Article

Hypo-interventions: Intimate activism in toxic environments

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Abstract

Chemical toxicity is part of everyday life in Puchuncaví. The most polluted industrial compound in Chile, Puchuncaví is home of fourteen industrial complexes, including the largest copper smelting plant in the country and four thermoelectric plants. Stories of biological mutation, corrosion and death among plants, humans, fishes and cattle are proliferate in Puchuncaví. Engaging with the growing interest in care and affective modes of attention within STS, this paper examines how ill, intoxicated or otherwise affected people in Puchuncaví act upon and know about their chronic sufferings. Drawing on ethnographic fieldwork, I focus on what I call 'hypo-interventions', or the minimal and unspectacular yet life-enabling practices of caring, cleaning and healing the ailments of their significant others, human and otherwise. By minutely engaging with somatic and affective alterations in the domestic spaces of the body, the home and the garden, Puchuncavinos render industrial harm visible and knowable, and hence a type of political action is invoked. While outside technical validation and alien to conventional politics, these actions have proved crucial for people in Puchuncaví striving to persevere in the face of industrial violence and institutional abandonment. I coin the term 'intimate activism' to describe the ethical and political affordances of the subdued doings and engagements deployed in Puchuncaví. Intimate activism, I claim, draws its political power on its capacity to create minimal conditions for ethical and material endurance.

Keywords

care, hypo-interventions, politics, pollution, potentiality

Sara settled in Puchuncaví twelve years ago. Originally from Santiago, she moved to Puchuncaví when the grocery store she ran with Pato, her husband, went bankrupt after the mushrooming of big supermarkets around their neighborhood. Pato grew up in Los

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Maitenes, a hamlet within Puchuncaví. He and Sara, with their three children, spent every summer holiday in Pato's hometown for 35 years. Almost a Maitenina, for Sara the project of re-settling in Los Maitenes was always in the air. As are toxicants, now that she lives and works in the area.

Puchuncaví is home of Chile's largest copper smelting plant and other fourteen petro-chemical complexes. The smelting plant is run by the *Corporación del Cobre*, or Codelco, Chile's largest, state-owned mining corporation. For the past five decades neighbors of Puchuncaví have co-habited with excessive levels of arsenic, BTEX, SO2 and SO3. The 'cloud', as Sara calls it, envelops her daily life. 'Sometimes it passes through at night', she explains, 'at 2:00 or 3:00 in the morning, and you can't breathe. It's a toxic cloud that touches everything.' Harmful industrial chemicals sediment in her lungs and on the bodies of her loved ones, on her water well, animal companions and plants – especially on her plants. Indeed, one of Sara's prime preoccupations is her garden. 'Plants [suffer]; when the cloud passes through it ruins your crops … because it's acid', she explains, pointing at how the cloud burns tomato and potato plants.

Sara has articulated a repertoire of responses to deal with the cloud. Things she does at home, in her garden and with her family, tactical and reparative interventions deployed in the spaces of her quotidian life. When I asked her about how she copes with airborne toxicants, she answered succinctly. 'We simply keep quiet.' After thinking a bit more about my question, she added: 'Children have to drink a lot of milk and that's it. And inhale some Mentholatum, something minty, maybe take a peppermint.'

This article is about what Sara and other neighbors in Puchuncaví do about the toxic cloud harming their lives, and to what extent these doings redefine the meaning of politics in the face of ubiquitous and inapprehensible industrial damage. I'm interested in questioning how practices in the register of domesticity, affection, silence, boredom, the everyday and the ordinary can be elevated as particular strategies for ethical endurance. Sara's actions are minimal and subdued, but they provoke and are conjured by practices of care, attention and commitment towards significant others (human or not) that enable basic conditions to live and die well (Haraway, 2016). This article is about rethinking the pragmatics of politics without abstracting it from the abjection of damage in Puchuncaví and the durative present of their neighbors' sufferings.

'Intimate activism' is the term[1] I adopt for the type of ethical response to pervasive chemical harm that emerges through domestic practices of care. It situates politics at the intersections of passiveness and action, coping and contesting, reclusion and mobilization and feeling and knowing. By reclaiming the trope of 'activism', I attempt to locate (somehow provocatively) my proposition *within* political theory and practice, instead of accepting the boundaries circumscribing what 'activism' is and how it is construed upon particular definitions of the social and the public.

I argue that intimate activism is sustained on a mode of acting and thinking that brings into relief mundane yet purposeful doings, which I call 'hypo-interventions'. Hypo-interventions are attuned to the rhythm of everydayness, set out by people to secure their conditions of existence and to render knowable otherwise intractable afflictions and matters. In the face of chronic industrial toxicity, these hypo-interventions with and along-side plants, bodies and objects congeal a kind of ethico-political commitment towards inhabited worlds that has not been fully recognized in STS-inspired political debates.
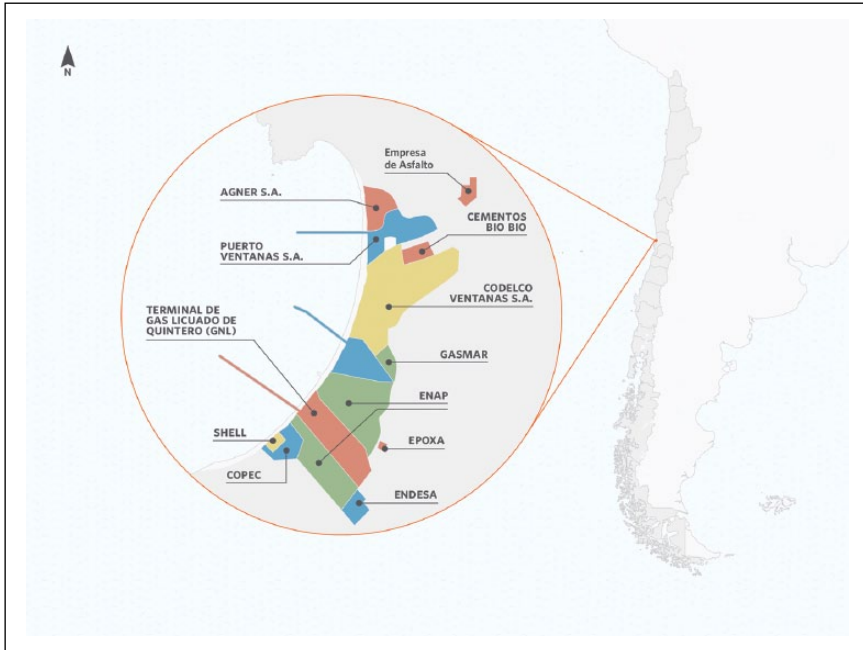
Figure 1. Map of Quintero Bay and the Complejo Industrial Ventana. Source: Sebastián Saldaña.

