

JUDGES' COMMENTS

The story hooks the reader and sustains interest throughout with its carefully researched, compelling — and sometimes downright unbelievable — narrative. This story required considerable sleuthing and the author chased it. The results are frightening.



BY **EMILY URQUHART**
ILLUSTRATION **MIN GYO CHUNG**

NUCLEAR FAMILY

UNEARTHING THE TOXIC LEGACY OF A STATELY, AND NOW DEMOLISHED, CENTURY HOME

Paul Evans met me at the door of his home at 150 Dorset Street West in Port Hope, Ontario. It was August 2016. Evans, silver-haired, 71, a fast-talker with a British accent, was wearing shorts and a collared shirt, as if I'd caught him en route to a country club tennis match. His wife, Helen, was charming on the phone, bubbly and warm. I'd called when I arrived in town and we agreed to meet at their house in 10 minutes. But when I rang the bell only her husband and a small dog, the latter like a children's toy, answered the door. Evans showed me to a front-porch seating area, making it clear I wouldn't be going inside. He sat on a porch swing and I sat opposite him on a small couch. We were surrounded by soaring trees on the back half of his double lot, affording privacy from the neighbours whose century homes—houses built 100 years ago or more—were set closer to the road, as my uncle's house had been, when it still stood on this land. It was a place I'd heard stories about since childhood.

I was visiting the Evans' house to ask about the site's nuclear heritage, part of a story I'd spent the previous year uncovering, one connected to my family. During our one-hour meeting, Evans alternated between frustration and charm. He said he thought I was trying to ferret out information on the nuclear industry. He wouldn't tell me anything about his background, only that he was retired and that he moved to Port Hope 10 years ago. Even simple questions were laced with tension.

"Where did you move from?" I asked him.

"We were refugees."

"From where?"

"Toronto."

I laughed. I thought he was making a joke.

"It's not funny," he said. He paused, then repeated himself. "It's not funny."

I stopped laughing. He was right. It wasn't funny. None of it was.

IN THE LATE FALL OF 1977, THE PORT HOPE EVENING

Guide ran a front page story about a radioactive century home that the Canadian government's Atomic Energy Control Board paid to tear down. (The AECB would be replaced by the Canada Nuclear Safety Commission in 2000.) The address was 150 Dorset Street. The accompanying black-and-white image showed a post with a rectangular sign, about the size of a shoebox, and on it the trefoil symbol with its radiant petals. Behind the sign were the remains of a Victorian-era home: a set of front-porch steps leading nowhere, two decorative cedar trees standing on either side of its sagging handrails. A few steps further in, the roof's eave had collapsed into a pile of red bricks and splintered wood; planks from the home's hardwood floors, pieces of crown moulding, and the newels, spindles and caps of the main staircase had all been reduced to rubble. The demolished home had been one of a cluster of stately residences along this west-end stretch of Dorset Street in Port Hope, a tidy Loyalist town a little more than 100 kilometres east of Toronto on the shores of Lake Ontario. It's home to Canada's longest running nuclear refinery. The town is surrounded by a largely agrarian region, collectively known as Northumberland County. It's where my great-great grandparents settled in the 19th century, escaping Ireland just before the famine. Their descendants lingered in the region and you can still see their surname on businesses and mailboxes throughout the county. My parents live there, and so do my aunt and uncle, and some of my mother's many cousins. Our family cottage is on Lake Ontario, 40 kilometres east of Port Hope.

In the two years leading up to the end of 150 Dorset Street, all homes in the town had been checked for radiological contamination, prompted by the discovery of radon—the odourless, invisible and tasteless gas emitted as a natural part of uranium's decay process—in a local elementary school that had used free infill from the plant (then called Eldorado Nuclear). Similar issues cropped up in 550 homes that were either built on or used toxic landfill or were renovated using the refinery's architectural cast-offs (items such as old doors and floorboards). From 1976 to 1981, 100,000 tonnes of contaminated earth and homes were removed.

