Crystallizing Value: Quartz mining, crystal healing, and the energies of market making

DISSERTATION

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DOCTOR OF PHILOSOPHY

in Anthropology

by

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2018
DEDICATION

To

The men and women who risked their lives and livelihoods by allowing me to understand and tell their stories
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ABSTRACT OF THE DISSERTATION

Crystallizing Value: Quartz mining, crystal healing, and the energies of market making

By

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Professor William M. Maurer, Chair

This dissertation tracks the transformation of value as quartz crystals pass through a New Age commodity network spanning from rural Brazilian mines to crystal markets in the U.S. Southwest. The multi-sited research for this dissertation was guided by three primary goals: (1) to map the different ways that informal Brazilian miners, international wholesalers, and New Age crystal healers imagine “crystal energy;” (2) to trace how quartz crystals become spiritually, economically, and socially valuable; (3) to understand what people’s encounters with crystals might tell us about the world’s multibillion-dollar quartz crystal market and about New Age spirituality in the twenty-first century.

Drawing from classic follow-the-commodity studies, I conducted over 18 months of ethnographic research in Brazilian quartz mines, in wholesale warehouses, at the world’s largest gem and mineral shows, in U.S. retail spaces, and with crystal healers throughout California and Arizona. While value has long been theorized in terms of labor, exchange, and fetishization, this dissertation interrogates the phenomenal, performative, and semiotic processes that impact value transformation as crystals pass through each node of this commodity network.
Hedging against Marxian notions of use-value, this dissertation encourages scholars to think through how value and markets are distinctly shaped by performative, semiotic, and phenomenological processes. In doing so, it offers a way to understand other value circuits which don't seem to fit within standard accounts, such as art markets and designer goods.
Introduction: Crystallizing Value

“A commodity has a value because it is a crystallization of social labor.”
– Karl Marx (Value, Price, Profit)

On August 15, 2017, the New York Times published a story in the Fashion and Style section, “The Great Crystal Boom of 2017” positing in the lede: “How did crystals go from a New Age curiosity to ubiquitous accessory in the luxury wellness world?” This is a question that Elle, Vogue, and the LA Times had all respectively been asking in different ways in recent years.¹ The beginning of this dissertation predates the Times query’ by nearly half a decade.

On November 9th, 2012, I dropped off my car to get new tires and took a walk in a district near the airport in suburban Santa Ana, California. Strolling through the uninspired office park, I encountered a Holiday Inn with a tattered red sign vinyl sign hanging off of an entryway advertising, “Gem and Mineral Show This Weekend.” Not knowing exactly what to expect, I muttered to myself, “This ought to be interesting,” and sauntered through the hotel’s side door and down a hallway.

Each room off of the corridor had been cleared of its furniture and converted into a miniature store for the weekend’s three-day show, occupied by various pop-up stores: Dragon Minerals, Empire Gems International, Fossils Inc, Jewel Tunnel Imports, and Jim Parrish Collection. Meandering through the various rooms, I scooted past geology professors in safari gear looking as though they had come straight from an excavation; I brushed elbows with high-end mineral collectors dressed in

Figure 0.1 The unintentional fieldsite where this project was born
business casual; and I met New Age crystal healers clad in all white. In addition to these categories of rock enthusiasts, I also found myself in a sea of Orange County and Los Angeles residents who, like me, seemed to have ended up at the show by accident. In addition to the odd cast of attendees, I found myself equally awed by the thousands of rock and crystal specimens from every corner of the world.

In my second year of graduate school at the time, I was struggling with anxiety. On a whim, I Googled the phrase “best crystals for anxiety” as I shuffled down a side corridor adorned with crystals on both sides of the floor—similar to an airport runway lights—guiding me into the makeshift shop of Dynamic Energy Crystals, a company based in the Bay Area, California. The room’s modified overhead lighting was soft and calming. New Age music wafted from a wireless Bluetooth speaker set up in the corner of the room. This store, unlike most others, had photos hung on the wall of the owner posing with miners at excavation sites in Brazil. The grey-haired gentleman handling sales in the room explained to me that he travels to Brazil several times a year and has long-standing relationships with local miners and dealers. More importantly, Google had yielded thousands of hits for my anxiety query, and he had the exact amethyst and black tourmaline that I had requested.

As I left Dynamic Energy Crystal’s room and continued down the red-carpeted corridor, I was struck with by an odd sensation not unlike the ineffability and noetic qualities of mystical

![Figure 0.2 Ed at the Caba Saco site in 2002 where he was struck by the crystal energy and decided to start a business importing stones from Brazil](image)
experiences characterized by William James and others. Over the years—especially when speaking to academics—I have chosen to laugh the sensation off as being “zapped by the crystal energy,” but to this day, I have yet to come up with a fully rational explanation that accounts for both matter and mind. In that odd moment, every hair on my body stood up, I sensed the top of my head open, and my mind cleared. In these brief seconds of transcendence, one thought rang out: “I need to tell the story of how all these people and rocks ended up in this Holiday Inn.” I needed to tell the story of how these crystals became differently valuable to different people.

**TRACING THE MARKET**

I spent the weeks following this experience visiting every rock shop possible in Southern California—speaking with retailers, healers, customers, San Diego miners, and just about anyone who would talk to me about rocks. I was told repeatedly to go to Tucson, Arizona in February (2013) for the world’s largest gem and mineral show. Several months later, Liz and I flew to Tucson, posted up in an over-priced budget hotel on Freeway Avenue, and spent a few days wandering around the city and trying make sense of the show. The Tucson show is massive, consisting of 42 different shows with clustered venues sprawling across the city. We stopped first at a budget hotel along Interstate 10 on Tucson’s west side, home to at least a dozen Brazilian vendors. The second show we visited, had as many—if not more—Brazilians, and the third even more. Nearly all of these Brazilian dealers were from the interior state of Minas Gerais, a locale that at the time I had never heard of, but since has become my second home, and the primary field site for this dissertation project.

A few months later, with virtually no Portuguese language training—I boarded a flight to Belo Horizonte, Minas Gerais, Brazil to meet with a man I had purchased some stones from in Tucson. We played phone tag for weeks but never connected. Having grown somewhat restless, I
left Belo Horizonte on solo trips out to the rural gem-producing corners of Minas Gerais—a state the size of Texas, with the hilliness, social inequality, and mining significance of Kentucky.

Though at the time I was highly proficient in Spanish—which I mistakenly assumed might be good enough to help me get by in Brazil—the uniqueness of Mineiros’ accent and their limited exposure Spanish made research difficult in those first few months. “Portunõl,” as it is known, simply didn’t work there.³

During one of these solo jaunts to Diamantina—five hours from Belo Horizonte and deep into the Serra do Espinhaço (spine mountains)—I spotted a small sign for the “Comercio do Cristais” as my bus rumbled into town. After touring Diamantina’s UNESCO heritage sites the following morning, I back-tracked several miles to the Comercio do Cristais and had a charmed, but horribly awkward conversation in broken Portuguese, with the shop-owner, Tião. After stumbling around a revelation that I was from California, Tião explained that he also had a friend from California—a crystal enthusiast who buys from nearby miners, and sells at small shows. He described the man that I bought my first stones from in Santa Ana—the man with pictures of himself at local mines; the man whose room I walked out of and had that profound moment of inspiration which propelled me toward Diamantina and toward his shop. Tião called his son out to translate as we toured his gated wholesale compound, and he offered to arrange for a moto-taxi driver to

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³ Figure 0.3 Photo from the highlands of Diamantina, Minas Gerais, Brazil
take me an hour out to a clandestine quartz mine famous for producing “Laser Crystals”—long, slender, water-clear crystals that often look like icicles.

The following morning at 10:00am, Bianno, a local moto-taxi driver arrived at my *pousada* (inexpensive boutique hotel). We set off through Diamantina’s narrow, cobbled streets to the outskirts of town, past the Federal University of the Valley Jequitinhonha, dropping 500 meters in elevation down curving winding roads, over the Jequinitonha river to the *Posto de Mendanha*, where we stopped for a quick buffet lunch. Bianno knew everyone—honked at everyone—and responded, “Some gringo from California” when people asked who he lugging around. He was clearly having a blast. As Bianno and I ate at the small gas station, a local miner came up to us and asked Bianno if I was looking for diamonds. He opened his hand to reveal a gorgeous blue-green stone about the size of my pinky fingernail. I gasped aloud, having never seen a diamond of that size before. Bianno asked the price: $3,000USD, a mere fraction of what a consumer would pay on the diamond market.4

After lunch, we continued on BR-330 for a few minutes before turning onto a small, winding, one-lane dirt road climbing toward some distant hills. As the moto spun out on loose gravel and the shocks bottomed out bumping through deep ruts, I was struck by the road’s changing color—from deep red to green to white— which I later learned signaled the earth’s rich

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*Figure 0.4* Tião’s shop at the outskirts of Diamantina.
mineral composition. The road grew steeper and steeper before us and I nearly fell off the back of the moto as Bianno charged up the grade; the motorcycle began to overheat. Eventually, we arrived at a cluster of small brick shacks and as if on cue, men stepped out from their shelter as they heard the bike’s engine sputter to a stop. Bianno knew everyone and introduced me as a friend, giving me a few precious tokens of social capital. After an obligatory second lunch of rice, beans, chicken, and squash, Bianno gave me a quick tour of the mine, showing me all the various holes he had worked, excitedly bragging about the size of crystals he had discovered in them.

As we explored, he explained the mining process: how to follow a vein down to where it opens to a pocket; how to penetrate the pocket with a metal rod to gauge its depth; where to anchor the explosives to open the pocket without causing its collapse. Even more harrowing, Bianno’s friend showed me how to pack explosives and how to attach the fuse to the blast-cap with your teeth while not blowing oneself up in the process. Throughout the day, we stumbled upon his friends scratching around in the sandstone pits and taking breaks to snack and share stories. While it would take several months of extensive fieldwork to gain confidence and grace in my linguistic footing, I found that I was able to understand nearly everything and even convey relatively complex ideas about my interest in quartz crystals and life at the mine.

Before leaving we sat with two garimpeiros (miners), Gerdal and Davi, under the shade of a mango tree and listened to them complain about low production and vent about their tenuous relationship with Tião, whom they described as the largest and most important wholesaler in the region. After a pause in conversation, Gerdal turned to me and asked why I had come all the way from Los Angeles to learn about their lives at the Caba Saco mine. I explained that I was
interested in “social life of the stones” and in particular the idea that stones have energy, and that healers can use them to help people with their troubles. They all nodded, engaged.

“Do you guys believe that crystals have energy?” I asked after a lull in conversation, expecting sarcastic eye-rolls.

Gerdal became excited and explained how, indeed, crystals had a positive energy that “clears the eyes.” He explained that he meant this in the spiritual sense of encouraging awareness, but also in the practical sense, in that crystals’ energy helped him find purer, clearer, more valuable crystals. Bianno too chimed in, explaining how, while working for Tião some years ago, he’d invented crystal-infused water and began assembling healing packages for customers (as Bill Maurer has noted, a real “energy drink”). After several more stories, we exchanged contact information and I hopped back on Bianno’s bike. As we sped back down the colored dirt path dropping down to BR- 330, I spotted a vista where my acquaintance Ed from Dynamic Energy Crystals had taken a photo of himself and now carries with himself to gem shows. In many ways, this project crystallized in that moment for me.

STAKING A CLAIM

Karl Marx suggested that analysis of culture must “begin with the analysis of a commodity” (1968:43). In my focus on mineral commodities, I cobble together scholarship concerned with the production and maintenance of markets, and specifically the generation and transformation of value within them. By building on pragmatic and performative concerns with global networks—while also remaining attentive to Marxist concerns with power—this dissertation offers new insight into how the situated experience of consumption is intimately tied to production within a “commodity scape” (see Appadurai 1996). As Anna Tsing has observed, “supply chains offer a model for thinking simultaneously through global integration, on the one
hand, and the formation of diverse niches on the other” (Tsing 2009:150). By studying the social lives of spiritual objects and the lives of people whose job it is to mine, transport, sell, and use them, I contribute to a broad understanding of stone markets in late capitalism and to perspectives on new religious movements in the twenty-first century and beyond.

My patchwork introduction to this commodity scape—bouncing backward from retailers to miners—is an incomplete but fitting context for my fieldwork. Over three years, I embarked on seemingly endless bus rides through Brazil, countless intercontinental flights across the Americas, and long drives through the moon-scape deserts of the American Southwest. I chased Diamantina lasers across these pathways to their various homes: crystal collectors and energy healers Los Angeles, mineral wholesalers in Germany, boutique smudge fan artisans in rural Kentucky, the Smithsonian museum in Washington DC, and thousands other of rock enthusiasts around the world. Diamantina lasers are now given nearly daily cameos on the feeds of popular lifestyle and fashion accounts on social media platforms such as Instagram. They have appeared in Hollywood movies and have inspired countless amateur and professional jewelry makers in every corner of the globe. This dissertation provides a small slice of stories from these journeys, and in doing so, illustrates how a global market has emerged and transformed across social, political, and spiritual contexts.

Though the research questions and theoretical framings have evolved over the course of this project, I have been guided by one central objective: to map how different people, in different places, at different times make unique meaning with the same laser crystals. Put another way, how do such crystals become valuable, in what ways, to whom, when, and how? How do the ways that people narrate their experiences with crystals—and their purported spiritual powers—intersect? Where do such narratives diverge? What personal and embodied experiences
drive these narratives, and what can they tell us about New Age spirituality in the twenty-first century? What role do such narratives play in the production and maintenance of global markets?

In the broadest terms, this project has been guided by a long anthropological tradition of following global goods, and minerals in particular. Commodity chain studies emerging from World Systems theory have generatively focused on consumer-driven, producer-driven, or trader-driven chains; however, the distinct vantage points of various actors within these networks are often understated (see Çaliscan 2010; Mintz; Topik et al. 2006). Through many months of ethnography along this value chain, I offer insight into the overlooked aspects of these actors’ lives, their sensory experiences, and the cultural-economic forces that shape them. Recent commodity biographies by Anna Tsing (2016), Elizabeth Ferry (2013), and Kris Peterson (2014) signal a renewed effort within anthropology to elucidate the importance goods in motion— not only for understanding value, but for analyzing the increasingly complex global systems we are all snarled within. Quartz is an ideal object through which to narrate differently positioned people’s vantage points since it is at once the second most common mineral on earth, but is also wildly valuable to certain people at certain times.

Social and historical fields of power help contextualize Brazil’s role as the world’s leading producer of New Age crystals. Brazilian economic booms and busts for the last 500 years are easily traced through resource extraction from sugarcane, to gold and diamonds, to rubber and coffee. Slavery was a defining feature of these industries until 1888, and the site of one of Brazil’s most productive diamond mines, Mendanha— where Bianno and I stopped for lunch that first day— was at the center of these intertwined industries. I moved to Mendanha, Minas Gerais in April 2015 to understand miners’ lived experience at Caba Saco. I bought a
rickety old bicycle and began peddling the 11 km up a ragged dirt road to the Caba Saco mine everyday – no small feat, even for an experienced cyclist.

I also eventually became very close friends with Ed, the owner of Dynamic Energy Crystals, and joined him on several trips to Minas Gerais’ most important mineral-producing regions – snapping pictures of him in such places for use in his future displays. We traveled several times to the amethyst-producing region of Rio Grande do Sur where I was able to build a comparative perspective on variation in Brazil’s mineral production and wholesaling practices around the country.12

For the years leading up to my extended stay in Brazil, I had cultivated many important connections with Brazilian buyers who travel to the U.S. to sell their goods at the world’s largest gem and mineral shows in Tucson, Arizona and Denver, Colorado. I conducted ethnographic research with over a dozen of these wholesalers in their warehouses in Brazil to understand how cleaning, sorting, and packaging crystals impacts their distinct social, spiritual, and economic values. Central to this labor are not only various modes of negotiation associated with buying and sell quartz crystals, but also knowledge of the various legal and documentary practices required to move crystals from mines to consumers – many of which hover in legal grey areas.

Additionally, for several weeks spanning January and February of 2014, 2015, and 2016,
I worked with many of these same wholesalers at the annual Tucson Gem and Mineral Show. I intimately labored alongside these international dealers; setting up booths, moving pallets of crystals by forklift, and translating for them as they negotiated large wholesale transactions. If markets are defined by relationships, then market making is a process of relationship building. In this sense, I became an important market maker by connecting some informants, who happened to be wholesalers, with other informants, who happened to be consumers. While more often then not, this was a win-win for everyone involved, relationships were at times fraught with uncomfortable tension.¹³

Lastly, in addition to working at the Tucson show three consecutive years in month-long stints, I followed many of the Brazilian crystals we sold to New Age retailers and healers in Sedona, Arizona, often described as the New Age epicenter of the American Southwest. In Sedona, I tracked emerging trends in New Age crystal healing by embedding myself in a network of crystal

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Figure 0.6  The author laboring at the world’s largest gem show in Tucson, Arizona. (Photo by my collaborator, Maria)

Figure 0.7  The author receiving a crystal healing session in Oakland, California
healers and by participating in weekly crystal healing and meditation workshops throughout the Sedona valley. I also conducted ethnography with healers in various cities throughout California, spanning from San Diego to Mount Shasta. Issues of entrepreneurship and consumerism sit precariously within a spiritual movement that calls for detachment from the material world (Hess 1993). This tension of course is not unique to crystal healers in the American Southwest, as New Age has long been theorized as a consumer movement responding to secularization in West more broadly, and to economic globalization in particular (Hanegraaff 2000; Heeles 2008). As is the case with many spiritual movements, money and spirit often go hand-in-hand.

Quartz is everywhere, and is used in nearly everything. From radio transmitters to metaphysical healing tools, Brazilian quartz crystals have unique social histories. Beyond simply focusing on how quartz, the second most abundant mineral compound on earth, can become a talisman of profound economic and cultural importance, I show how an entire network of miners, wholesalers, and healers transmute and transform crystals various forms of value to meet their daily needs. Attention to such transformations can tell us about the production, circulation and consumption of other commodities imbued with mystical powers, from designer goods, to pharmaceuticals, to trendy health foods such as water (Mintz 1984; Foster 2008; Miller 2005), but can also show how a phenomenology of commodities might illuminate broader disjunctures and transformations of spiritual and market networks. Since people everywhere spend incredible amounts of money on things with no apparent use-value, anthropologists need to take people’s own assumptions of use-value– as well as their sensorial experiences with various commodities– seriously. Indeed, this challenges traditional concepts of “use-value” by tracing the multiple valences of crystal quartz across different times and places. In doing so, it offers a new way to
understand how value and markets are distinctly shaped by performative, semiotic, and phenomenological processes.

**CHAPTER OVERVIEWS**

In the first chapter, which is primarily historical, I show how over several centuries the Diamantina region became mapped and constituted as a highly regulated zone of mineral production, initially for gold and diamonds, then for strategic materials during the Second World War, and now as a premier site of New Age crystal production. This *longue durée* perspective of Diamantina’s place in global mineral markets shows how the hinterlands became demarcated as a site of economic and geologic potential, and offers insight into how entrenched extractive industries are to my collaborators’ social and economic worlds. By looking at value, materiality, and commodity circulation spanning several centuries, this chapter offers a way to understand how social theories of value are necessarily situated within distinct historical, political-economic, scientific, and spiritual contexts.

In addition to offering context to the chapters that follow, the first chapter shows that Diamantina Lasers’ movement from under the ground to consumers has long been anchored in the valuation of their energetic and sight-enhancing properties—first in their uses in optical and electronics equipment, and now as New Age healing instruments. I argue that Diamantina quartz’s value history is defined by energy, though the fundamental meaning, value, and function of these crystals’ energetic properties has transformed over time. Telling these stories helps situate the social and economic realities of Diamantina within global flows of mineral commodities.

In the second chapter, I follow my friends from Caba Saco, Manuel and Vicente, to show how the lived experience of informal mining is framed by the particular historical and
socioeconomic contexts of life in Brazil’s interior, a region often overlooked by the Brazilian state. Building upon recent anthropological concerns with affect, I argue that the affective power of hope comes to play an important role in the production, valuation, and movement of crystals as men throw themselves deep into the earth to find crystals that can be sold to buyers from near and far. However, this is not simply an economic game, as unique forms of social value also emerge in crystal’s affective extraction.

Many artisanal miners frame their experiences with crystals’ metaphysical properties in terms of a moral energy—such as a reward for a life well lived. As Manuel claimed, “crystals are only attracted to people with good energy.” The implication, of course, is that only a certain type of person will find success in Brazil’s precarious informal mining industries. Percolating up through this moral frame is a broader critique of the changing social fabric of Brazil’s interior as illicit drug use becomes more prevalent in small, marginalized communities that benefitted minimally from the country’s massive economic boom last decade. I show that in the face of these new social challenges (as well as a long-standing struggle with perpetual poverty), ‘hope’ (or a type of moral optimism) has become a key object of social cohesion. I show that this stark contrast between miners’ lived experience of disadvantage and the value of hope, optimism and positivity drives the exhausting and dangerous search for crystals. This contrast propels stones through this informal market.

As crystals are exchanged between miners and circuits of wholesalers in Brazil, different prices and different types of values become associated with crystals. The multiplicity of price has been compounded in recent years due to the increased presence of foreign buyers deep in the mountains of Minas Gerais. The third chapter investigates this market shift as well as the emergence of palpable tensions between Brazilian and Chinese modes of conducting business,
particularly in bartering. This is important because many Brazilian wholesalers see Chinese buyers— and more specifically their wholesaling tactics— as directly responsible for “wrecking” the Brazilian quartz market over the past decade.

