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Corrosive Aesthetics
On the Receiving End of Oil and Gas in *Who by Fire*

I. Lighting the Match

In Fred Stenson's 2014 work of petrofiction, *Who by Fire*, pyric imagery assumes striking visual form in the gas flare stacks that populate rural Alberta, conjuring promises of light and wealth drawn from the earth and separated into useful and waste substances. Spectral and yet material, natural gas has made for some spectacular profits in the province in the decades since its discovery. At the same time, though, the imagery of fire developed in the novel conveys the experiences of those who are burned by contact with an industry prone to creating ecological sacrifice zones with only limited attempts at precaution in advance or reclamation after. The spectrality of gas has material effects beyond money, yet such effects are rarely fully accounted for in the calculus of extraction. At its heart, the novel asks whose fates hang in the balance when the energy status quo in Western Canada continues without interruption, and what happens when demands for accountability are ignored in the drive to make Canada a global energy player. To explore these issues, I consider how Stenson develops the key metaphor of corrosion to probe the limits of narrative and industry containment, and investigate how the leaks corrosion generates might offer means by which to question the kinds of petrodeterminism that obstruct critique by pointing to our widespread indebtedness to oil. Ultimately, Stenson's work pushes its readers to understand (and ideally to *change*) the mechanisms of an existing system wherein industry and government feed one another's interests in enabling capital accumulation instead of safeguarding the health of citizens, animals, and landscapes that remain well after the resource is exhausted.

II. Leakiness in the Oil Patch and Narrating Chemical Encounters

The figuration of Alberta as a landscape with a fiery underbelly is one that stretches back into literary history. In 1907, for instance, Rudyard Kipling travelled across Canada on the CPR, and upon learning about southern Alberta's natural gas reserves, he commented, "This part of the country seems to have all hell for a basement, and the only trap door appears to be in Medicine Hat" (qtd. in Hanson 16; see also Gershaw 41). It would take several decades following Kipling's visit for the natural gas industry to become firmly established in southern Alberta, but by the 1950s and 1960s it was flourishing, with wells springing up across the region. There have been ebbs and flows in the petroleum industry in the ensuing decades, but as various scholars have pointed out, the long-standing "rule of capture" in the Western Canadian resource industry has largely encouraged a rush to rapid production, along with an accompanying compromise of regulatory regimes or adherence to principles of precaution (Daintith; Zalik 355-56).[1] Many businesses, workers, and municipal utilities went on to benefit from the extraction of this subterranean wealth, yet for some rural residents, the reality of living alongside the gas industry proved costly.

The experience of living "too close to the fire" is explored in Stenson's 2014 novel, a text that weaves together two different settings, the first of which is located in southern Alberta in the 1960s and focuses on a farm family living near a sour gas plant, while the second is situated in the present Alberta tar sands region, where natural gas is primarily used to liquefy bitumen (Stenson 355). In the 1960s setting, the Ryder family finds itself under siege from hydrogen sulphide (H_2S) leaking from the Aladdin Corporation's recently opened Hatfield processing plant on a neighbouring property. Their animals sicken (and in some cases die), and the family frequently has to evacuate to town when the gas makes them ill. In the latter, present-day setting, the young farm boy Bill Ryder has grown up to become a senior supervising engineer at an upgrader in northern Alberta, also run by the renamed New Aladdin Corporation. By weaving together these two settings, the novel invites readers to reflect upon divided loyalties, complicity, and the unruly temporalities of extractive economies. Here the past haunts the present with the prospect of unpredictable illnesses and deaths that trouble narratives of progress.

