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Thieves of *Patria*:  
Vertical Politics in Plurinational Bolivia

By

Andrea Janet Marston

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Geography

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

Professor Jake Kosek, Chair

Professor Michael Watts

Professor Donald Moore

Professor Nancy Postero

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## Abstract

Thieves of *Patria*: Vertical Politics in Plurinational Bolivia

by

Andrea Janet Marston

Doctor of Philosophy in Geography

University of California, Berkeley

Professor Jake Kosek, Chair

In this dissertation, I offer a materialist account of the relationship between nation, nature, and political economy in Bolivia. Using the history and politics of Bolivia's tin "mining cooperatives" (*cooperativas mineras*) as a window, I rethink key concepts in political economy in relation to the matters of mining: strata and resource, mountain and class, tin and labor, machine and value, and dynamite and state. In so doing, I argue that the political economy of resource extraction in Bolivia cannot be understood outside of either the *matter* of nature or the historical intertwining of nation, race, and gender. Colonial encounters of rock and laborers created the conditions of possibility for the consolidation of capitalist extraction, and these histories are key to understanding the political formations of the contemporary era.

Understanding these formations is politically pressing beyond Bolivia. Since the 2005 election of Evo Morales, the country's first Indigenous-identifying president, Bolivia has been hailed as a place of hope for progressives convinced that the future of a world mired in economic, social, and environmental crisis depends on Indigenous political thought and action. In 2009, Morales ushered in a groundbreaking constitution that transformed the country from a republic into a "Plurinational State," a change that signaled a reorganized relationship between the state and Bolivia's many Indigenous, Afro-Bolivian, and intercultural nations and peoples. Given all of this, it might be assumed that resource extraction has been retooled to align with the goals of Indigenous territorial autonomy. To the contrary, the Bolivian state retains control over all subterranean resources, including but not limited to minerals and hydrocarbons, marking a vertical limit on Indigenous sovereignty. Through both direct and indirect involvement, the state has strengthened its control over the subsoil, often at the expense of surface-level communities.

Plurinational Bolivia is thus characterized by a tension between state-led (and state-authorized) resource extraction and a commitment to decentralizing resource governance in a way that prioritizes Indigenous territorial rights. Mining cooperatives embody this tension. With connections to both agrarian and market economies, these associations of small-scale miners have been involved in both defining the contours of the plurinational constitution and writing mining laws that facilitate resource extraction. Just as importantly, they have a long history of being in-between subjects, perpetually caught between both class categories of worker/peasant and racial categories of Indigenous/*mestizo* (mixed race). They have fallen on the outside of successive Bolivian nation-building projects, including this plurinational one. Usually interpreted as a conservative group that rose from the ashes of the country's once famously progressive miners' unions in the 1980s, *cooperativistas* are discursively figured as internal outsiders, a group of not-quite-rights whose very presence threatens the stability of national imaginaries. They *are* the fault lines of the Plurinational State, and following them allows me to rework

political economy in ways that take seriously the material legacies of nation building and the production of social difference.

Drawing on over eighteen months of ethnography with small-scale tin miners, much of which was spent underground, as well as extensive archival research and over one hundred interviews with scientists, engineers, politicians, and activists, I argue that *geosocial formations*, forged in the vertical contact zone between miners and rock, perpetuate resource extractivism even in the context of putatively Indigenous nation-building. Bolivia's subterranean was produced as a national 'public' space in the 20<sup>th</sup> century, imbued with masculinist and *mestizo* dreams of progress, and these nationalist ideals remain sedimented in the *matter* of the subsoil. These ideals shape cooperative miners in ways that reverberate on the surface when they take to the streets or run for political office. By tracing the influence of material nature and buried places on the more familiar terrain of resource extraction and contestation, this project rethinks the boundaries of political economy in Latin America and beyond.

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# LIST OF ABBREVIATIONS

ABBREVIATION	SPANISH	ENGLISH
<b>APEMIN</b>	Apoyo al Desarrollo Económico Sostenible en Áreas Mineras Empobrecidas del Occidente de Bolivia	Support for Sustainable Economic Development in Poor Mining Areas in Western Bolivia
<b>CEDIB</b>	Centro de Documentación e Información de Bolivia	Center for Documentation and Information of Bolivia
<b>CEDLA</b>	Centro de Estudios para el Desarrollo Laboral y Agrario	Center for the Study of Labor and Agrarian Development
<b>CIDOB</b>	Confederación de Pueblos Indígenas de Bolivia	Confederation of Indigenous Peoples of Bolivia
<b>COB</b>	Central Obrera Boliviana	Bolivian Workers' Central
<b>COMIBOL</b>	Corporación Minera de Bolivia	Mining Corporation of Bolivia
<b>CONAMAQ</b>	Confederación de Ayllus y Markas del Qullasuyu de Bolivia	Confederation of <i>Ayllus</i> and <i>Markas</i> of the <i>Qullasuyu</i> of Bolivia
<b>CONCOBOL</b>	Confederación de Cooperativas de Bolivia	Confederation of Cooperatives of Bolivia
<b>CSUTCB</b>	Confederación Sindical Única de Trabajadores Campesinos de Bolivia	Unified Syndical Confederation of Peasant Workers
<b>DENAGEO</b>	Departamento Nacional de Geología	National Department of Geology
<b>DYM</b>	Desarrollo de Yacimientos Minerales	Development of Mining Deposits
<b>EMPLEOMIN</b>	Empleo en los Áreas Mineras de Bolivia	Employment in Mining Areas of Bolivia
<b>FENCOMIN</b>	Federación de Cooperativas Mineras de Bolivia	Federation of Mining Cooperatives of Bolivia
<b>FERECOMINORPO</b>	Federación de Cooperativas Mineras del Norte de Potosí	Federation of Mining Cooperatives of Bolivia of Northern Potosí
<b>FPS</b>	Formación Política Sindical	Political Union Formation
<b>GEOBOL</b>	Servicio Geológico de Bolivia	Geological Service of Bolivia
<b>MAS</b>	Movimiento al Socialismo	Movement Towards Socialism
<b>MNR</b>	Movimiento Nacional Revolucionario	National Revolutionary Movement
<b>TIPNIS</b>	Territorio Indígena y Parque Nacional Isiboro Séure	Isiboro Séure Indigenous Territory and National Park
<b>SERGEOMIN</b>	Servicio Nacional de Geología y Minería	National Geology and Mining Service
<b>UNSXX</b>	Universidad Nacional Siglo XX	National University Siglo XX (Twentieth Century)



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wisdom that he imparts, and the thrill of being awarded the “caboose” – the last office hour slot of the day, which could easily last four hours. Finally, I am extremely grateful to Nancy Postero, who welcomed me into her all-star team of *bolivianistas* even from afar, and who has kept me on the straight-and-narrow when it comes to being true to Bolivian theoretical and political concerns. Not only did she invite me to San Diego twice, but she also traveled northwards to attend my qualifying exams in person – a truly rare dedication from an outside committee member. I have regularly counted my lucky stars to have had such a great team. Beyond my committee members, I am grateful to Gill Hart, Nancy Peluso, Nathan Sayre, and Sharad Chari for offering feedback and community at various stages in my dissertation process. I owe to Gill Hart any claim I might make to theoretical rigor, and for training me in my first two semesters as a Graduate Student Instructor. As well as training me in political ecology, Nancy Peluso invited me to participate in the small-scale mining group that she convened, where I also learned from faculty and graduate students Philippe Le Billon, Angela Castillo, Sebastián Rubiano Galvis, Jimena Díaz, Matt Libasi, and Brian Ikaika Klein.

In addition to the small-scale mining group, I have been fortunate to be part of several collectives of brilliant graduate students from whom I learned not only in seminar rooms but also over beers, on dance floors, and on the bike trails. Foremost among these collectives is the Fabulous Gang of Five, comprised of Camilla Hawthorne, Meredith Palmer, Erin Torkelson, Mollie Van Gordon, and myself. At some point between processing dense theoretical texts and crying into tequila shots, these women became sisters and role models, and I am in awe of them all. This collective overlaps with my writing group, which has included Jen Rose Smith, Erin Torkelson, Ashton Wesner, Camilla Hawthorne, Alex Werth, John Elrick, Meredith Palmer, and Brittany Meché. I probably would not have finished this dissertation without these perceptive and encouraging people. Finally, I have received feedback and support from many other contemporaries who include Alessandro Tiberio, Jeffrey Martin, Julia Sizek, Iliaria Giglioli, Shuwei Tsai, Stephen McIssac, and Zahra Hayat, as well as thoughtful advice from those who completed their PhDs before me, such as Julie Klinger, Lindsay Dillon, Shannon Cram, Shaina Potts, Erin Collins, John Stehlin, and Greta Marchesi. I am also grateful to Nick Lee for creating the two maps (Figures 1 & 2).

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# Bolivia and Potosí



Figure 1: Map of Bolivia and the department of Potosí. Cartography courtesy of Nick Lee.

# Norte Potosí



Figure 2: Map of Norte Potosí. Cartography courtesy of Nick Lee.

# Preface

## Wreckage of a Pink Tide

When I first conceived this project seven years ago, Latin Americanists everywhere were captivated by the ‘pink tide’ sweeping across the region. Since the early 2000s, Latin American countries had been electing administrations that proclaimed themselves to be some configuration of socialist, environmentalist, pro-Indigenous, and for the people (*pueblo*). In the spirit of critical encouragement, progressive scholars set to work documenting continuities and ruptures between these new administrations and their neoliberal predecessors. But while we wrote, the political panorama was undergoing a nearly complete inversion. The gradual rise of the far right seemed regionally contained until Jair Bolsonaro’s 2018 presidential victory in Brazil, and then the whole map seemed to have gone from pink to a patchwork of blue and orange. Argentina’s Mauricio Macri, Chile’s Sebastián Piñera, and Colombia’s Ivan Duque are cut from a similar cloth as Bolsonaro, while Ecuador’s Lenin Moreno and Peru’s Martín Vizcarra have both moved rightwards since coming to power. With Venezuela’s economic fiasco, Bolivia appears to be the only country ‘pink’ country left standing.

All of this might beg the question of how or why study Bolivia, a relatively small landlocked country historically located at the bottom of economic and political food chains. Why study a political outlier, the last holdout from a previous era? Even more, why study it from the perspective of a group of people that has been relatively marginal to Bolivia’s leftist project? The margin of the periphery is not the most obvious place from which to discuss global capitalism and nation-building projects.

Yet the margins are precisely where the leftist project is an imperfect fit, where the glue can come unstuck, where the seeds of resentment take root. Indeed, it never made a lot of sense to describe Bolivia’s current administration, led by President Evo Morales, as ‘left’. The country’s 20<sup>th</sup> century history of worker unionism, geopolitical tensions, and nation-building matters enormously, but it does not explain the explosive growth of Indigenous political activism in the last few decades. Similarly, the narrative thread that draws a direct line between Spanish colonialism and the social movements that brought Morales to power is necessary but insufficient. There are no straight lines to be drawn: the ghosts of eras past materialize as much in ‘marginal’ everyday practices as they do in spectacular social uprisings, and those ghosts do not always see eye-to-eye.

For Bolivia’s *cooperativas mineras*, the small-scale ‘mining cooperatives’ whose labor and politics I foreground in this dissertation, both trade unionism and Indigenous political organizing figure large in collective memory and daily life. But these miners are also part of something new: the global rise of ‘Artisanal and Small-Scale Mining’ (ASM), or mining undertaken with relatively minimal mechanization by individuals and collectives for whom mining is often one of many livelihood strategies. As micro-entrepreneurs, small-scale miners are not generally known for progressive political stances, yet Bolivian mining cooperatives have supported Morales’s government since his first successful election in 2005. Not exactly the face of the Morales administration, mining cooperatives nevertheless make up its raggedy extremities, and their history speaks to the limits of the Latin American left more broadly.

Rethinking the constitution of what has been described as the ‘new left’ is key to combatting the rise of the ‘new right.’ Twin features of this new right, in the United States and Europe as much as Latin America, are resurgent nationalism and overt racism. Conspicuous in scaled back minority rights, tightened immigration policies, and infrastructure such as prisons, overpasses, and border walls, racist nationalism is often associated with European fascism of the 1920s-40s. But nationalist sentiment is also seeded into the populism of Latin America’s left, where it appeals to past imaginaries

of nationhood. Often imagined as an ambivalent category that can be articulated with either progressive or exclusionary politics, nationalism always involves drawing lines on a map and lines within a body politic. Nationalism is key to the story I tell about Bolivia, nationalism whose racial and gendered dimensions were folded into the leftist project. Like sedimentary layers, these folds are the substrata on which new political formations develop, and like sedimentary layers they are not as stable as they appear: fault lines develop, and new movements erupt from a seemingly calm surface.

As these metaphors suggest, the nation that I explore in the following pages is about more than people and land. I conceive of nation in three dimensions, extending deep into geological layers beneath the soil, and I am attentive to the *matters* of which nation is composed. In addition to providing a new spatial framework within which to imagine the nation, this approach is driven by an attention to the interplay between nation, race, and nature. While critical approaches to the study of nature and race have tended to focus on living nature – flora and fauna – the non-living subterranean has been an important site of sociocultural and political economic production in Bolivia. Silver, tin, and natural gas have been the literal and metaphorical bedrock of the nation for the last 500 years. My focus is on tin, a commodity extracted from metalliferous veins laced throughout the mountains between the city of Oruro and the northernmost provinces of Potosí. Although the history of the tin industry is often told in strictly economic terms, its emergence was concomitant with a new vision of *mestizo* (mixed-race) nationhood. Protagonized by unions of male *mestizo* miners, this national imaginary remains powerfully influential today. The cooperative miners whom I feature in this dissertation labor in the same hallowed/hollowed shafts that were once excavated by unionized tin miners. As they extract the remnants of a twentieth century metal, cooperative miners' bodies, social organizations, and political desires are shaped by both the material qualities of the ore and the value with which it has been instilled.

The material history of nature is thus integral to the story of nationalism and, with it, the tensions embedded in Morales's 'leftist' administration. In the tin mines of Norte Potosí, colonial and corporatist pasts haunt the present not just as memories but as slag heaps, rusted machinery, and empty underground passageways. These ghosts shape the present in ways that the political category 'left' cannot quite contain.

### **Ghost of June Nash: Methodological Reflections**

Ghosts of political formations past haunt Bolivia's mining cooperatives, but I had my own ghost to contend with when I was conducting fieldwork. Anthropologist June Nash's *We Eat the Mines and the Mines Eat Us* (1979) was based on research conducted mostly in the city of Oruro, but Nash also spent a significant amount of time in Llallagua and Uncía, the twin towns where I was based. Because of this, I often found myself thinking about her while I went about my work. Part of a wave of Marxist anthropology, Nash's book asked why it was that some of the world's strongest workers' unions had formed in the Bolivian tin mines, which appeared to be the extreme periphery of global capitalism. Tracing the threads that bound workers' unions to family and community life, her argument that indigenous cultural practices and domestic labor facilitated collective action in the unions still resonates in Latin American ethnographies today.

Although the unions Nash studied had virtually disappeared within six years of her book's publication, my Bolivian colleagues speak frequently and approvingly about Nash's respectful tone and comprehensive research. It is daunting to imagine covering the same ground – or the same underground – as someone who has already done it so insightfully. Semi-intentionally, I began to use her (or my imagination of her) to evaluate my own research progress. She crossed my mind at the strangest moments: when I was contemplating crawling through a particularly unstable-looking tunnel (would she have taken this risk?), when I looked at the crumbling ruins of the old tin mill (was this

state-of-the-art equipment when she was here?), or when I peered through the dirty windows of the barred-up administrators' office, where I could see stacks of paper left behind decades ago by geologists and engineers (did she speak to whomever once occupied that desk? Did she rifle through those papers when no one was looking?) Nash began to represent a strange mixture of inspiration and impossibility - a goal that, as Bolivians say, remained a horizon rather than a reality.

With this horizon always in mind, I conducted 18 months of fieldwork in Bolivia between 2013 and 2017. About half of this time was spent in Norte Potosí, where I established a weekly rhythm that included regular visits to the many mineshafts scattered around the mountain, the offices of FERECOMINORPO (*Federación Regional de Cooperativas Miners del Norte de Potosí*, Regional Federation of Mining Cooperatives of Norte Potosí), the offices of the seven local mining cooperatives, the university's FPS (*Formación Política Sindical*, Political Union Formation) and Mining Engineering departments, Radio Pio XII, and the Catavi office of the COMIBOL Archives, where I poured over employee files from the 1910s-1930s. Once I had established myself as a regular visitor in these places, I began receiving invitations to participate in local and regional activities, such as political meetings, annual festivals, commemorative ceremonies, fairs, and parades. While participating in – and occasionally helping to organize – these events, I got to know people both connected to and critical of the cooperative mining sector. I followed up with formal interviews, usually conducted in their homes or offices, one of Llallagua's two cafés, or in the tea room of the Hotel Colonial, the ironically named hotel where I rented a long-term room. Following Jacqueline Nassy Brown (2005), I also conducted 'walking interviews,' in which I spoke with people while they toured me through places of significance. Finally, I recorded life histories with two cooperative miners, Rosalia and Modesto,<sup>1</sup> whose candor and hospitality greatly facilitated my research.

I did not intend to spend as much time underground as I did, in part because these mines have a reputation for collapsing and in part because it did not seem appropriate for a me, a white woman taking notes for her dissertation, to trail a group of working men underground all day. But when I started showing up at mineshafts in the mornings in the hopes of getting to know miners while they ate breakfast and prepared for work, it became painfully apparent that everyone was far more interested in showing me their worksites than in discussing their professional trajectories. I bought myself a pair of rubber boots, a helmet, and a lamp and committed myself to going underground. In total, I spent about 20 days underground (between 5-10 hours per trip), during which time I got to know the work process and the workers, both during the one-hour *píjchea* (coca chew) that always precedes a day's work and during 'crawling interviews' through the tunnels that miners jokingly refer to as ants' nest. These underground ventures proved some of the richest parts of my research, a fact that is reflected especially in Chapters 2 and 3.

When I was *not* in Norte Potosí, I was traveling throughout the Bolivian highlands and valleys conducting interviews with earth scientists, policy makers, and researchers and working in a variety of public and private archives. In addition to the COMIBOL archives (in Catavi and El Alto) and the National Archives of Bolivia (ANB), two of the richest archives I worked in belonged to Hans Möeller, a German-Bolivian economist who worked with FENCOMIN (*Federación Nacional de Cooperativas Mineras de Bolivia*, National Federation of Mining Cooperatives of Bolivia) in its early days. I also benefited from libraries held in the Geologists' College and MUSEF (*Museo Nacional de Etnografía y Folklore*, National Museum of Ethnography and Folklore), both in La Paz. Finally, I visited several other mining sites for comparative exposure: Huanuni in Oruro, Teoponte in Norte La Paz, Chuquiuta and Amayapampa in Norte Potosí, Mallku Khota in Norte Potosí, Chorolque/Atocha in Southern Potosí, and of course the Cerro Rico in the city of Potosí.

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<sup>1</sup> These names are pseudonyms. Throughout this dissertation, I will use pseudonyms for all cooperative miners except those who have a public presence and would be otherwise easily identifiable from their political activities.

In the spirit of June Nash's *We Eat the Mines*, there are photos sprinkled throughout the pages of this dissertation. These photos are intended to give a sense of place or illustrate analytical points. The underground shots, in particular, are meant to destabilize the sense of sight: the difficulty of taking pictures in the dark, where flashes glisten off of wet surfaces, parallels the difficulty of knowing and navigating in the dark. Even in the one chapter where I use portraits (Figures 37, 38, 41, and 42, all of Fidel Colque) the emphasis is on the changing background, which is meant to demonstrate the distinct worlds that Fidel occupies as a miner-turned-parliamentarian.

But photos also do work to place the photographer, even when s/he is behind the lens. In *We Eat the Mines*, Nash is the photographer of nearly every photo, so she herself is rarely seen. Her strangeness – a *gringa* living in the Bolivian tin mines - is marked only by the sometimes-quizzical gazes turned towards the camera. But in one photo, by an unknown photographer, Nash appears in the foreground. She is sharing a bench with several other helmet-wearing male miners, and behind her stands a crowd of several dozen more. Everyone's face is turned away from the camera, and they appear to be listening to a speaker located just outside of the shot. In her hands, Nash holds a notebook – the symbol of her trade - that she does not appear to be using. The photo is labeled “Anthropologist attends plenary union meeting” (p. 285).

When I was re-reading Nash's book in Llallagua in early 2016, this photo provoked an uncomfortable shock of recognition. It looked so similar to so many of my personal photos that feature a blond *gringa* – or, as Bolivians say, a *choca* or *choquita* (blondie) - looking ridiculously out of place. Of course, there is a long tradition of anthropologists and other ‘fieldworkers’ taking photos of themselves ‘with the natives’ to assert their ethnographic authority, and such images have been deservedly critiqued (Clifford 1983). But erasing oneself from the research project comes with its own set of ethical quandaries, particularly when it allows the researcher to perform the “god's trick” of appearing to speak from nowhere (Haraway 1987). In my case, as in Nash's, there is no possibility of feigning objectivity. No matter how long I hung around, I remained a source of curiosity rather than a fly on the wall (Figure 3). Not many foreigners come to Llallagua. In fact, some people never stopped calling me *turista* (tourist) even after I had been ‘sight-seeing’ for more than a year. *Gringuita*, *choquita*, *turista*: these names were used interchangeably with *Andreita*, a term of endearment used for Andrea, a very common Bolivian name. The words marked a simultaneous distance and proximity that frankly suited me. The proximity meant that I was invited to parties; the distance meant that I could go home early, before social obligations would allow any *Llallagueños* to leave.





Figure 3: *Choca* attends underground Carnival celebrations. Photo by Fidel Colque. Llallagua, Feb 6, 2016.

When I first began this project, many close friends and acquaintances in Bolivia told me that I was going to get myself into trouble. These warnings were specific to my topic as much as they were to me as a *gringa*. I had already spent time in Bolivia working on a research project about community-run water supply systems in the peri-urban fringes of Cochabamba, and the only danger that anyone had suggested I would encounter was potentially rabid dogs. Cooperative miners, my friends told me, could be dangerous, especially for women. Unionized miners of years past are remembered as masculine in a positive light: they “sacrificed” themselves, both in their underground labors and their armed struggle, for their families, the nation, and the global working-class struggle. Without the direction of the unions, however, cooperative miners’ virility is framed as wild, selfish, and indiscriminately violent. This reputation extends even to Llallagua, as I discovered when an undergraduate engineering student warned about cooperative miners: “*Cuidado, te van a pegar* (be careful, they’re going to hit you.)” In La Paz, so many people warned me about the possibility of rape in the dark underground that I very nearly designed a different project. Cooperative mining, they implied with their concern, necessarily produced predatory men, and these tendencies would go unchecked in the lawless space of the subterranean.

Yet aside from regular comments on my day-to-day appearance, I never encountered a single cooperative miner, man or woman, who embodied the threat I had been warned against. Although whiteness is eroticized in Bolivia, as Andrew Canessa (2012) has shown and as I was able to observe looking at the many pornographic images of white women that decorate underground mining chambers, actually being a white woman among cooperative miners came with more privileges than

dangers. I glued myself to women whenever possible, but I was also able to enter men's spaces with something akin to ease (nothing ever felt fully easy). Moreover, because I was doubly foreign – both from outside the community and outside the country – cooperative miners were less immediately suspicious of me than they are of middle- and upper-class *q'aras* (non-indigenous Bolivians) whom they expect to be *ambientalistas* or *indigenistas* (environmentalists and indigenists), come to decry the ecological and cultural 'contamination' of mining. When I visited the Vice Ministry of Mining Cooperatives, the representative who downloaded data onto my USB actually told me that he would not have given the information to a Bolivian student, since Bolivians were not capable of understanding mining cooperatives outside of the negative discourse that circulates about them. In this case, I managed my immediate guilt by sharing the files with fellow Bolivian researchers, but I went on struggling with my relationship to mining cooperatives and the 'negative discourse' that surrounds them.

As I will unpack in the following chapters, most Bolivian scholars and activists have a not-entirely-unfounded distrust of cooperative miners that made my own project difficult to design and communicate. Having spoken with these experts before writing my research proposal, I arrived in Bolivia in June 2013 intent on understanding how it was that mining cooperatives – which I understood to be pro-extractivist, anti-environmentalist, and individualistic – could be so embedded within Bolivia's putatively indigenous, socialist, and environmentalist plurinational state. Several months into my ethnographic work, this plan was in shambles. Not only were cooperative miners less rapacious than I had been led to believe, but they also articulated a clear claim on subterranean resources justified by inter-generational labor and ancestral ownership. These arguments challenged my own political commitments in ways that made me squirm, and I found myself growing jealous of researchers studying 'progressive social movements' with which they could be in easy solidarity, or at least more complicated 'fluidarity' (Nelson 1999). The people I worked with asked me to help them develop partnerships with Canadian mining companies. In November 2016, I even found myself on the phone to the Prospectors' and Developers' Association of Canada (PDAC) asking what it would take for an investor to be willing to work with Llallagua's mining cooperatives. Apparently, the key would be a comprehensive geological map of the area: any investors would need to *see* what they were investing in. No such map exists, and the idea was tabled, much to my relief.

Cooperative miners further challenged my research plan by shifting political allegiances continuously throughout my time in Bolivia. They went from allies of the state to enemies and back again. This elasticity pushed me to think more deeply about the dynamics between cooperative mining, state formation, and this new formation called 'plurinationality.' Rather than just a political alliance between an economic sector and a political party, how were cooperative miners articulated historically and at present, and how might their experience speak to the fault lines of the plurinational project? This reformulation of the question sent me deep into the underground, where I followed cooperative miners tracing veins of ore through the belly of the earth. The fractured vertical space of this underground world became not only the arena of research, but actually the central object of inquiry.

Rather than studying mining cooperatives, I wound up studying the politics of the subsoil, with cooperative miners as my guide. They pushed me backwards in time, forcing me to engage not only the relatively recent history of miners' unions but also the deeper histories of geological mapping and knowledge production in colonial and republican Bolivia. They also pushed me outwards across space, encouraging me to examine the subsoil's connections not just to the central state but also to regional agrarian communities. Although most people writing about mining in Bolivia have done so in political economic terms, the cooperatives' frequent invocations of community and nation encouraged me to begin tracing the subsoil in relation to nation-building projects.

I am not certain that either cooperative miners nor Bolivian political economists would agree with anything I have argued here. By trying to bring together two traditions of Andean thought –

political economic theory, which is most often trained on the mining sector, and theories of culture, race, and nation, which are most often used to analyze indigenous and agrarian politics – I have had to make my peace with the possibility of failing to satisfy anyone. As cooperative miner Fidel Colque often said, whenever he was at a loss for an answer to one of my questions, *así trabajamos, Andreita*. This is how we work, and it isn't always pretty.

## Introduction

# Faults

## *Patria* and Plurinationalism

In March 2016, I rested on a park bench in Sopocachi, a trendy neighborhood in La Paz known for its upscale cafes, bars, and activist communities, and opened a book I had just purchased: the first of five volumes of Guillermo Lora's *History of the Bolivian Workers' Movement*. Lora was a Trotskyist historian who came of age in the Bolivian tin belt in the 1940s, and several acquaintances had made it clear that his books were required reading for anyone hoping to study mining in Bolivia. I was pleased to have finally found the whole series tucked away in an alley of vendors known for their informal reprints of Bolivian non-fiction.

I had read less than two pages, however, before the man on the bench next to me grew curious about why a *gringa* was reading Bolivian labor history. One of the older middle-class *paceños* who sit in the park every afternoon to sun themselves, this man had a distinctly grandfatherly presence, marked by a flat cap, knitted sweater, and gray bottle brush moustache. He leaned forward as he spoke, eager to tell me that his father had been an engineer in the tin mines and that he himself had been radicalized listening to union leaders' speeches as a young man.

Smiling politely, I explained that I was interested in the workers' movement, but that the main focus of my research was the *cooperativas mineras* (mining cooperatives), which have far surpassed the miners' unions in membership numbers since the 1985 closure of the state mining corporation. The change on the man's face was dramatic. He leaned away, the edges of his moustache bristling. "Why would you want to study those assholes (*cabrones*)?" he hissed. "They're not really cooperatives, you know. They're thieves – they take what belongs to everyone. They are thieves of *patria*." He rotated his whole body away from me, suddenly very interested in the pigeons that were flocking around us, and refused to engage me further.

Inadvertently, this man whose name I never learned had captured the central dynamic of this dissertation: the relationship between mining cooperatives and the *patria* that they are supposedly looting. The word *patria* is usually translated as "country," but it derives from the Latin word *pater* (father) and is sometimes rendered as "fatherland." This Latin root is shared with the word *patrimonio* (patrimony), which in Bolivia is frequently used to discuss natural resources that supposedly belong to all citizens, constitutionally and discursively. The etymological entanglement of *patria* and *patrimonio* speaks to the conceptual entanglement of nation and nature, threaded together by traditions of patrilineal inheritance as much as political machinations. In Bolivia, the nature that matters most – economically, geopolitically, socioculturally – is what lies beneath the national soil: metallogenic ores and hydrocarbon deposits. How did cooperative miners emerge as thieves of subterranean nature, a supposedly shared national inheritance? How are these 'thieves' transforming the nation they are supposedly plundering?

In this dissertation, I offer a materialist account of the relationship between nation, nature, and political economy in Bolivia. My analysis draws on and departs from Latin America's rich political economic tradition, which has provided the language in which most stories of Bolivian resource extraction have been told. Using the history and politics of the mining cooperatives as a window, I rethink key concepts in political economy in relation to the matters of mining: strata and resource, mountain and class, tin and labor, machine and value. In so doing, I argue that the political economy of resource extraction in Bolivia cannot be understood outside of either the *matter* of nature or the historical intertwining of nation, race, and gender. This is a material history rather than historical

materialism. I begin with the stuff of nature and the people who work with it as laborers, scientists, and political leaders. Colonial encounters of rock and laborers created the conditions of possibility for the consolidation of capitalist extraction, and these histories are key to understanding the political formations of the contemporary era.

Understanding these formations is politically pressing beyond Bolivia. Since the 2005 election of Evo Morales, the country's first Indigenous-identifying president, Bolivia has been hailed as a place of hope for progressives convinced that the future of a world mired in economic, social, and environmental crisis depends on Indigenous political thought and action. In 2009, Morales's party, the MAS (*Movimiento al Socialismo*, Movement Towards Socialism), ushered in a groundbreaking constitution that transformed the country from a republic into a "Plurinational State." This new name signalled a reorganized relationship between the state and Bolivia's many Indigenous, Afrobolivian, and intercultural nations and peoples (*pueblos*).<sup>1</sup> Indigenous values feature prominently in the new constitution, Indigenous ceremonies are now integral to state functions, and Indigenous conceptions of *Pachamama* (Earth Mother) form the foundation of environmental law (Postero 2017).

Given all of this, it might be assumed that resource extraction has been retooled to align with the goals of Indigenous territorial autonomy. For example, the Bolivian state might have enshrined the principle of "Free, Prior, and Informed Consent" (FPIC), a right protected by both the International Labour Organization's Convention Indigenous and Tribal Peoples Convention (C169, adopted 1989) and the UN Declaration on the Right of Indigenous Peoples (adopted 2007), or it might have devolved control over natural resources to Indigenous territorial governments. None of this has transpired. The new constitution only guarantees free, prior, and informed *consultation* (CPE, 2009, Art. 352), not consent. More importantly, the Bolivian state retains control over all subterranean resources, including but not limited to minerals and hydrocarbons (CPE 2009, Articles 349, 359, 369). This is not unusual to Bolivia – most Latin American countries have divided surface and subsurface property rights, with the latter held by the state – but it is the condition of possibility for ongoing dispossession of supposedly autonomous Indigenous communities. As Eve Tuck has written about the division of surface and subsurface rights during the Alaska Native Claims Settlement Act (ANCSA) of 1971, "The invention of subsurface estates is a remaking of *terra nullius*, as if somehow land a few inches below ground is uninhabited; it is a re-creation of the doctrine of discovery where there were/are already people" (Tuck 2014, 252). As I argue in Chapter 1, this invention marks a vertical limitation on Indigenous sovereignty.

Rather than limiting or devolving extractive industries, Morales's government capitalized on the decade-long commodity boom that coincided with his election. In his first year in office, he nationalized the natural gas industry (Kaup 2008), and rents from this sector have underwritten his transformative social programming, including social grants and rural construction projects. The same was true, to greater and lesser extents, in contexts such as Ecuador, Venezuela, Brazil, and Chile. As Uruguayan sociologist Eduardo Gudynas (2009) argues, the Latin American left developed an economy based on "neo-extractivism," which he defines as state-led extraction used to benefit "the people" in ways that legitimate both the administration and the extractive economy itself. Even in the mining sector, where state entities are not actually running most of the extractive projects, the state

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<sup>1</sup> "Intercultural" is the term commonly used for Quechua and Aymara people who have migrated from the highlands to the lowlands, where they often practice agriculture on a much larger scale than they did on the altiplano. Afrobolivians are descendants of enslaved people brought from Africa to work in the silver mines and smelter of Potosí starting in the early 1600s. Following emancipation in 1826, many Afrobolivians moved to the Yungas, a semitropical region near La Paz. Today, there are approximately 23,000 Afrobolivians (0.2% of the population) living primarily between the Yungas, La Paz-El Alto, and Santa Cruz (Zambrana B. 2014).

still authorizes and regulates extractive permits. Through both direct and indirect involvement, the state has strengthened its control over the subsoil, often at the expense of surface-level communities.

Plurinational Bolivia is thus characterized by a tension between state-led (and state-authorized) resource extraction and a commitment to decentralizing resource governance in a way that prioritizes Indigenous territorial rights. It is with this tension in mind that Morales's critics argue that the *real* subjects of the Plurinational State are neither Indigenous peoples nor unionized workers but rather the "lumpen" masses: informal workers, merchants, and poor (and not-so-poor) rural "entrepreneurs". These petty capitalists are importing cheap goods from China, cutting down old-growth forests to cultivate coca, and transforming fields into toxic wastelands as they search for metal ores. Although they do not feature in the new constitution, such "savage capitalists" are thought to be the economic beneficiaries of Morales's process of change (*proceso de cambio*). This creates a strange irony: the very people who do not seem to fit the language of the constitution are the ones benefiting from the plurinational state's economic program. So, if these are the real subjects of the plurinational state, might not an evaluation of the state start with *their* formation, their self-proclaimed interests, and their style of political engagement?

In fact, mining cooperatives embody the tension between plurinationalism and extractivism. With connections to both agrarian and market economies, these associations of small-scale miners have been involved in both defining the contours of the plurinational constitution and writing mining laws that facilitate resource extraction. Just as importantly, they have a long history of being in-between subjects, perpetually caught between both class categories of worker/peasant and racial categories of Indigenous/*mestizo* (mixed race). They have fallen on the outside of successive Bolivian nation-building projects, including this plurinational one. Usually interpreted as a conservative group that rose from the ashes of the country's once famously progressive miners' unions in the 1980s, *cooperativistas* are discursively figured as internal outsiders, a group of not-quite-rights whose very presence threatens the stability of national imaginaries. They *are* the fault lines of the Plurinational State, and following them will allow me to rework political economy in ways that take seriously the material legacies of nation building and the production of social difference.

As demonstrated in my conversation in the park of La Paz, most Bolivians are not very fond of cooperative miners. Despite their name, mining cooperatives are not exactly "cooperative" in structure: although they hold their concessions collectively, they labor individually or in small groups, rarely sharing supplies or profits and sometimes hiring third-party workers to labor on their behalves (Poveda Ávila 2014, Francescone and Díaz 2013). Moreover, because they are legally considered "not-for-profit" organizations, they are exempt from paying taxes beyond royalties, despite profiting from resources that technically belong to all Bolivians (CPE, Art 349: I). For these reasons, cooperative miners are often portrayed in academic and popular presses as individualistic "savage capitalists," willing to gamble their lives and lands for a chance of finding their fortune (Neri and Czaplicki 2016; Velasco Portillo 2014). At present, there are an estimated 122,000 such thieves operating in Bolivia (Mamani 2018), and their numbers are growing steadily.

Throughout this dissertation, I use the term *geosocial formations* to explore the relationship between these thieves and the national subsoil in which they work. I borrow this term from Kathryn Yusoff and Nigel Clark (2017), but I use it differently. As they have conceived the phrase, "geosocial formation" invokes the contemporary shapes taken by sedimented historical co-becomings of society and geological matter. They use the term to describe a global geosociality, in which human societies are made possible and limited by the geological substance of the earth, but I have a different goal in mind. As an analytic in this dissertation, geosocial formation speaks to how specific geological substances come into being concurrently with specific social constellations that extend from deep into the earth to the national parliament to the global marketplace. À la Gabrielle Hecht, my aim is to hold the global and the particular together in the same analytic plane (Hecht 2018: 112). The idea is not to

lose sight of the global, but rather to follow the seams that stitch together the very specific material qualities of nature – as resource and as more than resource – and the social worlds that emerge in relation to it. I have no intention of following the commodity from the point of production to the point of sale, but I am interested in how the commodity’s material and meaningful qualities reverberate far beyond itself. For instance, I am interested in how a cooperative miner’s daily labors in a tin mine affect his or her political stances, and how these stances manifest on a national political stage. Through such mundane pathways, I trace a geosocial formation specific to Bolivian tin, a metal that was constitutive of industrial production and military exploits from the late-1800s to the late-1900s. In Bolivia, it dominated the national economy from its discovery, at the turn of the 20<sup>th</sup> century, to the crash of the tin market in the mid-1980s. But the story of tin mining in Bolivia must start centuries earlier, since the geosocial crystals of the nascent tin formation – the elemental relations, knowledges, and infrastructures of extraction – had colonial and early republican roots.

Through my story of geosocial tin formations, I argue that the tension between plurinationalism and resource nationalism in Bolivia has a *vertical* spatiality that reflects a much older tension between the politics of land and the politics of subsoil. This tension is contained in the hyphen at the center of “nation-state.” The vertical depths of the Bolivian subterranean has been produced as state space and infused with dreams of economic progress. The horizontal plane of the surface, on the other hand, is imagined in relation to nation: a primordial, rooted connection between people and land (Gilroy, 1987; Malkki, 1992). In plurinational Bolivia, land can be owned privately or collectively and is frequently imbued with place-specific meaning – a kind of unity amid diversity – while the depths below remain rational, state-managed space, thick with racialized and gendered meanings notions of progress stemming from the 19<sup>th</sup> and 20<sup>th</sup> centuries. As boundary crossers – literally crossing the boundary between soil and subsoil – cooperative miners expose both the raw friction between these realms as much as their unexpected unity. By tracing the influence of material nature and buried places on the more familiar terrain of resource extraction and contestation, I am rethinking the spatial boundaries of political economy in Latin America and beyond (see also Bebbington and Bury 2013).

In what remains of this introductory chapter, I will begin by elaborating Bolivia’s contemporary political and economic situation, focusing on the ways that the politics of gender, race, and nation have intertwined with both attitudes towards the extractivist economic model. In the following two sections, I go deep into Bolivia’s colonial history to track histories of geology, labor segregation, and nation-building efforts, demonstrating how colonial and geological histories set the stage for the rise of capitalist resource extraction and, with it, the contemporary separations between proud labor unions, “noble” Indigenous communities, and scrappy cooperative miners. Finally, I conclude by giving a brief outline of each of my subsequent chapters.

## **Bolivia’s Plural Nation and Extractivist State**

Bolivia’s contemporary political situation is alternately described as “decolonial, plurinational, postneoliberal” and “extractivist, authoritarian, duplicitous.” How can it be both? In this section, I examine the prominent features of the Extractivist Plurinational State, pointing specifically at the relationship between so-called “identity politics” and political economy.

Since the turn of the 21<sup>st</sup> century, Bolivia has experienced a shift that is sometimes described as an “Indigenous awakening” (Canessa 2007). In the 2001 census,<sup>2</sup> 62% of people self-identified

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<sup>2</sup> This was the first census since the 1952 National Revolution to include a question about ethnic-racial identity, since all Bolivians had officially been declared *mestizo* in that year. This makes it hard to compare the 2001 census to earlier senses of identity.

Indigenous (Nicolas and Quisbert 2014), and from 2000-2005 a wave of social uprisings swept across the country, bookended by the Cochabamba water war on one end and Morales's election on the other (Gutiérrez Aguilar 2008). This was a period of popular struggle, in the sense that it brought together a diverse set of Indigenous nations, trade unionists, neighborhood associations, and informal workers, but its proudly Indigenous character is what was recorded by international media outlets. The president who emerged victorious was emblematic of this political shift: an Aymara speaker who led the *cocaleros*' (coca growers') unions in the Cochabamba valleys and who makes radical speeches about climate change while wearing patterned knit sweaters and hand-woven jackets. As of May 2019, Morales has been in power for thirteen years and counting. While a few decades ago Orin Starn (1991) could critique Andean scholars for "missing the revolution" in Peru because they were too focused on cultural stasis, now scholars flock to Bolivia to witness Indigenous revolutionary struggle. As surrounding Latin American countries swing back towards the right, Bolivia's trajectory is all the more important for progressive political thinkers.

The notion of plurality figures centrally in new imaginations of nationhood under Morales. This is demonstrated in the preamble of the new constitution:

We, the Bolivian people, of **plural composition**, from the depths of history, inspired by the struggles of the past, by the anti-colonial Indigenous uprising, and in independence, by the popular struggles of liberation, by the Indigenous, social and labor marches, by the water and October wars, by the struggles for land and territory, construct a new State in memory of our martyrs.

A State based on respect and equality for all, on principles of sovereignty, dignity, interdependence, solidarity, harmony, and equity in the distribution and redistribution of the social wealth, where the search for a good life (*vivir bien*) predominates; based on respect for the **economic, social, juridical, political and cultural pluralism** of the inhabitants of this land; and on collective coexistence with access to water, work, education, health and housing for all (CPE 2009, Preamble, emphasis added)

The new Plurinational State brought into being by the constitution is supposed to be capable of articulating multiple nations, specifically the 36 listed "Indigenous nations and peoples" (CPE 2009, Article 5)<sup>3</sup> as well as intercultural and Afrobolivian communities (Article 3). The prominence of plurality is accompanied by an emphasis on harmony and complementarity - borrowed Aymara values - which enables a capacious interpretation of nation. If balanced plurality is the defining quality of Bolivian-ness, then, theoretically, no one should be excluded.

In reality, exclusions have happened, and they have most often been associated with resource extraction. In 2011, a massive conflict emerged after Morales announced plans to build a highway from the tropics of Cochabamba to the Brazilian border, slated to pass directly through lowland Indigenous territories and a national park called TIPNIS (*Territorio Indígena y Parque Nacional Isiboro Sécore*, Isiboro Sécore Indigenous Territory and National Park) (Fabricant and Postero 2015, Burman 2015). Since then, Indigenous federations from both the highlands (CONAMAQ) and the lowlands (CIDOB) have denounced the gap between Morales's discourse and action. TIPNIS is not an isolated incident, although it was an important flashpoint: across the board, extraction of minerals, hydrocarbons, and export-oriented agriculture has been steadily climbing (Anthias 2018). Some of this

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<sup>3</sup> The Indigenous nations recognized in the constitution are: Araona, Aymara, Ayoreo, Baure, Canichana, Cavineño, Cayubaba, Chácobo, Chipaya, Chiquitano, Esse Ejja, Guaraní, Guarasugwe, Guarayo, Itonama, Joaquiniano, Kallawaya, Leco, Machinerí, Maropa, Mojeño, Moré, Masetén, Movima, Murato, Pacahuara, Quechua, Sirionó, Tacana, Tapiete, Tsimane/Chiman, Urus, Weenayek, Yaminagua, Yampara, Yuki, Yuracaré, and Yuracaré – Mojeño.



has been state-led, most notably in the natural gas sector, which Morales nationalized during his first year in office. This was a strategic move since natural gas not only provides the greatest revenue stream in the country but is also symbolically important: conflicts surrounding the privatization and export of natural gas sparked the “Gas War” that unseated President Sánchez de Lozada in 2003 (Perreault 2006, Lazar 2008).<sup>4</sup> Mining and large-scale agriculture, however, remain mostly private operations: only a handful of mines have been nationalized, and none of the agribusinesses. In 2016, 82% of mining production was undertaken by private companies, with mining cooperatives coming in at 14.6% and the state mining company producing a measly 3.4% (Filomeno 2016). Business has been booming in both mining and agriculture, encouraged by commodity prices that rose precipitously in the first decade of the 21<sup>st</sup> century, but it has been state-supported rather than state-led. The president who was supposed to represent the indigenization of the state is now popular among agribusiness owners in lowland Santa Cruz.

In the context of increasing disappointment with Morales and his “process of change,” the question of nation and national identity is once again on the table. In the 2012 census, only 40% self-identified as Indigenous, which generated a storm of controversy when the results were released in 2013. How could it be that Indigenous peoples were the minority within the Plurinational State? As Vincent Nicolas and Pablo Quisbert (2014) have taken great pains to show, the “statistical rebellion” was in part the result of the way the question was framed on the census,<sup>5</sup> but they also point out that there was an emerging argument for including a “mestizo” category on the census. They argue that this demand was denied in order to maintain coherence between the ethnic groups recognized in the Constitution and the census, which would in turn bolster the legitimacy of the Plurinational State (p. 92). Whether or not this is the case, there remains the question of what was driving the demand for a *mestizo* category, especially so few years after the passage of the constitution.

In the aftermath of the census, liberal historian and former president Carlos Mesa waded enthusiastically into public debate, arguing that the low level of Indigenous self-identification was the result of a *mestizo* majority that could not identify as such in the census. In a radio interview, he argued:

It makes no sense that, in a question about self-identification with a culture, community, or ethnicity, nearly half of Bolivians will have to respond “*ninguno*” (none). The concept of “*ninguno*” is something unacceptable within a census... [It] is *ninguneo* (belittlement) (Interview Radio Fides, qt. on Eju TV, 2012).<sup>6</sup>

Mesa and Vice President Alvaro García Linera proceeded to lock horns in an angry series of exchanges about the relationship between nation and race. Mesa’s book *La Sirena y el Charango: Ensayo sobre el Mestizaje* (2013) demanded a re-writing of the constitution to recognize the country’s *mestizo* culture,

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<sup>4</sup> Although even in the natural gas sector, nationalization was more like a “hostile takeover”: the state simply purchased 51% of company shares (Kaup 2010).

<sup>5</sup> Whereas in the 2001 census the question was, “Do you consider yourself part of any of the following originary or Indigenous communities?”, in the 2012 census it had been rephrased as “As a Bolivian, do you belong to any Indigenous Originary Campesino or Afrobolivian nation or community?” By beginning the question with “as a Bolivian,” the census automatically made Indigenous identity subordinate to national identity. Moreover, although it sounded more inclusive, few Indigenous communities used the term “Indigenous Originary Campesino nation,” and few urban Indigenous people recognized themselves in a label that included “campesino.” Finally, the shift from a question of subjective identification (“do you consider yourself?”) to a question of objective belonging (“do you belong to?”) could have been a major factor in the decline (Nicolas and Quisbert 2014). All of these semantic distinctions point to the difficulty of defining the relationship between nation and Indigenous communities, but more importantly they show how the categories of indigeneity have become conceptually purified since Morales came to power.

<sup>6</sup> Mesa’s language of “self-identification” strangely echoes the language used in ILO 169 and the UN Declaration on the Rights of Indigenous Peoples, which shows how much this framing of belonging has entered into everyday politics.

which he held would not negate the notion of plurality of cultures and ethnicities. In response, García Linera wrote *Identidad Boliviana: Nación, Mestizaje, Plurinacionalidad* (2014), which argues that fewer people identify as Indigenous because they no longer need to define themselves in opposition to the state. Instead, the state has become the articulator of their ethnic and cultural identities so they can be Bolivian alone. In this formulation, indigeneity is absolutely tethered to the Plurinational State: whereas Indigenous peoples once sought recognition *from* the state, the state now requires Indigenous peoples to give expression to its constitutional categories and thus affirm the state itself. As Bolivian sociologist Silvia Rivera Cusicanqui (2014) put it in her disgusted response to the Mesa-García Linera census debate: “The power game that the State represents for Indigenous ‘nations’ only allows one winner and causes an oppressive cascade of territorial totalization and cultural essentialism.”

This is the context in which cooperative miners appear as subjects-out-of-place and yet strangely central. The history of mining cooperatives, as I explain in more detail in Chapter 2, is intertwined with both the boom-and-bust cycle of the mineral market and the labor laws that regulated Indigenous peoples’ participation in the economy. Far from informal conglomerates of surplus laborers, mining cooperatives have received formal recognition since the 1958 passage of Law of Cooperative Societies, and they were eligible to receive government-backed loans from the Mining Bank of Bolivia starting in the 1930s (Poveda Ávila 2014). Today, they are listed in the constitution alongside the state and private mining divisions as recognized “productive actors” in the mining sector, they are close personal allies of the president, they have sent members to parliament and the senate, and they participate in the drafting of laws affecting the mining sector. What are these thieves of nation doing inside the state? In the following two sections I provide the necessary background to answer that question.

## Matters of Nation and Ore

A material history of political economy in Bolivia must begin well before political economy itself. While scholars of Latin America and the Caribbean have long explored the relationship between colonialism and the rise of capitalism (Gunder Frank 1967; Laclau 1971), I argue that capitalist relations in Latin American— and in a sense, capitalism more broadly — was shaped by socio-material relations that historically preempt capitalism, and that these prior histories shape political economy today. In this section, I will move from a consideration of historical materialism, “new materialisms” (and its limits), and geographies of vertical space.

Taking as their starting point the material conditions of society — i.e. the social relations of production and reproduction — historical materialists posit a continuous dialectical relationship between the material world and the mental categories that people use to understand the world. Put differently, such an approach aims to apprehend how categories of thought have been formed historically in relation to the actually existing worlds of economic production (Hall 2003, Ollman 2003). The *material* world — by which Marx means the forces and relations of production — fundamentally shapes history:

The mode of production of material life conditions the general process of social, political and intellectual life. **It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness.** At a certain stage of development, the material productive forces of society come into conflict with the existing relations of production or — this merely expresses the same thing in legal terms — with the property relations within the framework of which they have operated hitherto. From forms of development of the productive forces these relations turn into their fetters. Then begins an era of social revolution (Marx 1977[1859], emphasis added).

The theme of labor is important here, and throughout this dissertation. It is through labor that Marx understood people to be transforming nature, building social relations, and developing themselves as conscious workers. Labor thus emerged as a highly ambivalent category, used both to oppress and to unite in emancipatory struggle. Marx's famous line – “What the bourgeoisie therefore produces, above all, are its own grave-diggers” (Marx 1998[1848]) – might be true, to a point, but it fails to consider the varieties of labor that existed in colonial capitalism and the erasures that the emphasis on labor entailed.

In Bolivia, historical materialism is the dominant theoretical body through which questions of mining, state, and consciousness building are understood – not only by social scientists, but also by many workers and casual commentators. Marxism and Trotskyism provide many of the “folk categories” through which people interpret the world around them, particularly in relation to mining. A rich body of theoretical and historical work has been produced in this vein, which traces the connections between the labors of mining and imperial-state collusion that robbed Bolivia of its patrimony (Lora 1946, Zavaleta Mercado 1986, Ferreira 2010). Trotsky was an especially appealing theorist for Bolivian miners, since according to him “backwards” countries did not need to pass through the same stages of development as “advanced” countries. The bourgeoisie of what he called “semicolonial” countries were too compromised to undertake a proper bourgeois revolution; they had arrived late to the table to divide global resources and would always end up seeking alliances with imperialists. Instead, the proletariat had to lead a proletariat-peasant alliance to a complete defeat of the bourgeoisie (Trotsky 2010[1930]). As Javo Ferreira, prominent Bolivian Trotskyist, explained to me over a hot *api* (sweet corn drink), Gramsci is a theorist for countries in the heart of capitalism, whereas Trotsky is more suitable for the semicolonial peripheries (Interview, La Paz, 17 February 2016).

This theoretical perspective is actually rooted in the tin mines of Oruro, Huanuni, and Llallagua-Uncía, where the Bolivian workers' movement took off in the early 1900s. At this time, Bolivia's economic epicenter was shifting northwards from the silver mines of Potosí to the tin mines of Oruro. Industrializing Europe and North America hungered for tin, and the Cornwall tin mines were on the decline. Everyone was on the hunt for tin, and its discovery in Bolivia precipitated a 20-year economic expansion led by just three “tin barons”: Simón I. Patiño, Mauricio Hochschild, and Carlos Víctor Aramayo (Rivera Cusicanqui 1987: 41). Although Bolivia has a much longer history of artisan-led anarcho-sindicalism, which laid some of the groundwork for the nascent workers' movement (Rodríguez García 2012, Lehm and Rivera Cusicanqui 2005), the catalysts arrived on the railroads: railway workers from Chile and Argentina, already deeply committed to Marxist and Trotskyist labor organizing (Smale 2010). They shared their analyses and their books with the tin miners, and by the 1920s the tin miners' unions were some of the strongest in Latin America.

But the matter *with* which and *in* which these miners were laboring – metallogenic ore, sedimentary rock, tools, and the architecture of engineered underground space - always gets short shrift in historical materialist analyses. The “material conditions” of labor has always been important for historical materialists, but their understanding of materiality does not usually accord any historicity or productivity to nature in its own right. A “new” approach to materialisms takes matter as strikingly different from the materiality of Hegel and Marx: rather than a condensed site of social relations, as with Marx's commodity, matter for the new materialists is “vibrant, vital, energetic, lively, quivering, vibratory, evanescent, and efflucescent” (Bennett 2010, p. 112). The point of this long list of adjectives is to bring some sense of activity (rather than mere re-activity) to matter, which is usually assumed to be passive, inert, or - at best – resistant (Barry 2012, Bakker and Bridge 2006). This approach to nature disturbs the Christian-enlightenment theories of “the human” as defined by a movement out of nature and into *polis* (Braun et al., 2010). It also reinvests meaning into “technical” processes that have been

epistemologically separated from the political sphere (Mitchell 2002). As Native American and Indigenous Studies scholars have made clear, however, this approach to materiality is neither particularly new nor particularly comprehensive (Todd 2016, TallBear 2017). Although at its most expansive it takes seriously the political constitution of race, gender, and sexuality through the animacies of everyday objects (Chen, 2012; Alaimo and Hekman 2008), new materialist theories tend to revel in European political philosophy while ignoring the fact that “indigenous metaphysics” have long attended to relations not just humans and nonhumans but also the immaterial – spirits, earth beings, energies, and so on (TallBear 2017, p. 191; see also de la Cadena 2010). In privileging the material world over the immaterial, there is an inherent danger in slipping into positivist empiricism or assuming that what can be sensorially experienced is the same as what can be known.

When I discuss *geo-social formations*, I am taking as my starting point the places of encounter between the stuff of mining: the matters of flesh, rock, ore, dynamite, chemicals, and machines, among others. The mine is teeming with human life: *perforistas* who encounter the rockface with drills, *barreteros* who use pickaxes to pry open new veins, geologists and their scouts who mark the passage of veins with painted arrows, and mining engineers who devise ways to prop up the rock that yawns above them. This sociality is unevenly distributed across three-dimensional space, extending deep into the earth’s crust, upwards into slag heaps and concentration plants, and outwards across downstream fields and urban areas. I show how this vertical and horizontal space has been stratified by “natural” and social forces, and how they, in turn, produce geosocial communities. This involves both a re-incorporation of nature into history and a historicization of nature. This latter point is key to resisting the slide towards positivist empiricism. Matter is not a natural, pre-existing surface overlain by social interpretations or cultural constructs; instead, matter can be understood as an effect of power, brought into being through the very categories that regulate it (Butler, 1993). Neither tin nor tin miners, for example, pre-exist their encounters with one another. They come into being through a variety of knowledges and practices, none of which are *only* about tin or mining. Rather, the practices and knowledges of mining emerged in tandem with ideas about race, gender, and nation; supposedly a-political production processes were always already suffused with nationalist ideals and exclusions.