After years of painful and exhausting exchanges, some Brazilians refuse to sell to Chinese buyers altogether, while others have adopted new modes of conducting business to gain power in such transactions. As one wholesaler explained, “I’ve found a stone more powerful than the Chinese.” For him, a stone more powerful than the Chinese was any stone he refused to sell. By withholding material from the market, this dealer illustrates how new capitalist logics emerge as differently positioned actors compete for economic and social power. This chapter demonstrates how price is almost never static throughout this market, but is always contingent and (nearly) always negotiated. In this sense, the significance of social ties cannot be understated, as value (price) is always dependent on a relationship’s potential. I refer to leveraging social values in price setting as “negotiative value,” and show how value (price) is always anchored to a larger system of cross-cultural meaning, potentiality, and sociality.

The fourth chapter provides a counter example to how price, value, and materiality are enacted by following how crystals are made into legible, traceable, and calculable export commodities. Much of the social theory on gem and mineral markets highlights the relationship between their material properties and their social meanings and value. Instead, I focus on the materialities around crystals— such as packing materials, steel barrels, shipping containers, and the documents required to move them— and how they come to obscure, highlight, and make stable prices that are unique and temporary, prices that I refer to as “phantasmic value.” Phantasmic value is a temporary likeness of market value, but reflects neither price paid nor price to be sold— it is merely often a temporary price needed to move crystals from mines to
consumers. Newspapers, barrels, shipping documents, and containers are unique market materialities that hedge against and engender new forms of risk, and along with it offer new opportunities to create value. In relation to these technologies, phantasmic value is a notional price reported in documents and shipping manifests, but never used in sale or purchase price; it is never a market value.

By way of conclusion, I return to initial questions that drove me toward this project, specifically, “how are stones made meaningful.” The final chapter explores the types of conflicts that emerge as New Age spiritual healing practices collide with stones markets. Central to this discussion is how knowledge emerges, moves and what is at stake as people personalize, politicize, and capitalize upon it. I introduce Natasha, a well-known New Age author and crystal healer who, after a conflict with a co-author is being forced to reinvent herself in the New Age healing world. Natasha’s experience points to a curious tension between the politics of New Age authority (particularly around what stones are good for healing, and who sells them) and the centrality of personal experience as a way of knowing (rather than knowledge codified through publication or certification courses).

In order to draw out this point I briefly trace how color and light became associated with the chakra system, and thus how colored stones became the primary mode of treating chakra misalignment. This has in turn shaped the world’s stone markets for the past several decades. Natasha was in part responsible for perpetuating this trend that she now claims is wildly off par with how stone healing actually works. I show how Natasha’s new technique to learn which stones to use for dis-ease are anchored to her new healing methodology, which includes sets of “Crystal Ally” playing cards and techniques for using intuition rather than prescription to select stones. In her quest to push against a brain-bound mind, Natasha has sought to re-enchant the
invisible forces that shape our daily lives, and in doing so, attempts to re-animate the market she played a central role in forming through new commercial offerings. I end by exploring how such offerings invite not only a deeper reflection of spiritual markets, but also of our own humanity.

LOOKING FORWARD

After years of ethnographically studying multiple aspects of the quartz market, I feel prepared to answer the *Times’* query regarding how crystals went from a New Age curiosity to ubiquitous accessory in the luxury wellness world. It happened through relations: relations between humans; between humans and objects; relations between ideologies, bureaucracies, and state formations; relations between market forces; and relations between objects themselves. Such a claim of course draws from decades of social scientific study of markets, which has documented the various ways that people and markets are co-constructed (Peterson 2014; Myers 2001; Foster 2008; Callon 1998; Tsing 2015; Weiner 1992). Thus maintenance of relations remains a central aspect of market making. The primary theoretical thread woven through this entire document is that markets are predicated on the various types of relationships that hold them together (and inversely by the conflicts that threaten to pull them apart).

For all its depth and richness, there are aspects of this network that simply could not be addressed in this dissertation. For one, Brazil’s rapidly emerging New Age movement, and all its variation across the country’s vast urban landscapes sustained my attention, first as an ethnographer with this project, and then later as a professional strategy consultant working in Brazil’s rapidly developing healthcare space. In the year since completing my fieldwork, I have returned to São Paulo several times as a consultant studying chronic health conditions such as obesity and sleep apnea. In my work with patients, health care providers, and even medical supply companies, I noticed that crystals– and New Age thought more broadly– have found their
way into new imaginaries around health and wellness in urban Brazil (distinct from ways described by Dawson 2007).

In my last days at Caba Saco a young hippy kid from São Paulo named Rafael had joined some friends in tunneling toward a new vein. Over lunch we discussed his experiences with stones as a believer in esotericism (he has practiced crystal healing) and as an adventurer looking to make a little money on the side (he often busks and sells crystals to fund his travels). After I asked if he liked to use lasers for anything in particular, he jumped up from the sofa, ran into the bedroom to grab his backpack, sat back down next to me and opened a Portuguese-language version of Judy Hall’s (2003) “The Crystal Bible” to a page on Laser Crystals. He pointed out the following passage:

> Laser quartz focuses, concentrates and accelerates energy, transmitting it in a beam of energy that acts like a laser... It should never be pointed at random toward anyone and should only be used with clear intent. If used in this way, this crystal is an amazing healing instrument.  
> - Judy Hall (2003)

Just as crystals are remade into different economic and spiritual objects as they move from the interior of Minas to Tucson, Los Angeles, and beyond, so too is New Age spirituality remade as it moves from the American Southwest through international teachers, books, and into Brazil’s urban centers and beyond. Rafael is particularly unique in that he is at once a producer, a consumer, a practitioner, and retailer of laser crystals. He embodies each facet of the supply chain and offers as way to think about studying commodity networks not simply as multi-sited engagements, but multi-sided projects. Such projects seek to unravel people’s perspectives about other people’s perspectives to whom they are intimately tied through commerce and this case, spirituality. How do such perspectives impact mining strategies, wholesaling tactics, and crystal healing
practices in both Brazil and the U.S. Southwest? In what ways does the global crystal market come to reflect these perspectives

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1 Three of many examples can be found throughout the popular press:

2 In James’ Varieties of Spiritual Experience he explains that, “Although so similar to states of feeling, mystical states seem to those who experience them to be also states of knowledge. They are states of insight into depths of truth unplumbed by the discursive intellect. They are illuminations, revelations, full of significance and importance, all inarticulate though they remain; and as a rule they carry with them a curious sense of authority for after-time.” My experience was certainly much more a state of knowledge than a state of feeling, and as I discuss in the fifth chapter, such encounters are not uncommon for anthropologists in the field. For many the question becomes “what to do with it?” I hope to show that I chose to at once take this experience seriously, while also think quite critically about what it could mean for anthropology and for my own professional career.

3 If I am truly honest, at some moments I doubted deeply whether I would be able to complete the project as initially envisioned in that Holiday Inn hallway. I often found myself at the mercy of hand gestures or an occasional English speaker; but most importantly, I relied on the unbelievable patience of the people of Minas Gerais.

4 The serendipity of this encounter is difficult to explain. First, the gas station—which is also a restaurant, also a bus stop, and also a small tire shop, and also has a few rooms upstairs for sleeping travelers—was the site of some of the largest diamond excavations in Brazil in the early 1700s. This history is explored in Chapter 1, where I argue that many of the social and political-economic tones of diamond mining continue to resonate today.

5 Though carat for carat, quartz crystals are less economically valuable than other resources, mining at Caba Saco has long been mired in political-ecological conflicts and a burgeoning global demand like many important mineral extraction industries (Ballard and Banks 2003; Kirsch 2008). Slavery was a defining aspect of Brazil's extraction economies until 1888, and unsurprisingly, the issues of race, violence, and marginalization widely addressed by anthropologists undergird this research as well (DaMatta 1991; Goldstein 2003; Scheper-Hughes 1992). I intentionally build upon a robust body of scholarship concerned with political-economic and ritual formations of rural mining locales in Latin America and beyond by tracking how local meaning-making practices intersect with global markets (Taussig 1980; Nash 1979; Ferguson 1999).

6 In fact, Bianno did not invent this— as crystal infusions had been on the market in the U.S. for some time— however, it is fascinating that he believes he did. My best guess is that Ed had mentioned this at some point and that Bianno had cleverly devised a crystal pouch and selected a rainbow of tumbled stones to fill the market niche in Brazil.

7 In their classic ethnographies of mining, Taussig (1980) and Nash (1979) outlined important links between ritual practices and economic formations in Latin American mining locales, drawing attention to the dynamic social and mystical valuation of mine materials (see also Godoy 1985). Recent scholarship on industrial mining highlights both the role of power and the agency of mine materials in relation to communities, environments, and bodies (see Ballard, and Banks 2003; Ferguson 1999; Kirsch 2008, 2010; Richardson and Weszkalnys 2014; Scott 2010). Meanwhile, an emergent body of scholarship focusing on small-scale artisanal mining in Africa and Latin America has again outlined the role of mine objects in relation to global markets and local devotional practices (Ferry 2005, 2013; Smith 2011; Smith and Mantz 2006; Walsh 2003, 2010). Preserving this
attention to the ways mine materials link rituality and market processes in mining locales, I seek to add temporal and spatial nuance to these theories by demonstrating how bodily encounters with crystals are transformative not just at mines, but also in far-flung places such as Sedona, Arizona, and California more broadly. Because of its long gold-mining history, California becomes a particularly salient site for what Weszkalnys (2016) refers to as resource affects. This is a topic discussed in the second chapter.

In particular, this line of thinking builds on a long list of scholars concerned with mining and resource materialities (Taussig 1980; Ballard, and Banks 2003; Richardson and Weszkalnys 2014), and the role of mined objects such as diamonds in everyday life (see Fall 2014).

These debates are timely only in that they draw from rich concerns with the production and maintenance of markets (Bohannan 1955; Çalışkan 2010; Callon 1999; Elyachar 2005; Gyer 2004). Of course many scholars address both the semiotic and Marxist approaches to consumptions and I do not mean to polarize these approaches. Most commodity studies generatively push back against Marxist notions of production and exchange by underscoring how consumption seldom generates the alienation that Marx suggested, or at least not as in as vulgar terms as Marx outlines. Recent scholarship in this realm is deeply committed to Munn’s attention to qualia, but that also attends to political economy and the exploitative nature of commodity production (see Calvão 2013; Ferry 2013; Graeber 2001 among many others). Peterson (2014) is also a book about transnational commodity chains.

Such an approach builds on pragmatic and performative concerns with global networks, and contributes a new way to ethnographically explore how consumption, as a situated experience, is intimately tied to others within a “commodity scape” (Appadurai 1996). Follow-the-commodity studies have tracked a wide array of global commodities from producers to consumers including (but by no means limited to): coffee (Roseberry 1996; Lyon 2008), Coca-Cola (Foster 2008; Miller 1998), the Sony Walkman (du Gay et al. 1997), Barbie dolls (MacDougall 2003), flowers (Hughes 2000), tuna (Bestor 2001). I build upon the anthropological tracking of mineral specimens (Ferry 2005, 2013), sapphires (Walsh 2003, 2010), and other mined materials such as tantalum and Colton (Mantz 2008; Smith 2011) as they journey from mines through export circuits.

Most commodity studies generatively push back against Marxist notions of production and exchange by underscoring how consumption seldom generates the alienation that Marx suggested, and throughout this dissertation I show how such approaches more accurately reflect peoples’ lived experiences— particularly in my interrogation of hope.

One can look to Topik et al. (2006) for very detailed histories, and to Machado and Figueirôa (2001) for a perspective on how these exploitive histories shaped extractive industries in the decades following.

Much of the scholarship on early extraction industries in Minas has focused on the human labor required to extract, refine and transport mineral wealth (especially gold) from the subsoil to global markets. For example, J.R. Russell-Wood’s (1977, 1982, 1987) outstanding work on the relationship between mining and slavery importantly highlights the impact of gold mining on colonial institutions of slavery, tracing how Brazilian gold transformed the political economy of Portugal, and Europe more broadly (1977).

Similarly Marshal Eakin (1989) has noted that “in the eighteenth century, Brazil produced the vast majority of the gold that circulated in Europe and helped fuel England's industrial expansion,” and has suggested also that deposits near Diamantina made Brazil the world’s largest diamond producer until the late 1800s, when South Africa filled this role (1989:76).

Because of their variable histories, the cultural, economic, and social differences between Minas and Rio Grande do Sur are stark, and the economic and social practices associated with buying and selling crystals are also extremely varied.

In their different ways, Geertz (1979), Marcus (1997) and Haraway (1991) point to complicity, rapport, and reflexivity that define complex fieldwork engagements. There is simply not an easy way through these entanglements often and we typically must simply do our best to minimize harm and to enrich the lives of our collaborators in any way possible. This is inevitably messy, and there are always consequences.

Recent trends in commodity and consumption studies have mapped networks of (multi-sided) perspectives, offering insights into how people’s encounters with the qualities of commodities are shaped
by the encounters of people elsewhere (see Callon et al 2002; Foster 2008; Thomas 1991). At stake here are the ways that actors’ diverse perspectives become unified within commodity networks.
Chapter One: Mapping Historical Value

INTRODUCTION

Jim and I first met in his hotel room that had been converted into a retail space for a local southern California gem and mineral show. As a former amateur machinist and metal-worker myself, I was struck by the craftsmanship of the artisanal crystal lamps he was selling, and by the incredibly high-quality crystals they displayed.

“Here, take a look at this scrap-book, it shows the process.” Jim had anticipated my interest. The photo exposé of fading photographs taken over several years showed Jim selecting crystals from a massive stockpile, designing and then hand crafting each lost wax-cast lamp base, and wiring discrete LED’s within the casting, and finally displaying the final product.

“Most of that is old government quartz from Brazil, some from Madagascar.” Jim explained. “It was part of the national stockpile, and then we bought it all in the 1980s as the government replaced everything with synthetic quartz. Actually all of these pieces here are government quartz.”

I was stunned. I had just spent the week prior beginning research on the history of quartz mining in Brazil, but specifically the quartz crystal procurement program between the U.S. and Brazil during the Second World War. Richard Thompson’s (2012) “Crystal Clear: the struggle for

Figure 1.1 A photo of a polaroid Jim snapped in the 1980s illustrating the mountain of piezoelectric quartz his boss had purchased from the US government. (Used with Jim’s permission)
reliable communications technology in World War II” intricately documents the production, importation, and processing of Brazilian quartz during that era, and I was sure Jim would find it interesting. To my surprise, he ordered the book immediately and when we reconnected in Tucson some months later, he excitedly shared that the material in his inventory was in fact from Carlisle, Pennsylvania, a small city Thompson referred to as “Crystal Town, USA” – the epicenter of the piezoelectric quartz industries. This prompted Jim to begin his own research about the radio crystal program of the 1940s and we continued to share resources over the years: Jim learned about the trajectories through which this material moved around the US, and I conducted research about the excavation and transportation of this material in Brazil throughout the twentieth century and how Brazil was made and remade into a zone of extraction through the process. This chapter synthesizes a fraction of my archival work in Brazil and the U.S. as well as interviews with nearly two dozen gem dealers, geographers, and historians. 

To make any sort of claim about quartz mining in Brazil, one must trace a convoluted history involving many European, American, and Brazilian actors through their situated political-economic milieus. This chapter explains how over several centuries, Brazil became—and sustained itself as— one of the world’s most important sites of quartz production. By assembling historical vignettes about Diamantina quartz crystals, I illustrate a longue durée portrait of Diamantina’s place in global quartz markets. This perspective is curated through the works of mineralogists, explorers, geographers, military personal, industrialists, New Age entrepreneurs, and of course garimpeiros, all who played crucial roles in demarcating Diamantina as a site of economic potential.

I begin by tracing mineral exploitation in Brazil through a European fascination with gold and diamonds. I show how in the 18th century, the Distrito de Diamantina was constructed as a
highly regulated zone of production, and how specific mineralogical and geological knowledge were generated in this process. Next, I follow the linking of geological knowledge and mineralogy/metallurgy knowledge by tracing how the interior of Minas Gerais was mapped as a space of economic potential in the 19th century. While much of the economic and geographical interest generated through these efforts was focused on Minas Gerais’ vast iron reserves, quartz crystal – also known as ‘rock crystal’– also emerged as an important resource.

From the 1800s until the buildup to the Second World War, Germans largely controlled Brazil’s quartz market. I show the process through which quartz became an important strategic mineral and how the U.S. levied its hemispheric power to control the flow of quartz crystals from Minas Gerais to the U.S. and its allied forces. Much of this material found its way to Carlisle, Pennsylvania. While several scholars have focused on networks of crystal engineers, scientists, military experts, and entrepreneurs who gave rise to a massive Wartime crystal industry in the 1940s, Brazil itself has received little attention in these discussions.

This chapter offers insight into how Brazil became demarcated as the epicenter for quartz crystal production during the Second World War, and what happened as Brazilian quartz lost value and significance as lab-produced crystals became more widely available. I conclude by tracing the rise of new uses for Brazilian crystals in the North American New Age movement. While crystal healing is nothing new, specific knowledge practices were codified during the 1980s which have now become a global phenomenon (this history is discussed in detail in chapter five). The primary point I wish to impart in this chapter– and indeed in this manuscript– is that Brazilian quartz crystals’ value, utility, and cultural significance change over time (see Mintz 1980). Understanding these shifts in a historical and spatial context provides insight into how social theories of value are necessarily situated within political, economic, scientific, and
spiritual contexts. The shifts in context offer a unique way to understand value, materiality, and commodity circulation over the span of several centuries.

**GREEN STONES – STRANGE LAND**

Early Portuguese explorers had great hopes for Brazil as a land of potential mineral wealth. The first adventurers failed to encounter any great reserves; however, they encountered many green amulets (emerald) used by local native people, as well as fashioned quartz points and other lithic tools. Their fascination with colored stones immediately drew the attention of the Portuguese Royalty, and inspired the Crown to commission several “viagens filosóficas” (scientific expeditions) to the unknown regions of Brazil in search of botanical and mineral samples. Maps– along with travel journals, illustrations, and mineralogical knowledge– formed a constellation of tools and expertise through which Europeans and Brazilians alike were able to construct and exploit the region’s economic geology.

For the Portuguese mercantilist class in the sixteenth and seventeenth centuries, colonial Brazil was simply a territory for exploitation. In fact the story of exploration, economic development, and independence for Brazil is defined by cycles of economic boom and busts: from lumber to sugar to gold and diamonds to (most recently) soy and iron. Central to these booms and busts– and to the history of Brazil– is the large scale trade and exploitation of enslaved peoples required to extract, process and circulate these resources from the hinterlands of a rugged country to global markets in Europe and beyond.¹⁶

As these new mineral territories were mapped, and their potential wealth described, these cartographic documents shaped the economic imaginaries of European elites as well as the lives of many generations who were to inhabit this region. Sugar exports from Brazil peaked in the 1650s and the discovery of gold in the 1690s offered renewed economic opportunities, and
Minas Gerais quickly transitioned from peripheral hinterlands to the home of the largest number of slaves in Brazil, as well as the economic focus of colonial elites (Bergad 1996). The gold boom in Brazil took root at the end of the 1600s, and diamonds were discovered shortly thereafter, in 1725. By some estimates, at least 50 percent of the world’s production of gold and diamonds took place in Brazil during this period (Machado and Figueirôa 2001).

Geographically isolated from many of Minas Gerais’ other gold-producing regions, the Diamantina plateau lies in the north-central region of the state, where the Espinhaço Mountains feed high tributaries of the Jequitinhonha River. The Arraial do Tijuc, now known as Diamantina (or the Distrito Diamantina), became an important site of mineral production in the beginning of 1729, when diamonds were discovered in nearby riverbeds. Historians of the region often note that the “discovery” was really one of Europeans identifying that the small clear river-stones that were used as game tokens by enslaved laborers in the region were actually diamonds, and valuable diamonds at that! This mismatch of value sets the context for mineral exploitation throughout Minas Gerais, and indeed Brazil for several hundred years.

Because of the small size of diamonds, smuggling became of great concern to Portuguese Crown. Histons Peirera et al. (2005) suggest that because of their susceptibility to becoming contraband, “about one fifth of the diamonds mined were not reported to the Royal Treasury” at
that time. In an attempt to tightly regulate the flow of diamonds from the region the Crown established boundaries limiting entry into and out of the diamond regions, and required that diamonds be taxed at the same rate as gold (20 percent by weight). Smuggling remained a viable way to secure a premium over the official price, and to profitably evade the “o quinto.” In fact, the word “garimpeiro” derived from the Portuguese verb garimpar (to climb) refers to these prospectors, who as Cornejo and Bartorelli (2009) note, when pursued by the royal troops “climbed to the top of mountain ranges to escape from repression in the Demarcação Diamantina during the colonial period” (2009). The discovery of Brazilian diamonds led to an influx in supply on the European markets: prices dropped by nearly 75% percent. Between 1735 and 1739 the crown ordered many Brazilian mines closed in order to stabilize supply of this commodity.¹⁹

Because its geographic limitations were precise, and travel within the district was only permitted with Crown authorization, Distrito Diamantina was considered a type of “state-within-a-state” (see Holanda 1995)²⁰. To regulate this more efficiently, the Crown issued diamond mining contracts only to Portuguese (and Mestizo) elites, and the village of Tijuco grew into the most important urban center in the Distrito and the most important diamond-producing region of the world (between 1729-1867).²¹ Throughout the eighteenth century, five pivotal maps (published respectively in 1770, 1775, 1776, 1784), helped to demark Diamantina as an important space in the European economic and cultural imaginary through the diamond boom.²² Through these maps, Diamantina was bounded as an important zone of mineralogical and economic potential, and became a site of intense interest

Figure 1.3 Map of Minas Gerais within Brazil, with the present-day Distrito Diamantina highlighted (source: Wikipedia.com)
to Europeans naturalists seeking to understand the region’s unique geological and botanical features, as well as hoping to find wealth.23

As Brazil produced great wealth for Europe throughout the eighteenth century, Portugal found itself in a curious place within the enlightenment as a metropol in a fumbling mercantilist empire. Unlike the English or Dutch who had systematically charted an empire through trade, Portugal became the political hub of a rather accidental empire. To eek out a space for itself in the establishment of Europe’s emerging natural sciences, the Portuguese state sent several Brazilian and Portuguese mineralogists to be trained as mine managers in countries such as Saxony, France, and Germany, then hubs of mineralogical thought. As geological historians Figueirôa and Silva (2000) have theorized, the goal for Portugal was to “combine scientific inquiry with policies fostering economic exploitation and political action” (2000:188). The rational exploitation of nature in Brazil—as well as Portugal itself—necessarily included agriculture, botany and minerals, and specifically the routine surveying of the natural features and the resources held within them in the Portuguese territories. In this context, mapping the interior of Minas Gerais, and the Diamantina region in particular, illustrates a crucial intersection of 18th century cartography and the burgeoning field of geology in Europe and Brazil.