Recent attempts within STS to theorize political action have revisited the connections between evidence-making, expertise and material practices in the deployment of political conflicts and collectives (Barry, 2001; Callon et al., 2009; Marres, 2012, 2013). Against the traditional understanding of politics as a circumscribed type of action and matter, STS perspectives suggest that politics is distributed along and made actionable by multiple actors in different sites. The recognition of accrued, invisible and slow forms of violence has further complicated the conventional view of political conflicts as highly visible acts that are relevant because of their focus around events bounded by time and aimed at specific bodies (Nixon, 2013).

While these perspectives allow for a better understanding of how politics is constituted, their analytics around political action itself – the actual inventory of doings and responses with which people confront damage and violence – are often grounded in narratives of volition, mobilization and publicness that eclipse the minute and unspectacular interventions highlighted in this paper. By proposing the idea of intimate activism, I am not trying to explicate the physical, affective or situated mechanics of politics, as I am neither reclaiming non-political spaces *as* political, following the trails left by STS scholars. Inheriting from feminist technosciences, I speculate about the flourishing, amid blasted landscapes and lives, of *another* kind of politics. Thus my exploration is, as well, an exercise in positionality within STS. Hypo-interventions – these hushed modes of knowing, resisting and relating – have proven crucial in Puchuncaví and elsewhere, as

people and territories subjected to different kinds of slow violence persevere in their attempt at living in the ruins of late industrial developmentalism. Since making visible 'can change the conditions of existence of the invisible, of those who would not see it, and the relations between them' (Puig de la Bellacasa, 2014: 38), the recognition of hypo-interventions and the forms of intimate activism they convoke is a call for a more careful politics of knowledge from and within STS in the face of social injustice.

My ethnographic account is staged mostly by rural housewives and mothers, all of them fitting the ambiguous category of 'poor'. Most of these women are in their fifties; some are in their seventies and eighties. By distilling intimate activism from the practices of these Puchuncavinas, my attempt is neither to romanticize their relegation to the domestic task of caring and gardening, nor to feminize these practices. Like Sara, these women have to maneuver in a world coated by industrial toxicants, but also shaped by diverse power, economic and gender geometries and misfortunes – and my attempt is precisely to make visible these biopolitical entanglements. I ask what political action means and how it is deployed when harm is diffused, invisible and incremental? Insofar as toxicity marks our late industrial present (Fortun, 2014), what other political possibilities can we invoke beyond the market-oriented grammar of 'stakeholders', 'controversy' and 'public participation' (Stengers, 2005)?

I unfold my argument in four parts. I begin by locating intimate activism as a conversation with and response to recent work on political action and environmental harm. In the following section I turn to my ethnographic material to start delineating the scope and meaning of hypo-interventions. By tracking the practices of gardening, cropping, healing and cleaning deployed by Sara and other neighbors in Puchuncaví, I aim to make visible the spaces of ethical potentiality cracked open by mundane doings, attentions and solidarities. In the third section of this article, I continue my description of hypo-interventions by zooming in to the specific epistemological affordances of unspectacular yet bodily experiences of harm. I conclude by speculating about how intimate activism calls for the reflection on our worlding capacities as STS researchers.

Intimate activism

The cloud described by Sara has descended upon Puchuncaví for the past fifty years. The smelting plant was built in 1964 in Ventanas, a small fishing village near Los Maitenes. In governmental plans to ignite a new, import-substitution developmental phase in Chile, Ventanas was to become a world-leading industrial hub for copper processing that would 'translate into wealth and jobs' for Puchuncaví (*Mercurio de Valparaíso*, 1957). But it didn't. The development of the *Complejo Industrial Ventanas*, Ventanas Industrial Complex, fueled by the smelting plant, is marked by a complex history of permissive regulations, economic decline, ecological deterioration and disease clusters. Farmers were the first to formally denounce the toxic effect of the smelting plant on the environment in the late 1960s, and the first toxicological study in Puchuncaví was conducted in 1985 – confirming high levels of arsenic in the population. In 1995, copper, cadmium and arsenic were found in levels well above the norm in local oysters, mussels, abalone and sea urchins (Cámara de Diputados de Chile, 2011). Oyster farms, set up by fishermen after the fish disappeared from the contaminated waters, were closed down. More

recent research has suggested that rates of cancer-related death between 2001 and 2010 are significantly higher in the Ventanas area when compared against national rates and controlled groups (Salgado et al., 2013).

'We live toxic lives', neighbors in Puchuncaví say, half jokingly, half hopelessly. Indeed, stories of biological mutation, corrosion and death among plants, humans, fish and cattle are plentiful. There are stories about quotidian encounters with industrial harm: concrete and often normalized experiences of lacerations, cancers and breathing problems proliferating outside the purview of medical attention. In Puchuncaví, toxicity is lived in the rhythm of ordinary corrosion and decay, in the nondescript temporality of chronicity and continuity. Sulfur messes with gustatory balances and makes everything taste sweet; fences and roofs corrode faster in Puchuncaví than anywhere in the region; lawns have to be watered constantly to prevent the suspension of dust from carbon burning. People sense toxicants through bodily dispositions and careful attention.

During my research I asked Sara to keep a diary. Through her daily observations I got to know, for example, the multiple ways she has trained her body to monitor pollution. Every morning, while she waters her plants, Sara feels and tastes the atmospheric toxicants that harm both her garden and her body. Two extracts from her diary:

Day #2

Today: It is 10 in the morning and the fume goes through los Maitenes and your mouth becomes bitter and your throat begins to itch and you cough.

Day #7

It is 8.30 in the morning. The clouds are low and you can hardly see the chimney of Codelco. Your throat starts to itch. It is a cloudy morning. Throat starts itching, lips are acid. The acids must be very high.

There are neither climaxes nor dramaturgies staging the chemical violence at stake in Sara's garden, just the ongoingness of life and the cumulative effects of the cloud as it constantly conditions bodies and ecologies. With the concept of intimate activism I want to think seriously not only about the suffering of Sara and her plant companions, but also about the political situation at play in the deep phenomenology of chronic pollution.

