

The Water Crisis in Flint, Michigan: Citizen Scientists, the Media, and Science Anarchists

Marc A. Edwards

February 6, 2018

Marc A. Edwards is University Distinguished Professor in the Department of Civil and Environmental Engineering at the Virginia Polytechnic Institute and State University.

It all started going wrong for me, or right, depending on your perspective, in 2002, when I was hired by the U.S. Environmental Protection Agency (EPA) to work on what seemed like a routine corrosion consulting project. The EPA said the city of Washington, D.C. had high levels of lead in their water and wanted my group to fix the problem. Suddenly, this became anything but routine. The press eventually called this the Washington, D.C. Lead in Drinking Water Crisis. It is now known that government scientists and engineers hid knowledge about high levels of lead in drinking water from the public for three years before it became front-page news in the *Washington Post*. The other tragedy is that five good, honest, ethical scientists and engineers who tried to expose this were fired or left their jobs. They laid down their professional lives, and no one ever thanked them for that.

When working for the EPA, I saw some things that did not make sense, asked too many questions, and soon was no longer working for the EPA. Later in my career, I eventually showed that hundreds and perhaps even thousands of children had their blood lead elevated above the current level of concern for lead poisoning set by the Centers for Disease Control (CDC). There were children who were not born as a result of this lead exposure in Washington, D.C. due to miscarriages and fetal death. I ultimately had to expose misconduct by the CDC, which had published a falsified scientific report that claimed no one was hurt. I worked on this for seven years before we were able to write a paper in 2009 that showed the CDC's narrative was false. Children, just like those throughout history who drank too much lead in their water, got lead poisoning. This became the subject in a bipartisan hearing in 2010 where Congress blamed the CDC for what they did and noted that their report was completely scientifically indefensible. By this time, 2010, it had already been a long journey. I was just thinking—hoping—that people were going to learn from this mistake. That the CDC will say they are sorry, the EPA will learn from it, and we will never have another tragedy like Washington, D.C. again. Our research group that worked on this—and I am just a representative of that group of amazing undergrads, grads and other faculty—got a lot of attention in the media; we were in *PRISM* magazine, *TIME*, and *The Chronicle*

of Higher Education. At one point it was really cool because the MacArthur Foundation called and gave me a check for half a million dollars and never bothered me again. It does not get any better than that.

But what I knew in my heart in the aftermath of the D.C. crisis and the Congressional hearing was that we learned nothing at all from this mistake. The takeaway message from Washington, D.C. was that the agencies can attack good people and defend bad people. There was an attitude at these agencies, that we got away with the Washington, D.C. lead crisis; even after the Congressional hearing not one employee across five agencies who perpetrated this crime lost their job. Not one. In fact, they were rewarded. Their attitude was “let us just get a whole lot better at covering up and avoiding responsibility for these problems so people will never find out about it.” This made another D.C. inevitable.

To prepare for that day, one of the things I started to do was to learn about the history of science and engineering, a history—I am embarrassed to say—I at age forty did not know enough about. I learned about all the things that scientists and engineers do that can go wrong. I realized that in our educational institutions, we really do a great job of preparing students to deal with the technical problems that they are going to face. But the thing we do an absolutely horrible job at is preparing students to understand the role of science and scientists in society. I read a lot of books and became fascinated by scientific misconduct. I just cannot stop myself from reading about the bad things scientists do now. It is a kind of curse, but there is an incredible amount of literature on this subject that I was ignorant of. This is part and parcel of who we are as human beings, and scientists are not above misconduct like lying and cheating. I also studied the role of cowardice and heroism in science and engineering. What happens to a world where scientists and engineers are cowards? The answer, and you do not have to look very far, is that it becomes a very unjust world indeed. Read about Lysenkoism in the Soviet Union. Read about the scientists who supported Nazi Germany. Then also read about the great heroic actors in history. Albert Einstein, who is pretty famous for his career as a physicist, was an even greater humanitarian and heroic actor for the social stands he took.