A year and a half into the investigation, on August 6, 1976, a gamma radiation survey of the property at 150 Dorset Street showed elevated levels of radioactivity and the next month, on September 3, 1976, technicians returned to take radon air samples in the home. The results, along with an urgent memo, were sent to the AECB head office. Byron Boyer, an AECB official based in Port Hope, wrote to his superiors in Ottawa: "As you will note it is quite highly contaminated and probably should not be lived in until it is cleaned up." The letter is dated October 27, 1976. The letter notifying the owner, a single man named Robert Zeller, dated a month later, takes a calmer tone, explaining that further testing is needed because of "slightly higher" radiation levels.

The story I remembered was that a mad scientist had stolen radioactive material from Eldorado Nuclear and conducted experiments.

The problems at 150 Dorset Street were unlike the other cases, in that they were much more severe. There was surface radiation in every room, meaning that someone who'd lived there had carried radium particles on their body; they'd left traces of it on doorknobs and walls and tracked it across the floors with their shoes. Hugh Spence, a public relations official for AECB, blamed outdated health and safety practices. He told a local reporter that in the 1940s when Eldorado Nuclear was refining radium—much of it destined for the Manhattan

Project—employees must have lived there and worn contaminated clothing into their home. At the time, 150 Dorset Street had been annexed into apartments that housed employees from the plant. It was, in other words, a rooming house packed with careless technicians leaving a trail of nuclear breadcrumbs in their wake, the same material that fuelled history's largest deployed weapon of mass destruction.

In a June 22, 1977, meeting with the AECB, Zeller, the homeowner, assured officials he did not leak information about his contaminated home to the press, nor did he plan to speak with any reporters in the future. In this way, the AECB's Spence became the key voice of the story. He didn't relay that all seven of the home's fireplaces were contaminated—including the fire boxes, smoke shelves, cast iron sections that surrounded them, the brick fronts, and one marble hearth—and that a glass jar containing radium bicarbonate had been lodged into a joist beneath the floorboards on the main level of the house, information I found in a previously classified AECB file. Over the course of a typical year, humans receive a dose of about 600 milliroentgen (mR) of radiation from a combination of manmade and natural sources. The bottle reading was reported at 100 mR per hour; a person spending time in the living room above the toxic bottle at 150 Dorset Street could receive the annual dose in as little as six hours.

Once absorbed by the body, radiation causes cell changes that can increase a person's risk for cancer and other hereditary issues. The AECB knew it was important to test not just Zeller, who'd lived there for a year, but also the previous occupants of the house. The AECB claimed to be having trouble tracking them down, and finding former renters was likely tricky. Still, from the time of contamination to discovery the home changed hands only three times, and they did not attempt to contact my uncle, John Carter, who, along with his then-wife, Illona Kirby, bought the house in 1970 in an estate sale. "It was the kind of house that you looked at and dreamed about owning," he told me. "God almighty those houses were big up there."

Before the wrecking ball, 150 Dorset Street was a tall, ramshackle, red-brick, Victorian beauty, trimmed in white with a wrap-around porch that had begun to sag. It had a grand entrance with a sweeping curved staircase that reminded John of Twelve Oaks in *Gone with the Wind*. Dorset Street runs along a ridge that sits about 12 metres above the lake, and from 150's front porch you could see the smokestacks of the nuclear refinery in the town's main harbour. Despite that, it was and still is

a prestigious address, flanked by tony manors built in the last century.

After my uncle and his wife purchased 150 Dorset in 1970, they rented out space on the second floor to a high-school teacher in his mid-20s named James Rose. Even still, the space felt cavernous and when John was away for work Illona would sequester herself in the living room at night, closing the door to keep out drafts, lighting a fire and pulling her chair close to the hearth. "I would rest my feet on the edge of the mantle to warm them," she told me. "I got as close as I could." As sparks gave way to flames tiny flashes of bright yellow light spread across the rear wall of the warming stone hearth, each about the size of a pinprick. They looked the way a night-time landscape appears from the window of an airplane. Illona noticed this curious phenomena every time she lit a fire. Years later, she recalled that the lights were odd but not alarming.

Five years later, John and Illona sold their rambling Victorian mansion to Robert Zeller and moved to a smaller town on the shore of the same lake. Another year passed and for some reason Zeller stopped paying a second mortgage, which he'd taken over from Illona and which remained in her name. She considered taking legal action. Then, a phone call from a friend changed her mind. He was in Ottawa, working as Eldorado's health physicist. A troubling document had come across his desk. "You might want to hold off on pursuing that matter with the current home owner," he said to Illona. "There's something you need to know about the house on Dorset Street."

