

## On the Slopes of the Volcano

When my two older children were still in preschool, we visited a couple I knew who lived in Tarrytown New York. He and I were in the Marine Corps together, and I had known his wife since graduate school. The area is full of places of historical interest going back to the time when it was a Dutch colony and we spent much of the weekend doing tourist things. We visited a restored colonial mill, which was quite intriguing, and we wandered through the churchyard of an old reformed Dutch church. The churchyard figures in one of Washington Irving's stories. In folklore, evil spirits were supposedly not able to cross running water, and, in Irving's story, *The Legend of Sleepy Hollow*, Ichabod Crane crosses a bridge near that churchyard, in an attempt to shake off the headless horseman who pursues him.

We wandered the churchyard or burying ground as it is called, and at one point came upon a group of seven headstones from the late eighteenth century. It was late afternoon and the slanting sunlight just made the worn inscriptions visible. From the carved names and ages, the eroded stones marked the burial place of a mother, a father, and five children. All had died within eight or ten days of each other.

I was not yet a physician, but it didn't take much to surmise that they had died from some communicable disease, perhaps smallpox, cholera or typhoid, all of which were common in colonial times. My friend's wife, Betty, with two young children of her own, showed some emotional reaction and voiced relief that we had been born into and lived in an essentially disease free time; she said how glad she was that we would never have to worry about our children dying in an epidemic.

I said nothing; Betty is just sufficiently younger than I am, that she does not remember polio. But, I do. Sixty years ago last summer, well within the memory of many of us in this room, Cincinnati suffered the worst polio outbreak of its history.

Polio was not one of the diseases of colonial times or even prevalent during the early history of the United States.

There is perhaps some ancient historical evidence for polio. An [Egyptian](#) inscription from the [18th Dynasty](#) is thought to represent a Polio victim. But the disease smoldered in small, essentially unrecorded, endemic numbers until the nineteenth century in Europe and then began to be seen in the US.

What happened wasn't the spread of a newly mutated pathogen, but a change in cultural norms. Polio is, in some ways, a disease of cleanliness. It is a virus which attacks the coating of the nerves. This coating, called myelin, is some what analogous to the insulation around an electric wire and allows the nerve impulses to travel along neural

pathways; when the myelin is destroyed or damaged, nerve function is interrupted and paralysis ensues. But we are not born with myelin coating around our nerves; it develops in the first few years of life and when very young children contract polio before their nerves are myelinated, they suffer little morbidity but develop immunity to the disease. The virus is shed in the nasal secretions but also in human waste, and in the day when bathing was considered something not to do very often, and diaper-less toddlers wandered about outside or on dirt floors, the population essentially immunized itself. But, in the latter part of the 19th century, cleanliness in nurseries and around children became the custom, particularly in middle and upper class homes. In Europe and America improvements were made in community [sanitation](#), including improved [sewage](#) disposal and clean water supplies. The result was a huge increase in the susceptible population, and increasing numbers of polio outbreaks.

By 1910, frequent epidemics occurred in the cities of developed countries all over the world, especially during the summer months. And, from 1916 on, a polio epidemic broke out, each summer, somewhere in the United States. In 1916, in New York City, over 2000 people died. The epidemic stopped with the first frost. But during that summer, twenty-seven thousand cases of polio were reported in twenty-six states between June and December. There were six thousand deaths. Eighty percent of those affected were children under five.

At its peak incidence in the early 1950s, polio occurred at a rate of 13.6 cases per 100,000 people. It paralyzed or killed over half a million people a year, most of them children. By contrast, the incidence of cancer today is 566.1 per 100,000.

Death, when it came, came as the nerves controlling respiration failed. Unless the patient was placed in an iron lung which forced air in and out of the lungs, the patient died from suffocation. And most often when the patients didn't die they were crippled. I have a colleague here in town, a radiologist who is my age and has a withered arm. Franklin Roosevelt contracted polio as a young adult and spent the rest of his life either in braces or a wheel chair.