I pair this supposedly new attention to the politics of matter with recent approaches to geology and vertical spatiality (Braun 2000, Weisman 2007, Elden 2013, Bridge 2013). While political analyses are usually confined to the surface of the earth, recent studies have focused on the depths and heights of social relations, such as drone warfare, secret tunnels, high-rise construction, and geological prospecting. The non-human elements of these vertical studies demand reconsideration of the politics of architecture and engineering as well as the humanity’s relationship to geological time. The newly coined “political geology” (Bobbette and Donovan 2019) emerges out of political geography to engage the vertical dimensions of global “geo”-politics, adding airspace and subterranean to state borders as important sites of struggle for sovereignty.

In the Bolivian context of plurinationalism, the horizontal tendencies of political geography become even more troublesome, given that the subsoil remains state territory even when the land above it is autonomously governed. In his essay *Articulations of Complexity* (2007), Bolivian scholar and erstwhile supporter of Morales Raúl Prada Alcoreza traces a spatial history of Bolivia that shows how different institutional maps were created on top of the substrate of former cartographies. The Plurinational State, for him, “is organized from a new institutional map, a complex map, which recovers the alternative institutional forms, articulating the political map in multiple dimensions” (12). In other words, the pluri-nation is achieved “through the articulation of multiple histories and geographies of decolonizing struggle” (Gustafson 2009, 1002). Prada’s allusions to map-making are metaphorical, but they demonstrate the extent to which “nation” is imagined in relationship to land, or the surface of the earth. Indeed, plurinationalism is often conceived in terms of “horizontality,” which does not only invoke a flat political relationship between the central state and its many

constituent nations, but also a two-dimensional understanding of nation as – at its most complex – a series of overlapping two-dimensional sheets, a depthless “manipulable cartography of forces” (ibid, 1003). Given interwoven histories of nation and nature – and in Bolivia, particularly subterranean nature – such two-dimensional interpretations of plurinationalism occlude not only an important site of national formation but also the political economic relationship between nature and nation-state.

The second half of this dissertation’s title, *vertical politics of plurinational Bolivia*, draws attention to the material space beneath the surface of the earth, to the subterranean depths which have been so economically contested and within which generations of Bolivians have been politically formed. But it also draws attention to the hierarchical patterns of government that have emerged within the Plurinational State. Rather than a flat social relationship between the state and the plurality of nations, rural leaders are now invited to climb social ladders to access positions of power within the state. The two senses of verticality – physical and metaphorical – are tightly intertwined, as will become apparent.

### **Nature, Race, Nation in Bolivia**

Race, nation, and nature emerged as historically conjoined categories in Latin America, and not only Latin America: despite Benedict Anderson’s assertions that “nationalism thinks in terms of historical destinies, while racism dreams of eternal contaminations” and that “dreams of racism actually have their origins in ideologies of class rather than nation” (Anderson 1983: 136), in practice national unity has usually been forged along lines of inclusion/exclusion that create endless “enemies within” and cement an isomorphism between nation and race (Gilroy 1987). Nationalisms traffic in their own distinction from one another (Chatterjee 1993), but these distinctions are rarely meaningful to all of the nation’s population – and they are often downright threatening to some (Goswami 2004; Hart 2014).

In the early 16<sup>th</sup> century, Bolivia was part of the Incan empire and the basic unit of government was the *ayllu*, a territorialized society with a nested, rotational political system and non-contiguous lands that historian Herbert S. Klein (1993) compares to an archipelago. The *ayllus* were all part of the network of Incan tributaries, which were expected to labor for the Incan empire for a set number of days per year. This obligation was called *mit’a*, which means “turn” in Quechua, the lingua franca of the Incan empire (Kohl and Farthing 2006: 37). When the Spanish *conquistadores* arrived in 1532, they assumed control over the Incan empire and appointed Indigenous elites as *caciques*, who were in charge of local government (Postero 2007: 27). Starting in 1569, *reducciones*, or resettlement programs, forced dispersed Indigenous households into concentrated communities where their labor could be more easily taxed. This labor was extracted under the same name as the Incan system – the *mita* – but it was used in silver mines rather than fields. At any given time one-seventh of all adult males were expected to be working in the silver mines of Potosí; often their wives and families went with them (Silverblatt 1987). The inhuman working conditions of the silver mines resulted in the deaths of more than eight million people (Galeano 1973).

This history might seem very far removed from contemporary cooperative miners, but it defined a series of labor and identity categories that are still operational today. To justify their violent system of labor taxation, the Spanish sorted people with logics derived from Christian senses of nature and human exceptionalism. In its European formulation, “nature” is often said to have two meanings: external nature, or the realm of non-human objects and processes considered outside of society, and internal nature, which refers broadly to “human nature” with all of the compulsions, desires, and struggles that are assumed to naturally adhere within the human-as-animal (Smith 1984). For the Spanish, the distance between those two natures became the basis on which they distinguished between humans (those with souls) and animals (those without) (see Anderson 2007 for this argument in the Australian context). In 1550, in the famous debate between Bartolomé de las Casas and Juan

Ginés de Sepúlveda, the distance between internal and external nature was foundational to both sets of arguments. While the two men agreed on that Indigenous Americans had souls that should be “saved,” Sepúlveda argued for the use of force, since a “just war” was one that protected men from their internal natures, or appetites for vice. Las Casas argued that the Spanish crown should lead Indigenous Americans not as “beasts” but rather as “men and brothers”; for him, the distance between their internal and external natures was sufficient for them to be treated as (lesser) humans. Las Casas’s dubious victory (he is remembered for having suggested bringing Africans to undertake the slave labor against which he was defending the Indians) also laid the groundwork for defending the Spanish right of conquest on their basis of their “care” for the Indians – that is, their coaxing away from “natural” impulses and towards Christian morality.

Measures of nature thus became key measures of race in the early modern period, and this obsession only deepened as European empires expanded. This intellectual history is important not only because it set up the ideological justifications for colonial pursuits but also because it was bound up with 19<sup>th</sup> century debates about the constitution of the modern nation. To offer just one influential example, Wilhelm Hegel argued the world spirit had reached a level of self-consciousness that corresponded with the nation, but that such national consciousness was not equally distributed around the world. The barest requirement to enter world history, he argued, was a reflection of the spirit in opposition to nature, and the struggle between nature and spirit was particularly challenging in torrid and arctic regions, where nature exerted more force. This formulation justified the ongoing conquest of the “new” world, about which Hegel only notes, “We do have information concerning America and its culture, especially as it had developed in Mexico and Peru, but only to the effect that it was a purely *natural culture* which had to perish as soon as the spirit approached it” (Hegel, 1997[1822-28]: 114, emphasis added). By “spirit,” Hegel meant Europe, which he saw as the sole world historical actor; nature and those who did not sufficiently transform nature were out of time and therefore incapable of nationhood. In later decades, Marx transposed Hegel’s theories of racial improvement and emphasis on labor into the realm of class relations. The theoretical traffic is thick between continental philosophers who defined historical subjects in terms of their ability to transform nature, British philosophers who defined property owners as those who mixed their labor with the land (such as Locke 1689), and political economists who identified the laboring proletariat as the subject of world history. This is the intellectual history that makes labor such an ambiguous category of analysis.

Ironically, Hegel penned these words at precisely the same time that Latin America and the Caribbean was awash in anticolonial nationalist struggles – indeed, his theories of struggle were in some sense inspired by these movements (Buck-Morss, 2007). With the exception of Haiti, however, these struggles were led by Creoles (*criollos*), Latin American-born descendants of Spanish colonizers. Creole nationalism was forged *against* the Indigenous, Afro-Latinx, and mixed communities that comprised the vast majority of Latin America’s population. But it was also forged against a Hegelian and broadly enlightenment sense of nature-culture relations: rather than figuring the “intemperate” climates and rugged terrains of Latin America as obstacles for societal progress, Simón Bolívar and other nationalists described these same environmental features as majestic and linked them to national strength of character (Bolívar 1815; Sarmiento 1868). In so doing, they often invoked the writings of Alexander Von Humboldt, whose travels throughout the interior of the continent at the turn of the 19<sup>th</sup> century combined romantic prose with his project of scientific classification (Humboldt 1995[1834], Pratt 1992). Nineteenth century Latin American nationalisms thus involved naturalizing a link between Creoles and landscapes, while simultaneously erasing the people who already lived there but whose labors were illegible to European invaders. European philosophy and natural history thus contributed to the consolidation of Latin American nationalism as an association between nature and those able to both enjoy its beauty and radically transform it to suit their needs.

In Alto Peru – as Bolivia was known in the colonial era – the rise of Creole nationalism

threatened an arrangement that historian Tristan Platt calls the “tributary pact” (1982), in which *ayllus* were granted self-governance and continued access to communal lands in exchange for supplying labor for the silver mines. In the colonial era, the division between Spanish and Indigenous peoples was spatial and juridical: there were two different legal codes applying to different places and peoples (Larson 2004). When the Creole elite won independence in 1825, they immediately sought to overcome this “dual republics” system by dismantling Indigenous land-holdings and creating rural land markets for large-scale agriculture (Platt 1982). Indigenous communities, however, were fiercely resistant. In fact, the threat of land sales prompted many Indigenous communities to revive their traditional systems of community authority “as a defense mechanism against encroachment by the large estates” (Rivera Cusicanqui 1987: 26). The newly-minted Bolivian state, moreover, was cash stricken following the long independence war, and tax revenue provided by communal Indigenous landholdings was its prime source of income. The push to liberalize abated and the “dual republics” model continued well into the 20<sup>th</sup> century (Larson 2004).

At this point, in the early 20<sup>th</sup> century, the conglomerate of race and nation was developing newly scientific dimensions that led to a new era of nation-building in Bolivia. While European eugenics were creeping into nation building projects around the world, the uptake of these theories was unique to the racial reality of each country. In Latin America, Argentina adopted the most strident project of social Darwinism, Brazil aimed for whitening through European immigration and education programs, and post-revolutionary Mexico, Peru, and Bolivia developed a concerted project of *mestizo* nationbuilding (Graham 1990). *Mestizaje* translates literally as miscegenation, and prior to the 20<sup>th</sup> century such racial mixing had been understood in largely degenerative terms, despite the proliferation of racial “types” (Wade 1997). By the 1920s, however, *mestizaje* was being re-imagined as the optimal combination of Spanish and Indigenous “attributes.” In *The Cosmic Race* (1979 [1925]), the book that defined Mexican *mestizo* nationalism for decades to come, José Vasconcelos argued that the racial diversity and tropical climate present in Latin America would produce “the definitive race, the synthetical race, the integral race, made up of the genius and the blood of all peoples and, for that reason, more capable of true brotherhood and of a truly universal vision” (p.20). Latin American leaders were more receptive to Lamarckian eugenics than their European counterparts, and in the early 1900s they developed programs that aimed to “improve” the nations’ racial “stock” with hygiene, bodily care, and education (Stepan 1991, de la Cadena 2000, Nelson 2003, Marchesi 2014). All of these were focused on shaping people through engineering their environments, essentially distancing them from the “natural” worlds that they were thought to live in. This involved a literal distancing from the earth: bare feet, earthenware pots, and dirt floors were associated with Indigeneity and treated as public health concerns (Orlove 1998).

In Bolivia, there were two eugenics camps at the turn of the 20<sup>th</sup> century, both of which naturalized a link between indigeneity and “wild” environments. The first, led by historian and writer Alcides Arguedas, was a classic tale of degenerative environmental determinism. The central argument of his essay *Pueblo Enfermo* (1909) is that geography (nature) negatively shaped the character of Indigenous and that this was now obstructing national development. As Latin American literary scholar Javier Sanjinés puts it:

To be Indian, from [Arguedas’s] point of view, was to be stamped by fate, for the Indian’s being had been determined by the purely mechanical and immutable action exerted on him by the high plateau of the Altiplano region... According to his vision, man [sic] had lost any ability to transform nature... Bolivia was a wild, chaotic landscape. Geography thus determined development. (Sanjinés C. 2004, p. 46).

The second, “softer” approach to racial-national eugenics was led by nationalist writers Franz Tamayo and Jaime Mendoza, the latter of whom I discuss in more detail in Chapter 1. In a scathing review of Arguedas’s unreserved embrace of European racial theories, from 1909-10 Tamayo published 55 editorials in the newspaper that he edited, *El Diario*, which he later assembled into a book titled *Creación de una pedagogía nacional* (Creation of a National Pedagogy, 1910). Tamayo believed that Bolivia’s unique national spirit could be found in the “subjugated Indian” who was “autonomous and strong, concrete and disciplined” and who was the “repository of the nation’s energy” (p. 51). These energies, however, had to be carefully cultivated in the classroom. Tamayo is commemorated throughout Bolivia as a radical educational reformer – every small town seems to have a school named after him - but his program was actually geared towards racial improvement through transformation of *milieu*, or “environment” broadly construed. For his part, Jaime Mendoza was a writer of novels and social commentators that later became national classics: *En las tierras de Potosí* (1911) and *El macizo boliviano* (1935) are two of his most successful. The latter takes Arguedas’s theories about the relationship between the Andean landscape and Indigenous racial development and flips the value assigned to this relationship. Instead of degenerating because of the harsh landscape, Mendoza argues that the elevation and climate of the Andes strengthened Indigenous “racial characteristics” and that the landscape was ultimately the mother of the Bolivian nation. He described the two generals who led the revolutionary war in Bolivia, Simón Bolívar and Antonio José de Sucre, as doctors who helped deliver a nation that “still had not been born but already existed” (Mendoza 2016 [1925], p. 283).

Conceptualizing the landscape as a pregnant Indigenous woman waiting to give birth to a nation (with the help of male Creole doctors), Mendoza continued a European tradition of gendering the nation as woman, especially as a fecund woman who gestates both bountiful natural resources and “sons of the soil” (McClintock 1995, Anthias and Yuval-Davis 2005). Correspondingly, the wealth of botanical metaphors for nationhood (family of nations, uprooted migrants, national family trees) do not only naturalize a spatial isomorphism between segments of land, nation, race, and culture (Malkki 1992), but they also work to fix nationhood in the (gendered) soil, drawing a sharp distinction between life-giving land and the barren rock below (see Smith 2019 for a similar argument about the apparent impossibility of “giving root” in ice). Just as the time of nationhood is gendered, with a “natural” past represented by women and a modern future represented by men (McClintock 1993), the space of nationhood is gendered too: the earth (*Pachamama*, Mother Earth) is coded as fertile and female, while the subsoil – to the extent that it is included in national imaginaries at all – is hard, future-oriented resource. In these ways, Mendoza’s theories were not so distant from those of Alcides Arguedas, despite the fact that the former is remembered for his racist eugenics while the latter is remembered for popularizing *mestizo* nationalism in Bolivia. In fact, the two were friends, and Arguedas even wrote an enthusiastic prologue to *En las Tierras de Potosí* in 1911. The project of mestizo nationalism thus emerged out of a much older association between indigeneity, femininity, and nature.

Popular nationalism, however, has its origins in a parallel history of armed struggle over subterranean resources. In what some historians claim was a drastic attempt to distract national attention from a dire economic situation, in 1932 President Daniel Salamanca went to war with Paraguay over the Gran Chaco desert, a region that the two countries had disputed for decades. The Chaco was rumored to contain petroleum – and, although this proved inaccurate, it did end containing a huge natural gas deposit that has become enormously important in recent decades (Anthias 2017). Although Bolivia lost the Chaco War disastrously, in retellings of Bolivian history the Chaco War is figured as a crucial turning point for Bolivian “national consciousness” (Zavaleta 1986). During the three years of near-constant retreat, middle- and upper-class students fought alongside workers, peasants, and soldiers. In the post-war period, a plethora of new political parties and unions emerged. One of these was the *Movimiento Nacional Revolucionario* (National Revolutionary Movement; MNR). While founded by mostly middle-class students who had been radicalized by the war, this party was



able to articulate the demands of laborers, miners, middle class, and Indigenous peasants. Among these, the tin miners' unions were the most militant and are still remembered as the revolutionary vanguard.

Around this time, a sense of “resource nationalism” began to crystallize across Bolivia and particularly within the working class (Young 2017). Dreams of wealth and social progress elicit powerful emotions that bind nationalist sentiment to natural resources, creating a sense that nature is “patrimony” – again, note the gendered suggestion of inheritance – that should benefit all citizens equally. While conflicts often emerge between national and local claims on the resource, it is also true that the national value attached to resources can elevate their local significance (Ferry 2005). This latter is what happened in the Bolivian tin mines. Antipathy towards private and especially foreign ownership began to feel like theft: shared goods should not be subject to private ownership. Yet what started as “resource nationalism” ended up being something closer to “resource state-ism,” as I argue in Chapter 1. In 1952, the MNR led the national revolution that established Victor Paz Estenssoro as president. Within months, he had nationalized all the tin barons' mines and created the Corporación Minera de Bolivia (Mining Corporation of Bolivia; COMIBOL), to manage them.

In addition to nationalizing the tin mines, the 1952 National Revolution also resulted in the institutionalization of *mestizaje* in Bolivia. Moving away from the “dual republic” model that had been the de facto model for the previous 350 years, the MNR's “State of '52” relied on a re-categorization of all people (and their lands) in class terms rather than race terms. Instead of *indios* and *criollos*, everyone in Bolivia was categorized as racially *mestizo*: *indios* became *mestizo* peasants (*campesinos*) and Creoles became *mestizo* professionals. Since the Bolivian vision of *mestizaje* was primarily cultural, it was backed by social programs designed to integrate *campesinos* as productive citizens in the modernizing country (Rivera Cusicanqui 2004). For Indigenous peoples, this corporatist political structure implied forced membership in state-sponsored peasant unions. This political project was reinforced in 1953 with the passage of the Agrarian Reform, which focused on re-distributing private land rather than restituting communally held *ayllu* land (Postero 2007: 39). While these reforms were readily accepted in the Cochabamba valleys, where *haciendas* had been most widespread and peasants had begun to organize themselves into unions prior to the revolution, they faced steady resistance in the *ayllu* strongholds of La Paz and Norte Potosí.

Considered one of the most “traditional” highland regions, Norte Potosí is known for its numerous, highly organized *ayllus* that have survived centuries of colonial, liberal, and corporatist onslaughts (Rivera Cusicanqui 1990). Celebrations of Norte Potosí's history of resistance often drift towards romanticization, with contemporary Norte Potosino politics read directly in relation to previous anticolonial struggles (Spedding and Llanos 1999). The image of “the warrior *ayllu* of Norte Potosí” is widespread and reenacted within the *ayllus* themselves in *tinkus*, annual ritualized - but genuinely violent – inter-*ayllu* fights in which spilt blood ensures fertility in the coming year (Le Gouill 2014). In the late 1970s, as the miners' unions were pummeled by dictators, the Indigenous movement in Norte Potosí was taking off. *Katarismo*, which began as a movement of relatively deterritorialized Indigenous intellectuals near the city of La Paz in the 1970s, was re-directed in Norte Potosí towards a reconstitution of the (very territorialized) *ayllu* system (Le Gouill 2014). Drawing their name from 18<sup>th</sup> century Indigenous revolutionary Tupak Katari, these activists were not opposed to the peasants' unions, but rather sought to understand the “double oppression” of Indigenous peasants (Rivera Cusicanqui 1987). In the mid-80s, Oxfam partnered with THOA (*Taller de Historia Andina*), a La Paz-based group of *katarista* anthropologists interested in reviving Indigenous political institutions (including, most prominently, Silvia Rivera Cusicanqui), to understand the *ayllus* of Norte Potosí (ibid).

The material importance of nature came to the fore in the early 1980s, when the Bolivian tin mining sector began to crumble. In large part, this collapse was a response to falling demand for tin, which had been replaced in many industries aluminum and tinplate. But it was also due to

COMIBOL's exhausted geological reserves. The percentage of ore left in the mines had fallen precipitously, and virtually no prospecting had been undertaken since the nationalization of the sector. The Bolivian economy, buoyed for years on the income of a single export, folded in on itself. Economic collapse coincided with – or perhaps precipitated – a tumultuous return to democratic politics after two decades of dictatorships. A parade of interim presidents came through during the transitional period, ending with the re-inauguration of President Victor Paz Estenssoro, the same man who had led the country immediately after the 1952 revolution. In the growing economic crisis, “Paz Estenssoro set out to undo what his “social revolution” had accomplished some thirty years earlier” (Perreault 2005: 271). Within weeks of being sworn in, Paz Estenssoro initiated the New Economic Policy (NEP), which scholars usually qualify as the first “wave” of neoliberal restructuring in Bolivia. The vast majority of COMIBOL mines were either privatized or closed, the currency was allowed to float against the dollar, and borders were opened to direct foreign investment. Most importantly for this story, 23,000 of the country's 30,000 miners were laid-off (Kohl and Farthing 2006). In Llallagua, residents recall this period by referencing the truckloads of people who began leaving on a daily basis, transforming the mining town into a ghost town nearly overnight. This was true across the highlands: laid-off miners left in droves, spreading their knowledge of union organizing throughout Bolivia and laying much of the groundwork for Evo's later rise to power (Gill 2000, Spronk 2007). As I will explore in Chapter 2, many of these miners later returned to the subterranean spaces left behind by the retreating state. They established mining cooperatives in a subterranean nature deemed officially exhausted and formally abandoned. Digging through the craggy layers of history, influenced by both memories of unionized glories past and visions of Indigenous economic futures, these cooperative miners retrace the invisible seams of ore and nation.

As the miners' unions collapsed, the *kataristas'* demands went mainstream. Gonzalo Sánchez de Lozada, a mining magnate who became president in 1993, was elected alongside Vice President Victor Hugo Cárdenas, leader of the Tupac Katari Revolutionary Liberation Movement, and together they began to introduce reforms that might be described as “neoliberal multiculturalism,” in that they recognized cultural difference only insofar as it was compatible with liberal market capitalism (Hale 2002). In 1994, the Goni-Cárdenas administration introduced the *Ley de Participación Popular*, which transferred 20% of central state revenue to municipal governments, in 1995 it rewrote the constitution to describe Bolivia as “multiethnic and pluricultural,” and in 1996 it introduced the *Ley INRA*, which created a legal category for *territorios indígenas originarios campesinos* (Indigenous Originary Peasant Territories (Anthias 2017). These reforms, while insufficient in their own right, set the stage for Evo's rise to power, particularly by allowing his entry into local politics at the level of his municipality, supported by the cocalero unions of which he was the leader (Postero 2007).

The two social mobilizations that preceded Evo Morales's election were directly linked to struggles over nation and nature: the 1999 “water war” in Cochabamba and the 2003 “gas war” that was sparked by the announcement that Bolivia's rich natural gas deposits would be exploited by a foreign company that was going to transport the gas through Chile, a country that has raised Bolivian nationalist ire since Chile appropriated all of Bolivia's coastline in War of the Pacific (1879-1883) (Kaup 2010; Kohl and Farthing 2012). Although both of these mobilizations appeared to be unifying, each of these also involved a re-writing of the division that runs through the heart of the national body politic: between Spaniards and Creoles, between Bolivians and *indios*, between workers and campesinos, between mestizos and Indigenous Bolivians. Rather than disappearing, these historical divisions simply faded as new ones were added. Mining cooperatives have emerged in the cracks between these overlapping divisions.

## Chapter Summaries

Each chapter in this dissertation corresponds with a material object that drives my analysis. In Chapter 1, *Strata*, I show how the Bolivian subsoil was produced as vertical state territory through the production of knowledge by naturalists and geologists. In tracing this history, I argue that contemporary “resource nationalism” has emerged as fundamentally anti-Indigenous, since it is predicated on knowledge that divides the surface and subsoil into two distinct realms, only the former of which can be associated with cultural particularity. To make this argument, I focus on two moments of post-revolutionary state consolidation – the period immediately after Independence in 1825 and the period immediately before and after the 1952 National Revolution – and I draw on classic political geographical literature concerning territory, state, nation, and natural resource.

In Chapter 2, *Mountain*, I return to the present and begin my close examination of mining cooperatives in Llallagua and Uncía, Norte Potosí. In this chapter, I focus on class relations within cooperative mines by examining the divisions of space and labor with the Juan del Valle mountain. I tell a spatial history of the region, showing how mining cooperatives emerged in relation to both the miners’ unions and waves of migration from the surrounding *ayllus*, and how this history has manifested in the vertical space of the mountain. I argue that the kind of small-scale mining that happens within the mining cooperatives would be better understood as “vertical farming” than petit bourgeois exploitation, which is how mining cooperatives are commonly understood.

From class relations I turn to individual miners in Chapter 3, *Tin*. Starting from the common critique that cooperative miners have no political consciousness, I examine how cooperative miners’ bodies and body politics are formed in relation to the mineralogical and metallurgical qualities of the orebody tin. I use the concept “geosocial formation” to discuss this co-constitution, emphasizing in particular the gendered and racialized dimensions of underground and surface labor.

In Chapter 4, *Machine*, I begin to explore the relationship between mining cooperatives and the state through the legacies of machinery and waste that remain in Llallagua-Uncía. This chapter is fundamentally concerned with temporally and spatially variable relationship between waste and value. Using machines as the central object of study, I argue that historical dreams of progress (and perceived social “regression”) inform perceptions of waste and value in ways that are fundamentally racialized and gendered. I also begin to unravel the ways that nostalgia and material objects bind cooperative miners to the state, constraining their ability to pursue alternative political projects.

Finally, in Chapter 5, *Dynamite*, I trace the movement of individual cooperative miners into the governing apparatuses of the Plurinational State in order to show how the miners exert a slow but inexorable pressure within the state – what I call “everyday state deformation.” Emphasizing the relationship between everyday politics and patron-client relations, I argue that cooperative miners and the state shape one another through subtle friction as well as the political eruptions for which the miners are notorious. The purpose of this chapter is to show how subterranean worlds, historically produced by scientific and political economic processes, continue to shape the Plurinational State through the movements of individual miners between the two spaces.

I conclude speculatively, by moving beyond the nation-state and beyond the contemporary moment. Through a consideration of Bolivia’s recently constructed satellite, I trace a connection between vertical territoriality and notions of futurity. Constructed with Chinese capital and Chinese expertise, this satellite is emblematic of new geopolitical configurations that are ambivalently understood as “south-south cooperation” or a new round of global imperialism. By forming partnerships with Chinese mining companies based in Yunnan – the only place in the world with the same hard-rock tin deposits as Bolivia – Bolivian tin mining cooperatives have become active participants in this new political arena. The vision of political horizontality that characterizes plurinationalism is thus being challenged from above and below. As a new, three-dimensional conception of geopolitics crystallizes, so too do new configurations of nation, race, and nature, grounded in the earth but stretching towards the stars.

## Chapter 1

# STRATA

## Resource Nationalism and Vertical Territory

### Introduction

Every Wednesday afternoon at 5pm, a group of Bolivia's most successful retired geologists gather at a chic, western-style café in the southern zone of La Paz, the region of the city where wealthy light-skinned Bolivians have historically congregated. Of this group of around ten geologists, some are still working as consultants, many spend their days golfing together, a couple are hard of hearing, and all are *k'ara* (Quechua word for non-Indigenous) men. Their ranks include a former president of COMIBOL, a former Minister of Mines, and an elderly Scotsman – the only foreigner among them - who claims to have singlehandedly discovered the San Cristóbal silver deposit, currently the largest mine in Bolivia.

When I joined this group one Wednesday in February 2017, I received a warm welcome that was likely conditioned by expectations about what a *gringa* geographer would be interested in knowing. Once I had explained to them that I was interested in learning about the relationship between geological exploration and politics in Bolivia, however, they looked perplexed. As I switched on my audio recorder to begin an impromptu focus group, Enrique Arteaga, a recent president of the College of Geologists, summed up the group's general puzzlement:

Geology is the study of nature. It's never been political, it's a pure science... We are like doctors for the earth. [Medical] doctors diagnose what you have in your body, and the geologist does the same: he deduces what has happened in the earth. The form the work takes is drilling: just as a doctor takes a sample of your blood, geologists take a sample of rock...

If there's a political component, it's that there's never been enough support for our work: there's no political mining framework (*política minera*) to apply geology as an instrument of progress (Enrique Arteaga, La Paz, 17 February 2017)

He went on to tell a story about his grandmother, who had misheard his adolescent announcement that he would study “geology” as an intention to study “theology,” and had expressed delight that they would finally have a priest in the family. She had never heard of anyone studying geology, and in this way was typical of Bolivians more generally, Enrique concluded, who failed to understand the value of geological studies. The Bolivian state exemplified this tendency, having repeatedly failed to center geological mapping and prospecting in its economic development plan since the nationalization of the tin mines in 1952.

Yet Enrique's stance was challenged by evidence from his own life story. As an undergraduate at a state university in the decade immediately after the 1952 National Revolution, he and all his fellow students had been made to produce geological sheets of unmapped parts of Bolivia's subsoil, with the idea that the work of enough students could create a detailed map of the national underground. His sheet won him a job on the first team of geologists to form DENAGEO (Departamento Nacional de Geología), the nation's first independent department of geological study. The formation of DENAGEO in 1960, which was changed to GEOBOL (Servicio Geológico de Bolivia) in 1965 and has been called SERGEOMIN (Servicio Nacional de Geología y Minería) since 1995, marked a crucial

moment of centralization and segregation of geological inquiry. For miners who were part of the 20<sup>th</sup> century unionized labor movement, DENAGEO represented an outrageous fragmentation of COMIBOL and violation of the spirit of the 1952 National Revolution, which had been motivated by a desire to reclaim resource wealth for the nation (interview Edgar Ramírez, El Alto, 22 February 2016). But Enrique Arteaga saw this all as entirely unpolitical map-making geared towards national progress – a goal that was never achieved due to a lack of government support.

Enrique's conviction that earth sciences are separate from "political" processes is far from unusual and speaks to a broader academic silence on the relationship between geological mapping and state formation (with several notable exceptions such as Braun 2000; Scott 2012, 2015; Himley 2019). In this chapter, I argue that geological pursuits have played a crucial role in processes of state consolidation in Bolivia during post-revolutionary periods, specifically the post-independence era (1825-1840) and the period before and after the National Revolution (1940-1970). In making this argument, I offer an alternative history of Bolivian "resource nationalism," which Kevin Young (2017) has succinctly defined as "the idea that resource wealth should be used for the benefit of the nation" (1). My alternative history attends to the consolidation of "vertical territory" (Braun 2000) as a public (state-owned) resource, devoid of surface-level "particularizing" influences of Indigenous or local cultures. This colonial gaze was institutionalized in the state at the same time that it was crystallizing as a scientific practice.

Telling this history is important because it speaks to the tension between efforts to pluralize national territory and guarantee Indigenous territorial claims and a re-asserted resource nationalism, which manifests as support for resource extraction as long as it is used to fund public works and social grants for poor and working-class Bolivians (Kaup and Gellert, 2017; Perreault, 2013; Kohl and Farthing, 2012, Pellegrini, 2016). Although resource nationalism might appear to be a progressive effort to redistribute resource wealth, capable of countering the neoliberal privatization of decades prior, such extractive projects threaten indigenous territorial rights, compromising the purportedly decolonial goals of the Plurinational State.

More than a tension between the contradictory goals of a multiply-constituted political left, I argue that anti-Indigenous racism was historically *built into* resource nationalism through ongoing collaborations between earth scientists and various iterations of the Bolivian state. Through the production and consolidation of geological knowledge, the state was territorialized vertically, and the underground was produced as a rational, state-managed space, thick with racialized notions of national progress. The political impact of this is a spatial limitation on contemporary plurinationalism. While national land can be owned privately or collectively and imbued with place-specific meaning – a kind of unity amid diversity - the subsoil remains state territory, not only in law but also in the bodies of knowledge associated with it. Tracing the historical development of these knowledges will show how contemporary Bolivian resource nationalism works against the goals of Indigenous territorial sovereignty. More broadly, it speaks to how resource nationalisms are formed through *specific* territorial histories with varying ideological content; resource nationalisms are as varied as nationalism itself.

I begin by laying out the conceptual stakes of my claim, focusing on debates about state territoriality and resource nationalism, and then turn to examine the production of interrelated bodies of knowledge about the Bolivian earth. Although geology is my primary interest, geology as a field of inquiry emerged from natural history, and this is where I begin my analysis. In the post-Independence era, I focus on the work of French naturalist Alcide<sup>7</sup> d'Orbigny who, in the 1830s-40s, wrote extensively about the geology, landscape, and Indigenous peoples of Bolivia. Although he is primarily remembered for his geological findings, vestiges of his reflections on race and landscape can be found

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<sup>7</sup> Bolivian authors tend to spell the naturalist's first name as "Alcides," whereas French authors write "Alcide." I have opted for the latter except in direct quotes.

in 20<sup>th</sup> century literature and political theory. In the era of the National Revolution, I show how d'Orbigny's ideas were taken up and transformed in works of literature and geology. Although none of these men (and they were all men) were uniquely responsible for territorializing the Bolivian subsoil, I seek to identify continuities and slippages in the ways that they produced knowledge, looking specifically at how notions of race were laced throughout their writings. I return to the present in the conclusion by reflecting on how the categories established in the past continue to operate in contemporary Bolivia. Finally, I discuss the implications of this research for theories of resource nationalism and political geography more broadly.

## **Resource Nationalism and Vertical State**

Until recently, the concept of “resource nationalism” had been mobilized primarily by scholars working in the fields of public policy and applied economics, where it has been used to describe both increasing state involvement in domestic resource extraction and increasing state involvement in securing access to resources located beyond national borders (Andreasson, 2015; Bremmer and Johnston, 2009). Taking for granted an isomorphic relationship between state and nation, as well as a universally accepted understanding of “natural resource,” such studies have tended to focus on changing relations between states and firms. Often, they treat resource nationalism in the global south in the language of “risk” while resource nationalism in the global north – such as rent redistribution in Norway or the race for energy security in the United States – is framed as a rational approach to resource development (see Childs, 2016;, and Koch and Perreault, 2018 for full critiques of these tendencies). Local histories of nationalist sentiment, as well as regional struggles around resource extraction and/or the limits of the “nation-state” itself, are bracketed in these analyses.

In just the last few years, geographers have started renovating the concept of resource nationalism. Drawing on insights from political geography, they have pointed out that the worn approach to geopolitics as a set of territorially-bound interlocking puzzle pieces no longer has much purchase in an era of oceanic conflict, terraforming, and digital diasporas (Mountz, 2013; Steinberg and Peters, 2015). Indeed, Westphalian sovereignty has always existed more in theory than in practice; recent developments have only rendered this inequivalence clearer. As “cultural artefacts” (Anderson, 1983), the communities hailed by nationalist invocations are historically sedimented compounds that rarely correspond neatly with state jurisdiction or national boundaries. Similarly, resources are not just “out there,” waiting to be extracted, but are rather produced through techno-scientific, political economic, and cultural-symbolic processes (Bridge, 2011; Richardson and Weszkalnys, 2014). Resources do not necessarily correspond with any sort of nationalism, and when they *do* correspond, they often do so unevenly, in association with local and regional histories as much as or more than national politics (Himley, 2014). Although resource nationalism might be defined, as Kevin Young does, as the belief that resource wealth should be used to benefit the nation, questions remain surrounding who or what draws the contours around “nation” and decides what “benefit” is, where it applies, and within which time horizon. This does not make the concept analytically inoperable, but it does indicate that resource nationalism should be treated as an uneven, fluctuating constellation of people and nature within a given territory rather than an objective fact.

One of the concept's basic tensions is that “nationalism” implies a collective sentiment across a broad community, whereas “resource nationalism” is usually used, in practice, to refer to state-led resource extraction, which has been globally on the rise since the early 2000s (Humphreys, 2012; Kaup and Gellert, 2017; Burgess and Beilstein, 2013). Although there is certainly a relationship between national affect and state policy, they rarely correspond perfectly. For example, the London-based think tank Maplecroft regularly lists Bolivia as a “high risk” resource nationalist country – a status the state has earned by nationalizing the natural gas sector and a handful of key mines – but for many Bolivians

the state has never done been sufficiently involved in the extractive industries, as the above story of my conversation with Enrique Arteaga highlights. The development of a collective sentiment about nature and the institutionalization of industrial extractivism within the state are intertwined but not codetermined histories.

As traced in detail by historian Kevin Young, the roots of resource nationalism as a collective sentiment in Bolivia are usually located in the early 20<sup>th</sup> century and are identified with the workers' movement. In the 1920s, responding to the rise of three "tin barons" who together controlled more than two thirds of the most lucrative industry in Bolivia, popular nationalist sentiment began to crystallize in a form inseparable from resource nationalism (Young, 2017). This process was accelerated in the 1930s with the Chaco "war for oil" between Bolivia and Paraguay (1932-35), which most Bolivians identify as the origin moment of nationalist sentiment. War, the story goes, united the children of middle-class professionals with the children of peasants and workers in the trenches. Realizing that they shared a common enemy in the landed oligarchy, these groups collaborated in a revolt now known as the 1952 National Revolution. The central rallying call of this Revolution was "mines to the state, land to the people." While the latter goal of land reform was never fully achieved, particularly in the lowlands (see Postero, 2007), the tin mines were nationalized within six months of the revolution (Supreme Decree 3196, 2 October 1952). The consolidation of the tin mines under the newly created state mining corporation COMIBOL is usually lauded as one of the greatest achievements of the post-revolutionary state. In history books, it is remembered as the outcome of national-popular struggle, or more generally of resource nationalism. Across the Bolivian highlands, the enduring symbol of the National Revolution is a helmeted miner bearing a drill in one hand and a gun in the other (Perreault, 2013).

As much as resource nationalism as a sentiment is tied to a history of popular struggle, however, its institutionalization has also supported state consolidation in post-revolutionary periods. In the 19<sup>th</sup> century, wresting control of subsoil resources was a key aspect of the independence struggles; in the 20<sup>th</sup> century, the party that took power after the 1952 Revolution (MNR: *Movimiento Nacional Revolucionario*, National Revolutionary Movement) compared its struggle against Bolivia's tin barons to the independence struggle against Spain precisely because of their shared focus on subsoil resources (Nicolas and Quisbert, 2014, p. 32). But still, there is no reason that nationalist sentiment about the subsoil should *necessarily* result in state-led resource extraction; it could just have easily resulted in the privatization of subsoil resources, as has notoriously been the case in the United States. How was the Bolivian subterranean historically produced as a "public" (state-owned) territory? What meanings were sowed into the underground through this process?

The answer to the first question has juridical roots that grew in the colonial era and thickened in later republican years. Once the Spanish had wrested control of Latin America from the many Indigenous nations who inhabited it, it was decreed that land could be privately owned (by Spaniards and *criollos* with money) while the subsoil was held in perpetuity by the Spanish Crown. This system, which was first based on Roman theories of state ownership (Lacy, 1988), consolidated the literal bedrock of the Crown's claim on the New World and facilitated expropriation in times of need. For example, this is how the Viceroy of Peru Francisco de Toledo seized control of the Huancavelica mercury mines in 1570, when mercury was needed for amalgamation in the silver mines of Potosí (Brown, 2012). But this legal-juridical history does not tell the whole story - the process of state consolidation through the subsoil was not limited to the production of laws or even administrative bodies. The generation and dissemination of territorial data through mapmaking and map-teaching have been key aspects of state territorialization since at least the 18<sup>th</sup> century (Thongchai, 1994; Goswami, 2004; Ramaswamy, 2017), and counter-mapping projects continue to be key tools for legitimating Indigenous and minority sovereignty claims (Wainwright and Bryan, 2009; Mollett, 2013; Anthias, 2017). Most critical studies of these mapmaking projects, however, have focused on

cartographic expressions of surface area and, at most, topographic terrain. Yet particularly for states with colonial histories connected to resource extraction, the production of subsurface maps has been as important as surface maps to territorial consolidation. Here Bruce Braun's (2000) work on the production of Canada's "vertical territory" through geological mapping is exemplary: by rendering the landscape legible in geo-economic terms, British Columbia was not only integrated into the state's purview but also produced as a space of resource extraction. Resources were produced at the same time that the state was territorialized; vertical territory was state territory. But Canada is far from the only country to have employed geologists in the process of state building, and there is considerably more that can be learned by considering territory in three dimensions, particularly in contexts of struggle over subterranean resources (Bridge, 2013; Bebbington and Bury, 2013).

As with most of the natural sciences, geology emerged out of a previous era of natural history, in which the study of humans, organic life, and nonorganic nature were tangled in practice the practice of science (often undertaken by the same people) as well as its theory. "Modern" geology did not crystallize until the period between the late 18<sup>th</sup> century and early 19<sup>th</sup> century, dates marked by the publication of works by James Hutton (1788) and Charles Lyell (1830). Although the surface and subsurface are clearly connected - they are, after all, defined in spatial relation to one another - scientists began to approach the two separate realms with separate sets of research questions and agendas. Indeed, the recent emergence of the subfield "political geology" (Bobbette and Donovan, 2019) from the intersection of political geography and architecture (Elden, 2013; Weizman 2007) underscores the contingency of the separation of geo-graphy (earth writing) from geo-logy (earth science) to begin with. But it was during this period of disciplinary crystallization at the turn of the 19<sup>th</sup> century that particular ways of knowing were standardized and institutionalized, often with exclusionary results.

The exclusion on which I focus in this chapter is anti-Indigenous racism; although anti-Black and other forms of racism, not to mention the production of gendered and sexualized difference, are also likely bound up in the production of geological knowledge, they are beyond the scope of this chapter. I use the term race rather than ethnicity, the term more commonly used in Latin America to discuss indigeneity, because race traces a longer history of colonial dispossession and exploitation, and because it speaks shifting divisions within a body politics (Goldberg 1996). Far from suggesting that "race" has any biological implications, I am emphasizing how racial categories emerge and shift in relation to theories of nature, culture, and spatial emplacement (Wade 2010). While undeniably social constructs, race and racism still shape everyday lives; "ethnicity," which emerged to describe non-biologized difference in the 20<sup>th</sup> century, can paper over these lasting effects. Unearthing the historical roots of such social constructs exposes them for what they are while also creating possibilities for thinking about alternative futures. As I said, there is no necessary reason why resource nationalism should result in state-led extraction.

The concept of race also emerged in historical association with nation. Despite Benedict Anderson's assertions that "nationalism thinks in terms of historical destinies, while racism dreams of eternal contaminations" and that "dreams of racism actually have their origins in ideologies of class rather than nation" (Anderson, 1983, p. 136), in practice national unity has usually been forged along lines of inclusion/exclusion that create endless "enemies within" and cement an isomorphism between nation and race (Gilroy, 1987). In Bolivia, expressions of nationalism in the 19<sup>th</sup> century were articulated by *criollos* (of Spanish descent), joined in the 20<sup>th</sup> century by *mestizos* (mixed-race) - despite the fact that Indigenous peoples constituted the majority of the country's population. Indeed, as Brooke Larson (2004) has shown, a "dual republics" model of government, which separated Indigenous and non-Indigenous Bolivians spatially and juridically, persisted well into the 20<sup>th</sup> century. As I will argue, this separation was carried out in the realm of science as well as law; it was also spatialized vertically into earth as well as horizontally across its surface.



The connection between race, nation, and state has become much more complicated in Bolivia in recent years. With the passage of a new constitution in 2009, Bolivia was officially transformed from a regular nation-state into a *plurinational* state, a transformation that describes a reorganized relationship between the Bolivian state and Indigenous nations. Rather than a *recognition* of Indigenous peoples *by* the state, the state itself is – supposedly – indigenized. According to the Bolivian Vice President, multiple nations are now articulated (joined up and given voice) by a single state (García Linera, 2014). In practice, however, these nations rest on a bedrock of state-owned property; this is what makes it possible for resource extraction to take precedence over

In the next two sections, I explore the role of studies by earth scientists in two historic moments of state-building, both of which happened in the wake of nationalist revolutions – the independence revolution of 1825 (led by Creole nationalists) and the National Revolution of 1952 (led by the combined forces of middle-class professionals, trade unions, and Indigenous *campesinos*). I focus on the explorations of Alcide d’Orbigny in the early 19<sup>th</sup> century and the way his works were interpreted by geologists and political theorists in the 20<sup>th</sup> century. As a natural historian who is remembered almost exclusively for his geological writings, d’Orbigny’s work shows how a “scientific gaze” removed Indigenous peoples from discussions of the subsoil, and territorialized this empty, “public” subsoil as state property. In the subsequent section, I show how these tendencies were crystallized in the work of state-employed geologists and nationalist literature.

## A “Splendid Vision of Bolivia” at the Dawn of the Republican Era

Possibly the naturalist who best and most widely studied our natural heritage at the dawn of the Republic was Don Alcides d’Orbigny, wise Frenchman who published the most monumental work about the natural wealth of our soil, and who traversed from place to place the patrimonial territory, generally on foot, accompanied only by his two loyal yuracaré guides... (Muñoz Reyes, *Presencia*, La Paz, 8/8/1975, p. 339).<sup>8</sup>

In 1825, after 16 years of war, Bolivia became the last South American country to win its independence from Spain. In the same year, a young French zoologist named Alcides d’Orbigny was commissioned by the Museum of Natural History in Paris for a three-year voyage to South America, where he was to assist a British mining company working in Potosí, Upper Peru (as Bolivia was still known to Europeans). Despite having thus far demonstrated his scientific chops only in a recently published book about mollusks, the Museum decided that the 24-year-old had everything needed for the voyage: “youth, health, and extended and varied knowledge in the different branches of natural

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<sup>8</sup> All translations from French and Spanish are mine unless otherwise noted.



Figure 4: Alcide d'Orbigny. Photo from Wikipedia Commons.

history, acquired as much from his father [a surgeon for the Marines] as from his time in Paris, his zeal, and his studious conduct” (qtd in Béraud, 2000) (Figure 4).

In this section, I contextualize d'Orbigny's journey and show how the knowledge he produced worked to fix Indigenous peoples on the topographical surface of the continent while effectively erasing them from the subterranean, which was treated as a separate realm. I do this by reading two of his works alongside one another: *L'Homme Américain* (1839) and *Estudios sobre la Geología de Bolivia* (1907). As might be guessed by the dates, the latter was not published during d'Orbigny's lifetime, but was instead a compiled translation of his writings on geology. Together these texts speak to the circulation and interpretation of the knowledge d'Orbigny produced, which has informed a lasting separation between the sciences of the subsoil and Indigenous land politics.

Today, Bolivian geology textbooks and memorials all begin in exactly the same way: by noting that Alcide d'Orbigny was the first geologist ever to work in Bolivia (Ahlfeld, 1946; Muñoz Reyes, 1975; Ávila Salinas B., 1970). He is mentioned as a touchstone, or a historical beginning for the geological rationalization of Bolivia's subsoil. His numerous publications are never mentioned by name, and no indication is given that he was anything other than a geologist. But d'Orbigny was a natural historian who also wrote extensive ethnological and botanical descriptions of people and landscape. As Mary Louise Pratt (1992) has documented, d'Orbigny set sail at a particularly important time in European-Latin American relations: as the “new world” convulsed in revolution, cracks were opening for European travel and investment. Looser travel restrictions meant that France and Britain began sending natural historians by the dozen, both to generate new knowledge and to identify sources of new wealth; Latin American leaders, meanwhile, were eager to gain new international allies and install new political models. Alexander von Humboldt's five-year expedition to the Americas (1799-1804) was so widely praised that he is said to have launched a “Humboldtian science” that was combined precise observations with an attention to romantic aesthetic ideals (Cannon, 1978). Later, Charles Darwin radically transformed theories of life and descent following his five-year journey around the Americas (1831-1836). D'Orbigny's voyage took place between these two, and although his work had less of an impact in Europe, it was received enthusiastically in Bolivia.

Prior to his departure, d'Orbigny studied in Paris and was greatly influenced by two mentors: Alexander von Humboldt, whose travel logs d'Orbigny read with reverence, and Georges Cuvier, a naturalist who is remembered both for developing a technique to classify geological strata historically using fossils *and* for influencing scientific racism by arguing that there were three biologically distinct races that could be separated through cranial measurement. In both fields, Cuvier's methodological approach was defined by dissection (of rocks and bodies) and taxonomic classification. Whereas

Humboldt had a “physiognomic gaze” (Poole, 1997) that demanded a mobile, observing subject who could perceive features of the landscape and create an impression of the whole, Cuvier was interested in what lay within. His gaze, or the way he objectified and categorized the world, passed from the surface towards internal structure – strata rather than mountain, skull rather than body (Foucault, 2005[1966]).

The influence of these two men manifested in d’Orbigny’s work as a kind of “doubled gaze.’ Both in his study of rocks and his study of people, his writing seemed to move in two directions at once, continuing Cuvier’s (Linnaean) taxonomic classification while extolling the beauty of the landscape with Humboldtian romanticism. Although these gazes were not as clearly divided by subject matter in d’Orbigny’s original (French) publications, in subsequent Spanish translations the former tendency (dissections after Cuvier) was more clearly seen in geological writing while the latter tendency (landscapes after Humboldt) was muted - only to reappear in 20<sup>th</sup> century nationalist writings about landscape and national character, as I will discuss in the following section.

D’Orbigny had already been in South America for four years when he received a letter from Andrés de Santa Cruz, President of the Bolivian republic, inviting him to explore Bolivia. Santa Cruz described Bolivia as a “country of great riches, principally in the mineral and vegetable kingdoms,” noting that any “discoveries that are made could give a rapid boost to the industry.” Like other leaders of new Latin American countries, Santa Cruz needed to cultivate new political and rebuild an economy that had been devastated by the independence war. Since coming to power in 1829, Santa Cruz had been drawing closer to France with a series of reforms that included the issuance of a new Civil Code based on the Napoleonic Code in 1830, the appointment of three Frenchmen to the tribunal responsible for training health professionals, and the introduction of French language training into a series of new scientific high schools (Mendoza L., 2002 [1971]). Finally, French commerce was encouraged through a series of trade agreements (Albarracín Millán, 2002). With these overtures, France became the first non-American country to recognize Bolivia’s independence in 1833. France had also been the first European country to formalize a National Geological Survey (Rudwick, 1996), and Santa Cruz hoped to mobilize this science in the reactivation of the mining sector, which was suffering from a shortage of labor and mercury in the post-revolutionary years (Brown, 2012).

With all these goals in mind, Santa Cruz asked d’Orbigny to look for new mercury deposits and to complete a geological map of the country, which would be the first of its kind (Mendoza L., 2002 [1971]). Santa Cruz told the young explorer that he would have the full support of the Bolivian government in his travels, in addition to the assistance of a “pair of youth” to keep him company, and financial support should he need it (10 June 1830). D’Orbigny accepted the invitation and refused the financial support. But he did take the pair of youth, whom he intended to train so that they might continue his scientific collection after his departure, and he also requested pack animals and some “*indios*” to drive the animals (19 June 1830)<sup>9</sup>. Contrary to the quote at the beginning of this section by Jorge Muñoz Reyes, a 20<sup>th</sup> century Bolivian geologist, d’Orbigny traveled with more than just two “loyal yuracaré guides”. For the three years that he traveled in Bolivia, d’Orbigny had a full team of 60 Indigenous people who rowed boats, carried supplies and samples, and directed the naturalist around the country (Mendoza L., 2002 [1971], p. 233).

During his lifetime, nearly all of d’Orbigny’s publications were written in French, and few circulated beyond a small community of Bolivian elites (Albarracín Millán, 2002). In addition to *L’Homme Americain* (1839), d’Orbigny also published *Voyage dans l’Amérique Méridionale* - 11 volumes of travel diaries, published between 1835 and 1847. The only book he published in Spanish was *Descripción geográfica, histórica y estadística de Bolivia* (1845), and it was written at the explicit request of then-president

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<sup>9</sup> This correspondence is available online: <http://pocombelles.over-blog.com/article-14546919.html>. Accessed January 24, 2019.

General Ballivian, who, because of the high costs of printing in Bolivia, indicated that it should exclude all discussion of scientific debate and report only the “facts” about Bolivia (Quesada Elias, 1991). Nothing else was translated until 1907, when Victor E. Marchant Y., section leader of the Ministry of Colonization and Agriculture, translated three geologically focused chapters of the third volume of d’Orbigny’s *Voyage dans l’Amérique Méridionale* and published them as a standalone book called *Estudios sobre la Geología de Bolivia* (d’Orbigny and Marchant, 1907). Tucked into the back pages of this book was the country’s first geological map, with apologies from the editor for its reduced size (see Figure 5 for the original map). In 1944, an Argentine press translated *L’Homme Americain*, and in 1946 the Anglo-Bolivian Cultural Institute reprinted *Descripción* in an extended two volume version. Thus, despite having been written in the early 19<sup>th</sup> century, d’Orbigny’s work became widely accessible to Bolivians only in the first half of the 20<sup>th</sup> century.

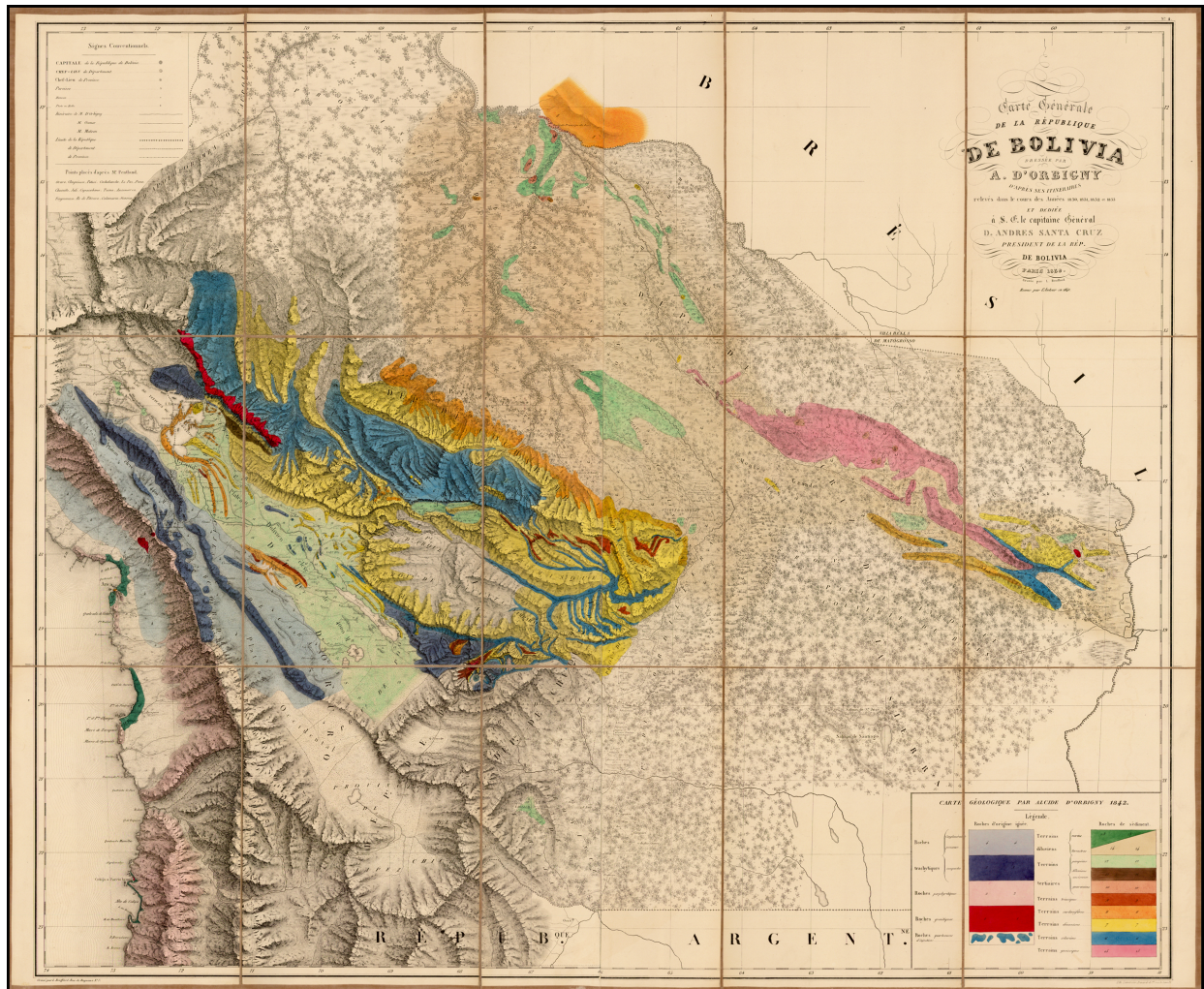


Figure 5: Bolivia’s first geological map, produced by Alcide d’Orbigny in Paris in 1859, dedicated to former Bolivian president Andrés de Santa Cruz. Image from Wikipedia Commons.