In 1798, Diamantina native José Vieira Couto—who had studied in prestigious European mining schools—was commissioned by the Portuguese metropolitan government to conduct the first comprehensive geological and mineralogical survey of the Serro Frio of Minas Gerais State (the region of Diamantina, and of Caba Saco specifically). His travel logs, published as a series of Memoirs, demonstrate an interesting commitment to a pragmatic approach of mineral classification as developed by Linnaeus and other Enlightenment scholars. In this sense, Couto’s
writings demonstrated how the description of landscapes—like mineral descriptions—was becoming professionalized in eighteenth century Brazil.

Because of the economic relationships generated through diamonds, Brazil drew the intellectual and economic curiosity of other Europeans as well. Granted permission by the Prince Regent of Portugal to explore the interior of Brazil, British mineralogist John Mawe was the first foreigner authorized to visit the diamond deposits of the Demarcação Diamantino. Mawe’s report and journal, “Travels in the Interior of Brazil” vividly documented the geology, social life, and chains of production from the mines to Portugal. For example, Mawe was present when a slave presented a mining administrator with a one-pound stone that was incorrectly believed to be a diamond: “Its value sunk at first sight, for before I touched it I was convinced that it was a rounded piece of crystal . . . I took a diamond of five or six carats and with it cut a very deep nick in the stone. This was proof positive: a certificate was accordingly made out, stating that it was an inferior substance of little or no value, which I signed” (Mawe 1812:140).

Figure 1.4 An illustration of the Jequitinhonha from John Mawe’s (1812) book. The caption describes “the manner in which the bed of the Jequitinhonha is laid dry by an aqueduct in order to search for diamonds” (p. 220)
It is extremely probable that the quartz Mawe handled was from the same geological formation from which Caba Saco quartz originates. Many of the alluvial deposits (river stones) found in the Jequitinhonha River near the small town of Mendanha where I lived have tumbled down from the steep cliffs flanking Caba Saco. Mawe’s description of Mendanha's diamond operations also provides important insight into Caba Sao. By explaining the disparities between the enslaved laborers from Africa who are “more hardly (harshly) dealt with than these of any other establishment” Mawe visited, and the liberally paid officers who lived “in a style of considerable elegance, which a stranger would not be led to expect in so remote a place” (225), Mawe frames the dramatic social inequity that persists in Distrito Diamantina today. Indeed, the Diamantina region is marked by a dark history of brutality towards enslaved laborers, and many original torture devices are still on display in small museums throughout the city.

Following Brazil’s independence in 1822, it was mostly British capital that invested in mining activities, particularly in Minas Gerais. Leading up to this period (1772-1822), a state enterprise took control of Brazil’s gold and diamond mines. In addition to Portuguese and Brazilian scholars, many German military engineers and technicians were enlisted by the Portuguese crown and contributed efforts to develop iron and metallurgy industries in Brazil. The most famous of these mine engineers, Ludwig Wilhelm von Eschwege, was tasked with developing the iron industry of Minas Gerais in 1811 through a firm named the *Fábrica Patriótica do Prata*. Now a household name in Brazil, Eschwege is also considered a founder of Brazilian geology, and eventually became director-general of Brazilian gold mines, although supplies and production were somewhat exhausted by that time. During his decade of geological studies in Brazil, Eschwege also collaborated with famed European naturalists Gregory Langsdorff and Georg Wilhelm Freyreiss on several important expeditions. Eschewege’s impact
was so great that the Universidad Federal Minas Gerais’ Geology department created a satellite branch in Diamantina named after him, where several of his original works are on display in the library. He was among the first Europeans to demarcate Minas Gerais, and Diamantina, as a zone of economic potential holding wealth beyond gold and diamonds.26

In the century spanning Mawe’s 1810 travels to the beginning of the First World War, European mineralogists and explorers conducted extensive studies of Minas Gerais’ interior. German emigration to Brazil started in the early 1800s, and while Germans primarily settled in the southernmost states of Rio Grande do Sul and Santa Catarina, industrialists in the states of Goias and Minas Gerais also sourced and cut large volumes of crystals and agates for European markets in the late 19th century (Willems 1974; Luebke 1987). American Geologists Kerr and Erichsen note that much of Brazil’s early production of rock crystal was for ornamental and optical material, with much of the “crystal being shipped to the Orient [meaning China] for cutting or carving”27 (1949:487). This exchange pattern with China has come full circle in some ways, as I discuss in Chapter Three.

The earliest record of crystal mining in Brazil comes from German Max Herman Bauer, a mineralogist and crystallographer from the University of Göttingen, who notes in his exhaustive treatise “Precious Stones” that in the states of Minas Gerais and Goias, Brazil's finest quartz rests upon the earth’s surface or just below. For example, Bauer wrote of a famous mining locale in Goias state: “for a long time the occurrence gave employment to 200 persons, who in the space of two years, collected 7,000 tons of material” (1904:478).28 In addition to the carving of artisanal bowls, figurines, and chandeliers– a craft which occupied an important place during the middle-ages in Europe– Bauer noted that at the time, much Brazilian quartz was beginning to be used for lenses. Indeed, telescopes, magnifying glasses, and other optical equipment long utilized
quartz because of its hardness and resistance to scratching. As Bauer noted, quartz, rather than glass, was preferred since “Brazilian rock crystal is easy to obtain, is very cheap, and has therefore ousted other material from the market” (1904:478). With an important new interest in optical-grade quartz, a new market was born.

AN ECONOMIC GEOLOGY OF BRAZIL

Throughout the 19th century, cartography and map-making became increasingly institutionalized, as mapping was linked to the growth of geography as an academic discipline. Historians of geology often mark the period between 1780-1840 as a critical epoch in the development of the early earth sciences—primarily as a British endeavor defined by a new appreciation of empiricism, comprehensive field expeditions, and explorers’ rich, descriptive documentation of the natural world. As the natural sciences became separated from theology and religion, notions of deep time and a ‘history written in rocks” replaced the short biblical history of the earth. Additionally, the Darwinian revolution also led to discoveries about the longue durée of geological change and an interest in the causal and historical forces that shaped the earth. Just as mineralogists adopted biologists’ concern with taxonomy as methods of identifying and organizing plants and animals, geologists too began thinking in terms of types and groupings to express patterns in the earth’s physical properties (Laudan 1987). For the various European and Americans exploring and mapping Brazil’s interior during this century, Diamantina remained a site of intellectual curiosity not only for its diamonds but because of the region’s unique geology, and more importantly for its other mineralogical potential.

Two Cornell University geologists, Charles Frederick Hartt and Orville Derby, were among the most important figures in Brazilian natural history, and more specifically in shaping Brazil as a space of geologic potential for the imperial world. From 1870-1872, the two
researchers undertook several important field expeditions mapping the geological character of Brazil, and in 1875 Hartt became chief of the *Comissão Geologica do Brasil*.

His student, Orville Derby, later also became assistant director and was a similarly prolific scholar, publishing some 173 papers on Brazilian geology, as well as the first comprehensive geological map of Brazil. Derby assumed the role as director of Brazil’s first national geological survey in 1906, and for the next decade established the field of “Economic Geology” by leading teams of international geologists and surveys throughout the country— including the first U.S. Geological Survey expedition in Brazil.

From these trips, Derby published his 1898 paper, “On the Association of Argillaceous Rocks with Quartz Veins in the Region of Diamantina, Brazil” in the American Journal of Science— the first official record of quartz formations in the region. After Derby’s death, Brazilian teams took over the role of the *Comissão Geologica do Brazil* in mapping and developing statistics about mineral production for the federal government, and by extension, a host of private parties interested in mineral exploitation. Precisely when Derby and Hartt were formalizing Brazil’s geological record, South America’s first *Escola de Minas* (School of the Mines) was founded in the historic gold mining center of Ouro Preto (1876), further beckoning a new era in the professionalization of geology and the earth sciences throughout Brazil.

It is important to point out that these American-led geological surveys this time did not occur by chance, but rather were conducted in conjunction with a new global awareness of Brazil’s massive iron ore reserves (and other precious minerals), primarily with a focus on the heart of Minas Gerais. The signs, symbols, and nomenclature of cartography drove international encounters with new institutions, landscapes, and economic opportunities. In this sense, mapping
was as much about extending political ideology and codifying regional power as much as it was about legitimizing economic opportunities for an industrializing hemisphere.³⁴

One of the great mysteries historians of geology have yet to solve about this era is why the English—who had been heavily invested in Minas throughout the 19th century—had failed to exploit these massive reserves (see Pereira de Silva 1995). Whether it was poor logistics, or unwillingness to invest in the development of a massive—and at times turbulent—industry, it was U.S. firms, not the British, who effectively took advantage of Brazil’s massive mineral reserves.

Prior to the First World War, much of the Brazilian quartz trade had been controlled by Germans, who for most of the previous century had been exporting stones from Brazil to Europe (and as mentioned, sometimes China). For example a 1904 mining legislation document in Brazil listed Germany as the largest importer of Brazilian quartz in 1902 (61,440 kilograms) followed by Belgium (19,654 kilograms).³⁵ In his 1919 excursion to Diamantina in search of clear rock crystal on behalf of an English optical device manufacturer, British mineralogist Robert R. Wells was charged with assessing the local quartz market. Documenting his travels in a short lecture titled “The Rock Crystal of Brazil,” Wells noted that since the First World War, many Brazilians have tried to capture the trade in rock crystal from the Germans, “but as they do not understand it, they have practically ruined the industry . . . There is a big commercial opening for mineralogists in central Brazil, and it is to be hoped that England will not allow the immense resources of this country to be explored by Germany alone in the future” (1920:164).

Curiously, while Wells noted the abundance of crystal in Brazil, he claimed little of it would be appropriate for optical purposes. The quartz around Diamantina is often described as some of the purest in Brazil, and is particularly valuable for precisely this reason. Why a skilled mineralogist and traveler such as Wells had failed to encounter the water-clear crystal that
Diamantina had become famous for over the prior two centuries is not immediately obvious, but I am willing to speculate. Given the precarious nature of the quartz market, such material may have simply not been available in Diamantina (or Rio) at that time—dealers may have tightly held their supply for preferred buyers. Moreover, from the distrustful tone of Wells’ writings, it seems as though local Brazilians did not find him agreeable, and perhaps simply offered him poor material at higher prices. It is very likely that since he was an outsider with no connections to the region, they simply never offered him high-quality material. This is indeed often the case today.

Whatever the precise reason Wells never found optical-grade quartz on his excursion, an ironic point can be gleaned from his essay: the English firm which commissioned Wells, Hilger and Watts, was an important manufacturer of survey and magnification equipment favored by geologists conducting surveys around the world at that time. They had sent Wells to Brazil to source new lens material. It is almost certain that the various American, Brazilian, and German geological surveys taking place throughout Brazil had utilized Brazilian optical-grade quartz in Hilger and Watts’ theodolites and other survey instruments. And despite Wells’ opinion, it is incredibly likely that some of this optical material had originated from Diamantina.

On my first trip to a Diamantina quartz mine in 2013, a garimpeiro explained that among crystals’ many metaphysical attributes, they have the power to help one “see.” He referred both to crystals ability to help him find bigger, clearer and more valuable crystals, as well as their ability to help one see in a more abstract, metaphysical sense. They help one understand “truth” and the nature of the universe. In the early twentieth century, optical quartz helped geographers “see” quartz and Brazil in a very practical sense, and it is somewhat fortuitous that these
experiences with sight helped create a new market and new opportunities to “see” with quartz for a century that followed.

FROM SIGHT TO SOUND

While quartz had been used in sonar equipment since the First World War, amateur radio operators in the early 1920s began experimenting with cutting thin wafers of quartz to regulate frequency in their radio transmitters. Like everything in the physical world, crystals have a resonant frequency, and because crystal plates of different sizes vibrate at distinct frequencies when connected to electrical circuits, quartz oscillator plates offered a crucial medium for specific frequency control. Of the 32 known classifications of natural crystals, at least 20 classes are piezoelectric, that is, they that generate an electrical charge under mechanical stress, such as percussion. Because of its desirable combination of electrical, mechanical and thermal properties, and because of its relative abundance, quartz was an ideal material with which to develop radio oscillator technology. Crystal oscillator wafers enabled greater radio frequency control– channels were more easily indexed, and remained more true to their operating frequency. It is a little known truism that the phrase “crystal clear” refers not to the clarity of crystals, but to the clarity of communication that crystal technology enables.

Oscillator plate technology was quickly adopted beyond simple ham radio operators, and by 1926 most commercial radio stations were crystal-controlled. Richard Thompson (2012) has gone as far to suggest that the move toward crystal technology “marks the very beginning of the evolution from an analogue to a digital world” (2012:4). In addition to ringing in the digital age, crystal technology also marks the beginning of dramatic transition in the Brazilian crystal market, drawing together a vast network of poor rural miners, rich American industrialists, allied military personnel, and opportunistic Brazilian exporters. Important advances in crystal
technology created a new demand for quartz during the 1920s and 1930s. During this time, Western Electric had established important trade relationships with Brazilian exporters, particularly with the firm Telequartz, who at the time owned several mines in Goias and Minas Gerais states. The U.S. Geological survey had mapped many potential locations of quartz from North Carolina to Arkansas to San Diego County, California. There was little indication, however, that any of these locales had sufficient supply of quartz for the burgeoning electronics industry. An exhaustive survey of sufficient domestic quartz deposits was conducted throughout the 1920s, but no adequate supply equal to Brazil was ever discovered (McGahey 2009).

During the early 1930s, the early years of the radio oscillator boom, the U.S. military did little to develop its crystal communication technology, primarily due to fears of becoming dependent on foreign sources of strategic raw materials. 38 While U.S. commerce was bogged in economic crisis in the early part of the decade, Brazil was burdened by dramatic political unrest (not unrelated to the jolt of markets in the US). With a revolutionary overthrow of powerful Brazilian oligarchies at the beginning of the 1930s and dramatic coup in 1937, Brazil found itself on shaky economic and political ground for much of the decade. Despite important policy commitments to each other via the Monroe doctrine, Brazil had not remained entirely loyal to the U.S. throughout the 1930s. Coffee–Brazil’s primary commodity–fell sharply in price, and the growth of socialist and fascist movements in Europe created fierce competition between British and German traders, with whom Brazil had important long-standing relationships, particularly in the mineral sector. Further, many Brazilian intellectuals admired Germany’s brand of nationalism, and Brazilian president Vargas adopted a “wait-and-see” attitude toward escalating military and political tensions in Europe and continued engaging with parallel trade both with Germany and the U.S. (Antonio Tota 2010: 68). Meanwhile, Berlin proactively vied for
Brazilian alliance. Hitler understood that Brazil held the world's largest known iron reserves, and part of his aspiration for economic and territorial expansion included moving factories from Czechoslovakia to Itabira, Minas Gerais (see Antonio Tota 68 for a historical description). In many ways by accident, the interior of Minas Gerais was thrust into the political economic imaginary because of its mineralogical potential.

During the buildup to the war, the U.S. desperately needed Brazilian raw materials such as iron, manganese, quartz, phosphorus, and Brazil was interested in U.S. manufactured goods. The U.S. saw military weakness and vulnerability in the social and economic instability of Latin America. Brazil and the U.S. had enjoyed long-standing commitments to each other thorough the Monroe Doctrine’s hemispheric (Good Neighbor) defense polices and as a way to push economic liberalism and trans-American cooperation. As Europe braced for war, the U.S. passed the Stockpiling Act of 1939, the first official motion by Congress to establish a national stockpile for strategic wartime materials. Authored with the intention of “acquiring strategic stocks of strategic and critical materials essential to the needs of industry” for weapons and “common defense”, the act authorized an initial $100 million USD (and Congress later approved another $70 million) to develop stockpiles over a four-year period. This was followed by a 1940, “Act to Expedite the Strengthening of National Defense,” which gave the Reconstruction Finance Corporation broad authority to acquire, transport, and stock defense materials. Quartz crystals—both optical and piezoelectric—were among the 26 “basic materials” listed as strategic wartime material.39

In addition to private manufacturers’ imports, the U.S. government officially entered Brazil’s crystal markets in 1940, as both a national security measure and as a strategy for disrupting the flow of crystals to Axis forces in Europe. In the words of General CV Morgan,
“The whole radio crystal program of the Armed Services depends upon the success of the procurement program in Brazil. Nothing must be allowed to interfere with it.” (quoted in Thompson 2012:117).

As the U.S. entered the war, the military’s demand for oscillators grew rapidly, and new manufacturing plants sprung up across the US. Due to a variety of political and industrial hindrances, an oscillator industry was never established in Brazil at that time. Driven by the constant demands of the armed forces, roughly 55,000,000 quartz oscillator-plates were produced from 1941 to 1944 alone (Frondel 1945:208). Many manufactures were located in the central Mid-west, locales thought to be safer from air attacks than the coasts; Kansas City and Chicago, for example, each had dozens of crystal blank manufacturers. As Clifford Frondel notes in a 1945 American Mineralogist article, more than one of these new companies soon were producing more crystals in a week than the whole country did in the year 1939 (1945:211). The industry grew rapidly, as did the demand for Brazilian crystals, yet stable supply remained a primary concern.

Following the passage of various Accumulations Acts—policy measures to bolster, expedite and

Figure 1.5 A photograph of a flier from Jim’s scrapbook. Origin unknown, though clearly WWII propaganda. The Morse Code spells S.O.B’s
strengthen U.S. national defense stockpiles with strategic materials— the Wartime Purchasing Board (Metals Reserve Corp) made establishing a stable, predictable supply of Brazilian quartz a top priority. In doing so, the Board created a unique opportunity for suppliers and miners in rural Brazil.\footnote{From 1935 to 1944, the price of quartz rose from $5CR per kilo to $246CR per kilo, an increase of 4,800 percent.} Further, the quantities exported from Brazil also increased ten-fold. The U.S. imported 67,052 pounds of quartz in 1939, and nearly doubled that number in 1940 to 126,521 pounds.\footnote{Government quartz was purchased, graded and shipped to the National Stockpile managed by the Metals Research Company and released by the War Production Board for processing. Though attention had been focused on growing the national stockpile, a deficit of 87,200lbs of raw quartz meant that the U.S. needed to shore up supply, and quickly. The official “Quartz Crystals Procurement Plan” made its way across the desk of the Chief Signal Officer of the Armed forces on September 23, 1940. A team was promptly sent to Brazil, while the State Department requested that the Brazilian government only sell to other countries after offering to sell to the U.S. first. The U.S. Army sent several “fact finding” missions to Brazil in 1941, the first of which was led by Stephen Capps of the U.S. Geological Survey. Capps’ tour of the Sete Lagoas Region (situated between Belo Horizonte and Curvelo) indicated that the U.S. would}
need to start buying both low and high quality crystals as a way to prop up mining industries in Brazil (Butler and Johnson 1945). As Thompson recalls, “Larger crystals, and those having two or more faces were, of course, more desirable than smaller or un-faced crystals. However, small, un-faced crystals could make up approximately 15% of any lot purchased. Also crystals containing obvious defects could be purchased provided the usable volume of the stone was at least 60 percent” (Thompson 2012:95). In short, despite suffering from a glut in supply, the U.S. was becoming pickier about what material it was receiving from Brazil.

The U.S. government had contracted with Brazil to buy all quartz production (to keep it out of Axis powers’ hands), and mine owners had become increasingly worried about having to shut down mines due to the elimination of Japanese market for their lower-quality crystal. Capps passed onto the Metal Reserves Corporation the suggestion to buy all production, however in order to do so, the U.S. required that all quartz be inspected and graded several times as it passed from mines to U.S. purchasing agents. The following year, the U.S. established inspection offices near the port in Rio de Janeiro and trained a motley crew of quartz exporters, American mining engineers and inspectors from both Brazilian and British governments. An additional 400 local Brazilian inspectors were also trained in inspecting and grading crystals’ usability. The makeshift inspection stations allowed for rejected quartz to undergo salvage attempts by trimming away portions with defects, twinning, or inclusions. During a purchasing hiatus in 1941, inspections teams were able to work through the dozens of tons of quartz that had accumulated in Rio, effectively stabilizing supply to manufactures in the U.S.