Yet at the same time, such hauntings also allow readers to see relations where they might previously have gone unnoticed, and open room to consider how to change the ways we live with the energy sector and its by-products. Put another way, Stenson's work of petrofiction opens up space to consider

geologic life and our implication in it as extractors, refiners, and consumers of fossil fuels, and as individuals whose biopolitical subjectivities are differentially animated and influenced by them, right down to the skeletal and cellular levels.[2] The question of which bodies get to enjoy the freedoms fossil fuels offer and which absorb the by-products generated by that pursuit of freedom is not always easy to untangle given that many bodies experience both, albeit not necessarily to the same degrees. The effects of petroleum are thus mixed in their promise when it comes to enabling the good life for characters in the novel; while some enjoy material prosperity and the chance to technologically improve the processes by which petroleum is drawn from the earth and turned into consumer products, Stenson also highlights the problems petroleum creates for those who live alongside its primary industrial sites but have little power over how those sites are run. The fifty-year timeline of the novel, as well as its open-ended conclusion, formally suggests that these problems have no quick or immediate solution given the current, mutually dependent relationships between public institutions and private industry in Alberta.

In what follows, I investigate the novel's handling of three key problems when it comes to the relationship between humans and petroleum. First, *Who by Fire* negotiates the challenge of how to narrate sensory encounters with oil and gas in ways that will generate corporate or governmental responses that move beyond outright denial of responsibility or bland statements of empathy. The novel thus contributes to a growing "critical petro-aesthetic" which tries to find aesthetic approaches suitable to communicating the effects of bodily encounters with fossil fuels, especially when those effects are rendered diffuse or invisible (Wilson et al. 6). Second, the novel confronts the systemic and ethical challenges facing those working within the petro-industry who might seek to aid affected citizens when it comes to addressing petro-industrial pollution. In so doing, the novel leaves readers to contemplate difficult questions about what defines success for those who seek safer, cleaner systems of extraction, production, and transport. Finally, I consider what readers can learn from one of Stenson's main aesthetic strategies—namely, that of developing *corrosion* as a key metaphor—to better comprehend the connection between the novel's two temporal and spatial settings. What can this metaphor reveal about the *limits* of containment, whether of plot, place, characters, or petroleum itself? And further, how might the very ideas of rupture and friction that corrosion implies be politically redeployed to disrupt the status quo when it comes to the movement of oil and gas in Canada?

Stenson's development of corrosion as a central metaphor is an especially appropriate representational strategy for narrating Western Canadian life in the twentieth and twenty-first centuries. Corrosion imagery demonstrates the limits of current regulatory mechanisms that attempt (and fail) to fence off humans, animals, and plant life from sites of petro-production, processing, and transport. Corrosion's gradual nature, made up of micro-processes that often only become noticeable once the damage is done, also echoes the kinds of slow violence enacted by exposure to pollutants over time.[3] Further, the metaphor of corrosion defines the fraught position of the engineer as a recurring figure in the novel, someone charged with keeping production running while also minimizing risk to the environment and the public. As the book illustrates, such obligations are difficult to fulfill when the barriers between industry and government are highly perforated, and when seemingly inanimate substances like gas and steel also evince active properties whose agential capacities are not fully understood. Although the problems faced by the engineers in Stenson's book seem technical on their face, they end up serving as fitting metonyms for the broader challenges of confronting the cozy relations that exist between industry and government in contemporary petro-states like Canada. These are problems that cannot be solved by engineers alone; they demand the broader exercise of citizenship by those who live under petroleum's halo and cloud.

One of the things that makes petroleum a challenging subject to write about is its simultaneous ubiquity and elusiveness (see, for example, Barrett and Worden; Szeman; Wenzel, "Taking Stock"; LeMenager, *Living*). On one hand, oil is everywhere, powering our lives in forms that range from everyday consumer items, to transport, to long-range economic forecasts. However, getting a handle on the industry that brings oil into our lives is not easy. As Amitav Ghosh observed in the early 1990s, the oil industry is often perceived as geographically distant, multi-spatial, secretive, and multi-lingual. Further, oil exhibits forms of chemical agency whose side effects are not always easy to trace or to narrate. Collectively, these features pose challenges to novelists who might wish to write about oil (Ghosh 29-30; Macdonald, "Oil" 7; Macdonald, "Containing" 55). At a personal level, few among us have likely handled crude oil in its pure form or held a bottle of natural gas captured from a crack in the earth (Kerber 384). Despite the fact that we are in daily contact with petroleum products of one form or another, such contact is often highly mediated through processes of containment, transport, and chemical transformation into substances like plastics. Jennifer