All of this was playing in my mind. What is our job as scientists and engineers and even citizens in this world? It was around that time, 2004, that I was president of the Association of Environmental Engineering and Science Professors, and I asked students, “Can you describe what it is we do as scientists and engineers?” I was so touched by their very simple motto: our job is to “save humankind from itself.” Not only from the products of waste as a result of living and industrialization, but also from the very worst perverse incentives and evils that we can perpetrate on each other.

This is what prepared us for the day in 2014, in Flint, Michigan, when another D.C. happened. This time, instead of the most powerful city on the planet, Washington, D.C., it was one of the poorest cities in the United States. I am going to argue that what happened there was really a triumph of citizen science. Citizens worked with scientists to defend themselves and promote social change.

Like many engineering and science disasters, the Flint disaster started out innocently. Someone tried to do something good. In this case, it was a short-term switch from buying Detroit water, which had orthophosphate corrosion control inhibitor (and they had been purchasing it for several decades), to using a local water source, the Flint River, for which they had a treatment plant that they had been using. The idea was that if they could use the local Flint River while they were building a pipeline, they would save \$5 million, which in a bankrupt city is a whole lot of money.

There was a big ribbon-cutting ceremony and speakers called this “a historic day” for Flint. It turned out to be really historic, just not for the reasons they had thought. Scientists and engineers at the Michigan Department of Environmental Quality had forgotten to follow the federal corrosion control law. It was common knowledge, so important that we have a federal law that says, “Thou shalt use corrosion control.” They forgot to put a chemical into the water of the Flint River that protects the pipe from corrosion. I think it is quite likely that this was overlooked innocently, at first. But from the time that this water got put online, people started to complain.

LeeAnne Walters is a resident of Flint, and I call her Hero Mom. At a meeting with public officials, she held up a bottle filled with water that went through a filter and came out of her tap. She complained that she was paying amongst the highest water rates in the world—which is what Flint residents pay for their water because there are very few people left in the town—for water that looked like rust soup. One official, an emergency manager, told her he did not believe that that water came from her tap. In the background LeeAnne’s daughter thought, “Oh my gosh, Mom is going to go to jail tonight because she is going to slug him,” because that is who LeeAnne is, she is a fighter. But thankfully she did not throw a punch that night.

The emergency manager also told LeeAnne that even if the water did come from her tap, that water was safe. We now know that was not true. We have since analyzed the water in those samples and know that it contained hazardous waste levels of lead. Two-and-a-half times the hazardous waste level of lead. One sip of that water could cause lead poisoning in one of LeeAnne’s children. The water in large Flint buildings also had too much dangerous bacteria in it, including *Legionella*, which you can breathe into your lungs and which can often times cause a fatal case of pneumonia.

So what did Hero Mom, LeeAnne Walters, do? She had a living experiment in front of her, twin boys. One of those boys was not growing as fast as the other, physically and socially. She wondered why. LeeAnne figured out that that child had elevated lead in his blood. She figured out that the water was the source of the lead. She contacted an EPA employee, Miguel Del Toral, and the two of them confirmed that Flint had no corrosion control in their water. The two of them did all the science that needed to be done, but unfortunately, sometimes the truth doesn’t count for some people.

Then I worked with Miguel to figure out a way to get the EPA to do its job and enforce federal law. Miguel decided to write a memo, laying out, in no uncertain terms, the imminent and substantial endangerment to Flint residents. By doing this he put his career on the line. The memo came out June 24, 2015. Anyone reading it would realize this was a very serious problem. We already had one lead-poisoned child and proof that federal corrosion control law was not being followed in Flint. Half of the city had lead pipes. How could his memo be ignored? Well, it was. Miguel's boss found out about this memo and got very angry. Miguel asked the EPA ethics officer, "What did I do wrong?" The ethics officer's response was, "Miguel, do not speak to anyone from Flint or about Flint ever again." Miguel was out. The next day, he wrote an email to his colleagues at the EPA. He was really upset, obviously, and he wrote, "I am really tired of bad actors being defended, bad actions being ignored, and people trying to do the right thing being subject to intense scrutiny as if we are the ones doing something wrong. I truly hate working here, EPA is a cesspool." But Miguel was out.