*L'Homme* is the book most often forgotten by those who celebrate d'Orbigny's contributions to geology, since it lays out a deeply troubling series of Indigenous "types" (Poole, 1997). This book is dedicated to Humboldt, "whose genius in some way inspired it" (d'Orbigny, 1944, p. 5), but d'Orbigny's interest in Indigenous Americans was actually inspired by Cuvier's project of racial taxonomy. Since Cuvier had not himself traveled to the Americas, he had not seen fit to include Indigenous Americans in within any of his "three great races" (Caucasian, Mongolian, and Ethiopian) (D'Orbigny, 1839, p. viii-ix); d'Orbigny hoped to fill finish Cuvier's project. Over the course of his eight years in South America, d'Orbigny spent with the Guaraní, Ona, Mapuche, Aymara, Quechua, and Chiriguano people, and in *L'Homme* he categorizes them into three "races" based on shared physical traits (Ando-Peruvian, Pampian, and Brazilian-Guaranian), seven "branches" based on shared

RACES.	RAMEAUX.	NOMS DES NATIONS.	LIMITES D'HABITATION. DES NATIONS :		
			en latitude australe.	en longitude ouest de Paris.	
1. <sup>re</sup> Race. ANDO-PÉRUVIENNE.	1. <sup>er</sup> Rameau. PÉRUVIEN...	Quichua ou Inca.	0° au 28°	65° au 83°	
		Aymara.....	15° au 20°	69° au 75°	
		Chango.....	22° au 24°	72° 30'	
	2. <sup>er</sup> Rameau. ANTISIEN....	Atacama.....	19° au 22°	72° 30'	
		Yuracarès.....	16° au 17°	66° au 69°	
		Mocéténès.....	16° =	69° au 71°	
	3. <sup>er</sup> Rameau. ARAUCANIEN.	Tacana.....	13° au 15°	70° au 71°	
		Maropa.....	13° 50'	70° =	
		Apolista.....	15° =	71° =	
	2. <sup>re</sup> Race. PAMPEENNE.	1. <sup>er</sup> Rameau. PAMPÉEN....	Auca ou Araucano	30° au 50°	60° au 76°
			Fuégien.....	50° au 56°	68° au 77°
			Patagon ou Té- huelche.....	39° au 53°	65° au 74°
		2. <sup>er</sup> Rameau. CHIQUITÉEN..	Puelche.....	34° au 41°	60° au 68°
			Charrua.....	31° au 35°	56° au 62°
			Mbocobi ou Toba	21° au 32°	61° au 64°
Mataguayo.....			22° au 28°	63° au 65°	
Abipones.....			28° au 30'	61° au 64°	
Lengua.....			27° =	62° =	
Samucu.....			18° au 20°	60° au 62°	
Chiquito.....			16° au 18°	60° au 64°	
Saravéca.....			16° =	62° =	
Otukè.....			17° =	60° =	
Curuminaca....			16° =	62° =	
Covaréca.....			17° =	61° =	
3. <sup>er</sup> Rameau. MOXÉEN....	Curavès.....	19° =	60° =		
	Tapiis.....	18° =	60° =		
	Curucanéca....	16° =	62° =		
3. <sup>e</sup> Race. BRASILIO- GUARANIENNE....	Paiconéca.....	16° =	63° au 64°		
	Corabéca.....	18° =	62° =		
	Moxos.....	13° au 16°	64° au 69°		
	Chapacura.....	15° =	64° au 65°		
	Itonama.....	13° au 14°	65° au 67°		
	Canichana.....	13° au 14°	67° au 68°		
3. <sup>e</sup> Race. BRASILIO- GUARANIENNE....	Movima.....	14° =	68° au 69°		
	Cayuvava.....	12° au 13°	68° =		
	Pacaguara.....	10° =	67° au 68°		
3. <sup>e</sup> Race. BRASILIO- GUARANIENNE....	Iténès.....	12° au 13°	67° au 68°		
	Guarani.....	du 34° de l. a. au 14° de l. b.	37° au 64°		
3. <sup>e</sup> Race. BRASILIO- GUARANIENNE....	Botocudo.....	18° au 20°	43° =		

geographies, thirty-nine "nations" based on shared root language, and dozens of "tribes" based on shared dialects (pp. 9-11, see Figure 6). These groupings are explained as "an amalgam of linguistic and physiological characteristics – as if d'Orbigny did, indeed, wish to merge the study of bodies and words into a single particularizing grid for the comparison and classification of humans" (Poole, 1997, p. 79).

Like Cuvier, d'Orbigny's attention to detail was meticulous and cold. He compared Indigenous peoples in terms of facial features (noses, chins, jaws, foreheads), height, skin color, and even smell (see p. 87). He communicated all of this information through typological tables, creating neat grids through which to render individuals and collectives legible to colonial eyes. Although he was not literally dissecting in the style of Cuvier, he sliced bodies in a way that conjures dissection. For example, he described Indigenous women thus:

"They are too robust, too wide to be well made, in the sense that we give this word in Europe. Nature has endowed them, on the other hand, with all the desirable advantages for the kind of existence that calls them: broad shoulders, modest breasts, well-proportioned throat... wide hips; also the act of childbirth is always easy and never has unpleasant

Figure 6: D'Orbigny's racial taxonomy of Indigenous Americans. 109)  
From *L'Homme Américain*, p. 11.

Such bodily segmentation and explicit comparison to a European ideal of feminine beauty (understood as the opposite of utility) is epistemologically violent and written in a style reflective of Cuvier's scientific racism (see Cuvier, 1827).

Most importantly for my argument, however, d'Orbigny also categorized each "nation" by its territorial limits, noting longitudes and latitudes in his typological table (p. 11, see Figure 6). These territorial limitations, he argued, affected racial development indirectly. Unlike his contemporaries, he believed that humidity levels rather than temperature caused differences in skin color. Without an instrument to measure humidity, he judged it based on whether the plants he pressed in his notebook dried or rotted (p. 78). With this imperfect system, he tended to use elevation as a proxy for humidity as he mapped Indigenous people to the continental surface of South America. This attention to landscape and environmental *milieu* more generally was a practice passed along from Humboldt rather than Cuvier, since the latter believed that life was shaped from within rather than from the outside. In practice, this way of discussing indigeneity worked to fix communities along the surface of the earth, bounded not only by longitude and latitude but also by depth: in this book, d'Orbigny attends to verticality only in relation to elevation, not the subterranean.

*Estudios Sobre la Geología de Bolivia*, on the other hand, is all about depth. Unlike *L'Homme*, *Geología* is an edited excerpt from d'Orbigny's travel logs, and it is organized as a description of his journey across space, much like Humboldt's famous travel diary that d'Orbigny had poured over prior to his journey. All the descriptions are in the first person and literally describe the landscape from d'Orbigny's ambulatory point of view. To offer two examples:

I crossed this chain [of mountains] perpendicularly to its orientation, [and] here is what I saw: the first branch is, as I said, a little less elevated than the second, composed of rich layers of quartzose sandstone, often very friable, with reddish coloration. I have not seen any fossils, but many traces of copper, either in oxides, or as infiltrate between the layers, or disseminated in tongues (p. 9).

I crossed the slates of the Silurian period to the Pampa de Ruis, a small sort of valley, located in the middle of the hill. There the accumulated layers of slate rocks end, and the Devonian sandstones begin to be found again. I ascended... to the top of the hill, where a vast plateau, dominated by sandstone mammoths in almost horizontal layers, form something like a chain of low elevation (p. 169).

Although these descriptions are told from d'Orbigny's point of view, they are remarkably impersonal. In the first quote, his gaze is down, towards the rocks, and he is dividing and classifying their mineral structure as he goes. In the second quote, he narrates his ascent in relation to the geological origins of the rocks, effectively moving through time as well as space. By the time he sees the whole landscape from the top of the hill, he has already temporally catalogued its individual parts. A continuous description of what he saw, d'Orbigny's geological writings thus shift from the layers visible only up-close, which are described with objective disinterest, to the landscape, which is often described with poetic language that would have appealed to Humboldt's romantic sensibilities.

Even though d'Orbigny approaches the study of both people and rocks with the same doubled gaze, people are as absent from d'Orbigny's geological writings as geological references are from his studies of people. The only reference to people in *Geología* is the note that "Indians wash... the sands of the river" in the search for gold (p. 13). In part, this is a product of the fact that *Geología* was a compilation of geologically-focused chapters from d'Orbigny's travel diaries, curated by the translator. But this compilation was actually an easy project for the translator, since d'Orbigny had already organized his diaries by topic. Although the diaries as a whole were organized by geographic region,

each region had sub-sections that were easily collected by the 20<sup>th</sup> century translator. In either case, it is striking how much *L'Homme* refers to landscape, elevation, and climate (humidity), closely associating Indigenous peoples with their (surface-level) environment, while subterranean rocks are decidedly *not* associated with the people above them. Given the note that people are actively looking for gold, it is also striking that this is not included in *L'Homme* in the list of their livelihoods, which are instead confined to plant cultivation and animal husbandry. Instead, subterranean geology is entirely free of cultural particularities, and ready to be territorialized otherwise.

The perceived importance of *Geología* is evident in the book's Introduction, which was written by Belisario Díaz Romero, amateur archeologist and geographer. He expected the book would be

...useful to the diverse industries that now are starting to exploit the Bolivian soil: to the miners, searching for metallic veins in different groups of our mountains; to the agriculturalists, who will search the lands more appropriate for their diverse crops; and now, at last, to the studious Bolivians who wish in the future, upon the foundations laid in this work, to deepen the study of the layers that constitute the terrestrial crust of this rich and varied piece of South America. (Díaz Romero, 1907, p. xviii).

In Díaz Romero's opinion, D'Orbigny's writings were instructive for a nation looking for its future in the industrialization of mining and agriculture. Nearly a century later, Bolivian sociologist Juan Albarracín Millán (2002) would similarly observe that "without [d'Orbigny's writings], there could not exist in Bolivia any possibility of developing a modern national culture based on scientific knowledge of the Bolivian reality" (p. 282). Both men glide right past d'Orbigny's ethnographic work, an absence made possible by the compartmentalization of d'Orbigny's observations.

When d'Orbigny finally left Bolivia, he took two samples of everything: one for France, and one for a new Museum of Natural History that he helped to start in La Paz (Mendoza L., 2002 [1971], p. 222). He also took charge of five young Bolivian students, including one of the assistants who had accompanied him on his travels, who were granted scholarships to study in France. D'Orbigny thought it best that they study disciplines that would serve their home country, including mineralogy, geography, and mechanical engineering (ibid, p. 226). In these practical ways – through museums and education – he helped institutionalize geology as an economically-oriented field of inquiry long after his departure. The knowledge that he had produced formed the substrata on which these institutions were built, as I show below.

## Twentieth Century Earth Writers

By the early 20<sup>th</sup> century, Bolivian working-class unions and rising middle-class professionals were both starting to see the subsoil as a pathway to economic sovereignty and national progress. These groups worked together to topple the mining oligarchy in the 1952 National Revolution (Young, 2017), but it was middle-class professionals who took control of the state in the post-revolutionary period, represented by the center-left party *Movimiento Nacional Revolucionario* (MNR) (Field, 2014). In this section, I explore how d'Orbigny's influences were split among 20<sup>th</sup> century "earth writers". Historians and geographers harnessed d'Orbigny's writings on people and their surface-level environment to make an argument about national identity in the lead-up to the National Revolution. Meanwhile, geologists emulated d'Orbigny's tendency to partition and categorize the subterranean without any reference to the people who lived above. In the years after the Revolution, the production of knowledge about the subsoil became a more central component of state policy, and state-employed geologists generated an increasing quantity of publications well into the 1970s.

Some of the first inklings of a modern “resource nationalism” are apparent in the writings of Jaime Mendoza (1874-1939), physician, novelist, and geographer, who was also an avid reader of d’Orbigny. Mendoza’s books *The Geographic Factor in Bolivian Nationality* (1925) and *The Bolivian Massif* (1933) argued that the formidable Andean mountain range had positively informed the character of Bolivian people, even shaping their national identity. In the appendix of the latter, he detailed his sources, noting that: “Maybe the best study of the incipient field of Bolivian geology is also the oldest. It has been a century since a wise Frenchman, Alcide d’Orbigny ascended the Bolivian Massif, and he studied it in large part by taking long trips, frequently on foot, for thousands of kilometers... His work can be considered monumental” (Mendoza, 1933, p. 295). Indeed, Mendoza’s own life is something of an echo of d’Orbigny’s. Like d’Orbigny, he traveled around the country writing about the people and the landscape. Mendoza was fascinated with the mines, and his earlier novel *En las tierras de Potosí* (1911) documents the travails of miners in Simón I. Patiño’s tin mines of Llallagua, in the northern reaches of the department of Potosí, through the eyes of a visiting law student from the city of Sucre. While this book was part of a more general emergence of “indigenist” literature in the Andes, which applied a realist lens to the plight Indigenous Andeans (compare to Ecuadorian Jorge Icaza’s *Huasipungo*, 1934, and Peruvian Ciro Alegría’s *El mundo es ancho y ajeno*, 1941), in Bolivia it also inaugurated a period of “mining literature” and supported the emerging struggle of the miners (Montoya, 2017). Mendoza was popular among nationalists because he “used geography – and the heights of the Andes and the hegemonic and administrative impulses that they inspire – to affirm Bolivia’s right to exist as an independent nation” (Sanjinés C., 2004, p. 83). In other words, he affirmed a natural connection between people and land, as seen in d’Orbigny’s characterization of Indigenous nations, but applied it to a different understanding of nation, one that would be coterminous with state territory.

Mendoza’s fascination with the romance of elevation would continue in the works of later nationalist writers, including Carlos Montenegro, a journalist who had been a founding member of the MNR in 1941. Montenegro’s book, *Nacionalismo y Coloniaje* (1944), narrated the history of Bolivia as one of a continuous battle between the nation and the “anti-nation,” a force composed first of Spanish colonizers and second of feudal landholders. This argument claimed Indigenous peoples as the ancestors of Bolivian *mestizos*, who were framed as the true national subjects. Like the “cosmic race” of Mexican nationalist José Vasconcelos (1997[1925]), Montenegro’s *mestizaje* denied the contemporary reality of indigeneity, preferring to locate it in a glorious past (Rivera Cusicanqui, 2003). Despite the fact that he was working with primarily journalistic sources, Montenegro’s history played out on clearly Bolivian landscapes, with frequent references to mountains, forests, and Lake Titicaca working to naturalize national history within the state’s territorial borders.

Montenegro’s distinction between nation and anti-nation became crucial in the years following the National Revolution, as the MNR worked to frame their takeover of the state as a concluding chapter of a national history. If the revolution of 1825 had signified political independence, the MNR argued, the revolution of 1952 meant economic independence. As Victor Paz Estenssoro, first president following the national revolution, put it in an address in Sucre in 1954:

The fight for political independence, initiated on May 25 1809, is a process that had another decisive day on April 9 1952 and that remains ongoing until we achieve the economic emancipation without which political independence does not exist (Paz Estenssoro, qtd in Nicolas and Quisbert, 2014, p. 32)

The distinction between “political independence” and “economic independence,” the unity of which was framed as true sovereignty, was crucial to the historical project of the MNR. This framing allowed the state management of the subsoil to be understood as a continuation of the national revolutionary



project. A homologous connection was drawn between the subsoil, which offered the nation an economic future, the national body politic – which, according to the MNR, was *mestizo* – and the state (see Coronil, 1997 for a similar history of Venezuela).

The consolidation of this homology can be seen in the realm of geological study. Throughout the 19<sup>th</sup> and early 20<sup>th</sup> centuries, geological exploration was confined to active mining sites, where it was paid for by private prospectors (see Guise, 1922). In contrast, the state was less invested in the science and technology of mining until after the National Revolution of 1952, when it expropriated all the holdings of the three “tin barons” who had controlled Bolivia’s lucrative tin sector: Simón I. Patiño, Moritz Hochschild, and Carlos Víctor Aramayo. The state mining company, COMIBOL, was created in the months after the revolution with Supreme Decree No. 3196, released on October 2, 1952. This decree declared that COMIBOL would take charge of “exploring, exploiting, and making use of (*beneficiar*) the minerals of the mining deposits that the Government of the Nation assigns it,” as well as commercializing metals and importing needed supplies (DS 3196, Art. 2). In other words, COMIBOL was to centralize the work of mining: not only exploitation, but also exploration and prospecting – tasks for which earth scientists were needed. The engineers and geologists who had been employed by the tin barons were hired straight into COMIBOL (interview Edgar Ramírez, El Alto, 22 February 2016).

Aspirations that COMIBOL would centralize geological research in Bolivia, however, was short-lived. Bolivia was struggling with political and economic instability, and geological knowledge became a key arena in which the post-revolutionary state collaborated with the United States to limit the power of the workers’ unions.<sup>10</sup> The nationalization of the mines had occurred the midst of tumbling tin prices, which left COMIBOL without resources to pay its ballooning workforce, and miners were growing ambivalent in their support of the MNR. The threat of a soviet-style revolution in Bolivia was worrisome not just to the MNR, but also to the US. In this context, in 1958 the Bolivian Ministry of the Economy struck a deal with the US Operation Mission to Bolivia (USOM) that resulted in the formation of the Bolivian Department of Supervised Mining Credit, a program under which USOM managed loans to (private) Bolivian prospectors and developers, and in 1959 the program *Desarrollo de Yacimientos Minerales* (Development of Mineral Deposits, DYM) was created as the modification of a plan proposed by a firm of mining consultants engaged by USOM (Killsgaard et al 1991: 1-2, Ford, Bacon, and Davis, 1956). DYM gave technical advice, loans, and even financial training to private mine operators with financial support from the US. The state geological service DENAGEO was established in 1960 with the assistance of USGS representative Thor H. Killsgaard, and it was helmed by Gustavo Donoso, the only geologist who had been working at DYM (Killsgaard et al 1991: 2). DENAGEO’s original purposes were the elaboration of an official Geological Map of Bolivia, at a scale of 1:100,000 and technical and financial assistance to small-scale mining (GEOBOL 1978: 1), but its role grew substantially following the military coup that ousted the MNR in 1964. The newly empowered General Rene Barrientos requested a report on the state of Bolivia’s mining sector from Roberto Arce, a mining engineer who had worked as a manager at Patiño Mines prior to the nationalization. Arce’s scathing review of the mining sector recommended that DENAGEO be transformed into an entity with its own autonomous legal personnel (Arce, 1965, pp. 17-18) and that a percentage of taxes on the mining sector should go to strengthening DENAGEO’s services. On June 11, 1965 Barrientos announced that DENAGEO would become precisely such an autonomous entity. Newly rechristened as GEOBOL, the institution would be responsible not just for producing

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<sup>10</sup> While Bolivian historiography has traditionally portrayed the MNR as the unwilling servant of the US government, Young (2017) and Field (2014) have shown that members of the MNR were also frightened by the strength of the unions and stood to benefit from US intervention.

a national map but also for coordinating technical services for private companies and foreign geological services (DS 7212, Art. 3).

According to Edgar Ramírez, a retired miner who currently directs the COMIBOL Archives in El Alto, the separation of geological knowledge from COMIBOL – first through DENAGEO and then through GEOBOL – was part of a more general process of de-nationalizing the mines that began before COMIBOL even got off the ground (Interview Edgar Ramírez, El Alto, 22 February 2016). For my purposes, it is also important to note that this move contributed to the stabilization of the state by wresting power from the miners' unions, which still had veto power within COMIBOL. Through centralizing this knowledge, the state territorialized the vertical depths of the subsoil, constructing the rocks below as state-owned resources. Although this might be perceived as a natural progression of resource nationalism, it was never a foregone conclusion that the best arbiter of “national” resources would be the state. This is particularly evident in Bolivia, where the miners' unions were highly suspicious of the state and had unprecedented control over other aspects of the mining sector – just not the knowledge production center.

The state's ability to segregate and claim geological knowledge for itself was facilitated by features of geological knowledge itself. Geology had changed since d'Orbigny's journey to Bolivia, both in its underlying theories and its methods of knowledge production and communication. Instead of first-person descriptions of rock layers, geologists seemed to have removed themselves from the work entirely. Instead of cartographic representations of the distribution of rock formations across a particular region, geologists were relying increasingly on vertical representations of historical sedimentation. As Bruce Braun (2000) argues, a specifically geological vision came into being over the course of the 19<sup>th</sup> century: “One no longer attended to scattered mineral samples or other curiosities, but to the ‘inner architecture’ of the earth” (p. 22). This shift was not limited to geology. Led by Cuvier and his disciples, natural scientists were moving away from description and towards dissection and categorization; descriptions of landscapes and cultural practices were left for novelists and political theorists, like Mendoza and Montenegro discussed above. Instead of offering subjective impressions of a place, geologists rendered the earth from an impossible perspective: a slice of cleanly ordered vertical layers that can be apprehended all at once.

In Bolivia, this shift is exemplified by the prominent work of Federico Ahlfeld. A German geologist who immigrated to Bolivia in 1924 to work in Hoschschild's tin mines, Ahlfeld is remembered as the “father of Bolivian geology” (Redwood, 2003) or “the most zealous and consistent geological researcher in Bolivia” (Ávila Salinas B., 1970: 4). Ahlfeld was already important to the Bolivian state prior to nationalization, having held positions as the Chief Geologist of the Bolivian government (1935-36) and as the Chief Geologist of the Directorate General of Mines and Petroleum (1935-36 and 1938-46), and he was one of two geologists on the Bolivian side during the first formal involvement of the USGS in the country from 1940-41 (the other was Jorge Muñoz Reyes, who penned the epigraph of the last section) (Kjølsgaard et al., 1992). When the National Revolution started taking shape, Ahlfeld was back in the private sector, working at the Patiño Mines in Llallagua. He left Bolivia briefly during the revolution but returned a few years later as a geological consultant for the United Nations (1956-60) and the German Geological Mission (1959-63) before finishing his career teaching in the Regional Institute of Geology of the Universidad Mayor de San Andrés in La Paz (1959-1964).

Specializing in ore genesis and metallogenic belts, Ahlfeld contributed significantly to both the historical record of Bolivia's geological history and the development of the mining sector (Redwood 2003), and he took a special interest in Llallagua's tin mines, publishing several journals articles specifically about the region (Ahlfeld 1931, 1936, 1941). Among all of his publications, however, Ahlfeld's most important contribution was the compendium *Geología de Bolivia* (1946, reprinted in 1960 and 1972), which is still regularly cited. The first sentence of this book recognizes the contribution of

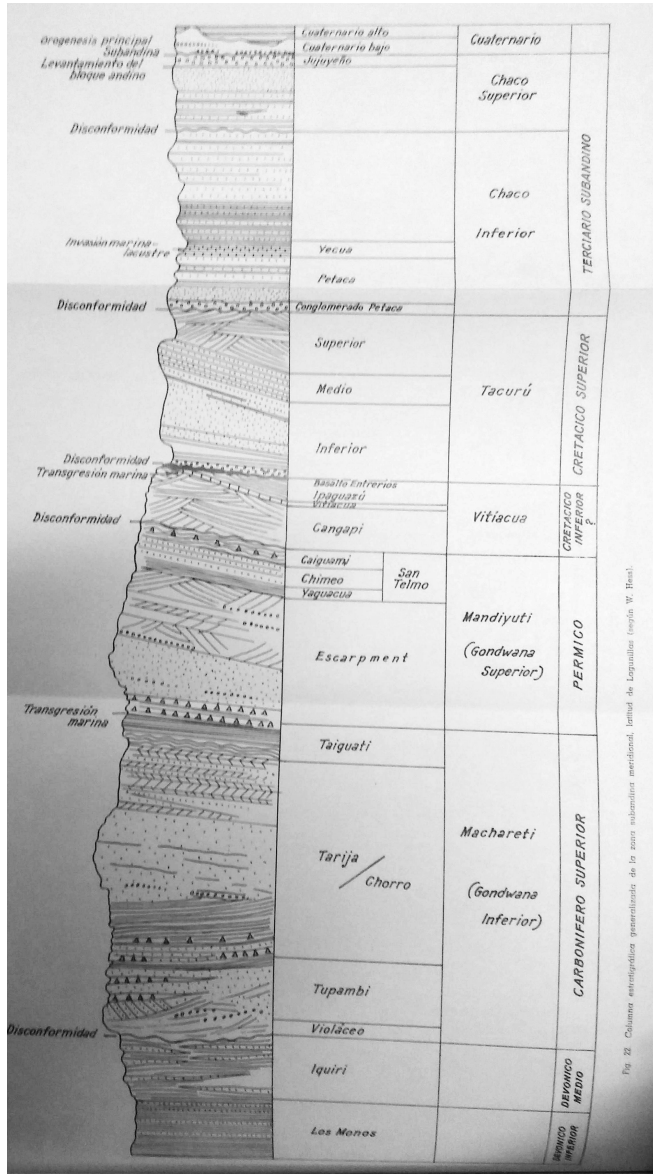


Figure 7: Ahlfeld's vertical vision of Bolivia. From *Geología de Bolivia*, p. 82-83.

way that he had inherited from Cuvier and which is visible in Ahlfeld's later work. D'Orbigny took this same approach to his study of people, but he also fixed them to the surface of the earth in a way that allowed Ahlfeld and others to study the subsoil without discussing people at all. This was the kind of scientific "seeing" that allowed the state to consolidate national subterranean territory while also "denationalizing" the knowledge – that is, Ahlfeld stripped it of nationalist sentiment and rendered it in a neatly packaged form for use by state and private entities. Ahlfeld, and d'Orbigny before him, thus contributed to building a kind of resource nationalism that is categorically not "the people". Even today, the courtyard in front of SERGEOMIN (present-day GEOBOL) is called "Plaza Ahlfeld," and his bust greets visitors near the door.

d'Orbigny (1972[1946], p. 9), but the book is written and organized exceedingly differently than d'Orbigny's naturalist approach. Unlike d'Orbigny's 11-volume description of his travels, Ahlfeld's book is concise, less than 200 pages even in the extended 1972 version. The chapters are organized by geological epoch rather than geographic region, beginning with the Precambrian and ending with the Holocene (marked by the appearance of humans). In other words, Ahlfeld orders Bolivia by time rather than space. His own gaze is not directly referenced; there is no "I" in his study, even in the foreword, in which he notes that "we" felt compelled to re-publish the book given the absence of comprehensive data available about Bolivian geology. Most importantly, the book is studded with folding maps that depict history vertically, each layer textured with a different crosshatching to identify its geological epoch (Figure 7). These simple maps do more analytical work than any of the words, which contrasts sharply to d'Orbigny's flowery descriptions and nearly absent visuals.

Despite these differences, however, d'Orbigny and Ahlfeld were both European geologists employed for at least part of their lives by the Bolivian state, and they both produced knowledge that transformed the subterranean not only into natural resources but also state territory, devoid of the particularizing influence of local culture. Although d'Orbigny's geological writing relied on perspectival description, he nevertheless tended to compartmentalize rock "types" in a

## Conclusion

The purpose of this chapter has been to show how anti-Indigenous racism was built into Bolivian resource nationalism through the process of subterranean territorialization. Focusing on two post-revolutionary eras, I have shown how knowledge about the subsoil was produced and consolidated in state institutions through collaborations with earth scientists, particularly naturalists and geologists. The subsoil was rendered natural resource, but it was also transformed into state territory, a combination that supplied post-revolutionary states both an unassailable bedrock of territorial jurisdiction and a source of revenue in economically precarious moments. In short, such scientific investigation has legitimized the state by reinforcing a separation between land and subsoil that has been codified in law since colonial times.

At present, Bolivia might be understood as in the midst of a post-revolutionary period similar to the post-1825 and post-1952 eras. The current government, helmed by President Evo Morales, frequently characterizes the Plurinational State as the outcome of “democratic cultural revolution” (Nicolas and Quisbert, 2014). The history I have presented here provides a framework to think vertically about the apparent contradiction in this post-revolutionary era: on the one hand, Indigenous and communal land rights, and on the other hand, a re-centralization of subsoil management within the state. I have shown that this contradiction is historically embedded within Bolivian resource nationalism, which is undergirded by knowledge and institutions that are inherently inhospitable to Indigenous sovereignty. In fact, the granting of territorial rights to Indigenous peoples in the contemporary era is actually not such a radical departure from the past, as Indigenous people remain grafted to the surface, and surface rights remain secondary to subsurface claims. The legal frameworks that have been erected to support Indigenous territorial claims are only soil-deep. This spatial limitation on sovereignty is made possible by the production of knowledge that separates people and soil from the rocks below. More importantly, this limitation has many material consequences: despite their recent demands, Indigenous people in Bolivia are not permitted to mine their own resources (Marston, forthcoming) nor are they permitted to veto extractive projects within their territories (Fabricant and Postero, 2015). Rather than “free, prior, and informed consent,” the Bolivian constitution only guarantees free, prior, and informed *consultation* (CPE, 2009, Art. 352). Not only does this override territorial claims, but it also limits the possibilities for other forms of resource governance. What might Indigenous, community-led mining look like? Such a question is not currently open for debate.

The situation in Bolivia speaks to the importance of not generalizing the meanings wrapped up in “resource nationalism.” Local histories matter, as do the resources in question; not every resource nationalism is connected to the subsoil, but every resource nationalism will be inflected by local inflections of nation and state territory, which will in turn be differently entwined around the material nature in question. Painting resource nationalisms with the same broad brush runs the risk of environmental determinism, not to mention the assumption that “nation” can be bound and uniformly defined. In practice, nations are complex historical artifacts whose members rarely if ever agree on what nature or nationalism ought to look like. Even more to the point, the very attempt to bound a nation, whether territorially or by memberships, generates a constitutive outside full of people who might not be represented by state institutions. Just as all nationalisms are distinct and politically ambivalent, so too are resource nationalisms.

More broadly, this chapter underscores how key categories political geography, including nation, state, resources, and territory, can emerge as already racialized because of the knowledge systems that underpin their production. Political geographers have long been attentive to how cartographic representations and geographic information can be used to lay claim to space (Bryan, 2010; Zimmerer and Bell, 2013), but the knowledge itself is political even before it is used for anything. It comes into being within categories of thought that already have a political history of their own.

There is no “natural” reason why subterranean and surface-level knowledges should be treated as distinct, or why human social worlds might be taken into consideration in relation to ecology but not geology. After all, human societies have always made use of rocks, and human bodies are full of necessary but non-organic substances (calcium, iron, magnesium). Indeed, the recent “discovery” that human actions have a disproportionate impact on geological change – which has incited significant conversation about the Anthropocene, the proposed designation for a human-centered geological era (Szerszynski, 2012; Clark and Yusoff, 2017) – might not have come as such a surprise if geological questions had not been so quarantined from sociocultural questions. Moreover, the clumsy process of “bringing humans back in” to a conversation about geology might not have figured humanity as such a homogenous group if earth science had been systematically occluded Indigenous and minority communities from its scope of analysis (see Todd, 2015). While geographers continue to push the territorial reach of cartographic and scientific production into the subsoil (Braun, 2000; Scott, 2012, Himley, 2019), it is important to consider how these sciences emerged through processes of systematic exclusion, processes that remain sedimented deep in the earth below. In subsequent chapters, I show how these systematic exclusions manifest in laws pertaining to the Bolivian subterranean and the worlds that emerge within it.

## Chapter 2

# MOUNTAIN

## Vertical Farming of *Agro-Mineros*

*The small-holding peasants form a vast mass, the members of which live in similar conditions but without entering into manifold relations with each other... In this way, the great mass of the French nation is formed by simple addition of homologous magnitudes, much as potatoes in a sack form a sack of potatoes.*

- The 18th Brumaire of Napoleon Bonaparte (Marx 2008[1852]:124)

Choquita, ¿dónde está tu k'epirina? (*Blondie, where's your k'epirina [potato sack backpack]?*)

- Market woman calling as I walked through Llallagua wearing a miner's helmet and boots, 10 Feb 2017

### Introduction

When dawn breaks over the peak of the Juan del Valle mountain, miners are already congregating around the Cancañiri *bocamina* (mineshaft). At an altitude of more than 4000m, Cancañiri is the highest of the three major mineshafts in the twin towns of Llallagua and Uncía, which are nestled on either side of the Juan del Valle mountain in Northern Potosí. As the miners unlock their shared storage garages and find their boots, helmets, and lamps, vendors open the doors of their kiosks to sell coca leaves, snacks, soda, and small plastic tubes of pure alcohol. Although it is barely 7am, many miners are eating two-course lunches in the canteen, since they will not eat again until they leave the mine in the late afternoon. The smell of peanut soup wafts out from the canteen, drawing people towards it as much with the promise of warmth as flavor. The wind is biting.

Most of these miners are wearing *k'epirinas*, compact backpacks made out of potato sacks. The word comes from Quechua; in Peru, the colorful rectangular cloths used to transport babies and goods are similarly called *k'epirinas*, but in Bolivia *k'epirina* is reserved for backpacks worn by miners. K'epirinas have straps that attach to the front of the bag rather than the back, holding it close to the body and tightly shut without zippers (Figure 8). The first time I put one on I turned it inside out, trying instinctively to make it into the kind of backpack with which I was familiar, and a miner had to tap me on the shoulder to tell me it was gaping wide open. These are the bags the miners use to carry in their supplies at the beginning of the day, but more importantly they are used to carry out ore. A k'epirina full of crushed rocks weighs around 20 kilos and has to be carried through a maze claustrophobia-inducing tunnels, up dozens of ladders, and along the mile-long main passageway before the miner emerges at the entrance.

*K'epirina* is also the name of a series of seven illustrated booklets published in Llallagua starting in 1987 (Figure 9). This was the year that the largest cooperatives in Llallagua-Uncía came into being, two years after the local state-owned mining company Empresa Minera Catavi had been dismantled. As discussed in the Introduction, neoliberal restructuring hit the mining sector hard, with some 23,000 unionized miners “relocalized” (laid off) nationwide following Supreme Decree No. 21060 in 1985 (Kohl and Farthing 2006); many of these same miners were founding members of mining cooperatives starting in 1987. In Llallagua-Uncía, the first few years of transition from unions to cooperatives were tumultuous, generating significant confusion about what this emerging sector was and its role within the restructured economy (and nation) would be. In this context, the publication of *K'epirina* by Radio

Pio XII, a local Catholic radio station that is still an active community organizer,<sup>11</sup> was an early attempt to explain what exactly mining cooperatives were, both to the general public and to the cooperative miners themselves. The booklets combined historical education with training manuals through a series of comics that follow the life of Pedro, a young Indigenous *campesino* (peasant) from the *ayllu* Chullpa, which encompasses the land around Llallagua. The comics narrate how Pedro is forced to leave his village when his crops are lost in a bad frost. When he arrives in Llallagua, wearing a *chulu*, or knitted cap that marks indigeneity in this region, he encounters a friend whose *chulu* is partially obscured by a miner's helmet. The friend invites him to a rally celebrating the government's 1987 decision to inaugurate the mining cooperatives. Joining unemployed miners, students, and other *campesinos*, Pedro enthusiastically embraces the chance to find his own fortune in the Juan del Valle mountain.



Figure 8 (left): *K'epirina*, the bag. Pictured at the Bocamina Siglo XX, Llallagua. September 24, 2016.

Figure 9 (right): *K'epirina*, the book. Excerpt: Pedro first hears about mining cooperatives (1987: 4).

<sup>11</sup> Throughout the Andes, locally-controlled radio stations were an important means of communication for miners and peasants organizing against oppression in the 20<sup>th</sup> century (O'Connor 1990). In Llallagua, the two prominent radio stations were *La Voz del Minero*, founded by unionized miners in 1952, and *Radio Pio XII*, a Catholic radio station run by Oblate missionaries from Canada. At the beginning, Pio XII was at loggerheads with the unions, and the priests aimed to draw miners away from the “danger” of communism. But after witnessing military brutality against the miners, the radio station began to champion the workers’ cause (López Vigil 1985). In the 1980s, Pio XII also began working closely with the regional peasant unions and *ayllus* (Le Gouill 2014). Today, it remains firmly on the side of “the people” but walks a fine line between supporting agricultural communities in their struggle against pollution, and supporting mining cooperatives in their struggle for increased access to mining concessions.

This series of booklets was called *K'epirina* because the bag was taken to be a symbol of cooperative mining. In the eras of state and private mining, miners shoveled ore into carts that were wheeled out with the help of electrical cables, rendering such sacks unnecessary; the *k'epirina* represents the more manual work of the cooperative miner. Importantly, the bag also symbolizes the “*campesino-ization*” of the mining sector: Literally made from a potato sack but filled with tin ore, the *k'epirina* is a material link between the potato-producing fields of the *ayllus* of Norte Potosí and the mines of Llallagua-Uncía.

This symbolism suits the cooperative miners gathered around Cancañiri, most of who identify as *agro-mineros*, or agricultural miners. While mining is their primary source of income, they also have farm land that that they tend at least a few times a year – to plant, to harvest, and to freeze-dry potatoes into *chuño*<sup>12</sup>. When I joined these miners for breakfast in the morning before a day’s work, they would frequently tell me about their visits to family lands in the *ayllus* surrounding Llallagua-Uncía. Or, as a retired cooperative miner put it in a public lecture in Llallagua: “In the era of the unions, we talked about the worker-campesino alliance, but now that work is being carried out *within* the cooperatives.” (Adrian Villa, 22 September 2016). This statement was followed by raucous applause by cooperative miners who imagine themselves as the link between land-based and subterranean economies.

Outside observers, however, are not so flattering in their descriptions of cooperative miners. As discussed in the Introduction, Bolivia’s dramatic leftward political shift, epitomized by the rise of President Evo Morales and the transformation of Bolivia from a Republic into a Plurinational State, has involved the rejection of neoliberal economics and the constitutional enshrining of Indigenous values. From the perspective of plurinational Bolivia, mining cooperatives were created by neoliberal policies and remain the purest expression of neoliberal capitalism: selfish, unregulated, and insatiable. Like the peasants described by Marx in this chapter’s epigraph, cooperatives’ control over their means of production is thought to have turned them into “potatoes in a sack” – individuals working for themselves and their families rather than developing a class consciousness or becoming truly “cooperative” collectives.

This chapter explores the history and labor practices of mining cooperatives in the towns of Llallagua-Uncía, in Northern Potosí. Contributing to a growing body of literature linking small-scale agriculture and small-scale mining (Peluso 2017, Lahiri-Dutt 2018a, 2018b, Maconachie and Binns 2007), as well as emerging conversations about the importance of vertical spatiality in resource extraction and place-making (Braun 2000, Bridge 2013, Elden 2013), I argue that cooperative mining in Bolivia’s tin belt has emerged as a *vertical* instantiation of small-holder farming practices that migrated, along with miners themselves, from the *ayllus* of Northern Potosí. In other words, the divisions of space and labor typical of agriculture in the *ayllus* have traveled across rural space to be re-embedded in the vertical dimensions of the mountain. What is described as an incredibly individualistic, neoliberal, and selfish entrepreneurialism is then, in fact, made possible by family networks that extend out across Norte Potosí.

In the subterranean, however, these extended family networks interacted with the legacies of unionized tin mining, which was characterized by labor hierarchies that were themselves created by early 20<sup>th</sup> century hiring practices and Cold War geopolitics. These pre-existing labor hierarchies

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<sup>12</sup> Bolivian highlanders turn their smallest potatoes into *chuño* for preservation over the winter. Made in the coldest month of the year, the potatoes must freeze fully overnight for two nights in the row. Farmers then pile the frozen potatoes into small mounds and physically step on them with a circular motion that removes the potatoes’ skins. Finally, the skinless frozen potatoes are left to dry in the sun.



corresponded with vertical variation in ore quality. New social striations crystallized as small-holder farming customs settled into the subterranean structure, creating sharp social differentiation across these subsoil “family farms.” Thus, instead of creating individualistic entrepreneurs, neoliberalism – and Cold War dynamics before that – caused the proliferation of a new economic model, characterized by an intermeshing of old hierarchies and new relations of kin. The resulting combination is *geosocial* in form: these are geological as well as social hierarchies, shaped by the uneven underground matter of the mountain.

I begin this chapter by situating Bolivian mining cooperatives in relation to the long theoretical engagement with the articulation of mining and agriculture and the new “vertical turn.” I then examine the socio-spatial reality of cooperative miners’ labors in Llallagua and Uncía before unearthing their history, starting with the emergence of an institutionalized form of thievery known as *ke’ajcheo* in the colonial period and moving to the rise of “subsidiary organizations” in the mid-20<sup>th</sup> century. I then examine the institutional history of mining cooperatives, and consider how their identity as *agro-mineros* has afforded them a privileged seat in the plurinational state.

Towards the end of the chapter, I shift to discuss how “vertical farming” is also making an appearance within agrarian communities that are turning to mining to supplement their livelihood practices and even to finance political organizations that no longer receive state support. I look specifically at demands for “communitarian mining” by CONAMAQ, the highland indigenous federation, and reflect on how small-scale agriculture and small-scale mining practices are influencing one another and, by extension, Bolivia’s political economy as a whole.

## **Mining, Agriculture, and Class Formation**

For political economists, mining has long been something of a rogue occupation, not easily categorized as either the toil of the peasantry or the fully salaried work of the proletariat. On the one hand, it tends to take place in geographically remote areas and workers often maintain close ties to agricultural lands, but on the other hand miners’ unions have been among the most militantly class conscious, not only in Latin America (Nash 1979) but also around the world (Mitchell 2011). The articulation of mining with peasant agriculture has often facilitated the accumulation of wealth by extractive companies, as illustrated by Alain de Janvry’s (1981) classic analysis of the Latin American agrarian question. He argued that the region suffered from a “disarticulated economy” in which export-oriented industries (mining in particular) depended on “semiproletarianized peasants,” whose wages did not need to be high enough to satisfy their reproductive needs because they had ongoing access to subsistence crops. A similar point was made by Wolpe (1972) with respect to migrant mining labor in South Africa, where Apartheid worked to preserve “pre-capitalist” modes of production that allowed capitalist mines to pay wages below the cost of social reproduction. This body of scholarship emphasized not just the dynamic interaction between agriculture and extraction, but also between small-scale extraction and industrial extraction, often pointing to an unruly proliferation of practices outside the traditional categories of salaried proletarians and subsistence farmers (Cleary 1990, Dunbar Moodie 1994, Ferguson 1999).

In Bolivia, there was a similar struggle over the categorization of mid-20<sup>th</sup> century miners. At this time, Bolivia’s nationalized tin industry dominated the economy, and unionized tin miners were symbols of nationalist revolutionary commitment, having been instrumental to the success of the 1952 National Revolution (Dunkerley 1984). To suggest that these miners were anything other than the paragon of worker unity was near sacrilegious, yet Harris and Albó (1976) did precisely that in their landmark ethnography of peasants and miners in Bolivia’s tin belt. They argued that the majority of miners employed by tin mining companies were *campesinos* (peasants) seeking wages to supplement rather than replace their farming livelihoods, and that these *campesinos* did not develop political

consciousnesses because of the seasonal and subsidiary nature of their work (I will discuss subsidiary organizations in more detail later). Union leader Filemón Escobar, a miner based in Llallagua, wrote a testimonial (1986) in direct refutation of Harris and Albó's work, emphasizing the miners' deep political commitments and horizontal (rather than hierarchical) relationships. This latter position is the most prevalent in historical accounts of Bolivian miners' unions. For instance, June Nash's (1979) seminal study of the tin miners' unions in Oruro and Llallagua argued that miners' strong sense of class consciousness was enabled by indigenous community practices. Although incredibly attentive to the micropolitics of the mining site, even her work largely ignored the reality of seasonal and subsidiary labor practices.

Agrarian studies have taken as a central object of concern the impacts of rural social relations on the patterning of capital accumulation, often demonstrating that transitions to capitalism – particularly in the Global South – have taken place in and through existing social stratifications such as class, caste, gender, and religion. Rural social relations are therefore not relevant to the countryside alone, but rather have “a decisive influence upon the pace, manner, limits, and very possibility of capitalist industrialisation” (Byres 1995, 569). Illustrating this point, Sharad Chari's study of “fraternal capital” in Tirrapur, South India, shows how rural social relations were historically transferred into the sphere of urban capital accumulation, creating a cultural context in which business owners developed familial relations with their workers by “toiling” alongside them (Chari 2004). Chari emphasizes that “the transfer not so much of things but of social and cultural relations’ in the movement from smallholder agriculture to garment production” (Chari 2010, 448). In this, Chari belongs to a longstanding tradition of agrarian studies that decenters urban, industrial, and European processes of capital accumulation, focusing instead on the ways that enduring agricultural practices give shape to contemporary patterns of capitalist production (Breman 1996, Bernstein 2010). Even as classical Marxist approaches were busy foreseeing the disappearance of the peasantry with processes of proletarianization, iconoclastic theorists such as Karl Kautsky (1988 [1899]) and Alexander Chayanov (1991 [1919]) were developing counternarratives that showed how smallholding farmers were transforming but *persisting* within industrial economies. Their conclusions continue to inform debates about the impacts of globalization and neoliberalization on peasantry around the world (Watts 2009).

Insights drawn from this literature are also instructive when devising a conceptual approach to the global boom of small-scale and artisanal mining. Since the 1980s, economic liberalization has opened new frontiers for foreign direct investment in natural resource extraction, particularly in the global south (Bridge 2004), while concomitant technological and organizational changes dramatically decreased the need for manual laborers. Spurred in part by layoffs and mine closures and in part by commodity prices that again began to boom in the early 2000s, the waged masses of the mining sector have given way to an explosion of Artisanal and Small-scale Mining (ASM) (Banchirigah 2006). The definition of ASM is contentious: although frequently defined as “labour-intensive, low-tech mineral exploration and processing” (Hilson 2011, 1032), many “small-scale” miners have large operations and high levels of mechanization. The ambivalence of the category, coupled with the fact that most countries have little or no infrastructure to monitor or regulate the sector, means that the number of small-scale miners is difficult to track. The best approximation is 40 million miners worldwide (IGF 2017, vi) producing between 15-20% of global mineral output (Verbrugge and Besmanos 2016) – numbers that do not include ancillary employment, dependent family members, or even quarrying of low-value subsoil resources such as gravel, sand, and limestone (Lahiri-Dutt 2018a).

Much of the academic response to the explosive rise of ASM has focused on its environmental and health risks and on the possibility of formalizing ASM operations, which would ideally integrate them into national and global economies with corresponding systems of oversight and regulation (Veiga and Hinton 2002, Siegel and Veiga 2009, Hilson et al. 2017; see Smith et al. [2017] and Marshall and Veiga [2017] for critiques of formalization). But another discussion is emerging that attempts to

re-frame small-scale mining as a livelihood strategy that exists alongside or instead of small-scale agriculture. Foremost in this category is Kuntala Lahiri-Dutt (2018a, 2018b), who deploys the term “extractive peasants” to describe “people taking up the pick in exchange for, or to supplement incomes from, farming or related livelihoods to survive changes unleashed by neoliberal economic policies’ (2018b:1). Building on numerous previous “expansions” of the peasant category that question whether peasants must be farmers, attached to the land, and have homogenous internal class relations, Lahiri-Dutt pushes the category further still by arguing that small-scale miners are also part of the global peasantry. In contrast, Nancy Lee Peluso (2017) draws on ethnographic work in Indonesia to conceptualize a “smallholder slot” that allows her to consider the dynamic interactions between small- and large-scale mining alongside those of small- and large-scale agriculture. Although their terminology is different, Lahiri-Dutt and Peluso are both concerned with the conceptual splitting of small-scale mining from other forms of engagement with natural resources by smallholders, such as peasants, swidden farmers, pastoralists, and forest farmers (Peluso 2017, 958). They also emphasize smallholders’ flexible livelihood strategies, and the inadequacy of available occupational categories for people who move fluidly between extracting “renewable” and “nonrenewable” resources. Indeed, small-scale mining has become an important complement to agriculture in countries throughout the developing world, including Ghana (Tschakert 2009), Sierra Leone (Maconachie and Binns 2007), and Zimbabwe (Spiegel 2009), to name just a few. While not denying the health and environmental impacts of small-scale mining, of which mercury (used in small-scale gold mining operations) presents the greatest concern (Veiga and Hinton 2002), overall these authors are exchanging an alarmist critique of ASM for a livelihoods approach in which small-scale mining is bundled alongside subsistence agriculture, remittances, and occasional wage labor as one of many rural survival strategies.

Although Bolivian mining cooperatives differ from the majority of small-scale and artisanal miners in that they enjoy an unparalleled level of political representation, they share with other small-scale miners the political ambivalence that contrasts starkly with the militant labor politics of mid-20<sup>th</sup> century Bolivian miners’ unions. This ambivalence is reflected in excoriating analyses by Bolivian commentators. As I discuss below, these commentators alternately associate mining cooperatives with the national bourgeoisie *and* the Indigenous peasantry, both of which have historically been blamed for national economic frustration.

### **“Lumpenbourgeoisie” and peasantry in vertical space**

In academic circles, the descriptor of mining cooperatives gaining popularity is “lumpenbourgeoisie” (Neri and Czaplicki 2016; Velasco Portillo 2014; Rueda n.d.) Andre Gunder Frank (1972) coined this term to describe the ethically compromised middle classes of Latin America, who made their fortunes in the legal shadows, undercutting their nations’ chances for economic sovereignty by selling raw national resources to neocolonial powers at basement bargain prices. This book was his attempt to respond to criticism about the geographic simplicity of his earlier work, *Capitalism and Underdevelopment in Latin America* (1967), which appeared to privilege international exchange relations over the social relations of production (Cabral Bowling 1969, see also Laclau 1971). His readers, he argued, had misunderstood him: what he had been trying to articulate was the effect of dependent satellite-metropole exchange on class interests and structure in Latin America (Gunder Frank 1972:1) “Lumpenbourgeoisie” is the word he uses to describe the class created by such imperial relations, and “lumpendevlopment” describes the ragged national economy this class generates.

Concern with the national bourgeoisie, however, was a distinguishing feature of the Latin American left long before Gunder Frank began publishing his theories of underdevelopment. Attempting to rethink Marx’s theories of class revolution in a postcolonial context, Latin American economists asked: in a context of economic imperialism, in which the national bourgeoisie are

economically dependent to the bourgeoisie of other countries, what chance was there for a true bourgeois revolution? In Bolivia, Trotsky's influence in this conversation has been enormous (Ferreira 2010, Smale 2010, John 2014). In his theory of permanent revolution, Trotsky argued that the bourgeoisie of "semicolonial countries" arrived too late to the table to divide international resources, which forced them to make alliances with imperial bourgeoisie. Through these alliances, the national bourgeoisie lost their autonomy and any revolutionary qualities they might have possessed. This was why any attempt at a bourgeois revolution in a semicolonial context was futile; to move beyond this dynamic, the proletariat had to lead an armed revolution to overthrow the dominant classes, as had happened in Russia. In Bolivia, the leading Trotskyist was historian and politician Guillermo Lora, who was born in Llalagua born in 1922. In 1946, Lora authored *Tesis de Pulacayo*, a landmark document written in the tin mining district of Pulacayo, which called for armed struggle led by the workers – in partnership with the peasants – to overthrow the feudal landholders and the incompetent bourgeoisie.

In Llalagua, Trotsky is never referenced by cooperative miners, but he still has a fair number of advocates among the older retired miners and university professors. The most outspoken among them, Roberto Flores, cuts a strange figure: his typical uniform includes a duffle coat with a news-blaring transistor radio stuffed in the front pocket, round mirrored sunglasses, and a set of explosive gray curls that always remind me of Bob Dylan. Roberto is a professor at UNSXX, and every time I ran into him he asked me if I had finished reading Guillermo Lora's *History of the Bolivian Workers' Movement*. When I guiltily confessed that I had not yet worked through all six tomes of this series, he would shake his head like a disappointed dissertation advisor.

On one occasion, apparently frustrated by my lack of commitment to Lora, Roberto switched into lecture mode. Using the wooden door next to us as an impromptu black board, he drew two invisible columns that were meant to represent miners' unions and mining cooperatives. "Cooperative miners," he said, pointing to the first column, "are like artisans: they do everything on their own. They mine the ore, they process the mineral, they take it to market. They each have their own *paraje* (work area). When the work is too much for them, they hire others, acting more like small-scale capitalists than collectivized workers." Gesturing to the second column, he continued, "the unions, on the other hand, had a social division of labor. Some miners dug the ore, others processed the mineral, and still others took it to market."

Moving to a different part of the wall, he drew an imaginary horizontal line. "Economic production has to be the basis of your argument. Then you can talk about the cooperatives' political organization" – a slightly higher horizontal line – "then about how they chew coca and worship the *Tío*<sup>13</sup> and all that" – a tap above the two lines – "But you need to begin with how they are landlords without socialized labor... They're landholders, *patrones!* Their consciousness is an extension of their mode of production."

"But there are not so many *patrones* here in the cooperatives of Llalagua," I said, reflecting on my own experiences with miners underground. "They don't hire third party workers the way cooperative miners do in the city of Potosí. If anything, the work reminds me more of *campesino* smallholdings, with whole families working together underground." Roberto responded:

That is precisely the trouble. In the Cerro Rico [silver mine in the city of Potosí, home to comparatively wealthier cooperative miners] they might hire *peones* who could think about unionizing, but here they just make their family members work as if it were the family farm. Nephews, brothers-in-law... and it's harder to convince someone to unionize when it's against their own family members!

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<sup>13</sup> Bolivian miners, unionized and cooperativized, are famous for paying tribute to a devil figure that lives underground and is called *Tío* (uncle). See Nash (1979) and Taussig (1980).

Roberto's comments gestured to the way mining cooperatives occupy a theoretical grey space between the petit bourgeoisie and peasant agriculture. Both groups hold their means of production, and both groups are rendered politically unreliable because of it.