A year later, in 1977, the home was gone, demolished, though if you look closely at the photo in the *Port Hope Evening Guide*, you can see that a listing brick chimney remained stubbornly erect. But that didn't last much longer, either. Before winter set in, it was removed, along with the rest of the debris, the two cedars, the ground cover of crisp fall leaves and several feet of earth below the site. It was loaded onto trucks and transported to Chalk River, 180 kilometres northwest of Ottawa, home of the Waste Management Facility of Atomic Energy of Canada Limited, which is a stand-alone Crown Corporation. There the remains of this once stately home will be stored for an unspecified amount of time as we figure out how to deal with our vast amount of low-level nuclear waste, which will remain radioactive for centuries to come.

A couple of weeks after the demolition of 150 Dorset Street the first snows fell, quietly blanketing the now flat patch of ground. It was as if no one had ever lived there and nothing had ever happened.

THE FIRST TIME I HEARD THE STORY OF MY UNCLE'S radioactive house was at our family's summer cottage, a blue clapboard saltbox on the shore of Lake Ontario in Northumberland County purchased in the 1930s by my grandparents and great aunt and uncle. Over the past six decades an open-pit limestone quarry swallowed most of the land directly northwest of us, reconfiguring the coastline in shape and matter; the water receded and what had been a stretch of sand became piles of palm-sized rocks.

I was about nine when my mother became leery of the lake. "Don't swallow!" she'd call from the shore. Afterwards, she'd quickly usher me into our rickety tin shower. The 1987 Great Lakes Water Quality Agreement between Canada and the United States identified 43 areas of severe environmental degradation. Lake Ontario had seven such areas and two of the seven were nearby—70 kilometres east in the Bay of Quinte and, of course, 40 kilometres to the west in Port Hope, due to the radiation contamination of Eldorado Nuclear's toxic legacy. There is an estimated 85,000 to 95,000 cubic metres of low-level radioactive sediment in the west slip and turning basin of the town's harbour, accumulated since the company began operating in the 1930s.

Today, Saskatchewan-based Cameco runs uranium conversion and nuclear fuel manufacturing facilities in Port Hope, still based in the harbour where Eldorado first opened shop. Port Hope is not alone. It's one of several nuclear facilities within the Lake Ontario basin. There are two nuclear pellet processing plants (operated by BWXT Nuclear Energy in Toronto and Peterborough) and five operating nuclear power plants (two in Canada, three in the United States) and the discharge drains of some of them empty directly into the water. My children swim in Lake Ontario, but more troubling is that nine million people rely on it for drinking water. In 1982, the Canadian Nuclear Safety Commission stopped monitoring radionuclides (unstable isotopes that can emit radioactive gamma rays) in the lake and they were not included as a Chemical of Mutual Concern in the 2012 Great Lakes Quality Agreement. If you want your beach and water tested for radionuclides, you'll have to do it yourself.

My Uncle John is 77 now. His hair is mostly grey. He's now married to a journalist, my Aunt Donna, and they've been together for more than 30 years. She has two children from a previous relationship. After four decades of practising law, he is now retired. At first, my uncle had seemed resistant to talk about 150 Dorset Street. When

I visited my parents over an Easter weekend I'd peppered him with questions while my mother dressed the turkey. Finally he rubbed his temples and hung his head.

"It was a long time ago," he said. "I'm surprised I remember as much as I do."

It's not human nature to leave the earth alone. We scratch, we dig, we gouge, we build.

But the next day he dropped off a stack of documents. "Someone needs to find out the truth," he said. He'd kept two files on the incident, one full of basic realty information, the second more like a research file full of evidence you might gather to mount a case. Among yellowed newspaper clippings were my uncle's correspondences with the AECB requesting information on his former home, and asking that he and Illona be tested for exposure to radioactivity. Illona made similar queries in person, at an office of Eldorado Nuclear. In both cases, their requests were denied as they weren't current owners of the property. The second request was denied based on the health of Robert Zeller, who'd bought the house from John and Illona, and who had passed the test. This is, of course, shaky science, since people have differing susceptibility to radiation exposure. Not to mention different lives—Zeller had only lived there two years, whereas John and Illona and their tenant, James Rose, had lived there for five.