So you can always find a new employee to do your bidding, and she came on the scene, and here's the situation in Flint. The people were going crazy because the water was crap. They were not getting satisfaction from the state of Michigan so they went to the higher authority, EPA Region Five. Here is what Jennifer Crooks, the EPA program manager on the scene, wrote about one of those phone calls: "Yup, another complaint about our favorite water supply :) Let me tell you, this Flint situation is a nasty issue. People are calling me four-letter words over the phone, yelling at me, calling me a crook. But, I am developing a thick skin."

The situation had gone on, at this point, for seventeen months. People were marching in the streets. Children had horrible rashes and their parents believed it came from the water. People were being told that it was safe to drink the water, and you are paying amongst the highest water rates in the world for water that does not look suitable for anything but flushing toilets. Dayne Walling, the mayor of Flint, read Miguel's letter and contacted Miguel's boss, Susan Hedman, the head of EPA Region Five, and asked, "Is there something going on here that I should be concerned about? I read this memo and this looks pretty scary." Miguel's boss apologized to Walling, said that that memo should have never been written, and said that if there was anything to be concerned about, she would call him. The residents were told the Flint water was safe to drink after that. In fact, Walling went on television four days after speaking to Hedman and based on her assurance, encouraged everyone in Flint to drink the water. When it was discovered that this water was not safe, he was voted out of office. But I ask you, who is more guilty? The politician who believed the lie, or the scientist who told the lie?

One of the fascinating things about this story is that it was so screwed up that most people cannot believe it was the scientists and engineers who perpetrated this crime. They have to blame it on some politician, whether it is the Democratic mayor of Flint or the Republican governor of Michigan. We

watched this unfold and I will tell you, to be honest, I got really mad. We had given the system every opportunity to work. In fact, if you want to criticize us, criticize us for even thinking that the EPA would do its job and for waiting months to try and let that happen.

We finally launched our offensive and did it with the attitude that “this is a war.” We felt that the children and people of Flint were in imminent and substantial danger, that with every moment that passed kids were getting unnecessary lead exposure and that, quite possibly, people were being exposed to harmful bacteria. When we launched our effort, we broke all the rules of academia and science and engineering. I had saved up money so I could fund this out of a discretionary account because there is no pot of money at a university to save the world. If you take money from the university to save the world, you are probably going to go to jail. Secondly, we pursued science for the public good and directly collaborated with the public through a citizen science program. We essentially declared war on these agencies that we felt in our hearts were unethical. In other words, it was like our version of your tradition here at Juniata College, Storming the Arch, except in your case I heard the myth is that no one has ever gotten through the Arch. Failure, however, was not an option for us. We were going to get through or end our professional careers in the process.

One of the things that I learned in the years of failing in Washington, D.C. was that scientific data and facts are meaningless in a war like this. You might as well be dropping spit balls on people from thirty thousand feet. What we had to do was engage the fourth estate, the press. And the way that you engage the press is to tell a story. Our approach was to tell the heroic science story of the Flint residents. This builds upon studies in the social sciences and the monomyth of Joseph Campbell, the heroic journey. If you ever want to reach people and make them act, you have to follow that script. This was a very powerful weapon that we unleashed, and I want to show you how it rolled out.

