

ENVIRONMENT

Poisonous politics in the Rust Belt

Mark Peplow extols two books on the water crisis in Flint, Michigan.

LeeAnne Walters and her family endured months of ill health before they discovered the source. In mid-2014, they developed skin rashes, lost clumps of hair and suffered mysterious aches. One of Walters's three-year-old twins stopped growing. By January 2015, the water supply in her home in Flint, Michigan, was brown. When she showed bottles of it to officials, they refused to believe it had come from her kitchen tap.

Flint's water was badly contaminated with lead, exposing tens of thousands of people to the potent neurotoxin. Amid denial and deception by authorities, a group of scientists, medics and engineers uncovered the scandal. But ultimately, the people of Flint turned the tide, thanks in part to remarkable citizen science that produced key water-quality data. Two books recount how the crisis unfolded.

The Poisoned City, by journalist Anna Clark, is gripping and packed with meticulously sourced reportage. *What the Eyes Don't See*, by Flint paediatrician Mona Hanna-Attisha, offers a powerful personal account of her role in the fight for justice.

Since the 1960s, Flint's water had come from Lake Huron by way of the Detroit Water and Sewerage Department (DWSD). But water rates were among the country's highest, so the cash-strapped city decided to set up its own provider. At first, it would take water from the Flint River and upgrade an old treatment plant. In April 2014, mayor Dayne Walling proudly switched on the supply.

Within weeks, residents' tap water began to taste metallic and smell rotten. As Clark and Hanna-Attisha reveal, the source was lead pipes that connected thousands of houses to the mains. Orthophosphate salts should have been added to the water to coat the pipes. But Flint's supply did not include this, breaching federal law. Chloride levels in the river water accelerated lead corrosion, which worsened when the treatment plant added ferric chloride to remove contaminants. The water also became tainted with bacteria, causing an outbreak of Legionnaire's disease.

For 18 months, officials insisted that the water met federal standards, and allegedly hid evidence. Some managers allegedly manipulated data to bring average lead levels below the regulatory limit of 15 parts per billion.

Clark's rich account intersperses policy and environmental science with vivid portraits of Flint and its citizens, ramping up the tension as the horror unfolds. She notes a turning point when Walters contacted environmental engineer Marc Edwards. Testing Walters's water in April 2015, he found lead levels



LeeAnne Walters holds a sample of her tap water.

hundreds of times those deemed acceptable: they averaged 2,000 p.p.b., with the highest more than 13,000 p.p.b.. So he mobilized an army of locals to collect samples.

His students distributed some 300 sampling kits, made an instructional video and set up a blog to report developments — a model of efficiency and transparency in marked contrast to how city, state and federal authorities acted. Yet when the team unveiled its findings in September 2015, officials dismissed the scientists, citizens and activists as rabble-rousers.

What finally forced the city to switch back to DWSD water a month later was proof that the supply was harming children. That came from Hanna-Attisha. She battled to access health records to show how levels of lead in children's blood had changed since the switch. She found that the proportion of under-fives with high blood lead levels had gone from 2.1% to 4%, topping 6% in the poorest areas.

Her book captures the urgency of dealing with a public-health emergency while maintaining rigour. She is honest about her fears of going public, anticipating that she would be vilified. Officials smeared her, distorted her findings and dismissed her evidence. A claim that she had "spliced and diced" the data hurt the most. "It felt like a public stoning," she writes, conveying the terror of a whistleblower confronting a powerful bureaucracy.

It would be all too easy to blame Flint's crisis on the incompetence of a few officials, but both authors pinpoint deeper factors. Flint is a classic Rust Belt city: its population has plummeted as industries shut plants. With fewer taxpayers, individual water bills soared, prompting the disastrous switch. Flint's leaky water-distribution network was

The Poisoned City: Flint's Water and the American Urban Tragedy

ANNA CLARK
Metropolitan (2018)

What the Eyes Don't See: A Story of Crisis, Resistance, and Hope in an American City

MONA HANNA-ATTISHA
OneWorld (2018)

also designed for a much larger population, making it even more expensive to maintain.

In 2011, a financial crisis prompted Michigan to appoint an 'emergency manager' to run the city, trumping the authority of mayor and city council. This led to a perfect storm of unaccountable decision-making, while budget cuts left environmental agencies poorly equipped to respond. Worse, the contamination particularly affected Flint's black residents, who tended to live in areas with the most poorly maintained water networks.

Clark and Hanna-Attisha identify these systemic failures — the impact of austerity, a breakdown in democracy and institutional racism — as the roots of Flint's water crisis. Their broader message is that these factors are not unique. Lead pipes are ubiquitous in US cities, and the Environmental Protection Agency has estimated that it would cost up to US\$80 billion to replace them. And chronic underfunding for public services continues to hit poor and minority communities hardest.

The story of Flint's crisis is still unfolding. Legal rulings have ordered the city to replace 18,000 pipes by 2020. Environmental and health officials are still on trial, facing charges including misconduct and tampering with evidence. It will be years before the health impact on Flint's children is fully understood.

These books, particularly Clark's, are must-reads — not only for those interested in environmental science and policymaking, but for anyone who believes that access to clean drinking water is a basic human right. ■

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CORRECTIONS

The article 'Maria Mitchell at 200' (*Nature* **558**, 370–371; 2018) incorrectly said that Mitchell had a reflecting telescope at Vassar College; it was a refracting telescope.

In the review 'Israel's wild treasury' (*Nature* **558**, 516–517; 2018), the picture credit should have been "Itai Benit".