My starting points are the practices, themselves ordinary and dull, by which people in Puchuncaví cope with accrued and silent industrial harm – and to what extent these practices have the potentiality to elevate 'minor enfeebling encounters into events that stir ethical consideration and potential intervention' (Shapiro, 2015: 369). Beyond describing the phenomenology of toxicant-human encounters and the multiplicity of situations invoking action against and upon industrial pollution, I attempt to elucidate the capacity of intimate resistances to become modes of ethical endurance.

Here I take ethical endurance as the 'potentiality of living otherwise' (Povinelli, 2011: 110) that emerges in the actions of survival and resistance rehearsed by those that suffer as they strive to persevere, however obdurate their conditions of existence may be. Ethical endurance thus intersects with what Derrida (1994) calls a *promise*. The promise indicates a future that is always uncertain and unknowable – the promise

is always about a future without guarantees (Fritsch, 2002). Hence for Derrida the political power of the promise does not lie in its fulfillment, but in the fact that its fulfillment is never secured, and thus on the articulation of a type of imagination that unfolds in the horizon of a future that can always be different. Ana from Los Maquis, a hamlet in the Puchuncaví Valley, has her terrace covered in *polvillo* every night, the fine dust coming from Ventanas's toxic plume. There is little she can do. After five decades of state negligence, she does not expect any significant changes. But she perseveres. She has no expectations, but she does not foreclose the possibility of an otherwise. Every morning, she sweeps the polvillo sedimented on her terrace, knowing that tomorrow it will be coated again – but also that she will not abandon the possibility of dignity, even amidst the ruins of industrial capitalism. Ana does not withdraw from the promise of a different life, even as she's tested every morning. This zone of friction between what Ana has been made to be (poor, illiterate, ill) and what she can be *in potentia*, 'can become the positive occasion for alternative forms of life… [where] a new ethics of life and sociability could emerge' (Povinelli, 2011: 109). The spaces of endurance in which Sara, Ana and their neighbors act are fertile soils for the emergence of alternative sociabilities and hence for rethinking the phenomenology of activism and the meaning of politics within STS.

A fundamental contribution of STS to political and democratic theory has been to signal the pragmatic constitution of politics (Blok, 2013; Marres, 2013). Defining politics as occurring '[w]henever an issue generates a concerned and unsettled public' (Latour, 2007: 816), STS scholars have offered a non-essentialist version of politics. In this version, politics is an always local and labor-intensive achievement inseparable both from the material problem at stake and the collective constituencies issued forth in the problem-making process (Marres, 2007; see also Barry, 2001; Callon et al., 2009; Marres and Lezaun, 2011).

The pragmatist account promoted by STS has rendered visible the variegated agencies and materials involved in the making of politics, but is in many ways still anchored to the assumptions, aesthetics and settings of liberal democracy that feminist theories, among others, have long criticized (Disch and Howkesworth, 2016; Heberle, 2016). The Dewey-inspired figure of the 'public', instrumental for much of the pragmatist-STS take on politics is a case in point. Whether mobilizing against neuromuscular treatments (Callon et al., 2009) or opposing wind turbines (Blok, 2017), 'publics' are often construed as emergent groups of well-organized, outspoken and articulated individuals capable of mobilizing cognitive (and economic) resources in the face of an externality. Uncritically building on the images of responsibility, action and voice assumed by liberalism (Cruikshank, 1998; Rose, 1999), and without attending to the many ways these political capacities are classed, gendered and racialized, the notion of the 'public' often ends up, unwittingly, describing the dynamics and actions of white, male and middle-class constituencies (Tironi, 2016). Moreover, the equating of 'public' and conventional social groups – agglomerations of individuals acting in the public sphere kn virtue of a functional bond created by a common interest – perpetuates a fundamental demarcation between the social and the individual, the public and the private, the *polis* and the *oikos*, that has been fiercely resisted by feminist political practice and theory (Heberle, 2016; Murphy, 2012). By linking collective action to the

'group', where the group is understood in classical sociological terms, modes of act-ing-as-a-collective that do not rest on assumptions of aggregation, identity and coher-ence, such as conspiring (Choy, 2016) or acting-together (Puig de la Bellacasa, 2014), are not acknowledge as valid forms of political action.

Contentiousness is also a critical phenomenological feature of STS-inspired prag-matist studies of politics. Publics act, and they do so belligerently. Matters of con-cern are discussed and confronted in the public sphere, the space where clashing positions struggle for visibility and strategize for validation. The political is revealed by and constituted in the dynamics of issue- and public-formation that are by nature conflictive, as expressed by the notion of the 'controversy', a heuristic that diagrams politics as a confrontation between contenders (Tironi, 2014). So politics is not only performed by liberal citizens collected in social groups to act in the public sphere, it is also an affair in which, as Haraway (2016: 42) asserts reflecting on Latour's take on politics, 'all the action remains within the narrative vise of trials of strength, of mortal combat'. By thinking politics as a matter of war and peace (Latour, 2013), regimes of action that have proved crucial in situations of ecological damage, such as caring (Puig de la Bellacasa, 2017) or healing (Tironi and Rodríguez-Giralt, 2017), are occluded.

Sara and Ana indicate the possibility of framing politics – collective action in the face of harm – in a different phenomenological and ethical tone. The social dramaturgy of the *mise-en-politique* (Callon et al., 2009) and the agonistics in the making of the 'public thing' (Latour, 2007) make invisible the political capacities inherent to the analytics and pragmatics conjured by Sara and Ana as they confront problems and solutions. Are there other configurations of the collective besides the public, other sites for political action besides the public sphere, and other regimes of action besides contentiousness? By chronicling the mundane and situated actions deployed in Puchuncaví, I do not attempt to identify the everydayness and minutiae of otherwise spectacular and dramatic political processes. Rather, I seek to elucidate how politics is articulated and practiced when harm and the repair responses to it are 'ordinary, chronic, and cruddy rather than catastrophic, crisis-laden, and sublime' (Povinelli, 2011: 132).