Wenzel concludes that one of petroleum's "conjuring tricks" is to normalize a world where those with energy security are relieved from having to think much about how time, labour, distance, and environmental expendability enable their existences (Wenzel, "Introduction").

Stenson's characters complicate these dynamics since they are at once relatively privileged (they are landowners, for instance) yet unafforded the luxury of *not* thinking about petroleum. Instead, they are forced to reckon with geologic forces that are often unseen, but not unfelt. Stenson's narrative strategy of repetition, which blurs together a series of nighttime evacuations and cases of headache and nausea, helps readers to appreciate the cycles of frustration that his rural Albertan characters experience as their exposure to gas leaks becomes a chronic way of life. When exposure to toxic gas at varying levels becomes such a frequent occurrence, it becomes more difficult for the family members to separate out the crisis points from mere nuisances. Their health is clearly suffering as a result of exposure to flares and leaks at the plant, yet also they lack the formal training in risk analysis or environmental health to directly address the cause, or even the political allies who might aid them by regulating industry.

This set of challenges is compounded by the fact that Aladdin company officials normalize petro-stench as an undesirable but common side effect of gas plant start-ups, wherein elements in the extracted gas that cannot be processed and sold are burned off to purify the remaining natural gas as a saleable commodity. As one Aladdin executive puts it, sour gas is rendered "mostly harmless by removing the elemental sulphur" (45). It is that adverb—"mostly"—that keeps nearby residents up at night, yet instead of following a principle of precaution, Aladdin views the trial-and-error approach to toxins as a necessary part of "how the history of this business is written" (45). Notably, the idea of shutting down the plant is never part of industry's script. Instead, it is brought into production as quickly as possible with the idea that kinks will be worked out as they arise. Unfortunately, when it comes to sour gas plants, leaks and malfunctions are often detectable only *after* they have begun to damage human and animal health. Biology reveals, but too late: the damage to bodies that did not choose such risks is already done.

When Tom Ryder looks from his property to the nearby facility, Stenson writes, "he boiled with frustration. The plant never looked any different, just buildings and towers, and the flare and steam rising in the blue cold air. You wanted to see some putrid yellow or purple smoke, or an explosion, something you could point at and say, 'There it is. There's the bastard that's

making me sick'" (24). Instead, the flare that shoots skyward from the stack is presumed to indicate the safe disposal of gases via dispersion by the wind, at least according to Aladdin executives (17). Throughout the novel, Stenson uses parallel imagery to describe Tom and his chief nemesis, the plant: for instance, both are sites of building pressure that smoke and periodically blow their stacks. Yet where the plant feels no ill effects from flaring or leaks, the long-term consequences for Tom's health and psyche are considerable. It isn't just the unpredictable bursts of invisible hydrogen sulphide that harm him; it's also the cumulative stress of feeling powerless against a faceless foe. Leaks are often difficult to pinpoint, gas does not stay in one place, and detection technologies are imperfect—a fact illustrated when the Titrilog stationed on the Ryders' property goes haywire, its pens recording fluctuations of gas in the air that take its needles right off the paper scroll (179). The image of the Titrilog's failure to record expresses the challenges that fossil fuels pose to representation, wherein the power of threat is demonstrated precisely via its unwritable character. When the Ryders call the plant to let them know of the problem, they're told that the technician who looks after the machine works out of Calgary, and that no one will come to take a look at it until after the weekend (180).

