HISTORY This Week EP 343: The Donora Death Fog
EPISODE TRANSCRIPT

NOTE: This transcript may contain errors.

Sally Helm: HISTORY This Week. October 26, 1948. I’m Sally Helm.

A foggy morning isn’t unusual in Donora. It’s a steel town on the banks of the Monongahela River, tucked into a spot where the waters make a graceful horseshoe-shaped curve. Most of the men work for local industries: especially Donora Zinc Works and American Steel and Wire. The mills are at the heart of the town. At Christmas, the kids head down there to pick up a gift: an apple, an orange, a dime, and a box of Animal Crackers.

On this day in late October, the waters of the Monongahela are still warm. The air is chilly. And the morning fog…doesn’t burn off at 10 am. It sticks around. Casting a pall over this little community in Western Pennsylvania, 20 miles south of Pittsburgh.

There’s always been something a little weird about the air in Donora. Everybody knows it. The sky changes color depending on what’s happening at the mills: sometimes it’s yellowish, or reddish brown, or black. People in Donora have to scrub their walls and repaint their houses pretty often, because they get covered in grime. Near the mills, flowers refuse to grow.

People knew the air wasn’t great. But they didn’t realize just how bad it could get.

By the next day, October 27, the fog is getting thicker. People are coughing everywhere, more than usual. Soon, they start calling their doctors, calling the fire station. Because they’re struggling to breathe.

Before long… some of them will stop breathing all together.

Today: a fatal mix of vapors settles over a small town in Pennsylvania. What caused the Donora Death Fog? And how did it lead to the creation of the Clean Air Act?

[AD BREAK]

Brian Charlton: It took about three days.

Sally Helm: For three days, the mysterious fog in Donora has been getting thicker and thicker.

Brian Charlton: You literally could not put your hand out at arm's length and still see your hand.

Sally Helm: Brian Charlton grew up in The Monongahela River Valley, five miles from Donora. He’s a retired history teacher and a member of the town historical society. He says that the fog was not just thick, it was poisonous.

Brian Charlton: Plants were dying. Small animals started to die. Cats, dogs, things like that.

Sally Helm: By Friday October 29th, people are starting to realize that the air is worse than usual, and yet…
Brian Charlton: But life went on as normal.

Sally Helm: They’d all dealt with bad air before. In this mill town, it’s just a part of life. And the people of Donora are tough. World War Two vets. Recent immigrants. They weren’t going to shut themselves inside because of some fog. After all, it’s Halloween weekend.

Brian Charlton: Yeah, they did go trick or treating at the height of the smog. It really was the worst, time to go out. But again, this was the mindset.

Sally Helm: The annual Halloween parade also goes ahead as planned. People squint through the haze to see the ghostly silhouettes of kids in costumes marching down main street. A dead cat is later found along the parade route. A black cat. Two days before Halloween. Hard not to read that as an omen.

Brian Charlton: And then you get arguments, of different legends and things that come out of the smog whether you could see the Halloween parade on Thursday night.

Sally Helm: And to make matter worse, there’s a smell

Brian Charlton: A very acidic sulfur, kind of a pungent smell.

Sally Helm: Some survivors say, it was so strong you could almost taste it. Another remembers, “if you chewed hard enough, you could swallow it.”

People start trickling into local doctors’ offices. One of the doctors, Dr. Roth, he isn’t too alarmed at first. He's mostly seeing his asthmatic patients. That’s expected. He knows from experience that the fog always makes their asthma act up.

But soon…dozens of people are coming in. A little after 3pm on Friday, Dr. Roth’s secretary hears a crash at the door and runs to investigate. She finds a man doubled over, gasping for air. He is moaning and clutching his throat. He yells between gasps ‘Help! Help me! I’m dying!’

And still…life goes on. On Saturday, there’s a high school football game, the Donora Dragons line up against their rivals at Monongahela High. Some people insist that the players could barely see the ball. That their coach had to run up and down the sidelines yelling instructions to help them find it.

Brian Charlton: He can see the ball, but these 16- and 17-year-old boys can't see the ball. Okay. I don't quite understand this whole part of the legend.

Sally Helm: The players carry on, their dim forms thudding into each other.

Brian Charlton: There are 11 doctors in Donora, for 14,000 people. And just about everybody in town is sick, whether they're willing to admit it or not.

Sally Helm: They’re dizzy. Nauseated. They can’t seem to breathe.

