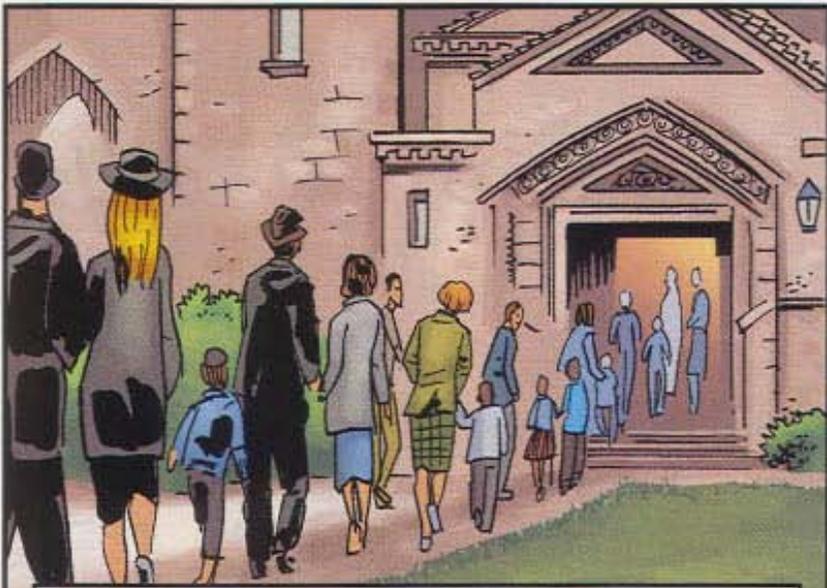
Sabin thought the best way to give immunity was by stimulating the body to create its own antibodies using a live, but less virulent, mutant strain of the poliovirus. Live viruses are also used in vaccines for measles, mumps, rubella, and chickenpox.



As with the Salk vaccine, the body produces these antibodies in the blood to prevent paralysis. But the Sabin vaccine, which is given orally, also stimulates an immune response in the lining of the intestines. The antibodies fight the poliovirus when it is multiplying in the gut, helping to prevent infection.

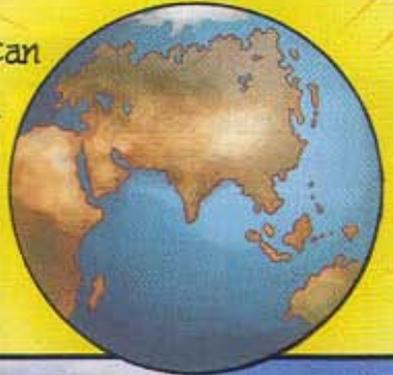


Since so many children in the United States had already been immunized with Salk's vaccine, Sabin conducted trials of his oral polio vaccine on millions of people in the Soviet Union in the late 1950s.

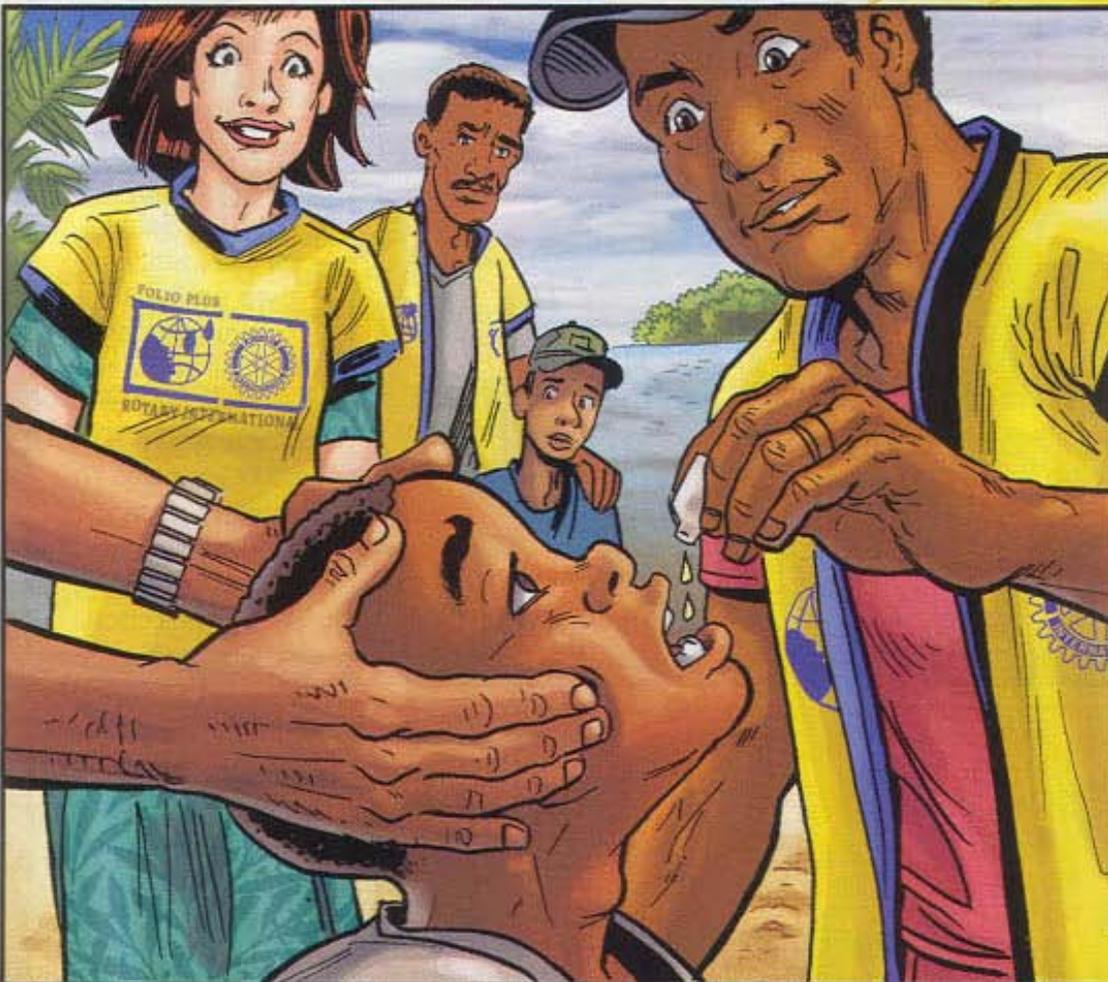


By 1964, only 122 cases of polio were recorded in the United States. The World Health Organization certified the Americas polio-free in 1994, the Western Pacific region in 2000, and Europe in 2002. But polio is still crippling children in four countries today. And it can easily jump borders. As long as it is circulating somewhere in the world, the threat of an outbreak remains.

Afghanistan
India
Nigeria
Pakistan



Cincinnati, Ohio, USA. 24 April 1960:
"Sabin Sunday." The first test of Sabin's vaccine in the United States was held. The next year, the oral polio vaccine was approved for use in the United States.



Because it was so easy to administer and gave longer-lasting immunity, the oral polio vaccine became the weapon of choice in the global campaign to eradicate polio. Sabin, an honorary Rotarian, gave the first drops of vaccine himself to launch Rotary's PolioPlus initiative in 1985. By 2008, Rotarians had contributed more than US\$700 million and countless volunteer hours to immunize more than two billion children in 122 countries.

Help us to "END POLIO NOW" at www.rotary.org
(Source: Feb 2009 Rotarian magazine, Artist: Steve Buccellato)

ROTARY INTERNATIONAL