The first step involved working with Flint residents to do the job the agencies refused to do by allowing the residents to directly sample their water for lead. On August 13, 2015, we first announced our presence on social media. The next thing we did was start doing simple science experiments that anyone in the public or the reporters could understand. We had one beaker that contained water from Flint, without corrosion control, and another beaker with water from Detroit, which had corrosion control inhibitor in it. We put steel samples in the beakers to see what would happen and, lo and behold, the water from Flint that had no corrosion inhibitor ate up the steel. That was what was happening to the pipe infrastructure, and it was discoloring the water from the rust. The simple message: this is what you had (Detroit water), this is what you have now (Flint water), and LeeAnne Walters and the other residents were not crazy.

We then started other experiments where we looked at lead. One of the things that the corrosion control does is it keeps lead out of the pipes and out of the water. So we put Detroit water in the sample of

copper pipe with lead soldering. When we did that with Flint water, white stuff appeared in the water, looking like a snow globe. That was lead. This is what caused the lead poisoning of LeeAnne's children. Now one of the powerful things about science and engineering is that you can do experiments and replicate results. An experiment should be reproducible. We sent these bottles and all the apparatus to the Michigan Department of Environmental Quality, and we said, "You are claiming our results are false. Will you please repeat the experiments? It will only take you a few hours a day for a week to see the same results we have." But they refused to do it because they did not want to know.

One of the axioms I learned over the years is, "Do not waste your time trying to reason with unreasonable people." It will get you nowhere. At that point, since science is reproducible, we reached out to a fourth-grade classroom. They did the experiment. They got on the local news, and the state of Michigan looked ridiculous. At that point, we got nasty because we reached out to a troop of Girl Scout scientists and had them do experiments related to Flint water. Then we had them write messages to the Governor of Michigan, which I compiled and sent to the EPA headquarters in Washington, D.C. I said: "Is it not amazing this little troop of Girl Scout scientists gets what is going on in Flint, Michigan, and you guys do not." We posted this on our website and it got picked up by national media. It was a huge embarrassment to the agencies responsible.

Then we truly crossed the line. I and a member of our team, Sid Roy,] went up to Flint on September 15 2015, stood on the lawn in front of City Hall with Flint residents, and reported the scientific results that we had collected together. The sampling showed the city-wide lead problems, directly contradicting the data that were being collected by the state and the EPA. I made the dangerous decision that we were going to tell the story, to put it right out there. And this was the headline the next day in the *Flint Journal*: "Prof: 'Epically Bad Decision.'" I remember seeing it at the airport the next day. I thought, "Oh my gosh. If I am wrong, my career is officially ended." But history has proved, in fact, that we were right. Later we started working with an amazing local pediatrician named Dr. Mona Hanna-Attisha, one of the remarkable actors who stepped up. In collaboration with us, she started looking at the levels of blood lead in Flint residents and found that in Flint children they had essentially doubled in the time period. At that point, and given her effective communication strategy, together we had accomplished the impossible. From mid-August, when we launched this effort, to October—six weeks—this had become front page news in the *New York Times*.

The other issue that we had predicted was the bacteria problem. The lack of corrosion control will allow bacteria to grow. Some of them are harmful and can kill people. If you have unlined iron pipe, like Flint did, you are probably going to have *Legionella* bacteria. We sampled for that and, during this time, we were submitting Freedom of Information Act requests, posting the results on our website, and trying to force the state to act. Later, it was acknowledged that during this entire time period, the state, the

county, and the CDC knew about a *Legionella* outbreak in Flint during the time they were using the Flint River. This is the third worst *Legionella* outbreak in U.S. history, and the worst for a public water supply. Twelve people died over this period.

At this point, the Flint crisis entered a new dimension. It was not long before people across America realized that government agencies had perpetrated a crime against one of our most vulnerable populations, the residents of Flint, Michigan. In early January 2016, President Obama declared this a federal emergency, which freed up federal funding to flow to Flint. The National Guard was mobilized. FEMA was mobilized. Flint residents were provided bottled water. Children had their blood tested for lead. The governor actually admitted that what the state had done in Flint was horrible. He apologized, and then hired us to help with the recovery. That never happens, but it did here.