Hypo-interventions

Ester moved to Los Maitenes in the mid-1960s. Her father had died and she resettled in her mother's family house. She was eight years old. When she turned fourteen, she mar-ried her school sweetheart and never left Los Maitenes. Ester knows virtually everyone in the small hamlet that, besides agricultural decline, has barely changed over the years. As do most of her neighbors, she keeps a small vegetable garden and some fruit trees. Agriculture is no longer a source of income, but knowledge about plants, farming and gardening remains strong. Attention to her plants is an important part of Ester's daily routine – quite busy for a mother of seven.

Ester checks how her plants and trees wake up each morning. At daybreak she gets out to her garden and reviews the overnight effect of particulate matter on her plants. This is a frequent bio-monitoring technique in Los Maitenes. 'Some days I wake up and my chive and parsley plants have dried out, they are yellow, then I know we have a

heavy day ahead', remarked Ernestina, Ester's neighbor and good friend. For Ester and Ernestina, the experience of toxic harm is inseparable from the suffering of her plants and trees.

Ester's vegetable garden partakes messily in the liveliness – and deterioration – of her backyard, filled with all kind of unutilized objects, decaying machinery and abandoned construction materials. The lack of water, a critical issue in Los Maitenes, is evident. But her plants have managed to survive in this semi-desert landscape. As Ester explained to me, the lack of water was not her main preoccupation. She was more worried about how much longer her plants could resist the effects of the cloud and whether keeping a garden would be possible at all in the future. 'Plants can barely survive here', she told me, 'they don't grow! They would have to stop the industries for 500 years to revive the soil.'

As Ester takes care of her plants on a daily basis, she displays a multiplicity of mundane tricks, crafty fixes and playful maneuvers to heal them. An extract from one of our conversations:

> When fruits are sprouting on the tree, the flower and the tree don't give any fruits. That has been quite obvious. I use to have a lot of quinces here.

> *And that happened with the quinces?*

> Right, the flower … the acid is too strong and the quince is unable to ripe. My husband likes to plant beans – green beans – and it's the same thing. The flower falls as well. When the bean sprouts the little leaves get stained with acid. Like a yellowish stain. Potatoes too, they start going yellow. When the potato begins to sprout, the plant starts turning yellow. It manages to last some months before you have to take the potatoes out. You have to take them out before [they get yellow] to save them. He [my husband] sometimes comes and says, 'I'd better take it out because the potato has already dropped. The top limb is burned, like yellow'… [Also] I have to clean the black pulp sticking on the leaves of the lemon trees, it's like tar stuck on the trees. To protect the lemon trees and my potato and beans seedling nursery from this black pulp I spray the leaves with water and raw soap and that has given me good results.

The human-plant companionship recounted by Ester and Ernestina brings to the fore a particular political problem that industrial pollution poses in Puchuncaví: how to cope with and act upon harm that is queer and aberrant on the one hand, but quotidian and ordinary on the other. The pollution is uncanny and distributed, yet also empirically sensed and observed on bodies, human and otherwise. The damage is produced by the Chilean extractivist project, but lived in the intimate spaces of the home, the garden and the corporeal. Action is needed to survive and persevere, but it is not clear what Ester and her neighbors can do, trapped at the intersection of dispossession and chronicity.

It becomes clear, spending time with Ester, that she knows her plants and trees. While we talk, it becomes evident that she has observed their symptoms, suffocation and survival. Ester and her plants have established an affective sociability sustained by Ester's attention – but also by the help the plants give to Ester. 'Plants tell you [when toxicity is high]', indicated another neighbor, when explaining her monitoring methods. And fuelled by this interspecies cordiality Ester acts upon the suffering of her vegetable world. She performs caring operations to alleviate and save her plants: cleaning stained

leaves, protecting sprouts, taking out potatoes before time, spraying homemade immunizing products.

With the phrase 'hypo-interventions' I attempt to make visible Ester's minute actions to persist as an ethical subject amidst chronic suffering. The prefix *hypo* means an action, thing or relation that functions under, beneath or below the visible (i.e. *hypo*dermic) or the normal (i.e. *hypo*tension) (Merriam-Webster Dictionary, 2016). The opposite of *hypo* is *hyper*, a term that haunts the imaginary around political action. *Hyper*subjects, say Boyer and Morton (2016), are 'the experts who tell you how things are… [they] command and control; they seek transcendence; they get very high on their own supply of dominion.' *Hypo*subjects, on the contrary, 'do not pursue or pretend to absolute knowledge or language, let alone power. Instead they play; they care; they adapt; they hurt; they laugh' (Boyer and Morton, 2016).

Following these threads, hypo-interventions are minimal and unpretentious actions aiming at minimal and unpretentious changes in the context of minimal and unpretentious lives. As such, hypo-interventions are often viewed as futile in environmental justice accounts. Ester's trifling actions are usually seen as expressions of political disempowerment and hermeneutical incapacity (Auyero and Swistun, 2009; Nixon, 2013; Ottinger, 2013; Taylor, 2014).

Yet by attending to her plants, trees and flowers, Ester creates the conditions for the flourishing of life in a devastated landscape, and thus provokes the possibility of an ethical otherwise. Her garden is not just a discrete deviation from the normal inertness of her surroundings. Ester enables a precarious yet vital space where vegetal life can bloom. In return, entangled in a symbiotic relation, plants facilitate the environment within which Ester can become something *different*: not a healthy citizen emancipated from the various inequities she has been subjected to, but neither a numbed subject doomed to suffer with conformity the chemical and political violence of Chilean industrialism.

Like Ester, Ana from Los Maquis has knit together a web of practices concerning and affections for her plants. Ana is almost ninety years old, never married. 'God sent me to earth and will take me back just the same to heaven', she joked when we met. Years earlier, she had sold lemons from her trees and had harvested so many broad beans that, waiting to be sold or eaten, they would rot. Her garden, she remembers, was filled with wheat, barley, lentils, chickpeas, peas and potatoes. Those days of abundance have passed. 'Contamination from Ventanas kills plants. … This is gonna end like a desert', she foretells.

While she doesn't have the strength to spend as much time in her garden as she had, the life of her plants is still crucial for her. Ana hasn't abandoned her garden, even if, as she recognizes, plants hardly grow anymore. Once, having a conversation about her daily encounters with pollution, she told me about her tribulations with her avocado tree. 'Today I went to see my avocado tree and it's also black', she pointed with a pinch of despair. And then she added: 'I've tried to clean it but it can't be done because I clean it and it's dirty again the next morning.'