For its part, the Brazilian Government also became concerned about classification at this time, and codified laws regarding the exportation of quartz in February 1941. Intended to more precisely regulate and accurately assess taxes to the vast quantity of material being exported to
North America, the Brazilian Ministry of Agriculture instituted an official table defining quality specifications and minimum price standards. Material was classified first in two main categories, and then graded by class (A, B, C, D), size (twelve ranks from 100 grams to over 10 kilograms), and by form (faceted or irregular). In total, this resulted in 96 categories, each with its own individual minimum price floor. An ad valorem export tax of 10 percent was assessed by government inspectors at U.S. ports responsible for certifying export parcels to customs and administrators in the Receita Federal. (see Carvallio do Amaral 1949).

In a 1937 publication for the Brazilian National Department of Mineral Production titled “The Economic Geology of Minas Gerais”, Luciano Jacques de Moraes wrote that for North American piezoelectric consumers in the prewar years, “the most sought after crystals are those having a long body and short head, and the material should be free from defects and clear as glass.” Many mines near Diamantina produced optical-grade quartz today, however, only a handful of quartz mines are well known for producing crystals with “a long body and short head.” My field site for this study, Caba Saco, is one such mine. In the 1930s and 1940s, oscillator manufactures referred to these long crystals as “candles,” and they were not easily sourced (Gordon 1945:270). Today they are known as “lasers” and remain rare and difficult to source.

Monitor Piezo of Pasadena, California, represents one important crystal manufacturer whose success was hinged on ‘candles’ likely from Caba Saco. Established in 1928 by Herbert Blasier, Monitor Piezo initially produced crystal oscillators for amateur radios, commercial radio stations, and two-way radio sets (ie Police and Fire). At the start of the war, however, the company shifted to military radio oscillator production. Blasier entered the war effort by making
a survey of the quartz importers, “endeavoring to find out which type of raw quartz was least popular with other manufactures, but still available in large quantities” (2012:59).

Unlike other quartz importers, Blasier designed Monitor’s production strategy around utilizing the long, thin “candle” crystals, effectively decreasing competition for this type of raw quartz. For this he was dependent upon private importers, which eventually resulted in supply problems. From 1942 to 43, 60 percent of the raw quartz imported to the U.S. arrived through small importers (2012:111). After being unable to source candles— and to avoid closing its doors— Monitor Piezo petitioned the Metal Reserves Company’s government stockpile for a shipment of 1,000 pounds of candles. Working through these crystals quickly, Monitor’s supply-demand problems persisted. Signal Corps officials decided to authorize the release of 200 pounds of the highest-quality material from Treasury Stockpile for a special order, but required the direct approval of President Roosevelt to do so. On Easter Sunday 1942, Roosevelt signed Executive Order #9123 releasing crystals for Monitor’s specialized crystal units (see Bottom 1981; Thompson 2012:113). This phenomenal story demonstrates the profound political, economic, and strategic value that lasers, or “candles,” have held in U.S. and Minas Gerais’ history for over 75 years.

BRAZIL’S CRYSTAL COUNTRY

Most of Brazil’s production took place in the states of Goias, Minas, Gerais, and Bahia, where explorers and geographers had long focused their efforts on mapping the mineral belts spanning those regions. Minas produced about 45 percent of the quartz exported for U.S. stockpiles, and of that 75 percent of Minas Gerais’ production came from zones north of Belo Horizonte near Diamantina, Sete Lagoas, Curvelo, and Montes Claros (Carvallio do Amaral 1949). In these regions, most quartz occurs in veins embedded in weak shale or sandstone. With
some notable exceptions, large-scale industrial mining is often not possible due to a variety of
geological factors such as underground streams and reservoirs. For example, the presence of
water makes extraction exponentially more dangerous, dirty, and laborious, and almost always
necessitates human labor. As Johnson and Butler note in a 1945 article for the U.S. Geological
survey, “with few exceptions, individual deposits are small, and it is the aggregate production of
many small deposits that make the impressive production of Minas Gerais.” (Johnson and Butler
1945:644).

Richard Thompson provides a light-hearted glimpse into what life might have been like
for small-scale miners in Minas Gerais at that time:

“As the sun rose over the mountains to the east, the quartz miners would leave their
thatched-roof huts, grab their picks and shovels, and lead their donkeys down to the mines
to begin another day. Down in the open pits, the miners would spend the day chipping
away at the terraces that covered the sides of the mines. As the quartz occurred in long-
running veins as well as isolated pockets, this was the most efficient method of locating
and extracting the crystals. It was back-breaking work; for every few pounds of quartz
uncovered, hundreds of pounds of dirt, rock, and unusable “milky” or “bull” quartz would
be carted out of the pits by the donkeys” (Thompson 2012: 117).

During the War, a tremendous amount of labor was needed to yield relatively very little
valuable material. Most Brazilian quartz mines are burdened by gangue material (valueless ore)
such as milky-white opaque quartz that composes the majority of a vein. The proportion of mine-
clean material was very low in the 1940s, averaging about 1:10,000 based on the total weight
quantity of material excavated. Only a very small percentage of mine-clean quartz is usable,
and most mines produced at most 250 kilograms of clear radio-grade quartz each month. During
the war years, it is estimated that the cost of mining ranged from $40 to $200CR per kilogram (of
highest quality quartz yielded). American military geologists Stoiber and colleagues (1945)
noted that a price of 100CR was paid in mining districts from mine-clean crystal: “It is estimated
that during the war period there have been no more than six to twelve mines in Brazil in which

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there has been production of one ton a month for any length of time. Most diggings produce less than 500 pounds per month and many only 50 or less” (Stoiber et al. 1945:254).

A number of important social, environmental and infrastructural factors impacted production in Brazil during the early 1940s. Poor transport conditions often strained relations between miners and buyers, making it difficult and time intensive to move goods from the rural areas of Minas Gerais to Rio de Janeiro ports. Stoiber et al. noted that because of precarious transportation, “local trading has sprung up where the miner sells the crystal to a local merchant rather than direct to the quartz exporter” (1945:267). Thus, a series of five or six transactions created an appreciable time lag between production and export, and as I discuss in later chapters, remains a defining feature of the social creation of value in Brazil’s quartz markets even today.

In addition to transportation difficulties, Minas Gerais’ climate— defined by dry and rainy seasons— also definitively impacted wartime production, as pits would fill up with water— inevitably making work more frustrating and labor-intensive. Similarly, labor shortages, which followed seasonal weather patterns, also impacted production. Pumps permitted operation during the rainy season, however not everyone was interested in working in the muddy, dangerous, cold, wet pits. Much like today, U.S. geologists noted that in the early 1940s, miners’ “activities [were] entirely influenced by personal economic conditions. He may abandon the pit in which he is digging quartz in order to wash gold or diamonds, or if food is temporarily scarce, may take to raising the staples of his existence, rice and beans” (Johnson and Butler 1945:644). For miners, unlike large wholesalers, the economic payoff seldom matched the labor required.

Throughout most of the war, mines in Brazil produced only about 50 percent of the demand for crystals in the U.S. In 1942 the supply situation had become dire, prompting the U.S. to send specialists. The Army Signal officer sent special advisor geologist Dick Stoiber to Brazil
to develop a program to increase mining production through mechanization. The Board of Economic Warfare had authorized shipment of nearly $1 million USD of mining equipment to Brazil in order to bolster and stabilize production. Stoiber was charged with determining where, how, and to whom the machinery should be distributed (Thompson 2012:45). The investment in mechanization did little to increase the readily available supply of raw quartz, and eventually a large proportion of the machinery imported to Brazil for the quartz program was moved to other regions and used in mining mica and other strategic minerals. Stoiber and other military specialists noted that the limited success of the mechanization program was hinged on “the peculiar geological nature of the quartz deposits”; however, it also became clear to them that “the social and economic conditions of life and trade in Brazil were also a factor” (Thompson 2012:125). Further, because it was on an emergency basis, attempts to mechanize the quartz program generated little long-term development and failed to improve the sanitary conditions and public infrastructure in areas where equipment was allocated. The persistence of these precarious conditions and how they shape contemporary quartz markets are the focus of the first several chapters of this dissertation.

In September 1943, the mining claim “Caba Saco” was officially registered with the Brazilian Ministry of Agriculture. Though the mine surely predates the War, it was one of hundreds of quartz mines legalized throughout Minas Gerais in the 1940s. Most of my collaborators in Brazil come from families who have been working in the quartz business for generations, either as buyers or garimpeiros. In the period of greatest production during the War years, there were an estimated 50,000 garimpeiros working throughout Brazil, with nearly 15,000 working in Minas Gerais alone (1949:17).
Quartz businesses shaped the interior of Minas Gerais in untold ways, and a 1949 memo from the Brazilian National department of Mineral Production even thanks the “heroic garimpeiros” of the national quartz campaign to bring quartz to exporters and for the “much that they gave to the cause of the Allied Nations” (1949:11). On my first visit Corinto, Minas Gerais— a present day wholesale center located near the historic mining regions of the Serra do Cabral and the Serra dos Cristais— I stumbled upon several city monuments paying homage to these miners. A loose translation of one placard dedicated by the local municipal government reads: “In the heart of the land of Corinto explodes the exuberance of crystals.”

POST-WAR CRASH

After 1945, the urgent wartime demand for quartz slowed considerably, as did production in Brazil. By 1950, production was roughly one-fifth of what it had been during the War years. Likewise, the price of natural quartz continued to drop from just under $4USD per kilogram in the 1950s to around $1USD per kilogram in the early 1970s. Brazil remained the world’s largest producer of hyaline quartz, lasca (high purity silica feedstock), and crushed quartz in the 1960s, even after the first commercial production of synthetic quartz crystals in 1958. Likewise, the FOB (free on board) value remained relatively stable during this time, despite the lack of demand for piezoelectric crystals. As the piezoelectric market shifted to lab-grown crystals, the
precariousness of Brazilian production increased as and the need for reliable sources decreased. (see Perfil 1972).

With the instillation of a military dictatorship and the creation of the Brazilian Ministry of Mines and Energy in 1961, mining industries boomed for the next two decades. These years of massive infrastructural development in the country– often termed the Brazilian Miracle– was in part due to a massive increase in raw materials, which emerged in tandem with an overhaul of the country’s mining code that again separated surface from subsurface rights.

As with most Latin American countries, Brazil had been deeply committed to protectionist policies, and import substitution industrialization was the dominant economic strategy up until the early 1960s. While such policies made it difficult to import materials, the military regime increased growth and diversity of exports by abolishing state export taxes, simplifying administrative procedures for exporters and introducing a program of tax incentives of subsidized credits for exports, particularly of raw materials (Cardoso 2009:13). In regards to mining specifically, the most important contribution of the new military government was the publication of a revised mining code in 1967, which removed landowners as legal owner of mineral rights, and instead passed possession of subsoil rights back to the Brazilian government. The new code– aimed at attracting capital from abroad– required that all entities involved in mineral production were either Brazilian citizens, or appropriately registered as Brazilian entities. The code not only represented the strengthening of state bureaucracy, it represented confidence in Brazil’s newfound economic stability under the military regime.

Today, however some land-owners and wholesalers complain that the still-operating, revised mining code was filled with legal and regulatory loopholes, allowing large companies and rich individuals to take a nearly unlimited number of exploratory claims on a single property.
This creates opportunities for mine developers with experience and resources, while disadvantaging individuals not associated with industrialized mining, who don’t have the equivalent of $60,000USD to apply for a mining permit. In my conversations with mine regulators at the DNPM, many suggest that current mining code (nearly identical to that of 1967) is more than partially responsible for the persistence of undocumented and unregistered mining in Brazil. It is simply too cost prohibitive for small-time operators to go through the legal and regulatory channels to register and maintain small quartz mines. Thus, most small-scale mining today is technically illegal.

Though Brazil continued to export crushed quartz used as feed material for lab-grown quartz, the perpetual threat of disrupting quartz supplies from Brazil served as the foundation for the post-war development of the cultured quartz industry. Lasca, the small quartz chips used as feedstock or nutrient material for synthetic quartz continued to be exported to Japan, Europe and Russia, where cultured quartz industries boomed during the 1970s. Lasca is produced by chipping crystals, or flaking away the imperfection and faces. To produce .045 kilograms of cultured quartz, approximately 0.63 kilograms of lasca would be needed. Producing lasca was a very labor-intensive job, often filled by miners’ wives or children. An American importer with decades of experience buying in Brazil recounted to me his first arrival in Brazil, when the
production of lasca was in full force: “When you arrived at the mine and turned off the truck’s motor all you were hear was, ‘clink, clink, clink’ as people were chipping apart these perfectly formed long, clear crystals into little flakes . . . It made me want to rip my hair out.”

The Caba Saco mine– given the purity and clarity of the material it produced– became an important supplier to the world’s lasca industries after the demand for piezoelectric grade material tapered off. As many miners have suggested, the name “Caba Saco” itself– shortened from “acaba saco” (empty bag)– references the lasca era. As local legend has it, a miner carrying a 40 kilo burlap bag of lasca on his back, delirious from the brutal Brazilian sun, failed to realize that his bag had ripped at some point on his journey, spilling lasca out along the sandy trail. He arrived to find an acaba saco, and consequently had nothing to sell. The accuracy of this story is questionable given that there is a Serra do Acaba Saco and an Acaba Saco stream referenced in several maps from the 18th century. Curiously, these maps place those geologic features at a different location than the current mine. However, that the tale lives on in local imaginaries is important. The tragic acaba saco story was always told in joviality or as a joke, and points to the importance of levity as a type of moral capital amongst miners– who receive very little economic reward for their hard labor.

At crystallography labs around the world, researchers discovered that they could recycle synthetic quartz as the nutrient or feed material for lab grown specimens, “finally bringing America’s long dependence on Brazilian quartz to an end” (McGahey 2009:302). Unlike natural quartz, lab-grown material can be guaranteed free of impurities and defects making it ideal for fused silica products such as fiber optic cables and devices of the digital age. Brazil does continue to produce industrial quartz, though the majority of it is used in cosmetics, paints, cements, silicons, ceramics, refractory materials and a range of construction and other industrial
materials. Literally hundreds of products in our daily lives incorporate Brazilian quartz products.\textsuperscript{48} According to records from Brazil’s National Department of Mineral Production, 1970 was a booming year for Brazilian quartz production (Perfil 1973:9), but the market collapsed in the immediate years following. By 1972 the Brazilian National Department of Mineral Production noted that most of the quartz deposits in the country were paralyzed, not because their reserves were exhausted, but because the foreign market no longer needed its material.\textsuperscript{49} It was becoming clear that the market for quartz was shifting by 1970, as Brazil’s citrine and amethyst exports outnumbered exports of rock crystal by a ratio of 270:3. It is no coincidence that this corresponds with the rise in demand for colored stones in the US, in part because of an emerging countercultural consciousness around the power of stones, and a burgeoning New Age movement in particular.

\textbf{MAPPING THE NEW AGE}

The market through which Caba Saco crystals now flow, and indeed Brazil’s decorative stone and international New Age market more broadly, can be traced to a handful of Brazilian

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\includegraphics[width=0.4\textwidth]{figure1_9}
\caption{Synthetic quartz specimen with saw marks from quartz plate production.}
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and American actors who found themselves in Brazil during the early 1980s. Serendipitously, several factors coalesced to create a new demand in North America for crystals at this time. First, Lazaris, a channeled entity popularized by retired Florida insurance agent and New Age medium Jach Pursel, traveled the world giving conferences and channeling workshops, often with boxes of crystals in tow, many from these early suppliers in Brazil. Jach’s Lazaris website now claims that “after decades of honing his artistry of working with crystals, he has come to accept that he is a crystal liaison, a conduit who can listen and tell the tale the crystals want to tell” (Pursel 2016).

Second, in the mid-1980s, several important crystal-healing manuals were published, providing specific schematics and tutorials for working with crystal energy. These books were not immediately popular at first, but caught fire as New Age healing and channeling became more mainstream. In response to a question about where the popularization and demand for crystals originated, one wholesaler immediately replied “If you want all the good fruit, you need to go Out on a Limb. Shirley MacLaine—she was on the cover of Time Magazine.” Without fail, nearly every long-term wholesaler or practitioner I spoke with attributed MacLaine’s appearance on the cover of Time magazine holding a small quartz crystal cluster as a key spark from which North America’s crystal healing movement caught fire.

On such man was Rock Currier, owner of Jewell Tunnel imports, a large Los Angeles based crystal wholesale outfit. Rock passed away during my fieldwork period, though his legend in the crystal world lives on. A 1988 Los Angeles Times article pointed out that in the late 1980s as crystals were becoming an important New Age commodity, importer Rock Currier “saw his gross sales double between 1986 and 1987” (Beyette 1988). Despite being a pivotal force in
shaping the New Age moment Rock told me that the “hocus-pocus” of crystal healing was “total bullshit, that made people rich.” Perhaps himself included.51

Rock is an important figure not only because he was an initial market maker, rock hound and amateur geologist, but because his extensive global travels in the 1980s are meticulously archived in at Mindat.org, a mineralogy database featuring comprehensive descriptions of minerals and their provenance.52 Rock was a master storyteller and his writings are pragmatic, factual, detailed, and full of wit and sarcasm. His dozens of trips to Minas Gerais (and Diamantina in particular) include extensive photo archives, descriptions of the people he met, descriptions of the geology, and even occasionally disparities in U.S. and Brazilian market value and the profit he was able to realize. Perhaps Rock’s greatest contribution to the New Age movement beyond simply supplying crystals is that he connects crystals to a particular place—Diamantina in particular—and in a way has helped make that place real to consumers and mineral collectors. Rock’s writings on Mindat.org build on the long history of maps, guidebooks, and centuries of geologists and their locating technologies which have defined Diamantina as a site of production. Rock offers an important contemporary perspective on the origins of New Age material.

In addition to the Mindat.org database, a new type of map is shaping how foreigners and Brazilians alike are engaging the economic geologies of Brazil informal crystal mining. As one wholesaler complained to me, “Things are all fucked up now because anyone can just go on Google Maps and figure out where a mine is! Before, you had to have connections and someone had to take you out there. Now anyone [though in reality he was referencing Chinese wholesalers] can go out there and buy.” I must confess that Google Maps was crucial to my own archival work, not as a way to find a mine to buy material from, but in order to understand the
location of old mines and how precisely European explorers might have discovered them. In this sense, maps still represent an execution of territorial power, or at the very least territorial aspiration. For centuries, the symbolic iconography of maps reproduced and communicated political power both for colonial elites as well as for European and American geologists anxious to exploit Brazil’s mineral wealth. Today similar types of iconography continue to communicate opportunity as much as they do market power, or at least market potential.

15 Archival work for this project was conducted at the Arquivo Público de Minas Gerais in Belo Horizonte and at the Casa da Gloria Instituto Geociências of the Federal University of Minas Gerais.

16 An extensive bibliography of Brazilian slavery by both foreign and Brazilian scholars has documented the social, political, and racial dimensions of slavery from sugar (Eisenberg 1974; Schwartz 1987), to coffee production (Dean 1976; Stein 1957, Topik 2006), to rubber (Weinstein 1983), and Minas Gerais boasts a rich historiography concerned with the relationship between mineral extraction and exploitative labor as well (Bethell 1970; C.R. Boxer 1962; Freitas 1994; Fogel and Engerman 1973; Igléias 1958; Matosso 1986; Wirth 1977). Much of the scholarship on early extraction industries in Minas has focused on the human labor required to extract, refine and transport mineral wealth (especially gold) from the subsoil to global markets. For example, J.R. Russell-Wood’s (1977, 1982, 1987) outstanding work on the relationship between mining and slavery importantly highlights the impact of gold mining on colonial institutions of slavery, tracing how Brazilian gold transformed the political economy of Portugal, and Europe more broadly.

17 Marshal Eakin (1989) has noted that “in the eighteenth century, Brazil produced the vast majority of the gold that circulated in Europe and helped fuel England’s industrial expansion,” (1989:76), and much of the historical treatment of mining in Minas Gerais has traced the economic significance of gold (Bergad 1996; Boxer 1962; Higgins 1999) and diamond mining (de Lima Júnior 1945; D. Ramos 1988) through booms and their slow demise. The village Vila Rica de Ouro Prêto (Black Gold) became the capital of the Minas captaincy, and Ouro Preto has remained one the state’s iron ore centers, and producer of many other minerals and gemstones from quartz to imperial topaz.
The Jequitinhonha river flows below Caba Saco, and the mine’s natural springs flow down into the river.

Brazilian diamonds were in such high production that many diamonds were being passed off as Indian origin, in addition to being sent there for processing.

Diamantina– and Minas Gerais more broadly - must of course be contextualized in terms of these complex socio-racial dynamics. It has been estimated that 341,000 enslaved people were brought to Minas Gerais during the mining booms between 1698-1770, engendering a demographic shift that shaped the social dynamics in the region and indeed Brazil in general. Strong social hierarchies between diamond prospectors, representatives of the crown, and enslaved African populations are still resonant today.

The Portuguese Crown garnered massive wealth from Brazilian Diamonds which were sold primarily to Holland and England, primary cutting and polishing centers at that time. Portugal's fortunes were used to erect spectacular buildings as it further developed its Empire, whereas England invested the wealth it received to subsidize the war against Napoleon (Peirera et al 2005).

Brazilian mines were nationalized in 1771 as a way for the Crown to assert control over the riches, though as soon as Brazil gained independence in 1822 they shifted back to the original concessions system.