In some ways the peak outbreak in 1952 was a confluence of factors. The first wave of the baby boomers born in 1946, were six years old and beginning to play and mingle with other children outside of their immediate homes. They were in the peak age group for incidence of new cases of polio. That summer there were sixty thousand new cases. Some left the cities; people were warned not to drink from water fountains, and to avoid amusement parks, swimming pools, theaters, beaches, and other public gatherings. In Cincinnati, the pool and other parts of Coney Island were closed.

Other diseases could be more fatal. But polio terrified. It terrified because it attacked children. It attacked children of middle and upper class parents. The parents of victims tended to be people who planned and ordered their lives and tried as much as possible to

control their circumstances. Unknown to them, this virus mocked their efforts at so called “modern” parenting, with clean nurseries and sterilized baby formula.

Reminders of the disease were highly visible. Most retail stores had a collection box made to look like an iron lung, and people would drop change in it, sometimes in an almost religious way, as if lighting a candle in church or marking a lintel with lamb’s blood so that the dreaded thing would leave them alone.

The disease generated fear because it came so suddenly and affected victims with little prodrome. On my first day of third grade, in 1951, the teacher had labeled each desk with a piece of masking tape on which was written a student’s name, thus arranging for the students to sit in alphabetical order. In the middle of the class was an empty desk where the tape had been torn off; small pieces of the adhesive were still visible. The boy had sickened and died in the week or two between the teacher’s preschool preparation and the opening day. Nothing was said in class, but on the playground, at recess, the story was quietly whispered. The telling had a furtive, superstitious quality. Today a single death in a grade school would be a cause for a plethora of grief counselors to descend on the institution. Then it was a topic to avoid. Perhaps if you didn’t say the devil’s name too loudly he would not hear and not notice you.

On the night before fourth grade, the year of the 1952 outbreak, I did not think about that first day of school the year before. I hadn’t forgotten it but, grade school children live very much in the present. I was excited. We had moved to Terrace Park and given the small size of the village I was going to be allowed to walk to school by myself. It seemed a milestone of growing up. I was nine and three quarters, not just nine and a half. For children to measure their eager progress toward adulthood in that fine a fashion is a bit like second lieutenants comparing dates of rank. But I was nine and three quarters- almost ten.

As things turned out, I didn’t walk to school the next morning because by the time school started, my legs didn’t work anymore; I couldn’t walk. And polio turned my world upside down very quickly.

I had woken early just “not feeling well”. My legs still worked. I complained to my father who was the other early riser in the house. He brushed it off, suggested I had “school-itis”. He had played football in college and gave me the parent’s equivalent of the coach’s pep talk: “get back in the game and run through it”.

But an hour or so later the disease had progressed to where I couldn’t walk. My mother called the doctor who told her to take me to the hospital. I was too heavy for her to carry, so she called our next door neighbor who came over and lifted me into the car.

I wish I had had an opportunity to meet that neighbor as an adult and thank him. That was no casual gesture on his part; my mother told him what she thought I had. Medical science wasn't certain how the disease was spread and he had three small children.

If there was an emergency room entrance to Children's Hospital in those days, my mother and I didn't use it. We negotiated the front steps as best we could. She partially dragged me by my belt and I used my elbows and forearms like the flippers on a seal, until someone came out to help us. Next came the wheel chair, the spinal tap, and then my mother had to leave me. That was not easy for either of us, but I knew she had to leave and there was something in that for me to hang on to.

The human race has evolved a number of survival mechanisms which have become burned into our wiring in the three or four hundred thousand years since we climbed down out of the trees and began to walk upright on the African savannah. One of them is probably older than three or four hundred thousand years because it is seen in some other primates. It might be called the lifeboat rule: "Women and children in the lifeboats first." When push comes to shove, the small babies get taken care of first; and, there was a small baby at home. I accepted, at least intellectually-if not emotionally, that my mother had to leave me. This was a grown-up thing; she was trusting me to be grown up in this regard, and that helped a little.

I was left with the doctor. I asked him what I had and he didn't tell me I had polio; when I got into a bed on the ward, the boy in the next bed told me. He was about fourteen, and between children and adults, children that age group are still on the children's side of the generational divide; but younger children accept them as knowledgeable. "You've got polio" he said. "This is a polio ward. Everybody in here has polio."