My uncle didn't know James Rose well and struggled to remember much about him. There was a separate entrance to his apartment so their lives didn't often connect. Through archival files and by speaking with his best friend, I discovered that Rose was a bachelor who worked as a history teacher and was the basketball coach at Port Hope High School. He lived in town for less than a decade before moving to Mississauga, where the AECB reached him to have bloodwork done. The results were normal.

My uncle and Illona did eventually get tested, thanks to John's badgering, and they both "passed." But the AECB continually denied John access to the radiological survey information on his former home. As with much of the information about the house on Dorset Street, John and Illona had to rely on rumours and stories. The strangest of which turned out to be true.

THE STORY I REMEMBERED FROM MY CHILDHOOD WAS that a mad scientist had stolen radioactive material from Eldorado Nuclear and conducted experiments in the fireplaces at 150 Dorset Street, after which he'd stored the results of his experiments in mason jars that he hid under the floorboards. It turns out that Willem Van den Belt was less a mad scientist and more of a jack of all trades: sailor, pilot, crocodile hunter, land surveyor, regent boy, refinery support worker, technician, black market profiteer and, when he died at age 60, he was running the woodworking shop at Trinity College, an exclusive private boarding school in Port Hope. Van den Belt lived at 150 Dorset Street from 1942, when his in-laws bought the place, for several years while he was employed at Eldorado Nuclear. He is named in both a *Globe and Mail* article and referenced in AECB files as the person who was responsible for contaminating the home. His goal, it seems, was not rogue science but something far more banal: profit. He was high-grading radium and refining it in the fireplaces with the aim of selling it on the black market. Back then, even trace amounts of radium were valuable. We don't know if he succeeded. William Van den Belt, son of Willem, was interviewed in a 1977 article in the *Globe and Mail* and he claimed his father only distilled radium at work, but he did mention at least one curious incident. "I remember also that he had a platinum cover for some kind of container and he had a couple of little plastic bottles containing material that glowed," he said. "He himself was burned. I think whatever burned him had been spilled in a pocket of his coveralls."

By the late 1940s, Van den Belt had moved on. Two decades later, Illona was looking at yellow sparks in the fireplace. There would have been no way to know that they were the 25-year-old remains of Van den Belt's DIY radium refinery.

Before you purchase a home in Port Hope today, most real estate agents will give you a copy of the site's radiological survey as part of the home inspection. The final document on 150 Dorset Street in the AECL file, the Crown corporation that carries out the obligations of the Low-Level Radioactive Waste Management Office (LLRWM), was dated 2013. It was a letter from the current owners, Paul and Helen Evans.

The AECL had offered the Evans a radiological survey, but they'd politely declined, believing the levels wouldn't have changed since the previous year. "It was and is of no concern to us," they had written.

If there are any lasting effects from living in a radioactive home for five years, they haven't manifested in my uncle or his first wife Illona. John is surprised that

no government officials have ever offered to monitor his health. "We were the most obvious people for them to check out and follow, to this day, even. And they didn't, we had to contact them," John said. "Aren't they interested in some scientific way, curiosity, something as to what might happen?"

Radiation exposure can have an effect on future generations, as witnessed after the Chernobyl disaster. John and Illona didn't have children together and neither one had children with their subsequent spouses. James Rose, their tenant, didn't have children either. He stayed a bachelor until he died, at 50, the last of his family line. I know this because 20 years after 150 Dorset was demolished, in December 1997, my mother received a letter from his mother, Doreen Rose, who explained that she had read a story about my mother, who is a novelist, in a national magazine and recognized her as the sister of her son's former landlord. She was writing with a question that had plagued her for the past decade: "I have always wondered about the health of your brother and sister-in-law," she wrote. "I hope they are both well and haven't developed any cancer." Her son James had developed osteosarcoma—bone cancer—in 1990 and after seven operations it moved to his lungs. He died in 1993.