Brian Charlton: They're exhibiting some form of the symptoms that are eventually going to kill people.
Sally Helm: Brian Charlton’s mother-in-law was working at the local Bell Telephone office the week of the smog.

Brian Charlton: She talks about going to work on Saturday, and she walks into, the switchboard.

Sally Helm: It’s a huge room. About forty young women sitting at a line of phones.

Brian Charlton: The supervisor comes up to my mother-in-law, and the other young ladies who are walking in and said, okay, hurry up, get to your station, get to your board. Everybody in town is dying and she said the day was total chaos.

Sally Helm: The phones are on a party-line system. Multiple people share a phone line, and only one can make a call at a time.

Brian Charlton: And there were people having arguments on the party line that I've gotta use the phone now.

Sally Helm: They’re crying. Begging her to put them through to any doctor she can reach.

Brian Charlton: She says, that's when it hit her that there was really something up. It's a disaster that they are totally unprepared for. There's no book that they can turn to and say, okay, what do we do in a case like this?

Sally Helm: Doctors, meanwhile, are doing what they can. Giving people oxygen. Giving them adrenaline shots, which are usually used to tamp down an allergy attack. It’s just a stop gap. Something to keep people alive until they can escape. Bill Rongaus was one of those doctors. He figured out quickly that the available treatments… just weren’t enough.

Bill Rongaus Archival: I told them the best thing they could do at that particular time was to get out of town!

Sally Helm: That’s him on an archival recording from the Donora historical society. Dr. Devra Davis, an epidemiologist who grew up in the town, says yeah, that’s what happened.

Devra Davis: He was very, very vociferous. He said, get the hell out of town if you can.

Sally Helm: Davis was 2 years old when the smog hit. Years later, she interviewed Dr. Rongaus for her book, When Smoke ran Like Water.

Devra Davis: When I visited him at the old age home, Doc Rongaus told me that the folks that had managed to get up to Palmer Park, just 500 feet above the valley floor, they seemed to recover.

Sally Helm: The problem is how to get them there. By Saturday, the smog has gotten so thick that you can’t drive a car down the road. And so…

Devra Davis: He and his brother took women and children into a horse drawn wagon and hauled them up there to get up to the park.
Brian Charlton: They are trying to get from house to house, and these guys didn't sleep for literally two or three days.

Sally Helm: The entire town is now cloaked in gloom.

Donora Historical Society Oral History Archival: Whether it was 12 o’clock at noon or 4 in the evening you had to have your headlights on.

It would almost be as smoggy inside of the house as it was outside.

When you walked down the road you would pick up ‘black greasy stuff on the soles of your shoes and you would leave white footprints.

I would stand under a streetlight and look directly up, and it was just a small dim light that I could see.

Devra Davis: I interviewed a fireman, John Volk, who remembered taking oxygen home to home to try to help people. And he said that even the air inside the fire station was blue.

Sally Helm: Volunteer firefighters move through the streets with flashlights and walkie talkies. When they find a house with someone in need, they can’t stay long. They have to ration the oxygen. They can give just enough to keep the person alive.

Some families plead with them to stay. But they must move on to the next house. There are other families waiting. This goes on all of Saturday night.

The doctors call for help from surrounding towns. They ask for more oxygen, more medical supplies.

Brian Charlton: But whenever the outside towns approach Donora, they kind of hit a wall of Smog. It's like this, this wall that's kind of slowly creeping along the river.

Sally Helm: The people of Donora are trapped. Despite the best efforts of the doctors and firemen, hundreds are sick. And eleven people are dead. Dr. Rongaus is also going door to door, searching for people who might not make it. When he finds one, he sometimes gives them an adrenaline shot to keep their heart pumping. It’s a nightmare situation. And he thinks he knows who is to blame:

Bill Rongaus Archival: I was so bitter against them to see these poor people dying or suffering or whatever. I said this is just plain murder! I had a good idea that it’s the poisonous gasses coming out of the Donora Zinc works.

Brian Charlton: Somehow Dr. Rongaus gets on NBC radio. And he says people are dying and it has to be the zinc works. It's the only thing that I can figure.

Sally Helm: Other media outlets start picking up on the story.

News Archival: The Deadly cloud over Donora Pennsylvania. But nobody knows what the poisonous vapor is in the Smog!

News Archival: Residents have difficulty in breathing the murky air… Oxygen tents care for sufferers in the town’s community center transformed into a hospital.
Sally Helm: This gets the attention of the general manager of U.S. Steel. Just before midnight on October 30th he personally calls the Zinc Works and orders them to turn down the furnaces.