I wasn't sure, so when one of the nurses or candy stripers came in, I asked her. I didn't ask outright; I was sure she wouldn't tell me, so I tried something I'd heard on one the adventure radio shows that I listened to. This was pre television so on special evenings I listened to shows like Sky King, The Green Hornet, Johnny Dollar insurance investigator, or the Shadow. Borrowing from one of those shows I put on the most naïve expression I could manage and asked "Is this the only polio ward in the hospital or are there others?" She explained that there was another one for the older girls and one for the younger children. I began to feel very very alone; and then the boy in next bed told me I was going to die. "The last kid in that bed died" he said. That's one of the beds they put kids in who are going to die."

It was too much to cope with. My father had not believed me; my mother had had to leave. You were supposed to trust doctors but he had lied to me, and I was going to die. I pulled the covers up to my neck, lay there and wanted to die and get it over with.

I don't know what would have happened if I had stayed in that frame of mind. I've seen how people who fight serious illnesses seem to do better than those who don't; and there is beginning to be physical evidence that the brain can affect the immune system and healing. I was fortunate in having an example. I had a grandfather who was a significant figure in my early years. We lived with him during the war when my father was away. He had been diagnosed with TB when my mother was in second grade, and been told he had six months to live. He fought it. He went seventeen years. I thought of that, identified with it and decided I wouldn't give up.

Fighting it was a combination of boredom and pain. Boredom came from having no visitors and little to do. I read torn copies of Readers Digest with stories that I couldn't relate to because they were for adults, and beginners reading books that were too simple to be interesting. I tried listening to soap operas on the radio during the day.

Pain came from the treatment. Conventional treatment a decade earlier in the nineteen thirties and early forties involved enforcing strict immobilization during the acute and convalescent phases of the disease with standardized splints and what were called Bradford frames, to which children were strapped on boards, sometimes for months. They were then often put into cumbersome metal leg braces. The end result was withered limbs and/or the lifelong need for braces.

Sister Kenny was a Canadian nurse. (She was not a nun but that's the title in the British medical system) who developed a method using moist, hot compresses to ease muscle spasm pain, eliminating immobilization during the acute phase of the disease, and gently exercising the paralyzed muscles. It showed better results than the older treatment and won the approval of the American medical association in the nineteen forties. The pain came when the limbs were flexed and tendons and muscles stretched. Those of you who have remobilized a limb after it has been in a cast can appreciate that. I remember, while I was waiting my turn outside the physical therapy room hearing one of the children scream.

I was able to float above the pain. It was as if I was having an out of body experience looking down at myself.

My parents and siblings were quarantined. Quarantine is a centuries old method of dealing with communicable diseases. In the middle ages the galleys of Italian maritime city states like Venice and Genoa brought bubonic plague, the Black Death, into Europe from trading ports in the Crimea. Without having a full understanding of the disease process, the Italians nevertheless understood that passengers or crew might be disease carriers. So, ships returning from the Crimea were required to remain in the harbors for forty days, in order to see if anyone on board developed the disease. The Italian for forty is "Quarente" Thus our word.

There was yellow sign placed on my parent's door. Neighbors bought groceries and left them on the front porch. My seven year old sister at first was enthusiastic; she didn't have to go to school. That reaction faded quickly when she found she was confined to the house and couldn't play with any one.

It wasn't until years later when I became a parent that I really appreciated what they had gone through. Four years ago my youngest son, Steve was sent home from boarding school with a gaping draining wound in his leg. He had an infection with one of the new super-bugs, which is called MRSA for methacillin resistant staph aureus. I watched his wound knowing if it got worse he might lose his leg; I waited, in suspense for the lab tests to tell me if there was an antibiotic to which the bacteria was susceptible.

My parents must have sat there in the house in Terrace Park with a small baby and a cooped up, bored, seven year old and watched each other and the children for anything that might be a first sign of the disease.

But they got through it.

I got through it. After a month I went home. I had crawled into the hospital, but I walked out.