The fact that the effects of gas work according to uneven temporalities—whether at the individual scale of human health or at larger scales like climate change—means that it is also challenging to come up with the right methods to trace its impacts. To fill the gap, human and animal bodies often serve as scouts, "the stop-gap technology for absorbing dangers that can't be or won't be otherwise controlled" (Trimmier). Given the elusiveness of the gas itself, along with the difficulty of holding any one party accountable for leaks, it is not surprising that regular citizens like the Ryders anthropomorphize the plant as a conscious agent of destruction: it is the thing they can *see*, and is a constant in their lives in contrast to company employees and scientists who briefly arrive on the scene to respond to complaints only to depart without doing much to alleviate them.

In the novel, as Tom's marriage sours and his livestock sickens, he increasingly figures the plant as a wilful antagonist, one whose godlike proclivities to decide the fates of the living are provoked by any hint of contentment on the Ryder farm. For instance, after a run of good luck during spring calving in which the final cow gives birth to twins, the plant's noise and gas emissions suddenly become stronger than ever. Tom ruefully reflects, "[i]t was almost fate that a happy time would rouse the plant's ire" (127). He needs to imagine

a force more spectacular and intentional than the mundane trial-and-error approach next door to reckon with the surprising loss of two newborn calves. Yet by figuring the plant as an independent and malevolent actor, there is also a risk of obscuring the human decisions that have created this situation in the first place; it comes to seem as though one must adjust one's activities to accommodate petroleum as an eternal, naturalized force, rather than framing it as a substance whose effects arise from particular human systems and choices.[4] In a petro-economy where easy mobility is prized, it is long-term intimacy with place that becomes reframed as a liability; to invest too much in a relationship with a particular landscape is to risk pain when that relationship is disrupted.[5] This is true not only at a physiological and emotional level, but also at an economic one, since the Aladdin company's buyout offer to the Ryders is below market value and limited only to one half section (162-63).

Throughout Stenson's novel, it becomes clear that there are other legitimate, non-technical means of expressing energy intimacies than those typically favoured by government or industry. Indeed, official discourse is often stymied when it comes to articulating the precise contours of people's experiences of natural gas and its by-products, whereas more "artful" speech can communicate the richness and ambiguity of physical sensation. For instance, when the gas plant superintendent, Alf Dietz, tries to explain at a community meeting the difference between the "regular" odour of a sulphur plant running as it should compared to the harmful odour that is making people and animals ill, his vocabulary is vague and repetitive: "'There's smell and then there's smell'" (46).[6] Yet where Dietz's explanations achieve little clarity, the figurative speech of local farmer Tom Ryder seems more viscerally precise by comparison; Tom describes the plant's smell as something that has a texture, "like wads of tissue winding in your nostrils" (87), and also as a "spunky fume from the deeps, the stuff that knocks birds off the perch at a coal face" (50). Here, metaphor does the work that technical language cannot, while also conveying the grim reality that methods of detection seem to have progressed little past those used in the era of coal.

What proves even more troubling in these olfactory descriptions, however, is the fact that hydrogen sulphide is a gas that humans can quickly lose the ability to smell at high concentrations or after continuous low-level exposure (called "olfactory fatigue"). This means that under certain conditions, amateur detection becomes difficult (see OSHA). In the end, the Ryders find themselves stymied at two levels: they cannot trust the plant's regulatory

mechanisms, but they also cannot wholly trust their own senses to detect danger. They thus live in a constant state of alertness, never knowing how much time they will have to leave for town before the gas knocks them to the ground. The fact that H_2S is a neurotoxin which at high concentrations can result in neurological symptoms including loss of consciousness, gives scientific support to Tom's sardonic comment to his wife Ella that "'this plant makes us stupider every day'" (88). Tom's comment in this context is meant to justify his decision to stay on the farm to look after a farrowing sow while the rest of the family evacuates once more amidst the creep of hydrogen sulphide, yet there is also a deeper biological basis for his assertions, a bodily reality sensed if not fully understood. The way in which petroleum wears away at its opponents thus works on two levels: the difficulty of predicting effects is something that industry struggles to master, but the problem of detection is also embedded within the chemical properties of the substance itself and how bodies respond to it.

