# Strata

By Vivian Wagner

*Fracture: Essays, Poems, and Stories on Fracking in America*.
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I started noticing the lines of tanker trucks at a deep injection well along I-70, not far from my southeastern Ohio village. They'd wait, their diesel engines idling and their lights on, to pump their fracking waste underground. Sometimes I'd drive by quickly on the interstate, looking over my shoulder at the trucks for as long as I dared before turning my attention back to the road. Other times, I'd drive by slowly on State Route 40, trying to see the drivers inside the trucks, trying to understand who they were and what they were doing. Trying, perhaps, to get their attention.

I felt deeply at odds with this well. To begin with, why was it called a "well"? That seemed to be the opposite of its true identity. A friend joked that we should call it, instead, an "unwell." It didn't bring forth fresh water. Rather, it "accepted" – in the industry's strange language of gifting – loads of toxic water from gas wells throughout the Marcellus and Utica shale regions. The trucks seemed an affront to me, a direct threat, a way that the hydraulic fracturing boom had suddenly entered my small, safe space. This well drilled down into the earth just a few miles from me, and the rock layers it hit stretched underneath my own home, my neighborhood, my village. I'd known that Ohio was quickly becoming ground zero for fracking, part of what the industry strangely terms the Utica and Marcellus shale "plays," but this well brought it close to home. This was my backyard. This was my earth.

The year before, I'd watched the well go in. I'd figured it had something to do with fracking, but I didn't at the time know about injection wells. The property had an old farmhouse and barn, and apparently the owner had either leased or sold the land to a gas company for this purpose. Soon, bulldozers plowed past the decaying barn and through the grass and wildflowers to the top of the small hill, clearing and flattening the land. Over several weeks, workers installed a tall, skeletal drilling rig, outfitted with dizzyingly bright lights. A day- and night-long commotion commenced. They drilled down, down, down, into deep layers of rock, far below the water table, far below anything we could ever even imagine at the surface of the earth.

The earth is a planet of layers, of history written into the rocks. These layers tell the story of seas coming in and retreating, of plants growing and dying, of seashells and limestone, of tremendous pressure, of coal forming, of gasses trapped, of water finding its course in secret underground tunnels and seeps. These layers of igneous, sedimentary, and metamorphic rocks tell the history of the state in a more detailed way than anything on the surface ever could. And except for brief glimpses you can catch along highways where dynamite blasts cut into the pages of this rich and complicated book, or in creek and river gorges where the water has worn down through the layers, these rocks are usually hidden from sight.

Certain spots in Ohio are suited for injection wells, because of the presumed sturdiness of the rock layers and the protection they afford from seeps or breakthroughs. According to the geologists who work for the drilling companies and the Oho Department of Natural Resources, which regulates Class II disposal wells, injecting millions of gallons of wastewater into these areas is relatively safe because the poisoned water goes so deep, far beneath the ground water, down through impervious rock layers, to a porous layer that can absorb it all. Essentially, the wastewater disappears. Thousands of years might pass before any untoward effect from such

dumping takes place. That's if everything goes well, if nothing spills, if nothing breaks. If things don't go well – which sometimes happens, due to drilling error or equipment failure or just the randomness that happens with any physical process – there can be breakthroughs, leaks, emergencies. There are numerous cases across the country of such spills, though the soil absorbs mistakes, hides evidence, heals itself as best as it can.

I pondered these issues, as yet at the edges of my consciousness, while I watched the installation of the injection well. When the initial drilling finally finished, the scaffolding and lights came down. A small drab green building and an innocuous-looking cement pad replaced the drilling apparatus. The dirt around the pad was smoothed out and reseeded with grass. If I didn't know any better, I might have mistaken it for some kind of industrial gas station. The building kept a little light on by its door, a light that looked for all the world like a porch light, as if it were keeping alive the spirit of the farmhouse that had first been on this land, a farmhouse that most likely kept its light on through the night since it had been built on the major thoroughfare of the National Road. In the early years, it might have been a lamp kept burning by a small, old-fashioned gas well on the farm. Later it would have been an electric bulb when the rural cooperative brought electricity in. The little building had drab brownish green tanks set up alongside it, with pipes and intake valves sticking out the top. A small road led up to the area. It was all neat and tidy, with the light, the door, the pad. It looked like it was open at least through the late night hours, and perhaps it actually accepted material 24 hours a day. Every time I drove past, the trucks were there, waiting.