Mariana de Oliveira Lacerda’s (2014) Ph.D. dissertation, "Paisagem da Terra dos Diamantes: passado e presente a favor de uma reflexão prospectiva" retraces both the early mapping of Diamantina and the early explorers’ findings as they stumbled through this strange land.

Mawe was among literally hundreds of European explorers visiting Brazil during the colonial and post independence period; some documented Brazil’s spectacular biological diversity, others, like Mawe, were concerned with Brazil’s unique geological and mineralogical potential. Mawe’s work is important because he offers a very thick description of elite practices and the general feel of Tejucó (now Diamantina).

Robert Francis Burton (1869), English explorer, geographer, ethnographer and important character in early anthropology, produced the second major English language documentations of the geological, mineralogical, and social commentaries of the Diamantina region in his travel journals published as “The Highlands of The Brazil” (1869). Burton was an avid and experienced explorer and it is interesting getting his perspective on how barren and rough the geography of Diamantina appeared to him, as well as his interesting perspective on slave relations in the region.

English capital left Brazil when the South African gold rush started in 1886. For an interesting body of scholarship concerned with the history of British preeminence throughout Brazil and the role of foreign firms in early modernization projects throughout the 19th century. I would direct the reader toward Manchester (1933); Graham (1968); Guenther (2004); Stein (1957).

Silvia Figueiroa (1990, 2001, 2002) has published extensively on the history of mining in Brazil, and particularly on Germany’s role in developing geosciences in Brazil through the training of Brazilians in Freiburg and in the Portuguese commissioning of German mineralogists to work at the school of the mines in Ouro Preto and to develop mining activities. Situated in the heart of the Zona Metálgica, Ouro Preto is home to the Escola de Minas (School of the Mines, opened in 1876), which served as the technical training center for generations of mineralogists working throughout Brazil (see Cornejo Bartorelli 2009). Now a UNESCO heritage site (like Diamantina), Ouro Preto remained the capital of Minas Gerais until 1897, when it was then relocated to the planned city of Belo Horizonte.

Brazilian material being “shipped to the orient” is a market formation that is still around today, as I will discuss in later chapters.

I would direct the reader to Max Hermann Bauer’s 1844 Precious Stones to get a sense of the global market for quartz and other semiprecious rocks during the mid 19th century.

Rachel Laudan’s From mineralogy to geology: the foundations of a science (1650-1830) offers an incredibly useful critique of how the field of geology emerged through enlightenment concerns with how minerals are formed.

Leitão and Alvarez (2011) make a good case that the history of geology actually goes back much further than geologists have traditionally recognized, specifically to the Capernican revolution. They argue that the early geological knowledge and ways of thinking about the earth were shaped through the many voyages taken by Portuguese and Spanish explorers.
Many European explorers made their way to Diamantina throughout the 19th century. It would be a disservice to an intellectual history of the Diamantina to not mention the important contributions of Augustin Saint-Hilaire, whose 1817 travels throughout the Diamantina district provided intricate descriptions of the region’s unique geology. Similarly significant are German botanists and explorers Johann Baptist von Spix and Carl Friedrich Philipp von Martius who voyaged (1817-1820) to the interiors of Brazil collecting and describing animals, plants, rocks, and nearly anything else of scientific and economic significance. Similarly, French Naturalist Auguste de Saint-Hilaire collected around 7,000 species of plants and visited Diamantina in 1817. Sainte-Hilaire published “Viagem pelo Distrito dos Diamantes e litoral do Brasil” in 1833. The Swiss naturalist Johann Jakob von Tschudi, who later became a diplomat to Brazil, spent much time mapping South America, and Diamantina specifically in the late Imperial era (1858-1863). Taken together with Mawe, Eschwege, and Burton, these European naturalists paved the way for North American geologists in the later part of the 19th century.

Hartt was part of the Morgan Expeditions and drew from many other European and Brazilian explorers. Derby, O. A. (1899). On the association of argillaceous rocks with quartz veins in the region of Diamantina, Brazil. American Journal of Science, (41), 343-356.

Harley’s (2009) “Maps, knowledge, and power” in Geographic Thought: a Praxis Perspective provides a useful way to understand critical geography or political geography. Curious here is how “critical geology” might emerge through this tradition. Critical geology undergirds my claims in later chapters.

Calógeras, João Pandiá is listed as the author of “As Minas do Brasil, e Sua Legislação” (1904), a national publication of mineral laws in the early days of the Republic.

In addition to amateur radio operators in the early 1920s, Bell radio laboratories was also experimenting with pickups and microphones containing plates manufactured from quartz crystals. However, a revolution in electronics began in the 1920s with the development of crystal oscillator plates.

In an attempt to outline a 500 year history of mining in Brazil, Machado and Figueiroa (2001) have noted that along with the domestic industrial importance of Brazilian minerals, Minas Gerais was a central supplier of manganese to Allies in the First World War. Despite being rich in natural resources, before WWI Brazil lacked any major iron, coal, petroleum, or cement industries (Topik 1986:150). However, through federal loans and the promotion of the industrial sector, Brazil did come to play an important role in the supply of strategic minerals to the U.S. and the UK throughout WWII. Such mineral supplies included mica, bauxite, calcite, diamonds, iron, quartz, tungsten, manganese and iron ore, all shipped to Allied forces in Europe and the U.S. (Thompson 2007).

Throughout the 1930s, Brazil exported crystals primarily to Germany, the US, and Japan. The specifics of the rise of the crystal industry are fascinating, and I would refer readers to McGahey’s Ph.D. dissertation “Harnessing Natures Timekeeper: A history of the piezoelectric quartz crystal technology (1880-1959) from Georgia Institute of Technology. Also, Richard Thompson’s (2012) “Crystal Clear: The struggle for reliable communications technology in World War II” is an invaluable resource for understanding the political-business partnerships required to secure massive mounts of quartz from Brazil.


Frondel (1945) and many other authors contributed fantastic work to a special edition of American Minerologist. (Vol 30:5-6. 1945) which details the importance of the oscillator plate industries in the Second World War. It truly was a remarkable undertaking.

This frenzy to stockpile impacted Brazil in multiple ways. The 1942 “Washington Accords” as they are known in Brazilian stipulated that through financial support, Brazil would reinforce the supplies of Allied steel by building a maritime terminal, modernizing the country’s railroad system, and open mines in the Rio Doce basin. Thus, in 1943 Compania Siderúrgica Nacional and Companhia do Vale do Rio Doce, now Vale, the world’s largest mining company were born. The agreements bolstered trade relationships...
between the Allies and Brazil, and finally incentivized Brazil’s development of a fully virtualized steel industry and dramatically transformed mining legislation and enforcement for the next 85 years.

42 Stoibet et al. note that as an indication of the wide range of prices, quartz from the government stockpile was sold at prices varying from $2.25 to $46.20USD per pound. Quality and quantity directly impacted price.

43 Government imports of piezoelectric quartz in 1943 were valued at $11,370,803. Indeed, no small sum for that time.

44 This number of course varies mine-to-mine, and indeed pocket-to-pocket. In my experience, breaking through, and removing, gangue material defines much of the manual labor associated with quartz mining.

45 Thompson notes that equipment included dragline shovels, caterpillar tractors, bulldozers, compressors, pumps, drills, welding and cutting tools, generators, trucks, jeeps, radios, camp gear, shotguns, jackhammers, spikes, picks, explosives, and blasting caps.

46 If one is interested in learning more about the industrial commodification of minerals & rocks and their markets, Kogel et al. 2006 provide a fantastically detailed account of quartz.

47 There were several origin stories, including reference to an empty lunch bag, however, this was the one that was retold most frequently.

48 Brazil has now been surpassed by Turkey as the world’s largest quartz producer a curious fact given that I wrote this chapter in Istanbul.

49 By 1970, it became clear that the market for quartz was already starting to shift, as Brazil’s citrine and amethyst exports began to outnumber exports of rock crystal by a ratio of 270:3. Interestingly this corresponds with the rise in demand for colored stones by practitioners in the Hippie and emerging New Age movement.

50 Crystal healing knowledge was had been around for centuries. Even in the 1970s, several dissertations had undertaken systematic assessments of crystal healing. However, Rafaeli’s books are important because they give examples and tutorials.

51 Several factors in at the beginning of the twenty first-century have dramatically shifted the dynamics of Brazil’s quartz markets which buyers and sellers enjoyed in the 1990s. First, with a surge of Chinese buyers in the early 2000s severely limited the supply of crystals in Brazil’s interior. Next, in the mid-aughts the DPNM required many mine operators to re-register their claims through an expensive and lengthy process. Lastly, as the Brazilian economy strengthened, men who typically were forced to work in the informal margins of clandestine mining found new opportunities in labor markets, often in larger cities. Taken together, material was no longer abundant, nor was it particularly cheap. Further, the start of the 2007 global recession signaled the end of many North American dealers traveling to Brazil and selling at shows in the U.S. Many could simply no longer compete with Brazilian dealers at U.S. gem shows, and it was often not worth the time or money to spend traveling to Brazil when the same material could be found on tables in Tucson or Denver. Their New Age clientele were also feeling the pinch of the recession and sales dipped sharply for several years.

While the market in some ways has recovered, dynamics are constantly shifting and were particularly tenuous during my fieldwork. Corruption scandals throughout 2014-2016 rocked Brazilian politics and the Real lost over 60 percent of its value during my time in Brazil. At the same time, the dollar was the strongest it had been in 10 years, causing many Brazilians to rethink their expensive selling trips to Tucson and Denver. Many wholesalers also claimed that political concerns in the U.S. further impact the market. In the words of one dealer who has been in business since the 1980s, “election cycles make people’s buttholes pucker up. And shit, this year, rightly so!” Despite the constant fluctuations, one thing seems clear: Brazil will continue to produce crystals for the foreseeable future and clients in the U.S. will continue to buy them. Of all the market shifts over the last century, this has remained constant.

52 Incidentally, I worked with the sons and daughters of his primary supplier in Corinto and Diamantina from those days. One particular post of his explicitly shows Rock’s impact:

“When the New Age movement became a prominent force in the quartz marketplace there was a considerable demand for large, relatively perfect quartz crystals which the New Age movement called ‘generators.’ The supply of such crystals fell far short of demand because most of the big crystals were either damaged in the ground by ground
movement over geological time or damaged during extraction. It was found that the New Age movement would accept “recuperated” crystals, where the sides were often cut flat and the terminations polished. They have become a staple in the marketplace and the same method has been applied to making “generators” out of rose quartz and almost any other lapidary material” (Currier 2011)

As more and more Brazilian’s “found that the New Age movement would accept recuperated crystals,” material that was once valueless junk suddenly had potential resale market value. This was not unlike the previous century when quartz that was unfit for optical purposes suddenly had value as piezoelectric material. The rapid decline of industry’s demand for high-quality quartz in the 1970s made the acquisition of clear, high-quality material relatively easy to come by in the 1980s, and with some simple lapidary work, a chipped, or even shapeless hunk of quartz can be brought back to life, embedded with commercial value. Many Brazilian quartz dealers come from generations of quartz workers, however my collaborators who do not come from long established crystal families, most arrived on the scenes in the 1990s. Stories of crystal mania at these gem and mineral shows were the initial draw for these market newcomers.
Chapter 2: Affect and the Moral Values of Hope

INTRODUCTION

Even as an accomplished bicyclist, I took nearly an hour and a half each day to traverse the 11km ride up the dirt road to Caba Saco from BR-367— and as any miner will tell you, the trek is much longer by foot. When I finally arrived to Caba Saco one hot, clear July morning, I found my friends Vicente and Manuel in slow motion. Most miners work in teams of two or three and it had become clear in the days prior that these two were a very poor match— the relationship was beginning to wear them down.

I asked Vicente if he was okay, he looked at Manuel, then looked back at me and groaned, “I am tired. We haven’t found anything in a month. I want to leave.” His eyes drooped and his clothes hung loosely on his skinny frame. “When we find crystals, I feel energized, I can work all day— the crystals animate me! But when it’s like this I just want to sleep; it’s too exhausting.” Vicente's claim of feeling “energized” or animated when finding crystals was one

Figure 2.1 Hand-made cardboard sign indicating the road to Caba Saco
that I have heard echoed by miners from Brazil, Arkansas, California, Turkey, Austria and Nepal over the years of this ethnographic study. In Brazil, such narratives are nearly always followed up with an optimistic statement about how the best is yet to come. Luck, patience, and stamina will pay handsomely—will pay.

History is important for understanding how the affective aspects of mining shape life at extraction sites. For example, “gold fever,” and the mineral rushes of the eighteenth and nineteen centuries illuminate the affective power of minerals, the hope of opulent futures, and the expansion of national boundaries associated with them. Central to such affective encounters is not simply what mineral rushes mean, but what they do. As anthropologist Gisa Weszkalnys has explained, “mineral rushes show us how dispersed energies have helped open up extractive territories” (Weszkalnys 2016:141). This is true throughout the Americas, and as the previous chapter showed, Brazil in particular. In this chapter I ask, how might such affect energies shape labor process at one node of a commodity network? Assuming that these experiences are not simply false consciousness made manifest, what does it mean to be “energized” by the affective experiences of mining? What forces, bodily experiences, histories, and intimacies animate such encounters? How do the various moral, discursive, and political-economic arrangements in Brazil’s quartz industries shape how these affective experiences become part of a “moving, interpersonal field of wishes and desires” (Cassaniti 2015)? Bringing together anthropological engagements with affect in reference to notions of “hope” helps frame these questions.

Scholarship on affect spans many disciplinary chasms and traditions; across these, affect has multiple meanings, and is difficult to pin down. This makes the concept of affect generative. Most anthropologists tend to treat affect as distinct from emotion (Lutz and White 1986), characterized as a type of embodied intersubjectivity with roots in Spinoza (1985), Deleuze
In distinguishing affect from emotion, Analiese Richard and Daromir Rudnyckyj (2009) have argued, “affect suggests relations practiced between individuals rather than experiences borne by sole individuals” (2009:61). In this sense, affect might be viewed as a type of “public feeling” (Stewart 2007), energy field (Cassaniti 2015), or general “atmosphere” (Anderson 2009). Julie Archambault has brilliantly characterized affect as a “shared autonomic force that exudes transformative, or in the least, productive potential” (2016:249). As the 2008 U.S. presidential elections demonstrated, the affective dimensions of “hope” pair well with powerful political discourses or fears (Masco 2014), and can be an important driver of social change (Masummi 2015). Affect is a public, interpersonal, yet embodied field through which hope may travel.

At Caba Saco, a hopeful affect influenced by shifting economic, social, and soil conditions is at once political and geological. A political geology of hope reframes hope as a method (Miyazaki 2004, 2006), a social category (Crapanzano 2003), or a practice (Mattingly 2010). I argue that hope as affect is more than just ethical action (Zigon 2009), it is a type of locomotive disposition that drives miners to throw themselves deep into the earth in search of crystals which eventually move toward New Age healers in the global North. Humor, like hope, as Donna Goldstein has similarly argued, can serve as a “window into the complicated consciousness of lives that were burdened by their place within the racial, class, gender, and sexual hierarchies” that inform the complex and stratified social worlds of contemporary Brazil (2005:3-4). Like humor, I argue that hope is both a personal and communal constitution– an affective way of being through which Caba Saco miners navigate the economic, political, and material realities of Brazil’s remote interior. This pushes back against claims that hope is a type
of false consciousness, but rather situates embodied experiences and moral frames of mine laborer within a complex global commodity network.

As Elizabeth Ferry and Mandana Lambert describe, it is the “affective qualities and moral sentiments embedded in the material practices of resource making” that help frame the contradictory aspect of global resource capitalisms (2007:12-13). Hope, as Webb Keane describes, “is one configuration of peoples’ stance for the future” (Keane 2015), and in this chapter, I show how the transcendent and temporal power of hope orients miners toward the potentiality of what lies just beyond. I argue that a hope dictates the daily practices and techniques of mine labor, molds how Caba Saco miners interact with each other and with buyers, and thus shapes the broader market through which their crystals pass. At stake in these affective engagements with subsoil geologies, mined objects, and value chains, is the potentiality embedded within them and flowing through them. Attention to the affective experience of hope gets at Trouillot’s call for an anthropology that makes “explicit claim(s) to the moral optimism that may be this discipline’s greatest appeal and yet its most guarded secret” (2003:136).

I begin this chapter by framing Caba Saco miners’ lives in reference to the broader social, political, and economic conditions of the Diamantina region. I draw from Cheryl Mattingly’s (2010) “narrative phenomenology” through which she has explored “hope as a practice at once personal and communal” (2010:8) to show how hope becomes deeply imbricated in the moral and political economy of artisanal mining in Brazil’s Jequitinhonha Valley. A “hopeful affect,” as I call it, undergirds the personal and collective actions that have driven boutique mineral production in Minas Gerais for over three centuries. The “energies” that Vicente feels are neither solely subjective, nor are they explicitly private emotions (Ahmed 2004)– they simply do not exist in vacuum. Like the “ordinary affects” described by Kathleen Stewart (2007), the
The energizing powers of hope are “public feeling that begin and end in broad circulation, but they’re also the stuff that seemingly intimate lives are made of” (2007:2). The affects of hope frame the personal and collective histories of mining throughout Brazil.

ETHNOGRAPHY UNDER GROUND

“The term *garimpeiro*, or prospector, which applies to an individual that goes around looking for precious stones, is derived from the word *garimpar* (to climb) which refers to the fact that when pursued by the royal troops they climbed to the top of mountain ranges to escape from repression in the Demarcação Diamantina during the colonial period.”

Cornejo e Bartorelli (2009)

“Minerals and Precious Stones of Brazil”

In contrast with much of the classic anthropological work on mining which focuses on large-scale industrial mining, this ethnography centers on Caba Saco, a small semi-clandestine quartz crystal mine about 25 kilometers east of Diamantina Brazil. At Caba Saco there is no formal boss, miners use very little machinery, and labor is not organized; thus, there are no salaries. Men are self-organized, working and living in groups of two or three. They spend their days tunneling down through loose sandstone and shale, and spend their nights in small huts or block houses listening to small radios, huddled around small television sets, or drinking and hanging out together.

Labor is difficult and turnover is high. Each time I visited Caba Saco between 2013-2016, I encountered new faces and new stories. Some men work for only a week or two, while a few I met had been laboring at the mine for decades.

If I am honest, much of my time at Caba...
Saco was spent standing around with Vicente or other friends in the dangerously hot sun waiting at the mouth of a small tunnel for someone below (often Manuel) to signal for us to hoist a bucket of sandy dirt up a rickety pulley-system, often rigged onto a lattice of scavenged tree branches. After pulling up several buckets of dirt, we would wheelbarrow the debris away. Caba Saco is essentially a giant sandbox, littered with huge piles from this task. During the long spells of downtime, when the miner below was chiseling through the sandstone, we would throw rocks at locusts and dangling mangos; I would be schooled in national politics, the art of sexual conquest, how to drink cachaça without getting sick. Despite miners’ recent purchases of smartphones and internet packages, quartz mining remains under-mechanized, and is extremely labor intensive.

*Garimpeiros* begin a mine by clearing dirt from the surface, exposing a vein– which may have been buried from decades of moving and replacing piles of sand. Finding a vein, more specifically finding a *productive* vein, requires a type of skilled vision that only experience can bring (see Grassoli 2007). Though I never got to see it in action, a handful of miners shared stories of being able to pass a dousing rod, or even a metal bar over the ground and having it pull toward the earth where a vein of crystals lay waiting. Such stories are not unique to Caba Saco, and share similarities with other transcendent experiences in other mining locales around the world (Nash 1979; Taussig 1980; Ferry 2005).

![Figure 2.3](image) An example of a vein which has opened up into a “pocket” where laser crystals grew

Once a vein is discovered, miners penetrate the earth by using mallets and
long steel bars or an electric jackhammer to break apart the fragile sandstone. Veins are not tubes of silica as their name suggests, but are more like horizontal plates that plunge diagonally into the earth, often crisscrossing other veins on their way down. As the veins widen into a mass of tightly packed milky white crystals “zippered” together so closely that they lack crystal known as \textit{dente de cão} (canine tooth/ dog’s teeth). As miners follow veins down, \textit{dente do cão} becomes too dense to penetrate— both jackhammers and large steel bars become useless. Homemade explosives composed of fertilizer and diesel fuel become the most efficient way to get through the mass of milky quartz. It is often just behind a mass of formless \textit{dente de cão} that a vein will un-zipper into a cavity, allowing crystals to expand and grow into the long thin lasers that Caba Saco has become famous for.

One hot July day, Vicente and I waited above as Manuel sliced through the loose sandstone with his temperamental electric jackhammer. Clouds of sparkly fine-grained silica burst up from the pit. Manuel couched and wheezed, well on his way to silicosis, a common respiratory condition that shortens the lives of many working in Minas Gerais’ quartz industries (Chiavegatto 2010). Vicente rolled a cigarette with a small scrap of paper torn from a child’s schoolbook and confided in me exploits from his “recreational” crack habit, his time in prison, and his distain for crystal mining. He loved to compare and contrast his experiences at Caba Saco with those at a clandestine diamond mine further down the Jequitinhonha- once Brazil’s most famous site of diamond production during the 18th and 19th centuries. Like many of the thirty or so miners at Caba Saco, Vicente had never learned to read, and when asked if he could write, he smiled shyly and looked away, “very little, only my name.”
I had met Vicente and Manuel shortly after moving to Mendanha, a small town of 900 inhabitants twenty-five kilometers east of Diamantina. Their mutual friend and financier (socio), had connected them in Diamantina, and though they had only worked together a short time at Caba Saco, their relationship was already quite strained. This was as much an issue of personality as it was about intergenerational and intra-class differences between the two. Unlike Vicente, a drug addict and petty criminal, Manuel was born a laborer and will die a laborer. Years of working as a machine operator on large infrastructure projects had conditioned him to be methodical, organized and extremely self-disciplined. Like Vicente, Manuel had never gone to school, but instead had spent his youth working at nearby clandestine gold and diamond mines. The Diamantina region is unique in that these precious commodities typically occur together. He had been enlisted by an older brother to haul dirt, cook for the men, and pan for gold flakes from the Jequitinhonha river. During these formative years, Manuel often slept underground in abandoned diamond pits, and eventually made himself a little subterranean shelter complete with a “fogo de linha” (a very efficient wood-burning stove and the central feature of many homes throughout rural Minas Gerais).