In *The 18<sup>th</sup> Brumaire of Louis-Napoleon Bonaparte* (1852), Marx was similarly focused the reactionary effects of both these groups. This book was Marx's attempt to unpack the abstraction "the state" at a particularly contradictory moment of French politics, when Napoleon I's nephew defied expectations by ascending democratically to power in 1848. Although Marx is generally credited with arguing that the state is a reflection of the interests of the dominant classes, in this book the state is conceived not just as an extension of society, but as an important locus of struggle. Most importantly, the groups involved in this struggle are not always pursuing their logical class interests. The petit bourgeoisie, the lumpenproletariat, and the peasantry, in Marx's estimation, failed to conceive of themselves as a class and were thus responsible for the surprise election results. Small-holding farmers, he wrote, were unable to form a class "for itself" because their access to land - however measly their plots - made them less dependent on the market, while their mode of production isolated them from one another. His interpretation of peasant politics was nothing short of scathing:

A small holding, the peasant and his family; beside it another small holding, another peasant and another family. A few score of these make up a village, and a few score villages make up a department. *In this way, the great mass of the French nation is formed by the simple addition of homologous magnitudes, much as potatoes in a sack form a sack of potatoes.* In so far as millions of families live under economic conditions of existence that separate their mode of life, their interests, and their culture from those of the other classes, and put them in hostile opposition to the latter, they form a class. In so far as there is merely a local interconnection among these small-holding peasants, and the identity of their interests begets no community, no national bond and no political organization among them, they do not form a class. They are consequently incapable of enforcing their class interest in their own name, whether through a parliament or through a convention. *They cannot represent themselves, they must be represented.* (Marx 2008[1852]:124, emphasis added)

Much ink has been spilt exploring, refining, and refuting this passage (Shanin 1982; Hobsbawm 1973; Roseberry 1991). Among Latin Americanists, Eric Wolf was among the first to develop a more elaborate theory of peasant revolutionary involvement, arguing that village-dwelling smallholders were more likely to revolt than their rural and landless counterparts (Wolf 1969). In recent decades, when indigenous and peasant movements have been at the forefront of social change in Latin America, the claim that smallholders are inherently reactionary seems baldly unjustifiable (Postero 2007; Sawyer 2004; Wolford 2010). None have noted, however, that in 1852, Marx did not seem to find it strange to speak about potatoes as if they were the quintessential food of the French countryside, when they were in fact evidence of relatively recent colonial relations with the Andes. Spanish conquistadores arrived in Peru in the 1530s and began growing potatoes at home shortly after, but they did not become popular in France until well into the 18<sup>th</sup> century. Whether or he knew it or not, Marx's analysis of the French peasantry was steeped in colonial history. Written from and about the heart of Western Marxism, this was also inadvertently an Andean Marxism.<sup>14</sup>

But there is still something sticky about peasant politics for many Latin American Marxists, particularly those steeped in the Trotskyism for which Bolivian miners' unions were so well known. Trotsky argued, after all, that the proletariat should lead the peasantry to the revolution, as they were

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<sup>14</sup> Thanks to Donald Moore for this point.

unlikely to find their own way there. The potatoes in the sack cannot represent themselves; they must be represented. Are those who carry tin ore in a potato sack any different?

This is the question I had for Javo Ferreira, Trotskyist writer and former professor at the UNSXX in Llallagua, when I met with him at a Bolivian fast-food restaurant in La Paz. Light-skinned and speaking with an Argentine accent from years lived abroad as a child, Javo marked his Bolivianess with a large ball of coca leaves in his cheek and a wide-brimmed felt hat. He reflected:

In many ways, the cooperatives are something like campesinos. When campesinos possess little land, they tend to get cozy with the working class, but when they have more land they become more entrepreneurial... But there's a big difference because land within the same zone is relatively even in terms of fertility, but veins of ore vary widely! The system doesn't work: it just generates self-exploitation inequality... Moreover, by blocking state development in the mining sector, cooperatives are functional to transnationals. They don't move with a national spirit...

We Trotskyists have always insisted on the need to differentiate between classes. In the 1990s, many sectors of society that were once part of the working class stopped being working class - in Bolivia, [cooperative] miners are an example... And when they're in precarious conditions, these non-working classes often have political practices that resemble those of the left. But poverty does not make you working class! Right now, they are allied with the MAS, but they are very pragmatic and individualistic. How long will their support continue? *Así es la subjetividad de la pobreza: dice 'sí' al patrón hasta que clava el cuchillo.* [That's the subjectivity of poverty: say 'yes' to the boss until you can plunge the knife]. (Interview Javo Ferreira February 17, 2016)

Javo draws a Trotskyist attention to the potential political slide of those who own their means of production from an alliance with the working class when they are financially struggling to an alliance with the bourgeoisie – foreign bourgeoisie, in semicolonial contexts – when they are financially successful. This political ambivalence has been highlighted in Marxist agrarian studies since at least Kautsky (1899) but has rarely been considered in relation to mining. As I will show, however, cooperative miners in Llallagua cultivate tin in a way that mimics agricultural practices in terms of labor and spatial division. In doing this, I will complicate the narrative that they are a problematic “other” to the acceptable political positions of miners' unions or indigenous communities. Rather, I show how mining cooperatives have emerged at the intersection *between* miners' unions and indigenous agrarian communities, a fact that has afforded them a particularly influential position in national politics.

Far from metaphorical, this intersection is physically located underground, where cooperative miners practice agrarian traditions within rocky, three-dimensional plots that have been shaped by millions of years of geological activity and a century's worth of capitalist exploitation. While most studies of agrarian and extractive articulations have focused on the horizontal migrations of peasants into industrial areas (and sometimes back again), I am interested in how *agro-mineros* have shaped and been shaped by the vertical space inside the mine. In so doing, I am engaging a growing body of literature interrogating the production of vertical space, be it military infrastructure (Weizman 2012; Graham and Hewitt 2013), aerial security (Adey 2010), or subsoil resources (Braun 2000, Bridge 2013). Through such analyses, geography and cognate disciplines have been expanding notions of “territory” and “geopolitics” to encompass the third dimension (Elden 2013, Graham 2016).

But the underground is more than a volume to be secured, or layers of wealth to be calculated, or even an object of scrutiny amid mounting anxiety about geological limits of extractive economies;

it is also where miners confront rock most directly, where they negotiate their labor relations and conceptualize their political interests. They leave their mark in the mine's hollowed galleries and twisted arteries, and these material legacies provide the scaffolding climbed by later generations of laborers. But just as surely as transformations in miners' social composition manifest in the vertical materiality of the mountain, uneven subterranean geologies also inform miners' labor practices and social structures.

### **Llallagua-Uncía and Bolivia's national economy**

What you need to emphasize in your dissertation is the thread that connects previous eras – the era of Patiño, of COMIBOL – to the cooperatives. No matter what form the cooperatives have taken, it's within them that the political consciousness of the miner continues. The workers' unions today are politically weak because they don't have the history that the cooperative miners of Llallagua carry within them. The real fighters all ended up in cooperatives.

*Cooperative miner Fidel Colque, Interview, Llallagua, Feb 2016*

Simón I. Patiño called his lucky strike in the Juan del Valle mountain *La Salvadora*, or “the savior” because it saved him certain penury, having spent all of his wife's inherited fortune prospecting without luck. According to local lore, *La Salvadora* was several meters wide when Patiño first found it in 1899. Over the next 20 years, he expanded his operations by buying out the other smaller companies around him, and on July 5, 1924, he became the sovereign regional tin magnate with the incorporation of Patiño Mines Enterprises in Delaware, a company that was responsible for 49% of Bolivian tin production and 11% of global production (Mitre 1993, 208). In celebration of the modernizing promise of his mine, Patiño named its most important section *Siglo XX* (20<sup>th</sup> Century). Well into the 21<sup>st</sup> century, the name “*Siglo XX*” rings strangely anachronistic, but it is still attached to Llallagua's largest mining cooperative, the local university, the richest mineshaft, and the section of town that was once worker housing.

As Patiño's operations expanded, the towns of Llallagua and Uncía emerged on either side of the Juan del Valle mountain and quickly became the heart of national politics (Field 2014). Influenced by a steady stream of Marxist and Trotskyist political theory that flowed into Llallagua along the railroad the Patiño built to transport his tin ore (Smale 2010), miners in these towns established what would become some of the world's most powerful workers' unions (Nash 1979; Dunkerley 1984). These unions were committed to the nationalization of the tin mines, which they saw as a step towards the establishment of economic sovereignty in a true workers' state (Lora 1946). Although the latter was never achieved, Llallagua's unionized miners were protagonists in the 1952 National Revolution, which famously resulted in universal suffrage, land reform, and the nationalization of the tin mines. Patiño's properties were expropriated, and Llallagua-Uncía became the productive center of the nascent COMIBOL. Although the ideals of the National Revolution gave way to more than two decades of military dictatorships starting in 1964, Llallagua-Uncía remained an unshakeable center of the national economy and national politics for two more decades.

Llallagua-Uncía was transformed overnight following the passage DS21060 in 1985, which dismantled COMIBOL and sent truckloads of laidoff miners to Cochabamba, where many got involved in producing coca for traditional and not-so-traditional purposes. Anxious to lure the miners away from cocaine production, in 1987 the government passed another decree that (DS21377) allowed the formation of independent cooperatives in COMIBOL's abandoned properties. Miners flocked back to their former worksites. Between 1986 and 1990, the number of mining cooperatives in Bolivia jumped from 325 to 586, all located in the highland departments of La Paz, Oruro, and Potosí (Poveda Ávila 2014, 97).

In Llallagua, the regional federation of mining cooperatives was formed in June 1987 (FERECOMINORPO). Today this federation represents 16 cooperatives with approximately 4000 members across Northern Potosí. In Llallagua and Uncía alone, there are seven cooperatives with a total membership of more than 2600: Siglo XX, 20 de Octubre, Dolores, Juan del Valle, Carmen, 23 de Marzo, and La Multiactiva. Of these, the first four cooperatives work below ground, while the latter three work aboveground, re-processing tailings left behind by both Patiño and COMIBOL. All of them retain the political militancy of the miners' unions – they take pride in always being the first to respond to national calls to action – but their demands differ radically from those of the unions.

The basic structure of “cooperative” mining is what most horrifies outsiders. While mining cooperatives hold concessions as a collective, the majority of cooperatives do not pool supplies or profits or reinvest in production in any substantive way. Rather, becoming a member – which can cost anywhere from \$50 to \$1000, depending on the cooperative – gives you access to the concession, after which you are free to move around and find your fortune underground. Any *veta* (vein/deposit) that is already being exploited is off-limits, so new members must either join a pre-existing *cuadrilla* (work gang) or establish their own work areas. Within a *cuadrilla*, which might consist of anywhere from two to fifteen people depending on the quality of the ore being exploited, profits *are* redistributed, but always with reference to a hierarchy based on who bought the mining equipment, who found the *veta*, and who has been working longest in the *cuadrilla*. Hierarchies thus form within each *cuadrilla* and in the cooperative as a whole.

Mining cooperatives, moreover, resist paying taxes, which is interpreted as a resistance to sharing the wealth of Bolivia's subsoil with the rest of the country's citizens. Cooperative miners, however, insist that they *do* contribute to state coffers in the form of rent, royalties, and debt servicing: when the *cuadrilla* takes their ore to the “commercializer,” middlemen companies in Oruro that buy ore from cooperatives and transport it to Chile for sale to exporters, percentages of the *cuadrilla*'s profit are deducted for rent for the concession (1%), rent for abandoned state infrastructure (0.5%) and royalties (*regalias*). Royalties, unlike regular taxes, are returned directly to the department from which they came, with 20% going directly to the municipality of origin (in this case, Rafael Bustillos) and the other 80% going to the departmental government (Potosí). Considered “not for profit” entities, mining cooperatives do not pay regular taxes, and their royalties vary depending on the price of the mineral. For tin, mining cooperatives pay only 1% in royalties if the price drops below USD\$2.50/lb, and up to 5% if the price rises above USD\$5/lb (Ley No. 535, Art 227: I). In 2016-17, the price for tin hovered between \$8.00 and \$9.50 per pound – implying a relatively high royalty rate. However, because they do not pay regular taxes, which would go into a national rather than a regional pot, Bolivians still tend to imagine cooperatives as unpatriotic thieves.

In some regions of Bolivia, such as the city of Potosí, the cooperative labor structure has resulted in a kind of *tercerización* (outsourcing) whereby cooperative members accumulate enough capital to become stakeholders rather than workers. They invest in machinery and contract workers to labor on their behalves, often while pursuing separate highly-paid careers in medicine, engineering, politics, and so on. This practice is especially widespread in gold cooperatives in the north of the department of La Paz, which emerged in direct relation to the commodity boom and did not already have the kind of history associated with the hard rock “traditional” minerals, of which tin, silver, and *complejo* (mixtures of zinc, lead, and silver) constitute the vast majority. The differences between gold cooperatives and traditional cooperatives were so acute that the gold cooperatives split from FENCOMIN in 2015 and formed their own organization. But the traditional silver and *complejo* miners of the city of Potosí are also implicated in such practices, with high levels of social differentiation between cooperative members and the *peones* (peons) who work for them (Nogales Vera 2009).

The image of a rich cooperative miner sitting comfortably in a two-story house while dozens of his hired laborers work in grueling conditions fuels much of the anti-mining cooperative sentiment



in Bolivia. It would appear that the salaried miners, having been granted control over their means of production following neoliberal restructuring, forgot their Marxist training and began to treat the mountain as their personal property rather than shared national inheritance – exactly as Roberto and Javo theorized. But there are other histories worth excavating.

### **Migration, subterranean divisions of space and labor, and *agro-minero* politics**

Mauricio,<sup>15</sup> a leader of the mining cooperative Dolores, invited me to ride up to the peak of the Juan del Valle mountain on his motorcycle one afternoon in February 2016. From there, I would be able to see the lands of the *ayllu* Chullpa, where he had been born and raised. It was the rainy season, and the dirt path that wound its way up the side of the mountain was treacherous with stones emerging from the mud. But we persevered, dismounting and pushing the motorcycle over rough patches. As we climbed, we could see increasingly more of the land around us: miles of rolling hills, dotted with villages and potato fields.

Gesturing in the general direction of his village, Mauricio told me about his childhood as he navigated up the mountain. As a boy, he had traveled seasonally by foot between his village high in the altiplano and the much lower valley regions, where he and his father would trade potatoes and llama wool for grains, fruit, and vegetables. It was not an easy business. Mauricio described waking up in the open air having been covered with snow in the night, and the trials of trying finding water for the llamas in the dry season on the altiplano. While only a few hours' walk from the mining town of Llallagua, few people from Mauricio's village became miners. "My father was of the generation that was scared of the mine," Mauricio commented. "And there was a lot of discrimination back then, you know. Not just anyone could work in the mines. They didn't hire from the area.

Historians of mining in Llallagua-Uncía have made the same observation. Luis Oporto Ordóñez's study, which focuses on the early era of tin mining in Llallagua-Uncía (1900-1935), argues that workers in Uncía came largely from the exhausted silver mines of Colquechaca, within Norte Potosí, while workers in Llallagua came largely from the valleys of Cochabamba and Oruro. Another wave of workers came from beyond Bolivian borders, with a particularly high number of Chileans who had been working for the Chilean Compañía Estañífera de Llallagua (later purchased by Patiño) (115). He did not find one single case of a worker born in Uncía prior to 1913 (23). My review of over 200 employee files in the COMIBOL Archives shows similar results. Among workers hired between 1927 and 1929, 40% came from within the Cochabamba valleys, 40% were from other major mining towns (Colquechaca, Oruro, and Potosí), 20% were from towns in the department of La Paz, and only 10% were from towns or villages in Norte Potosí (COMIBOL Archives, Catavi). It is impossible to know why Patiño limited his recruitment activities in the immediate surroundings, but if he was looking for workers already disciplined for wage labor then the Aymara-speaking *ayllus* of Northern Potosí would have been unlikely sources. These *ayllus* had paid tribute and sent *mitayos* (corvée laborers) to the mines since the beginning of the colonial period, but in exchange they had demanded control over their lands relatively autonomy from both the Spanish crown and the Bolivian state – what Tristan Platt has called the "pact of reciprocity" (Platt 1982, 36). In the 1874, the state had attempted to "modernize" agricultural production by dissolving the *ayllus* with the *Ley de Exvinculación*, but massive indigenous resistance in Northern Potosí prevented the program's implementation (Rivera Cusicanqui 1987). As a region, the *ayllus* of Northern Potosí have thus maintained the greatest degree of control over their land and internal governance structure in Bolivia. Patiño, with his vision of modernization, created an enclave economy in the heart of indigenous territorial control; the revolution that expropriated Patiño's mines in 1952 had little effect on this socio-spatial division.

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<sup>15</sup> All cooperative miners' names are pseudonyms except for those with substantial public presences.

Ironically, it was neoliberalization and the virtual closure of COMIBOL in 1985 that fully pierced this barrier. When cooperatives were first formed in Llalagua in 1987, ex-salaried miners enlisted the help of migrants from the ayllus to help them extract as much as possible as fast as possible, as they did not expect the cooperatives to be a durable economic formation (interview, Llalagua, February 25, 2016). Like Pedro from the comic *K'epirina*, this is how Mauricio's father first began working in the cooperative Dolores. Like the other migrants, he was called a *makunku*, the Quechua word for the small green fruit produced by potato plants, to highlight his agricultural origins. When his father died from a severe stomach infection, Mauricio as the oldest son took his place in the mine at age 16. But in his *cuadrilla* (work gang) of 30 people, Mauricio distinguished himself with his mathematical skills, quickly taking over the *cuadrilla*'s financial operations rather than spending his time underground. He began taking on leadership roles in the cooperative, and now, at age 36, he is the cooperative president. He did all this while returning to tend to his land on a weekly basis and participating in ayllu government.

As Mauricio's story highlights, *makunkus* and their children do not always stay *makunkus*. The integration of ayllu members into the cooperatives has happened gradually in some cases, and by force in others. Most dramatically, in 2005 a group of people from the ayllu Chullpa who had been working as *makunkus* in the lowest level of the cooperative Siglo XX organized an occupation with others from the ayllu. Entering at night, they barricaded themselves inside the mountain, taking all the tools and declaring themselves owners of the mountain, as it was situated within their historical territory. These ayllu members took the lowest (and richest) levels of the mine to exploit, which has transformed the cooperatives from within. After several days of armed conflict, the situation was resolved by accepting 100 members of the ayllu into Siglo XX and granting them the lowest levels of the mine to exploit (level 700 downwards). From there, more and more members of the ayllu began to enter to the cooperative.

Miguel Soria, who was President of Siglo XX at the time and has since retired to drive a taxi and run an internet cafe, was still bitter about the conflict:

We the *cooperativistas* were assaulted by the ayllus, they treated us like **thieves**... They said that they were the **dueños (owners) of everything, the mine, the land, and everything that is common (llano)**... According to their history, the Chullpas, those from the ayllu Chullpa, were the first ones in this town. So this has made them believe that **as descendants they are owners** of Llalagua, no?...

I think that one way or another we wanted to tell them that **we are also born here**, in this town. We don't know much about the trajectory of our parents, but look, for example I was born here in Llalagua, I am also equal, owner as much as anyone, no? I began my life here, my parents were miners, I was a miner. **They were never miners, the ayllus have never been miners. They were dedicated to the land, no?** But in some moment maybe they saw the money that can be made extracting from the mine, and they maybe no longer wanted to work in agriculture and came here to put themselves in the mine as well.

We never asked anything from them, and they wanted to force us out of the mine. I think that we were trying to make them understand that **no one is the owner here**, that they can also become *socios* and they can also enter the mine and work, but they can't displace anyone. (Interview Miguel Soria, 9 July 2016, emphasis added in bold)

Miguel's quote not only demonstrates some of the ongoing rancor that the "old generation" of cooperative miners have against newcomers; it also expresses tensions around the question of *how*

claims to the subsoil are made. While the migrants from the ayllu claimed the subsoil as an ancestral right, the descendants of salaried miners claimed it by virtue of their own, individual births and their multi-generational labor underground. The last sentence also references a key aspect of cooperative miners' sense of collectivity. Rather than trying to stabilize the boundaries of the cooperative and redistributing wealth within it, they insist on "free association," by which they mean that there are no restrictions on who or how many people can join. At meetings of cooperative miners, the refrain "all for one and one for all" is often repeated, which would probably elicit eye rolls from political economists who do not trust the miners' cooperative intentions. But cooperative miners actually take the "all" part very seriously. They would not cede the mountain to the *ayllu*, but they were willing to invite *ayllu* members to join them underground. Anyone who wants to extract from the earth is welcome to do so; they are, after all, Bolivians, which gives them the right to exploit the nation's patrimony.

All this free association and rapid movement of agriculturists into the mine has influenced divisions of space and labor underground. From 2016-17, I spent about 20 full days (4-10 hours) underground with members of all four of the subsoil cooperatives. All of them work in what are called *cuadrillas* (work gangs), each of which has its own *paraje* (work area) – the interior space of the Juan del Valle mountain is carved up into hundreds of these *parajes*.<sup>16</sup> Within a *cuadrilla*, operations look something like a family farm. *Cuadrilla* members are very often related to each other – nephews coming to help out their uncles, fathers and sons, even an increasing number of widows and their children. Given the current exhaustion of the mine, newcomers have a hard time finding a *cuadrilla* without a family connection. Labor is distributed relatively equally across all members of the *cuadrilla* and rotated to ensure that no one is responsible for the most onerous tasks on a daily basis. In a *cuadrilla* of three, for example, one member will "send air" (operate the air compressor at a distance) to his two *compañeros* handling the pneumatic drill deep in their *tope* (literally "limit," refers to the point of exploitation, where the vein is visible). One of these will be holding the drill while the other directs the end into the right point in the rock. The next day, the three rotate their jobs. The mining cooperatives have an official policy that disallows membership prior to age 18, but there is a collective blind eye to teenagers assisting their parents, especially during school vacations. Equipment, including the compressor that sends air to pneumatic drills (the most expensive piece of equipment owned by cooperativistas) is shared across families.

Most importantly, *parajes* and their associated veins of ore are hereditary. In the wake of the death of a *socio*, traditionally his eldest son will enter the mine, though increasingly widows are working in their husbands' steads. Until recently, these sons also had their membership fees waived, but with the commodity boom that policy was rescinded. Now they have to pay to join the cooperative, but once in they have immediate control over the vein that their father was exploiting, or guaranteed membership in his *cuadrilla*. In this way, relations of kin mediate access to the mine: although they are described as "savagely" individualistic subjects, in practice the productive capacities of cooperative miners are enabled by kinship networks that turn *cuadrillas* into vertically organized family farms.

Sergio, a miner in Siglo XX, further demonstrates the impacts of migration between mines and fields – not only on the cooperatives, but also on the agricultural communities. Sergio is from Maraca, a town in the ayllu Karacha. Like many from his village, he had migrated to Uncía as a young teen to attend high school and had started working with his uncles underground shortly afterward. His *cuadrilla* is mostly made up of his brothers and cousins, and they work in a strange corner of the mountain. Although members of Siglo XX, they do not enter through the major mineshafts, but rather through small tunnels tucked away on Uncía's side of the mountain.

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<sup>16</sup> The aboveground cooperatives are beyond the scope of this chapter – I will return to them in Chapter 4 - but suffice it to say that *parajes* and *cuadrillas* also exist on the surface in ways that parallel underground arrangements.

We rode Sergio's finicky motorbike up to the entrance, tipping over twice in minor accidents that he blamed on my being so much larger than the average Bolivian woman. These transportation troubles made us late, and by the time we arrived the rest of his cuadrilla was already going in for the day's work. The two of us sat for half an hour in his *paumiche* anyway, chewing coca and sipping from a bottle of *Tres Plumas*, a sweet coffee liqueur. Because they worked in short tunnels rather than long mineshafts, Sergio's cuadrilla had built a small outdoor shack to use as a *paumiche* rather than dig a room underground, the norm for most Siglo XX cuadrillas. Windowless and unlit except for a single hanging lightbulb, it might as well have been underground, except for the wind that whipped through the cracks in the plywood walls.

But it had been a couple of weeks since Sergio had come up to the mine, as he was trying to complete a degree in law at the local university. After nearly 20 years as a miner, Sergio had plans to move into politics. He wanted to pursue leadership in the CSUTCB (*Confederación Sindical Única de Trabajadores Campesinos de Bolivia*, Unified Syndical Confederation of Peasant Workers), and his goal was to move all the way up through the ranks to the COB (*Central Obrera Boliviana*, Bolivian Workers' Central), where he could represent *agro-mineros* alongside workers from all different sectors. Historically created and dominated by the national federation of unionized miners, the COB in theory represents all workers in Bolivia, including peasants, but its policies dictate that the leader must always come from within the unionized mining sector. Sergio was tired of this policy. Once in the COB, he wanted to propose modifications that would strengthen the COB's service to the unsalaried sectors it claimed to represent: the *campesinos*, the *taxistas* (taxi drivers), the *gremiales* (guild members), and the *cooperativistas*:

Do we want to strengthen the Bolivian Workers' Central, or not? We want to, so let's [do it]. In order to benefit these cooperatives, transportistas, guilds, campesinos, let's make a Thesis similar to that of Pulacayo and make it prevail in the Bolivian state. (Interview, Uncía, June 3, 2017)

The Thesis of Pulacayo to which he referred was the landmark document in the worker's movement, penned by none other than the Trotskyist Guillermo Lora and signed by a group of miners in the town of Pulacayo in 1946. Although the Trotskyists never secured a majority in the federation of unionized miners, this document was adopted as the federation's central thesis. It called for a living wage, 40 hour-work weeks, worker control of the mines, arms for workers, and a proletarian-campesino alliance to fight to ruling classes (Lora 1946). For Sergio to call for a new such document that identified the unsalaried workers as the new subject of the plurinational economy was significant. It shows the extent to which mining politics and particularly the openness of mining cooperatives is influencing agrarian politics as much as agrarian social relations are influencing the world underground.

I had met Sergio nearly a year prior to this conversation in Cochabamba during FENCOMIN's 24th National Congress, and I brought this experience up with Sergio now. The most striking aspect of the Congress had been, to me, the way leadership was selected on a turn-taking basis (I will return to this congress in Chapter 5). I said to Sergio that this incident had struck me at the time like a strange mixture of ayllu and union. Although all the leadership positions in the cooperative reflect those in the unions, there is much more importance placed on rotational turn taking, which I had seen at play in the fights within both the regional federation FERECOMINORPO and the national federation FENCOMIN. "Would you agree that it's a mix between the two systems?" I asked.

Yes, yes, that's it. It's a mixture, yeah, it's a mixture of ideologies, mixture of leaders, mixture of speakers... Cooperatives include both ayllu and union, and inside the cooperative it's like

this, right? The union puts forth its point of view, the ayllu puts forth its point of view, and so you mix it altogether... That's how it works. (Ibid)

But this “mixture” does not happen on a blank background. Rather, it is formed in a particular geo-social context that influences its political shape, as I show below.

### Mountainous Materiality and Subterranean Histories

The transfer of agrarian social relations into the subsoil was not without friction, particularly vis-à-vis the vertical materiality of the mountain. Even more than variation in soil quality across farms, there is massive variation in ore quality across *parajes*. The mountain is divided into horizontal slices, each about 30 meters high, that start from the peak (level 0). The lowest workable level is at 800 meters down from the peak (level 800) – below that there is too much water, even with multiple pumps. The Cooperative Siglo XX holds the largest concession, from level 412 all the way down, across the whole mountain. Three cooperatives share the higher space, from level 412 upwards (20 de Octubre, Dolores, and Juan del Valle) (Figure 10).

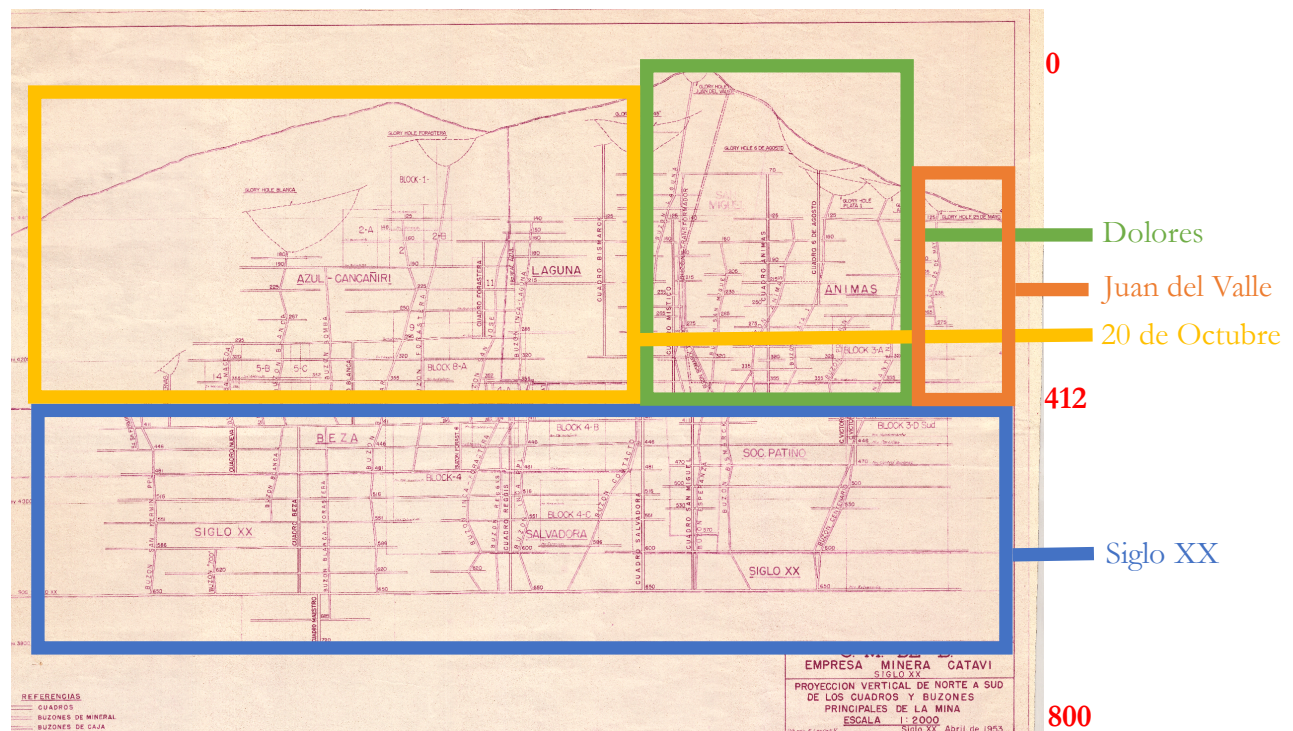


Figure 10: Divisions of space among cooperatives inside the Juan del Valle Mountain.

This vertical division reflects an older social division, in which the lower levels were reserved for the state corporation COMIBOL and its salaried workers, while the higher levels were exploited by a “subsidiary organization” called *locatarios*, which I will discuss in the following section. The tin deposits are richer on the lower levels of the mountain than they are in the higher reaches, which means that the cooperatives working in ex-locatario areas have lower-quality tin at their disposal. Ore from the lower levels is purer and can be processed relatively quickly using just water and gravity, but ore from the higher levels is mixed with sulfur and must be processed with gasoline, hydrochloric acid, and xanthate. In addition to extracting less value from their ore, cooperativistas working in the higher

levels have hands that are rubbed raw from xanthate exposure, and they claim to have higher rates of respiratory problems from inhaling the xanthate fumes. Thus, although social organization *within* a single cuadrilla is relatively egalitarian, there is significant social differentiation *across* the cuadrillas within a cooperative, and even more *between* the different cooperatives.

This social differentiation is shaped by the material history of the subsoil. When ayllu members were incorporated en masse into mining cooperatives after the neoliberalization of mining sector, they encountered a subterranean world in which social hierarchies were organized in relation to the geologically differentiated mountain. This section charts the historical emergence of this “geo-social hierarchy” – shaped by geological materiality, global geopolitics, and local migration patterns – and its impact on contemporary cooperatives in Llallagua-Uncía.

Cooperative miners across Bolivia are always quick to point out that the oldest mining cooperative in the country, which is still operational today, was founded in 1931 in the immediate aftermath of global economic crisis (Mariobo Morena 1987). Not generally noted is that this group was not *technically* a cooperative; rather, it was a union of free workers in the city of Potosí claiming a lineage with the practice of *k'ajcheo*, organized theft of ore by miners that slowly evolved into a customary right starting in the 17<sup>th</sup> century (Tandeter 1981; Stern 1988; Abercrombie 1996). The cooperative *K'ajchas Libres y Palliris* was, in fact, the first union of such entrepreneurial thieves who wished to pool their production and avoid the commitment of selling their ore to a single processing plant (Absi 2006; Barragán 2015).

The term “cooperative” did not make a legal appearance until the mid-20<sup>th</sup> century. The Bolivian government passed the General Law of Cooperative Societies in 1958, at a time when the US-led Alliance for Progress was promoting workers’ cooperatives to weaken unions and impede socialist uprisings in Latin America in the context of the Cold War (Field 2014). Mining cooperatives began to form across the country at this point, selling their ore to the Mining Bank of Bolivia, which also extended credit to the budding cooperatives (Poveda Ávila 2014, 9). This process was accelerated in 1960 with the launch of the Triangular Plan, a prong of the Alliance for Progress aimed specifically at “rehabilitating” the flagging COMIBOL through a series of massive worker layoffs. Laid off workers, however, reappeared in the mines as *jukus*, a Quechua word that translates as “bird that flies by night” and implies thievery (Kohl, Farthing, and Muruchi 2011, 36). Mining cooperatives were established to absorb the *j'ukus*, and by the time the Triangular Program ended in 1970, COMIBOL had forty-eight cooperatives on its property, which collectively had 5,000 official members and 4,000 associate members (Burke 1987, 33). Meanwhile, FENCOMIN was founded in 1968, representing 80 mining cooperatives with a total of 20,000 members (FENCOMIN 2008).

The history of mining cooperatives in Northern Potosí both dovetails with and diverges from this national story. I have already mentioned that Patiño tended to hire workers from distant areas rather than from the ayllu of Northern Potosí, but here I want to show the slippage of this tendency. Beneath the history of unionism – what Ricardo Godoy (1985a, 107) calls the “labor aristocracy” of Llallagua-Uncía – there is a history of continuous interaction with the ayllu of Northern Potosí (Harris and Albó 1974). Part of this relationship has been limited to the realm of exchange: to supplement their husbands’ incomes, miners’ wives would travel to rural areas and trade marked up company store goods for fresh vegetables (Godoy 1985b). But a pyramid of “subsidiary organizations” beneath the unionized workers also offered accessible, short-term employment that was never as thoroughly monitored as the unions. In rough hierarchical order, under the two unions of “regular” (salaried) workers (Siglo XX and Catavi) there were five groups of subsidiary workers: *locatarios*, *lamerros*, *veneristas*, *palliris*, and *jukus* (Godoy 1985a; Harris and Albó 1976). Retired miners who had been members of subsidiary organizations recounted in interviews that that these collectives were more porous than their salaried counterparts: in addition to absorbing miners laid off during the Triangular Plan, they permitted continuous migration between regional ayllu and the mines. Moreover, these subsidiary

organizations provided the organizational structure for five of the seven mining cooperatives in Llallagua-Uncía.

The first three subsidiary organization were called unions, but they were not technically employed by the company; rather, they sold all of the ore they extracted to the company, which deducted a percentage of what they produced as rent. *Locatarios* (literally “tenants”) worked underground in less profitable sections of the mine starting in 1969, near the end of the Triangular Plan. Andres Mena, co-founder and ex-leader of the locatarios, recounted their history to me over tea in the restaurant of Llallagua’s hotels. The friendly 72-year-old, who always looked dapper in a collared shirt, sweater, and flat cap whenever I ran into him around town, explained that after General René Barrientos Ortuño came power in 1964 through a *coup* supported by the US government, he directed his military power at weakening the miners’ unions in Llallagua-Uncía. Alongside the implementation of the Triangular Plan, Barrientos gifted sections of the state-owned mine to 31 individual (often foreign) prospectors known as *arrendatarios*. These *arrendatarios* proceeded to hire miners who had been laid off from the state corporation to work their private concessions. When Barrientos was killed in a plane crash in 1969, Andrés Mena returned from Argentina, where he had been in exile to avoid persecution for his union activities, and found a job working for one of these *arrendatarios*, an Italian who was operating the Dolores section.

“It was unjust that we were working as employees of the *arrendatarios*, who were essentially mini *patrones*, so on October 20, 1969 we took possession of the mine and expelled the *arrendatarios*” (Interview Andrés Mena June 12, 2016). The union of locatarios was called 20 de Octubre to honor this day. “We were workers dependent on COMIBOL, but not as *regulares* [salaried miners] so much as *dependientes*... COMIBOL deducted a rental fee and also provided us with technical support...The 31 areas that were rented [to *arrendatarios*] were converted into 31 work sections [for *locatarios*]. I worked in Dolores level 190.” With the gutting of COMIBOL in 1985, this union of *locatarios* provided the basis for two cooperatives: 20 de Octubre (est. January 26, 1987) and Dolores (est. 1987), the latter of which was a breakaway group of locatarios led by Andrés Mena.

Like the *locatarios*, the *lamerros* had a “union” of workers, sold all of their production to COMIBOL, and had rent deducted from their profit. Lamerros, however, worked above ground, capturing tin from the wastewater that flowed out of the “Sink and Float” processing plant, which was constructed in 1945. Victor Hugo Vargas, who worked in lamas since he was 15, explained to me that the lamerros were the brainchild of Federico Escobar Zapata, a famous union leader who was at the time the head of the Siglo XX union. Victor, who at 69 is working in construction, started tearing up when he spoke of Escobar. “He was a great leader, and I believe he understood humility, simplicity, and work” (Interview Victor Hugo Vargas, July 5, 2016). In 1963, with rising demand for employment, Escobar designed the lamerros union and requested that access to wastewater be turned over to the union. “Lama” means “slime,” and this was an accurate descriptor of work conditions. Escobar divided the river into segments, each of which was between two and three meters long. Every morning the 150 lamerros would line up next to their assigned segment and, at precisely 9 o’clock, a woman who worked as a guard would blow a whistle to begin the work. All 150 workers would jump into their segment of the river and begin shoveling out lamas, the slimy silt that still contains small amounts of tin settled on the river floor. Since the segments of the river nearest to Sink and Float had the richest mud, lamerros worked rotationally each week, with those who had been in the back going straight to the front.

Victor Hugo and several other members worked tirelessly to turn their group into a recognized union, achieving this in 1971 with 200 founding members. But only four months later, COMIBOL told them that their numbers would be doubling with the incorporation of some 250 *palliris*, women who worked in the slag heaps of the mine, picking over discarded rocks to find the dark sparkle of tin. There were already a large number of women working in *lamas*, and theirs became the only

majority-women union. “They didn’t want to hire women as regular (salaried) employees,” Victor Hugo noted of COMIBOL. All of the lameros processed their ore in artisanal *ingenios* (processing plants) called *budles*. Although there are no more lameros because the Sink and Float plant no longer generates wastewater, in the 1980s members of the former subsidiary union joined the cooperatives 23 de Marzo and Carmen, where they still use *budles* to process ore purchased from other cooperatives. Both of these small cooperatives are still majority women.

Finally, *veneristas* worked in the ore sands at the base of the mountain, digging holes that were up to 50 meters deep straight into the ground. This was a dangerous job: although bolstered from within with wooden beams, accidents frequently occurred when these beams collapsed or the water level suddenly rose. The oldest cooperative in Northern Potosí – and the second oldest in the country, according to locals – was a group of *veneristas* based in Uncía called the Cooperativa Minera Juan del Valle. They registered as a cooperative in 1961, shortly after the passage of the General Law of Cooperative Societies (Poveda Ávila 2014, 29), but one of the cooperative’s founding members explained that this was just part of their story: what became a cooperative in 1961 had existed as an informal group of ex-company miners known as Centenario since at least 1950. At its height, around 1952, it had 2500 members, or roughly half of the population of Uncía (interview, Uncía, Feb 19, 2016).

Juan del Valle is still an operational cooperative today, but now the members work underground in the upper levels of the Juan del Valle mountain rather than in the ore sands. The current president of the cooperative is a young leader whom everyone calls *El Ingeniero* because he completed an undergraduate degree in mining engineering. In the Juan del Valle offices, he explained to me that the *veneristas* were exploiting three layers of mineralized rock in a former riverbed, and by the 1980s they had basically exhausted their deposit. Relocalization, or the shutdown of the state corporation and layoff of the unionized miners, worked in their favor because they were granted sections of the underground mine. All the current members of Juan del Valle now work underground, and the only remaining evidence of the *veneros* are piles of dirt and half-filled holes scattered all across the floodplain below Uncía.

Actually, Juan del Valle was only one of several regional cooperatives, but the rest are now defunct, with apparently no trace that they ever existed. When FENCOMIN held its second national congress in 1970, there were 98 mining cooperatives nationwide, nine of which were based in Norte Potosí. These nine were associated with the Oruro Departmental Federation, which was geographically closer than the city of Potosí (FENCOMIN 2008)<sup>17</sup> – Norte Potosí’s own regional federation, FERECOMINORPO, was not formed until after the relocalization in 1987. Of these nine, one was Juan del Valle, but there is no record of the others. I would always ask people about these cooperatives, and the majority insisted that they had never existed; their very ephemerality points to the way that such organizations could be used by rural people to gain short term or intermittent access to the subsoil to supplement their income.<sup>18</sup>

The two remaining “subsidiary groups” were not officially subsidiary in the same way as the first three. *Palliris*, or women who traverse slag heaps looking for rocks with tiny traces of tin, never received their own political representation. As Victor Hugo mentioned, they joined the lameros’ union, but they never formed their own. This pattern is consistent today, in which women, most of whom

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<sup>17</sup> Retired cooperative miner and recently ex-Senator Efraim Condori shared his copy of the *Recopilación Histórica de Congresos de la FENCOMIN* and helped me interpret some of the information, for which I am grateful. This compendium of FENCOMIN resolutions was published in 2008, with funding from the Morales government, to celebrate the federation’s 40<sup>th</sup> anniversary.

<sup>18</sup> One of these cooperatives was called “Kennedy,” which might not be a coincidence since this was the era that US President Kennedy was pushing cooperatives across Latin America (Field 2014).



work on the surface as *palliris*, are integrated into every cooperative but do not have their own organization. The Quechua word *palliri*, still widely used, means “to pick up” and refers most directly to the women who roam across the *desmontes* (slag heaps) searching for rocks with traces of tin left behind, which they then break apart with a hammer. Nowadays, although the *desmontes* of Llallagua are enormous – from the road they appear as a whole separate mountain range, the less verdant afterimage of the real mountains behind them - the surface has been so picked over that only the lucky *palliri* encounters anything worth exploiting. Instead, “*palliri*” has come to refer more generally to women who work on the surface, including those who operate *budles*, the artisanal systems for concentrating mineral using gravity, water, and a toxic mixture of gasoline and xanthate. The word *pailliri*, however, is deeply unpopular with many women cooperative miners, who prefer *socias cooperativistas mineras*, with the grudging acceptance of *socias pailliris* only for women who work aboveground. In fact, it is striking that *pailliri* is the only term that has been carried forward from the subsidiary era to today, while all the others have fully disappeared, absorbed into the more general “cooperative mining.” This speaks to the broader way women are asked to carry a historical and cultural weight from which men are exempt, even in relation to the supposedly “non-Indigenous” activity of mining (Nelson 1999 discusses this phenomenon among Mayan women in Guatemala).

Finally, *jukus* are the thieves of the underground, the *k’ajchas* of the 20<sup>th</sup> century. Meaning literally “birds that fly by night” in Quechua, *jukus* were and are miners who enter illegally at night to extract ore. As was the case with *k’ajcheo* in the 19<sup>th</sup> century, *jukeo* was a largely accepted practice during the eras of Patiño and COMIBOL, with *jukus* lining up in the evening to enter as soon as the guards were off-duty (Godoy 1985b). Many of these *jukus* were teenagers who were either too young to work in the company or who had recently migrated from rural areas – and many of them transitioned straight into the cooperatives post-1987, without ever having set foot in the state corporation.

Such an experience was described to me during Carnival in 2017, as I sprinkled beer on to the ground around machinery used to process tin ore in order to ensure its reliable functioning in the year to come. My friend Rosalia’s husband José, usually a taciturn man in his 60s, began regaling me with his life stories, beginning with the death of his father in a COMIBOL mining accident. José, too young at the time to work for the company but feeling the financial weight of the family falling to him, had joined a group of teenaged *jukus*. None of them knew how to mine, but they learned by asking more experienced miners to join them in exchange for a cut of the profit. When the cooperatives were forming in 1987, José was as well known among the miners as if he had been a regular employee, and he joined the Cooperative Dolores, which had been primarily formed from ex-locatarios. After this conversation, I began to ask other older miners about their experiences with *jukeo* and many told me similar tales of entering the sector through thievery. This does not prevent them, however, from feeling a deep anger towards contemporary *jukus*, who affect cooperativistas more personally than *jukus* ever affected salaried miners; cooperativistas own all of their own equipment, and the disappearance of drills, dynamite, and even lightbulbs implies a personal cost. Cooperativistas build doors on their *parajes* (work areas) and padlock them shut at night, but determined *jukus* find their way in regardless.

Overall, the seven cooperatives in Llallagua emerged from the five workers’ “unions,” of which only two were salaried, and one pre-existing cooperative (Juan del Valle) (Figure 11). *Palliris* and *jukus* joined all most of these cooperatives as full card-carrying members.<sup>19</sup>

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<sup>19</sup> The card itself is symbolically important. People who have not been cooperative miners for years, like Victor Hugo Vargas who has been working in construction for a decade or my colleague Johnny Mollinedo who is now a professor at the local university, will whip these cards out of their wallets at any moment to prove to me or others that they were once miners.

Pre-1985 Mining Collectives	Post-1987 Mining Cooperatives
Siglo XX Union (salaried)	Siglo XX Mining Cooperative
Catavi Union (salaried)	Multiactiva Mining Cooperative
20 de Octubre Union ( <i>locatarios</i> )	20 de Octubre Mining Cooperative Dolores Mining Cooperative
Canal Workers' Union ( <i>lameros</i> and <i>palliris</i> )	Carmen Mining Cooperative 23 de Marzo Mining Cooperative
Juan del Valle ( <i>veneristas</i> )	Juan de Valle Mining Cooperative

Figure 11: Transitions from pre-1985 mining collectives (unions, *locatarios*, *lameros*, *palliris*, cooperatives to post-1987 mining cooperatives.

When they were first created, subsidiary organizations both absorbed surplus labor and allowed for fluid migration between the mines, the fields, and other activities (school, service labor, etc.). They also permitted family labor in a way that the unions did not: teenagers and wives could assist *lameros* in processing the mineral they extracted from the wastewater, for example, and *palliris* could increase their own production by working with their children.

During the neoliberalization of the mines in the late 1980s, however, these same subsidiary organizations provided the geo-social structure within which mining cooperatives developed. Mining cooperatives that formed in the shafts once worked by *locatarios*, for example, have access to more marginal work areas than those formed in the shafts of once worked by unionized miners. The geologically varied depths of the mountain have shaped and been shaped by a century's worth of rural-urban exchange; today's mining cooperatives crystallize social structures that have emerged in this rocky contact zone of union politics and small-scale farming. Below I explore the implications of this formation.

### ***Agro-Mineros* in Politics**

The movement of ex-salaried miners into FENCOMIN post-1985 transformed the institution gradually. Efrain Condori, a former union leader who became a cooperativista and rose to the presidency of FENCOMIN before becoming a Senator for the MAS in the plurinational legislative assembly, described this experience:

When I entered FENCOMIN, I found everyone using neckties, it was obligatory to use one, but we ex-unionized miners don't like neckties much and so we needed to change the situation. Until I entered in 1998, FENCOMIN had never put forward a list of demands (*pliego*) like we did in the unionized camp, and I was the one who suggested this for the first time. (Interview Efrain Condori September 23, 2016)

Mining cooperatives did indeed become distinctly more combative in this period at the end of the 1990s. They also started to win a number of concessions from the state – though these were mostly palliatives for their chronic underemployment. In addition to COMIBOL's ex-concessions, they were

“given” all of COMIBOL’s machinery, though in fact the cooperatives are still paying off accrued debts from these less-than-free gifts (see Chapter 4). Ex-leader of FENCOMIN Adrian Villca narrates a story of gradual political awakening that begins at the turn of the 21<sup>st</sup> century, when cooperative miners began to fight for incorporation into the social security system and the *caja* (national healthcare). In 2001, there was a major mobilization demanding more help from the state: machinery, equipment, and most of all prospecting. Then-president Hugo Banzer signed an agreement promising to fulfill all of these demands. Although they were never carried out satisfactorily, this agreement remains important because it was the first of its kind (Interview Adrian Villca, 17 January 2017).

Mining cooperatives are rarely identified as major leaders in the protests that preceded Evo Morales’s rise to power in 2005, though most cooperativistas claim to have been by his side since his party’s earliest the earliest days. “We supported the *proceso* from the beginning,” declared Jesús Aldunate, president of FERECOMINORPO. “For that reason, we consider ourselves owners (*dueños*) of the process of change, because we offered our lives” (Interview February 25, 2016). In either case, the mining cooperatives have been close allies of Morales since he came to power, a relationship that was consecrated with Morales’s immediate appointment of a former FENCOMIN leader, Walter Villaroel, to the position of Minister of Mining and Metallurgy – an unprecedented event in Bolivian history. Although Villaroel quickly lost this position following a violent conflict between mining cooperatives and salaried miners in his hometown of Huanuni (Webber 2011), the relationship between the cooperatives and the state bounced back. Since Morales’s election, wealth and power have in general accrued in sectors of society that had been previously marginalized, such as the *cocaleros* (coca growers) from whose ranks President Morales emerged in the early 2000s following decades of US-driven persecution of coca cultivation (Grisaffi 2013). Mining cooperatives, although not as directly associated with the Morales administration as the *cocaleros*, have similarly benefitted from efforts by this “social movement state” (Gustafson 2010) to redirect decision-making towards its political base.

In combination with rising commodity prices, favorable policies towards cooperative miners have provoked the sector’s dramatic growth, from 40,000 in 2000 to 110,000 in 2011 (Francescone and Díaz 2013: 13). The official count is currently more than 120,000 (Mamani 2018), though frequent movement in and out of the sector makes this number difficult to track. In either case, the mining cooperatives now constitute a major voting bloc for the MAS, and they know it: “We are important when it comes to choosing a government... Between us and our wives we are 300,000 voters, plus our children with the right to vote and we would arrive at 400,000... The unionized sector right now must have some 14,000 workers, many fewer than us. We are important.” (Interview, Efrain Condori, Llallagua, 23 September 2016). Efrain’s analysis of mining cooperatives as a voting bloc, with all the ingrained masculinism and heteronormativity embedded in the assumption that all cooperative miners are men “with wives,” reflects a widely held opinion among *cooperativistas*.

Mining cooperative leaders participated in the Constituent Assembly that wrote Bolivia’s new constitution, passed into law in 2009. A founding principle of Bolivia’s this constitution is economic pluralism, and it recognizes four kinds of economic organization: state, private, cooperative, and communitarian (CPE, Art 306: II). The one exception to this rule is in the natural resource sector, where only state, private, and cooperative entities are recognized as “productive actors” (CPE, Art 351:1). As a result of this exception, in 2013 Bolivia’s highland Indigenous federation CONAMAQ was excluded from negotiations around the new Mining Code (Law No. 535) (Marston and Kennemore 2019). Representatives of the cooperative mining sector, however, were given a privileged seat at the table. Unsurprisingly, the law that was ultimately passed in 2014 gave the cooperativistas privileged access to minerals, territory, and water (Marston and Perreault 2016). At this point, mining cooperatives also have their own Viceministry in the Ministry of Mining and Metallurgy, which works closely with FENCOMIN.

Perhaps most importantly, mining cooperatives have a direct line of communication with the president. As an example of this, on May 27, 2017, President Morales held an event in a stadium in Oruro to honor women cooperative miners across the country. After traveling overnight to arrive from every regional federation, *socias cooperativistas mineras* and *palliris* gave Morales an enthusiastic welcome that was only partially motivated by their anticipation for the lunch and beer that they expected him to provide. As Morales stood to speak, two women wearing helmets and *polleras* (traditional pleated skirts) approached him and ceremoniously helped him into a *k'epirina* that he wore for the duration of the event (Figure 12). The *k'epirina*, the potato sack bag that exemplifies the agricultural origins of the *agro-minero*, symbolized the mutual support of mining cooperatives and the Morales government.



Figure 12: Evo Morales wearing a *k'epirina* to speak to *socias mineras cooperativistas*. Oruro, 27 May 2017.

The proximity of the Morales government and cooperative miners, who have largely supported one another since 2005, is related to the latter's *agro-minero* identification. The country's first indigenous-identifying president, Morales's rise to power involved the unification of many sectors that did not always see eye-to-eye, including indigenous federations, peasant unions, salaried workers' unions, and collectives of unsalaried workers (e.g. carpenter guilds, taxi driver unions, coca grower unions, etc.) Although mining cooperatives technically fall into the last category, they can also slide between other identifications. In Llallagua-Uncía, most cooperative miners are also members of either CONAMAQ, the highland indigenous federation, or CSUTCB, the national peasant union. Thus, *in addition* to exerting pressure on the government through the ballot box and FENCOMIN, cooperative miners also influence rural political bodies from within.

While it is certainly not the case that all indigenous or campesino union leaders support mining cooperatives, there is noticeably little resistance to small-scale mining in the rural highlands. In fact, in the lead-up to the release of the new mining law in 2014 (No. 535), CONAMAQ even made a failed attempt to gain legal recognition for "communitarian mining," which would have involved the incorporation of traditional *usos y costumbres* (customs and practices) (Marston and Kennemore 2019). I later met with Tata Félix Becerra, who led the charge for communitarian mining during his term as leader of CONAMAQ from 2013-2015, to ask him about this process. When I met him, Tata Félix in the San Pedro prison, the minimum security men's prison in downtown La Paz, where he had been detained without being charged during a scandal involving the Indigenous Fund that broke in early

2016.<sup>20</sup> Despite the difficult circumstances of my visit, he was still eager to assert the indigenous right to mining.

### ***Territorio hasta abajo (Territory all the way down)***

The San Pedro prison is home to some 2000 inmates and, in many cases, their family members who cannot afford to live elsewhere. I stood in line with women and tiny children, all carrying huge bags of bread, fruit, and toilet paper. The prison itself provides virtually nothing for its inmates, so this kind of ferrying of supplies is not only encouraged but fundamentally necessary to the prison's functioning. We shuffled forward to a security room created by a couple of sheets hung up as curtains, where a TV suspended from the ceiling played a Sex and the City rerun while each woman presented her ID card. When I got to the front of the line, the policewoman looked suspiciously at me and then at my passport, immediately announcing that foreigners aren't allowed inside. The prison has had a lot of trouble with foreign tourists going on "prison tours" that end in massive cocaine deals, and now they have a strict stance on anyone without a Bolivian identity card. I showed her my permission letter from Carlos Romero, the minister of the interior, which she read very carefully, muttering the words under her breath. Finally, she nodded, handed me back my documentation, and patted me down. She assigned me a number - 40-M, the first two letters of my passport number plus the first letter of my last name – and wrote it in indelible marker on my wrist.

With that, another police officer took my passport, opened the gates to the main prison courtyard, and waved me in, shutting the door tight behind me. Inmates are responsible for everything in this prison, from cooking to cleaning to keeping the peace, so there were no "real" guards beyond the barred front gate. Instead, prisoners marked by black vests had been hired by other inmates to perform internal security tasks such as breaking up fights and dealing with theft. Other prisoners wearing red vests were identifiable as *taxistas* (taxi-drivers – a tongue-in-cheek name considering that everything is done on foot) who made a few bolivianos by escorting visitors to whomever they were hoping to see.

As soon as the door clanked behind me, a *taxista* with a nose so broken he looked like a Picasso painting ran up and asked who I wanted to see. "Felix Becerra," I said, and then added "*Sección Palmar* (Palmar Section)," imagining the *taxista* wouldn't know all 2000 inmates by name. But he had already taken off at a clip, and I had to race keep up with him as he dashed down the hall yelling "Felix Becerra!" at top volume. We dodged small groups of inmates in the narrow hallways, some in the company of women and small children, others pushing huge carts of food or trash, and finally emerged into another cement courtyard. Doors to prison "cells" encircled both the ground and second floors of the courtyard. Men on the second floor of the courtyard leaned out to inspect the scene below, and laundry strung all around the balcony flapped gently in the slight breeze, lending the place an unexpectedly neighborhoodlike feeling.