Our society got through it too. During my stay on the ward, a doctor came onto the ward one day. He was chief of infectious disease at Children's Hospital. I had no idea what that was (and certainly could not have spelled it) but he was treated with some deference and we were told he was working on a cure for polio. His name was Albert Sabin, and in parallel with Jonas Salk and a doctor named Hilary Koprowski, who is seldom mentioned, he developed a vaccine.

Mass vaccinations began in the US in 1955. Sabine's vaccine was given in the pink-tinged sugar cubes many of us remember. Polio essentially disappeared from developed countries.

So my friend Betty concluded that that kind of threat was gone forever. Based just on her own knowledge, that conclusion was reasonable. But for others who should have know better, it wasn't.

In fact, in 1970, the Surgeon-General of the United States of America supposedly said that it was "time to close the book on infectious diseases, declare the war against pestilence won, and shift national resources to such chronic problems as cancer and heart disease". The story of his statement may be apocryphal. But one of the medical societies suggested decreasing the number of fellowships in infectious disease, because we no longer needed as many doctors trained in the subspecialty. In Canada one of the

provincial governments drastically cut the number of epidemiologists on its provincial public health staff; an official remarked at the time that there was no point in paying people to sit around doing nothing and added “what are the chances that we will see the outbreak of an emerging disease in Ontario.” That was three or four years before the outbreak on the SARS epidemic in Toronto. That remark brings to mind the story of the British maritime officer who, in April of 1912, was asked about the safety of the Cunard White Star Line’s latest and largest ocean liner. Supposedly he indignantly replied “Sir! Not even God could sink this ship.”...

Mankind has shown a great deal of ingenuity at biology and biological engineering, both in dealing with disease, and also unfortunately at causing it. For three years before retiring I worked at a very mundane low intensity medical job with no call and no weekends. But before that I spent almost two decades working with what is termed biological warfare. The initial person of interest in the case of the anthrax letters worked for me; and I had met the person who actually did it. I was kept well informed about the case. And, at the end, like a number of people, I was amazed by the ingenuity which the perpetrator showed in developing weapons grade anthrax without using any of the equipment that might have tipped his hand. But if people are ingenious when it comes to disease, nature is real mother. Maybe we won the war against pestilence but somebody forgot to tell nature.

Over the half a century since polio we have seen new strains of TB develop that are resistant to all of the powerful drugs which we once used for treatment. Infection control personnel in hospitals now worry about the new super bacteria; and, the viruses against which we have never had much in the way of treatment, only prevention, have made real inroads. HIV has come out of the jungle and spread around the world. The hanta virus was first seen a few years ago in New Mexico, not far from Los Alamos where I was working. Some of the hemorrhagic fevers have broken out in developed countries.

One of the deadliest strains of hemorrhagic flu virus is the “U strain” of a virus called Marburg, a nastier and more virulent cousin of Ebola; the Soviets weaponized it in their biological warfare program; but, they didn’t increase its virulence; nature did that. They only harvested it when it eluded all their laboratory safeguards and infected and killed a man named Ustinov, for whom it was named.

In China, on countless small farms, the poultry and pigs share the numerous small ponds into which they excrete waste loaded with viruses. The viruses infect across species and share genetic information. As a result, every few years a new strain of bird flu comes out of the Far East. So far we have not seen one that is easily spread by person to person contact.

To date we have managed all of this, and a recent piece in the Wall Street Journal by an Assistant Secretary of Health and welfare states that the vaccine companies are ready to produce any vaccine we might need. But we have been some years attempting to develop a vaccine for HIV and have yet to succeed.

So, sometimes at two o'clock in the morning when I can't get back to sleep and the dark thoughts come, I wonder if we aren't like some primitive tribe living on the slopes of the volcano. The soil is rich. The grapes grow well and make sweet wine. Oh yes the mountain rumbles occasionally and there are grandfather's stories which they had from their grandfathers that once upon a time the mountain reached down and destroyed the village. But that was long time ago.

Tonight before I conjured the shade of polio out of some spectral petri dish at the far edge of night, most of you probably hadn't thought of it for years. Human memory is short. But, standing in that graveyard in New York, my friend Betty used the word 'never'. And never is a long time.