Brian Charlton: So, they begin to bank the furnaces at the blast furnace at the open hearth and also at the zinc works.

Sally Helm: Turning the furnaces off altogether wasn’t an option because once a furnace of that size is extinguished it can never be started again. Ever. It would mean permanently shutting down the mill…and so instead they begin to slowly lower the temperature of the furnaces. But…at around noon on Sunday October 31st…a miracle for the people of Donora—it begins to rain. And the fog just…lifts. Evaporates from the valley.

Alec Lonich is a crane operator at the plant. From his perch atop the crane, he watches the fog give way to a bright blue sky. He says it was like a curtain being opened. In the following days residents say they had never seen a bluer sky. The sun shone so bright people had to squint. The immediate crisis is over and now begins the aftermath.

20 people have died. 34 are hospitalized and over 800 more need medical attention. Donora’s board of health calls an emergency meeting to discuss what they’ve just witnessed: an event that will come to be known as the worst air pollution disaster in American history. They have a question. How was this allowed to happen?

[AD BREAK]

Sally Helm: Even before the smog has cleared from the Monongahela valley, the United States Steel Corporation sends a small army of chemists and public health experts to Donora to investigate. They need to figure out what went wrong. And who’s to blame. Here’s Brian Charlton again.

Brian Charlton: The superintendent of the mill, I’m certain at some point called all of his foreman together and all of the engineers and said, “what are we doing differently?”

Sally Helm: In other words, what change in the plant’s operation caused the disaster? But when the engineers look … they find no difference. Workers had been feeding the furnaces and smelting the steel as they’d done for over 40 years.

Brian Charlton: Well, the only thing different was the temperature inversion.

Devra Davis: Normally hot air rises like a hot air balloon because hot air is lighter than cold air.

Sally Helm: Dr. Devra Davis explained that, during an inversion, this typical pattern gets flipped. Hot air gets trapped against the ground and can’t rise past the cold air above. So, pollutants in the air can’t dissipate. For example: pollutants in a plume of smoke from a train.

Devra Davis: I interviewed one guy who talked about watching a big coal fired engine release its plume of coal smoke and watched the plume slowly move along the horizon horizontally, and then drop right back down.
Sally Helm: The train smoke can’t get out because, Davis says, cold air is sitting over the town like a lid on a pot. The inversion traps not only smoke, but all of the rest of the chemicals and pollutants from the mills. They had nowhere to go but into the homes—and the human lungs—of Donora.

Dr. Davis has looked at the Smog victims’ autopsy reports. Photos show that their lungs looked like they’d been attacked by poison fluoride gas. The same stuff used in WWI.

Devra Davis: What makes fluoride so insidious is that when you inhale it, it goes into the lower part of the lung and eventually, basically almost crystallizes it so that you are suffocating from the bottom up.

Sally Helm: The immediate toll of the smog event was twenty fatalities. Davis also attributes 50 deaths over the following months to the smog. And she added that survivors were not untouched. Many ended up with significant heart and lung problems. Including Davis’s grandmother, Her Bubbe Pearl.

Devra Davis: When I was growing up, my mother would tell me stories about her mother, how she was the first woman to hand crank a model T, which took a lot of force.

Sally Helm: But Dr. Davis says, after the smog, her grandmother was never the same.

Devra Davis: She suffered 25 heart attacks. And the first one occurred during this killer smog.

Sally Helm: Now, an epidemiologist like Davis knows that it is very difficult to trace one person’s health crisis to a specific event like the smog.

Devra Davis: But when you have many different people suffering from similar patterns of poor health and a similar event happening, that's when you can put the puzzle pieces together.

Sally Helm: It is a puzzle that the United States Steel Corporation does not want solved. And so, they hire the country’s top pulmonologist—a researcher at Harvard named Philip Drinker—he’s asked to weigh in on the steel plant’s role in the disaster. Here’s Brian Charlton.

Brian Charlton: Now Philip drinker is famous for inventing the iron lung. So, he's no lightweight.

Sally Helm: He is no lightweight. His version of the iron lung had helped save the lives of countless polio patients. And Drinker has spent more than a decade researching the effects of atmospheric pollution on people’s health. He’s even spoken publicly about another deadly temperature inversion, this one hit a small smelting town in Belgium in 1930. And his verdict?

Brian Charlton: That will never happen here in Southwestern, Pennsylvania, you guys don't need to worry about anything.