III. Engineering, Extraction, and the Power of the Petro-Genie

Bill Ryder, the main character in the present-day setting, spends his childhood witnessing his family's frustrations with sour gas, and it is partly his desire to bring about technical improvements that leads him to become a petroleum engineer. Bill is the central character across the novel's two interwoven timelines, and through his work at a gas processing plant in northern Alberta, he seeks a measure of calm that might lay the turmoil of his past to rest. Bill's decision to go into gas processing work might seem counterintuitive, but it accurately reflects a larger social shift in Alberta in the second half of the twentieth century, wherein a largely rural agrarian society was transformed into an industrial and urban one by the rapid development of the energy sector (Stenson in Boyer and Howe, 18:58-22:30; 36:05-40:17). Rather than setting up a purely oppositional narrative wherein those who suffer for petroleum fight tooth and nail against it, *Who by Fire* explores the more fraught positions of those who are allied with industry and attempt to transform it even as they recognize its shortcomings. For example, following one of the requisite "community consultation" meetings hosted by New Aladdin at a First Nations community centre near the plant he oversees, Bill is questioned by Marie Calfoux, one of the community's residents, about why he continues to work in an industry he knows is operating at a scale that is environmentally risky. "'You could retire,'" she suggests. Bill responds, "'[s]omeone else makes the sulphur. What would that change?'" (102). It's a

bleak answer, but it also shows Bill's recognition of the fact that individual actions are not wholly adequate to address what requires systemic change.

Through much of the novel, Bill's preferred methods of coping with the contradictions in his life are to go on alcohol and gambling binges, activities that help to temporarily suppress his anxiety and generate physiological effects similar to the symbiotic motifs of "exuberance and catastrophe" that have come to define the North American cultural relationship to fossil fuels since the early twentieth century (Buell 276). Even when Bill wins at the casino, he experiences the haunting sensations of his encounters with H_2S as a child:

> Instead of feeling happy about the money, Bill's body surged with unpleasant after-effects. His lungs seemed too large, felt as if they were crawling up his throat. He'd been yearning in the direction of every VLT lounge in every town he passed. In his trailer days, he'd played them all. The only way to stop feeling disgusted over the waste was to gamble more. (Stenson 170-71)

Narratively, the line between cause and effect does not move in one direction, but rather in a circuit, wherein oil work becomes both an enabler of addiction and a means of coping with it. As Bill reflects, "His job was the only thing that could reliably stop a binge. In this way, work and gambling were essential to one another. The balance between them had to be maintained if he himself was not to crumble" (171). As with most addictions, though, the fantasy that one can keep things in balance breaks down; Bill's failure to seal away difficulties in his personal life ends up echoing the problem he wrestles with at a technical level, namely keeping noxious substances from leaking out of pipelines into the surrounding atmosphere.

Clearly, the binge activities of gambling and drinking tax Bill's soul, but when considered from a wider angle they are also difficult for readers to condemn without also shaking the foundational logic used to justify an enterprise like the oil sands in the first place. Indeed, they serve as metonyms for a larger social addiction to cheap energy, a belief in what Imre Szeman describes as a "fiction of surplus" that gets renewed every time we experience a six month interval of lower prices at the gas pump (Yaeger et al. 324). To reject this fiction is seen as a mark of bad faith for loyal Albertans, especially for those who work in the industry. Bill thinks to himself, "[i]f the oil sands made sense at all, it was the sense of money and economic privilege. If someone did not obey those laws, the whole thing swayed in the muskeg" (221). There is much that is left out of this calculus, of course—including the health of air, water, and human and non-human animals—but its logic is propped up by the assertion that such things can be reclaimed after extraction.