Her stubborn practice of cleaning the leaves of her avocado tree, even if the effect will only last until the next morning, indicates another crucial element of hypo-interventions: their modulation on the sensibilities and logics of care. The hypo-interventions deployed by Ana are congealed in and through dense threads of attention, love and companionship.

Plants are part of her past, her land and her personhood in a toxic environment, and thus are treated carefully. This means, first, that by committing to intensive (and frustrating) gardening practices Ana recognizes the 'troubles of interdependent existences' (Puig de la Bellacasa, 2012: 199) and hence attends her plant companions beyond any functional calculation: Ana cleans her avocado tree because she has established a bond of affection with her plants that fits uneasily within the grammar of strategy, enemies and opportunity of contentious politics. Second, her practices are themselves attentive, delicate and careful. Cleaning her avocado tree, leaf by leaf, is a kind and subtle action, perhaps the type of action needed for the repairing and healing of fragile worlds, even at the cost of appearing pointless. Zoom out and hypo-interventions are inconsequential; zoom in and they are full of therapeutic affordances to heal and soothe what has been broken (Tironi and Rodríguez-Giralt, 2017).

Ester's and Ana's interventions, attuned in the register of the *hypo*, are predicated on low-key and banal quasi-events, actions below the sight of the public, too modest to appear in the 'public domain'. But they sustain the conditions of possibility of their lives. The cleaning, repairing and healing of their plants won't stop toxic pollution. But by creating the possibility of collaboration, invention and care with their vegetable companions, Ester and Ana interrupt, even if momentarily, the cadence of what Rose (2006) and Haraway (2016) have called double death, or the extension of death accompanied by the impossibility of life. Ester and Ana *do* something, however banal and intimate, to contest toxic harm. In their gardens, paying close attention to their plants through gentle tinkering, they punctuate the inexorability of their 'toxic lives', and hence invoke the possibility of an alternative social project.

Ecological knowledge, political speculations

Murphy (2006) has chronicled how chemically saturated, Reagan-era North American office buildings provoked a myriad of uncategorizable symptoms in the women workers who filled them. Congested noses, nausea, irritations, scratchy rashes, fatigue, burning inhalations and queasy stomachs were some of the somatic ailments suffered within carpet-floored, glass-walled offices (Murphy, 2006: 4). In a different setting, thousands of kilometers apart, neighbors in Puchuncaví also sense chemical toxicity through multiple yet uncertain bodily afflictions. In Ventanas, Los Maitenes and Los Maquis, continuous contamination produces itchy throats, blue lips and dizziness, a multiplicity of subtle and equivocal alterations that are sensed and suffered in the intimate register of the everyday encounter with airborne matter. 'Right now *los bajos* [the lower part of the hamlet near the marshes] are completely covered by toxic gases', said Sara in one of our conversations. 'If you ask me how one knows that toxic gases are here', she continued, 'it's because the air is so dense that it has a bluish hue and your lips become bitter and you have a frog in your throat and usually a headache.' Industrial pollution is also indexed in the interaction between chemical toxicity and different objects of quotidian life. Particulate matter sediments on every available surface. 'Your car windshield gets dirty', points a neighbor from Puchuncaví. 'It's that constant rain, even if it's imperceptible, it's always surrounding us, sometimes is a kind of trough, like a fog.'

Both in the spaces of non-industrial labor and in Puchuncaví, a crucial question for the affected is how to validate evidence deemed psychosomatic, subjective or even menstrual. How does experiential evidence fit along expert knowledge and other validated forms of technical argumentation? Murphy (2006) explains how, through different experimental methods that invited women to trust 'their own corporeal sensations over medical authority' (p. 64), experience was elevated as an alternate and more accurate source of knowledge, transforming intimate alterations into the source for the problematization of how bodies (and buildings) were constructed in post-WWII North America.

Puchuncaví seems to be marked by a different epistemological and political trajectory. There, low-level afflictions have remained attached to the intimate spaces of the domestic and to the minimal practices of healing and caring, without amounting to more conventional forms of political action in the public sphere. Yet they have afforded Puchuncavinos with a critical evidence-making capacity: the possibility of rendering visible and knowable, through their effective doings, the geometries of power explicating their afflictions. Their hypo-interventions, their quotidian practices of care and healing, have proven fundamental, as did the experiments described by Murphy, to elicit the web of causalities and responsibilities behind industrial contamination – a web otherwise obscure to the people of Puchuncaví.

The story of Eliana Morales illustrates the epistemological affordances of hypo-interventions. Ms. Morales is almost 80 years old. She lives in Puchuncaví, the small town after which the entire municipal area is named. She lost her husband, Raúl Lagos, in 2009, after months of painful agony. His intoxicated body had unusual levels of lead, copper, arsenic and other metalloids. Lagos worked at the smelting plant for almost two decades and had always been proud to be part of a large national corporation such as Codelco. After spending day after day, for several years, attending to her husband's altered body, Morales now thinks differently about Lagos's pride.

Morales never imagined what life had waiting for her. Absorbed by her domestic duties at home, or wholeheartedly involved in her husband's recuperation, she never had time for, nor was interested in, political affairs. 'I'm not a political person', she once said to me categorically, afraid of being associated with anything political. Breathing and skin problems had accompanied Lagos for a long time. He had become what people in Puchuncaví call – with both affection and disgust – an *hombre verde*, a 'green man', a worker from the smelting plant stained with greenish wounds due to chemical reactions on his body. But neither he nor his wife made any conjectures about these reactions. Verdant lacerations, unwashable stains on the working equipment and the strong chemical odor impregnating his body were, they thought, part of the material and sensorial archive of labor anecdotes.

Things changed when memory loss began. The two assumed that Lagos had Alzheimer's and paid for a private consultation with a neurologist. When the neurologist learned that Lagos worked at the smelting plant, he asked for a complete toxicological exam. The results were blunt: Lagos's body was severely poisoned and his days were numbered.

After that, Morales took full care of her husband. His final year was horrid. He was bedridden for 3 months, during which Morales hardly did little other than take care of her husband. Lagos died of bladder cancer weighing just 32 kilos. 'We suffered horribly',

Morales remembered. 'Raúl threw out part of his guts. At night he screamed. You could smell a strong odor of ammonia throughout the house. My husband was rotting away inside.' Once in the hospital, the doctor confirmed what she already knew: Lagos was a case of severe lead, copper, arsenic and cyanide poisoning. Probes were inserted to drain his poisoned body. Morales was bewildered when she saw that her husband was losing little pieces of flesh through the probes. She asked the doctor what was going on, to which he replied that those fragments were his internal organs. Lagos was disintegrating inside out.