Timothy Jorgensen is the director of the Health Physics and Radiation Protection Program in the Department of Radiation Medicine at Georgetown University Medical Center and the author of *Strange Glow: The Story of Radiation*. I asked him if living at 150 Dorset might have killed James Rose. Based on the survey numbers from 150 Dorset, Jorgensen isn't convinced that's how Rose contracted cancer. "People who get cancer, they're always trying to find out a reason why," said Jorgensen. "Just like this guy's mother thought it must be the fact that he lived in that house. I think it's very easy to jump to that conclusion, but the fact of the matter is that cancer is a very common disease."

Exposure to nuclear radiation causes cell damage at a molecular level, and these mutations can lead to cancer. But it depends on the dose. Long-term exposure to low-level radioactivity near the refinery continues to be monitored. In April 2009, the CNSC published a report that synthesized all the environmental and epidemiological studies done in Port Hope and concluded that "no adverse health effects have occurred or are likely to occur in Port Hope, as a result of the operations of the nuclear industry in the community."

Despite this bureaucratically unsurprising reassurance, the notion that seemingly inanimate matter is alive, distilled with stardust from millennia-old explosions, and

that this matter emits an odourless, invisible, tasteless gas that can interfere with the cells in our bodies, is at once terrifying and abstract. And, with their hyperbolic cooling towers and black and yellow trefoil warnings, nuclear power plants can provoke anxiety in even the most level-minded who, buoyed by images of previous catastrophes elsewhere, see the plants as looming disasters. The irrational (or unwarranted) fear of radiation exposure even has a name—radiophobia—and some experts believe this can be more dangerous and have a longer lasting effect on your health than the toxin might. In other words, if the radiation doesn't kill you, the fear might.

“I had dreams about that house for a long time,” Illona told me. “Horrible dreams.”

For Illona, the anxiety related to having lived at 150 Dorset was difficult. When I called her in 2016, we hadn't spoken in nearly 30 years, yet I found her voice unchanged and her memory sharp. She told me about meeting two nuclear industry officials, one sweet, the other cold, to discuss the contamination issue. She'd arrived feeling aggressive, but the kind man disarmed her. He asked if she had any children, and sighed with relief when she said no. The second man, with ham-fisted delivery, informed her that it could take up to 20 years for radon-related lung cancer to develop. Illona is healthy and in her mid-70s now, but speaking about Dorset Street still rattles her. “I had dreams about that house for a long time,” she told me. “Horrible dreams.”

We live with radiation daily. In some parts of Canada and the United States, if you are using indoor lighting, in a heated or air-conditioned office, in a public space, or in your home, you already have a relationship with nuclear power that you can't live without. This mythic-sized power can be destructive but it also allows us to live comfortably. There are 19 operating nuclear power reactors in Canada (mainly Ontario and New Brunswick) producing 15 per cent of the country's electricity. The United States has 99 reactors producing close to 20

per cent of the country's electricity. Some might argue that nuclear energy also plays a role in saving the planet. Nuclear power emits less carbon dioxide into the atmosphere than fossil fuels and is nearly on par with solar and wind power. But waste remains the pressing issue, not just in our time, but for hundreds of thousands of years into the future. The white drums of Chalk River that house Canada's high-level radioactive waste, and the gravel-lined pit, covered in clay, topsoil and seeded with grass where the low-level radioactive waste is stored—including the remains of 150 Dorset Street—are stop-gaps awaiting a permanent solution. There is talk of burying the high-level waste deep underground, and a proposal is in the works to house the low-level waste in a near-surface depository on the Chalk River site that will ultimately look like a massive grassy knoll. But, to date, no one has suggested a foolproof plan. Or found a volunteer host for the high-level waste. It's not just an issue of what to do with the waste produced by the nuclear industry. It's an issue of how we're going to power our futures without continuing to poison ourselves.

I CAN'T SAY WHY HELEN EVANS WAS NOT THERE

when I arrived at 150 Dorset Street to talk to her and her husband, Paul. It had only been 10 minutes since we'd spoken on the phone and she had asked me to come by. I wanted to ask them why, in May 2013, they had declined a radon test offered by the AECL. Helen never did materialize and Paul Evans was animated and tense throughout. As he and I sat on their front porch, the swing creaked. He'd heard stories of long-ago technicians who wiped down their work areas and then smuggled the cloths home, burning them in the fireplaces of the original 150 Dorset Street to refine the radium, a mix of rumour and PR spin that has lasted nearly half a century.