A TV in the center of the courtyard was blasting a soccer game, but the *taxista* was capable of yelling overtop of anything. "FELIX BECERRA," he bellowed. A man watching the soccer game turned around, and I was relieved to see that it was Tata Felix. Surprisingly young for such a well-known indigenous leader – late-30s at most – Félix has an easy smile and a warm enthusiasm that seemed only slightly dampened by prison life. He waved me over and indicated that I should sit down next to him. We scraped the two chairs to face each other and sat down to talk right in the middle of the courtyard, attracting a small group of interested spectators as we spoke. I was not able to record

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<sup>20</sup> I am grateful to Amy Kennemore, who was supporting Tata Max as he navigated the legal system, for putting us in touch.

this interview because of prison regulations against technology, so the quotes below are approximations derived from my furious notebook scribbling.

“Look,” Tata Felix said when I had finished telling him about my interest in communitarian mining,

the struggle for communitarian mining was always about the struggle for autonomy, about getting control over the non-renewable resources in our territories. We are still doing communitarian mining, even though it was never approved. We work within the *marco* (legal framework) of the mining cooperativas, but we are self-governing indigenous communities. We practice our *usos y costumbres* within the mining process. For example, while a regular cooperativista will get a concession and then hire other workers to do the labor, in my sector all community members have automatic affiliation. Everyone who is over 18 and who is participating in community responsibilities is given a lot in the collective concession. Everyone is automatically affiliated to both the indigenous federation and to the mining cooperative.

His community cooperative mines limestone (*piedras calizas*). Everyone in the community is assigned a “plot” of about 20m by 200m – it’s free to join as long as the person in question is performing their communal responsibilities. The only expense is a fixed amount that everyone pays – 100Bs (\$12.50) per year - which covers the cost of the concession and some collective meetings and trips. Everyone pays the same amount whether they’re working or not; that way the cooperative works for the community, and the community works for the cooperative. Félix wove his fingers together to show the inextricability of the two. “You have to attend to both sides, to community and cooperative.”

Miners in his community work seasonally, he went on, because at some times of the year they have to be harvesting or planting.

They’re under no obligation to be in the mine, whereas in a regular cooperative the workers have to be there. Some members of our cooperatives work only once in a while, while others work without rest. This is indigenous mining, it’s very different than the companies, I mean the other cooperatives. It’s an inheritance – it’s passed from family member to family member. And the whole family works inside. Young people can work, and they can earn money for school. Women bring food. There aren’t any restaurants like at other cooperative mines, so the women have to bring lunch every day. And then the women carry back smaller rocks on their backs. Some of the rocks are big and men carry them, but women carry the small ones. *Como hormigas* (like ants).

I was struck by how similar his description of the advantages of communitarian mining is to the defense of regular cooperative mining to which I am frequently treated by miners in Llallagua. They argue that the advantage of all cooperative mining - not just Tata Felix’s communitarian variant - is its temporal flexibility, which allows them to *be agro-mineros*, and its family orientation. A youth who wants to work his father’s *paraje* has to pay an (often expensive) membership fee, but after that he has dibs on the mineral vein that his father located and prepared: it is his inheritance. Tata Félix went on:

Lots of people talk about needed to look after the *Madre Tierra* (Mother Earth). But you know what? **The land owner looks after the earth.** He never does just anything he wants. And the money that comes from mining has to benefit the person from that place.

You know, in some places you just can’t grow potatoes anymore. They don’t get big anymore. And in those places, maybe you have gold in the ground, so you have to take advantage of what

you can produce there. In a place where llamas graze really well, you'd keep llamas, right, instead of producing potatoes? So why not mine gold where there is gold?

Tata Félix used the Hispanicized “Madre Tierra” rather than the Aymara “Pachamama,” and his argument married a classical liberal understanding of property rights through labor with an agrarian practicality that interpreted mining as just one more livelihood strategy alongside llama husbandry and potato cultivation. Mining, by this estimation, would just be a matter of pushing agricultural practices underground. I asked him how long indigenous communities had been working with such communitarian mining models, and he replied:

Since the year 2000. By then we knew our rights. We produced coca, wheat, potatoes - but these have low prices. We didn't understand at first, but slowly we decided we needed to administer our non-renewable resources. Indigenous communities were prepared and we wanted to be owners (*dueños*). We knew our rights to manage our territory. We knew the laws, knew about contracts with international companies. In 2013, we wanted to move forward. That's when we had the [communitarian mining] summit [of 2013]. We were all in agreement. We hosted various commissions, and we started putting together a draft of a new mining law. But it failed, and now we just continue as cooperatives.

Mining, Tata Felix emphasized, could even be used to fund CONAMAQ, which is currently starved for financing since its break with the Morales government in 2013. After being forcibly removed from their offices and replaced with an “official” (state-sponsored) CONAMAQ populated with MAS supporters, the “organic” CONAMAQ rented an informal space for a few years before running out of money to pay the rent. Now the organic CONAMAQ is virtually paralyzed for lack of financing to even host a gathering, and Tata Felix saw mining as a potential solution to their dependency on outside money flows.

I wondered aloud why communitarian mining hadn't been officially recognized in the 2009 constitution, if indigenous communities had been practicing it for nearly a decade. Félix responded immediately:

Because of the influence of the state. All minerals belong to the state, it's the owner (*dueño*). [The state] didn't pay attention to indigenous communities, and in the constitutional assembly they just associated us with llamas, chuño, coca - they assumed we would live from that. But that's not the case! We have rights to all our resources. In 2006 we were already proposing communitarian mining, but in reality, we don't care what it's called. **What's important is the idea of indigenous communities: we can administer exploitation. It's territory all the way down (*territorio hasta abajo*).**”

This political vision shreds any romantic notion that indigenous peoples are *necessarily* opposed to non-renewable resource extraction; in fact, resource extraction can facilitate the *economic* autonomy that is so often missing from political autonomy, as Becerra's focus on funding for CONAMAQ highlights (see also Anthias and Radcliffe 2015, Hale 2011). More importantly for my argument, Becerra's comments underscore the overlapping economic projects of mining cooperatives and indigenous federations. Although Becerra frames communitarian mining as radically different from cooperative mining, his description is actually not so distant from the reality in Llagueta-Uncía, where cooperative mining looks more like family farming than third-party outsourcing. Widespread acceptance of this family-oriented model seeds support for cooperative mining even within indigenous

strongholds, while the miners' thick kinship networks limit opposition further still: no one wants to take their cousins to court, particularly if those cousins are sending remittances.

With this kind of widespread rural interest in small-scale mining and a close alliance to the Morales government, mining cooperatives have a disproportionate influence over national governance of minerals, land, and water (Marston and Perreault 2016). In this way, geo-socially differentiated vertical farmers are actually contributing the *de*-nationalization of the mines that their unionized forebears worked so hard to win. But *de*-nationalization is not *inherently* terrible, particularly if it brings needed financial resources to underserved and politically disconnected communities. It muddies the line between “agrarian” and “extractive” communities, confusing progressive researchers and activists, but the appropriation of vertical space for the purposes of economic sovereignty could indeed imply the need for a new theory of “territory all the way down.” This is not about *tierra* (land) but rather *territorio*, and it is a three-dimensional project.

## Conclusion

This chapter has explored the historical emergence of Bolivian mining cooperatives in the tin mining region of Llallagua-Uncía through the intimate traffic between mining towns and agrarian communities. The policies deployed to manage surplus labor populations in 20<sup>th</sup> century Bolivia, paired now with the commodity boom of the early 20<sup>th</sup> century, generated an enormous number of highly organized cooperative miners across the country. In Northern Potosí, these policies worked through racialized colonial labor categories, such that the miners populating contemporary mining cooperatives have come increasingly from the trilingual (Aymara, Quechua, and Spanish) ayllus of Northern Potosí, while salaried unions of the bygone era of corporate mining were populated mainly by the descendants of Quechua- and Spanish-speaking migrants from the Cochabamba valleys. While Cold War and neoliberal policies eviscerated the miners' unions, they also opened the doors for a new wave of migrants, this time from regional ayllus. Joining first subsidiary organizations from the 1950s to the 1980s and then entering mining cooperatives en masse starting in 1987, these regional migrants have transformed the internal operations of cooperative mining in Bolivia. In this sense, mining cooperatives are the most recent expression of a long lineage of economically peripheral mining organizations, including bands of thieves, “subsidiary” mining organizations, and early cooperatives, all of which facilitated a continuous communication between the mines and fields that is not normally recognized in historical analyses of Bolivia's enclave mining economy.

In Northern Potosí, this history has manifested materially in the internal space of the Juan del Valle mountain and in the labor practices of cooperative miners. The historical inequalities between the unionized salaried miners and the various levels of “subsidiary unions” have been reproduced in the mining cooperatives' vertical division of the mountain, and the entire interior space has been carved up into underground *parajes* that closely resemble family farms. Traditions of inheriting access rights to underground “plots,” joining extended family members' cuadrillas, sharing equipment and knowledge across families, and rotating the actual labor of mining among cuadrilla members all reflect organization of a family farm. Moreover, kinship networks link the miners working underground to families and land in surrounding areas, networks through which people and resources move with regularity.

But small-scale agricultural practices are different in the subsoil than they are on land. Most obviously, “subsistence mining” implies a *necessary* link to the market that agrarian livelihoods do not – no one can eat metal (Peluso 2017, 959). Even more importantly, however, the quirks of biophysical nature play a much greater role in determining the relative wealth of small-scale miners than they do for small-scale farmers. Although the attributes of agricultural plots certainly vary in terms of soil quality, water access, slope, and so on, none of these variations are as significant as the difference



between a *paraje* with a thick vein of ore and one without. In Northern Potosí, this “natural” geological variation has shaped the development of historical social hierarchies that divided workers based not only on their relationship to the mining company but also on their access to good quality ore; this latter distinction remains, even three decades after the mining company has left.

Finally, this chapter showed how the “vertical farming” practiced by mining cooperatives is also emerging in the “communitarian mining” practices of indigenous communities who are attempting to incorporate subterranean resources into their livelihood strategies. These efforts are stymied by the state’s status as the ultimate landlord of the subsoil, but in a practical sense they are able to get around this fact by opening mining cooperatives that parallel their community organizations. Thus the subsoil is being treated as a vertical farm by both the descendants of unionized miners, influenced by rural migrants, and descendants of indigenous campesinos. The kinds of geosocial hierarchies that emerge in both places are shaped by local geosocial histories and proximities to the state, as I explore in subsequent chapters.

## Chapter 3

# TIN

## Labor of Flesh and Ore

### Introduction

“Here’s the vein,” Samuel said, pointing his helmet upwards to shine light on the ceiling a few inches above our heads. It revealed a barely visible black streak, sandwiched between two lines of white quartz. Samuel and his two other *cuadrilla* members had been following the white quartz for weeks, hoping it would lead them to tin, and it finally had. The nearly vertical shaft through which we had just crawled, rubber boots shoved into crumbling footholds, traced their laborious journey. Now they hoped the black streak on the ceiling would not *despintar* – literally to lose color, or to disappear. Samuel explained that tin is often more like a pearl necklace than a vein, and you had to keep following the string to collect all the pearls.

We were on our hands and knees in a section of the tunnel that had just been dynamited yesterday, beginning the process of separating the freshly broken rocks into two piles: those that contained tin ore, and those that did not. Samuel leaned on my knee and reached around my leg to show me what to look for. He picked up a rock with a thick sheet of black on one side. “This is a good one. Feel how heavy it is – it’s at least 55 or 60% tin,” he said, dropping it into my hand. He leaned back and looked around his knees for another rock for comparison. “This one is less than 30% tin – it’s *k’ara*,” he said, chuckling a little. *K’ara* is the Quechua word for peeled, but it is also a derogatory term for non-Indigenous Bolivians, whose paler skin and proximity to foreign powers have left them culturally “peeled.” In this case, the lightweight rock had been stripped of tin, and was perhaps just as worthless to Samuel as a Bolivian *k’ara*. In the *k’ara* rock, the black streak was lighter, with an almost orange-red hue. It was pyrite, a tin sulfide that makes the water inside the mine run orange. “Anything lower grade than that isn’t worth exploiting,” said Samuel.

These black lines have guided the movement of miners throughout the Juan del Valle mountain since the turn of the 20<sup>th</sup> century. Formed through magmatic activity over 60 million years ago, these veins supported a global economy that relied on tin to package food for the working masses. As the Cornwall tin mines coughed in exhaustion, and as global wars cut off Western access to the rich tin deposits of East and Southeast Asia, Bolivia’s national economy became hinged to Western desire for tin. For Bolivians who were drawn to the Juan del Valle mountain by the promise of stable wages – and who were often coerced into staying with debt – tin became the animating force of everyday life, both the source of wealth and object of struggle. From the underground encounter of worker and rock, the place where a miner could push a pick into a slim black line of tin ore, spiraled a set of relations that dominated regional and national politics while facilitating the reproduction of a hungry global workforce.

This chapter centers tin in an analysis of the complicated geosocial formation (Clark and Yusoff 2017) of mining cooperatives in Llallagua-Uncía. It is about the processes through which both cooperative miners and the commodity tin come into being through a series of interactions that take place deep underground, in above-ground concentration sites, and in initial points of sale. By focusing on the specific material qualities of tin, I show how this orebody shapes the fleshy bodies and body politic of cooperative miners as surely as miners use tools, chemicals, and their physical strength to shape the ore into a commodity. At the “contact zones” (Pratt 1992) between mountain and miners, an internally differentiated geosocial formation comes into view. Through stories from these contact

zones, I argue that the raced, classed, and gendered striations within mining cooperatives have geological substance. Tin's chemical properties are what made it so desirable for industrial development; its mineralogical and metallurgical properties, however, have directly shaped cooperative miners' bodies and social structures.

My analysis centers labor as a crucial site of political formation, but it is an analysis that both draws on and departs from historical materialist approaches to labor. Specifically, it reimagines the "matter" of historical materialism as itself historied and productive in its own right. Tin is crystallized by forces beyond a human sphere of influence (tectonic plates, magma plumes) before it is materialized through a series of interactions with laborers, chemicals, and machines. Yet tin does not exist in nature as a pure metal; it is always found in compound ores from which it is extracted through mechanical and chemical processes. The processes through which tin is materialized as a standalone element are richly discursive, as shown by the stories in this chapter. Tin comes into the world dripping not only with blood but also expectations of wealth and progress, and the miners who produced it during the bulk of the 20<sup>th</sup> century (1900-1985) were elevated as symbols of national development.

Cooperative miners in Llallagua-Uncía, however, are neither wealthy nor symbols of progress. In part, this is because tin is no longer a crucial ingredient for capitalist production, having been replaced in many arenas by aluminum and expanded tin recycling programs. In even greater part, it is because the Juan del Valle mountain no longer yields the tin it once did. Miners continue to coax the metal from the mountain's veins, resisting their own potential slide into economic obscurity by proving again and again that the mine is not totally exhausted, but they are not the economic or political protagonists that salaried tin miners once were. Cooperative miners yearn to discover untapped veins at great depth, for technologies to re-process waste rocks, and even for their mountain to be transformed into an open pit. In the meantime, they continue following ever-smaller veins that allow them to stake a claim to Llallagua's proud history as the nation's economic center. The cooperatives are thus formed in relation to tin's historical material qualities and the contemporary abandonment of tin as a metal and Llallagua as a mine.

The chapter begins with a brief consideration of the traffic between subject formations and geological formations in Llallagua before examining the geological peculiarities of the Juan del Valle mountain in more detail. I then explore the co-formation of mining cooperatives and tin at the point of extraction (underground) and the point of concentration (above ground). My aim in these sections is to show how mining cooperatives emerge as internally differentiated labor organizations with often problematic political aspirations through their everyday interactions with a gradually disappearing ore. The final section of the chapter explores the relationship between exhaustion and geosocial formation more closely, asking how geological uncertainty shapes cooperative miners' political "consciousness" and in turn their political projects. I conclude by reflecting on the implications of my analysis for theories of geosociality, which I argue have neglected labor as a key site at which life and non-life are simultaneously differentiated and bound together – a true seam in the geosocial fabric.

## Geosocial Formations

This section explores the relationship between Llallagua's geological formation and the political formation of the cooperative miners who currently exploit it. The choice of the term "formation" is deliberate: it echoes the way that Bolivians discuss personal political histories. The common question, "what's your formation?" can be interpreted with equal accuracy as "what have you studied?" and "how have you been shaped as a person?" Llallagua's local university, the *Universidad Nacional Siglo XX* (UNSXX), founded at the behest of unionized miners in 1985, has a Political Union Formation (FPS) department in which all students – even those studying dentistry and engineering – are required to study Marxist political economy. The explicit aim is to produce "organic professionals"

who will continue to serve the interests of their working-class roots even when their climbing social status would dictate otherwise. “What is an organic intellectual?” asked one of the FPS professors of his students in a class I attended. “It’s he who is always in service of his community... Our consciousness/conscience<sup>21</sup> must be committed. We are the extract of the class of campesinos, of miners, and when we get ahead are we going to turn our backs on our roots?” (fieldnotes January 26, 2016).

Fidel, a middle-aged cooperative mining leader, laughed when I told him I had been spending time with the political economists of FPS and even sitting in on some of their classes. “Good,” he said. “You will have your political formation over there with them and your counter-formation underground with us.” We were sitting in the offices of the regional federation of mining cooperatives, and the other miners present roared with laughter. Fidel’s implication was that the FPS department, run by ex-unionists, was detached from the reality of the mines that the cooperative miners knew all too well. It is the friction between these two worlds that I want to access by invoking “geosocial formations”: how cooperative miners are formed both as (a-)political and geological subjects.

This underground reality – the geology of labor – is rarely explored in relation to political formation, which has been at the forefront of most analyses of Bolivia’s tin mines. When Bolivians speak about tin miners’ unions of the mid-20<sup>th</sup> century, they often praise the miners’ level of “consciousness,” language lifted from the pages of Marxist analyses. Fascination with the peripheral location of Bolivia’s tin mines drives these Marxist analyses: since Marx had predicted that the strongest resistance to capitalist development would develop first in the urban factories of Western Europe, how was it possible that some of the most militant labor activism could have emerged in rural Bolivia? For instance, June Nash’s celebrated book *We Eat the Mines and the Mines Eat Us* (1979) argued that class consciousness in the Bolivian tin mines was not just a function of physical proximity of workers in a similar state of economic dependence; it was also cultivated through practices of solidarity that take place in community and domestic spheres, often protagonized by women. In this way, Nash reworked a Marxist theory of consciousness in a way that was deeply attentive to culture and gender.

But such an analysis, rooted in a study of the miners’ unions, does not easily transfer to the mining cooperatives. As political economists in the FPS department repeatedly reminded me, cooperative miners are not laborers in a Marxist sense. Rather than accepting wages from an employer, they hold their means of production. They pay rent (*arriendo*) to the state in the form of a small percentage of their profits, and they continue to pay off debts accrued for the state’s “gifts” of abandoned machinery (see Chapter 4), but the relationship is still fundamentally different. The profits they extract from the earth line their personal pockets, and the state is more of a landlord than an employer. As I detailed in Chapter 1, this distinction makes mining cooperatives a group of small bourgeoisie or mutated peasants, depending on who is doing the categorization. The point to underscore here is that most analyses of miners’ political formation have started with the union – the collective of laborers – rather than the individual or the process of labor itself.

But Marx himself did not start with the collective, even if it is collective consciousness that he celebrated. Rather, his “First Premises of Materialist Method,” in *The German Ideology* (Marx and Engels 1846) begins with a detailed analysis of individuals in relation to nature. The quote below contains two sentences in parentheses that Marx wrote and then struck out, which I have included because they instructively point to the theoretical lineage within which Marx was working.

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<sup>21</sup> In Spanish, the words “consciencia” (consciousness) and “conciencia” (conscience) are pronounced the same way. In conversation, it is sometimes unclear which meaning is intended, which creates an unintentional linguistic overlap: to be conscious is to have a conscience.

The first premise of all human history is, of course, the existence of living human individuals. [The first *historical* act of these individuals distinguishing them from animals is not that they think, but they begin to *produce their own means of subsistence*.] Thus the first fact to be established is the physical organization of these individuals and their consequent relation to the rest of nature. Of course, we cannot here go either into the actual physical nature of man, or into the natural conditions in which man finds himself – geological, ore-hydrographical, climatic and so on. [These conditions determine not only the original, spontaneous organization of men, especially racial differences, but also the entire further development, or lack of development, of men up to the present time.] All historical writing must set out from these natural bases and their modification in the course of history through the action of men. (Marx and Engels 1846: 37, emphasis in original)

Marx’s “materialist method” thus begins not with a set of economic relations, but rather with the relationship between “men” and nature. In this way, his method was not as radical a departure from that of his theoretical predecessor, Hegel, as Marx would have us believe. Among other hats that he wore, Hegel was a geographer of sorts, and he wrote extensively about the determining impact of environment on (racialized) human development. Through transforming their surrounding external nature, Hegel argued, “men” move out of their own internal “state of nature” and attain higher planes of self-consciousness (Hegel 1997[1822]). While dropping the overt environmental determinism (and literally crossing out the sentence that connected nature to race), Marx retained Hegel’s emphasis on the transformation of “sensuous” nature through labor as key to the development of consciousness.

Marx’s reflections on the relationship between human consciousness and nature have new relevance, as the question of matter has reappeared on the academic table. While “new materialists” are reconceiving of matter as lively, vibrant, and even agential (Bennett 2009, Barad 2003, Latour 2005), political ecologists are reevaluating the matter of nature, whose chemical and physical contours have shaped politics and economics across multiple scales (Mitchell 2012, Bakker and Bridge 2006, Whatmore 2006). Matter, it is becoming increasingly clear, complicates notions of political scale and political practice. Infinitesimally small particles contribute to the production of racialized, gendered, and sexualized bodies (Chen 2012, Agard-Jones 2013, Murphy 2017) while also threatening destruction on massive scales (Barad 2017, Hecht 2018). At the same time, planetary changes, from the scrape of tectonic plates to rising sea levels, continue to shape human and non-human life (Chakrabarty 2009; Yusoff 2014).

Here conversations about socio-materiality collide with conversations about the Anthropocene, perhaps the biggest – in terms of physical scale – socioenvironmental concept of all. The basic proposition of this literature is that humans, primarily through their use of fossil fuels, have so thoroughly transformed the planet, from its climate to its geological record, that it qualifies as a new geological era (Crutzen 2006). While critics have challenged the position that this planetary change has been provoked by “humanity” rather than particular sets of human relations that have had uneven socioenvironmental impacts, such as capitalism (Moore 2017) and colonialism (Todd 2015, Simmons 2017), others have called for scholars to “geologize the social” to match the “socialization of the geological” that has been the driving component of conversations about the Anthropocene (Clark and Gunaratnam, 2017). In so doing, they draw the Anthropocene into closer conversation with new materialisms. The former concept leans heavily on the acting human, while the latter draws attention to natural forces that exceed humanity’s temporal horizons and geographic reach, including those taking place in the center of the earth and between planetary bodies.

None of these conversations have much to say about labor (with some exceptions, see Povinelli 2016). The anxiety about the Anthropocene appears to be a consumptive one: humans (especially those in the global north, and especially those with significant purchasing power) have

transformed the material nature of the planet through consumption of subsoil resources. In addition to changing the climate by burning fossil fuels, humans have also created mountains and seas of non-biodegradable waste (Hecht 2018, Gille 2007). Metals and plastics, both of which have subterranean origins, are returned to the subsoil as trash, where they are sometimes scavenged by human recyclers and sometimes left to leach toxins into local ecosystem (Millar 2018, Knapp 2016). Corresponding with this imagery, the geosocial subject of the Anthropocene is rendered agential through consumption.

But all that consumption cannot happen without someone or something digging in the ground. Perhaps this labor does not look the labor politics envisioned by Marx: richer mines and most oil fields require relatively few workers, equipped as they are with state-of-the-art technology and, while millions of unsalaried artisanal miners use hand tools such as pans, picks, and the occasional pneumatic drill to transfer rocks from the subsoil to the market (Lahiri-Dutt 2018a). Although this is the labor upon which the Anthropocene depends, they are usually cast as its abject detritus, uncomfortable foragers whose very existence should shame wealthy consumers into making responsible decisions. Yet labor remains a crucial site of boundary setting, a place where nature and people are transformed and defined.

## A 20<sup>th</sup> Century Metal

When Bolivian prospector Simón I. Patiño discovered a massive vein of black ore in his tiny mining concession in the Juan del Valle mountain in 1899, he apocryphally whispered to himself while waiting for the laboratory results: “*Que no sea plata*. Don’t let it be silver, dear God, let it be tin’ (Querejazú Calvo 1998 [1977], 45). Although silver mining had dominated Bolivia’s economy since the start of the colonial era, times were changing. Tin, which had been used in Europe and the Middle East since ancient times – when it was known in Latin as *diabolus metallorum* (the devil’s metal) because it could make any alloy brittle (Duffield et al 1989, 147) – was finally coming into its own. Suddenly, the shiny metal was used in dye fixatives in the textile industry, in solder and bearing metal in electrical and mechanical construction, and in a variety of military attachments (Ross 2014). Above all, however, it was used to preserve food. Unlike most metals, tin does not oxidize when exposed to air or water, and it was therefore used to package food for urbanizing populations and armed forces. This technique was so successful that tin, which had never before been ubiquitously present around the world, can now be found in trace amounts in nearly all living creatures. Accordingly, world production of tin rose from 36,000 to 124,000 tons between 1874 and 1914 (Duffield et al 1989, 147). The Cornish tin mines, which had been the main source of tin in Europe for the previous 2000 years, sputtered to exhaustion under the weight of rising demand. The whole world set out on the hunt for tin.

Despite its long history of use, tin compounds occur only in isolated parts of the earth’s crust, with notably few deposits in Europe and almost none in North America. In fact, three “tin belts” – one that runs from southwest China through Indonesia and Malaysia, one that runs from Nigeria through the Democratic Republic of Congo, and one that runs across the middle of South America from Peru through Bolivia and Brazil – constitute the vast majority of available tin at present. Most of these operations work “alluvial” deposits, or deposits formed from grains of tin settling on the bottom of river beds. Virtually all tin mining in Brazil, Indonesia, and Malaysia takes place under these conditions. But in Bolivia – as in Cornwall - most tin mining takes place in lode formations, hard rock mines located deep underground.



holds a special place in many Bolivians' hearts, as he was the only not intergenerationally linked to mining and is sometimes remember as a sort of people's businessman. The other two, Moritz Hochschild and Carlos Victor Aramayo, were descended from German and Bolivian mining families, respectively. Solidly middle class, Patiño was working in Oruro as an assistant in an import/export company when he formed a partnership with Sergio Oporto, a prospector who had acquired in 1895 four *pertenencias* (100m squared concessions) in the Juan del Valle Mountain (Geddes 1972, 43). Short on cash, Oporto welcomed Patiño's partnership because it came with a significant financial infusion – Patiño's best business decision had been marrying Albina Rodriguez, a wealthy member of the Oruro elite. Quitting his desk job in Oruro, Patiño built himself a small dwelling on the peak of Juan del Valle, some 4,400 meters above sea level, from where he hired workers from surrounding ayllus. There were a handful of other prospectors in the region – one other Bolivian, one British, one French – of which Patiño was the poorest. His wife began selling her family's jewelry to support him, and he contracted his workers through a system called *pirquin*, in which they exchanged labor for the right to mine the concession on their own time. But Patiño's patience was rewarded in 1899, when he struck the vein that saved him from certain penury: at more than 50% tin, it was the richest vein in the region, and possibly the world (ibid, 63).

Over a beer in the evening, Mario, a relatively well-off miner in the cooperative Siglo XX, informed me that he was writing a book about Patiño's business acumen and nationalist pride. In Llallagua, Patiño is sometimes remembered for having saved Juan del Valle, the crown jewel of the Bolivian tin belt, from encroaching Chileans. The War of the Pacific (1879-1884), in which Chile claimed all of Bolivia's coastline, is still a sore point for Bolivians; at the turn of the twentieth century it was an open wound. When a Chilean company acquired concessions in the mountain in 1906, Patiño traveled to Santiago and bought more than half of the company's shares because he refused to let Bolivia's sworn enemies exploit national wealth. Connecting this story to Patiño's comparatively humble origins, cooperative miners sometimes transform the prospector into a heroic figure, a people's businessman. This narrative does not square with Patiño's subsequent orchestration of worker massacres or his decision to export abroad his money and his smelting business, yet the two tales are often recounted in tandem. Some add that Patiño was *mestizo*, or that his mother was a *cholita*. None of the histories I have read corroborate this point, but it speaks to the degree to which Patiño is claimed as *one of us* by upwardly aspirational cooperative miners.

Buying the other smaller operations around him, Patiño became the sovereign regional tin magnate with the incorporation of Patiño Mines Enterprises in Delaware on July 5, 1924. The new company was responsible for 49% of Bolivian tin production and 11% of global production (Mitre 1993: 208). Patiño's mine, along with those of Hochschild and Aramayo, propelled Bolivia to the top of global tin production by the late 1920s, vying only with the Dutch East Indies (Indonesia) and the Federated Malay States (Malaysia). The three countries together supplied three quarters of the world's tin (Mantell 1949). By 1929, the Patiño holdings supplied 60% of Bolivian tin, of which three quarters came from his holdings in the Juan del Valle mountain (ibid, 80). In celebration of the modernizing promise of his Juan del Valle mine, Patiño named its most important section *Siglo XX* (20<sup>th</sup> Century). Well into the 21<sup>st</sup> century, the name "Siglo XX" rings strangely anachronistic, but it is still attached to Llallagua's largest mining cooperative, the local university, the richest mineshaft, and the section of town that was once worker housing. The name also fits the metal, which was such a fundamental ingredient of global capitalism in the 20<sup>th</sup> century.

Life in Llallagua over the next several decades was shaped by global price fluctuations and international political intervention, as many historians have documented (Field 2014, Klein 2003, Dunkerley 1984). A necessary element of war, tin prices skyrocketed during WWI - and collapsed immediately afterward. Attempting to wrest control of the spiral, the first tin global tin cartel was established in March 1931, with four founding members: The Federated Malay States, Nigeria, the



Dutch East Indies, and Bolivia. Like OPEC in more recent years, the International Tin Committee (ITC) was made possible by the geographic and geological qualities of tin. It was present in only a few countries, in relatively uniform orebodies, and was underutilized in its countries of origin (meaning that producers' and consumers' interests were easily separated by country). Moreover, the market crash of 1929 had driven small tin producers out of business, and the industry had a relatively stable oligarchy running the sector nearly every country (excepting Malaysia). Over the course of the next decade, the ITC was renewed three times (1933, 1938, and 1942) and was joined by three new members - Thailand, Belgian Congo, and French Indo-China. Production capacities were renegotiated at each of the three meetings, and a buffer stock was maintained with increasingly formalized control.

Threatened by the cartelization of tin, the United States developed a plan for stockpiling the precious metal. With the passage of the Strategic and Critical Materials Stockpiling Act of 1939, the U.S. began to build up reserves of minerals that had proven themselves particularly scarce in WWI. Bolivia's ore was of particular interest, given its relative proximity to the U.S. sphere of influence. With the outbreak of WWII, Japan took control of Malaysisan tin mines and Atlantic shipping routes were suddenly too vulnerable for Bolivians to continue shipping to smelters in Europe. By 1942 Bolivia was only supplier of significance to the Allies and was forced to ship its product to smelters in Texas City. Prices were kept artificially low, prompting the *rosca* to increase production. At the end of the war, substantial deposits had been mined at unfavorable prices (Dunkerley 1984, pp. 11-12).

In Llallagua-Uncía, Patiño's mine was nearly exhausted by the end of the war - down from more than 50% head grade in 1900 to 2.46% in 1945 (Espinoza 2010: 100). While Patiño died in 1947 in Paris, his company introduced two new technologies that allowed a maintenance of output amid a falling grade of tin. First, in 1948 they moved away from vein excavation and towards a system of "block caving" inside the mine. This involved dividing up the interior space of the mountain into 25 meter cubes and carefully staking out and detonating one cube at a time. Ideally, the cube's fragmented contents fell through a constructed chute into carts below, but in practice rocks often jammed in the chutes, forcing workers to risk life and limb dislodging them. In addition to potential cave-ins, these workers were exposed to choking levels of dust, even more than that produced by drilling and dynamite (focus group with COMIBOL engineers, La Paz, November 9, 2016). Eventually, so many cubes had been removed from inside the mountain that its peak started to collapse, a slow slide visible from the top of the mountain. On the inside, this giant game of Jenga is still generating cave-ins. Miners know rocks to avoid moving and galleries to avoid entering, but they are still sometimes taken by surprise.

Second, since block caving produced a load of rocks that far exceeded the capacity of his first concentration plant (Victoria Plant, 2000 tons/day), in 1947 Patiño installed a new concentration plant called "Sink & Float" with a capacity of 3000 tons/day (Espinoza 2010: 100). The Sink & Float Plant differed from the Victoria Plant in that it was chemical as well as "gravimetric." In other words, while the Victoria plant had relied on water and gravity to separate the heavier tin from the lighter surrounding rock, this system had been inadequate to deal with the increasing presence of pyrite. Cassiterite has a specific weight of 7, and pyrite has a specific weight of 5; these weights are close enough that the shaking tables struggled to separate them efficiently (focus group with COMIBOL engineers, La Paz, November 9, 2016). Sink & Float used the chemical xanthate to force the pyrite to "float" up to the surface of a slurry formed with water, xanthate, and milled ore. When xanthate, an organosulfur compound, reacts with tin sulfites, it forms a hydrophobic compound that bubbles upwards in an attempt to escape the water. These large shiny silver bubbles can be swept aside, freeing tin to sink to the bottom of the mixture. While this process allowed Patiño to capture more tin, it also spelled unemployment for hundreds of *palliris*, women whose jobs had involved separating by hand those rocks that contained tin (cassiterite) from those that contained only pyrite (Nash 1979: xxxii).

After the mine was nationalized in 1952, COMIBOL continued to use block caving and chemical flotation to extract tin from the sputtering mountain. By the time the mining cooperatives inherited the mine, the average head grade was 0.33% (Espinoza Morales 2010: 100). The two concentration plants (Victoria, which Patiño had purchased from an earlier British company, and Sink & Float) were granted to two of the seven cooperatives that formed in the Llalagua-Uncía region: Sink & Float went to the cooperative “Siglo XX” and Victoria went to “La Multiactiva.” As I detailed in Chapter 1, these two cooperatives differ from the other five cooperatives in that they were composed of miners who had been directly employed by COMIBOL: Siglo XX’s members had been salaried miners working in the underground, and La Multiactiva’s members had worked in the Victoria Plant itself (although they were joined by several former desk employees, such as the women who had operated the telephone switchboard in the former COMIBOL). Within the hierarchy of regional mining cooperatives, Siglo XX and La Multiactiva are at the top, as they have better equipment to process ore and better ore itself: while Siglo XX received the lowest levels of the mountain, where the bulk of the tin stock is located, La Multiactiva was granted access to the huge *colas arenas* – tailing sands – that were discarded by Patiño. Already crushed to a powder and sometimes blackened from chemical processing, these waste sands still contain significant amounts of tin that can be accessed with the shaking tables in Planta Victoria. As I explored in detail in the previous chapter, the power structure that was established in the era of the state mining industry is perpetuated in the cooperative era by geological variation within the mountain

Within each cooperative, the materiality of dwindling tin deposits similarly shapes labor processes and labor hierarchies. The cooperative Siglo XX, like all the underground cooperatives in the region, is divided into hundreds of *cuadrillas*, or work gangs, which form in relation to veins. Any member of the cooperative can wander through the cooperative’s concession in search of a vein that has not yet been exploited, but it takes time, money, and luck to find a vein that no one has claimed, so most miners pool their resources. A larger vein, or two nearby veins, necessitates a larger cuadrilla. Some even have arrangements whereby half the cuadrilla will be exploiting one vein while the other half is working at a loss – *trabajando en perdida* – to cut through a section of rock to where they suspect another vein might be found. The cooperative Siglo XX has one geologist working on retainer who helps individual cuadrillas dig in the right direction, though he is working with a meager handful of maps that the cooperative managed to get its hands on in the frantic transition from state operation to cooperatives. At that time, geologists and engineers were selling the maps that they had produced to whomever would pay (focus group with COMIBOL engineers, La Paz, November 9, 2016). The geologist who works now for Siglo XX reproduces relevant sections of the mine for individual cuadrillas, and I often saw *jefes de cuadrilla* (work gang leaders) inspect their individual maps in the morning, allowing hand-drawn lines to guide their daily dynamite (Figure 14).<sup>22</sup>

In the next section, I follow Samuel, the miner with whom I opened this chapter, and his cuadrilla through their labors in the underground to show social differentiation within mining cooperatives emerges through labor in the rock itself.

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<sup>22</sup> An out-of-date but more complete set of maps still sits in Patiño’s old geology room, spread out across tables and visible through the dirty glass on the windows, but these maps are held by the COMIBOL Archives under lock and key to prevent private interests from getting access to them. My own perusal of the maps was watched by an archivist who confided that COMIBOL had never been able to produce maps as comprehensive as Patiño’s, and that COMIBOL had made generally poor business choices, failing to plan for the future through geological exploration and prospecting. As she talked, she marked her place in the book she was reading with her thumb, and I saw that it was *Semblanzas*, a semi-autobiographical book by Filemón Escobar, a famous local union leader from the era of COMIBOL who would have been horrified to hear her sing Patiño’s praises. In either case, the maps she guards are off-limits to the cooperatives.

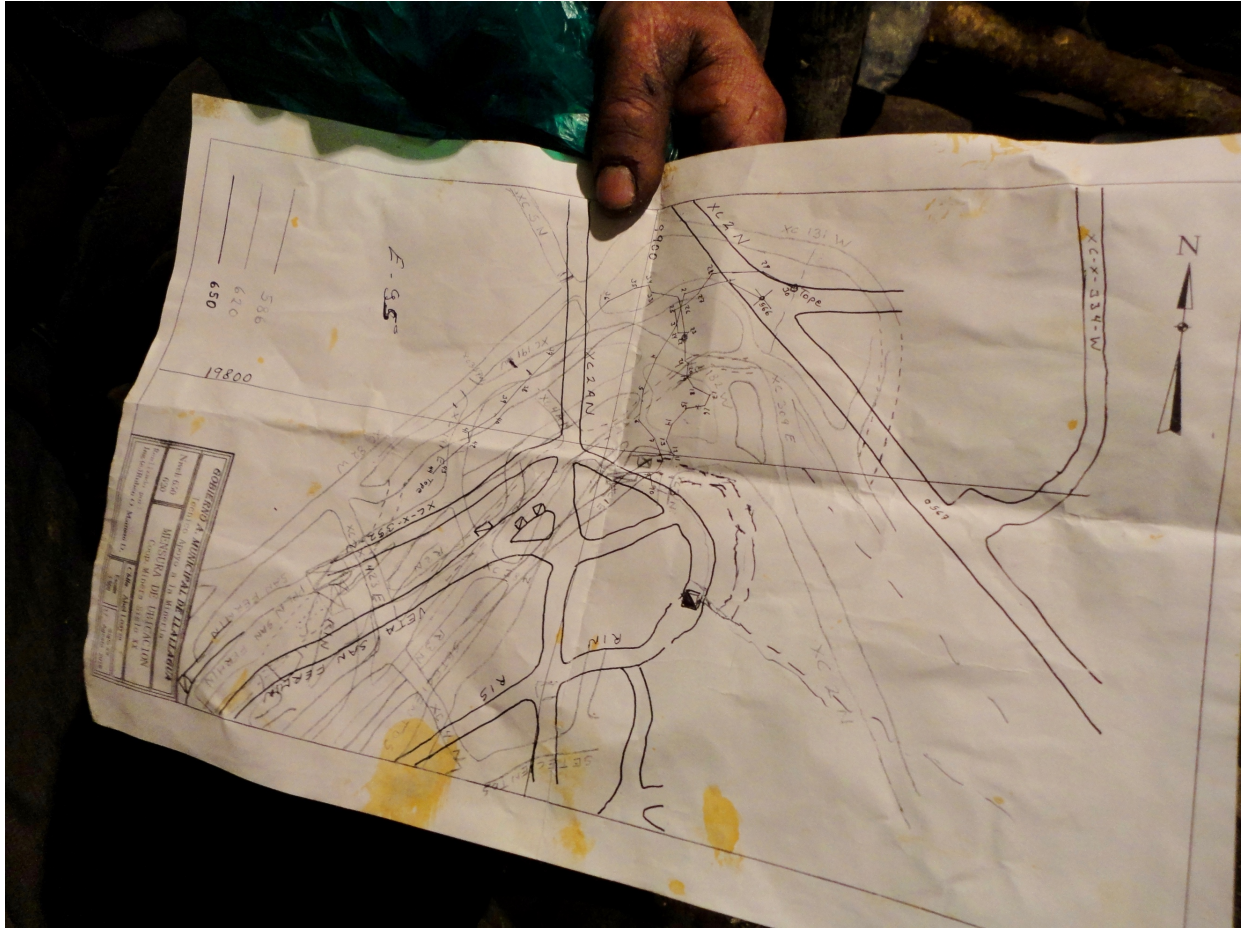


Figure 14: Palimpsest of Veins. Geological map used by miner inside the Juan del Valle mountain. February 20, 2017.

**Underground Labor**

The day I accompanied Samuel and his cuadrilla underground, the trolley that normally operates at the Siglo XX Mineshaft was broken and we had to walk two horizontal miles to get to the group’s *pauwiche*, the underground staging room where miners prepare for the day. This walk was tiring, as the Siglo XX Mineshaft is at a lower level of the mountain (650m down from the peak) and the ground is always wet, alternating between mud and puddles of standing orange water – orange with *copajira*, the miners’ word for pyrite. The slopping noise of our boots in this rubber-eating acidic water seemed deafening in the otherwise thick silence of the mineshaft. Over this noise, Samuel, who is in his 40s, explained that he had become a miner in 1995, when tin prices were high and he thought he could earn more than he did through farming and construction. Unlike most of the miners in Siglo XX, he did not come from a mining family, and had no one to teach him how to find and process tin. He therefore began working as day laborer, milling and concentrating tin for other *cuadrillas* in exchange for a daily wage, before he amassed enough money to become a full cooperative member and begin working underground. Then he worked in a *cuadrilla* led by Marcos Martínez, a former union leader who had used his influence to lay claim on one of the richest sections of Siglo XX’s concession.

Samuel’s *pauwiche* was locked when we arrived, metal sheeting held shut with a padlock over a hole in the rockface. Despite this security system, someone had still managed to break in and steal their lightbulbs the week before, so we had to sit in the dark - save the light from a single headlamp -

while we chewed coca and talked. In the pauwiche immediately next door, however, all the lights were on and we could hear a large group of miners laughing and talking. Quietly, so they wouldn't hear us, Samuel told me that these men were *campesinos* (peasants) from the regional Ayllu Chullpa, and that they had occupied the mine back in 2005, claiming that they had a right to operate it since it was on their ancestral territory. They had been particularly interested in Marcos Martínez's veins, where Samuel had been working as a cuadrilla member, as rumor had reached them of Marcos's lucky strike. To settle the violent conflict that emerged, the cooperative Siglo XX agreed to accept 100 members of the Ayllu Chullpa into their ranks, and Marcos had had lost most of his equipment and *paraje* (work area). Without the veins to hold them together, his cuadrilla splintered, and Samuel and others set out to form their own groups. Samuel spoke wistfully of the days when Marcos was still in charge. Marcos's cuadrilla had made use of the time they couldn't work because of the water level (at the lowest levels of the mine, electric pumps draw out water to make mining possible) clear out the *caja* (waste rock) from the passageways, whereas these *campesinos* never cleared anything; Marcos had made sure everyone was busy, whereas these guys were lazy.

*Caja* translates literally as box, and it is used to refer to rock that does not contain anything of value: it is just an empty box. In a properly cared-for mine, Samuel and others have explained to me many times, the passageways are cleaned (*limpiar*) of *caja*. In the age of the cooperatives, when miners are making money based on how much ore they can extract rather than how many hours they work, it is difficult to imagine having the excess energy to move worthless rocks to their designated disposal sites underground. But Samuel's suggestion that the ex-*campesinos* were dirty and lazy for not having removed the rocks – a common assertion amongst cooperative miners – is highly racializing language. Colonial and imperial discourse has long normalized the white cishetero male body and associated difference with dirt and disease, both justifying colonial expansion and naturalizing a gendered and racialized hierarchy on the basis of personal and domestic hygiene (Ahmed 2002, McClintock 1995). In Samuel's case, this racialized language cemented the boundaries between those who have legitimate right to the underground and those who do not. To an outsider, the racializing distinction is not straightforward: Samuel also comes from a rural area, also speaks Quechua as his first language, and also had to learn to mine from his *compañeros* – that is to say, he did not come from a long lineage of miners, and he was technically as much of a *campesino* as those in the neighboring pauwiche. Yet because he joined the “right” way, moving up through the ranks and learning to labor from ex-unionized miners who taught him how to “properly” care for the space, he felt strongly that he was on the side of the miners, against the *campesinos*.

This exchange was gendered as well as racialized. Samuel works with two other miners: his son Juan, in his 20s, and Manuela, in her 40s, who is one of only about ten women who work underground across the whole mountain. Sitting next to Samuel, Manuela nodded her agreement with his assessment of the miners next door. When these latter tried to start a conversation through the wall, she yelled at them to “grow some balls” and “knock on the door like men” if they wanted to talk. Coming from a woman, this comment was even more insulting than it would normally have been, and the miners next door quieted immediately. Her jeers also emphasized the fluid movement between racializing and gendering language, both associated with laboring in the “right” way. Manuela herself transgresses both these boundaries, as a *cholata* (urban indigenous woman) who has been working underground since her husband, a miner in Siglo XX, left eight years ago to work in a tungsten mine near Cochabamba and never returned. With children to feed, the middle-aged housewife started working her husband's *paraje* (work area) by herself and had only recently joined Samuel's cuadrilla, after having first proved her ability to work alone. In her above-ground of her life she is *de polleras* (of skirts), meaning that she wears the clothing of urban indigenous women (pleated skirts, sandals, straw hats, blouses, and blankets pinned around the shoulders), but underground she wears men's work

clothing, and is often indistinguishable from her male companions. She frequently jokes that she “transforms herself” every morning when she changes clothes.

Now Manuela is the delegate for women in her cooperative, and I asked her casually if she had aspirations to represent women miners at the regional level in the upcoming leadership change. She shook her head no, and then began to complain about the recent leadership transition that had taken place at the national level, in FENCOMIN. The woman who had been voted in as the representative of woman cooperative miners nationwide, Manuela said, did not know real work, she only knew office work – how could *she* represent anyone? I had been present at this election and remembered being surprised myself by the woman who had won. From the city of Potosí, this woman was *de vestido* (of dress), which means that she wears western women’s clothes – in this case, jeans, high heels, dangling earrings, and a manicure. She had been running against two other women, one who was *de polleras* and one who wore a mechanic’s overall, both of whom held up their callused hands to demonstrate their knowledge of mining. Hands are always used to evaluate whether someone’s claims to have worked hard are to be trusted. The woman who won, however, gave an impassioned speech about how the women’s representative needed to be able to speak, needed to be “well formed” to communicate in front of men. Clothing is often interpreted as signaling the wearer’s education level, with the assumption that a woman who can read, write, and speak in public – and who is therefore considered qualified for a leadership position – will be *de vestido* rather than *de polleras*. Still, I had been surprised that the women of Norte Potosí, who had only one vote between them, had chosen to put their weight behind the manicured desk miner who (everyone speculated) had probably inherited membership in the cooperative and now made others work on her behalf. Manuela, between drawing coca leaves through her teeth to remove the hard midribs, explained that Norte Potosí was hoping to send one of their women to FENCOMIN two years from now, so they had traded votes with the city of Potosí, the hometown of the manicured miner. But Manuela was still angry about it.

By this time, everyone had large balls of coca leaves in their mouths and had changed into *ch’utos*, layers of muddy and slightly damp clothes that would offer some weatherproofing against the wet work area. They strapped on knee pads made out of car tires and rubbed car oil on their hands, laughing that people never identify them as miners because their hands are so soft. We exited the pauwiche and climbed down eight ladders strung end-to-end, each separated only by a small platform. The wood of the ladders was soaking wet and slimy under the hand, and a couple of the ladder rungs were missing – Manuela reminded me to always hold the sides of the ladder because the rungs had a tendency to break. As we approached the bottom of the ladders, a terrible roaring noise greeted us. We were at level 685, only 35m (one gallery level) below the pauwiche, but the humidity levels had increased dramatically, and electric pumps were needed to suck out the water. Samuel led me to the pumps and insisted I snap a photo of them. My camera struggled to focus in the dark and the photo wound up depicting only pipes ascending from a dark void (Figure 15). Samuel looked down into the darkness and spoke wistfully of an untapped wealth of tin, which miners say can be found further underground, inaccessible because the amount of water required industrial water pumps beyond the capacity of the cooperatives (see Chapter 4).



Figure 15: Water pipes from ghost pumps. Inside the Juan del Valle Mountain. February 17, 2017.

A little further on from the pumps, Samuel stooped to open a small corrugated metal door that had been shut with a padlock, explaining that he had prepared this *paraje* (work area) himself with dynamite and a drill. He had been subsequently forced to sell the drill because the monthly installments were too high, but he was still the *jefe de cuadrilla* (work gang leader) because he had invested the initial labor. This is how it works within the cooperative: those who identify veins and prepare them for exploitation become their “owners,” and by extension the labor managers for other *cuadrilla* members. Property and authority is established in an almost stereotypically Lockean manner, on the basis of the miners mixing their labor with the rocks.

The tunnel seemed to go straight down, forcing us to step with one foot on either side of the tunnel as we lowered ourselves. Then we were on our hands and knees, scrambling past human-sized holes that led to other, now-exhausted *topes* (literally “limit,” where the vein is visible). I had to crawl with my body at an angle because my hips could not fit facing forward, and we could not turn our heads sideways because our helmets were too wide. A stick of dynamite detonated somewhere nearby, marked by a bodily popping feeling rather than a noise in the enclosed space. Dislodged pebbles sprinkled harmlessly on our helmets. Samuel, crawling in front of me, called back at me to look up and view the *tope*, where the tin was streaked in black lines on the ceiling. Short logs of wood that had surely been scavenged from Patiño’s original infrastructure had been jammed into the ceiling to prevent it from caving in. The grain of the rock was more clearly visible here than it is in many parts of the mountain: a patterning of dark and light lines formed by sands and dirt settling on a lake bottom

millions of years ago. Samuel pushed his pick into the rock along one of these lines and it broke open smoothly, showering us lightly with dust. Some damp splinters of wood also fell from the beams, contributing to the mixture of organic and inorganic matter beneath our hands and knees.

Samuel began to shovel the *llampu*, fragmented rocks with flecks of tin embedded into them, into sacks that he carried to Manuela, who began the process of selecting the ones with ore to take out of the mine. The few women who work underground are often assigned this task, which is deemed less physically strenuous than drilling, planting dynamite, or heaving sacks of *llampu*. Manuela sat up on a ledge with a giant plastic tub and a large hose of gushing water – it was the water, she explained, that had been pumped from down below up to level 650, from where it now gushed back downwards with the help of gravity. She had a makeshift sieve, a plastic jug that had been cut open lengthwise and perforated with dozens of 1cm holes, into which she poured a small amount of *llampu*. She washed the rocks clean with water from the hose, and what had looked like a mass of dirt became a clearly defined collection of stones, some sliced with dark streaks or peppered with crystals of tin. Her hands moved quickly, plucking the valuable stones from the rocky chaff and dropping them into a burlap sack.

She paused to show me her hands, which were puckered and peeling, and laughed that you could always recognize miners from their hands. But *her* hands were specifically those of a woman miner. When rocks with high sulfide content are exposed to water and oxygen, they release hydrogen ions that substantially lower the pH of water.<sup>23</sup> The water thus becomes more acidic the further miners move away from the cassiterite and into the pyrite sections of the mine. Given the current state of exhaustion of the mine, this is exactly what miners are being forced to do. And since women are the ones who are more likely to spend their days with their hands in the buckets, they are the ones who bear the brunt of this geological burden. Gendering takes place at the intersection of flesh, water, and hydrogen ions.

Manuela and I had been squatting over the buckets for several hours when we heard another explosion of dynamite. This one was much closer and much louder; Samuel's son, working in another corner of their *paraje*, had detonated it. Seconds later we started to smell the dynamite, and Samuel said we would have to hurry to beat the smoke. We crawled quickly back to the main passageway, and I was panting for air at the top – what is difficult to descend is always worse going back up. Samuel grinned and told me I had to be careful not to get *la herencia de la mina* (the inheritance of the mine) – silicosis of the lungs. He touched his own chest and said: “I guess we all have this, as soon as we start working.” Just as miners go inside the mountain every day, the mountain also slowly goes inside of them, settling into layers in their bronchial passageways just as it once settled at the bottom of a Triassic lake, the humble origins of the mountain range.

Nearly a year earlier, I had spoken with a doctor in the local hospital who mounted three x-rays of lungs with various stages of silicosis for me to examine while we chatted about miners' health (Figure 16). The lungs were arranged in order of severity. Scarring from silica dust showed up like thickening mist, gradually turning the space inside the miners' ribcages opaque. The doctor explained to me that rates of silicosis are much higher now than they used to be when the mine was run by the state. The state company used hydraulic drills, and the continuously circulating water produced mud rather than dust. But the small-scale cooperative miners cannot afford to maintain running water underground, so they use only pneumatic drills. “The literature says that silicosis should start after 15 or 20 years working underground,” the doctor told me, “but I regularly see miners with silicosis after having worked less than ten years.”

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<sup>23</sup> Acid mine drainage (AMD) is one of the major environmental problems associated with mining, but its impacts on miners are rarely noted. Chemical explanations here: <http://www.westech-inc.com/en-usa/industry-solutions/mineral-overview/acid-mine-drainage>.

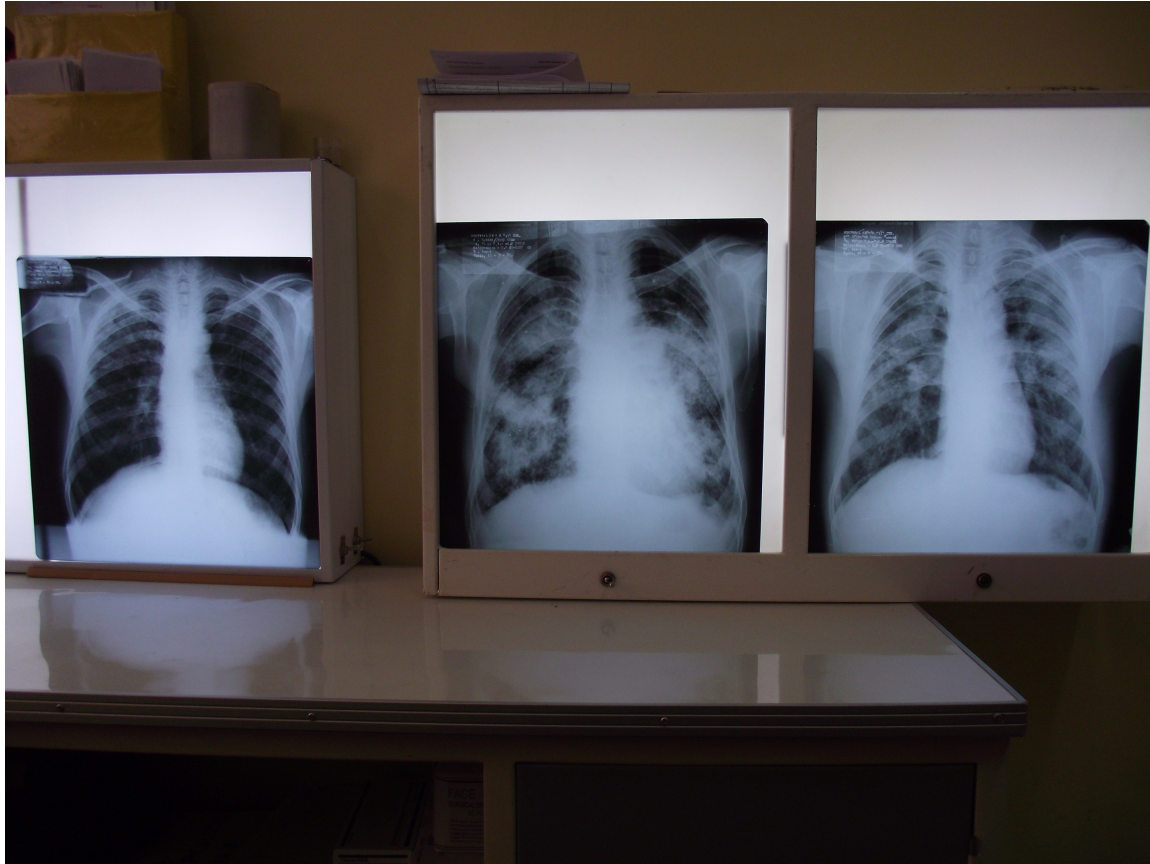


Figure 16: Corporeal dust. Catavi Hospital, July 29, 2016.