Ms. Bernal, the widow of Roberto Álvarez, recounts a similar story. Álvarez worked at the plant's furnace for 20 years, and he was admitted urgently to the hospital when he suddenly started to lose his memory and vomiting a green liquid. Álvarez weighed about 120 kilos and lost almost 50 in just three months. Bernal reorganized her daily duties to stay by her husband. Rural public health in Chile is anything but well-equipped, and Bernal decided to complement the hospital services with her own commitment to her husband healing. It wasn't an easy task. Álvarez's kidneys were shattered and part of his lower abdomen had exposed skin sores. All of his teeth fell out. After three months in the hospital and many exams, no apparent cause for his ailment was found, 'The doctor, an oncologist, didn't understand it', explained Bernal with a tone of bewilderment.

Bernal's bafflement – like that of Morales – was not just related to the doctor's inability to find a precise causal factor explaining his husband's affliction. Organs, tissues and internal chemical reactions, vitalized by the Puchuncaví's lead-loaded atmosphere, began behaving in awkward ways, in ways the doctor didn't understand. Bernal and Morales kept close track of their husbands' transformations, vigilant registers of their lesions. However, any reference to a normal body, with its expected chemical reactions and mechanics was unavailable. 'My husband suffered in ways I had never imagined that a person could suffer', Bernal explained, perplexed by the extraordinary biochemical re-configuration of her partner's poisoned body.

Although corporate technicians have systematically ensured them that levels of exposure to toxicants in the smelting plant were not harmful, Morales and Bernal came to understand that something was wrong – the behavior of their husbands' bodies was too aberrant to fit normal medical parameters of illness. And they came to this conclusion not by rehearsing amateur science or forms of popular epidemiology (Brown, 1999), but by curing their sick husbands, cleaning their wounds, calming their pain and attending to their minute needs and alterations. Morales and Bernal, spending time caring for their ill husbands' bodily malfunctionings and metabolic rifts, became aware that their condition exceeded any 'normal' account given medical experts. Their husbands' sick bodies required other explanations, explanations that Morales and Bernal never considered but that their hypo-interventions were now bringing into crisp relief. And the starting point was the smelting plant.

Like Morales and Bernal, Carolina Vega, another widow of an *hombre verde*, never questioned the manifold occupational afflictions suffered by her husband. When he died in 2007 of laryngeal cancer, she joined the dots:

> When they were working [at the plant] they had to handle drums with liquids that were unlabeled, and they had to open them. … One Saturday he was called to clean some tricycles they used to carry the material. He came home with his face all red, like when one boils crabs.

I got scared and asked him what had happened. He told me he was hot and that his face itched.
(Urquieta and Saleh, 2012)

For Vega, as for Morales and Bernal, the smelting plant had always been a risky place
where 'safety' was a tenuous expectation. Earning a living in Puchuncaví has always meant
having a flexible attachment to life. Peasant agriculture and artisan fishery, the traditional
economic activities in Puchuncaví, were anything but safe, and thus exposure to toxic
chemicals never seemed as an acute life-diminishing problem. But the somatic aberrations
they were healing brought the smelting plant to their awareness. They realized that their
partners' sick bodies were embroiled in an uncanny web of vectors and relations in which
the smelting plant was at the core. And the 'smelting plant' was way of consolidating in one
figure a plethora of things and arrangements eventually involved in the abnormal conduct
of their husbands' bodies: corporate negligence, state abandonment and obsolete technolo-
gies. Vega, Morales and Bernal put the puzzle pieces together. Their husbands' suffering,
the hypo-interventions deployed to heal them showed, was relational and needed physio-
logical as well as *political* explications. Attending to the miniscule yet perturbing somatic
transformations of their husbands, the three widows came to an enhanced appreciation of
the scales, sources and consequences of chemical harm in Puchuncaví.

Eventually, these appreciations, borne out of the minute practices deployed to heal the
sick bodies of their loved ones, scaled up to become the basis of collective action against
Codelco. In 2007, Bernal and other widows successfully sue Codelco, demanding the
exhumation of their husbands. But beyond this political augmentation, I want to empha-
size the epistemological affordances of hypo-interventions. Care, as Tronto (1993) notes,
has the capacity to articulate, connect and signify lived worlds in particular ways. When
something is attended to with affection and care, for example the sick body of a loved
one, things become animate in enhanced and unknown ways. Details that had been over-
looked and elements that were taken for granted express their excess to any ideas about
them. Things that outside of the radius of caring attention seemed inert, passive or generic
suddenly become active, capricious and generative. Care defies objectification by re-
affecting lived worlds (Puig de la Bellacasa, 2011).

If hypo-interventions render possible the opening of an ethical space for endurance where
new social projects can flourish, they also enable an awareness of the political ecology driv-
ing industrial harm. This awareness is partial, situated and entangled in affective modes of
knowing and relating. It can be slower and less resolute than other forms of political aware-
ness. But it grants an ecological emplacement crucial for those who have to persevere in
toxic environments: the awareness that their experiences, however intimate, are valid forms
of evidence since they are enmeshed in and explicated by multiple sites, forces, relations and
things. Bernal's practices of care are subdued and ordinary, just as her husband's experi-
ences of pain are outside the metrics of toxicological knowledge, but they have enabled a
better understanding of the causes and complexities of pollution in Puchuncaví.

Conclusion

In spite of her toxic life, Sara doesn't want to leave Los Maitenes. 'Where to?' she asked
me when I posed the question. She and her family are doing relatively well in Los

Maitenes. Some years ago she began repairing clothing with her sewing machine. Now she supplies sport uniforms to a couple of local primary schools and her husband has an almost-permanent job. Their existence is too precarious, always on the verge of poverty, to experiment with drastic changes. If stability comes at the price of toxicity in Los Maitenes, Sara is willing to take her chances. She has not surrendered to a life of chronic suffering, but for her – as for Ester, Ana or any of the Puchuncavinos that have populated this article – the achievement of a decent life does not amount to grandiloquent actions or epic gestures.