Jon Gordon points out in *Unsustainable Oil* that to question the economic logic of petroleum extraction as it is currently practised in much of Alberta is ironically portrayed as "irrational" or living in a fantasyland. The novel illustrates the strange workings of this bubble of logic when Bill gets cast by his superiors and co-workers as the one who lacks sense when he decides to evacuate a nearby Indigenous community after his plant malfunctions. To adopt an ethic of precaution is to go against the reactive stance adopted by industry through much of Bill's life. Further, his mixed feelings of "relief and disappointment" (266) when a post-evacuation air-quality test turns up clean shows his understanding of how the status quo works: since there is "[n]o evidence that what he was doing was necessary" and the evacuation generates bad press for the company, he can expect to be fired (266). The idea of working for environmental change within the industry seems possible only so long as such efforts do not stall oil's path to market.

The company Bill works for is called New Aladdin, a fitting name since despite the technological improvements in the oil and gas industry that have occurred since the 1960s, much of the older kind of magical thinking persists in the contemporary Alberta oil patch, especially the idea that one can release the power of the province's energy genie with few negative consequences. In the carry-over of the Aladdin name, one sees how the past bleeds into the present, and in Bill's increasingly uncomfortable position as a defender of a plant and an industry he knows to have problems, we begin to see the untenability of keeping things separate—whether those things are gases within pipes, or memories of the past and the present, or professional and personal lives.

The most prominent trope Stenson uses to explore the breakdown of such fantasies of containment is that of corrosion, a problem that engineers in the gas industry have been grappling with for decades. To corrode is to gnaw through with force (usually by slow chemical action), and in the natural gas business, the long-standing challenge has been to figure out a way to separate the sulphur from natural gas while keeping stray hydrogen ions from corroding the steel used to contain substances. When the ions embrittle steel, it results in leaks of potentially deadly hydrogen sulphide, as well as explosions and fire (Stenson 54). At the Aladdin Hatfield plant of the 1960s, leaks occur with disturbing frequency in part because the plant is brought into service before it has been properly tested. Further, it turns out that the very newness of the steel used in the plant is a liability, since the molecules of high-calibre steel line up so neatly that it's easier for hydrogen ions to invade

them, causing key bolts to fail. The plant actually functions marginally better once its engineers adopt a bricoleur approach, substituting older bolts that are more resistant to corrosion. Ultimately, however, truly fixing the plant requires a lot of money, and the engineer Lance Evert explains to Bill in a posthumous letter that Aladdin was not willing to make the investment (346). Instead, the company offers Bill's father a bit of barbed wire to replace that which exposure to gas has rendered brittle along his property lines (161). It's meagre compensation, and the steady erosion of the division between farm and plant reaches its climax when Tom and Ella give up on their herd and young Bill leaves home to work in a new gas plant up north.

At the end of the novel, Bill is on his way out of a job, but he leaves behind a document he's authored on his desk, which one of his junior engineers, Henry Shields, picks up and peruses. Henry is struck by Bill's development of what looks like a viable corrosion maintenance plan, something that could solve a decades-long problem for the gas industry. Despite Bill's boss' skepticism that any local plant could evolve a new best practice (109), Bill seems to have solved the technical problem of corrosion at last. Henry believes that by applying Bill's plan to the plant, he can resolve the problem of divided loyalties once and for all, satisfying the need for environmental safety while also ensuring that the plant need not halt production while checking for cracks and leaks. In the end, though, Stenson's narrative, like the petro-substance it explores, resists containment: Henry is fired along with his mentor Bill for disloyalty to New Aladdin, and while their boss says he's read the plan and "might be able to use some of it," there is no guarantee it will be implemented (353).