But what about accountability? What does it take for a bad actor in government to lose their job? At that point, something interesting happened. The story got on *Comedy Central*: <https://www.cc.com/video-clips/13hiav/the-daily-show-with-trevor-noah-michigan-s-toxic-water-crisis>

Male voice: The saddest thing about this news is how little it would have cost to prevent it all.

Female voice: The fix was about one-hundred dollars a day, all of this could have been avoided for just that small amount of money.

Male voice: A hundred dollars a day. Why did you not say something? I want to call out to all of my people in Africa right now watching *The Daily Show*, because my friends, for only a hundred dollars a day, we can save a village in America! And get these people's drinking the water that they so badly need. For just the price of five cups of coffee in New York.

You laugh or else you cry. That segment really says it all. By then, we were not only a national embarrassment, but an international embarrassment too. At that point, something had to give.

Within a week, during which time America became the brunt of world-wide jokes, Susan Hedman resigned from the EPA. To date, there have been fifteen civil servants who have been indicted for what happened in Flint. In the aftermath of Flint we learned that the only thing unusual in Flint was that these officials got caught, because many of our bigger U.S. cities were doing the same cheating on the lead and copper rule that Flint was doing to cover up the high levels of lead in their water. Even with the cheating, by the way, 5000 U.S. water systems had too much lead in the water. This is a national scandal.

Before long, money started flowing to Flint. Unprecedented amounts of relief money; in total to date, more than \$600 million has been donated by private and government sources. That translates to about \$67,000 per child, which you do not see unless there is a natural disaster, and even then, you do not see that kind of money. We worked with the amazing people from the EPA and FEMA to help with the recovery. Miguel Del Torral, who had been removed, became the face of the EPA because they had lost

so much credibility. Once again, that never happens, but it did here. This here is the triumph. This is the story of Flint residents saving the day in collaboration with Virginia Tech and many other outside actors.

At this point, what happened next was remarkable. And it was horrible because we started having tragedy upon tragedy. People now came to town to use the Flint tragedy to promote their own agenda. Some in the media overstated the harm that was done to Flint's children. How many people believe that many children in Flint have suffered irreversible brain damage from the lead-in-water exposure? I know exactly where you got those stories. If you listened to the media, that was the message. But here is the reality of what happened in Flint to the children's blood levels.