Sally Helm: Steel executives around the country realize that the disaster in Donora poses a threat to the industry. So, one of the largest smelting companies hires Drinker and his lab to test a hypothesis. It goes like this, sulfur dioxide from the plant is not what killed people.

Brian Charlton: This is a loaded investigation because Drinker's going to give United States Steel and the National Association of Smelters exactly what they want.
Sally Helm: Like other investigators, Drinker declares the deadly smog to be an act of God. He’s like, 
Sure, the smoke from a mill played a part. But the real villain here was the temperature inversion. 
Combined with the topography of the river valley. Don’t blame it on man, blame it on nature.

But a toxicologist on Drinker’s team at Harvard says, Wait a minute. Maybe there’s more to investigate 
here. Her name is Mary Amdur.

Devra Davis: Mary Amdur also comes from the valley and her father had also worked in the mills

Sally Helm: Amdur had watched lung cancer kill her father. She blamed that on the mills. So, this is 
personal. Her theory goes like this. May toxicologists have been thinking about the danger of 
pollutants too simplistically. They’ve been saying, basically, that if a chemical doesn’t kill or maim you 
on contact, it’s safe. But what if there’s more to it than that?

Devra Davis: She questioned what would be the long-term effect of breathing low levels of air 
pollution.

She wonders, what are the cumulative effects of pollution? And how do we test that? She has an idea.

Mary Amdur heads to a pet store and buys a few guinea pigs. Literal guinea pigs. And she rigs up a 
contraption in her backyard so she can slowly expose them to low levels of sulfuric oxide. That’s the 
main pollutant emitted by the mills.

Devra Davis: She exposed animals for longer periods of time to, to levels of air pollution like you 
and I might be breathing if we were young people living in Donora

Sally Helm: Then she dissected the guinea pigs and tested their lungs for pollutants. She found that after 
just 3 days, the lining in the lungs had thickened and scarred. Which suggests that breathing chemicals in 
the air did have a cumulative effect. Which means that even now, after the smog has lifted, the people of 
Donora are still in danger. And that’s true not just in Western Pennsylvania, but in polluted cities and 
towns across the globe.

Devra Davis: She wrote up a paper and she said, she thought that there was a need to control air 
pollution.

Sally Helm: This is not what the execs want to hear. Remember, they’re the ones that hired Philip 
Drinker. They’re the ones funding research at his Harvard lab. The lab where Mary Amdur is working to 
develop her new theory of pollution.

Devra Davis: They never dreamed that money. They were giving to Harvard would go to fund 
research on the deadly effects of air pollution.

Sally Helm: Amdur presents her findings in 1953. Soon afterward, Philip Drinker fires her.

Meanwhile, in Donora, things are fractured. People don’t agree about what caused the problem, or what to 
do about it.

Brian Charlton: There were very few people who said it was the steel Mill's fault.
Sally Helm: But one person who does is Dr. Rongaus. The man who’d led people through the smog in a horse drawn carriage.

Dr. Rongaus gives interviews to the Associated Press and writes newspaper columns about the four days of hell he’d lived through. He’s the first doctor to bluntly blame the disaster on the Zinc Works factory.

Brian Charlton: It took a lot of courage on his part to actually say that. That was something that just wasn't spoken out loud.

Sally Helm: Rongaus and a few other community members say the mill should be moved. Far from Donora, where it can’t hurt anyone. But lots of other people fear that losing the mill would put an end to the town as they know it.

Devra Davis: The denial of course was profound, precisely because people would be losing jobs.

Sally Helm: The Zinc Works practically owns the town. Almost everyone works there. The town council is stacked with its allies.

Devra Davis: I think more than half the members worked for the mill. There was a member of the town council, who said, I've got a darn good job and I'm gonna keep it. I don't care what it kills. That was the attitude of people. It was just considered the cost of doing business. In fact, when people would come to Donora they came because they thought smoke meant jobs.

Sally Helm: But a local citizen’s group does push back. It’s called the ‘Society for Better Living’. The group files a lawsuit against American Steel and Wire.

Brian Charlton: And United States steel is about as worried as your local high school team would be if they were playing the kindergartners of the school district.

Sally Helm: Steel, at this time, is one of the most powerful industries in the U.S. Charlton says that it would be like trying to sue Amazon or Google today.

Lawyers for American Steel and Wire go to the Society for Better Living, and they say, look. We have all of these scientists saying that the Smog was just an act of God. If this goes to court, you’ll lose. Why not just settle? And so, they do. For two hundred and fifty thousand dollars.