He ran me through a quick history of 150 Dorset post-remediation: a local contractor bought the empty property in 1978 and moved a carriage house onto the site, taking it from a grand heritage home he'd been working on elsewhere. The contractor went “tits up” according to Evans and the project stalled for three winters until 1981 when a diminutive 71-year-old named Hazel Horn stepped in and had the renovations finished, including a back kitchen extension. There had been plans for a large basement underneath the kitchen, but Horn didn't need this extra room. Her contractor hired a local construction business to bring in earth to fill and seal the extra space.

In 2003, in her 90s, Horn moved into a retirement home and put the restored carriage house at 150 Dorset

TO THE ANGEL WITHOUT HANDS

You pray to a space beyond wrists
where your sculptor once laboured

uncounted hours to carve
two hands. Those fingers

fallen or flown from the limbs
that would tether them, knuckled

to a bodily form, would mimic
some version of musculature or suggest

a pattern of tendons, bones.
Once, window-lit, I took a picture

of a headless form, its graven hands
placed safe upon its knees

—it didn't pray—and only the window's
glow to suggest the light of eyes, the lack

of ears or chin or nose. We take more care
with other bodies than we do our own.

—*Erika Luckert*

up for sale. Evans and his wife saw possibility. They bought it and began extensive renovations. As with all properties in Port Hope, they received the radiological history of their home in advance of the sale. It was colourful, certainly, but they were confident that the property had been remediated. Tests in 2003 had noted high radon levels, but a letter from an AECL representative explained that this was a result of the home being left vacant. At one level, it made sense. Radon is naturally present in most homes and can reach higher levels in places without airflow, like basements, or in buildings that have been sealed for a long time. However, that was not the case in the carriage house.

“It was a waffle weasel letter,” Evans said.

In 2015, new clean-up efforts in the town had begun through an organization called the Port Hope Area

Initiative. This is the largest project of its kind in Canada, aiming to remove 1.2 million cubic metres of contamination, and eclipsing the efforts of the earlier decontamination. Much like in the 1970s, however, this initiative began by checking homes for any lingering radioactivity. A survey of the land and gardens showed that the 1970s remediation efforts had been successful at 150 Dorset. And while the Port Hope Area Initiative holds information on current cases as confidential, Evans said that, at 1,200 Becquerel per cubic metre (1,200 Bq/m³) of radon air, the interior of the carriage house told a different, and troubling, story. The World Health Organization pegs the acceptable radon air level at 100 Bq/m³. The math is simple. Twelve times the limit. There was, once again, a problem at 150 Dorset Street and Evans knew immediately where it was.

“I told them, ‘Look in the basement,’” Evans said. “They got down there and said, ‘Oh, yes, this is slag from Eldorado Nuclear.’”

150 Dorset Street is, once again, radioactive.

“So having in 1977 cleaned up the site to pristine condition, AECL, through lax regulation, and I would maintain absolute negligence, allowed the local yokels to dump 200 tonnes of radioactive filth into the back kitchen,” Evans said.

It's not human nature to leave the earth alone. We scratch, we dig, we gouge, we build. We form a task-force to clean up our mess and then we start all over. Our grandchildren will one day die but the radioactive matter we've dredged out of the earth will not. In government literature, the contamination of Port Hope is referred to as a historical event. This is a misnomer. With nuclear waste, there is no such conclusiveness to be had.

I had parked at 150 Dorset Street so that the nose of my car faced the footprint of the original house. I'd hoped to take a photo, but Evans escorted me to my vehicle when I left, so I didn't. The meeting had been fraught. I didn't want to agitate him further. Mostly, I just wanted to get as far away as possible. There wouldn't be anything to see in a photograph anyway, just the empty space where a house once stood. There were hawks circling overhead. The cicadas were singing. Turning the other direction, I could see the lake stretching out to meet the horizon.

I thanked Evans. As we said goodbye, our pleasantries were punctuated by garbled vocal sounds from the tinny but audible intercom of the nearby Cameco plant. The sounds felt like distant, coded messages, or maybe they were just banal communications. The intercom went quiet. Then came one long, low whistle. ☐