The stories of Bill, Henry, and the communities in which they work thus leave readers with many frayed edges: we do not know what will happen to these characters or places, though it seems unlikely that the future will involve the shutdown of New Aladdin. Further, the problem of "divided loyalties" seems as entrenched as ever given that Henry and Bill are now both out of work. And finally, even if Bill and his fellow engineers *were* successful in implementing an improved corrosion plan, the novel leaves a key question hanging: would their work merely facilitate more efficient and regularized extraction of fossil fuels, thereby speeding along climate catastrophe and the misery of many around the globe? When considered from this perspective, what the system might require is *more* rather than less corrosion to impede its smooth delivery of planet-warming emissions. By drawing the attention of readers to the pressure points surrounding

demands for constant petro-flow, *Who by Fire* ultimately suggests that even if the system were to function perfectly, at a larger scale even seemingly non-polluting pipes cannot contain themselves: there are emissions that will still be experienced by someone, somewhere. Matters of safety thus cannot be disentangled from thorny problems of scale, nor from readers' own complicity in an industry that supports so much of modern life. The novel thus uncomfortably exposes the gap between what people often claim to feel about a subject like the petroleum industry, and their willingness to investigate and question its business conduct so long as the downsides are not immediately felt.

The conclusion of *Who by Fire* seems fitting for a novel about petroleum; as Stephanie LeMenager points out, "[i]f we conceive of plots . . . as predominantly expressions of our desires for order, oil spills [and, I would add, gas leaks] fiercely resist plotting" (*Living* 23).[7] The dilemmas that the novel's engineers confront also speak to tensions embedded within their profession's current guidelines: according to the *Guideline for Ethical Practice* published by the Association of Professional Engineers and Geoscientists of Alberta, the duty to protect the safety of the public in accord with existing regulations must take precedence over the interests of the professional's client or employer (APEGA 4.3.1). However, the guide also explains that it is then the responsibility of the client or employer to address an engineer's concerns. Yet when the lines separating government regulators and industry have been corroded such that industry is relied on to self-regulate, there is little motivation for either employers or clients to take actions that do not help their bottom lines. As Bill observes, part of the problem is that industry and government only "[s]ort of" abide by the duty to protect citizens from harm (327). It "isn't concern number one," Bill says after years of experience, and while ordinary citizens often care about their lands, livelihoods, and health, "they don't think they know enough to challenge the industry or the government" (327). The issue in the novel and beyond is thus partly about vast differentials in economic and political power, but it is also an epistemic problem that stems from how different kinds of knowledge about oil are valued.

IV. Corrosion as Problem and Gateway to Understanding Energy

In some key ways, then, Stenson's novel shows that corrosion—especially of the boundaries between the energy industry in Alberta and the government that is supposed to regulate it—persists, despite whatever technical developments have been achieved.[8] Far from acting as the ideal gas plant

does, purifying elements by fire and leaving little residue, the novel hurls us back into a messier reality, one in which we're forced to see the flip side of fossil fuels' convenience and the toll it has taken on the health and safety of some Alberta residents for decades. The corrosion of boundaries between industry and government also pushes readers to consider some of the contradictions that pass for normalcy in petro-states like Canada, wherein institutions call for climate action on one hand while subsidizing the petroleum industry on the other. Furthermore, the novel's structural interweaving of two different timelines shows how decisions made in the past establish patterns of acquiescence that continue to characterize contemporary relationships to industry in Alberta today.

Who by Fire ends with a tripartite image that renders the abstract character of energy materially tangible—in "[t]he shaking house, the creatures born dying, the rivers running discoloured to the sea" (Stenson 355). The capacity to convey what it means to live "too close to the fire" will become more important as the current fracking boom and its fallout put many of the problems faced in the novel by the Ryder family in the 1960s squarely in millions of other North American backyards.[9] I'd suggest that if there is hope for imagining an alternative future, it might lie precisely in what LeMenager calls a "hunger for entanglement" that leads us towards the density of thought needed to understand what it means to live in oil, and to conceive of life beyond it (*Living* 194). At both the provincial and national levels in Canada, this means considering how to address the problem of ceding responsibility for industry regulation and oversight to industry itself. This situation can be altered only when a majority of citizens pressure the governments that represent them to subject industry to genuine critical scrutiny.