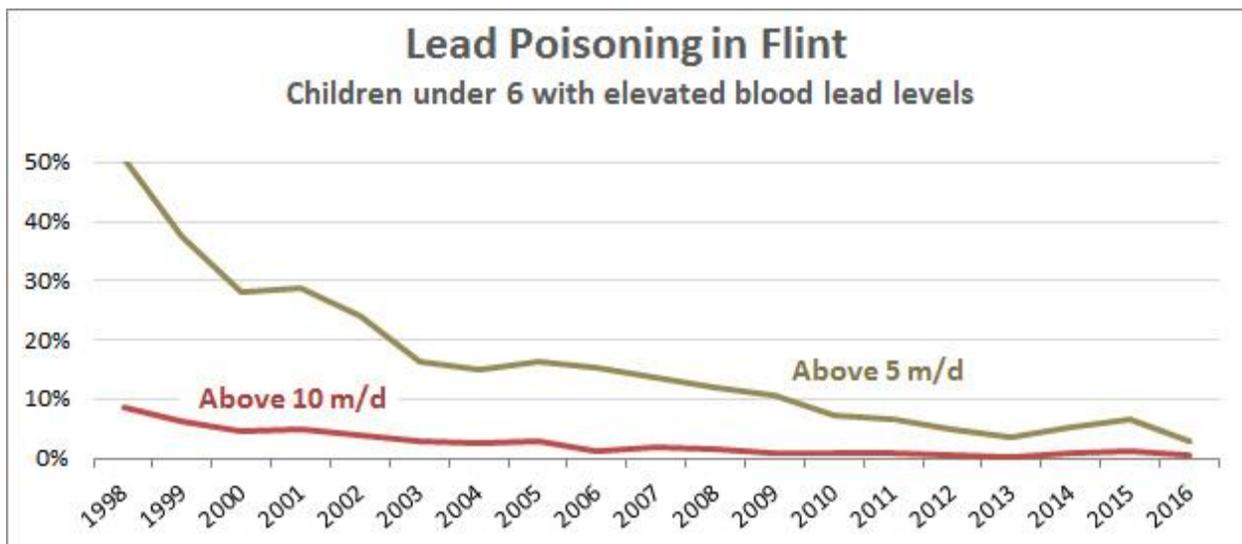


Figure 1: Incidences of Elevated Blood Lead in Children at the Five and Ten Microgram/Deciliter Threshold Over Time. Source: Kevin Drum, "In Flint, We are Laying Tragedy On Top of Tragedy On Top of Tragedy," *Mother Jones*, 26 January 2017, <https://www.motherjones.com/kevin-drum/2017/01/flint-we-are-laying-tragedy-top-tragedy-top-tragedy/>

What you see overall is the triumph of public health, the results of having taken lead out of gasoline, out of food, and regulating lead in water. Levels of lead in blood are plummeting all around the country because of our legislative action. That little blip in 2014 and 2015 is the effect of the Flint water crisis. I am not downplaying the harm that was done, for it was horrible and inexcusable and criminal. But the elevation in blood lead there simply raised the children's blood lead back to levels that were considered normal just four or five years earlier. To levels much lower than what children had had in Flint just ten years ago. It would have been a tragedy if we had not stopped the exposure when we did because the lead was really just starting to fall off the pipes. We ran model predictions that show that we caught this at just the right time. Many children could have had their blood lead elevated back to levels that had not been seen since the 1990s, but that did not happen because of the citizen science studies. This is part of the problem with the media. To some extent you could excuse it because the logic is, "If we do not overstate

the problem, people will not give the money that Flint needs to recover.” But at the same time, this exaggeration creates its own set of problems and harm. When we go to Flint schools, there are teachers who literally tell us they cannot teach Flint’s children because they have brain damage. Parents are telling their children they cannot learn because they have brain damage. It is hypothetically possible that the harm done from that false messaging is worse than the actual harm done by the lead exposures. This type of harm lasts generations, the idea that “this was done to you on purpose by someone trying to save money, by some politicians.” This is part of the reason that trust in the media right now is less than trust in government, and this is a huge problem.

Another thing that happened was science anarchists came to Flint. A Hollywood actor named Mark Ruffalo came to Flint through his non-profit activist group Water Defense. I am told Mark Ruffalo is some kind of great actor—I really do not know—but I can tell you his efforts in Flint were an unmitigated disaster. Here is what they did. They started taking samples to suggest to Flint residents that the CDC, the EPA, and Virginia Tech were lying to them and that they really were still in a lot of danger from taking a bath or a shower. They collected samples in ways that gave false high results and published them on their websites. People were listening to them and getting scared.

This is dangerous because one of the most important public health advancements of the last several hundred years is basic hygiene. We take baths and showers because it prevents disease. We stop class sometimes to have everyone go wash their hands so that they do not transmit disease. One of these is the shigella infection. Shigella sometimes comes from drinking water, but more commonly it is transmitted from hand-to-hand contact through fecal contamination. Within a few weeks after Water Defense arrived in Flint and started spreading this message about how dangerous it was to take baths or showers, Flint residents started experiencing one of the worst shigella outbreaks in their history. Water Defense held press conferences claiming that they discovered dangerous levels of chloroform in Flint showers, and that people were essentially getting gassed like it was a gas chamber and causing carcinogens. Those were some of the terms that were being used. They put up YouTube videos, like on April 13, 2016, saying “Bathing in Flint Is Not Safe.” We now know from the work the CDC did in the aftermath how effective Water Defense’s misinformation campaign was. Eighty percent of Flint residents with rashes had changed their bathing habits, seventy-five percent showered less frequently, and seventy percent took shorter baths and showers. They also claimed they had gone to all of these other disasters and that they had never seen chloroform levels like this. They tested bathrooms all around the country and had never seen anything like Flint. This later turned out to be a complete lie; they had never tested any bathrooms before, and Flint was the first. Scott Smith, the chief scientist of Water Defense at the time—I call him a pseudo-scientist because he has never had any degree in science—was running around acting