Intimate activism is an ethico-political compromise in the domain of the affective and the domestic. In the intimate sphere of caring for significant companions, human or otherwise, people in Puchuncaví execute a myriad of routine and hushed tricks and interferences referred as hypo-interventions. These hypo-interventions, by allowing poor, illiterate or otherwise marginalized people to interrupt, even if minimally, the trajectory of industrial harm, articulate a space of ethical potentiality that has proven crucial for counteracting damage in Puchuncaví. Hypo-interventions create and are composed of affective doings and caring commitments, and are thus inseparable from therapeutic, healing and repairing modes of thinking and acting. Insofar as care enlivens and renders visible relations and matters often unseen or deemed unimportant, hypo-interventions also facilitate an ecological and critical awareness about the multiple elements participating in the production of what Murphy (2017) calls alter-lives, or the persistent and integral chemical alteration of existence by contemporary industrial development. These practices, I have contended, need to be incorporated into the inventory of political action if we are to take seriously what activism means in the face of slow violence.

Haunting this article is why Sara doesn't mobilize against Codelco, organize with her neighbors, demand state protection or simply leave Los Maitenes. I have argued that the attempts by Sara and other women and men to endure amid the ruins of capitalism is an ethico-political interference that needs to be recognized. When harm is incremental, chronic and inseparable from life itself, the act of cleaning wounds or watering plants is an ethical statement. It is an act of saying 'not that' (Povinelli, 2011: 191), of identifying an ethical promise against which a problem is signaled and a response, however minimal, is rehearsed.

But what comes after the 'not that'? What kind of institutional intervention or political mobilization enters the public sphere? I have intentionally eluded that question, for I want to slow down any policy or practical translations of the situations, problems and solutions I encountered in Puchuncaví. Povinelli (2011: 190) suggests that the principle, by which any say about the ethical intensity of a harming situation must be put on hold until substantial discourses and solutions are found, is 'part and parcel of how power is organized in late liberalism'. The political power of hypo-interventions, I want to argue, does not reside in its capacity to produce a clear program to deepen democracy or eliminate corporate irresponsibility – but in its power to invoke an indeterminate space in which to persevere as ethical beings in spite of and with their material conditions of existence. The political power of Ana's ordinary doings lies not in what comes after she cleans her avocados, but in the possibility that *something* can be brought up in the act itself of materially interrupting toxicity with her plant conspirers. A focus on potentiality might not advance dramatic changes in policy, but it draws attention to the ethical

activism tirelessly exercised by women and men in Puchuncaví, a first and fundamental step towards a critical appraisal of their toxic lives.

Finally, intimate activism and the kinds of ethical matters and affective doings it elicits, put into question our own knowledge practices within STS. Stengers (2005) has insisted that politics is a careful composition around the encounter between different cosmos, different worlds saturated with attachments, passions, matters and relations, worlds that do not coincide nor can be easily equalized into a harmonic whole (de la Cadena, 2015; Tironi, 2014). STS scholarship has embraced this cosmopolitical sensibility, rendering visible how the politics of cities (Blok and Farías, 2016), infrastructures (Schick and Winthereik, 2016) and environmental management (Tironi and Calvillo, 2016) require thinking with frictions, incommensurability and ontologies.

But after spending time with Sara, Ester and Ana, I have come to realize that a radical aperture onto ontological alterity requires more than a shift to cosmopolitics. This move risks iterating liberal assumptions – perhaps the assumptions framing the researchers' own political imaginaries and practices – if it is not accompanied by an aperture of what a political situation is. We often keep boiling down the political to those sublime, public and argument-oriented situations, temporalized in the excitement of the 'conflict' that have defined most of our political thinking since Kant (Shapiro, 2015). But in many worlds politics is not about debates and argumentation but about the white noise of chronicity, while the composition of a common world often means surviving, coping and resisting. In many worlds, politics in the form organizing, mobilizing and claiming, is not available, as lives are too precarious and damaged. 'Where to?', Sara's answer to my perplexed question, has to be taken more seriously. In many worlds, activism, or the rehearsal of new social projects in the face of suffering, *is* watering plants or putting some ointment on infants' noses, or maybe even 'doing nothing', as Ester told me – forms of action that our political theories, including those of a cosmopolitical tone, are not prepared to recognize. And as it happens, these worlds are often at the margins of development: declining rural communities, industrial sacrificial zones, urban ghettos, indigenous lands and most of what has to be called the Global South. These worlds are not outside the interest of STS scholarship, but are made invisible when our research is done through the heuristics of political situations that alienate modes of enduring in damaged worlds.

Note

1. My use of this term is quite different from that of Cymene Howe in the title of her book *Intimate Activism: The Struggle for Sexual Rights in Postrevolutionary Nicaragua* (2013).

As far as I know, Howe doesn't operationalize or utilize the term as part of her analytical vocabulary.

References

Auyero J and Swistun D (2009) *Flammable: Environmental Suffering in an Argentine Shantytown*. Oxford: Oxford University Press.

Barry A (2001) *Political Machines: Governing a Technological Society*. London: The Athlone Press.

Blok A (2013) Pragmatic sociology as political ecology: On the many worths of nature(s). *European Journal of Social Theory* 16(4): 492–510.

Blok A (2017) Infrastructuring new urban common worlds? On material politics, civic attachments and partially existing wind turbines. In: Harvey P, Jensen CB and Morita A (eds) *Infrastructures and Social Complexity: A Companion*. London: Routledge, 102–114.

Blok A and Farias I (eds) (2016) *Urban Cosmopolitics: Agencements, Assemblies, Atmospheres*. London: Routledge.

Brown P (1992) Popular epidemiology and toxic waste contamination: Lay and professional ways of knowing. *Journal of Health and Social Behavior* 33(3): 267–281.

Callon M, Lascoumes P and Barthe Y (2009) *Acting in an Uncertain World: An Essay on Technical Democracy*. Burchell G (trans). Cambridge: MIT Press.

Cámara de Diputados de Chile (2011) Informe de la Comisión de Recursos Naturales, Bienes Nacionales y Medio Ambiente recaído en el mandato otorgado por la sala a fin de analizar, indagar, investigar y determinar la participación de la empresa estatal CODELCO y empresas asociadas, en la contaminación ambiental en la zona de Puchuncaví y Quintero. Available at: https://www.camara.cl/sala/doc2.aspx?DOCID=3043 (accessed 28 February 2016).

Choy T (2012) *Ecologies of Comparison: An Ethnography of Endangerment in Hong Kong*. Durham, NC: Duke University Press.