I asked the doctor if he had any x-rays of women's lungs. He shook his head and informed me that women are not susceptible to silicosis. At first, he said that this is because women do not do any drilling, which is the task that generates the most dust. But when I informed him that I personally knew several women who had been drilling for decades but who could not convince his hospital staff to x-ray their lungs, he suggested that women have stronger bodies that fight against the impurities of silica. Apparently, scarred lungs are an attribute of "real miners" that women are not quite permitted to attain. Once again, the materiality of the underground interacts differently with different bodies, or at least is perceived to act differently in consequential ways.

Bodies and social bodies are shaped together inside the mine through labor and geological matter. Miners distinguish themselves from indigenous campesinos through their relation to labor and to the rocks themselves: they work harder, know the mine better, respect its contours by keeping it clean for future years of exploitation. Although women can "transform" themselves through labor and clothes, their transgressions are limited by the labors they are assigned and the dangers to which they are exposed (acidic water rather than dust of drills and dynamite). Their bodies are shaped correspondingly: for instance, Manuela's clean, peeling hands look dramatically different than Samuel's callused, dirt-ingrained hands. Ownership and inheritance (such as Manuela working in her husband's stead) depends on geological knowledge and bodily labor. Finally, circulating stories of untapped wealth, of a geological boom waiting to happen, keep everyone dreaming, keep everyone laboring.

### Surface Labor



Not all miners work below ground, and almost none of them work underground all the time. After extraction comes concentration: before it can be sold, the ore that is hauled outside on miners' backs must be milled and refined, processes that multiply the number of laborers involved. Concentration means increasing the percentage of tin per volume of ore, which involves continuous refinement. The processes of concentration are iterative: what one miner mills and discards as waste rock can be concentrated again by another miner using different technologies and chemicals. One bag of ore can be processed half a dozen times, moving through a network of *cooperativistas* and brokers. There is no obvious end point at which the tin has completely removed from the waste rock – there is always the possibility of more.

Siglo XX's underground *cuadrillas* usually spend their Sundays working above ground in their small *ingenios* (concentration plants) that line the road that winds up from Llallagua proper (3865m) to the mineshaft Cancañiri (4090m). Sundays here feel almost festive, as miners chat and blast transistor radios while they work. Each *ingenio* consists of a small storage building, which doubles as a shelter to rest and eat during the day, a pool of rainwater that is used in the concentration process, and a *plancha* (metal sheet) on which a miner rocks a *quimbaleta* (large cement semi-circle) back and forth across the rocks, milling it into the consistency of sand (Figure 17).



Figure 17: *Ingenio* with *quimbaleta* in the foreground. Feb 28, 2016, Uncía.

Wilfredo and José work in a father-son *cuadrilla* of two, and on Sundays they hire a *jornalero* (day laborer) to help them with the *quimbaleta* while they manage the concentration process. Wilfredo

is from Amaya, a nearby ayllu famous for its *tinkus*, annual ritual fights that ensure the earth's fertility, and José jokes that no one can throw punches like his father. Wilfredo and his own father had migrated to Llallagua in 1987, right when mining cooperatives were first formed, when Wilfredo was only a teenager. José, who could not have been older than 25, started mining alongside his father four years ago, after first working in construction in Cochabamba, in a logging camp in the Bolivian lowlands, and in Sao Paulo as a server in a restaurant. He had returned to be closer to his family and to help his father, who was starting to feel the effects of the mine in his lungs.

When I joined them one Sunday, Wilfredo was slowly transferring the freshly ground ore into a barrel of water, running it through a sieve to catch any grains larger than a pebble. He picked through these pebbles, tossing the darker ones - which had higher levels of tin - into one bucket to be dried, reground, and put through the whole process again, and reserving the lower grade lighter ones to sell to others for further processing. Once all the pebbles had been sifted out, there remained a sandy ore slurry inside the barrel. José used a process called *tintinear* (to jangle or clank) to separate out the heavy tin from the lighter waste rock. This involves filling the barrel with water and stirring it as fast as possible with a shovel, until it moves like a muddy whirlpool, and then loudly banging a shovel back and forth on the inside of the barrel, which makes an incredible clanging noise and causes the water to jump up in little spurts. After several minutes of this process, José left it alone to settle, taking the time to explain to me that the clanking encouraged heavier tin particles to fall to the bottom of the barrel, while the lighter waste rock collected at the top. While we talked, he rotated his arm in its socket, complaining that the repetitive motion of stirring the sand had given him chronic shoulder pain. Wilfredo, standing nearby, laughed and joked that young men were not as tough these days as they had been in his day.

When the slurry had settled, José poured off the water and revealed a flat sandy surface dotted with air bubbles, like the edge of a beach. He scraped off and disposed of the top layer of sand, then transferred the bottom layer into the upper end of a long flat tray that was resting on a slant. Into the lower end of the tray, José poured some water from the pool and used his hand to splash water continuously up from the bottom of the pan towards the pile of tin sands at the top. The water slowly separated the sand and pulled it towards the bottom of the pan, with the light waste rock falling farthest and the heavy tin staying closer to the top. José leaned semi-prostrate on his side to perform this time-consuming process, pausing once in a while to scrape the waste rock out from the bottom, while his father occasionally dumped another shovelful of tin sands for processing near the top. José told me that they used rainwater to do all of this because the water that comes out of the mine is so acidic that *te raja* (it cuts you). Underground the *agua de copajira* is not as bad, but the sun makes the acidity stronger. "Luckily our ore is mostly tin," he added. "Water that has *bronce* (pyrite) in it is even worse, much stronger than this." In other words, as members of Siglo XX, he and his father had access to veins with relatively high cassiterite content compared to those of other cooperatives; their *paraje* was inside the stock of tin.

While I sat and chatted with José, Wilfredo had disappeared into the storage room to talk with the wife of the day laborer who was helping them with the *quimbaleta*. This woman had been sitting and watching the men work while she knitted, and I had thought she was a family member, but José lowered his voice to let me know that she was a *rescatiri* (Quechua-ization of the Spanish word *rescatar*, "to rescue"), a woman who spends her Sundays buying concentrated ore from miners and then drives to Oruro on Monday to sell it to the commercializers, intermediaries who would then sell the concentrates either to one of the two smelters or transport it to a Chilean port for export. Wilfredo and José could not bring their concentrated tin to the commercializers themselves because commercializers would not buy quantities smaller than 100 kg, and it would have taken this cuadrilla of two weeks to amass that amount of concentrates. And in either case, José added with a laugh, how

would we transport so much ore ourselves? Oruro is a two-hour drive from Llallagua; without a truck, they were bound to sell ore to those capable of arranging transportation.

When Jose finally pronounced his work finished, he transferred the mostly pure tin (approximately 68% grade, he told me) into a burlap sack. The *rescatiri* came out of the house and picked up the sack, banging it on the ground a couple of times to get as much water out as possible. Nearly always women, *rescatiris* are often the widows of miners, or, as in this case, the wives of retired miners. Jose whispered that he and his father fought with her every week, because she tried to pay them less based on the grade of the ore and the amount of water soaked into it. She had no way to test these, but she would argue using the prices she had been given by commercializers the week before. She had Wilfredo lift the bag from a hook attached to a scale, and everyone leaned in to see the final number: exactly 40 lbs. Standing next to me in the doorframe watching, Jose told me that there are usually about 8 lbs of tin per sack of ore, and today they had processed 3 ½ sacks, so 40lbs was more than they had expected. The *rescatiri* took out a beat-up calculator. Wilfredo said that she should pay them 30 Bs/lb, since the price of pure tin was at \$9.07. She insisted that the price was at \$8.80, despite what the radio said, and offered him 25 Bs/lb. She used her calculator to multiply 25Bs by 40 and showed everyone the final price: 1000Bs (about USD \$150). Look, she exclaimed, a good amount! Wilfredo shook his head in annoyance but accepted her offer, already pulling on his jacket and getting ready to leave.

At the point of sale, the value and quantity of the nature that Wilfredo and José have to barter also orders them socially, dictating to whom they can sell and at what price. The fact that they are unable to amass enough tin to either make a sale directly to a commercializer or pay for the transportation that would get them there means that they have accept the price offered to them by *rescatiris*. While the process of concentration shapes their material bodies – peeling skin, sore shoulder – the meanings attached to bodily signifiers are rendered in monetary terms at the point of sale. On the other side of bargaining table, *rescatiris* are shaped as women of suspicion, set apart from the miners and marked as something between a broker and a witch, capable of turning rock into money through nothing but “calculator communication” (Bodomo 2010). Yet their intermediary work was necessary for the functioning of this geosocial formation in a context of dwindling geological resources.

But the tin that Wilfredo and José sell to the *rescatiri*, who sells it to the commercializer, who brings it to the smelter, who exports it to Chile and, from there, around the world – this tin is less than half of what they bring out of the mine. The *mamo* (literally “sucked’ sand) that they removed at every step in the concentration process, is still part of the concentration process, although Wilfredo and José will have nothing more to do with it. While they were working, they piled their waste sand into two piles: more wasted and less wasted. They sold the more wasted sand to one of the guards (*serenos*) who works in Planta Sink & Float. A retired cooperative miner, this guard owns a truck that he makes use of on Sundays, driving through the concentration area and taking waste sand off the cooperative miners’ hands in exchange for a few beers. Although none of this sand is valuable in the small quantities held by individual miners, the truckload that the *sereno* processes in the plant can be quite lucrative. Especially since he does not have to go underground to get the ore himself, his truck affords him a fairly comfortable existence on processing waste rock.

Wilfredo and José sold the less wasted sand to Adriana, a *palliri socia* of the cooperative 20 de Octubre. Like the *rescatiris*, Adriana spends her Sundays walking around the concentration areas looking for ore, but the ore that interests her is the low-grade *mamo* rather than the high-grade tin concentrate. In these exchanges, it is the underground miners who dictate the price, and they never even bother to go through the pretense of weighing the sands first. Adriana, like *palliris* of yore, works with some of the lowest grade rock and the most artisanal equipment, and is corresponding a member of one of the lowest-ranking groups amongst cooperative miners. She takes all the waste

sands that she buys to process in a low-tech concentration system known as a buddle, which uses water, xanthate, and car oil to extract tin from low-quality ore (I will discuss Adriana's buddle more in Chapter 4). Even more than their underground *compañeros*, Adriana's hands are cracked and dry, and light-colored lines radiate from around her eyes – skin left untanned in the folds of the squint developed from staring into water on the always-sunny altiplano.

Like Manuela, Adriana dresses *de polleras* and began working in mining when her husband left her a decade ago, but unlike Manuela, Adriana is considered a *palliri* because she works aboveground; she is a *socia cooperativista palliri* rather than a *socia cooperativista minera*. These words matter, as Manuela and the other underground women remind me frequently: they are not *palliris*! They transform themselves to go underground, but Adriana wears women's clothing all day in her above-ground labors. Adriana, meanwhile, once told me while she was working at her buddle that she would never dream of going underground because the men who go there say such ugly things, and the women who join them end up speaking like that too. "Those other women," she said, staring into the water of her buddle, "they are all very crude, they speak like men." I immediately recalled sitting underground with Manuela and her *compañera* Rosalia, asking them about the pornographic images of (white) women that are used to decorate pauwiches. I was used to seeing scantily clad women pinned on walls and floating across screen-savers in government, university, and cooperative mining offices, but I could not help noticing that even the sparsest of clothing had evaporated in the underground. "Oh, those women are a comfort for the men," Rosalia told me, directing her response at the buxom blonde who was watching over us from her calendar. I asked what comforts the women miners had in the underground, and Rosalia smirked: "Well, don't you have a boyfriend? Maybe we can take some photos of him when he comes to visit." She and Manuela roared with laughter at the idea of pinning up nude gringos.

Miners who work underground have a reputation for bravery, as their daily risk is greater and their tasks are often more physically demanding. Although women worked underground during the labor shortage of the Chaco War (1933-36), they were subsequently prohibited from subsoil spaces, a rule that stuck until very recently. Miners commonly asserted that the vein disappeared when a woman showed up because *Pachamama* grew jealous (Absi 2005), but the entrance of women like Rosalia and Manuela within the last decade shows the porosity of this assertion. Women who can become something proximate to men in the underground are accepted as *mineras* rather than *palliris*. At the same time, the very hierarchical distinction between these two figures emphasizes the gendering of the two realms, the above and the below ground. Through their labor, clothes, and even their jokes (see Nelson 1999), women make themselves fit for the masculine space of the underground, and their anxiety that I might mis-categorize them as *palliris* reveals the importance of what they have won socially through this transformation.

More generally, surface labor is valued less than subsoil labor, despite the fact that both are equally necessary to transform tin from a geological compound to a commodity. In addition to the danger and physical effort required to work underground, subsoil laborers are also closest to tin in its most "natural" form. They mix their labor with nature directly, achieving the Hegelian feat of bending nature to their will. Even more: historically, interior mine workers were considered more "conscious" than their above-ground counterparts. The great leaders of the unionized era, whose statues line the main plaza - Federico Escobar, Isaac Camacho, Cesar Lora – these were all underground miners. Those who risked the most in their everyday labors were apparently willing to risk the most politically as well. Another interpretation could be that, since they generally earned more than above-ground workers, they had a comparatively stable material base from which to organize – the labor elites leading the labor rabble. Perhaps both explanations are true. In either case, the underground is still interpreted as a place that forms fighters, a common-sense expectation that is reflected across the cooperatives today: Siglo XX, whose members work predominantly underground, directs the political activities of

the other cooperatives, while the cooperatives that work only aboveground (Carmen, 23 de Marzo, and la Multiactiva) are politically neutral in comparison. Carmen and 23 de Marzo also make significantly less money than Siglo XX, as they use only artisanal methods to concentrate ore from sands and rocks discarded on the surface, but La Multiactiva has grown relatively wealthy by controlling Planta Victoria and the ore sands left discarded by Patiño and COMIBOL. Recognizable around town with their matching jackets, members of La Multiactiva are sometimes reproached for being the only cooperative that does not accept new members. They abstain from local cooperative politics as much as they can, and the others sneer that they have money but no sense of solidarity, no consciousness.

## Conclusion

The word that miners most frequently use to describe Llalagua's Juan del Valle mountain is *agotada*: exhausted, used up. Occasionally, miners also use the word to describe themselves, or more specifically their lungs, which weaken after years working belowground. As Elizabeth Povinelli (2011) reminds us, endurance and exhaustion are differentially distributed across social difference under late liberalism, and even those who are enduring are often on the brink of exhaustion. As her later work on geontopower makes clear, this quality is not reserved for life: the governance of difference and the uneven distribution of harm is itself predicated on an ongoing separation and ordering of life and non-life (Povinelli 2016: 13). This ordering makes it possible to justify plumbing the depths of the earth to sustain (human, capitalist) life, but it also makes it possible to order people on the basis of their ability to distinguish subjects from objects, or activity from passivity, and to appropriately assert their will through the transformation of these objects (p. 27) – a Hegelian assertion that remains ghostlike in Marx's notion of labor and consciousness, as I explored above. Povinelli's work dwells on places and peoples left "abandoned" by late liberalism, and the "alternative social projects" that emerge, for example, in toxic wastelands whose very inhospitality to human life makes possible the exercise of indigenous sovereignty (2015). Yet exhaustion trails endurance like a shadow, always just one half-step behind.

Mining cooperatives occupied the Juan del Valle mountain only in its moment of abandonment by the state corporation, which at the time of closure in 1985 was working not only against the lowest tin prices in a century – below \$2/lb – but also against declining tin grades. The (near) exhaustion of the mine was the condition of possibility that allowed cooperative miners to stake a claim to the mountain, but this same condition foretold their increasing financial precarity. Endurance in this context not only means finding new ways to make tin from rock but also new reasons to keep mining when the weekly visit from the *rescatiri* can barely cover the cost of dynamite. Here nostalgia mixes with dogged optimism, and the possibilities contained in the subsoil motivate precisely because they *not* apparent.

How does the exhaustion of ore bodies and fleshy bodies shape the political stances adopted by cooperative miners? In Marxist terms, what does consciousness have to do with nature's limits, with the exhaustion of non-renewable resources? Capital itself moves on, abandoning mines that stop yielding sufficient profit, but people remain. No longer the "subjects" of revolutionary struggle, cooperative miners are still laboring and still enduring, but their political projects are different those of their unionized predecessors, different in ways that have been shaped not only by their lack of salaries but also by the material nature with which they wrestle. Rather than leaning into revolutionary struggle, their political projects are geared towards satisfying immediate material needs. In national-level discourse, this trait is interpreted as political opportunism. Rather than remaining ideologically consistent, mining cooperatives will throw their weight behind any party that promises material goods, and they made alliances with the MNR during the neoliberal period as easily as they made alliances

with the MAS during current period of putative indigenous socialism (Poveda Ávila 2014). But this political vacillation is also a symptom of geo-social precarity: it is a willingness to use any foothold on a slowly crumbling rock wall. Taking seriously the notion that the geological shapes the social also implies considering the ways that the geological shapes people as political subjects. In this geosocial formation, mining cooperatives have been shaped from the inside out by the matter with which they work, and both mountain and miners are tending towards exhaustion. These are not stable grounds for transformative political interventions.

The aims of this chapter have been to reinsert labor into discussions of geosociality, on the one hand, while simultaneously showing how the geological materiality of an exhausted mine shapes the political formation of cooperative miners. Within Llallagua's mining cooperatives, labor involves both sorting tin from sedimentary waste rock and sorting out internal social hierarchies, a process that is always inextricable from divisions of race and gender. Within and across *cuadrillas*, above and below ground, social divisions are cemented in relation to the geological properties of tin (cassiterite and pyrite) and the meanings that have been attached to its extraction, concentration, and sale. Labors in the subsoil, particularly the acts of drilling and dynamiting, are coded as masculine activities that are only done "correctly" by those who mimic the practices of ex-unionized miners (as opposed to the more recently arrived *campesinos*, who rarely ascend to positions of power in cooperatives). On the surface, labor is similarly differentiated in relation to waste rock and valuable rock, an iterative process that allows a single bag of ore to work its way through multiple people, establishing multiple hierarchical relationships along the way.

All of this speaks to the geo-specificity of global politics. By and large, discussions of the Anthropocene and geosocial formation have been planetary in dimension, yet the assumed subject is a consumer, or perhaps consumption itself. The stories I have unfolded here speak to the importance of labor on the so-called peripheries of capitalism for considering geosocial formations at multiple scales and in multiple contexts. Perhaps most importantly, they point to the contemporaneity of sites of consumption, where the impacts of the Anthropocene are supposedly still looming – a future-oriented perspective – and sites of extraction whose productive capacities were central to the acceleration of twentieth century capitalism – a historical perspective that renders invisible their political presents (see Hecht 2018). The oft-cited Faulkner quote that the past is not dead, nor even past, has a particular resonance in a context where the end of large-scale mining also marked the beginning of small-scale cooperative mining, which remains influenced by the social structures, rusty machines, and geological absences left by the former. The implications of the 20<sup>th</sup> century demand for tin cans are still reverberating in mining cooperatives' social structures and political objectives, just as the waste of the waste of the waste still reverberates through the social structures of the cooperatives. And if the Anthropocene claims to mark the convergence of accelerated population growth and increasing dependence on subsoil resources, there is hardly a commodity more representative than the tin can.

# MACHINE

## Value and Waste

### Introduction

Before any evidence of an urban population, Llallagua announces its presence through the *desmontes*, or slag heaps. From a distance, the *desmontes* look like a second mountain range running alongside the original - its afterimage, or its less verdant younger sibling (Figure 18). More accurately, the *desmontes* are connected to the mountains in the way that entrails are connected to the carcass. This connection is contained in the word itself: derived from the Spanish *desmontar* – to take apart – *desmonte* connotes the disassembly of the mountain. The *des-monte*, the un-mountain.



Figure 18: *Desmontes* along the highway approaching Llallagua. July 8, 2016.

These *desmontes* are composed of billions of rocks called *gramsa*, each about an inch long, that were discarded over the last century. The guts of the Juan del Valle mountain were not uniformly valuable, and the process of turning the mountain inside out yielded as much offal as meat. Workers on the surface – mostly women (*palliris*) – spent decades sorting between valuable and worthless rocks; these latter were added to rapidly growing *desmontes*. Patiño’s employee files, which are now housed in COMIBOL archives in Uncía, show that the most common reason for dismissing *palliris* was “throwing mineral on the *desmonte*” – that is, mistaking wealth for waste. Their job was to distinguish between the two. When the *andarivel* (gondola) was built in the 1940s, the *desmontes* grew enormously, since waste could now be transported further afield. Today, the disconnected poles of the gondola

transportation system still chart a line from the concentration plant to the highest peaks of the *desmontes*.

The newly paved highway between Oruro and Llallagua snakes around a kilometer of *desmontes* before reaching the town. Small houses appear on the outskirts, adobe or brick, all a dusty red or yellow color, with corrugated aluminum roofs held in place with rocks. Larger buildings nearer the bus station, cement with murals welcoming visitors to Llallagua, partially interrupted by graffiti expressing strong opinions about upcoming elections or equally strong opinions about unrequited loves. Across from the bus station, a mural features the faces of Bolivia's major revolutionaries to have emerged from the highlands. At the end, bigger than all the rest, is Evo Morales. Above them is painted: To those who with sweat and blood opened the path of change (*el camino del cambio*) (Figure 19).



Figure 19: Mural in Llallagua, with Evo on far right. January 27, 2016.

Just as this mural is more than a reminder of Norte Potosí's revolutionary history, Llallagua's *desmontes* are more than a ruined reminder of 20<sup>th</sup> century tin production. While the mural tells a tale of progressive revolutionary change, located in the Norte Potosí's deep history and projected far into its future, the *desmontes* both remind of past prosperity and contain the possibility of future value. These slag heaps reportedly contain more than 18 million tons of low-grade tin that could be processed today, given an adequate infusion of "new technology" (Erbol 2016). In 2012, the Morales government granted half of these slag heaps to FERECOMINORPO (*Federación Regional de Cooperativas Mineras del Norte de Potosí*, Regional Federation of Mining Cooperatives of Northern Potosí), an announcement that was received with much celebration in Llallagua – and much dismay amongst political commentators, for whom it was further evidence of Morales's duplicitous approach to environmental and labor politics. But the gift was more symbolic than material, since it was not accompanied by the technical or financial support necessary for exploiting such a vast quantity of low-grade tin ore. In the following years, successive leaders of FERECOMINORPO sought partnerships with private companies, and came close to signing contracts with two companies, one Chinese and one Brazilian, but their efforts were foiled by new mining legislation passed in 2014 that prevented the formation of



direct partnerships between mining cooperatives and private companies (Law No. 535, Art. 35). Yet the long shadows of the slagheaps remain a tangible reminder that *there is something left to exploit*. The *desmontes* remain a tantalizing promise, a literal horizon of possibilities.

My central object of analysis in this chapter is machinery, specifically how they mediate the relationship between waste and value while shaping the political aspirations of those who operate them. I examine both Llallagua's existing machinery, which was historically used to separate valuable tin from worthless rubble, and the speculative machinery that is imagined capable of extracting wealth discarded rocks and the unreachable depths of redundant mines. Most of the existing machines are themselves wasted, obsolete technology rusted into lacy patterns, but even unused machines can spark nostalgia among cooperative miners. These machines remind miners of a past with a brighter future, a future that was symbolized by new technology but which never fully materialized. But machines were never just about economic growth and technological improvement; or I might better say that economic growth and technological improvement were themselves bound up with visions of a masculine, *mestizo* national unity. The machines that transformed rocks into commodities were also appendages that transformed (Indigenous) peasants into (mestizo) miners; as the machines rust and rot, sliding back from metal to mineral, miners yearn for newer, better technology to tap hidden wealth that would restore them – as miners – to what they perceive to be their rightful economic position. They resist the perceived abandonment of the mine, the rocks, and miners themselves through the hopeful circulation of memories, rumors, and relatively small pots of money. With the right technology, the unseen depths of the mountain could be mapped and extracted, and the unquantifiable tin left in the *desmontes* could be made valuable again.

Temporality is a key aspect of this argument, as hinted by the mural of revolutionary leaders. In the late 19<sup>th</sup> and early 20<sup>th</sup> century, mining was an activity linked to social progress, through both “civilization” or economic growth. Mining in the region of Northern Potosí continues, but now cooperative miners are framed as the opposite of progress, as literally pulling the country backwards in time towards the colonial era. While this regressionist narrative is sometimes framed in terms of class consciousness, it is just as often explained in reference to the miners' lack of technological prowess. I once shared a taxi with an engineering professor at the UNSXX in Llallagua who said nostalgically: “Bolivia used to have the latest technology, the best equipment. But now, with the cooperatives, we are all walking backwards like crabs.” He went on to explain that cooperative miners never buy new equipment, never invest in the mine to make it more productive, and never do any prospecting to expand their geological reach. But his characterization of the miners as crabs also evoked an image of scuttling in the dark, eking out an existence like an animal rather than producing like a man. And yet: cooperative miners are motivated by precisely the same history of mining that this engineer was eulogizing. They limp along with the same technology, the same rocks, and the same dreams as their forefathers.

Time comes into this argument in a different way, too. As suggested in Chapter 3, and as will become more obvious here, both the Llallagua tin mines and the miners who occupy them destabilize categories of waste and value. Waste is often imagined as the antithesis of value, the excess that cannot be rendered profitable, but recent geographical work on waste has reimagined it as part of not-entirely-closed loop process of producing value (Reddy 2015, Dillon 2011, Stanley 2008). Vinay Gidwani writes: “waste is an untapped potential for capital: a boundary object; value-in-the-making; and a historical, technical, and political artifact. But it is also an excess or exudation that is prior to and product of capitalist accumulation that capital, try as it might, can never fully capture and which therefore is an ever-present threat to it.” (2013, p. 779). But waste is not such a monolithic category. What is waste and what is value-in-the-making is constantly shifting over time, depending on the skills, tools, and needs of whoever is doing the categorization as much as the demands of the global economy. In the case of Llallagua-Uncía, the whole zone, after all, was officially deemed waste in 1985

– no longer sufficiently profitable to even justify opening the doors. There was still ore in the mountain, but the thickest and most accessible had already been extracted, milled, concentrated, and shipped to the smelter; what was left would have cost the company more to extract than it was worth to sell. Yet this whole area continues to operate, with people extracting ever more value from both the underground and the waste left on the surface. I argue that the value-waste relationship is neither a direct line nor a closed loop, but rather a shifting relation mediated by labor, technology, and the meanings attached to both.

I begin this chapter by charting an intertwined history of cooperative mining machines and theoretical reflections on the importance of machines (section II), and then shift gears to explore the regional relevance of drills (section III), ancient treatment plants (section IV), and artisanal mining technology (section V) within Llallagua. I conclude by reflecting on the conceptual contribution of thinking machines, waste, and value together.

### Debts of Progress

Social relations are closely bound up with productive forces. In acquiring new productive forces, men change their mode of production; and in changing their mode of production, in changing the way of earning their living, they change all their social relations. **The hand-mill gives you society with the feudal lord; the steam-mill society with the industrial capitalist** (Marx, *The Poverty of Philosophy*, 1847, emphasis added).

Picture a miner. What do you see? A man, probably, in a helmet. If he is holding anything, I would guess it is a drill. Maybe he is using it, burrowing straight into the rockface, or maybe he is holding it up in the air in a revolutionary cry. Or maybe it hangs loosely from one hand, forearm muscles bulging in the effort. It is an extension of his arm, this drill, used to define his identity as much as access the ore.

The figure of the miner is defined as much by machines as it is by rocks; indeed, the miner is has been a central figure of techno-modernization narratives for at least the last several centuries. For Marx, as the above quote above demonstrates, the “productive forces” of society – i.e. the available technology – defined the contours of human social relations. This was not necessarily a pleasant situation for workers. Marx theorized machines as the congealed value of past labor – the labor of those who built the machines - which would be parsimoniously dripped into each commodity that the machine produced. Yet this “dead labor” continuously displaced living labor. “Owing to its conversion into an automaton, the instrument of labour confronts the worker during the labour process in the shape of capital, dead labour, which dominates and soaks up living labour-power” (Marx 1990[1867]:548). Even more than the division of labor, machines reduced the labor process to a repetitive set of motions, transforming the worker from the handler of a tool to an appendage of the machine, all while dramatically reducing a capitalist’s need for workers. With their labor power fully devalued, workers’ sense of alienation from the products and processes of production “develops into a complete and total antagonism with the advent of machinery” (p. 558). The introduction of machinery into the labor process is therefore the fullest expression of antagonisms *already* inherent within capitalist relations of production. For Marx, this was progress: it was the exacerbation of an antagonism that should eventually be resolved through societal struggle.

Although many of Marx’s contemporaries did not follow him on his more revolutionary points, they did tend to concur with the association between machines and progress. As Michael Adas (1989) has shown how, starting in the 18<sup>th</sup> century, Europeans defended colonial expansion in reference to (their self-assessment of) their “superior” science and technology; machines were “a measure of men” (and women, though Adas did not take that step). European philosophers evaluated

machines in relation to their ability to transform or master nature, and ranked people according to the machines they had produced. Herbert Spencer, for instance, believed that human consciousness was reflected in technology, and that “the degree to which a given people had been able to control the natural world through the application of this consciousness was a key measure of its advance towards civilized status” (Adas, p. 216). Technology was a key aspect of his theory of social Darwinism, which provided the theoretical underpinnings for scientific racism in the late 19<sup>th</sup> century. Technology became a shorthand way of evaluating peoples’ ability to transform nature, which, as I discussed in the Introduction, was a central aspect of racial theory since at least the Valladolid debates of the 16<sup>th</sup> century. By the 19<sup>th</sup> century, European technology was both facilitating rapid territorial acquisition in Africa, Asia, Australia, and the Americas, all while allowing colonizers to consider themselves benefactors of global progress. As H.H. Johnston, British colonial officer in Africa, put it: “There is no civilizer like the railroad” (qtd. Adas 229). In other words, there was widespread agreement that technology was an agent for positive social change, even if historical materialists like Marx had different notions of what “positive” meant.

Yet resource extraction was always peculiarly bound to both machines and to the narrative of techno-civilizing progress. Mining – such a quintessential colonial industry – was surprisingly slow to mechanize. Prior to the 20<sup>th</sup> century, most mining globally was done manually with chisels, picks, and pans (Mumford 2010[1934]:70). Dynamite, invented in the 1860s, was not widespread for another several decades, and pneumatic drills appeared around the same time. Open pit mines, although they date to the 19<sup>th</sup> century, have only become common within the last 50 years. Despite its slow technological advances, however, mining is what made all of the other machines possible. Railroads, steamboats, and tractors all relied on an excavation of metal ore and carbon fuel. Wrote George Orwell about early 20<sup>th</sup> century coal mining: “Our civilization... is founded on coal, more completely than one realizes until one stops to think about it... In the metabolism of the Western world the coal-miner is second in importance only to the man who ploughs the soil. He is a sort of caryatid upon whose shoulders nearly everything not grimy is supported” (Orwell, 1937, p. 18). Particularly among Marxists and socialists in the 20<sup>th</sup> century, the miner was elevated as the agent of both social progress (through revolutionary class struggle) and technological progress. Orwell, who belonged to that community, writes at length about both the bodies of the miners, which “look like iron hammered iron statues” (p. 2) and the machinery they use and produce. He notes the contradiction between representations of machinery in socialist propaganda, which tended to pair masculine figures with industrial technology, and the reality that technological developments are likely to reduce manual labor and make people “soft.” He actually compares coal miners’ bodies extensively to those of middle-class socialists, a group that he declares to include “every fruit-juice drinker, nudist, sandal-wearer, sex-maniac, Quaker, ‘Nature Cure’ quack, pacifist, and feminist in England” (p. 11). The miner alone somehow manages both: technological progress and rock-hard abs. The glory of this combination is evident in Llallagua, where like every mining town in highland Bolivia, a statue of a brawny shirtless – but helmeted – soldier stands holding a drill in one hand and a gun in the other: the tools of Bolivia’s masculine revolutionary modernity.

During the Cold War, technology was a particularly important aspect of Soviet and US efforts to sway the political leaders of the nonaligned countries, of which then-president Victor Paz Estenssoro was one. After Paz’s center-left party the MNR took power following the 1952 National Revolution, the Soviet Union offered to provide Bolivia with a new tin smelter and \$150 million in economic and technical support (Field 2014, p. 12). Smelting was a particularly controversial topic, since up to that point Bolivia had to ship all of its tin to the UK and the US for smelting, which meant that the country was constantly losing money by shipping unrefined ore. To counter the Soviet offer, the Kennedy administration partnered with the West German Government and the Interamerican Development Bank to collect funds for the Triangular Plan, which I discussed in Chapter 2. Later,

Czechoslovakia funded the construction of a smaller antimony smelter, which was finished in 1975. While the Cold War powers each tried to lure the Bolivian state with machinery, the state, in turn, passed along used machinery to the cooperative miners, often with a heftier price tag than it deserved (Interview Vladimir Schmitt, La Paz, March 3 2017). Gifts of metal would win the future.

When the state mining corporation folded in 1985, it happened too fast to sell or even move the machines. Machines, offices, files: everything was abandoned, save those items of value that could be immediately pilfered. Geologists and engineers began selling maps of the subsoil, and small tools – drills, picks, helmets – seemed to evaporate into thin air (focus group with COMIBOL engineers, La Paz, 9 November 2016). Two years later, however, when it was announced that cooperatives would be allowed to form in the abandoned mines, most of the large machines remained exactly where they had last been used, guarded by a handful of soldiers left to watch over the state’s most valuable investments. Coated with dust and pockmarked with holes, most of them are still here. Although to the outsider they may not appear like symbols of progress, they are still reminders of futures past.

Although all of the machines still belong to the state, like the mine itself they have been leased to the cooperatives. The declaration that announced the formation of the cooperatives also announced that everything that had belonged to COMIBOL – including not only the machines but also the buildings, furniture, and structures internal to the mountain (elevators, trolleys) – would be “gifted” to the cooperatives. They would have full control over the equipment, and full responsibilities for maintenance and repair, but they were also expected to pay for them, with interest. Today, with every sale of mineral that the cooperatives make to a commercializer (middleman companies that amass large quantities of concentrated mineral for smelting and export), 0.5% is deducted as a payment on this old debt.<sup>24</sup> Given that the interest is greater than their monthly contributions, however, the debt only grows. Siglo XX, the largest and most indebted cooperative in the region, now owes USD \$3 million for machinery and equipment – a figure that does not include debt for unpaid taxes, which the cooperative has also accrued (Interview Mauricio, Llallagua, 25 May 2017). In fact, although both the state and mining cooperatives call it a debt (*deuda*), in many ways it functions more like part of their rent, since a full repayment does not seem to be expected. Instead, the machinery is naturalized on the mining concession, an “improvement” of the subsoil that makes it possible for the miners to extract more from the earth. The state invested capital in the mine and can now charge the cooperative miners for using it; this is what Marx called differential rent. Cooperative miners, in turn, argue that paying this rent is their contribution to the state, a tax that justifies *not* paying traditional taxes.

Following in this tradition, Evo Morales’s administration has “gifted” a series of trucks and electrical generators that, although small compared to the amount the cooperatives already owed, work to solidify the contemporary state-cooperative relationship. These tools are laden with symbolism that entices cooperative miners as much as the money. The compact electrical generators and slag heaps are pale shadows of the huge equipment and tin veins that characterized the Juan del Valle mountain in the 20<sup>th</sup> century, but they still whisper the same promises. The exchange is consensual, but it has a very coercive aftertaste. Debt acts like a leash on the cooperatives, available for yanking whenever they step out of line; this will be further explored in the following chapter.

Like the rocks, the machines form the workers’ bodies in meaningful ways, but they mean nothing without something to exploit. For this reason, the value of the machines are always hinged to the geological value of the rocks located in either the slagheaps or the unexplored depths of the mountain. Although there is no actual prospecting going on, there is continuous speculation based on what is remembered or imagined rather than seen; it is a gamble on the future in light of the past. Although value in Marx’s sense is hinged to socially necessary labor time, in this case it is also hinged to the machines that congeal past labor and might complement future labor. The meanings imbued in

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<sup>24</sup> This percentage was listed on receipts from tin commercializers that cooperative miners showed me.

machinery – the pride, nostalgia, and hope – contribute to making waste newly valuable both underground and aboveground. Below, I explore this circulation of waste, machines, nostalgia, and value.

### Drills, Makers of Miners

“You don’t have any pictures of drills,” Max said, leafing through a stack of glossy photos I had printed for a poster we were making. A cooperative miner in his 40s, Marx was serving a two-year term as the coordinator of healthcare for FERECOMINORPO, the regional federation of mining cooperatives in Norte Potosí, and he and I had been enlisted to make posters about the health risks faced by miners for Llallagua’s health fair. María, host of a daily mining radio show and unofficial community liaison between the miners and the town, had left us with a box of colored markers, poster paper, and pinking shears, instructing us to make a series of posters that she could use to decorate the walls of the kiosk we would be sitting in the next day.

Watching Max’s evident discomfort with the construction paper and markers, I had volunteered to run to the local Kodak shop to print some of the photos I had taken while accompanying miners underground. Max had enthusiastically agreed, but the photos I returned with were not entirely to his liking. He did not appreciate the stark lights of headlamps shining across rows of grim faces, or my close-ups of rocks and hands. “There has to be a picture of someone drilling,” he said, tossing my photographs aside. “Maybe we can print something from the internet?”

Chagrined, I woke up María’s computer and searched “*Bolivia minero perforando*” (Bolivia miner drilling). “That one there!” Román crowed, pointing at a picture of two men standing in a tunnel, one of them directing a drill into the wall while the other appeared to watch. The picture, which we found reproduced on dozens of online fora, was low-quality and looked blurry when we printed it from María’s computer (Figure 20). “Better than nothing,” said Max as he ran a glue stick along the back of the photograph before pasting it to our poster. I tried not to feel bitter that my carefully curated set of photographs of women and men preparing dynamite, milling ore, and pushing cigarettes into the open mouths of Tíos all amounted to nothing. No drill, no miner.



Figure 20: Max’s self-representation. La Patria, original web address unknown. Downloaded October 26, 2016.

I had not yet taken any pictures of miners drilling in large part because I did not relish the prospect of spending long stretches of time underground with billowing silica dust, unrelenting jackhammer noises, and minimal safety precautions. But avoiding drills had not been particularly hard since not all *cuadrillas* (work gangs) use drills. There is no electricity in the *parajes* (work areas), and the drills rely on compressed air sent from air compressors kept in *pauniches*, the electrified underground rooms used to prepare for work and store equipment. Air compressors are prohibitively expensive, costing around USD \$3000 – more than many cooperative mining *cuadrillas* can afford. Even if several *cuadrillas* share an air compressor, the drill itself still costs hundreds of dollars. Those who do buy drills and air compressors do so on credit, while others stick to the classics: hammers, picks, dynamite. Max's need for a picture of a drilling miner was less reflective of a universal *use* of drills as it was reflective of a universal *desire* for drills.

Machines produce miners as well as mineral ore. To some extent, a miner is only recognized as such when s/he knows how to drill. Male *compañeros* would frequently ask me, when I mentioned my mining women friends, if they knew how to drill. If I responded in the affirmative, the men would nod their heads, suitably impressed. Those women who did not drill did not fully “count” as underground workers, even if they went under every day. The drills and the subsoil spaces defined one another, and the workers who interacted with both.

The following day, Max and the other FERECOMINORPO representatives outdid themselves with drills. Whereas María had suggested that we find a mannequin and dress him as if he were about to go underground – with all the appropriate protective gear, not all of which is actually *used* by cooperative miners – Max had produced a real miner (persuaded to skip work with the promise of free lunch) with a real drill, real dynamite, and a rock for a drilling demonstration. We also set up a small statue of *El Tío* – the devil figure of the Bolivian mines that has so fascinated anthropologists (Taussig 1980, Nash 1979). We arranged cassiterite rocks, coca leaves, and *mistura* - colorful confetti used for blessings and celebrations – around the Tío's base. Finally, almost as an afterthought, we pinned up the posters Max and I had made on the walls of our kiosk.

It was a health fair, and most of the other tables were occupied by representatives from the local hospital and the dentistry, medical, and nursing schools of UNSXX. These stalls featured droning powerpoint presentations given by university students that demonstrated how tuberculosis is transmitted, recognized, and treated. Maria, who had appeared to coach the FERECOMINORPO miners before she broadcast their public statements on her radio show, urged them to describe their experiences with silicosis and tuberculosis, but no one was eager to dwell on such topics.

Instead, they were excited to demonstrate their drilling prowess. The miner they had brought along posed with the drill for a series of photos with a rotating cast of university students. This drill was not actually operational, since no one had wanted to haul an air compressor down from the mountain. But the FERECOMINORPO miners had planned ahead, bringing a jackhammer that could be plugged into an electrical cable. With this, they took turns drilling into the rock they had brought, creating holes the size that they would normally make for dynamite, and complementing one another on their drilling form. A large crowd formed around them – dynamite was more exciting than tuberculosis slides, after all. The miners went on to demonstrate how they prepared dynamite, slicing it in two and sliding a fuse into each half. They were so eager to continue the show that they lit the fuse and then stamped it out right before it reached the dynamite. Maria grabbed my arm and pulled me out of the way, just in case (Figure 21).



Figure 21: Miners demonstrate drilling at the health fair. El Tío in the foreground, posters in background. Llagagua, October 27, 2016.

The phallic symbolism of the drill does not require much explanation. In her study of the map featured in Henry Rider Haggard's 1950 novel *King Solomon's Mines*, which charted the path to mythical diamond mines somewhere in southern Africa, Anne McClintock has already brilliantly articulated the connections between white male penetration of the subsoil and colonized women's bodies (McClintock 1995, 1-5). Mining might be considered the colonial activity *par excellence*, an enterprise that clearly yokes the extraction of (non-renewable, non-fertile) nature to the exploitation of racialized labor forces and the violent gendering of both people and land. Indeed, in much of the global south, the reverberations of colonial history might be expressed at the tip of a drill bit.<sup>25</sup> In a part of the world where nature is regularly deified as *Pachamama* (Earth Mother), the gendered symbolism is even more overt. For the cooperative miners, however, gendering more commonly occurs through invocations of purity and dirt. As Mary Douglas 2003 [1966] has shown, femininity is often constructed through ritual purifications and avoidance of sexual 'pollution'. Although cooperative miners infrequently reference *Pachamama*, they often describe geological formations that have yet to be exploited as "*roca sana*" (healthy rock), whereas rocks that have already been brought to the surface and processed are called *llampu* (Quechua for soft, spongy, weak) or *mamo* (Spanish for sucked). These rocks are not truly waste, as there is always more tin to be extracted. The richest ore, however, comes from the first round of processing; this is called "head grade" in English (*ley de cabeza*). Drills are only used during this first stage, on "healthy rock." Not only does this name underscore the irony of a drilling demonstration at a public health fair, but it also speaks to the phallic symbolism of the drill, which is transforming the healthy (pure) rock into sucked (polluted) rock. If machines make miners, drills make the most masculine ones, and the most productive/destructive ones.

But this is only true to the extent that miners have access ore worth extracting. A drill might facilitate extraction, but it is just a financial burden if the ore is low grade or absent. For instance, Samuel, the miner I followed in Chapter 2, is the *cabecillo* (head) of his *cuadrilla* because he purchased (leased-to-own) a drill with which he was able to open up a vein in "healthy rock." The vein now belongs to him because he mixed both his living labor and dead labor (the drill) with nature, but in a

<sup>25</sup> Compare to Elizabeth Povinelli's memorable comment on liberal multiculturalism: "In Western Europe and the United States, public anxieties about cultural diversity and national identity are often expressed at the tip of the clitoris" (1998, 575).

neo-Lockean twist he can hardly exploit it because his dead labor was repossessed by the financier. The vein was insufficiently rich to pay off the debt he had incurred by purchasing the drill. Yet he informed me that he was going to try to get it back by telling the financier that he had found a new vein, much richer than the first one. Of course, he had no way of knowing if it was actually richer than the last one until he started excavating it, but he needed the drill to do that. The rock-machine-value cycle rolls bumpily on.

## Industrial Debris and Deep Desire



Figure 22: Sink & Float Plant amid *desmontes*, Llagagua. March 1, 2016.

On the edge of Llagagua, along the blurry line that divides the town from the looming *desmontes*, is a large structure that appears fully abandoned. Constructed of sheet metal pock-marked with rusted holes, it is nearly camouflaged against the grey-and-rust colored *desmontes*, noticeable only because of how it is set apart from the town – and because it is frankly enormous. It is the Sink & Float Plant, constructed by Patiño Mines Inc. in 1947 to deal with the increasing presence of pyrite in the tin ore (Espinoza 2010, 100; see Figure 22). I took this plant to be valuable only as scrap metal until I noticed its minimal but constant military presence. The front gates are guarded by a pair of teenaged soldiers in uniform and – in case one does not get the message - decorated with paintings of soldiers holding rifles in shooting stances. Tin mining is still classified as a “strategic” industry, and the machines are apparently still worth guarding.

Once past the gates, however, it becomes clear that part of the structure is still operational. Although much of the largest equipment has been left to decay, the basic internal structure of the plant is operated by the mining cooperative Siglo XX, the largest cooperative in the region. As Mateo, a member of Siglo XX in his late 30s, explained when he toured me around Sink & Float, the guiding principles behind any mining plant is *triturar, pulverizar, y concentrar* (grind, pulverize, and concentrate), and each of the machines operated by his cooperative fell into one on of those categories. From a spinning mill that can crush up to half a kilogram of ore in each rotation, the rocks are moved to a



series of shaking tables, vibrating inclined surfaces across which ore slurry sluices continuously. As the tables shake, tin particles slide the farthest across the table, creating a thick black line of mineral grains that are harvested as they pour off the left-hand corner of the table. To the right of the line of tin is a thicker line of orange pyrite that is collected and directed to another shaking table lower down for a second round of processing (Figure 23). Any grains that fall to the left of the orange streak are waste rock and are directed straight into the river, where it causes downstream sediment buildup and acidic river water that cannot be safely used for irrigation.



Figure 23: Shaking Tables and Metallic Streaks, Sink & Float Plant. February 9, 2017.

These shaking tables were imported by Patiño in the early 20<sup>th</sup> century, and they are now encrusted with hardened rock crystals. Much of the non-essential framework of the building has giant holes rusted into it, and workers have put planks across the holes in the floor. Yet Mateo kept describing the whole operation as *bonito* and *hermoso* (pretty, beautiful) and expressing excitement about how much each machine could process and how old they were. He blew dust off of their labels, some of which were too worn out to read, to see when and from where they had arrived. He was satisfied that they were mostly American, with a few German pieces, and noted with pride that this was the most advanced technology in the world until 1952. He showed me the joints on the bottom of the tables, which were smelted into solid pieces, and informed me that Bolivian companies were now manufacturing lower-quality shaking tables with joints that were just welded together and easily came apart after a few years of continuous vibration. He snorted and shook his head in disgust at the quality comparison.

Finally, from the shaking tables the ore moves to flotation units, which were Patiño's *pièce de résistance* when he first constructed the plant: this was how he would separate tin from pyrite in a mine with dwindling levels of cassiterite. Mateo explained that a reactive chemical (xanthate) and an oil is added to each unit once it is filled with ore slurry. As the unit spins, the oil binds to the pyrite, creating air bubbles around it and forcing it to rise to the top, where it can be skimmed off like shiny metallic

bubble bath. The strong chemical smell burned the inside of my nose as I leaned over a large hole in the floor to peer inside the unit. “Bonito, no?” Mateo repeated admiringly.

Mateo’s nostalgia for the skeletal remains of technical innovation is shared by many cooperative miners, particularly in relation to the Planta Sink & Float, which was the crown jewel in Patiño’s enterprise in the first half of the 20<sup>th</sup> century. In black and white photos splashed across booster reports of the time, the focus was always on the *andarivel* (gondola), which transported waste *gramsa* (rocks about 3-5cm) to the *desmontes*. Not pictured in the photos were the hundreds of palliris who picked through these heaps, searching for valuable rocks, or the rapidly growing piles of waste rocks. Mateo pointed the gondola out to me, declaring that it was the prototype for the *teleférico*, a gondola public transit system recently installed to much fanfare in La Paz. Now the cables are broken, the carts are all on the ground, and the posts stand like wireless telephone poles, but it remains an object of pride (Figure 24).



Figure 24: Abandoned gondola in Llallagua. February 9, 2017.

But this plant is also an object of frustration, or a reminder of opportunities lost. On our way out, Mateo and I stopped in the main office to visit with Placido, a cooperative miner who had been appointed to guard and maintain the Planta Sink & Float. An older talkative man in a blue coverall, Placido explained that Siglo XX had been granted access to this machinery only ten or fifteen years beforehand, after they filed an official request with COMIBOL; in other words, from 1985-2005, the plant been sitting idle, growing rust. Yet the cooperative is still paying off the debt for this rusty machinery in percentages that are deducted from every sale of concentrate to a smelter. Placido reflected that it was difficult to justify this expense when the machines were already so out-of-date. Mateo agreed. He looked at me as he said: “Before it was cutting edge technology, but now it’s just junk (*chatarra*). In Peru they have more advanced technology, people that manage machinery from their computers, open pit mines that open up like a crater, like a snail, but not here.” His words stayed with me because of the disarming way the image of snail naturalized the open pit and even rendered it an aesthetically pleasing use of land.

Placido nodded to corroborate Mateo's assessment of Peruvian technology and informed us that a Peruvian engineer had recently visited the mine. This engineer, whose nationality apparently validated his expertise, had been confident there was still plenty of mineral ore left in the mountain, despite the century of mining that had taken place there. The hidden geological wealth was at the deepest depths of the mountain, where tin veins larger than anyone had seen remained untapped. "It's the mother vein down there, all right," Placido said with a sigh. "But we would need better pumps to get at it!" In response, Mateo expressed his disappointment that neither COMIBOL nor the cooperatives had invested in technology the way Patiño had:

We've regressed to the hammer and chisel. We've regressed one hundred years... Before the passageways and canals were clean, but now you can barely walk down there. We don't have the trolleys and the pulleys necessary to clean it out. And the longer we leave it, the harder it is to move because it becomes calcified and we would have to drill as if it were *roca sana* (healthy rock) (Mateo, February 9, 2017).

Alongside Mateo's nostalgia for the past is the hope that the good days might return – a desire that, in line with Lauren Berlant's (2011) notion of "cruel optimism," has profoundly negative consequences for miners' bodies, environments, and political lives. In this case, the desire is hinged to the unknowability of the subsoil, the geological depths of which are imagined rather than seen. Nostalgia mixes with dogged optimism, and the possibilities contained in the subsoil motivate precisely because they *not* apparent.

Into these geological depths, debt-stricken cooperative miners plant their hope and cultivate motivational stories. Only a handful of formal geological tests have been done in the mountain since the company folded, but rumors of new deposits hidden in inaccessible corners of the mountain circulate endlessly. Traveling geologists arrive regularly in Llalagua, like prophets in 4 x 4s, promising cooperative miners that the lower levels the mountain contain unbelievable wealth. These claims remain unverified because there is far too much water at the lower levels for exploration. *Cooperativistas* currently work down to nearly level 800 (800m from the peak of the mountain) but even here they must run pumps 24 hours a day to stay above water. Along with air compressors, these pumps are the most valuable possessions of those miners who work at these lower levels. For instance, the loss of water pumps figured centrally in an account of a 2005 conflict between cooperative miners and *ayllu* members by then-president of the cooperative Siglo XX:

We lost a lot of equipment - lamps, helmets - but also machinery, like pumps and drills. Because of the way nature is at those levels, you have to pump water all the time. Water just pours in, it can rise several meters in one day. And during the conflict, the water was just rising, and afterward it all had to be pumped out. It took a month to get those levels ready for working again. And a day that a worker here doesn't work, he doesn't eat. We can't eat when the mine is full of water. (Interview Miguel, Llalagua, 9 July 2016)

Their current water pumps cannot handle the volumes of water lower than level 800, and miners often pass the time by fantasizing about the depths that could be reached with newer technology. Sitting in *paunwiches* with groups of miners in the morning, I was regularly called upon to comment on the possibility of turning their mountain into a pit like the ones they had seen pictured in Peru and Canada. I was taken aback that they would even want such a mine – particularly given Marisol de la Cadena's (2010) contention that there is a qualitative difference between shaft mining and open pit mining for Andean peoples. Moreover, it was difficult to imagine how the mountain could ever be turned inside out: far from empty, the interior is so full of machinery, clothing, and

caverns of discarded plastic soda bottles that dismantling this geosocial world seems a virtually insurmountable task. With these observations in mind, I usually thought only to comment on the small number of jobs offered by such open pit mines, to which the miners would respond with disappointed head shaking. Only going through my fieldnotes much later did it occur to me to wonder at the number of miners who tied visions of technological salvation to *invisible* geological wealth. Miners found hope in this articulation, which I inadvertently unhooked by pointing to the negative consequences of technological “progress.”

Sink & Float is not the only concentration plant in the region. The Victoria Plant is located in Catavi, a submunicipality of Llallagua that is full of large, crumbling houses because it used to be home to COMIBOL’s engineers and managers. As we exited Sink & Float, I asked Mateo why that there were so many more soldiers guarding Victoria than Sink & Float. He told me that the equipment in Catavi was more valuable, but then added that the state was prohibited from selling any of it. Any unwanted machinery, Mateo averred, had to be buried in the ground. He recounted a tale about a president of the regional cooperative mining federation who had discovered a powerful ore mill buried in the earth near the *desmontes* and sold it raise money for the federation. When discovered, this man had been imprisoned for the theft of state property, but this did not stop others from hopefully digging for a similar discovery. Literal machines buried in the earth, like an industrial treasure chest. I laughed out loud at the ghoulish life cycle: from the earth the metal comes and to the earth it is returned, with the hope that it could be made to rise, zombie-like, to work again.

### Artisanal Technology and Waste Rocks

In the shadow of the Sink & Float Plant, there different kinds of technology at work. Between the enormous rusted skeletons of building-sized pieces of machinery, within the acres of rocks that form the *desmontes*, cooperative miners have dug themselves *parajes* (work areas). Paths snake through the rocks, around the *parajes*, allowing workers to climb and jump from one place to another. The *desmontes* have always been *palliri* territory, and most of the people climbing up and down these *parajes* are *palliris* in full skirts, plastic sandals offering minimal grip in the case of a misstep. They gather rocks that still contain streaks of ore and bring them back to their *parajes* to hammer open. Curlicues of cigarette smoke rise from the *parajes* dug into the rocks, marking the places where women are at work, otherwise invisible from the road.