like he was a scientist, and people were listening to him. This was their campaign, scaring people needlessly with completely erroneous data. This is really dangerous stuff.¹

At this point, we reached out to them and said you either have to correct this false messaging or we will call you out. We had actually hired third and fourth parties, the best water science experts in the country, to test Flint's water alongside us. Two other independent groups found totally normal levels of chloroform in the water, completely contradicting Ruffalo. They set up a phone call to talk to us, and then they never called. So at that point we had to go to war again. It was a national fight that appeared in places such as the *New York Times*. Basically, Ruffalo got trashed and discredited in some of the national media. The story on our website was picked up. You would think he would then back down because Water Defense had a lot of egg on its face and perhaps had responsibility for the shigella outbreak. You would think that maybe they would have learned their lesson from this. But that was not the case. There is a theme here: we never seem to learn from our mistakes, and Mark Ruffalo is no exception. What Water Defense did next, after having been exposed for the shigella outbreak and their fraudulent science, was form an alliance called The Young Turks Network. This was some kind of progressive, online news medium. They started sampling again, and Scott Smith either did the samplings or advised them on how to do them. Then they published their results in news stories that were broadcast in Chicago, scaring people even more. We fought back against this by showing people their tactics and what they were about. We called it the twelve-step misinformation program.

Jordan Chariton, who was the political reporter for The Young Turks Network, starts by showing people how to sample for water contamination by getting a kitchen knife and a non-sterile water bottle.

Chariton: Hey, it is Jordan with TYT and TYT Politics and I have come to kill you! Why do I have a knife and a water bottle? If the EPA is not going to do the testing, then I will.

Step two is to go find lead and bacteria that no one else will find.

Chariton: Scott Smith with the Water Defense Council. He has done private testing in about thirty Flint homes. He has gone through very extensively and carefully to find bacteria that the state has not found in Flint. Bacteria is in just about every home he has tested. I am not going to know the names of the bacteria.

Why should people listen to these two? Smith has no scientific credentials, and Chariton is a politics reporter. We will let them explain it to you in their own words.

Chariton: Scott Smith with the Water Defense Council.

Smith: You are more of the scientific kind. I said, I do not know whether it is safe to shower and bathe. I am not a doctor, I am not a toxicologist, and I am no PhD in statistics because I am not a trained plumber or pipe fitter.

Having established their scientific credentials, now they go and try to uncover contamination in the drinking water BY SAMPLING THE OUTSIDE OF A SEWER PIPE IN SOMEONE'S BASEMENT!

Chariton: So we are going to be getting water and what looks like a bacterial fungi [sic], we are going to be collecting them, and he is going to be testing them. And by the way, I can barely set up the T.V., so this could be tricky. There we go, we are sawing here...

They have collected their sample in this unsterile bottle, using an unsterile knife, from the outside of a sewer pipe. Then, whoops! They dropped the bottle cap on the floor, rubbed their hand on their shirt, and rubbed the bottle cap on their shirt.

The next step is to send that sample that no one has a clue where it came from to an independent lab that looks for the dangerous bacteria.

Smith: Because the key thing is the independent lab that we go to.

Now, put that news on primetime to scare people.

Male voice: On last week's Power Panel, we showed you video of TYT's Jordan Chariton drawing water from a water heater in East Chicago, Indiana, that looked like absolute sewage. Scott Smith of Water Defense was our liaison for that testing.

Chariton: Exactly. We tested it, and boy it did not come out good at all. It came out terrible.