Choy T (2016) Distribution. *Cultural Anthropology*, 21 January. Available at: https://culanth.org/fieldsights/787-distribution (accessed 18 June 2018).

Cruikshank B (2007) *The Will to Empower: Democratic Citizens and Other Subjects*. Ithaca: Cornell University Press.

De la Cadena M (2015) *Earth Beings: Ecologies of Practice Across Andean Worlds*. Durham: Duke University Press.

Derrida J (1994) *Spectres of Marx: The State of the Debt, the Work of Mourning, and the New International*. New York: Routledge.

Disch L and Howkesworth MH (eds) (2016) *The Oxford Handbook of Feminist Theory*. Oxford: Oxford University Press.

Fortun K (2014) From Latour to late industrialism. *Hau* 4(1): 309–329.

Fritsch M (2002) The enlightenment promise and its remains: Derrida and Benjamin on the classless society. *Human Studies* 25(3): 289–296.

Haraway D (2016) *Staying with the Trouble: Making Kin in the Chthulucene*. Durham, NC: Duke University Press.

Heberle R (2016) The personal is political. In: Disch L and Howkesworth MH (eds) *The Oxford Handbook of Feminist Theory*. Oxford: Oxford University Press, 593–609.

Howe C (2013) *Intimate Activism: The Struggle for Sexual Rights in Postrevolutionary Nicaragua*. Durham: Duke University Press.

Latour B (2007) Turning around politics: A note on Gerard de Vries' paper. *Social Studies of Science* 37(5): 811–820.

Latour B (2013) War and peace in an age of ecological conflicts. Available at: http://www.bruno-latour.fr/node/527 (accessed 18 June 2018).

Marres N (2007) The issues deserve more credit: Pragmatist contributions to the study of public involvement in controversy. *Social Studies of Science* 37(5): 759–780.

Marres N (2012) *Material Participation: Technology, the Environment and Everyday Publics*. London: Palgrave Macmillan.

Marres N (2013) The environmental teapot and other loaded household objects: Re-connecting the politics of technology, issues and things. In: Harvey P, Conlin Casella E, Evans G, et al. (eds) *Objects and Materials: A Routledge Companion*. London: Routledge, 260–271.

Marres N and Lezaun J (2011) Materials and devices of the public: An introduction. *Economy and Society* 40(4): 489–509.

Mercurio de Valparaíso (1957) El futuro de Ventanas, *August*, p. 25.

Merriam-Webster Dictionary (2016) Available at: http://www.merriam-webster.com/dictionary/hypo (accessed 28 February 2016).

Murphy M (2006) *Sick Building Syndrome and the Problem of Uncertainty: Environmental Politics, Technoscience, and Women Workers*. Durham, NC: Duke University Press.

Murphy M (2012) *Seizing the Means of Reproduction: Entanglements of Feminism, Health, and Technoscience*. Durham: Duke University Press.

Murphy M (2017) Alterlife and decolonial chemical relations. *Cultural Anthropology* 32(4): 494–503.

Nixon R (2013) *Slow Violence and the Environmentalism of the Poor*. Cambridge, MA: Harvard University Press.

Ottinger G (2013) *Refining Expertise: How Responsible Engineers Subvert Environmental Justice Challenges*. New York: New York University Press.

Povinelli E (2011) *Economies of Abandonment: Social Belonging and Endurance in Late Liberalism*. Durham, NC: Duke University Press.

Puig de la Bellacasa M (2011) Matters of care in technoscience: Assembling neglected things. *Social Studies of Science* 41(1): 85–106.

Puig de la Bellacasa M (2012) 'Nothing comes without its world': Thinking with care. *The Sociological Review* 60(2): 197–216.

Puig de la Bellacasa M (2014) Encountering bioinfrastructure: Ecological struggles and the sciences of soil. *Social Epistemology* 28(1): 26–40.

Puig de la Bellacasa M (2017) *Matters of Care: Speculative Ethics in More Than Human Worlds*. Minneapolis: Minnesota University Press.

Rose N (1999) *Governing the Soul: Shaping of the Private Self*. London: Free Association Books.

Rose DB (2006) What if the angel of history were a dog? *Cultural Studies Review* 12(1): 67–78.

Salgado E, Madrid E and González I (2013) *Evaluación de Riesgos para la Salud de las Personas y Biota Terrestre Quintero y Puchuncaví*. Santiago: Ministerio de Medio Ambiente.

Schick L and Winthereik BR (2016) Making energy infrastructure: Tactical oscillations and cosmopolitics. *Science as Culture* 25(1): 44–68.

Shapiro N (2015) Attuning to the chemosphere: Domestic formaldehyde, bodily reasoning, and the chemical sublime. *Cultural Anthropology* 30(3): 368–393.

Stengers I (2005) The cosmopolitical proposal. In: Latour B and Weibel P (eds) *Making Things Public: Atmospheres of Democracy*. Cambridge, MA: The MIT Press, 994–1003.

Taylor D (2014) *Toxic Communities: Environmental Racism, Industrial Pollution, and Residential Mobility*. New York: New York University Press.

Tironi M (2014) Hacia una política atmosférica: Químicos, afectos y cuidado en Puchuncaví. *Pléyade* 14: 165–189.

Tironi M (2016) Ningún acuerdo posible: Conflictos, diferencia radical y política especulatica. In: Araya R and Ceballos F (eds) *Conflictos, Controversias y Disyuntivas*. Santiago: Abierta.

Tironi M and Calvillo N (2016) Chapter 11: Water and air: Excess, planning and the elemental textility of urban cosmopolitics. In: Blok A and Farías I (eds) *Urban Cosmopolitics: Agencements, Assemblies, Atmospheres*. London: Routledge, pp. 207–224.

Tironi M and Rodríguez-Giralt I (2017) Healing, knowing, enduring: Care and politics in damaged worlds. *Sociological Review* 65(2): 89–109.

Tronto J (1993) *Moral Boundaries: A Political Argument for an Ethics of Care*. London: Routledge.

Urquieta C and Saleh F (2012) Las historias tras las exhumaciones de los ex funcionarios de Enami en Puchuncaví. *El Mostrador*, 9 July. Available at: http://elmostrador2015.mzzo.com/pais/2012/07/10/las-historias-tras-las-exhumaciones-de-los-ex-funcionarios-de-enami-en-puchuncavi/ (accessed 28 February 2016).

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