Relying exclusively on hammers and saliva (to wet the rocks and force them to reveal their tin), these *palliris* are some of the most artisanal cooperative miners in the region. The word “artisanal” means hand-produced, with doubled connotations: produced by hand with great skill, or produced by manual labor without sophisticated technology. In the academic world, Artisanal and Small-scale Mining (ASM) describes an entire field outside of state-led and transnational mining enterprises, and the term “artisanal” is meant to describe minimal mechanization rather than great skill. In Bolivia, cooperative miners are not usually categorized as artisanal, given all the mechanical gifts they have received, but this denies both the continued significance of low-tech mining and the great wells of knowledge necessary to do this kind of processing.

Further down from the Sink & Float plant, where *desmontes* give way to flat surfaces, other artisanal miners are working with *mamo*, the waste sands that have already been processed once, either by a *cuadrilla* of cooperative miners or, more anciently, by COMIBOL. On Sundays, most underground *cuadrillas* work above ground in small artisanal *ingenios* (concentration plants) that line the road that winds up from Llallagua to the mineshaft Cancañiri, as I described in the last chapter. Against this backdrop, *palliris* and some male surface workers walk between *ingenios* and offer miners a meal or a beer in exchange for their *mamo*. When they return empty handed, *palliris* will resort to paying one of the guards, who drive large trucks, to bring them a load of the once-processed waste sands left behind

by COMIBOL. Blackened by the slow sun-induced burn of the acid that the company used in the concentration process, these sands still contain enough tin to warrant their re-processing in small artisanal concentration plants known as *budles*.

*Budle* operators usually work on the downhill from the town, where they can take advantage of the slow rivulets of water that run downhill from the mines. A *budle*, or buddle pit, is a circular basin carved with a bundle of branches suspended vertically above its center. A slurry of water and ore sands runs along a narrow trough, down the bundle of branches and into the center of the pit. Cassiterite and pyrite, the two heaviest particles, collect in the center of the basin, while the lighter waste-rock is washed by the water towards the basin's edges. Buddle pits in this form are one of the oldest form of "slime concentrators," having been developed in the Cornish tin mines at least as early as the 13<sup>th</sup> century,<sup>26</sup> and German miner Georgius Agricola devotes considerable space to describing the buddle in his book *De Re Metallica* (1556), thought to be the first modern treatise on mining (Figures 25 & 26).<sup>27</sup>



Figure 25 (left): Buddles as featured in *De Re Metallica* (Agricola, 1556: 302).

Figure 26 (right): Buddle in Llagua, July 21, 2014.

Adriana, whom I introduced earlier, operates her buddle leaning semi-prostrate on her side all day, scraping a flat piece of metal back and forth across a screen through which the ore slurry flows. Small rocks collect in the screen and the rest sluices forward towards the basin where they collect. She adds xanthate, which releases tin from pyrite, and car oil, which loosens up the waste rock and allows it to flow more smoothly to the basin's edge, and then she runs the same batch of mineral through the whole system at least three times before collecting the tin from the center of the basin and selling it to commercializers in Oruro. Her *budle* is her own handiwork. She built it with scraps of metal and branches that she harvested from the fields of abandoned machinery surrounding the Sink & Float plant, after having learned the technique from her husband and friends. Around her, other surface workers use similarly creative methods to extract ever more value from mine waste. In a *paraje* next to

<sup>26</sup> Bulletin of the American Institute of Mining Engineers, Issues 92-96, p. 1932

<sup>27</sup> Agricola's treatise was translated into English in 1915 by Herbert Hoover, the mining engineer-turned-President.

hers, a mixed group of women and men miners from the cooperative Carmen use a process called *tintinear* (to jangle or clank), which involves using vibrations to encourage the heavy metals of tin to sink to the bottom of a barrel, and even further downstream *comunarios* (rural farmers) sift through the *lamas* (slimy wastewater from mining operations) looking for a final sprinkle of tin dust.

There are a fair number of men working in buddles and other such artisanal technology, but one would never know this from the way that the buddles are discussed back in the FERECOMINORPO offices. Here, the small systems are described as the last bastion of hope for widows and abandoned wives. Mirroring this representation, several NGO-led projects have funneled development funds directly into supporting women surface workers. The largest of these projects was a highly mechanized processing plant that was meant to operate on the scale of the Sink & Float Plant. I was first introduced to this plant in 2014 by Rosa, who was the representative of women miners in the regional federation of Norte Potosí at the time. Rosa is a tall thin woman in her 50s who flashed frequent smiles of gold-ringed teeth as she toured me through the edges of town, where most of the *palliris* work. She was dressed all in black because her husband, also a surface miner, had died the year prior and she was still in mourning. I imagined she must be roasting in her black sweater and pants under the midday sun. As she walked, she would occasionally stop to pick up a rock and spit on it to rub away the dust and make the tin reveal itself. She murmured continuous disappointment at how little tin was left in the *desmontes*, but occasionally pocketed a rock that might prove worthwhile.

What she was really eager to show me, however, was a half-completed women's *ingenio* (processing plant). The basic frame of the plant was already there, and all the shaking tables were already outside, ready to go in. Rosa told me excitedly that it wasn't just going to be like any old plant; this one was going to have a meeting hall for women and a daycare for children. The financing had come initially from APEMIN II, a program that ran from 2004-2010 that was designed to support sustainable economic development in "poor mining areas" in the departments of Oruro and Potosí. Funded by the European Union (70%) and the Bolivian government (30%), APEMIN II was a follow-up to a previous collaboration between the EU and Bolivia in mining zones (now known as APEMIN I). The main goal of both of these projects was to prevent unemployed miners and *campesinos* from migrating to areas in which they could cultivate coca (Oblasser and Chaparro 2008, 42). When APEMIN II ended in 2010, a new project called EMPLEOMIN (*Empleo en los Áreas Mineras*) was created to supply the funds necessary to conclude projects started by APEMIN II (La Patria 2010).

But this particular plant was never finished. When I returned to Llallagua in 2016, the new representative of women, a shorter rounder woman named Amalia, explained that the funds had been mishandled. Rosa had paid a construction company that never completed the project, and now they were short the money necessary to electrify the operation. For the next year, I checked in with Amalia occasionally on how the plant was developing, and there always seemed to be a new problem. Then, in the last month before Amalia was supposed to step down from her position, all of the most expensive machinery vanished from inside the plant, as did Amalia and her eldest son. Before she left, Amalia had lived alone, save a handful of cats, in a one-room apartment where she often invited me for tea. I mourned her disappearance as much as the incriminating circumstances.

Despite its sorry end, the fact that this plant was being built *at all* illustrated the extent to which women miners are associated with surface work. What few NGOs still work in Llallagua tend to focus on "empowering" women miners – a relatively small fraction of the entire workforce – and the only reason this plant was built was because of its stated goal of contributing to women's autonomous leadership capacity. The plant was meant to complement frequent empowerment workshops, which are popular among women miners because they receive free meals, trips to other cities, and sometimes good dance parties. Mechanizing women's artisanal mining practices was supposed to bring them up to the same economic status as their male *compañeros*, which would hopefully also translate into more political participation. But the (failed) construction of this plant wound up reinforcing two gendered

assumptions: that all artisanal surface work is performed by women, and that unequal gender status can be fixed with machinery.

Framing artisanal technology as a problem that must be overcome is a narrative of progressive improvement that denies the persistence of “artisanal” technologies and practices across time. It also depreciates the skills of artisanal workers, particularly those of women, which has the effect of feminizing not only surface labor – as I showed in Chapter 3 – but also low-cost surface technology. As I have shown throughout this work, such small-scale and artisanal processes have made large-scale extraction economically possible even in the heyday of industrial mining. In fact, the oldest mining cooperative in the region, the Juan del Valle Cooperative, was originally a group of predominantly men who worked artisanally in the ore sands of Uncía. Although they were confirmed as a cooperative in 1958, the year the General Law of Cooperative Societies passed, they had existed informally for at least a decade prior to that. Digging vertical shafts about 10 meters deep, these miners extracted grains of tin that had settled on the bottom of a now-dry riverbed and sold them to the company. This exceptionally dangerous work (cave-ins were frequent and usually fatal) was carried out by a mixture of miners who had been fired from their salaried jobs and migrants from rural areas for whom salaried employment had never been offered (Interview Rolando, Uncía, 16 January 2017). Functionally, they subsidized the state mining corporation in a time of falling tin prices and tin grades, but they are rarely acknowledged in historical accounts of the region. In this way, artisanal technologies and the indigenous workers who operated them were erased from the proud history of 20<sup>th</sup> century industrial progress.

More importantly for my argument, discounting artisanal mining also perpetuates the notion that there is a clear line to be drawn between ore and waste rock. Failing to acknowledge how much small-scale mining is actually re-processing waste dumps creates the impression that cooperative miners hunger only after expanded underground spaces rather than what they also want: the ability to transform waste into wealth.

## Wasted Opportunities

Mateo, the cooperative miner who toured me around the Sink & Float plant, is somewhat unusual amongst cooperative miners. The first time I met him, while waiting to go underground at the Siglo XX mineshaft, he was wearing a turquoise keffiyeh wrapped around his neck, and he smiled at me with a set of perfectly straight white teeth – a true oddity in the mines. Interviewing him later in the lobby of my hotel, I found that he is a practicing lawyer who decided to get into mining on the side, since “that’s where the real money is, as long you do it right and invest in machinery and technology” (Interview Mateo, Llallagua, 26 September 2016). Mateo became a miner in the cooperative Siglo XX to get to know the process and the other miners, but his real interest was in metallurgy. With his father’s help, he assembled the machinery necessary to build a small, borderline illicit metallurgical plant on the river downstream from Llallagua. More of a capitalist than any of the other cooperative miners I met, Mateo made a small killing buying and processing low-grade ore from other cooperative miners. “It’s all about investing capital,” he told me earnestly, baring his perfect teeth. “That’s what this government doesn’t understand. They’re stuck in socialism, an old ideology that comes from outside of Bolivia. You need capital to make things productive.”

After declining several invitations, I finally agreed to visit his processing plant in October 2016. I met him at his parent’s house in Catavi, the submunicipality of Llallagua where COMIBOL’s engineers and bosses had once lived, and from there we took his motorcycle. We had to cross a field of *colas arenas* (sand tailings) to get to his plant. Unlike the *desmontes* in Llallagua, which are formed of *gramsa* (rocks about 2-3 inches long), the sand tailings are made of just that – sand. It’s a shocking landscape. All the buildings disappear out of sight, and the panorama is reduced to a riverbed framed

by bright red mountains on one side and bright white mountains of sand on the other side. The altiplano always reminds me of an overexposed photo, like the land itself has been bleached by sun, but here it was even more extreme. Down the middle, the river ran beige, full of mining waste that flows out of the mineshafts Cancañiri and Siglo XX and through all the small mining operations around town before snaking through this part of Catavi. “That’s why my motorcycle is so dirty,” laughed Mateo, “because I drive it through this river every day!”



Figure 27: Tracing the dust. Catavi, October 23, 2016.

His processing plant, when we saw it, looked like an exact replica of the Sink & Float plant in miniature. Always built on the side of hills, the principle behind processing plants is to move the mineral from the highest levels to the lowest levels, using gravity to drive the purification. Mateo was eager to show me how everything worked. We started our tour at the lowest level of the plant, where there were two shaking tables set up. Although the plant was not actually in operation – it was Sunday, and Mateo had given his employees the day off – he drew in the dust on the table with his finger to indicate how the tin was harvested (Figure 27).

One of the tables was American and the other was Russian, and Mateo told me that the American one was much better because it shakes in a slightly oval shape, whereas the Russian one just moves forward and backward continuously. He proudly dusted off the label on the American one to show me that it was called “The Deister” and had been made in Indiana in 1906 (Figure 28). Patiño had brought these shaking tables to Bolivia for tin concentration, but Mateo suspected that they had been designed to process gold originally. I later found Deister website and saw that Mateo had been right:

In the days of the great Alaska Gold Rush early in 1906, Emil Deister, an immigrant from Germany, perfected and patented a seemingly simple concept in a shaking separation table which changed the history of a region and helped to bring fortunes to a new turn-of-the-century generation of miners. The new idea included pooling and body separating riffles running diagonally to the flow of the material. No other system separates so efficiently or so completely. (Deister Website, see Figure 29)



How odd to think that the technological remains of the Alaska gold rush could be found in a secretive tin processing plant on the Bolivian highlands. It had been repurposed multiple times, the machine itself waste that had found new value.



Figure 28: The Deister Concentrator, featured in Mateo's plant (October 23, 2016).

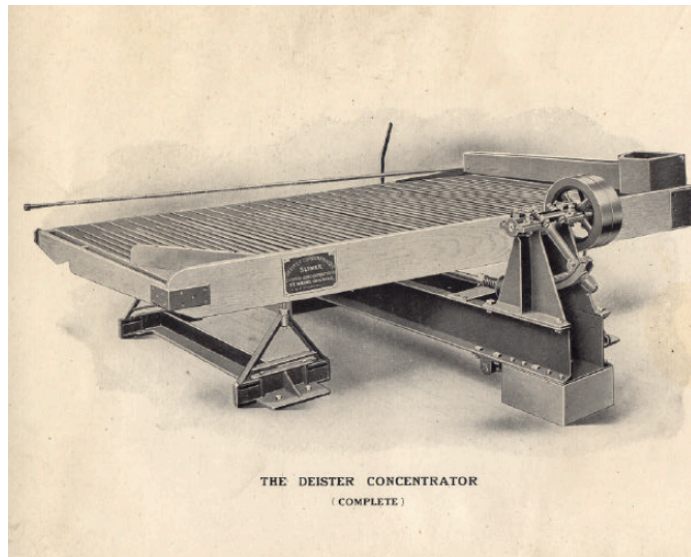


Figure 29: The original Deister Catalogue, 1906. ([http://www.deisterconcentrator.com/pdf/deister\\_book.pdf](http://www.deisterconcentrator.com/pdf/deister_book.pdf))

Mateo went walking up the levels of his plant, essentially moving backwards through the concentration process. In the middle level were more shaking tables, and further up was the mill, a huge metal barrel that is filled with loose steel balls. When rotated, the clanging steel balls slowly transform rocks into sand. Above the mill was a *chankeador* (grinder) that accepts larger rocks and spits them out as smaller ones to go into the mill. Next to the *chankeador* was the pile of large rocks that had just been delivered from the mine. Mateo leaned over and started picking through the rocks to show me the different kinds of tin. Most were just rocks with *puntitas* (points) or *chispas* (sparks) of tin in them like black sprinkles. He explained that underground miners saw these rocks as *mamo* (waste) because they did not have enough tin to justify processing in artisanal systems. Mateo cracked one rock on top of another, crumbling it open and “freeing” the tiny grains of tin. “That’s what the mill does,” Max concluded, “it frees the tin from the *mamo*.”

We circled back down the hill and at the very bottom of the plant he showed me where his tiny flotation system would go. It was essentially a human-sized square box with a rotating part inside, a miniature version of the one I had seen in the Siglo XX plant. Next to the box was a plastic bag full of xanthate, the toxic white powder used in flotation systems to separate tin from pyrite – packaged in the same kind of thin plastic bag that the market vendors sell fruit in – and next to that were cans of kerosene and sulfuric acid, ready for use. “Just like the one Patiño used,” Mateo said proudly. “Patiño knew that capitalism and technology were the only ways to get ahead, and now our president is trying to squash it!” I looked at the empty box and pile of chemicals and tried to see the promise that Mateo so clearly invested in it.

Mateo had been trained by his father and his surroundings to see these objects differently than me, as full of potential for economic and personal growth. Between being a miner, metallurgist, and lawyer, Mateo was also in the process of writing a history of tin mining that would prove that Simón I. Patiño had been an economic visionary whose legacy had been destroyed by COMIBOL – not exactly a popular opinion amongst cooperative miners (or most Bolivians, for that matter). Yet

Mateo's love of mining and faith in its power – particularly its technologically-driven power – was informed by listening to the same histories and looking at the same landscape of mountainous entrails and rusted giants. Like the other cooperative miners, his faith was strong enough to carry a significant debt. Each of these ancient shaking tables had cost him \$10,000 USD (a steal, he assured me, since the new but low-quality ones made in Oruro went for \$30,000). Although his father had helped him front the cost, the rest was courtesy of a financier in Oruro to whom Mateo expected to be indebted for at least the next decade. Moreover, although he was not personally beholden to the state, and in this way not as politically trussed as mining cooperatives in general, his ability to pay off his loan depended on the continued operations of the mining cooperatives: without their ore, his processing plant was just an open-air museum of antique machinery, orange rust settling gently on red earth.

All these stories speak to the instability of the category waste. It is true, as Vinay Gidwani and others have argued, there is never a clear line between waste and potential value. But there is more to it than that. There are so many different kinds of waste, even in a place where it seems like everything is rock. *Llampu, mamo, llamas, desmontes, colas arenas*: each describes a different kind of waste, a different kind of matter, at a different place in the processing cycle, located in a different place in three-dimensional space. Each of these can only be turned into value in relationship with particular people, those who have the right knowledge and the right tools. The difference between waste-as-obstacle and waste-as-untapped-value is technologically mediated, and technology – in all of its artisanal or mechanized forms – is combined knowledge and tools. Cooperative miners have the knowledge, often passed along as an inheritance, and they imagine that, with the right tools, they might transform themselves from the wasted remains of industrial advances. From the “crabs walking backwards” that I described at the beginning of this chapter, they could transform themselves into forward-striding historical agents.

## Conclusion

There are two annual holidays universally celebrated by miners, cooperative and salaried alike: Carnival and August 1st. While Carnival is widely celebrated in association with the beginning of lent, the first day of August is an important day in the agrarian calendar that has been transposed into the mining world. August is typically the driest month of the year, and Andean farmers welcome it by spilling llamas' blood on the ground to help crops survive until September. In the mines, both Carnival and August 1<sup>st</sup> are celebrated similarly, by spilling a mix of llama's blood or (much more commonly) alcohol underground. “*Que se mejoren las estructuras* (here's to improved [mineral] structures)” say the miners as they drip beer, wine, or *trago* (spirits) into the corners of their work areas.

But it is not just the rocks that receive this special treatment. The miners also spill beer on the machines, to thank them for working and to ensure that they continue operating for the year to come. Semi-trucks, elevators, trolleys, and ore mills are all festooned with soggy *serpentinás* (garlands) and *mistura* (confetti), and I have even seen miners flicking beer at cable TV hookups and radios. While not exactly a machine, cooperative miners in Llalagua also blessed their new indoor coliseum (another gift from the state, completed in June 2017) by spilling beer on the floor. This particular blessing had the unintended consequence of costing the cooperative miners a soccer match against President Evo Morales when one of Evo's all-star teammates slipped in the puddle. The prize for winning the game would have been state approval for the purchase of more semi-trucks, so the cooperative miners left the stadium with long faces that day.

Machines whisper of future wealth and past grandeur, and these promises persuade miners to gamble their present wealth on future possibility. But the machines also define the miners: the more dangerous (Max's drill), large-scale (Peruvian open-pit mines), and associated with grand mining

histories (Mateo's shaking tables), the more the machines recall memories and imagery of revolutionary history. This imagery is deeply gendered, as is the artisanal technology and the surface labor associated with women (but often performed by men). Driven by desire to be associated with this masculine future rather than a feminized, pre-industrial past – or worse still, animalized as crabs – cooperative miners willingly gamble their economic futures. Waste and value thus curl like strands of DNA around machines, binding together mining cooperatives and their financiers in its spiraled orbit. Value-creating labor is motivated by desires for the 20<sup>th</sup> century ideal of progress, the still-circulating dream of a past possible future, now lodged in rust and rocks.

The mural featured at the beginning of this chapter (Figure 19) speaks of the forward march of Llalagua's proud history of mining, casting the region as a maker of historical agents, and the mining sector as history's motor. Waste rock and artisanal labor both disrupt this linear temporality. Waste rock contaminates, turning the region's agricultural fields into wasted floodplains, while also introducing new complexity: the possibility of being continuously reprocessed gives waste rock potentially infinite value, but each time it yields less tin. This is not a circular economy (Lacy and Rutqvist 2016), but rather a downward-sloping spiral. Artisanal labor, meanwhile, harkens back to colonial and pre-industrial production methods, where everything depended on the human body's capacity to wield hand tools. Because the most artisanal methods have been associated with *palliris* – their surface labor always depended too much on discerning appraisals of the worth of individual rocks for full mechanization – any return to hand tools implies a feminization of the sector. Not only does this perceived regression elicit the disgusted sniffs of mining engineers and economists hoping to maximize the efficiency of extraction, it also alarms the cooperative miners themselves, who are motivated as much by nostalgia for the past as they are by promises of future growth.

Many of the actions that are perceived as evidence of aggressive greed are spurred by machines and slag: desire for new machines and access to new sources of ore, memories of past machines and unlimited geological wealth. In the next chapter, I explore these actions as they unfold across the contentious boundary between the Morales state and mining cooperatives, a boundary marked by patronage, parades, and corpses.

# DYNAMITE

## Plurinational State Deformation

### Introduction

The news hit like an electric shock, tearing through regularly scheduled programming across the media spectrum. In La Paz, a city accustomed to arranging its daily movements around parades, marches, and roadblocks, it is difficult to generate a scandal worthy of more than a groan. But the roadblock that mining cooperatives had erected in August 2016 in Panduro – a town along a well-traveled highway between La Paz and Oruro - was different than usual. Everyone was glued to TV screens as grisly photos and videos began to surface on Twitter and Facebook, the images grainy and the voices barely audible.

The Deputy Minister of the Interior, Rodolfo Illanes, had been murdered. After having gone to the roadblock to negotiate with cooperative miners, his body was discovered in the wee hours of the morning of August 26<sup>th</sup>. He was wrapped in a sheet and dumped on the side of the road. The cameras zoomed in on his face, bloody and swollen. A video filmed by a cooperative miner hours before Illanes's death shows him standing at the center of dense ring of angry miners, talking on a cell phone. Illanes appears to be begging the person on the other end of the line for help. Near the videographer, someone yells: “*A ver un palo, yo le voy a hacer gritar* (when I see a stick, I will make you scream).”<sup>28</sup> Later, the coroner announced that Illanes had indeed been tortured for six to seven hours before he was beaten to death, with a final blow delivered by a rock to the back of the head. Rumor had it that part of the torture had involved exploding dynamite in close proximity to Illanes's head. The picture of Illanes's car that appeared on Twitter revealed that it had similarly been burned with explosives, the tires completely melted off and the hood curled upwards from the heat (Figure 30). Dynamite, the signature tool of the miners, was also their signature weapon.



Figure 30: Vice Minister's Rodolfo Illanes's car, discovered soon after his death. Posted on Twitter by Correo del Sur at 7:12 am on August 26, 2016.

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<sup>28</sup> <https://www.elnuevoherald.com/noticias/mundo/america-latina/article98763332.html>

The events that had provoked this protest were complicated. The news outlets, however, focused only on recent events: cooperative miners were angry about a proposed modification to the General Law of Cooperatives (No. 356, originally passed in 2013), which would explicitly recognize the right to unionization for workers employed by “cooperative societies”. Mining cooperatives have a reputation for hiring poorly compensated workers – sometimes children – to labor on their behalves, a system of exploitation that could be threatened by unionization. For this reason, they are often called *patrones*, which translates as both “bosses” and “owners.” This name has serious colonial connotations, given that *hacendados* (owners of *haciendas* and all the people living there) were also *patrones*. Journalists agreed that cooperative miners had taken to the streets because they are more like bosses than workers, and therefore inherently anti-worker in their politics.

But this explanation leaked in all its corners. The vice president of the Confederation of Cooperatives of Bolivia, CONCOBOL, explained to me that as “productive cooperatives,” mining cooperatives had never been legally allowed to hire third-party workers in the first place: the Cooperative Law (No. 356) states that only “service cooperatives” – such as water-distribution and telephone/cable cooperatives – can hire employees for technical operations like plumbing or electrical wiring. Mining cooperatives, therefore, did not stand to lose anything with the new regulation (Interview, La Paz, 2 February 2017). Yet cooperative miners adopted the conflict as their own, declaring that unions and cooperatives were “like oil and water” since unions are driven by struggle while cooperatives aim for mutual support. Indeed, as the roadblock wore on, the miners used the roadblock as a platform to release a 10-point *pliego* (list of demands), only one of which was related to the Cooperative Law. *Pliegos* are a strategy typical of workers’ unions, usually aimed at their shared employer; since they are not employees, the cooperatives’ *pliego* was aimed at the state, which cooperative miners viewed as their own problematic *patrón*. Their demands included relaxed environmental standards, the extension of electrical lines to all mining cooperatives, and the modification of the Law of Mining and Metallurgy (No. 535) to allow mining cooperatives to partner with transnational corporations.<sup>29</sup> Only with the release of this *pliego* did the majority of Bolivians get an inkling of the depth of discontent that was brewing between mining cooperatives and the Morales administration.

In the aftermath of Illanes’s death, the media homed in on the violence inflicted by cooperative miners, portraying them as boorish aggressors. Missing from these stories was any hint of state-wielded violence. Yet in addition to Illanes, five cooperative miners died at the roadblock, four from police bullets and one from mishandled dynamite: Fermín Mamani, Severino Ichota, Rubén Arapaya, Freddy Ambrosio, and Pedro Mamani. As of August 2017, no one had been charged with their deaths, and it was unclear if any sort of investigation would happen at all (El Deber 2019). Instead, police arrested 59 miners, only a handful of whom were formally accused of participating in Illanes’s murder. By the time Illanes’s body was discovered by police on August 26th, most of the miners had fled the scene, and police were left to detain stragglers and latecomers. As I discovered by speaking with imprisoned gold miners in San Pedro prison in La Paz in October 2016, many of them did not even know about the murder for days after being imprisoned.

Such arbitrary state violence was complemented – and justified – by harsh legal retribution. Only five days after Illanes’s death, on September 1<sup>st</sup> President Evo Morales announced five supreme decrees designed to limit the cooperatives’ political and economic activities.<sup>30</sup> For a brief period of

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<sup>29</sup> Full set of demands listed on COMIBOL’s website: <http://comibol.gob.bo/index.php/24-noticias-inicio/815-coope>. The demand to partner with transnational mining companies was a reiteration of a plea they had been making since 2014, when the Law of Mining and Metallurgy (No. 535) was first passed (Marston and Kennemore 2019).

<sup>30</sup> These decrees prohibited the use of explosives in protests (DS 2888), established new procedures to regulate mining cooperatives (DS 2889), reverted to the state all concessions registered to mining cooperatives that were either inactive

time, all dynamite sales were suspended, which immediately halted production within mining cooperatives across the country. In Llallagua, cooperative miners were left to wander the streets whispering their theories about what had happened (many thought that Illanes had been planted there to goad the miners into violence) and to speculate on a future cut off from Morales's support.

In the last three chapters, I explored how cooperative miners are formed as collectives and individuals in relation to their vertically uneven mountain, the metal tin, and the rusted machines with which they work. The overarching purpose of this chapter is to connect the arguments I have been making about the formation of cooperative miners through their labors underground to the national political arena. Since the establishment of the Plurinational State in 2009, new avenues have appeared for cooperative miners (and other previously marginalized people) to take on leadership roles within or alongside state entities. As they move upwards – both out of the ground and towards power – they contribute to transforming the legal architecture and everyday practices of the state. To show how this operates, I trace the interwoven stories of two cooperative miners from Llallagua. Fidel Colque moved from the mines to parliament over the course of the time I knew him, and Jesús Aldunate attempted to jump from his leadership position in the regional federation of mining cooperatives to the Ministry of Mines and Metallurgy but was stymied on his course by the Illanes conflict. Through their stories – both tragic in their own ways - I show how the plurinational state system both invites cooperative miners to participate in the state and limits their ability to operate outside of state purview.

Violence permeates this chapter, both overt and subtle. This violence is gestured towards in my title, *Dynamite*, because this explosive substance is both an omnipresent underground tool and cooperative miners' weapon of choice when they take to the streets in explosive "events" such as the 2016 road block. However, I am primarily interested in the relationship *between* such explosive events and the more subtle, everyday violences that shape the relationship between miners and state. Building on the "everyday state formation" literature (Joseph and Nugent 1994) and borrowing the geological concept of "deformation", I call this continuous violence "everyday state deformation." In geology, the word *deformation* is used to describe an alteration to a rock's shape or structure resulting from stress or strain. Unlike geological "events" such as earthquakes and volcanic eruptions, deformation is what happens between events, when rocks are exposed to consistent pressure over an extended period of time. Like Diane Nelson's "piñata effect" (1999), deformation places less emphasis on revolutionary epochs – the smashing and rebuilding of states – and more emphasis on the periods of relative stability. Nothing is being smashed, but the state is certainly being hit with the expectation of receiving sweets (*ibid*, p. 77). While the 2016 roadblock and murder of Rodolfo Illanes was a political "eruption" (itself a geological term), everyday state deformation is a slow process of seeking avenues into the state, from where it can be pushed and pulled into a slightly different shape. As in geology, eruptions and deformation are not mutually exclusive: they happen along the same fault lines at different moments.

The chapter is organized around national-level events that happened between 2014-2017, but I use my interactions with Fidel and Jesús over the course of this period to reflect more expansively on the pressure that was building up and releasing. After discussing what I mean by "everyday state deformation," I work through four national-level events: the national election of 2014, the referendum of 2016, the struggle over the Cooperative Law of 2016, and the Day of the Plurinational State in 2017. Finally, I conclude with a discussion of what it means to think about "verticality" in the plurinational state, which is so often conceived in terms of horizontal social relations.

## Everyday State Deformation

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(DS 2890) or operated by cooperative-private alliances (DS 2891), and reiterated the right to unionization of all third party workers employed by mining cooperatives (DS 2892). These decrees were elevated to the status of law a month later (Law No. 845).

The relationship between state formation and grassroots politics has long been a recurring theme in Latin American studies. Emerging as part of a resuscitated conversation about the Mexican Revolution, the notion of “everyday state formation” aims to capture the contradictory ways that Mexico’s popular culture had contributed to the formation of the Mexican state – not just by fighting alongside celebrated revolutionary heroes during the *event* of the revolution, but also in less archivally legible processes surrounding the revolutionary buildup and its aftermath (Joseph and Nugent 1994, Alonso 1995, Radcliffe 2001, Ballvé 2012). In Bolivia, the relationship between popular cultures and the state has been an important topic of discussion in Marxist political economy, with Gramscian theories of hegemony figuring large in academic and everyday debates. For instance, political theorist René Zavaleta Mercado’s influential book *Lo Nacional-Popular* (1986) showed how normally divided subaltern subjects rallied together in the early 20<sup>th</sup> century to overthrow the oligarchic elites in the 1952 National Revolution. Current Vice President Álvaro García Linera, whom many would characterize as the intellectual architect of Morales’s government, regularly publishes books that invoke Gramsci to construct a vision of popular, plurinational hegemony capable of articulating the divergent interests of the labor unions, indigenous federations, and unsalaried urban workers, among others (García Linera 2010, 2014; García Linera and Stefanoni 2008). Indeed, Gramsci is such an omnipresent figure in national politics that an acquaintance of mine – a feminist Trotskyist student in La Paz – once told me that Gramsci was a weapon wielded by the state to immobilize its opposition. I could see what she meant. In *Del Estado aparente al Estado integral* (2010), García Linera argues that the plurinational state is the manifestation of Gramsci’s concept of the “integral state,” and in García Linera’s interpretation this means that the state and society are so thoroughly mixed that they can no longer oppose one another.

Institutionally, this mixing has been achieved through the transformation of democratic structures and processes. Bolivia’s Plurinational Legislative Assembly consists of a lower house (Chamber of Deputies, 130 seats) and an upper house (Senate, 36 seats). Of the deputies, 70 are elected to represent single-member electoral districts (*diputados uninominales*, uninominal deputies), 7 are selected by Indigenous districts, and 60 are elected by proportional representation from party lists on a departmental basis (*diputados plurinominales*, plurinominal deputies). This means that the electoral system is considered a “hybrid” between direct representation and proportional representation (Galindo 2017, 243). Based on the principles of “complementarity of direct and participatory democracy, representative democracy, and communitarian democracy” (General Electoral System Law, 2010, Art 1), this electoral system is a defining feature of the Plurinational State. Another defining feature is its emphasis on gender equality: 50% of the candidates on the plurinominal lists must be women, and any man running for an uninominal seat must run alongside a female alternate (and vice versa). For people in rural areas, these electoral reforms have translated into more opportunities to enter national politics, particularly since the MAS generally selects rural leaders as its plurinominal candidates.

As parliamentarians are plucked from rural, working class backgrounds, their “popular” sensibilities are having repercussive effects at the national level. Tighter relationships are woven between individual formation, collective formation (the topics of chapters 2-4), and state formation. This is an intentional aspect of the Plurinational State’s design, but it has caused some friction in urban areas. For example, well-known Bolivian feminist Maria Galindo recently published a book titled *No Hay Libertad Política si No Hay Libertad Sexual* (There is No Political Liberty if There is No Sexual Liberty, 2017), which shares the findings of a study of sexism and homophobia in the plurinational parliament. Drawing on interviews with 73 members of parliament (deputies and senators), Galindo argues that the socially conservative views that prevail amongst parliamentarians shape Bolivia’s laws around abortion, queer and trans rights, and domestic violence. Although I am sympathetic to

Galindo's argument – to which I will return later in this chapter – her book does not address the question of how so many rural parliamentarians arrive in their new offices with such apparently regressive political missions. In other words, she does not trace the historical interplay between the formation of individual parliamentarians, their collective identities, and state practices. Although individuals might take up new job titles, they are not suddenly transformed into autonomous, rational decision-makers. In the case of cooperative miners, apparently individual trajectories are shaped within geosocial formations that span subterranean and surface worlds, rural and urban spaces, and local and national politics.

Thinking this way about individual actors – as always forming and formed by material relations that stretch between the surface and the subsurface – implies rethinking one of the common ways that cooperative miners are characterized: as a simple reiteration of patron-client relationships that have long been attributed to Latin American politics (Auyero 2000, Taylor 2004). Clientelism, or the granting of material support in exchange for political (electoral) support, has emerged in Latin America's democratic era as closely connected to colonial histories of patronage exchanged between landholders and the Indigenous people living on their *haciendas*. Since Morales's initial rise to power in 2005, he and the mining cooperatives have generally supported one in ways that could easily be characterized as clientelism. Morales has relied on cooperative miners to run – and win - his campaigns in mining municipalities while, in exchange, he has bestowed upon these municipalities gifts such as electrical generators, soccer fields, concentration plants, small loans, and general political support. As a middle-class Bolivian acquaintance put it over wine at a mutual friend's house: "That's all you need to write in your dissertation. It's clientelism, pure and simple."

But mining cooperatives are not the only ones who are being accused of clientelism these days. Across the board, there has been a major shift in the way that rural and/or marginalized collectives in Bolivia seek financial support, and the current arrangement looks an awful lot like clientelism. In the 1980s and 1990s, NGOs and international development institutes – such as Oxfam, World Vision, GIZ (Germany), SIDA (Sweden), and CIDA (Canada) – provided financial assistance for rural projects in a context of relatively reduced state capacities. These organizations, however, have slowly rolled back their services in response both to Bolivia's economic growth and to global financial contraction since 2008. The Bolivian state, moreover, has been actively expelling and discrediting international development agencies: in 2013 Morales personally expelled USAID (BBC 2013), and in 2015 García Linera mounted a campaign against four Bolivian NGOs that relied on external funding and published works critical of the government (Achtenberg 2015)<sup>31</sup>. Explicitly intended to restrict the imperial reach of Europe and North America in Bolivia, these moves have also limited political opposition from rural and cash-strapped collectives. The state, and particularly its development fund *Evo Cumple, Bolivia Cambia*, dominates the rural development scene, and to critique the MAS would be to turn off the financial tap. This is why, in Chapter 2, Tata Félix was looking to mining as a means of funding CONAMAQ now that the highland indigenous federation is no longer on friendly terms with the state. When it was first established in 1997, CONAMAQ was funded mostly by NGOs, which allowed it to express strong anti-governmental positions (Andolina, Radcliffe, and Laurie 2005, Albro 2006). The state is not interested in funding its own opposition, and the state is now the only game in town. If not by design, clientelism is what happens by default.

And yet the movement of individuals *from* those rural and marginalized collectives into the state has blurred the line between client and patron, such that the former is not just supporting the state electorally but also crafting its legal architecture. It is this relationship of direct, mutual pressure that lends itself well to the concept of *deformation*. On the one hand, deformation refers to a slow,

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<sup>31</sup> The three NGOs were CEDLA, CEDIB, Fundación Tierra, Fundación Milenio. The first three are NGOs with which that foreign researchers and activists frequently collaborate.



inexorable pressure that exerts itself continuously but occasionally breaks; on the other hand, deformation provides a particular cut on the question of the relationship between state and civil society, which is usually a question that sits exclusively in a social sphere of analysis. The cooperative miners I have been following for the last three chapters have been formed in relationship to the literal rock of nation, which – as I argued in Chapter 1 – is not only owned by the state but has also been produced as a state space through the production and curation of geological knowledge. Although most of the stories in this chapter take place above ground, the influence of the subsoil remains strong. Under these stresses, even clientelism itself is deformed, as exchanges between the state and voting blocs are now mediated by individuals who move between the two worlds and are shaped by both.

Finally, simple definitions of clientelism do not capture the violence of being in a relation of exchange from which one cannot easily exit, even if the ‘gift’ offered is not sufficiently enticing to justify political support. Not only is there no alternative source of financial support, but attempting to seek alternatives (such as private companies) is met with harsh punishment. As I will show through the stories of Fidel and Jesús, being bound to the state through relations of individual and collective exchange is never an entirely comfortable position, even at the best of times. At worst, it is imminently dangerous. When the decision is not between accepting or declining a reward, but rather between accepting a reward or receiving a punishment, it is nearly impossible to say no.

### **Fidel and Jesús: Leaders and their *Pueblos***

I made Fidel’s acquaintance in 2014 through a Bolivian NGO called CEPROMIN (Centro de la Promoción Minera) that often called on him when they needed to tour a potential donor through a working mine. In years prior, Fidel had been the president of Northern Potosí’s regional federation of mining cooperatives, FERECOMINORPO, and he had developed a reputation for being a good guide for *turistas* – not that Llallagua had many of those.

When I met him, however, Fidel was in the midst of celebrating a new step in his career. He had just been selected as a candidate for a plurinominal deputy (*diputado plurinominal*) seat in parliament, a seat he was guaranteed to win as long as Morales was reelected in October of that year. Fidel and I arranged to meet in Llallagua’s center plaza and, although I was certainly the one who looked more out of place in the lively town center, I spotted Fidel well before he saw me. Like other off-duty cooperative miners, he wore a polyester tracksuit and a baseball cap, but his glasses and thick moustache gave him an intellectual look, and he strode in with the purpose of a local celebrity. He walked down the row of retired miners who always congregate along the park benches and took each of their hands in both of his to greet them. They all offered him huge smiles and tipped their hats as he passed. When he finally wended his way around to greeting me, he suggested that we have a coffee in Palos, the café on the plaza. He ordered exactly what I got – Nescafé with milk – and I would learn over the next several years that he made a point of always ordering the same as those around him, a small diplomatic move that contributed to his local popularity.

Once I had explained my research project to him, he immediately launched into a history of mining in Llallagua, from the time Simón I. Patiño purchased mining rights in the late 19<sup>th</sup> century to the present. Attempting to stave off one of the history lessons that Lllallagueños all seemed to feel compelled to give me, I redirected him by asking about his family history. He ran his hand through his silver-specked hair and said that his father had been a *campesino* from the region of San Pedro, a comparatively lowland region of Norte Potosí that has historically supplied much of the food consumed in the much less hospitable altitudes of Lllallagua and Uncia. He – Fidel’s father - used to watch planes flying overhead, on their way to the mines with fresh meat, cigarettes, and other such necessities, and he resolved that he wanted to “smoke the cigarette that the foreign man smoked.” Foreign goods were filtering into San Pedro from the mines at the same time that a series of droughts

were making farming a more dubious prospect, so Fidel's father came to work in the mines as a "very innocent *campesino*." Fidel joined his father in COMIBOL when he was a teenager but worked there for only 6 years before it was shut down. In 1987, he became a founding member of the cooperative Siglo XX.

Referencing his father's Indigenous background, Fidel went on to say that mining cooperatives were a completely different kind of organization than the unions of yore. Rather than the "logical socialism" of the USSR, which had a major influence in the unions, mining cooperatives demonstrated a kind "Andean socialism" based on the family. He discussed how cooperative miners' practices, such as sacrificing animals to appease the *Tío* with blood or sprinkling alcohol on the corners of subterranean galleries, echoed Indigenous agricultural practices, and added that he himself always returned to San Pedro for local festivals, even though he had never lived there. In making this argument, Fidel deftly linked cooperative mining to the economic vision proposed by Vice President Álvaro García Linera, alternately called "communitarian socialism" and "Andean Amazonian Capitalism," which is premised on the idea that communitarian economies at the local level might be articulated with a national export-oriented economy (Postero 2010). Fidel was creatively engaging this new grid of intelligibility to paint a positive picture of cooperative mining. For miners like Fidel, speaking of "Andean Marxism" is not disingenuous so much as it involves using the language available for staking claims on state (Li 2000). While I did not doubt that he had always attended local festivals in San Pedro, I wondered if he had always invested these local spectacles with the same meaning that he did now: as a means of justifying his Indigenous heritage, and with it, his claim on the Plurinational State.

Less than a week after this conversation, Morales won his presidential election of 2014 with 69% of the popular vote. The next time I saw Fidel, in early 2016, he was living by himself in La Paz in a one-room apartment near the parliament building, where he had exchanged his track suit for a button-down shirt and a long navy coat. But he still returned to both Llallagua and San Pedro for holidays, and he is the one who introduced me to Jesús, the new president of FERECOMINORPO, during Carnival.

As in most of Bolivia, Carnival is a big deal in Llallagua. By late afternoon on Friday, the first day of the week-long festival, the ground was littered with confetti (*mistura*), paper streamers (*serpentinás*), and plastic cups that had been ground into the mud of the street by thousands of dancing feet. A continuous light drizzle – February is the end of the rainy season – dampened no one's spirits as parades of dancers, brass bands, and groups playing autochthonous music (*música autóctona*) moved through the streets. School-aged children peaked out from behind corners to pelt unsuspecting passers-by with water balloons, while adults greeted friends by wrapping their necks in *serpentinás*, sprinkling a handful of *mistura* in their hair, sharing a drink, and wishing them *enhorabuena* (congratulations).

Fidel told me in private that he hated all the partying, hated how he was obligated to make an appearance at multiple events and, once there, would be expected to drink continuously. Everyone wanted to invite the newly minted member of parliament to a glass of beer or *chicha*, a fermented corn drink. To deflect some of the attention, he decided to use the opportunity to introduce me to his mining *compañeros*.

The party in the FERECOMINORPO building was already well underway by the time we arrived. The 12 members of the Federation's directorate – all male except for Amalia, the representative of women miners – sat in red plastic chairs pulled into a circle in a cement courtyard, with several crates of empty beer bottles next to them. Loud music blasted from a car stereo, every neck was wrapped with streamers, and a dozen hands raised to toast our entrance. Someone handed me an open beer bottle and asked me to serve everyone, which gave me the chance to greet them one by one. The last person I greeted was Jesús, the president of the Federation. A tall, lean man in his

50s with tired eyes in a gaunt face, Jesús is affectionately called *Brasil* by his friends both because his complexion is darker than average and because he has a reputation for being good at soccer – a nickname that speaks to Llallagueño stereotypes about their neighbors to the east, where many of them migrate to find work in moments of economic hardship.

Jesús pulled me into the seat next to him and began talking excitedly about his plan for the federation. He was in conversation, he told me, with two transnational corporations, one Brazilian and one Chinese, that were both interested in working with the regional mining cooperatives to exploit the slag heaps that had lain dormant for a century, and he wondered if I could help make contact with Canadian mining companies (I admitted that was unlikely). He wanted to bring tourists to Llallagua and turn the miners into underground tour guides, as had been done in the Cerro Rico of Potosí, and hoped that I might help him write a tourism report (I agreed that I would). He wanted to make a documentary about the miners' work to share on YouTube, and asked me if I had any cinematography skills (I did not, but had a friend who did). I was struck that all of his hopes for my presence in the region were about making Llallagua more visible: to foreign investors, to tourists, and to the world. Jesús hoped I could turn the mountain inside out and expose its jewels, both mineralized and cultural, and ultimately exchangeable for cash.

Satisfied with our informal agreement, Jesús invited me to go underground with him the next day. Miners all go underground on the Saturday of Carnival to bring offerings to their work areas, which ensures a safe and lucrative year ahead. He promised to bring extra boots, helmet, and lamp for me to the mineshaft, since I had not yet purchased my own. But Jesús did not wake up the following morning – which was unsurprising, I thought, after the long day of festivities. I grabbed a shared taxi up to the Cancañiri mineshaft in the hopes of finding Fidel and, with him, a spare set of mining gear. The drive up to Cancañiri switches back and forth up from Llallagua at a 45-degree angle, so most miners take a shared taxi up and walk back down at the end of the day. Looking down on one side of the road, into the river that trickles out from the mineshaft, one can see the ruins of former Patiño/COMIBOL housing, disintegrated in the sun and rain once their aluminum roofs were removed after neoliberalization. On the other side of the road are contemporary mineral concentration zones: *quimbaletes* – huge cement semi-circles that miners rock back and forth to crush rocks into sand – and pools of standing water, glossy with chemical runoff.

The taxi parked right in the middle of the miners' market. The first thing I saw was a group of teenage miners pushing one of their friends, so inebriated he could hardly stand, into the taxi that I was exiting. Behind them, hundreds of men were milling about in rubber boots, sweatshirts, helmets. Getting out of the taxi was an exercise in discomfort, since the moment I was visible everyone turned to look, murmuring *choquita* (Bolivian slang for “blondie”) and *gringuita* under their breath. I walked forward robotically, distracting myself by looking to see what people were selling. Along with the usual set of goods (coca, plastic tubes of pure alcohol, miniature bottles of *singani* – grape liquor – and wine, packaged and home-rolled cigarettes) miners were also buying paper streamers, confetti, shallow terracotta plates filled with offerings, white and pink balls of powdered sugar with fennel at their hearts, and white sugar squares with images printed on them representing different hopes for the year ahead: wealth, education, business success, housing, children (Figure 31).



Figure 31: Cancañiri miners' market. February 6, 2016.

Relief flooded me when I spotted Fidel, who grinned and told me that he hadn't expected Jesús to show up, either, given the party the day before. Fidel had some spare equipment for me to use in his storage shed. One boot had a hole in the sole but Jesús tied a plastic bag around it to keep the water out. And in we went.

Festival days underground are lively. The elevator operator, already a round man, was completely wreathed in paper streamers and dancing by himself to what sounded like a Spanish version of the Beach Boys. Everyone was talking and laughing, making plans to meet at different *Tío* statues after they had blessed their respective work areas. Fresh layers of streamers and coca leaves had been added to every corner of the underground, turning the interior space of the mountain momentarily colorful. Within a week, these streamers and confetti would be soaked in subterranean moisture and ground into the dirt by hundreds of rubber boots, but in that moment they were beautiful. Even Fidel's pauwiche – which suffered from neglect, given that Fidel was now most often in La Paz – brightened up in the dark (Figures 32 and 33).



Figure 32 (left): Fidel, inside the Juan del Valle Mountain. February 6, 2016.



Figure 33 (right): Fidel, outside the Juan del Valle Mountain. February 6, 2016.

The whole day underground, Fidel was campaigning. It was a new campaign this time. Hardly more than a year into his third term, Evo Morales had announced an intention to run for president a fourth time in 2019. Constitutionally, he was only allowed to hold the position twice, but he had wiggled into a third term on the basis of the fact that the constitution had been re-written in his first couple of years in office. Now, he was holding a general referendum that, if the *sí* (yes) vote won, would allow him to amend the constitution to make room for his next campaign. The referendum was scheduled for February 21<sup>st</sup>, just two weeks after Carnival, and Fidel's underground mission was to convince his *compañeros* to vote yes. As we moved from one *tío* to another, accompanying different *cuadrillas* in their underground blessing, he made a point to remind everyone of what *compañero* Evo had brought them, pointing out new electrical generators that had been "gifted" through the *Evo Cumple, Bolivia Cambia* program.

Back above ground after nearly seven hours of blessing the mine with alcohol, cigarettes, and coca leaves, Fidel and I sat in front of the Cancañiri mineshaft to share a few beers with Pocha, a woman who operates one of the stalls in the miners' canteen and who had served us peanut soup early that morning. By this point in the day, Pocha's work was done and she was busy celebrating Carnival and keeping an eye on her husband, who was passed out on her lap. "He's a good husband," she explained to me with a wink, "he always just passes out and stays where I can keep an eye on him."

Pocha took Fidel's presence as an opportunity to push him for details on a scandal that had broken in the national news just two days beforehand. Evidence had emerged indicating that from 2006-2007 Evo Morales had a relationship with Gabriela Zapata, a 17-year-old non-indigenous Bolivian woman who had been hired by the Chinese company CAMC to lobby for company interests

in the newly consolidating plurinational state. The couple had a child whom Morales claimed died shortly after childbirth. This story raised the ire of many people for many reasons, but two stood out. First, CAMC had signed seven major contracts with the Bolivian state since 2006, six of which were not open to bidding, and all of which dealt directly or indirectly with resource extraction. In a context of increasing concern about Chinese influence in the Bolivian economy, particularly its extractive sector, this story reignited a debate about whether the Bolivian economy had really transformed at all under Morales, or if it had just traded the influence of one imperial power (the US) for another (China). Critical analyses of the debate focused on this as both evidence of Morales's personally corrupt leadership style, which echoed Bolivia's long history of national elite collusion with imperial powers, and his ongoing promotion of extractivist economics.

But for Pocha and many other Bolivians, the more upsetting parts of the story were the moral and gendered implications of the relationship. Cradling her own, comparatively "good" husband's head on her lap, Pocha pressed Fidel on the details. Wasn't it just *wrong* of Evo to have had the affair, and especially to have abandoned the woman afterward? Fidel deflected: men are weak, Evo was single, and the company used a young woman to tempt him. Those sorts of *personal* stories, Fidel argued, should not count against Evo in the referendum. Instead, Pocha should remember that Evo supported the people (*el pueblo*) and the miners in particular; a vote against him would only strengthen the wealthy.

The very next week, an article appeared in the weekly La Paz newspaper *Página Siete* by feminist activist Maria Galindo. In her opinion piece, she worked against the private/public divide that was embedded in Fidel's argument. She wrote:

Here I want to tell the President directly that this is not about him invoking his right to a private life. That is a liberal vision, it is the liberals who proposed the division between private and public to legitimize a double morality. Feminists of all times have defended the political character of the private and of the public at the same time and because of that we never accepted this patriarchal double morality that allows a man to do what he wants in his private life, without consequences in his public life. This is not about a Christian morality, but rather about the search for coherence between public and private. It is not possible to transform the place of women's subordination in public life, without transforming the place of women in private life (Galindo, February 10 2016, *Página Siete*).

Arguing that any genuine effort to decolonize the state should recognize that the distinction between private and public is a western fantasy, Galindo dissected Evo's affair to show the contradictions between his claims to support women – and especially Indigenous women – and the machismo embedded in his way of life and the kind of state he reproduced. Just a few years beforehand, for example, he had called on cocaleros (coca farmers) to "seduce" Indigenous women who were marching to La Paz in opposition to a highway that was slated to be constructed through TIPNIS – a twice protected area, both as a national park and as Indigenous territory. In Spanish, the word for seduction is *conquista*, which has clearly colonial connotations (Canessa 2017, Fabricant and Postero 2019). How he treats the women in the bedroom, Galindo concluded, is also how he treats women across the country, despite plurinational commitments to proportional representation of men and women in parliament.

But if Fidel's campaigning tactics might be used as a more general commentary on the state's narration of Evo's affair, the division being drawn was actually not between private and public, but rather between private and *pueblo*. Although Fidel did attempt to justify Evo's "weakness" in the face of youthful beauty, the strength of his argument was that Evo's service to *pueblo* outweighed individual harms. The literal translation of *pueblo* is town or community, but in political contexts it is usually

translated as “people”. The loosely defined collective it gestures towards, however, is somewhere between people and community, and is also invoked by the terms *masa* (multitude or mass) and *popular* (popular in the sense of common, but also poor or grassroots). The *pueblo* is the community hailed by populist leadership, which has a long history in Bolivia and in Latin America more broadly. Framed as the common ground for forging political unity that escapes the divisions of either race or class, in practice the terms *popular* and *pueblo* sometimes impose a distance from indigeneity by virtue of their allegiance with the national (Hale 1994). In Bolivia, however, “the popular” has changed over time, taking on a distinctly Indigenous identity in the revolutionary period of 2000-2005 (Hylton and Thomson 2007). This “pueblo” that Fidel invoked was not strictly the “national-popular”, but rather articulated both Bolivia’s populist history and its more recent cycle of Indigenous struggle, much as Morales’s government has done in general (Cunha Filho 2009). Even more specifically, as a cooperative miner Fidel’s notion of pueblo had emerged from the interplay between subterranean union politics and agrarian social worlds. None of this is the same as the western political notion of “public” that, as Galindo noted, has been roundly critiqued by feminist scholars (Landes 1998, Yuval-Davis 2004).

This equivocation speaks to the need to situate the political goals of individual cooperative miners within the geosocial contexts from which they emerged. I was again reminded of this need about a year later, when I attended the launch of Galindo’s book *No Hay Libertad Política si No Hay Libertad Sexual* (2017), which I referenced earlier in this chapter. The lecture hall of La Paz’s MUSEF (*Museo Nacional de Etnografía y Folklore*) was packed for this much-anticipated book launch, and mine was far from the only blond head in the audience: a large number of *gringas* were scattered among middle-class activists and a handful of *cholitas*. Galindo came on stage dressed in her typical style, which included combat boots and a sash that read “EVA” (Eve), her head shaved down to the scalp on one side, red lace dress, black lipstick, and silver earrings that flashed down well below her shoulders. After giving introductory remarks, Galindo began to show video clips from the interviews that she had conducted with parliamentarians to make the argument in her new book. She showed how parliamentarians’ sense of Christian morality influenced how they voted in relation to topics such as gay marriage and abortion. The whole room, sympathetic to her mission, groaned and laughed as old senators with hair sprouting from their ears attempted to evade Galindo’s aggressive questioning, growing pink in the face as she cross-examined them into a corner, one after the other.

My own laughter, however, died in my throat as Fidel’s face suddenly appeared on the screen (Figure 34). Fidel, who had once tied a plastic bag around my rubber boot, was now the butt of a joke in downtown La Paz. Galindo’s disembodied voice was asking him about his views on family and gay marriage: Can two gay men who live together be family? “They are people, but they cannot be family... That is not the true spirit of human beings, which is between a man and a woman...” Then the video cut to another parliamentarian, and Fidel was gone, having been used as nothing more than a sound bite to illustrate the homophobic tendencies of the Plurinational State’s parliamentarians. He was a prop in Galindo’s spectacle.



Figure 34: Fidel at María Galindo's book launch, La Paz, 14 June 2017.