Brian Charlton: And if you know anything about United States Steel in the 1950s, you know, that basically is pocket change. That's what they put on their dresser at night when they take their pants off. Like that's next to nothing.

Sally Helm: In the aftermath of the 1948 smog, the company wins. But nine years after the disaster, they’ve fallen behind technologically. And their global competitors swoop in.

Brian Charlton: Somebody built a better mouse trap. Somebody built a better way to smelt zinc. This was just good, old fashioned capitalist competition. This is what happens.

Sally Helm: The zinc works portion of the mill closes in 1957, and the rest of the mill closes a decade later. Thousands of people in Donora lose their jobs. Jobs they had sacrificed their health and safety to preserve.
**Devra Davis:** Donora became for many years, a town left behind and part of what was called the rust belt throughout the Monongahela valley as a number of mills shut down and were left to rust.

**Sally Helm:** The steelworks move out … and the clean air moves back in. Flowers begin to bloom again in the valley. It’s a drastic change from the bare dirt landscape that Dr. Devra Davis knew growing up.

**Devra Davis:** As a child, all I knew was that we had wonderful mud pies to play with. And that we could sit at the top of Hills and slide all the way down to the bottom because nothing grew on them. And then when I came back from my grandfather's funeral, I was astonished at how green everything was.

**Sally Helm:** But the pollution has left a mark in the town’s high-than-normal rates of heart attacks and strokes.

**Devra Davis:** If you look back on the legacy of Donora that's written in the bodies and hearts of the sons and daughters of Donora.

**Sally Helm:** A second alarm bell sounds four years after the Donora disaster, in 1952. In London. A Donora-like brew of sulfur dioxide and fluoride settles over the city and will not move. And again, people die. This raises the same question.

**Devra Davis:** If a lot of air pollution in a short period of time could kill healthy working-class people. What were the long-term effects of this air pollution?

**Sally Helm:** The question that had prompted Mary Amdur’s experiment.

**Devra Davis:** These events really caused the world to wake up and pay attention to the fact that you couldn't just pollute the air.

**Sally Helm:** America’s environmental movement begins to emerge. Anti-pollution laws are passed in some places. And then in 1970, Congress passes, and President Nixon signs, the Clean Air Act. And act that can trace part of its roots to Donora, Pennsylvania.

**Devra Davis:** So, it became the, the foundation for the clean air movement. It became the foundation for the entire field of air pollution, epidemiology.

**Sally Helm:** I guess my last question is, again, I don't wanna just sort of sit in either a world that's too optimistic or too pessimistic when it comes to this. Like, I don't wanna sort of just say, oh, Donora led to us cleaning up the air—yay. And I also don't wanna deny the fact that like, we may be in a better place now than we were then, we are. Like, I don't know. How do you balance it all? How do you feel?

**Devra Davis:** Well, for the sake of my five grandchildren, I'm delighted that we've made progress, but I'm also deeply disappointed that we haven't made more progress. But the reality is there's always going to be trade offs.

**Sally Helm:** Tradeoffs between industry and the environment that are still very much alive today.
According to the World Health Organization, around 7 million people a year die from air pollution. Especially in steel-producing countries like Mexico and China.

**Devra Davis:** They may be different countries and speak different languages, but the lungs are the same.

**Sally Helm:** For decades, the people of Donora tried to put that week in October of 1948 behind them. But then 60 years after the smog swept through, the Donora Historical Society opened a museum. Brian Charlton works there now.

**Brian Charlton:** Our logo is the stacks of the zinc works.

**Sally Helm:** It commemorates the survivors of the disaster. And it celebrates the role that Donora played in raising the alarm about pollution. The museum’s tag line is. ‘Clean air started here.’

[CREDITS]

**Sally Helm:** Thanks for listening to History This Week. For moments throughout history that are also worth watching, check your local TV listings to find out what's on the History Channel today.

If you want to get in touch, please shoot us an email at our email address, HistoryThisWeek@History.com, or you can leave us a voicemail at 212-351-0410.

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This episode was produced by Rebecca Nolan. Sound designed by Dan Rosato, and story edited by Jim O’Grady. Our senior producer is Ben Dickstein. HISTORY This Week is also produced by Julia Press, Morgan Givens, and me, Sally Helm. Our associate producer is Emma Fredericks. Our supervising producer is McCamey Lynn, and our executive producer is Jessie Katz.

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