I watched all of this as an outsider, but increasingly I felt like an insider. I started becoming aware of the heft and roll of hills and rock layers. I started wondering about the connection between this well and my own land, my own rocks, my own water. I started trying to

visualize the wastewater and brine flowing through the deep, cool darkness to unseen places. Perhaps some of it had reached as far as my house, thousands of feet down below my yard and garden and street. I started imagining I could feel it down there, shifting the soil, moving the rocks. I started worrying about the slope of the land, about all the unseen layers beneath me.

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Two years ago, in the hot California desert, when the well was first drilled along the interstate, my father shot himself. He was alone in his house. A neighbor heard the shot and called the police. I got a call from my sister that night, telling me what had happened. When I arrived a few days later, his room had been stripped, all the furniture and the carpet removed as hazardous waste. All that remained was a deep blue spot where the clean-up company had tried and failed to scrub his blood from the cement. It had soaked down, too deep to be removed.

I don't know what to do with this fact of my father's death, with this spot. It's toxic. It's hidden. It's unspeakable. It's not safe.

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Fracking involves drilling a gas well, injecting it with a mixture of water, sand, and chemicals, and using that mixture to create small fissures in the rock layer that release gasses. The sand opens these fissures so that the gas flows out. It's a process that a geologist friend compares to getting blood out of a stone, and in some ways, that's exactly what it does. It releases gasses that would otherwise be trapped indelibly in the rock layer and forces them to come to the surface.

Fracking wells start with a rig that drills down into deep layers of rock. Geologists and engineers on the gas company's staff do a site survey beforehand to determine exactly where the well will be placed, how deep it will have to go. After they drill the well, workers install a wild mess of tangled pipes on the surface, some of them for injecting fluids, some for removing gas, some for separating the gas and oil from the leftover brine. Millions of gallons of brine can get pumped into a single well, but only some of the brine comes back up to the surface. Much of it stays behind in a watery grave. The brine that comes out is sometimes held in outside storage pits, where it evaporates into the air. Other times, it gets trucked away to injection wells like the one near my village. Sometimes, it accidently spills onto the ground, soaking quickly and surreptitiously into the unseen layers below.

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Fracking is a violent process of change, transformation, and forced release. Fracturing breaks apart, creates fissures, opens up. Bones fracture. Glass fractures. Skulls fracture and let go. Fracturing happens when pressure is brought to bear on a solid material, something that doesn't bend. It's from the Latin, *fractura*, which means to break. It suggests something more severe than breaking, though. Fracturing can't be undone, can't be fixed.

Fractures can be small, but many small fractures add up to create a large breakage, a falling apart. Water is damaging, even as it's life-giving. Under pressure, mixed with sand and chemicals, it breaks apart. It creates fissures. It destroys.

The gas, on its own, is soft, barely there. Even the language used to describe gas makes it seem unobtrusive. We speak of pockets of gas, as if the earth were a garment, as if the pockets

were simple things, decorating it, holding valuables like keys or stones. And the process of fracturing releases this gas, as if it's happy to be out, happy to be free of its confines.

It would be nice if we could leave the gas there, untouched, unreleased. It would be nice if we could leave the rocks there, unfractured. Leave the water there, in the streams. Leave the ground there, undrilled.

I wish I didn't feel so fractured. I wish there were some way to tell this story without resorting to strange language, but even my sentences break. The fissures will have to tell the tale.

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The inscrutable blue spot on the cement in my dad's room speaks a language I don't understand. Even though new carpet has been installed over the cement's sand and rock, reseeding it with respectability, the spot remains, speaking silently of its layers. Of its meanings. Of its depth. Of its inability, finally, to be cleaned up.