Like the rest of the audience, I was sympathetic to Galindo's project. Her analysis of the state through individual parliamentarians, is the driving inspiration behind this chapter. Yet I found it difficult to square Galindo's critique with the people in Llallagua whom I knew and respected. I was reminded of the final chapter of the classic book *Let me speak!* (1978), a testimonial by Domitila Barrios de Chungara, who was a leader of the housewives' committee (i.e. the wives of unionized miners) in Llallagua in the 1960s and 1970s. "Housewives" in this era were often the political wing of the unions, since they were not personally employed and could not be fired or otherwise penalized for blocking roads and occupying offices. Domitila, whom Llallagueños remember as the woman who sold the best *salteñas* in town, is most famous for leading a hunger strike in La Paz that resulted in several union leaders being freed from jail. In the last chapter of her testimonial, Domitila recounts her experience at the UN International Women's Year Tribunal in Mexico, and her critique of upper class, western, or white feminism could also be applied to María Galindo's take-down of MAS parliamentarians. The valuable point that Galindo was making about the preservation of machismo even within a plurinational assembly that is close to 50% women missed its mark by failing to address the personal and collective histories that shaped parliamentarians' positions on "feminist issues."

Both Fidel and Jesús emerged from the same collective, and had even followed similar leadership paths, with Jesús coming up just a few years behind Fidel. Both men had worked underground for years prior to taking leadership roles, and they were both from a relatively powerful segment of cooperative miners, being the children of unionized workers and members of the largest cooperative, Siglo XX. Although they maintained connections to rural areas, they did not themselves spend time laboring in the fields, but rather made choice appearances at rural celebrations. Despite this, they still spoke of themselves as *agro-mineros*, a label that simultaneously reflected the reality of the



majority of cooperative miners whom they represented, articulated cooperative mining with state discourses about Indigenous economies, and lent them individual credibility as more-than-extractive *patrones*. In fact, as multi-generational miners, both of these men were relatively more steeped in the history of unionism than the ‘bases’ they represented, and they had had access to richer tin veins than most miners working underground today. Their very elevation to leadership roles was reflective of spatial and material privileges they had inherited within the mine, inheritances that marked them, within the context of the cooperatives, as non-Indigenous men. Given his collective allegiances and personal class segment, there is little wonder that Fidel was defensive of heteronormative family structures: such structures run through the cooperatives and the Juan del Valle mountain, as I charted in Chapter 2. Grappling with this material history is a necessary part of critiquing cooperative miners as individuals and as part of collectives. This history also shapes their individual struggles, as I document below.

### Fallen from Grace

Morales lost the referendum 48.7% to 51.3%, a defeat that was largely credited to the Zapata scandal and a separate, much longer running scandal surrounding the Indigenous Fund.<sup>32</sup> Even Potosí, usually a MAS stronghold, voted “no” to a constitutional amendment (OEP 2016).<sup>33</sup> “My own daughter voted ‘no!’” Jesús lamented a few days after the referendum. “I told her that what Evo does in his private time is his business, but she voted no anyway!” Construction halted on a stadium that was being paid for the region’s mining cooperatives through *Evo Cumple, Bolivia Cambia*, and Jesús told me that this was Evo’s way of punishing the cooperative miners for not having rallied enough support during the referendum.

Actually, Jesús was just beginning to realize the precarity of his political position. The party system also runs through the mining cooperatives, and Jesús and all of the members of his directorate been elected as MAS candidates. But now the miners who represented other parties were calling for a change in leadership, since it was clear from the referendum that the MAS no longer represented the interests of all the miners. This tension boiled over to the struggle around the cooperative law, which emerged in the months following the referendum.

The first indication that I had of the conflict brewing around the cooperative law came in early June. I had shown up in the FERECOMNORPO office to speak with Jesús, but I discovered him surrounded by a mob of cooperative miners. They had traveled from a more rural area to demand that Jesús stop the changes to the cooperative law that were coming through parliament. “Why isn’t Fidel fighting this harder?” they demanded, and then turned to me to say that they were willing to take the to the streets if push came to shove. Jesús, looking harried, tried to shoo them out of the room by using my arrival as an excuse.

To understand the way the cooperative law played out, it is actually necessary to back up a couple of years to look at a separate controversy over the new Mining Law, which ratified in May 2014. In the constitution, there are three groups recognized as productive “actors” in the mining sector: the state mining company, COMIBOL, private industry, and mining cooperatives. Because of

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<sup>32</sup> In late 2015, news broke that hundreds of the projects financed by the *Fondo de Desarrollo Para los Pueblos Indígenas Originarios y Comunidades Campesinas* (Fund for the Development of Indigenous Originaries and Campesino Communities, or FONDIOC) had never been realized. This ongoing scandal has involved the detention not only of the government officials involved with the Fund but also many Indigenous leaders who were accused of having siphoned the money for personal use. Tata Félix, interviewed in Chapter 2, was one of these leaders. Many activists claim that this scandal was orchestrated by the state to imprison Indigenous leaders who had been critical of the MAS and install their own puppet leaders.

<sup>33</sup> Norte Potosí voted “yes,” but not with enough enthusiasm to outweigh the rest of the department.

this precedent, these three groups collaborated on early drafts of the mining law, which eventually made it out of the parliament and was sent to the senate (Interview Pedro Mariabo Moreno, La Paz, July 14 2014). In the senate, however, one article was identified as constitutionally problematic. In its draft form, Article 151 stated that mining cooperatives had the right to form “associations” with private companies. But cooperative miners, the senators pointed out, were supposed to be “non-profit” entities – which they certainly wouldn’t be if they were in partnership with private companies. The senate modified this article to state that such associations could take place only with state approval. Cooperative miners tore through the streets, shutting down several major transportation arteries for several days, but were ultimately unsuccessful in their bid to reinstate the original Article 53a. The mining law passed, and miners returned to their work (see Marston and Kennemore 2019 for a more detailed analysis of this law). In this context, the change to the cooperative law came as a blow to an already wounded psyche. *Compañero* Evo, who was supposed to be on their side, had failed to support them not once but *twice* in recent years. The blow was more symbolic than material, but that did not make it any less real.

A couple of weeks after the protest that ended with Vice Minister Illanes’s death, I met Jesús and the rest of the directorate in their courtyard, the same place where we had celebrated Carnival several months beforehand. The mood was very different: the men were all stony-faced, sitting on a bench with their arms crossed on their chests. Only Jesús was standing, leaning on a broom. He immediately began telling me about his experience at the protest. Although he had not actually been at the frontlines at the time of the murder – he had been negotiating in La Paz – he had been arrested nonetheless, beaten and forced to walk barefoot by police officers, who had fractured his ribs with their fists. Juan, one of the other directorate members, recounted how he had seen two miners shot straight in the face by police bullets at the roadblock. All of them were subdued, but every sentence that they uttered spoke to the violence of the bonds that lashed them to the state, bonds that had once nourished, but now strangled.

I asked if it would be helpful for me to write an article that could share their perspective on the protest. They all stared at me silently, and then Jesús sad-laughed. “It’s that we’re afraid,” he said. “We’re afraid of being thrown in jail, and we’re afraid they won’t release those of us who are already there.” Jesús went on to explain that he thought the whole situation was a set-up because no one would send in a politician *in alone*, with no military backup, to negotiate with miners! In a way repeating the discourse in the media that framed cooperative miners as animals whose rage could not be contained without a military presence, Jesús redirected the responsibility. If we’re such animals, he seemed to suggest, then the handlers should have taken more care.

Speaking with cooperative miners from Llallagua and Uncía over the next several days, I learned that the collective was divided on whether they should keep pushing against Evo and the MAS – maybe even backing a different candidate – or if they should crawl back “with their pants down,” as Jesús evocatively put it. Jesús was crushed with anxiety over which course of action he should take. He did not see a real path forward for the cooperatives without Evo’s support, but he was fully aware that he risked having his constituency turn on him if he continued to back Evo. There were already rumors that Jesús had been “negotiating” in La Paz during the protest because he knew something bad was going to happen. Why else, people whispered, would he have been released so quickly from prison, when so many were still languishing there?

The future of the mining cooperatives would be decided by the new FENCOMIN. Since all the members of the past FENCOMIN had been thrown in jail, the cooperative miners had been “beheaded,” as one miner framed it. A national congress of cooperative miners was hastily organized in Cochabamba, a relatively central city from both highland and lowland areas. To my surprise, Jesús invited me to attend. One of the other leaders fashioned me a credential – a stamped piece of paper

that certified my connection to the federation, which I wore around my neck – and instructed me to sit *only* with miners from Northern Potosí, who would look out for me in case I had any trouble.

The event was held over two days, Sept 28-29, 2016, and it was a site to behold. The newspapers reported an attendance of 2500 miners, but I would have put the number higher. Each of the 12 regional cooperative mining federations had sent a delegation of at least several hundred miners, and we all crowded shoulder-to-shoulder on the cement bleachers of an indoor stadium. Teenaged girls selling drinks and snacks made a killing walking up and down the aisles, peanut shells littered the floor, and polaroid photographers hawked their services to groups of miners looking for souvenirs of the trip. The place had a strangely festive feeling, despite the grim circumstances of the meeting.

The “election” process for the new FENCOMIN was complicated. As explained in earlier chapters, mining cooperatives have three political levels: one national federation (FENCOMIN), 12 regional federations (FERECOMINORPO in Norte Potosí), and some 2000 mining cooperatives, each of which has its own set of legal personnel. In choosing the new FENCOMIN directorate, every cooperative across the country could put forward one representative, and each regional federation would then choose one or two of these representatives to become official candidates. Finally, the presidents of the regional federations would lock themselves in a private room for the duration of the national congress to fight over which posts their candidates would have in FENCOMIN.

But this national congress had been put together quickly, and in Norte Potosí there had not been time for an *ampliado* to select regional candidates before leaving. Thus it was that in the morning of the first day of the congress, everyone from Norte Potosí gathered in the shade of a semi-constructed building to figure it out. In theory, each candidate would make a speech, and everyone would vote based on which candidate was most compelling. In practice, it was a battle between two powerful cooperatives in Norte Potosí, Siglo XX and 20 de Octubre. Siglo XX insisted that they were the largest cooperative and deserved the spot, while 20 de Octubre kept making the point that it was their turn (“nos toca”). The candidates themselves hardly spoke, and no one took candidates from any of the other cooperatives seriously. In the end, the candidate from 20 de Octubre won on the logic of turn-taking, much to the disappointment of my friend Rosalia, who grumbled that Siglo XX contributed more financially and therefore deserved more political representation.

On the second day, all the miners were divided into interest groups, with representatives from each regional federation attending each group: healthcare, economic production, sports and culture, and so on. I joined the juridical discussion, which is where the tensions surrounding the future political trajectory of mining cooperatives and the MAS were condensing. I sat next to Marcos, an older cooperative miner whose underground work area I had visited on several occasions, and he filled me in on the details of the conversations while we shared a bag of coca. The miners were discussing how they should go about getting their imprisoned companions out of jail: what legal paths were open to them? The young lawyers they had hired from Oruro did not have a clear answer to that question, so the miners agreed that the least they could do was require a monthly solidarity donation of 10Bs (about \$1.50) from every cooperative miner to support the families of those who were imprisoned.

One of the lawyers stood up to explain the nuances of the five decrees that Evo had announced on the 1st of the month. The first decree was the most roundly rejected – the prohibition of dynamite in political protests. Everyone agreed that dynamite was an historically symbolic weapon, since it had been useful in demands for rights and democracy throughout the 20<sup>th</sup> century. The other decrees were more complicated, and the lawyer kept repeating that they needed to make the case to the government that these laws would “asphyxiate the cooperative system.”

Suddenly Fidel – whom I had not noticed in the crowd – stood up and started re-explaining the decrees article by article, from the perspective of a member of the legislative assembly. But before he could get through the first decree, a younger miner stood up and shouted that Fidel had no place to right to talk, given how useless he had been during the conflict: “*Usted es del sistema y debería llegar*

*aquí con una propuesta, pero no...* (You are from the system and should have come here with a proposal, but you didn't)." Another miner yelled that Fidel was not even wearing his helmet, an important mining symbol that was technically required at all cooperative mining meetings. His bare head showed how far removed he was from cooperative concerns. The floodgates had opened. Everyone began yelling at Fidel, who scrambled to find his helmet and protested that he was one of only three people representing mining cooperatives in a parliament of 130 – he could not exert *that* much influence in the lawmaking process (Figure 35). No one wanted to hear his excuses, however, and he was forced to sit back down.



Figure 35: Fidel (center) at the congress, after finding his helmet. Cochabamba, September 29, 2016.

By the end of the second day, the stadium was growing restless, anxious to hear who would compose the new FENCOMIN. “*Ya está cocinado todo* (everything is already cooked),” Marcos had been telling me confidently for hours. “Now we just have to wait.” When the announcement finally began, everyone leaned forward in the bleachers. The speaker began at the bottom of the directorate hierarchy - the surveillance committee, the representative of sports – and worked his way up, getting each regional federation to “vote” by roaring “*aprobado!* (approved!)” after he announced the pick. Norte Potosí did only marginally well, with its first candidate landing as Treasurer and its second as the Representative for the Short-Term Social Sector, which essentially deals with healthcare for miners.

The presidency went to David Morejón from the federation Sur Atocha, in southern Potosí. If not a surprise, exactly, a lot of people in the room had strong feelings about it. Much as the cooperative Siglo XX normally dominates FERECOMINORPO because it is the largest, the regional federation Potosí – based in the city of Potosí – normally dominates FENCOMIN. Potosí always seems to get the presidency. But their reputation had recently been tarnished: several exposés in the Cerro Rico of Potosí had revealed thousands of poorly-paid laborers, including many children, working on behalf of cooperative miners who never themselves did any manual labor (Markisz 2014; Schipani 2008; Escobar de Pabón 2016; Nogales Vera 2009). The imprisoned former head of

FENCOMIN, Carlos Mamani, had been from Potosí, and many miners suspected that he had ordered the whole roadblock in Panduro just to protect cooperatives in Potosí from being further pressured to conform to the labor laws.

But the miners of Potosí were not accepting the overthrow of their dynasty so easily. Upon hearing the announcement that the presidency had gone to Sur Atocha, the miners from Potosí started storming down the stadium bleachers and into the center of the stadium. They likely also realized, as I did, that the only representative they had managed to put in office was the Representative of Women, who was rarely involved in any real decision-making – they had been punished by having their representation feminized. As they descended from the bleachers, miners in the other regional federations hurled insults at them, calling them *patrones*, the word that is frequently leveled at cooperative miners as a whole. In return, the miners from Potosí began throwing plastic bottles up into the bleachers. These were thrown back at them, accompanied by a glass bottle that shattered across the floor. Miners from Sur Atocha began to climb down into the ring, and I readied myself to make a dash to door if a fight broke out, but the Potosinos seemed to realize they were outnumbered and withdrew angrily.

The selection of Morejón from Sur Atocha, a region with a reputation for having mining cooperatives that are more legitimately “cooperative” than most, was a signal that FENCOMIN would be seeking reconciliation with the MAS government in the coming months. Sitting next to me, my friend Choco nodded his head in satisfaction that the Potosí reign was over: “*Ya no queremos patrones. Por culpa de ellos somos maltratados, malvistos.* (We don’t want bosses anymore. It’s their fault that we are poorly treated, poorly understood.)”

The figure of the *patrón* (boss, but also “patron” in the sense of patronage-clientelism) is key for understanding mining cooperatives. Choco was right that cooperative miners are often perceived as *patrones* in that some of them – particularly those from the city of Potosí – make others work on their behalves, usually for pittance. On the other hand, cooperative miners imagine themselves as uniquely free of *patrones*: unlike their fathers and grandfathers, who worked for and struggled against a company, they work only for themselves. Where this affirmation slips, however, is in their relationship to the state, and particularly the MAS government. Their reliance on the generosity of the state, which is their landlord (owner of the subsoil), their financier, *and* their regulator is a constantly grinding source of irritation. In this sense, the state is patron.

Miners often speak of Evo in familial terms – *papá Evo, hermano Evo, compañero Evo* – which invokes the widespread practice of *compadrazgo* (godparenting to create extended kinship networks). Many a foreign researcher has gained “access” to communities through such relationships, which usually involve exchanges of gifts or money. This practice has a colonial history, since it was how *hacendados* assured the loyalty of their workers, by suggesting that everyone was part of one big family of which the *hacendado* was the father. As with biological kin, these customary relationships are often charged with both affection and resentment. For cooperative miners, the tension between dependence and frustration with that dependence were on display in the seemingly contradictory moments of cooperative miners rejecting Fidel as a traitor and deciding to build a new FENCOMIN more closely reflecting “desirable” cooperative qualities, as dictated by the state. This tension is a slow pressure that builds and slowly shapes – or deforms – the plans of both parents and children.

## Stifled Beginnings

In early January 2017, I returned to Llallagua for the first time in a month and found that no one was picking up their phones. I walked up the hill to FERECOMINORPO’s offices, hoping to touch base with Jesús and see how the situation with the imprisoned miners was unfolding. A small film crew was standing outside the office, also waiting for Jesús to show up. Fermín, one of the other

members of the directorate, pulled me aside to say that they were having a “small problem” in the federation: the week beforehand, 60 or 70 miners armed with dynamite, all members of the cooperative Siglo XX, had attempted to take over the federation offices by force. They were upset, Fermín told me under his breath, because they thought Jesús was taking advantage of his position as president of the federation to jump ships in the government. Jesús had been promised a position in a national ministry – Fermín didn’t know which one – provided that he was able to pacify the miners in his federation who were still furious with the MAS government.

Jesús arrived and spoke with the reporter while Fermín and I peeked out the door. Jesús emphasized repeatedly that the protesters had not been leaders, by which he meant that they were not representing a larger group of malcontents. They were just a group of individuals who met underground, riled each other up, and came straight from the mines to the offices, still covered in the dirt.

After the interview, Jesús came into the office and flung himself in a red plastic chair, shaking his head and saying that the miners *de base* (rank-and-file) just didn’t understand why he and the other regional federation leaders had to grovel to the government. As a leader, he said, he knew that the only way to get his people out of prison was to make amends with the state. “These protestors think that we can get our imprisoned people out by pushing, by threatening, but they are just breaking up our solidarity. When we were in Cochabamba at the congress, we came out with three resolutions: to fight for justice for the imprisoned, the injured, and the dead. But all of these resolutions depend on the legal issue. We can’t advance if we don’t take the right steps.” He did not mention his own potential move into the ministry, and I did not ask.

I got the full story a few weeks later at a the 30<sup>th</sup> anniversary party of the one of the smaller mining cooperatives, Carmen. Jesús had taken the opportunity to show up and give a rousing speech about the need for cooperative miners to stick together and make amends with the state, even if it felt uncomfortable. Over beers during the afterparty, he began telling me about his plans for the future. It was clear that his presidential term in FERECOMINORPO was not going as well as he had envisioned it when I had first met him, nearly a year beforehand. Both of his deals with private companies had fallen through: the Chinese company turned out to be mostly interested in selling machinery to the cooperative, and the deal with the Brazilian company was foiled because the new Mining Law required them to involve COMIBOL, and COMIBOL had demanded 55% of the profits. “We wouldn’t have made any profit for seven years,” Jesús said, rubbing his eyes, “so we broke off the deal.”

Then he grinned and leaned in close to tell me that he was definitely headed to La Paz to become a Vice Minister within the next year – although he, like Fermín, wasn’t sure which ministry. He whispered that Evo had personally promised him a position. Then he added that he was headed to La Paz the following day to celebrate the culmination of Evo’s 11<sup>th</sup> year in office, and invited me to come along. I made the mistake of agreeing before learning that we would be leaving at 4am – in less than five hours’ time. Jesús promised to call me at 3:30am to wake me up, and I fell asleep that night hoping that he would sleep through his promise as he had done the year beforehand during Carnival.

Unfortunately, he followed through. The van that was waiting for me in the street was full of new faces, which surprised me since I thought I was joining a group of miners. Not so: I had inadvertently agreed to accompany Llalagua’s most strident MAS party members to the city. Other than me, there were three women – one middle aged school teacher and two young university students – and three men - Jesús, his teenaged son, and Lucho, a round man in his late 40s who turned out to be the leader of the local MAS chapter. Before entering politics, he had worked with Jesús underground for years as part of the cooperative Siglo XX.

The trip to La Paz took seven hours rather than the usual four, since the van we were driving blew two tires so early in the morning that we were unable to find any mechanics to help us patch them. We waded down buses and eventually made it to the city, where we expected to be late for the celebratory parade. Instead, we waited shoulder-to-shoulder in a seething mass of parade participants for four hours before the event began. Packed so tightly together that we could not turn around and speak to one another, we entertained ourselves by listening to Evo Morales's speech on someone's cell phone radio. The parade would start when Morales had finished talking, and it seemed that Morales was in no hurry. The sun slowly ascended over the tops of the tall buildings and began scorching us from above. At 3700 meters above sea level, the midday sun is ruthless. Rivulets of sweat ran down everyone's cheeks, since no one could move their arms to shed layers, and still Morales kept speaking.

When it was finally time to march, Lucho yelled at me to grab the other end of a banner that we unfurled as we went. The march, I was shocked to discover, was only one lap around the Plaza Murillo, where the presidential palace sits, and we were finished in less than ten minutes. Indeed, it felt like we were marching *for* the president, who stood on a raised platform in front of the palace. But of course, there were also several cameras trained on our brief procession, broadcasting it on national and international news; the march did not actually have to be long, since its purpose was just to fill the plaza and a singular public eye. As Lucho and Jesús excitedly told the others that they had seen Morales pointing specifically at *me*, the one gringa in the parade, I had the sickening realization that Jesús had invited me along as part of the spectacle, a way to make Llallagua's small contingent stand out as a particularly devout municipality. "[A]ctors on all sides of the Bolivian political spectrum use their bodies and charged symbols of indigeneity, history, and the nation in public performance," writes Nancy Postero (2017, p.19). Morales's government has proven particularly adept at mobilizing symbolic power in public spectacles to solidify his own place as rightful leader. Our march was technically to honor the "Day of the Plurinational State" – January 21<sup>st</sup>, a national holiday since 2009 – but the fact that January 21<sup>st</sup> was *also* the day that Morales was first sworn into office in 2006 creates a strange conflation between ritual celebration of the plurinational state and ritual celebration of *him*, Evo Morales, the embodiment of plurinationalism.

And yet: participation in these events is not without its own material reward. We did not spend seven hours in transit and four hours sardined into a parade corral just to celebrate Morales's ongoing reign. Jesús made no effort to disguise his own interest in getting into the President's good graces, and I knew that the Llallagua MAS party's funding was contingent on its participation in these events. The formation of the state through spectacle also relied on the charged material exchanges of much older patronage networks.

Jesús, however, never received his just reward. He held on to his position in FERECOMINORPO for as long as possible, eventually relinquishing it in June 2017. When I saw him after that, he made no mention of the vice minister position, and instead invited me to follow him around from event to event in Llallagua and Uncía where – to quote a friend – he was still pretending to be a leader. If he had not happened to be the head of FERECOMINORPO during the crucial 2016 protest, it is likely that he would be a leader still. Just as Fidel had jumped from the regional federation to parliament, other past presidents of FERECOMINORPO included Llallagua's current mayor, former senators, and former leaders of FENCOMIN. But Jesús was marked. Because he was a leader during the 2016 protests, it seemed unlikely that Morales would ever invite him to occupy a position of power in La Paz, and since he had tried to reconcile with the MAS after the 2016 protests, it was unlikely that regional miners would ever again elect him to a local position of power. He fell through the fault line of the mining cooperatives' strained relationship with the state.

## Conclusion

In March 2016, I sat down in the offices of Llallagua's Catholic radio station, Radio Pio XII, with Padre Roberto, an American priest who has been living in Llallagua since the 1960s. He has grown old as the only gringo in town: what remains of his hair is white, and his voice is permanently raspy. Although he is still a formidable presence, both because of his height and his general air of authority, he is also growing delicate, and has started wintering in temperate Cochabamba rather than withstanding Llallagua's freezing temperatures.

Padre Roberto was a strong ally of the miners' unions when they still existed, and he subsequently allied himself with the *ayllus*. He explained to me that he believed that the *ayllus* should own the mines, since they are situated within ancestral territory, and that the government should help the *ayllus* establish what would eventually become auto-governing extraction companies. This opinion is unpopular with both the cooperative miners and the Morales government: the latter denounced Padre Roberto on the radio, and the former detonated dynamite outside the radio station's door. Disgusted by both of these reactions, Padre Roberto developed his own theory about the relationship between mining cooperatives and the state:

The State became a good father and gave them machinery, loans, etc. When the government of Evo Morales comes in, [the cooperatives] ally politically to get things, not because they have the same ideology. As Evo Morales is also a good father, they support him, but that will last only as long as the government complies, if not they will withdraw support.

Like others who analyze mining cooperatives, the picture that Padre Roberto is painting is about patronage and clientelism, an exchange of gifts for votes. But his version of clientelism is couched within a broader understanding of the affective bonds that tie cooperative miners to the state. According to him, the state is like a capricious father who had abandoned his children (by closing down the mines) but who still returned occasionally to bestow gifts and assert his presence. This interpretation resonates with the miners' self-descriptions as the *hijos mendigos* (beggar children) of the state, while the workers of the nearby state-owned tin mine Huanuni are the *hijos mimados* (spoiled children). The state is *padre* and *patrón*, words that share the same Latin root for "father," and the state elicits the ambivalent sentiments of familial care: domination and security, dependence and benevolence, obligation and inheritance. Patronage depends on such emotional attachments as much as it does on material rewards.

But, as I have shown in this chapter, the current situation for cooperative miners is even more complicated than Padre Roberto's affective framing would suggest. The movement of individual miners into positions of power within the state has blurred the lines between state and society, as well as between patron and client. The domestic evacuation of NGOs and international aid organizations, moreover, have made the state the only possible patron around. The closer connection between mining cooperatives and the Plurinational State has permitted the flow of resources towards the miners, but it has also constrained their political agency. Similarly, cooperative miners' votes (and their ability to rally other votes) has helped Morales sail to power in three national elections, but their participation in legal processes has transformed the state from within. These processes of slow mutual transformation through material gifts, threats of violence, and quotidian parliamentary processes comprise what I call "everyday state deformation." Moments of political eruption, such as the murder of Rodolfo Illanes, occur when the pressures of deformation have become too great, but they are not as important to the story of cooperative-state relations as the more subtle interactions between individual miners, their collectives, and the multiple levels of state authority with which they interact.



Most of the stories I relayed in this chapter took place on the surface, whether in coliseums or offices or city plazas, but the subterranean worlds I described in chapters 1-4 remain crucially important. The subterranean technically belongs to all Bolivians but is held in trust by the state; to extend Padre Roberto's metaphor, this is the inheritance that will never be fully relinquished. Access to the subsoil, or the right to transform its depths into money, is awarded to loyal children, but it can be easily withdrawn in times of political strife. Less directly, all of the gifts that the state bestows upon the mining cooperatives – trucks, electrical generators, processing plants – are paid for by rents procured in Bolivia's natural gas fields, located primarily in the departments of Santa Cruz and Tarija. The state thus not only threatens cooperative miners with withdrawn subterranean access rights, but also coaxes them with subterranean rents siphoned from elsewhere in the country.

Even more importantly, the cooperative miners who are coming to shape the state have been formed in relation to the material reality of the underground. The strata through which they navigated and the tin they concentrated are historically enmeshed with imperial science, colonial labor arrangements, and global economies. These histories and their material legacies continue to shape the miners who labor within and around the mines. Mining cooperatives are internally organized in structures derived from both unions and agrarian ayllus, but in interaction with the meanings and materiality of the underground, these structures have developed new fractures. Divisions along lines of gender, race, and class chart material variations in ore composition inside and outside the mountain. The leaders who rise to the surface, who appear at the highest levels of government- such as Fidel and Jesús - are those who have benefited most from such geo-spatial histories. As these miners bring their subterranean experiences to bear on policy-making decisions, they remake the state in their own image.

## Conclusion

# BELTS

## Vertical Geopolitics

*Geo-politics is a flat discourse.*  
- Eyal Weizman, 2002<sup>34</sup>

### Return to the Rocks

During my time in Bolivia, I amassed a small collection of rocks that were gifted to me by cooperative miners. Lined up on my desk, they remind me of the people who passed them along. Some are dark black with an oily sheen, some are gray with a brownish mottling, and the most beautiful one has dozens of clear quartz cylinders emerging vertically from the rock's tin-sprinkled base.

In Bolivia, it is common to find such rocks adorning the tables and shelves of cooperative miners at home and in their offices. My friend Rosalia keeps hers in a cabinet otherwise reserved for fine china, though she took a couple out to show me when I visited her. In their craggy cavities, I noticed a couple of dots of *mistura* still clinging (Figure 36). More than samples of economic potential, these rocks were personally meaningful to her, and she regularly blessed them with beer and confetti to ensure the ongoing productivity of the mine from which they came.



Figure 36: Rosalia's tin. Purple *mistura* visible in the rock on the left. Llallagua, 23 July 2014.

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<sup>34</sup> [https://www.opendemocracy.net/en/article\\_631jsp/](https://www.opendemocracy.net/en/article_631jsp/)

These material objects, conglomerates of sedimentary and igneous rocks, cracked loose from their surroundings with pickaxes and dynamite, are valuable to Rosalia even though they will never be delivered to the market as commodities. She extracted them herself from the vein she uncovered in her early days laboring underground, when she was particularly eager to prove that women did not cause veins to *despintar* (literally ‘unpaint,’ or disappear). Tin from that vein allowed her to feed her six children and support her husband while he was hospitalized, but it also earned her the respect of her male *compañeros*. Men joined her *cuadrilla*, but she was in charge because it was her vein: she had discovered it and labored in it first. She learned to handle a drill and ascended a geosocial hierarchy that does not usually privilege women workers. These rocks made her who she is today, and she regularly honors that relationship.

Rosalia’s rocks are powerful reminders that matter is more than it appears. My objective in this dissertation has been to trace the co-constitution of key political economic concepts and the material objects to which they refer in the Bolivian tin mines: resource and strata, property and mountain, commodity and tin, and value and machine. Apparently inanimate geological matter emerges within regimes of power that configure it as natural resource and national patrimony, but it is always more than that. The processes involved in extracting those crystals of tin from their surroundings, in measuring and naming them, also mark the bodies of those who perform the tasks, ordering them along lines of race and gender while also shaping their individual and collective desires for the future. The miners’ internal social divisions are shaped by the rocks with which they work, while the rocks are in turn transformed by the miners’ labors. The products of labor – miners and metals – are usually interpreted within political economic categories of analysis that disguise much older colonial and pre-colonial histories, including scientific and local knowledge production. The historical excesses contained in words such as resource, consciousness, and value cannot stretch to accommodate the palimpsest of meanings preserved in Rosalia’s cupboard.

Empirically, the purpose of this dissertation has been to understand how mining cooperatives have been configured as thieves of national resource wealth and how they have come to shape the Plurinational State and particularly its extractive agenda. These empirical questions were grounded in the Bolivian political present, in which the nation-state has been constitutionally reconfigured to assure the participation of multiple Indigenous groups. The state is now supposed to articulate multiple nations – many of which have or are trying to obtain collective land titles - while remaining the sole arbiter of the subsoil, which it holds on behalf of all Bolivian citizens. I argued that the political economic analysis to which the mining sector in Bolivia is usually subjected is necessary but insufficient to understand the multiple articulations of labor history, Indigenous politics, and material conditions within which cooperative miners relate to state and nation. Through a study centering the material objects of the mining cooperatives’ worlds, I showed how the subterranean was constituted as a state-owned space whose material remains shape the internal hierarchies, bodies, and political goals of cooperative miners in ways that reverberate in contemporary national politics. This argument was presented in three moves: the historical constitution of the national subsoil, the historical and contemporary formation of mining cooperatives in Norte Potosí, and the contemporary relationship between cooperative miners and the Plurinational State.

In Chapter 1, I showed how the subsoil has been historically constructed as a state-owned space through scientific and literary production. Geological strata of the subterranean were rendered a universal scientific object, devoid of life, culture, and other local particularities. This deep colonization, the production of what might be thought of as *sub-terra nullius*, epistemologically cleared the Bolivian underground of Indigenous influences. The anti-Indigenous racism that undergirded this project of knowledge production has been folded into contemporary Bolivian resource nationalism, where it places a vertical limit on Indigenous autonomy. This genealogy charts how the subterranean

was constituted as national patrimony, a treasure chest of resources to be equitably distributed by a principled state.

Chapters 2-4 worked with ethnographic and historical material to analyze the geosocial formation of contemporary tin mining cooperatives in Llallagua and Uncía, in the region of Norte Potosí. In Chapter 2, I showed how regional mining cooperatives were formed as a class. I argued that mining cooperatives emerged from the contact zone between unions and *ayllus*, a contact zone that was located deep in the Juan del Valle mountain. The material qualities of the mountain's interior space, which is geologically and socially uneven, informed how divisions of space and labor specific to unions and *ayllus* were adapted to the mining cooperatives. Although I argued that cooperative mining looks more like 'vertical farming' than individual entrepreneurialism, the material reality of the subterranean has complicated the equality-oriented practices of traditional ayllu farming. In Chapter 3, I moved from mining cooperatives as a class to consider the production of individual consciousness in relation to the material qualities and economic histories of tin. Centering the labor of individual miners as they transform the earth into a commodity ready for the market, I argued the miners' individual bodies and body politic have been shaped by the metallurgical and mineralogical qualities of tin ore. Continuing the themes of Chapter 2, I focused on social differentiation as it emerges through individual contact with tin, considering how chemical burns and black lungs are constitutive of racialized and gendered difference.

Finally, in Chapter 4 I explored the relationship between waste and value through a study of cooperative miners' identifications with machinery. The landscapes of Llallagua and Uncía are dotted with dilapidated machines that stir miners' nostalgia and desire for the industrial futures that they once believed they were building. They invest hope in machines, both the ones they have and the ones they hope to acquire, because they believe that the right technology could reactivate the wasted remains of the mine. In these ways, I argued, real and imagined machinery encourages cooperative miners to keep mining despite the lack of remuneration and the physically harmful work conditions. Machines are as constitutive of the cooperative miners' senses of value as the geological formations of the earth. In the fifth and final chapter, I showed how cooperative miners emerging from within this geosocial formation have made use of the formal channels opened within the Plurinational State to attempt to turn their political goals into realities, and how they have been both supported and stifled in these attempts. Following the conjoined stories of Fidel and Jesús, I argued that structure of the Plurinational State has transformed rather than undone older relations of clientelism and patronage.

Overall, in this dissertation I traced a loop in which state-supported subjects produced a subterranean world that shapes the cooperative miners who are today deforming the vision of state plurinationalism. All of this analysis has remained in the sphere of the Bolivian nation state, but the political economic concepts I have been tracing are constituted by relations that extend well beyond national borders. Some of these are historical, such as the connections between Bolivia's tin belt, rapid industrialization in Europe, and the demand for tinned food during the world wars. But others are contemporary, and they connect global tin belts in a way that many would argue is a new round of imperialism. Cooperative miners are at the center of this material storm.

## **A New Imperialism?**

If you were to stick an exceptionally long needle through the planet beginning in Llallagua and Uncía, it would appear on the other side in the contested waters of the South China Sea, off the coast of Vietnam. Geologically improbable as it may seem, this is right in the middle of the world's *other* major tin belt, which runs from southwest China (Yunnan province) through Malaysia and Indonesia. Since the exhaustion of the Cornwall tin mines, most of the world's tin has been supplied by these two belts and one more that runs through the Democratic Republic of Congo and Nigeria. Yunnan's

tin is present in lode formations very similar to those of Bolivia, and three Yunnan-based companies are in the top ten producers of refined tin in the world (Yunnan Tin, #1, and Yunnan Chengfeng, #4, and Gejiu Zi Li, #10) (ITA, 2017). Bolivia's state-owned Vinto Corporation, which processes tin from both the state-owned mine Huanuni and the myriad of nearby tin cooperatives, is #6 on the same list.

In late 2016, articles began appearing in Bolivian newspapers denouncing the presence of tin mining cooperatives operating illicitly in Mount Illimani, an iconic mountain just outside of La Paz whose glacier melt feeds rural irrigation and urban water supply systems. Since 2012, Mount Illimani has been considered "Natural Patrimony of the Plurinational State of Bolivia" (Law 302), but that does not necessarily preclude mining activities. What really incensed readers, however, was the fact that several of these mining cooperatives were operating in full or partial partnership with private companies that could be traced back to parent companies in Yunnan, China. It was a sensible deal: access to mining concessions in exchange for capital investment and new equipment. But to the public, it looked like the Chinese companies had bypassed the nation-state to work with the cooperative miners, private profiteers who lacked interest in national patrimony. China and the mining cooperatives had locked hands across two tin belts to steal Bolivia's national patrimony right out from under them.

Does it matter that the new imperial power is Asian rather than Euro-American? According to most Bolivian political economists, it does not matter at all: imperialism is imperialism. But in a country where national history is almost always recounted as an encounter between Indigenous Andeans and white Spaniards – which tends to erase lowland Indigenous peoples, Afro-Bolivians, and the many descendants from Asian, Middle Eastern, and Eastern European countries, amongst others – this is actually a significant historical break. Although everyday encounters with Chinese culture is often limited to the local *chifa* (Chinese food restaurant – from the Mandarin for "eat rice," *chī mǐfàn*), Bolivians are acutely aware of the new importance China has for their economy. Aymara merchant families, famous for their ingenious maneuvering of merchandise across oceans and international borders, are responsible for exporting massive quantities of goods from China to Bolivia (Tassi 2017, Colloredo-Mansfield 2018, Müller and Colloredo-Mansfield 2018), and the line outside the Chinese embassy in La Paz always stretches around the block. This is not necessarily new, but it has a new visibility. And this visibility has been accompanied by more audible anti-Chinese racism, apparent in news stories about the 'bad customs' coming with Chinese immigrants, which range from moral panic about eating dogs to denunciations of theft of endangered species. Orientalist discourse framing Chinese businesspeople as sneaky and greedy intersects with and amplifies existing concerns about imperialism. Again, political economic relations are made and unmade along vectors that connect nature and nation, always tangled with race and gender.

It also makes a difference that mining cooperatives are such small fry compared to the national bourgeoisie of centuries past. Where does one draw the line between duplicitous national bourgeoisie and community resource autonomy? This question is particularly salient in the tin mining sector. According to the International Tin Association, 97% of tin is mined in "emerging and developing countries," around 40% of which has its origins in small-scale or artisanal mining.<sup>35</sup> In most of these contexts, small-scale mining is informal and often illegal; alluvial deposits in Malaysia, Indonesia, and the DRC make the metal relatively accessible to small and surface-level operations. Although Bolivia's cooperative mining sector is officially sanctioned, it is still morally opposed by the majority of Bolivians, who see their history in this rag-tag future.

Since I completed the majority of my fieldwork in Bolivia, the relationship between mining cooperatives and the Bolivian state has grown increasingly opaque, leaving more room for such international liaisons. In October 2018, FENCOMIN announced that it would moving away from

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<sup>35</sup> <https://www.internationaltin.org/artisanal-small-scale-mining/>

Morales and the MAS, and that it would not be offering any support for Morales's 2019 campaign. This proved the right threat to make. On the 21<sup>st</sup> of December, Morales passed a new law that brought into effect a "special relationship" between mining cooperatives and the state (Law 1140, Article 1). It created a unique contract – a cooperative mining contract – that is not held to the same standards of scrutiny as contracts with private companies. Morales announced that this law would help "visibilize" cooperative miners, which "today have both name and surname."<sup>36</sup> This statement could have passed as a threat given concurrent problems happening between the tin mines of Llallagua and Huanuni. A raft of *jukus* (thieves) – underemployed cooperative miners from Llallagua who can no longer make a living in the exhausted mineshafts – have started raiding the tunnels of Huanuni, the state-owned tin mine located just 30 minutes down the highway. Entering at night, they are taking *patrimonio* into their own hands, quite literally. On March 12, 2019, a nighttime cave-in in Huanuni killed four *jukus* from Llallagua, prompting an investigation that revealed 24 bands of *jukus* working Huanuni and selling their mineral as if it were extracted from Llallagua. In early April, 18 *jukus* were arrested, all men between the ages of 19 and 33 (Valdés, April 3 2019). Their first and last names were all recorded in the newspaper, and I doubt they appreciated this "visibilization."

Regardless of whether or not it was originally stolen, cooperative tin miners usually sell their ore to one of two smelters: OMSA, which is privately owned, and Vinto, which is state-owned. Both are in Oruro, and both ship the smelted products to the Chilean coast for further shipment around the world. No one at either Vinto or OMSA seemed exactly sure of where the metal went once it was on the coast, but they all agreed that most of it was likely headed to China, which is by far the world's greatest consumer of tin. Although tin is no longer the "strategic metal" that it was in the early 20<sup>th</sup> century, given that most tin cans and tin foil have been replaced by tin-plated steel and aluminum, demand for tin has been steadily growing over the last 15 years. First, tin is the primary ingredient in solder, a ubiquitous substance in electronic production; it is the glue that holds everything else together. Historically, solder has been an alloy of approximately 63% tin and 37% lead, but since the European Union passed the Restriction of Hazardous Substances directive in 2006, lead has been banned from electronics sold in Europe. In response, solder used in the manufacture of most electronics, even those destined for other markets, is now about 96% tin, 4% silver, and 1% copper (Black 2005). China, which is far and away the world's primary electronic producer, purchases most of this tin. Second, the expected growth of the electronic vehicle market and, with it, the market for lithium-ion batteries, will likely have a knock-on effect for tin, which researchers are finding makes a better anode than the traditional graphite. This means that, like ores such as indium, cobalt, and lithium, demand for tin will grow as the world shifts away from a fossil fuel-based economy. Again, China will likely be the main consumer of this tin. Stolen earth, "washed" through legal cooperatives, lining the circuitry of laptops and cell phones.

The intimate tangles between imperial theft, gender, and race condensed around the Gabriela Zapata scandal that rocked Morales's 2016 referendum, which would have allowed him to run again for president in 2019. As I discussed in Chapter 5, in the weeks leading up to the referendum it was leaked that Morales had had an affair with a young Bolivian lobbyist working for CAMC, a Chinese construction company. Allegedly, she began dating Morales prior to his first election in 2005, gave birth to their child in 2007, and began working for CAMC in 2013. Part of the scandal revolved around the personal relationship, but the other part was the possibility of a conflict of interests. CAMC was awarded seven construction contracts while Zapata was working there, only one of which was funded by a Chinese bank (which required, by contract, a Chinese construction company). The rest were all funded by the Bolivian government (Vaca Villa 2019). Six of the projects were connected to natural resources: drills for YPFB, the state natural gas company; a sugar processing plant; three projects for

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<sup>36</sup> [http://www.la-razon.com/economia/morales-ley-trato-especial-cooperativas-mineras-bolivia\\_0\\_3060893925.html](http://www.la-razon.com/economia/morales-ley-trato-especial-cooperativas-mineras-bolivia_0_3060893925.html)

the Misicuni dam in Cochabamba, and a plant to process potassium salts. Bolivians were livid. Although the accusation of “peddling political interests” was never substantiated in court, the scandal nevertheless opened up a larger question about Chinese involvement in Bolivian political futures.

### **Andean Futures in Vertical Space**

In 2013, Bolivia launched its first satellite. More precisely, this satellite was launched from the Xichang Satellite Launch Center in Sichuan, China, after having been built by the China Great Wall Industries Corporation (CGWIC). It is now managed by Bolivian engineers, trained in China, who work in the Bolivian Space Agency’s offices located in El Alto and Santa Cruz. The goal of the satellite was to provide telecommunication services – cellular, internet, cable TV – to Bolivia’s rural and relatively isolated communities. While fiber cables and other ground-based communications systems are more reliable, they are expensive to install in mountainous areas like the Andes; as a land-locked country, moreover, Bolivia cannot easily access coastal internet transmissions from submarine cables.

The satellite was named after Túpak Katari<sup>37</sup>, an 18<sup>th</sup> century Aymara rebel who led an army of more than 40,000 that laid a six-month siege to the city of La Paz. When colonial officials finally captured Katari, he was gruesomely drawn and quartered by four draft horses (Thomson 2002). This execution was meant to dispel rumors that he might be resurrected, given still-circulating stories that the body of Atahualpa, the last Incan Emperor, was regenerating underground (Postero 2007). But Katari assured his own legacy with his final words, shouted into the watching crowd: “*Volveré y seré millones!* (I will return and I will be millions).” In contemporary Bolivia, Katari has been aggressively harnessed as a symbol by the Morales state.<sup>38</sup> Advertisements and commemorative materials proclaimed that new satellite would be capable of uniting Bolivia’s “millions” with faster internet and reliable cell phone service. In Figure 37, Morales appears to be the reincarnation of Katari: their faces are featured shoulder-to-shoulder, their faces outlined in parallel strokes, their gazes both turned upward and to the right, towards a bright future. Katari is back, he is millions, and he is flying through space in the blink of an eye. With his return, Bolivia has officially entered the “space age” (*era espacial*, see Figure 38).

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<sup>37</sup> Born Julián Apasa Nina, Túpak Karati combined the names of two previous Andean revolutionaries: Túpac Amaru II (who led a concurrent uprising in Peru, and who took his own name from Túpac Amaru, the last leader of the Incan Empire, executed in 1572) and Tomás Katari (a rebel from Norte Potosí, who had been executed just years prior to Túpac Katari’s uprising). “Amaru” and “Katari” both mean snake or serpent, the former in Quechua and the latter in Aymara. “Túpac” means brilliant or shining in both languages.

<sup>38</sup> Túpac Katari also remains important for social movements of many stripes, some of which actively oppose the Morales state (Fabricant 2012, Yamamoto 2016).

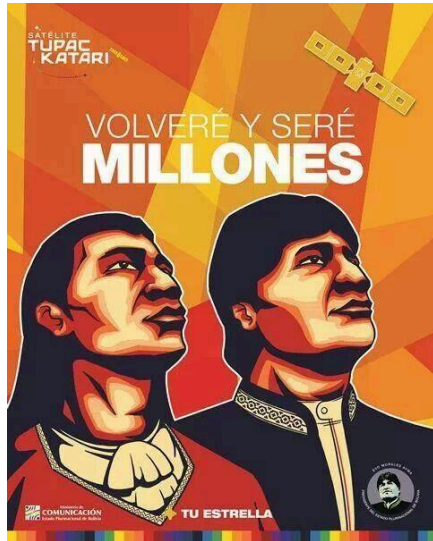


Figure 37 (left): Advertisement for the Tupac Katari Satellite. Bolivian Ministry of Communication.



Figure 38 (right): Advertisement for the Tupac Katari Satellite. Bolivian Ministry of Communication.

The notion that a particular space – outer space, beyond the earth’s atmosphere - has its own temporal era, and that this era is located in the future, continues a long tradition of associating progressive improvement with upwards movement, both metaphorically and materially. This is a movement away from the earth, from humanity’s “natural” confinement within the muck of life and death, to a world of metal and glass, a social achievement of epic proportions. Bolivia’s space age leap is spatially upwards, temporally forwards, and socially good.

In a dramatic reversal of expectations about technological-territorial expansion, however, Bolivia’s spatial journey is about “Indians” asserting sovereignty against a colonial past. Compellingly phrased in the government publication celebrating the Tupac Katari satellite:

In popular colonial thinking, still widespread in diverse sectors of the Bolivian society, it was inconceivable, and almost a hallucination, for a country of Indians governed by Indians, to have the audacity to lift their eyes to space and to the stars... In this vision, Indians should keep hoeing the earth with Egyptian ploughs and oxen, without lifting their heads nor their gaze further than the narrow limits of the peasant parcel. (Ministerio de Obras Públicas, Servicios y Vivienda, 2013: 13)

Imaging Indigeneity in the future is part of a broader revolutionary project that is a preoccupation of artists as much politicians. Although representations of the future in science fiction, in its most traditional form, has tended to reproduce a colonial gaze and narrative of intrepid journey and benevolent discovery (Rieder 2008), Indigenous artists, writers, and scholars have also pointed out that the absence of Indigenous peoples in representations of the future contributes to narratives of disappearance that serve assimilationist goals. The project of imagining Indigenous futures has captured the imaginations of multimedia artists (Lewis 2016, Igloliorte et al. 2016) and speculative fiction authors around the world (Dillon 2012, Dimaline 2017, Roanhorse 2018).

In Bolivia, the premier author of Indigenous science fiction is not herself Indigenous, but her books have nevertheless resonated with national Indigenous future-building projects. Alison Spedding, a British transplant who has been living in Bolivia since 1986, is an anthropologist and



*cocalera* (coca grower) in the Yungas, the semi-tropical region outside of La Paz. In addition to important academic analyses of coca culture and Bolivian politics (Spedding 2004a, Spedding and Llanos 1999), Spedding is also the author of several science fiction novels. *De Cuando en Cuando Saturnina* (Saturnina from Time to Time, 2004b) projects a future in which Bolivia undergoes an “Indianist revolution” and is renamed *Qullasuyu Marka* or “the Free Zone.” The only citizens allowed to travel outside of this zone are members of The Union (*El Sindicato*), a group of aerospace engineers world-famous for their technical knowledge of space travel. The two main subjects of the book, Saturnina and Fortunata, are aerospace engineers and lovers who meet in Xinjiang, China. Both dress *de polleras*, with full skirts and braided hair and both carry their gear in *q’ipis* (cloth used by Andean Indigenous women highlanders). This queer, Indigenous feminist future is one to aspire to.

Spedding’s knitting together of Indigenous nationalism, space travel and technology, and even the central link to China is all strangely parallel to real-life events that have happened in Bolivia since the book’s publication in 2004. But the differences between Spedding’s narrative and the real-life version also cast the shortcomings of the latter into sharp relief. Acknowledging the dangers of holding reality up to a fictional standard, Spedding’s story highlights the masculinist, state-centric qualities of Bolivia’s actual leap into the space age. The calculation that equates Evo Morales’s living body with Tupak Katari’s quartered body and Bolivia’s national body thoroughly reifies hetero-patriarchal traditions of sovereignty and statehood. Although Andean oral history emphasizes that Tupak Katari’s military victories were made possible by fighting alongside his partner Bartolina Sisa, her name is notably absent from the new satellite. Even the second satellite, should Bolivia get one, will be named *Tupac Katari II*.

On the other hand, there is little discussion of either material economics or material earth in *Saturnina de Cuando en Cuando*, and both of these have been important in Bolivia’s actual leap into the ‘space age’. When it was first announced in 2013, the Túpac Katari satellite was projected to cost USD \$295,440,000, 15% of which would be financed by Bolivia’s treasury (more specifically, by rents from the nationalized natural gas sector) and the other 85% of which would be funded on credit from China’s development bank. The final price tag was close to this, just over \$300 million. In a press conference held in late 2018, the leader of the Bolivian Space Agency, Iván Zambrana, informed the public that the satellite was largely successful: internet access in the country had increased from 30% to 64% and the satellite had generated over \$100 million in profits, meaning that the debt would be completely paid off in fifteen years total (El Deber 2018). If these figures are true, then they give lie to the popular meme that circulated on Facebook during the leadup to the launch of the satellite, in which someone had given the satellite a speech bubble saying “*volveré y costaré millones* (I will return and I will cost millions).” Still, a certain anxiety about the debt remains salient, a niggling reminder of the debt crisis that forced Bolivia’s doors open for neoliberalization in 1985.

Fear of a new imperialism is widespread in Bolivia, and with good reason: the country has a long history of being tossed from one imperial power to another – Spain, England, the U.S. – like a proverbial hot potato. It is not uncommon to hear speculation that the only reason China is interested in investing in Bolivia is to maximize its access to metal ores, particularly lithium. Bolivia’s still relatively untapped lithium deposit is the largest known source in the world, a detail that Chinese investors could not have failed to notice, given the importance of lithium for electric car batteries and the increasing demand for green energy solutions (Narins 2017). The future promised by the satellite and vertical sovereignty is thus coming, from a certain perspective, at the cost of subterranean sovereignty. Debts accrue to Bolivia, and subsoil resources accrue in China, where they are turned into commodities and exported anew. Given the similarity between this future and Bolivia’s past, one can understand the concern about a new wave of imperialism. Debt is not just monetary, and the future is being paid for in more ways than one.

## *Horizontalidad* and Vertical Geopolitics

In this dissertation, I have argued that the material subterranean worlds in which cooperative miners labor shape their bodies and body politics in ways that reverberate at the national level, in both state policy and national sentiment. The material subterranean, in turn, has been shaped by a long history of both geological and social processes, the latter of which includes labor and the knowledges associated with labor, geological mapping, technological engineering, and law. All of these processes have instilled the subterranean as a place and specific ores as commodities with value. This value is more than economic, though global metal markets obviously influence it. The cooperative miners who labor in the subsoil today are driven by more than market forces: they are motivated by meanings imbued in the rocks, machines, and their own bodies, as well as by memories of future imaginaries past. The dream of economic prosperity and “progress” is never far from their thoughts, even as they themselves are dismissed by scientific experts and policymakers for their “regressive” methods of extraction and political stances.

Verticality has been a central theme in the arc of my argument. For the most part, I have used verticality in its most literal sense: the vertical depths of the earth, a spatial dimension only recently taken seriously by geographers. But this literal verticality is related to metaphorical verticality, or unequal social relations. Morales’s government is often accused of reproducing vertical relationships of power and patronage with the leaders with which the state claims to be on equal footing. Mining cooperatives, too, are accused of such metaphorical verticality; as I showed in Chapters 2 and 3, this metaphorical verticality is produced materially in vertical space. In fact, much of what this dissertation has been doing is showing how social relations produced in material vertical space shape social inequalities, which might be understood as vertical relations. Imperialism might be thought of as another kind of vertical relationship, with debt holding countries becoming patrons and paternal figures for their debtors. This is not precisely a matter of spatial scale, but rather of unequal power relations between two supposed sovereigns that confront each other as equals. As Eyal Weizman notes in the epigraph of this chapter, geopolitics is a horizontal discourse in that it imagines nation-states confronting one another as flat puzzle-pieces on the surface of the globe. The relations between these puzzle pieces, however, are usually far from horizontal.

In Latin America, the opposite of such top-down inequality is *horizontalidad*, or horizontality, a term frequently invoked by the left. As Marina Sitrin explains through her fieldwork in Argentina, horizontality

does not just imply a flat plane for organizing, or non-hierarchical relationships in which people no longer make decisions for others... *Horizontalidad* is a new way of relating, based in affective politics, and against all of the implications of “isms” (Sitrin, 2006: vi)

Visions of plurinationalism frequently invoke this political horizontality, in which multiple groups can negotiate the terms of collective life on equal footing. Indeed, the image of a horizon (*horizonte*) is often invoked to describe the plurinational project, which sets aspirational goals against which success cannot be measured (Prada 2007, Gustafson 2009a). The horizon, a future that can never be reached, is a useful metaphor not only because it is a flat, horizontal plane that conjures flat, horizontal social relations, but also because it forecloses an evaluation of ‘actually existing’ plurinationalism. Yet this metaphorical vision of horizontality has been challenged by material verticality. Geosocialities deep in the Bolivian subsoil are connected to national policymaking arenas and even other geosocialities, located on the other side of the world, where smelted metal becomes useful strips of solder and tin plating. The materially uneven worlds belowground, patterned with

hopes and dreams from previous eras, help shape the politically uneven relations of imperialism aboveground.

Geologists can read the earth's deep history in the lines and folds of the rock, and astrophysicists read an even more distant history in the movement of light through outer space. The vertical dimension, whether through rock cores or telescopes, is supposed to reveal the past. Yet in the language of miners, science fiction writers, and heads of state, the vertical dimension is bound up with visions of the future, or a vision of progressive improvement over time. In this way, the vertical dimension is the key plane on which visions of sovereignty connect ancient history to distant futures. But people who work and live along this vertical dimension, who contend most directly with the remnants of the past, including the failure of past visions of the future, are also the ones most directly involved in shaping the present. The geopolitics they enact are far from flat, in both metaphorical and literal senses. Material histories are needed to imagine new material futures.

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