“What more did I need?” Manuel lamented. “I had the best sleep of my life; it was

Figure 2.4 Vicente signaling to me from the mouth of a mine
cool, dark, and it was safe. Everyone at that mine said I was like a little mouse down there.” He flashed a big, dentured smile as he ran two fingers across the sandstone wall like a mouse scampering away. But a mouse Manuel was not. At seventy-one-years-young, he was a brute of a man. His giant knuckles and forearms were deeply scared from continuous scrapes on rocks and rusty tools. Like many garimpeiros who swing a hammer for a living, one arm bulged considerably more than the other. Clad in a classic Brazilian ragged straw fedora, Manuel prided himself on being stronger than men half his age, particularly Vicente who he claimed that “drugs had eaten his muscle.”

Manuel had first arrived at Caba Saco with a mass of 300 miners who had descended on the claim in the early 2000s. I asked if production was higher in those days and he replied, “Well, there were more crystals because there were more people working, but mostly it was an illusion. People just told themselves there were a lot of crystals.” The ‘illusion’ Manuel described, represents the affective power of hope which has drawn people to the isolated hills flanking the Jequitinhonha valley in search of mineral riches. This is not unlike the false consciousness that has pulled millions of men to mining centers around the world, and in particular to the Diamantina region–first in search of gold, then for diamonds, then for crystals and other precious and strategic minerals. The rumors and hearsay associated with such hopeful illusions represent a type of “resource affect,” (see Wezkanlnys 2016) or what Benedict Anderson has called a, “deep, horizontal comradeship” that shapes ethical, economic, and political thought and action (Anderson 1983).

“OUT HERE I CAN BREATHE”

Tracing the routes between colonial producers and consumers helps frame how contemporary affective and sociopolitical arrangements are directly tied to these historical
processes. The historiography of mining in Minas Gerais often focuses explicitly on the economic significance of gold (Bergad 1996; Boxer 1962; Higgins 1999) and diamond mining (de Lima Júnior 1945; D. Ramos 1988), tracing these industries through booms and their slow demise. Extraction was a major factor in shaping Minas Gerais’ demography and political structure as enslaved labor was required to extract, refine and transport Brazil’s vast mineral wealth (especially gold) from the subsoil to Europe and beyond (Eakin 1989; J.R. Russell-Wood 1977, 1982, 1987). With the discovery of mineral resources in the late seventeenth-century, Minas Gerais quickly transitioned from peripheral hinterlands to the forced home of the largest number of slaves in Brazil, and the new economic focus of colonial elites (Bergad 1996). It has been estimated that some 341,000 slaves were brought to Minas Gerais during the mining booms between 1698-1770, engendering a demographic shift that shaped the social dynamics of Brazil’s interior, and country as a whole (Skidmore 1999; Freyre 1986[1933]).

Historian E.P Thompson (1963) has noted that the “only way to understand class is to see how class relations work themselves out over a considerable historical period (1963:49). This is especially true in Diamantina, and in an unsurprising example of how “class relations work themselves, out,” I found that Diamantina’s public archives list that many of my wealthiest collaborators in the Diamantina region share surnames with colonial slave drivers and local administrators from the eighteenth-century (see also Mawe 1812).

Miners at Caba Saco are situated in a precarious social position: at once embodying a romantic sentiment of Brazil’s historical ambition for mineral wealth and the forms of rugged individualism and courage that accompany it, while simultaneously facing intense prejudice and distain from others throughout this informal crystal network. Many middle-class Brazilians made
it clear to me – either with a sour look or more explicitly– that they feared for my safety at
mines. *Garimpeiros* simply can’t be trusted.

For example my friend Louis, a high-end mineral dealer joked with me on our first
meeting, “Oh, you’re an anthropologist? If you want to find the missing link to civilization you
can find it out there in the hills of Minas Gerais– they really are some ape-like humans.” I
chuckled uncomfortably, as he explained how miners– not knowing any better– indiscriminately
throw priceless collector specimens, worthless chunks of stone, and nicely faceted natural
crystals all together into one bag. As garimpeiros haul these mixed bags out of the pit and down
the mountain, specimens bump against each other, points break, facets chip, and the lot as a
whole becomes less valuable. “They bounce along down the path, starry-eyed and hopeful; they
think they’re bringing you a treasure, but when you open the bag all they have is junk. They just
can’t think.”

Louis's framing miners’ idiocy was echoed by another friend, a former miner who as we
were resting in the shade at Caba Saco one day, pulled out a smart phone to show me a short
cartoon video that he explained would provide “everything I need to know about miners.” The
short, titled *‘Seria que é?’* (What could it be?) presents a
back-and-forth exchange between two rural laborers (in
some versions referred to as Mineiros– from Minas Gerais)
walking along a road, commenting on how nice it was to be
working as men out on the land when they encounter a pile
of feces on the road, speckled with corn and other
undigested food:

![Figure 2.5 Screenshot of “Seria que é?” cartoon on Youtube.com](https://www.youtube.com/watch?v=qVPwdWk5cp0)
M1: Hey look at this! Is it shit?
M2: No it’s not shit.
M1: Yes, it is. It looks like shit, smells like shit.... [at this point the miner reaches down and swipes his finger in the pile of shit to taste it and comments] Yes, it is shit.

Unconvinced, the second hillbilly figure swipes his finger through the pile of shit, concurring that yes, it is indeed shit. They then joyfully continue down the road together in the sunset.57

Along with being portrayed as idiotic and subhuman, garimpeiros– like the bandeirantes before them– are considered dangerous in middle class Brazilian imaginaries. As the wife of one wholesaler exclaimed with a furrowed brow as I explained my research, “You have to be careful, those miners have no law! They will rob you and leave you for dead. They aren’t educated, they can’t read and write; they can’t think through stuff.”

During our conversation, her husband– a major buyer in the region– took a break from loading a container with stones bound for Tucson to add his two cents: “Every time I go out to the mine, someone is asking me for money! I just gave him money the week before and he spent it on women, marijuana, and cachaça. If I give him more, he will just spend it without thinking.”

The inability to “think,” as Luis and my friend’s wife described, echoes a classic trope of Brazilian emotionality from Sérgio Buarque de Holanda’s (1936) oft-critiqued chapter “O Homen Cordial” (The Cordial Man). Holanda’s social history makes use of the Latin root of cordiality, having to do with the heart, rather than colloquial references to courtesy or warmth. Thus Holanda’s “homen cordial” refers to one driven by emotions, or more accurately, affect. Holanda imagined a young Brazilian nation missing key growth and development opportunities by failing to execute rational or logical ways of engaging the world. Though Holanda’s work has been rightly criticized for failing to capture the broader historical and political factors that shaped Brazilian development– namely key economic arrangements that have hitched the country’s
dependence to foreign markets—his writings attempt speak to both the body politic and the organization of labor within the young nation. Drawing from the work of David Hume, Danlilyn Rutherfod (2009) similarly situates key links between affect and empire in arguing that “state-building becomes an affair of the heart in the head, and the head in the heart” (2009:5). A hopeful affect might suggest a tendency to following the heart, rather than following the head, at least in the eyes of these wholesalers. However, for Caba Saco garimpeiros, an affect of hope is not simply about striking it rich, it is also about positioning oneself in relation to complex inter- and intra-class prejudices in Brazil.

Such inter-class prejudices of course go both ways, and mistrust toward buyers was a favored conversation among miners. As Manuel explained one day at lunch while recounting his tenuous relationships with a longtime regional wholesaler who had become very well known and wealthy: “He’s rich now, really rich. But he is rich only because we are poor. All these rich people hate Dilma (then president), and that’s fine, she’s a crook. But they should realize the only reason they were able to buy cheap from us is because Lula (and Dilma) helped us eat.”

This is more than an example of class-consciousness—of miners deeply understanding of their social position within an inherently exploitative national and global network. Manuel’s claim that government inadvertently subsidized crystal production at Caba Saco in the beginning of the twenty-first century indeed has some merit. The success of President Lula’s (2003-2011) social assistance program, Bolsa Familia engendered an unprecedented 27.7 percent reduction in poverty in his first term. Indeed one of contemporary Brazilian capitalism’s greatest travesties is how middle and upper classes fail to recognize how their social position is directly dependent upon the perks they receive from the nation’s various social programs for the poor.
For the most part, poverty remains high throughout rural Minas, and the Jequitinhonha valley in particular. Young workers often migrate to urban areas in search of opportunities. Many miners work at Caba Saco while between other precarious low-wage labor jobs such as construction or masonry. With few chances for social or economic advancement in the region, Caba Saco becomes a kind of safety net, a place where men can go when other work isn’t available to them, and as some miners have suggested, “at least feel productive.” Indeed, several workers at the National Mineral Production Department (DNPM) explicitly told me that a central reason that clandestine and quasi-legal mines are allowed to operate is because they serve as a type of sponge for disenfranchised workers.

An unprecedented 10 percent surge of GDP growth during the late 1960s and early 1970s known as, “The Brazilian Miracle,” has come to define Brazil’s golden age of development and urbanization; during this time some cities grew as much as 67 percent. Aid from the U.S. and large-scale transportation and infrastructure projects increased government involvement in iron and oil industries. A dramatic strengthening of Import Substitution Industrialization (ISI) policies propelled the country on a path to prosperity that dwarfed other Latin American countries.

While this massive diversification and industrialization strategy thrust Brazil into the global economy and consolidated pockets of development and wealth in cities, much of Brazil’s countryside failed to see new wealth or even much improvement from the boom. In short, Brazil's heavily state-owned, capital-intensive economy failed to reach much of the interior, and peripheral regions of Brazil (see Nancy Scheper-Hughes 1993).

The Jequitinhonha Valley is one such forgotten place. While the GDP and overall wealth grew, so did wealth inequality. By the 1980s, when the military dictatorship was officially
overthrown, around 58 percent of Brazilians lived in poverty and 50 percent of the population saw its share of relative income drop from 17 percent in 1960 to 51 percent in 1980. It is often said that Brazil’s current economic crisis is tied to the country’s failure to create a truly diverse economy and continued reliance on an export-oriented market with a firmly intact feudal system of land ownership (see Goldstein 2005; CNN 2015).

However, choosing precarious labor at Caba Saco rather than moving to Belo Horizonte to work a minimum wage job is often more than an economic decision. Despite the harsh reality of mine labor and an inherently exploitive market, there is a certain type of freedom at Caba Saco that can’t be bought. For many garimpeiros, this freedom conjures romantic notions of taming the wilds of the Brazilian frontier. Manuel claims that his experience draws from the classic historical figure of Portuguese bandeirantes: roving groups of first and second generation Portuguese fortune hunters who exploited the interior regions of Brazil in search of mineral wealth and native populations to enslave. More importantly, bandeirantes are said to be responsible for the discovery and exploitation of the interior’s mineral wealth, first in gold, then in diamonds and other gemstones. U.S. readers might recognize bandeirantes if framed as a cross between early American land speculators roaming the American West, and California gold-rushers scrambling through the hills, sick with gold fever.

![Panoramic photo showing 100 years of dirt mounds at Caba Saco](image_url)
For many *garimpeiros*, Caba Saco offers freedom from the tangles of Brazilian bureaucracy as much as it offers economic opportunity. It is as much about living off the land, below the radar, and beyond the judgmental gaze of urban Brazilians as it is about striking it rich. Small-scale mining is still an important part of the Diamantina region’s identity and cultural imaginary. As one miner, who had lived and worked in São Paulo and Belo Horizonte for many years exclaimed: “In the city you feel like a number, out here you feel like a person.” At Caba Saco, the *bandeirante* lives on, offering contemporary *garimpeiros* the opportunity to tap into the historical forces of hope and fortitude that enabled their predecessors to endure the wilds of Brazil’s frontier. In the words of another miner: “I like it out here because I can do what I want to do, and no one messes with me. Out here I can breathe.”

Scholars continue to focus on Brazil’s absurd and profound social inequities, precisely because they are so striking. Robin E. Sheriff has perfectly captured the challenge of depicting these complexities in Brazil: “How can we practice a truly critical anthropology that seeks to expose for our readerships the ravages of economic injustice while at the same time doing justice to the persistent generosity of spirit that animates even the most oppressed communities?” (2007: 311). To deeply understand hope, one needs to contextualize the optimism and joviality of daily life within broader economic forces that shape Brazil’s stark class boundaries and persistent gaps in opportunity for the country’s rich and poor. Affect offers one such way to do so without essentializing or minimizing Brazilians’ lived experience of national optimism. By extending Miyazaki’s attempt to consider his informant’s “hope in capitalism side by side with the hope of social theories in critique of capitalism,” I argue that *garimpeiros*’ hopeful affect highlights how political economy can be socially embodied and resisted (Mattingly 2010; Rudnyckyj and Richard 2009). Indeed, this tension is what draws the ethnographic gaze. National dispositions
and other forms of intersubjective “cultural intimacies” frame how “state ideology and the intimacy of everyday social life are revealingly similar” (Herzfeld 2005:4). Garimpeiros’ willingness to risk life and limb for one of the most common minerals on earth shows is how such intimacies play out in everyday lived experiences.

**AFFECTIVE EXTRACTION**

Several weeks after Vicente claimed they were about to find the mother lode, I arrived after my morning ride to find him at the mouth of their mine working frantically—wide-eyed and tense-jawed. I immediately assumed that he had smoked crack that morning, but I instead joked if he had drank a lot of *cafezinho* that morning. “No, no, I’m excited,” he exclaimed. “We’re going **under** the vein today. There is a huge cavity under there, with stones **desta tamanho**” (this size). He arranged his hands around an imaginary crystal the size of a house cat. Though I already knew the answer, I asked if he had seen them, or if he just wanted it to be true. Vicente shot me a look, recognizing I had intentionally asked a rude question. He tipped his tattered sweat-stained hat to me and replied, “*Deus quizer*” (god willing). By the end of my time at Caba Saco, I learned that “**desta tamanho**” was in many ways a cry of hope; it was often a signal that my friends were frustrated or overwhelmed. Perpetual chatter of what is hidden just below—of what they will soon access—speaks to the anticipatory productivity and potentiality of Minas Gerais’ cottage quartz industries.

I asked what he would do once they pulled all the crystals from the pocket, cleaned them, and sold them to a buyer. With a toothless, sparkly-eyed, bashful grin Vicente announced, “I’m going to have meat for Christmas; I want to have a big barbecue.” As his mind and voice trailed off, he added, “I have never had that before. . . . Not meat on Christmas. *Deus quizer*.” God willing. His voice trailed off.
It was only July, and after months of watching Vicente blow his money on crack binges, I was doubtful that any of his cash would last until Christmas– or even beyond the coming weekend. Vicente had hardly ever mentioned anything of his extended family, and seldom complained about any material lack. Did his desire for meat on Christmas hint that Vicente was growing tired of the chaos of his addiction? Perhaps it signaled a hope to become more integrated into conventional aspects of Brazilian life, namely family and festivity.

Brazilian hospitality extends beyond royal treatment for foreigners, and poor Mineiros in particular are famous for sharing everything. Each day around 11:00am we stopped working and returned to the hut to fix a typical *garimpeiro* meal of rice, beans, meat and farofa. Even on days when there was little food to split between us, I was always saved a second helping, and was chided if I refused to eat it. However, while I was offered everything, Manuel’s willingness to share did not extend to Vicente, even on days of plenty. Manuel complained that Vicente would take huge plates of rice and then sneak around after lunch and help himself to even more, quietly trying to not let the ladle clink against the pot while scooping beans onto his plate.

His main gripe centered on Vicente’s weekend crack benders, specifically how he would return to the mine on Monday weak and famished. “What’s the point of eating if you’re going to just burn it all off with drugs?” Manuel found very little sympathy for Vicente’s weekend exploits, his stints in jail, or his seeming inextinguishable hunger. Vicente’s desperation was not an asset to the hard labor they faced, it was a liability. However despite his lack of trust, Manuel continued to work with Vicente for most of my fieldwork period in 2015. Even if Vicente was at times weak and clumsy, he was still able to pull dirt from the bottom of the mine. The main capacity needed to sustain that day after hot day was hope.
Just as Manuel was skeptical of Vicente, the inverse was true. One hot afternoon, after pulling up buckets of sand in the sun for hours, Vicente and I gathered up the water jugs and staggered down to the freshwater spring. Vicente tapped me on the shoulder when we were out of earshot from Manuel and whispered, “Gringo, when we get back, Manuel will have found crystals *com certeza* (without a doubt). Whenever I leave and return he has magically found crystals without me. He says he has no trust in me, but why should I have trust in him?” If hope and optimism animate these miners’ labor and extraction strategies and bind them together, then mistrust and paranoia dog their every move while apart.

Manuel’s explanation of ‘magically finding crystals’ was of course strikingly different. “I don’t think that is the case.” Manuel explained. “Maybe sometimes, but if you want to talk about crystal energy in your dissertation, you’d better mention that crystals are only attracted to people with good energy.” This was the one and only time that Manuel offered any explanation of crystals’ metaphysical properties, and in the same breath, he launched into a deep criticism of Vicente’s lack of work ethic and how he had spent last weekend in the Diamantina jail for trying to buy crack from an undercover cop. “*Que pena,*”

![Figure 2.7](image-url) Manuel reaching into a recently-discovered pocket full of perfect laser crystals
Percolating up through Manuel’s moral framing of energy as an unseen power that drives production are references to rising drug use in the Jequitinhonha Valley and the deep intra-class dynamics between he and Vicente and that play out in the organization of mine labor at Caba Saco. Such narratives are reminiscent of Michael Taussig (1980) and June Nash’s (1979) classic ethnographies exposing the dynamic social and mystical valuation of mine materials drawing important links between ritual practices and economic formations in Latin American mining locales (see also Godoy 1985). Despite his deep disgust of Vicente, a shared moral optimism propels him through the muck of living a good life and doing an honest day’s labor, even with an immoral partner.

If mistrust and skepticism actively frays the bonds of their solidarity, then hope is the knot that keeps them toiling together in spite of dangerous and precarious conditions within the earth. At stake here is how affect, hopeful affects, “create new types of subjects and new relations between those subjects” (Richard and Rudnyckyj 2009: 62). It is not enough to suggest that economic desperation binds these men. Unlike many laboring at Caba Saco, Manuel has a healthy pension from his career as a public works laborer. Despite their intense disdain for each other, Manuel and Vicente are bound together by something more than money; day after day, hammer strike after hammer strike, bucket of dirt after bucket of dirt. Hope structures the how and why of their engagements with each other, and hope also drives them deeper into moral debt with each other.
CONCLUSION

The following month after traveling throughout Brazil for research, I returned to Caba Saco mid-morning to find Vicente starry-eyed, yet again. He locked eyes with me as he reached into a bucket by his side and pulled out a foot-long clear laser crystal. My jaw dropped, and Vicente held his finger to his mouth signaling to remain silent as he ushered me down the shaft toward Manuel.

“O chefe! (hey boss)” I hesitantly called down to Manuel as I descended down the rungs of a rickety ladder haphazardly cobbled together with rusty nails and twine. Once in, I hopped down a series of shale steps toward Manuel in a narrow cavity that he had tunneled through the sandstone, some thirty feet below the surface. The air was damp and cool and flakes of silica crumbled from the walls and hung in the air. Despite the gritty sand in my teeth and nose, it was always a treat being underground— if only to get relief from the unbearable heat and UV radiation reflecting off of the billions of quartz particles, like a sheet of tiny mirrors.

As I scrambled down the rocky tunnel toward Manuel, the distant blasts of dynamite, the hum of gasoline generators, and the hoots of miners greeting each other on the trail above faded away. Manuel’s steady Grrrsch Grrrrrsch Grrrrsc stirring a small pocket of fine yellow sand with a two-foot-long steel bar overtook my senses. Manuel was serine, almost reverent. This was the moment that he and Vicente (and indeed myself) had been working for, hoping for. After weeks of chiseling at the sandstone with a jackhammer; weeks of packing and detonating homemade dynamite; weeks of hoisting buckets of sand and dirt up a 20 foot trench; weeks of piling dirt upon piled dirt; weeks of scraping our knuckles on sharp, worthless shards of quartz; weeks of sweating in the brutal heat; weeks of eating the same fermented beans three meals a day and suffering each other’s horrid gas; weeks of hoping.
Manuel took a break to look up at me and I mouthed, “Parabens” (congratulations). He nodded, clearly proud. “Mining is about courage, luck, and hard work.” Manuel once told me. In some ways, Caba Saco miners are workers in the classic sense: alienated labor with little interest in their product. However, while they may not be curious about following crystals through a commodity network, they remain intimately tied to the production of various social, economic, transcendent, and affective values that emerge through their labor (see Tsing 2015:146). Many miners claim that when others find crystals at Caba Saco, it gives everyone hope and stamina to work harder themselves. The general condition of precarity in artisanal mining— and indeed within Brazil’s lower classes— provides a fertile landscape for the contagion of hope to “intersubjectively leap from one body to another” (Herrmann 2015:170). Such affective states flow between miners boasting new finds and through stories of crystals, “desta tamanho” hidden just below the “dog’s teeth” that bloodied their knuckles.