Female voice: Hello?

Smith: Hi Maritza, it is Scott. Happy Friday once again.

Maritza: Happy Friday, Scott.

Smith: Hi Keesha.

Keesha: Hi, how are you?

Smith: Good, how are you? How is your day? How is your Friday? I have your results, and there are some similarities to Flint. As far as your water goes, I know you have got a lot of challenges. This bacteria probably should not be in your water.

Then, for maximum effect, they have Mark Ruffalo go on national television and talk about how they are citizen scientists and how everyone is benefitting from these data.

Ruffalo: [We shouldn't be having the debate of] whether or not my organization is scientists, because we are admitting we are citizen scientists. And so, all we are doing is giving people information and there is nothing wrong with that. And the more information people have, the better off they are.

We put this on our blog and, as you can imagine, they were not happy with it. TYT Network posted threats on our website: "We are working on an additional piece that proves you, Dr. Edwards, are a hack, and if you do not take that blog post down, you are going to face a public dispute with the largest online news scandal, in the world." We did not take the blog post down. On top of that, we got several letters from Ruffalo's attorneys telling us, "Cease and desist or we will take you to court." We did not cease, nor did we desist. Finally, we got death threats over this time period. It ultimately ended when Chariton got caught having an orgy in Flint, and got fired as part of the #MeToo movement. As for Scott Smith, he tried to sell water filters so that people in Flint could protect themselves from the imaginary contaminants that Water Defense claimed to find. He effectively told residents in Flint that in order to

have a safe bath or shower, a system that Smith was recommending would cost \$11,000. One online message showed that Smith was going to get \$2000 of that. So, Smith got fired.

We believe it is possible that Flint residents may have lead poisoned themselves to prove a false scientific hypothesis that TYT and Scott Smith put before them. You have to read about it for yourself at flintwaterstudy.org to believe it: <http://flintwaterstudy.org/2017/09/lead-sinker-story-timeline-bizarre/>

What we have is tragedy on top of tragedy. As recently as January 17, 2018, Nancy Pelosi went to Flint and claimed thousands of children still required bottled water. Countless families continue to live under a cloud of fear. It is true that there is a lot of fear in Flint, but a lot of it was caused by these science anarchists who came to town, scared people, and undermined the expertise of those who were trying to help them. It is not true that Flint water is presently any worse than water in any other city with lead pipes. But some people just cannot let go of that because they want to get more funding for Flint. I cannot blame them for that. But citing false facts is not helping anyone. The big problem left in Flint is that the crisis continues, but it is not a crisis of water as much as a crisis of trust. The residents there have been betrayed by government, science, and Hollywood.

The great scientist Albert Einstein said, “The world is a dangerous place to live. Not because of the people who are evil, but because of the people who don’t do anything about it.” This has been an amazing journey over the last fifteen years. I would not wish it on anyone, but at the same time I would not trade it for anything in the world because I have met so many amazing people. I have probably lost 80-90% of the friends I had when I started this journey, but I have met other amazing people. Being a part of this is something I wish everyone at one point in their life could do. We got up every day with such a sense of purpose. We felt like we were doing the job that we were born to do. And we were doing it for all the right reasons. Politics never came up. It was never a problem because we were putting it all on the line for Flint, Flint’s children, truth seeking, and truth speaking . . . and no one can ever take that away from us.

NOTES

1. Mr. Smith later reconciled with Flintwaterstudy and wrote a guest blog post on our website (<http://flintwaterstudy.org/2018/07/scott-smith-flint-guest-post/>). He also corrected the scientific record in the press (e.g., https://www.huffpost.com/entry/flint-water-crisis_n_5b4e1965e4b0fd5c73bf8113). We wrote a peer-reviewed paper that discussed our conflicts and Mr. Smith wrote a “lessons learned” section for that paper (e.g., <https://theoryandpractice.citizenscienceassociation.org/article/10.5334/cstp.154/>).