As a field and set of approaches, the energy humanities are showing that energy systems and their attendant benefits and problems are not merely technical in nature; they are also social and cultural, and so we need cultural forms to better understand, contest, and revise them in ways that steer away from climate peril. Energy humanists point out that a major concern of petromodernity is to make the resource as invisible and seamlessly integrated with modern human life as possible (Bellamy et al. 7). Perhaps nowhere are the fantasies of invisibility and containment more acutely illustrated than in the figure of the pipeline, a crucial entity of oil's infrastructure (Macdonald, "Containing" 38). To puncture this fantasy, *Who by Fire* lays bare the messy consequences of pipeline failures in terms that are tangible for readers—whether in the figure of a coughing child, a

dead piglet, or an emotionally scarred man. In Stenson's hands, corrosion is treated as a technical problem that literally ruptures the lines at Aladdin's gas plants, but also as a social one that tears apart families and communities who become uncertain about who to trust or where to turn for help when problems occur. The disruptions generated by corrosion are frequently conveyed in visceral descriptions of smell, but the Ryder family's experiences with sour gas also show the even more acute dangers of becoming habituated to pollution as olfactory fatigue wears down the body's capacity to sense risk. Such habituation to risk at the individual level captures in microcosm the problem of taking the continuous flow of cheap energy for granted without accounting for its dangers, which are reflected in poisoned air, water, and land, and the protracted effects of runaway carbon emissions at the global scale. Finally, by making a gas engineer the chief protagonist, the book is able to engage with interconnected issues of economic development, addiction, and environmental costs without oversimplifying them. Bill Ryder is a flawed character, but his actions and thoughts suggest how one might begin to poke holes in the logic of petrodeterminism that attempts to circumvent any critique of the oil industry by those who are also dependent on it. The novel's capacity to sidestep the temptation to either cast those who work in the energy industry as villains, or to dismiss environmental concern as naive, is something that is much needed in an era wherein political polarization, escalating climate change, and economic disparity gnaw at the fabric of national and planetary unities.

NOTES

1 On the "rule of capture," see also Alberta Energy's 2016 report, *Petroleum and Natural Gas Tenure in Alberta*.

2 See Kathryn Yusoff's call to understand ourselves as "geologic subjects" under the sign of the Anthropocene in her article "Geologic Life."

3 On "slow violence," see Nixon 2. See also Alaimo's discussion of transcorporeality in *Bodily Natures* 2-4.

4 On the risks of naturalistic modes that make narratives seem resource determined, see Riddle 59-61. See also Wiebe, who explains how public health discourse often individualizes systemic problems in cases of environmental injustice (53).

5 This is a fact recognized by the character Marie Calfoux, an Indigenous woman whose community is next to the upgrader where the adult Bill Ryder works (97). On "energy intimacy," see Cariou.

6 Such struggles express what philosopher of science Nancy Tuana describes as the "viscous porosity" of so many environmental challenges today, wherein agency is diffusely spread among networks of material-semiotic relations, such that it becomes difficult to say whether a phenomenon is caused by human actors or by other material forces (88).

7 See also LeMenager's "Spills" in *Fueling Culture*.
8 A recent example of the ongoing coziness between industry and regulators is illustrated in the case of Alberta landowner Jessica Ernst against Encana. In January 2017, the Supreme Court ruled that Ernst could not sue the Alberta Energy Regulator (AER) for its alleged failure to protect her groundwater from contamination. In 2013, legislation removed "the public interest" from the AER's mandate, effectively making it a corporation funded by industry. See Andrew Nikiforuk's *Slick Water* and "Landowner."
9 Problems with government oversight of hydrogen sulphide levels have recently come to wider public notice in Saskatchewan. See Cribb et al.

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