In my own experience gleaning crystals and mining a small corner of Caba Saco by myself, I can attest to the emotional and affective states that accompany mine labor. Upon finally finding a few small crystals after days of digging alone, it was as though I was possessed— I could not stop. Though I was sunburnt, thirsty, and had skipped lunch, I no longer needed water, or shade, or

Figure 2.8 A rainbow over Caba Saco on my last day of fieldwork
food. I became entranced by what lay beyond; what my next hammer swing might loosen; what my blistered and bloodied hand might blindly pull from a sandy cavity. Those moments of awe were as much about courage, luck, and hard work as they were about potentiality. With each hammer swing, I thought to myself, “I would love to bring back something desta tamanho to show my friends in California.”

53 I draw here on affect scholars such as Berlant 2011:15; Massumi 2002; Ahmed 2010; McGrail, Davie-Kessler and Guffin 2013 who reference hope as something beyond emotion. Hope does not only live in the brain, but resides in everyday socialites and approaches to the market. These interactions come to impact every aspect of miners’ lives at Caba Saco.

54 Since hope is not really an emotion but more a state of being, I use “hopeful affect” as a way to frame my friends’ lived experience at Caba Saco. Hope as a “locomotive disposition” is not simply a response to the underlying desperation of one’s precarious position in an exploitative world system, it is a way of relating to each other, to their country, to their social position, and to the market more broadly.

55 Hope, in the contexts of mineral markets in Minas Gerais, is also intergenerational and a unique form of historical subjectivity.

56 North American and Brazilian wholesalers alike describe the late 1990s as a bonanza for crystal dealers: material was abundant in Brazil, prices were reasonable, competition was minimal, and demand in the U.S. was great. In general, the U.S. economy in the 1990s is often looked upon fondly by crystal entrepreneurs as a time of steady economic growth and low inflation. Thousands of small clandestine quartz claims were opened throughout Brazil. Caba Saco experienced a “quartz rush” as hundreds of miners descended upon the camp. As more and more Brazilians began attending international shows, and as Chinese dealers entered the Brazilian quartz market and began buying directly from miners in the early 2000s, this began to change. Prices increased, and wholesalers were left out of a loop they once controlled; good material became increasingly difficult to come by in Brazil. Further, an economic crisis in the U.S. and a weak dollar strained American’s ability to buy cheaply in Brazil, while the massive influx of Brazilians selling (more cheaply than each other) at gem shows undercut their own business model.

57 One of dozens of versions of “É merda ou nao é?” can be found on the following Youtube link https://www.youtube.com/watch?v=qVPwdWk5cp0

58 Under Lula’s Bolsa Familia (and other poverty alleviation programs) extreme poverty—those living on less that $1USD/day - fell by 60 percent between 1993 and 2006. This was remarkably faster than the United Nations Millennium Development goals, and was considered a massive success by both Brazilians and by the international community as well. For more insight into this, Brandão and Aragão’s (2007) article in the Estado de São Paulo sums it up well.

59 In their introduction to a special issue on affect in the Anthropology of Consciousness, Ian Skogagard and Alisse Waterston (2015) point out that theories of affect can “accommodate the power of feelings, sentimentality, intimacies, and emotion in the public realm” (2015:110). This dovetails nicely with Herzfeld’s (2005) notion of “cultural intimacies” and Oliver Bennett’s (2011) musings on the “optimisms of everyday life”, both of which capture the idea that hope is contagion floating around the public realm, and has very real personal, political, and economic impacts on those whose lives intersect with this informal crystal market. This is also echoed by Cassaniti’s (2015) notion of an energy field, and Anderson’s general “atmosphere” (2009).
Chapter Three: Negotiative Value

INTRODUCTION

In his ethnography on the globalization of Coca Cola, anthropologist Robert Foster has suggested that by looking at a “globalized commodity or value chains as networks of not only production and exchange, but also of perspectives – as networks of people’s perspectives on other people’s perspectives” we begin to see that it is the disjunctions in these networks of perspectives that make the creation of value possible (2008:20). In this chapter, I track how price is negotiated as new global actors are brought into crystal networks deep in the mountains of Minas Gerais, Brazil. In a market that lacks formalized classification standards and pricing mechanisms – structures that unify actors around the assessment of qualities or quantitative measures – the negotiation of price through bargaining becomes a central market practice. Tracing a network of perspectives draws into focus the contours of this market. I show that price, and by extension value, are enacted and made stable and enduring as Brazilian, Chinese, and U.S. traders bargain for crystals (Bowker and Star 1999; Latour 1989; Mol 2002). Prices are neither standardized, nor are they arbitrary. Rather, they are negotiated and made legible through a variety of social and market strategies, and economic forces.

A growing canon of anthropological literature on value has focused on the classificatory practices and various types of skilled vision required to sort, grade, and categorize goods (see Otto and Willerslev 2013). Important theories have crystallized about the assessment and valuation of precious gemstones (Walsh 2010, Brazeal 2017), diamonds (Calvão 2013; Fall 2014), collector specimens (Ferry 2005; 2013) and even industrial minerals (Smith 2011; Mantz 2008). This important scholarship builds on a long tradition in anthropology seeking to understand the cultivation of taste and connoisseurship and how objects are made meaningful in
relation to themselves, people, and other things throughout their dynamic social lives (Appadurai 1986; Douglas and Isherwood 1996; Munn 1986; Miller 1998). However, such examples—while generatively focusing on the generation of affective, social, and moral value—often overlook both the intimate practices of price-setting and broader political-economic forces from which such practices emerge. As Jane Guyer reminds us, “an anthropology of value that fails to address prices is unsatisfactory, and so are studies of risk and reflexive categories that don’t take into account the composition, levels, conditions, and consequences of price. Price is a major cultural as well as political economic phenomenon” (2009:219). In this chapter, I strategically pivot away from the obsession with value in relation to ranking, measuring, or otherwise classifying commodities, and focus instead on how prices are enacted and performed. In Guyer’s assessment, anthropological theories of price “have always been implicitly composite, in order to encompass and recognize sociocultural components” (2009:202).

Nearly a century of ethnographic research on production and exchange has shown how networks and markets come to reflect social and economic worlds, and much of this work pushes against Karl Marx’s claim that price is a fetish that obscures the social relationships in which it is based. In his ethnographic study of global cotton markets Koray Çalıskan has argued that “it is through speech acts and conscious and unconscious bodily performances that the invisible hands of markets are located by traders” (2008; 246). All markets of course, require semiotic mediation (see Keane 2008) and embedded in these intimate interactions are the motivations, strategies, and boundaries that define both trade circuits and the various capitalist and “pericapitalist” forms within this market (Tsing 2015). Indeed, it is the diversity of economic logics at play throughout its value chains that makes these quartz markets unique. By bridging economic anthropology’s classic debate between formalism and substantivism, Çalıskan illustrates how prices are realized
through neoclassical (formalist) market assumptions as well as through the (substantivist) personal relationships involved in actually making the market. I build on Çalıskan’s approach here by drawing in the ontological concerns illuminated in Annemarie Mol’s brilliant account of a disease’s multiplicity. Like atherosclerosis, prices are not universal objects hidden away on receipts and ledgers. They are made legible through material semiotic practices. In that crystals are not regulated economic goods like most commodities, their price is composite: a constellation of signs, utterances, values, and ambitions that are enacted through coordinated techniques and market practices.

I begin by outlining crystals’ movement from mines to local buyers to regional wholesalers. I show the importance of personal ties that frame market exchange among Brazilians in this circuit. Next I offer ethnographic examples that draw out specific forms of competition and cooperation between regional wholesalers and international buyers and illustrate how price is established in a market that has no standardized mechanisms based on labor outputs or flows of supply and demand. Market equilibrium is based neither entirely on an automatic adjustment of supply or demand, nor on their social construction. Price does not fit into economists’ tidy formula (i.e. price does not equal supply + demand + taxes). Instead, I show how new international buyers contort the market, and how their presence introduces a disturbance into informal, negotiated pricing mechanisms. As Webb Keane has argued, bargaining “can be seen as an everyday disciplinary practice that sustains marketplace ideologies” through a variety of semiotic processes (2008:33). As a repetitive and predictable speech genre, bargaining can illuminate not only a shared (or disjunctured) language ideology, but reflect the broader political and economic realities of global trade.
During my fieldwork throughout Brazil, several wholesalers and buyers took me under their wings at various points from 2013-2016. I draw from several examples to show how these wholesalers fully “perform” the market economy by training me in the practices of selection, bargaining, and exchange (Cochoy 1998; see also Callon 1998; Kockelman 2006; Munisia 2007). In his analysis of a Javanese bazaar economy, Clifford Geertz has argued that “the whole structure of bargaining is determined by this fact: that it is a communication channel evolved to serve the needs of men once coupled and opposed. The rules governing it are a response to a situation in which two persons on opposite sides of some exchange possibility are struggling to make that possibility actual and to gain a slight advantage within it” (1978:32). Despite no standardized pricing mechanisms, prices are not arbitrary, rather they are made stable based on what people have to offer each other, and on larger economic forces and global financial trends such as currency exchange rates. In what follows I show how Chinese buyers—concerned primarily with the financial aspects of price—pay more, and in doing so, reshape how and with whom business is conducted. To provide a counter example, I illustrate that for Brazilian wholesalers, the morality of humor, laughter, and joviality becomes a type of currency that binds this market and its people together. Finally, I show how Ed—an American buyer highlighted in this dissertation’s introduction, who has long-standing ties to Brazilian wholesalers—incorporates a generative combination of both strategies. Building on classic debates in economic anthropology, these various perspectives offer insight into how gift exchange becomes a technology of power (see Çaliskan 2010) which animates both situated transactions and the flow of crystal commodities through this network.
**O CIRCULO (the ring)**

Crystals generally move through a series of exchanges in rural Brazil as they pass from miners to shipping containers destined for travel abroad. Smaller wholesalers, known as *cristaleiros*, buy directly from miners and sell to other Brazilian suppliers. Many of these people (mostly men) work only part-time with crystals, and most lack capital, resources, and social connections to compete with larger regional players and become the middlemen for larger regional wholesalers (for whom it would be impossible to visit the thousands of small clandestine mines throughout Minas Gerais). To be successful, smaller buyers must cultivate productive, future-oriented relationships with other local buyers, miners, and larger wholesalers. Such open-ended delayed exchanges result in networks of debts often deeply tangled with family obligations and reputations, themes well documented by social scientists studying exchange networks over the past century.

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*Figure 3.1* High-quality quartz from Caba Saco waiting for the buyer to arrive.  
*Figure 3.2* A massive 300kg “lot” of laser crystals which I tracked from miners to end users.

Much of the anthropological work about value highlights value as practices of categorization, classification, or making meaningful difference. However, such practices are not
a central part of these wholesalers’ work. Material is generally purchased in “lots”, consisting of a few kilograms to a metric ton, and circulates among several cristaleiros before making its way to the larger regional wholesalers and exporters. Local cristaleiros, unlike larger regional wholesalers, do not have the space, time, and resources to clean, organize, and grade crystals by quality. Rather, the majority of their labor involves negotiating to buy and then re-negotiating to sell, often for a small profit. Commonly, smaller wholesalers may skim the nicest crystals after a buy, replacing them with other lower-quality stones to boost the overall weight of the parcel before reselling. Alternately, they may also add a few nicer pieces to boost a lot’s desirability and negotiable price. Because these local wholesalers deal in smaller volumes, grading and classifying crystals could actually decrease the overall value of the lot. As one wholesaler explained when I asked why he had not chosen to separate some of his rare high-value lasers from other junkier poorly-formed crystals: “These (pointing to long, clear laser crystals), pull these (pointing less clear, shorter crystals), and these pull these.” Value in this instance isn’t necessarily about “sorting things out” (Bowker and Star 1999) or about making difference meaningful (Ferry 2013), as much as it is about curating and strategically assembling difference. In this example, “pull” refers to tethering and pulling bunches of stones that would have little value on their own, and would likely not move (through sale). Higher value stones in this sense have a sort of levity or anti-gravity force enabling them to “pull” lower value stones into the market and into spheres of circulation (see Pickles 2013; Munn 1986). This is yet another example of the hidden forces that lasers may possess.

Economic transactions require semiotic mediation (Keane 2008) and several unspoken rules pattern bargaining among these middlemen. These are as much economic strategies as they are social etiquette Brazil’s interior. I learned much about this decorum while tagging along on
dozens of buying trips throughout Minas Gerais, making many mistakes along the way. For example, when assessing a lot, one should never insult the quality of the sellers’ material; cordiality and flattery go far. Next, buyers should always make sellers name their price first. If the buyer names too low a price, the seller may be insulted, at times irreparably so. Inversely, the buyer may name too high a price. When countering the initial offer, buyers must not ask an insultingly low price; selling stones is more than economic exchange, it is about mutuality. Despite negotiators being “coupled and opposed” as Geertz suggests, the goal is to ultimately become coupled. The most successful negotiators have mastered the art of small talk and know when to step back from a tense deal to talk about the weather, family life, or music (politics and soccer, the most contentious topics, are off limits). Drinking cafezinho (Brazil’s strong, sugary coffee served in small cups) is the equivalent of breaking bread, and it would be naive to underestimate its cohesive power in Minas Gerais. I overshot my caffeine tolerance on many occasions.

Figure 3.3 A small lot of crystals of varying quality. The crystals on the blue tray are the highest value and will “pull” the other lower quality white crystals which may be unsalable on their own.
Above all else, Mineiros value joviality, levity and positivity in business above competition, and pauses for comic relief are perhaps the most important feature of buying stones in Minas Gerais. As Donna Goldstein (2003) has suggested, humor (even if seemingly out of place) provides a social lubricant that bonds people together, through a moral economy of laughter. Negotiations often warm up slowly, with a buyer quickly picking through sample batches of crystals to assess what percentage might be resalable. Buyers often hem and haw, claiming that while the quality is okay, their customers that are actually looking for something different. Perhaps they blame “the market,” claiming that it is difficult to unload such material, or gripe that supply is saturated or demand is throttled. Such statements are intended to subtly beat down the seller and convince them that their wares are less valuable than their asking price. When talks become tense, both the buyer and seller pull back. Coffee and cookies are offered, sometimes even cachaca. When prompted, the buyer will ask for a price; once made an offer, he will immediately reject and counter it. Prices come to reflect power relations, and as Koray Caliskan observed in Izmir cotton markets, prices are “prosthetic forms produced, deployed, resisted, and at times abused” by traders (2010:104). Price negotiations are as much about value speculation as they are about a willingness to forge or sustain a relationship. Agreements on price have as much to do with the valuation of the material in question as they do with the terms of payment, sometimes offered sem juros (without interest) if the relationship is strong enough. Frequently, payment plans are negotiated into the final price, and the more a buyer is able to pay upfront, the lower they will be able to negotiate final price. The building of trust bonds between local and regional traders exemplifies what Stephen Gudeman has suggested is an “ambiguous seam between mutual and moral basis that trade requires and the calculated transactions that it sustains” (2009:21; see also Hart 1988).
Generally, Mineiros are deeply skeptical of outsiders, and because of the clandestine nature of crystal mining and exportation, most outsiders trying to break into the market find accessing these middlemen impossible. Within this local circuit, markup is frequently small, around 5-15 percent (in contrast with 1000 percent markup once introduced into U.S. markets). This of course depends entirely on amizade (friendship), the potential for generating future social connection, and the reputations of the buyers involved in the transaction (some buyers are a liability and have a reputation for not paying. In such cases, prices are higher).

On several occasions, I watched negotiations unfold where the sellers agreed to sell lots for less than what they had paid simply because the transactions opened the door for future business and the expansion of one’s own network potential. Jane Guyer reminds us that “all prices are fictions – literally the results of narratives of creation, addition, and subtraction – in ways that go far beyond Polanyi’s discussion of ‘fictitious commodities’ in the mid-twentieth century of Marx’s theory of commodity fetishism in the mid nineteenth” (Guyer 2016: 2002). This is not unlike Paul Bohannon’s (1965) assessment of African market systems where he observed that sometimes “material gain is not as important as other social ends” (1965:17). Whereas in neoclassical (even formalist) views of a market, cultural and social obligations are sometimes seen as constrains on market optimality, this is not so within Brazil’s informal crystal networks, where crystal exchange plays an important role in these men’s lives beyond finances and economic ends.

“O COMPRADO FORTES” (Strong Buyer)

After crystals pass from miners through the hands of several local middlemen, they typically make their way to several-dozen larger wholesalers in the region. Many of the larger regional wholesalers I worked with descended from families with ties to Brazil’s crystal
industries since the Second World War. Experience, knowledge, prestige, and social connections have obviously helped favorably position these families. Minas Gerais’ “market” or marketplace as it were, is embodied in *galpãoes*, small warehouses or open-air barns often within a walled compound attached to wholesalers’ houses.

The permeable boundaries of domestic and market space is as practical as it is convenient. *Galpãoes* in some ways are not unlike garage sales in that they disrupt domestic and market spaces and combine profit-making and mutuality through various forms of bargaining and negotiation (Herrman 1997). Stephen Gudeman has suggested that such “‘house-businesses’ incorporate the dialectics of mutuality and the market” (2009:22). Anonymous transactions and quick sales are rare in this commodity circuit, and the recent rise of drugs, truck high-jacking, and poverty-related robberies in the region reinforces the importance of knowing intimately the people with whom you conduct business.

Much of what wholesalers do is essentially a process of making sense of huge volumes of crystals, classifying them by form, origin, quality, color, size, clarity, inclusions, or a combination of criteria that make them similar or dissimilar.
After a purchase, crystals are separated and washed with acid and other industrial cleaners, then resorted and then arranged for sale. *Galpãoes* are littered with piles of crystals, tables filled with trays, and drums and boxes waiting to be packed, loaded onto trucks and sent out into the world. While such warehouses appear to be in disarray, many wholesalers have meticulously handled each stone personally. Sorting and classifying is a highly skilled act, taking years of training and a familiarity with vast numbers of minerals (dozens of forms of quartz) from locales all throughout Brazil (Grasseli 2007).

The stockpiles of quartz at these wholesaler’s warehouses is staggering, and I often wondered if buyers harbored hoarding tendencies. In fact, overbuying is a central feature of the

*Figure 3.6* An example of a wholesaler’s warehouse littered with crystals waiting to be cleaned, classified, and sold
market, as wholesalers are often required to buy large quantities of crystals to get the few select stones that have value, or in the least that they really want. As I will show in later chapters, while only a fraction of the stones are seen as highly valuable, new markets are being created for lower quality rocks as well. Processing (cutting and polishing) industries for these stones originated in Brazil, however China has now developed major lapidary infrastructure to work the massive stockpiles of poor quality crystals imported to the mainland. As commodities in waiting, the sprawling piles of junk crystals represent material traces of a complex market sociality that points to Brazilian buyers needing to cultivate reputation and prestige through larger purchases. Indeed when local buyers speak about regional buyers’ power, they use the word for “strength” (forte) to talk about volume.

In addition to buying quality to find quality, many wholesalers claim that continuing to buy crystals (even when they don’t need inventory) is how regional wholesalers stay relevant, or specifically how they keep relevant the social relationships that enable them to function. Good material comes and goes very quickly these days and one must be in the loop, constantly visiting with, or even bribing local suppliers. One wholesaler bragged that he logs around 6,000 kilometers a month driving the harrowing, accident-prone roads of rural Minas Gerais paying visits to connections and buying crystals which he exports directly to the world’s largest gem and mineral shows in Tucson and Denver.

Since the turn of the twenty first-century, many large regional wholesalers have seen their markets boom and transform with the mass influx of foreign buyers. Expanding the clientele bases of these regional wholesalers has created both new opportunities and conflicts where reputations and lives are at stake. Many larger cristaleiros enjoyed lamenting about the heydays of the early 2000s when material was abundant and relatively cheap. Several factors contributed
to dramatic price increases and increasing scarcity of higher quality material in recent years. First, the emergence of Chinese buyers, who have found ways of subverting large regional buyers, has limited the supply of decent material to more long-term buyers. Further, in an attempt to regulate and draw informal mineral industries into view, the Brazilian DPNM (Department of National Mineral Production) began cracking down on landowners, forcing mine title holders and prospectors to re-register– a wildly expensive and lengthy bureaucratic process. At the same time, the Policia Federal began more strictly enforcing laws, requiring a certificate of origin and an official certified receipt to transport material. Crystals and stones found circulating without the proper documentation were confiscated, and their handlers fined, even jailed. Finally, mining by nature is precarious, and the market is forever tethered to the unpredictable booms and busts of prospecting and extraction.62

In addition to recent regulatory shifts, opportunities to sell abroad spread through word of mouth and ambitious Brazilians began attending large gem and mineral fairs abroad. The 2007 recession hindered Americans’ ability to take buying trips to South America. One wholesaler who had lost 50 percent of his business in the past decade exclaimed, “Why would they continue to come? They could get everything in Tucson cheaper than they could get it here.” Mid-level Brazilian wholesalers set off to the U.S. with stars in their eyes, not speaking a word of English, thinking they would set up shop at Tucson and money would simply flow in. For those with contacts or market knowledge times were lean, but for those lacking basic insight or ability, they often returned to Brazil in debt. Some cristaleiros, who had taken material on credit in Brazil, some suppliers were never paid, and who would not be returned the materials they had loaned. Those ambitious enough to go abroad not only found themselves in debt with other wholesalers,
but also with dangerous financiers who had sponsored their trip. Some men disappeared under mysterious circumstances.

“THE CHINESE PROBLEM”

Many in Brazil’s informal mineral industries recognize that their future remains increasingly uncertain. In the words of one international wholesaler: “Now that the East has woken up, Brazil’s crystal markets will never be the same.” While players in Brazilian quartz circuits had been experiencing what they refer to as ‘the Chinese Problem’ for decades, a 2013 exposé in Estado da Minas (a state newspaper published in Minas Gerais) titled “The Chinese Invade Curvelo” attracted the attention of the public. The article uncovered how each week, over twelve shipping containers of quartz crystals (at around 20,000 kilos per container) left the remote interior city of Curvelo, Minas Gerais bound for China. The Estado do Minas estimated that that up to 90 percent of all Brazilian gemstones produced in Brazil are bound for Chinese mainland processing centers such as Danghai, China’s crystal capital, and that as much as 95 percent of the cash associated with the clandestine crystal trade passes through unregulated channels.

Some wholesalers speculate that China’s interest in Brazilian quartz is a money-laundering scheme to deal with the massive amounts of cash that Chinese businessmen receive from importing counterfeit goods into Latin America. Paraguay is often the entry point for counterfeit items such as CDs, music, knock-off designer goods, and electronics, from which they are then smuggled throughout the continent. Authentic luxury imports in Brazil would face absurdly high import tariffs and fees, while smuggled counterfeits move well through Brazil’s cash-based economy. In that quartz crystal is a finite resource that generally does not depreciate in value, it represents an ideal commodity through which to launder money. Once transported,
crystals can be stored indefinitely, and since quartz is one of the most common minerals on earth and often has no formal market value, stones can be easily undervalued on logistics paperwork.

Chinese buyers often visit Brazil for months at a time, living often in cheap hotels, traveling a daily circuit of different mines and regional wholesalers to scout newly available material. The Chinese presence in Brazilian mineral markets has had a similar impact to their emergence in other mineral regions around the world, particularly Africa. They begin buying first from large regional wholesalers, with the end-goal circumventing wholesalers to buy directly from local suppliers and eventually from miners. Many larger Brazilian wholesalers themselves do not even buy from the mine, but instead rely on a local ecosystem of smaller buyers with long-standing connections with miners at the source. Subverting the supply chain disrupts the flow of material to others in the network. For example, Chinese buyers near the century-old crystal centers of Curvelo and Corinto began bribing young local men in the region for access and information about new finds. Brazilian wholesalers are understandably bitter about the cunning business prowess of these new buyers in the market.⁶⁴

As one cristaleiro complained, “They’re really smart. They began by paying a lot, so everyone depended on them. They always paid cash up front. Then they just stopped buying and the Brazilian’s suffered. When they started buying again they didn’t pay as much, but we were so desperate we had to take what they offered.” The market then is as much about buying and selling as it is about how different forms of collaboration and conflict move across social and economic boarders, and through labor practices and livelihoods. The cristaleiro continued, “It’s a plague. They’re coming through and killing the market, just like they do with every market they dabble in.”
My friend Bruno and his brother Tião are the largest wholesalers in the Diamantina region, and were crucial part of my fieldwork. Bruno in particular took me on as a sort of informal apprentice, teaching me about how to assess and negotiate the value of stones. Their father was a crystal miner during WWII, and as young boys in the 1960s, Bruno and Tião often worked alongside him in the Serra do Cabral. The brothers now own two stores in Diamantina catering to local tourists, as well as a galpão with a massive stockpile of crystals and minerals from the region and beyond. They have capital, connections, and are well known throughout the country for their incredible quality - though expensive - crystals. Bruno knows his prices are high, but also has enough experience to recognize that no other dealers own the diversity of inventory he keeps on hand. This is a central reason they have become popular with foreign buyers. Despite his strong position in the market, Bruno imagines himself an equal opportunity seller.

“Everyone should be able to buy what they want!” he exclaimed as we sat on a bench in front of their storefront watching cars bounce over speed bumps on the entrance to town one day. “Of course they will need to pay a little more if they only buy a little, but they should be able to buy what they want.”

I asked Bruno how he sets prices for his material. He gave me an ornery grin and continued, “Say you want to sell some material for 10 dollars a kilo. When an American or a German comes in, you say R$12 a kilo and they will be happy to pay R$10. Brazilians are about the same, maybe you set the price a little higher, but they are always going to negotiate. The Japanese are the best. If you say R$10, they will pay ten exactly, with no negotiation. But the Chinese, mother of God! You have to set the price at R$20/kilo, and then spend the entire afternoon as they beat you down to R$10/kilo. You can never give them anything easily because
they will just try all the harder next time! So you have to let them beat you down slowly. Negotiating with them is exhausting; but they love it, its part of their culture.” A truck rumbled by and beeped its horn, and Bruno waved and called out to the driver. He seems to know everyone on the road. I asked why so many Brazilians hate the Chinese.

“Have you seen them do business?! They spit everywhere, smoke like crazy and they always want ‘best price, best price!’” He mocked. Many Brazilian dealers are increasingly frustrated because Chinese buyers have wised-up to the price-setting tactics and have begun negotiating harder—demanding better prices, and offering none of the social lubricity so important for Brazilian exchange. The emergence of Chinese buyers represents frictions of dependency in a globalized world (Tsing 2005). This shift in buying practices, coupled with major changes in the regulation of Brazilian mineral markets over the past decade, have left many buyers at wits’ end—prompting some of them to avoid dealing with Chinese buyers altogether.

The antagonisms between Brazilian mineral markets and Chinese buyers are likely about more than culturally incongruent modes of conducting business. In Minas Gerais particularly, such conflicts may also be tied to centuries-old anxieties about foreigners looting Brazil’s vast mineral wealth (Russell-Wood 1982). Somewhat ironically, much of the country’s dramatic economic growth of the early twenty-first century has been the result of a massive increase in the exportation of iron ore, soy, copper, and other commodities, primarily to China. Today, between 40 and 60 percent of every mineral extracted from the earth is bound for China (Bevins 2016). Due in part to a rise in infrastructure and manufacturing since the turn of the century, China is now responsible for around 50 percent of the world’s steel production and consumption, of which most ore comes from Brazil. Predictably, when China’s unbridled growth slowed over the
past couple of years, so too did South America’s. This was nothing new for Brazil, whose entire
economic history can be mapped through a series of booms and busts linked to the extraction and
exportation of a variety of natural resources (see Chapter 1).65

Like most developing economies dependent on the purchasing might of global economic
superpowers, Brazil finds itself in a precarious situation. Coupled with an overall lack of
confidence in both markets and governments resulting from unending waves of corruption
scandals and the impeachment of President Dilma Rousseff in 2016, Brazilians of all
socioeconomic strata are hesitant about the future. This lack of confidence has spread to
investors abroad as well. What seems certain, however, is that despite investments from other
nations, China will remain nearby, ready to take on a more central role in shaping Brazil’s
commodity markets in the decades to come.66

After continuing our conversation on the street, Bruno and I moved to the lower level of
the showroom so he could show off some new crystals he had recently bought from Caba Saco.
As Bruno explained the difference between two exquisite laser specimens, four well-dressed
Chinese men descended the stairs, followed by one of Bruno’s employees. Brazilians are known
for their hospitality and particularly their joviality in greeting guests, but Bruno simply looked up
at the men, and then glanced back at me with a subtle eye-roll and continued talking with me. I
was accustomed to interruptions in our conversations as tourists frequently popped in on their
way in and out of Diamantina. Located on the edge of town, Bruno’s shop was designed to hook
tourists; however, serious buyers were invited to the galpão attached to his house down the
street.

“You can go help them,” I said to Bruno, tipping my head toward the Chinese visitors,
and trying to be respectful of his time.
“No, I’ll let João deal with them, I’m not going to sell them anything.” Then, in a regional dialect that I could barely decipher, but had grown accustomed to hearing when people were trying to keep me (and other outsiders) from understanding an insider conversation, Bruno called up to João, “Don’t let them know about the other space.”

By the way that they nodded at me, the Chinese men seemed to assume I was an European or American buyer conducting business with Bruno; they knew better than to interrupt us, doing so would have made them seem desperate. Using me as a placeholder gave Bruno the upper hand.

A few minutes passed and young João, flanked by the four Chinese men, popped his head through a doorway to announce (again in regional dialect) that the men were looking for bigger, better, and higher volume material than was available in the showroom. They knew about the warehouse down the block and had driven nearly two hours in hopes of seeing it.

Bruno shot me a look and then shook his head at the Chinese men, “Não tenho nada agora” (I don’t have anything now). They knew he was lying and shuffled around mumbling to each other, hoping that he would change his mind by staying put long enough. Bruno turned back to me and continued talking—ignoring his guests. The Chinese men finally gave up and tromped back up the stairs. I asked Bruno why he didn’t want to sell to them. His warehouse was full of material that the Chinese would buy in an instant, and probably at a reasonable price.

“Because I don’t feel like being beat down today! They are so annoying. They just haggle and haggle and then when you decide on a price, they offer you less! They have no respect. I don’t need money today, I can afford to wait.”

The sentiment was echoed by another wholesaler who once announced, “I found a stone more powerful than the Chinese.” He explained that if wholesalers have material they don’t want
to sell for less, they could simply look squarely into the Chinese buyers eyes and claim that money wasn’t important. “This drives them crazy!” he laughed. “And then, if they ask for your best price you give them a price higher than their original price. They lose their minds, but they will pay what you’re asking.”

Another wholesaler, who had worked in jewelry and gemstone markets in Thailand and had decades of experience dealing with Chinese buyers, told me that he simply prefers to ignore Chinese buyers altogether: “Anytime they ask me something, I just don’t respond, they get so frustrated that when they finally find something they want, they’re afraid to negotiate because they think I’ll shut them out. So they don’t haggle at all.”

One way to understand a market is to look at various sites of exchange as fields of power, and to study a market, prices, or associated values as a study of the performances and logics that undergird economic practices within these fields (see Çaliskan 2010). In the examples above, performances can be seen as a way to wrest supply and demand out of the hands of powerful Chinese buyers. Just as debates about ‘spheres of exchange’ offered a way to explain how some objects are tradable for certain objects and not for others, in Brazilian crystal markets, some material is quite simply not for sale to certain buyers. In his study of a Moroccan peasant market system Clifford Geertz began with a customary dictum: “In the bazaar information is poor, scarce, maldistributed, inefficiently communicated and intensely valued.” Bazaar functions then can be interpreted as attempts to “reduce ignorance for someone, increasing for someone, or defend someone against it” (1978:29). Market knowledge becomes a type of currency (Simone 2011). Negotiations between Brazilian and Chinese buyers are defined by asymmetrical relationships of knowledge, experience, resources, and cultural competency. In short, negotiations are about power.
These various wholesaling tactics are as much economic strategies as they are insights into Brazilian cultural logics and mores colliding with Chinese modes of conducting business. Realizing that they will never be able to cultivate the rich social connections based on mutuality and futurity, Chinese buyers have developed their own strategies for negotiating price: paying cash. By offering to pay cash upfront, Chinese buyers are able to leverage larger deals than most other foreigners, and thus a larger piece of the market, or at least supply. Many Brazilian wholesalers see this as a double-edged sword. On the one hand, they receive money they are owed, something that doesn’t always happen when dealing with Brazilian exporters who primarily receive material on credit and seldom pay in full. Inversely, Chinese buyers paying cash offer no promise of future trade. Exchanging cash does not bond Chinese buyers to wholesalers in the sticky ways that offering credit might. Cash prices circumvent the cultivation of long-term relationships that Brazilians value so highly—relationships through which they often come to define themselves and others.

The profanity of such sales leaves a sour taste in many Brazilian’s mouths, despite leaving their wallets a bit fatter. One wholesaler, tired of feeling victimized by the market dynamic brought on by the influx of Chinese buyers and the effect of their presence on the market, had these parting words to offer in my final days of fieldwork: “Rather than always talking about the Chinese problem, we should be looking at is as a Chinese chance.” The chance refers to using Chinese capital to shore up the supply chain and formalize the market so that regional buyers to not just go for the quick sale which often comes to undermine their own interests as well as their social relationships with others on which they rely throughout the supply chain.”
BUYING MUTUALITY AND BUYING FUTURITY

In the years following the global economic crisis of the past decade, many American and European buyers ceased taking buying trips to Brazil; the dollar had become very weak in relation to the Brazilian Real, and good material was being siphoned off by strong Chinese buyers. Others, like Ed, a crystal shop owner from northern California, took the opportunity to continue fostering relationships as a way stay relevant in the market. Like many Europeans and Americans, Ed has learned to leverage what he can in terms of both social relationships and buying power to negotiate price and material. Like Bruno, Ed adopted me as a protégé and took me on several buying trips throughout the states of Minas Gerais and Rio Grande do Sur. Ed also trained me on how evaluate parcels of stones and negotiate deals using a variety of tactics. In what follows I draw out Ed’s skill as a crafty buyer who deeply understands how social cohesion animates the flow of crystals from rural Brazil to New Age markets in the American West.

Ed and I had made the grueling twelve-hour trip from Belo Horizonte and arrived at Marco’s galpão on an unseasonably warm winter afternoon in early June. Similar to most regional warehouses, Marco’s space is essentially a 40 square-foot open-air barn shaded by a tin roof resting on iron rafters. Six-feet walls laced with broken glass flank his warehouse. A maze of tables was covered with small trays of assorted lots that Marcos had assembled for wholesale buyers. After the customary greetings and formalities about family

Figure 3.7 A high-quality Citrine lot which Ed purchased on one of our buying trips
and health, Ed and I walked from table to table with a shallow cardboard box, and without asking, began selecting the best stones from trays Marcos had curated. Normally, this would be a significant *faux pas* as the tray’s entire value may be hinged on a few select pieces.

A few minutes into our shopping, Marcos and his wife stepped over to a table draped with tarps which they gently peeled off, exposing a brilliant collection of over fifty spectacular golden citrine crystals. I knew instantly that Ed would be floored. Marcos called him over, and we walked around the table together. Ed gave a disinterested, deadpan survey of the material, commenting blandly that it was “okay” and resumed selecting small pieces. Rather than asking about the price of the larger lot, he summoned Marcos to inquire about the price of some of the smaller material we had been selecting. While Marcos typically deals in Brazilian Reais, he offered Ed a price in dollars. Marcos bit his lip and his wife Gaby hugged her chest. Both were visibly concerned about Ed’s lack of interest in the big lot.

Marcos offered a price of $15US per kilo for the material we had asked about, and Ed let out a dis-interested “hummm” countering with offer of $10US a kilo. Marcos paused for a moment, seeming to weigh his options: On the one hand, saying no might suggest he wasn’t willing to negotiate, particularly on the bigger parcel of citrine. However, if he immediately agreed, it might indicate he would be easy to leverage for a lower price on everything. He looked Ed in the eye, nodding, “Sure, I can do $10US.”

Marcos and his wife resumed chatting in the corner with another Brazilian buyer as Ed and I continued pulling crystals from the assembled trays. Ed explained that he knew it was rude to do so, but under his breath confided that that he was planning on buying the large lot of citrine, and this was part of his larger strategy. Despite feigning indifference, he seemed obsessed with the large lot of spectacular crystals. Having these crystals in his inventory would
set him apart from other dealers in California, and actually, most buyers in the US. While over the last decade a number of economic anthropologists and sociologists have used performativity to focus on the significance of financial instruments, discourses and other market devices in shaping economies, more classic approaches to performativity highlighting how conventionalized speech acts inscribe subjectivities remain useful as well (see Muniesa & Callon 2007). In this instance, Ed’s pageantry was part of a performance leading to the negotiation of the large lot of citrine on the table.

“See, I am going to use the big lot to negotiate the price on this stuff,” he whispered in English, pointing to premium material we had skimmed. “I’m pretty sure he’ll throw all these pieces that I’ve high-graded.” Ed’s broader strategy was to ‘round out’ his overall purchase: selecting a broad assortment of quality, size, and form. His clients in Marin County, California include tourists, high-end collectors, and New Age energy healers. After calling Marcos over again as we arranged the several boxes of hand-selected material out on a table for him to inspect, Ed asked for a price. We had spread the boxes wide to give the impression we were interested in volume. In general, the more one buys, the better the price.

Marcos wrung his hands as he scanned our flats. “Oh, you have a mixture of nice stuff here. Ha! This is all the best stuff. I need to do thirty-five a kilo for this material.” Ed didn’t argue, but instead walked over to the large lot on the table. Marcos darted over and asked if he was interested.

“Well, it depends.” Ed replied in Portuguese. “How many kilos do you have here? Can you make a good price?” The lot was about 300 kilos, and by the quickness of his response, it was obvious Marcos had a price in mind. This time he gave it in BR Reais: R$55,000 (~$15,000US). While not the largest transaction I have seen negotiated, it was a considerable
amount of money, particularly in this part of Minas Gerais. The number was not unreasonable, considering that the largest piece alone could garner that amount with the right client in California.

Ed countered with a second price, about R$10,000 lower, claiming that he wanted to be fair but that it was a lot of money. Marcos’s eyes darted as he thought for a moment and the air was heavy. We were all a bit jittery from the coffee. He offered a second price, increasing Ed’s offer by increasing it R$3000.

Ed nodded, replying in Portuguese, “Pode ser (sure). Can you add this stuff in that we selected?” This was a significant ask, as I estimate that it was around an additional $3,000USD of material.

“Of course, Ed,” and Marcos bounced over to shake Ed’s hand. Though brief, the bargaining had been incredibly tense. Marcos told a couple jokes about how he could finally pay taxes, and the politicians in Brasilia could finally build another swimming pool for themselves. We all laughed, recognizing that moments of harmony are the most important parts of these intense high-dollar transactions. I continued the mood, with a story of my friend’s father, one of the most well-known crystal dealers in a nearby region, who, after every big deal was famous for sprinting toward the bathroom: the release was just too tremendous for him. We all laughed again, and Marcos put his hand on my shoulder, and claimed that he knew whom I was talking about. In general, Brazilians abhor social discord– the joviality that follows being coupled and opposed is especially sweet.

After our playfulness subsided, Ed and I hovered over the crystals, taking photos and holding stones for each other in the light. Most local Brazilian buyers clearly wouldn’t have the money to make such a purchase, nor the clientele to unload the inventory onto. Marcos would
likely not have taken the tarps off for local buyers. Chinese buyers on the other hand, value citrine quite highly. It has been explained to me that in China, golden citrine is thought to bring both money and good fortune as it represents gold. Marcos choosing to unveil the crystals for us, rather than waiting for a Chinese buyer (and we had encountered several during this particular trip) is more than a simple act of “amizade” (friendship) toward Ed. By hiding, showing, or otherwise making available material for the market, Marcos performed his role as gatekeeper, and in doing so, upended neoclassical assumptions which frame the market as a relational balance of supply and demand. Looking instead at how flows are enacted, Marcos’s strategy shows that there are many competing logics, motivations, and practices, and economic forces that play out in how material is priced, and for whom.

After a moment, Ed approached Marcos about payment. They arranged to transfer some money now, and some in August. It was of course in Marcos’s best interest to be accommodating. Transactions like this are often made through money transfer service that convert dollars into Reais without the associated transfer and conversion fees, or drawing the scrutiny of Central banks and the Brazilian Receita Federal (a Brazilian version of the IRS). This grey market Real transfer economy is not unlike the black market Peso Exchange used by Colombian drug cartels in the 1990s to launder narcotics money from the US. Unlike narcotics money markets however, the Brazilian system is linked more to trade-based money laundering, the avoidance of Federal taxes, and different forms of corruption than to outright illicit drug activities. While financial services industries have long been haunted by rouge third party payment processors (TPPP) operating on the peripheries of various national and international regulatory agencies, gray market Real operators do a brisk business in Brazil, and exchange is expected to increase in the coming decades. Mohr World Consulting, reports that “Brazil is soon
to become one of the largest money transfer markets in the world; inbound outbound and domestic. Currently, if money transfers arriving in Brazil were duly accounted for, Brazil would be among the fifteen largest money remittance markets in the world.” (2015:3). At stake here are how FinTech companies are disrupting not only Federal tax collection, but the world’s quartz crystals markets as well.

Despite efforts by the Brazilian Government to modernize its money transfer regulations through money laundering controls and financial crimes prevention efforts, “market devices” such as such as third-party payment processing are a type crucial financial infrastructure in Brazil’s informal quartz markets (Muniesa, Millo and Callon 2007). While Marcos has family in San Francisco and New York, he preferred not involve them despite Ed’s suggestion that he could transfer payment of less than $10,000 directly into their accounts in the U.S. without any problem.

As we hopped into our rental car and headed off to visit another wholesaler nearby, Ed was jittery with excitement about the deal they struck. While he was confident that he could have negotiated the price down, paying a bit more – and paying on time – will ensure that he stays in Marcos’s good graces, and ensure that he will have access to more spectacular material from him in the future. Paying more pulls open the gates of supply, and further enmeshes both Ed and Marcos in multiple networks that will help both their individual and collective enterprises. The mutuality and futurity of this transaction fortified a relationship for years to come.

CONCLUSION

Before the flood of foreign crystal buyers into Brazil’s interior, particularly Chinese buyers, crystals’ journeys from miners to exporters was largely hinged on a small network of part-time cristaleiros who remained deeply tied to each other through longstanding social and
economic relationships. Negotiations served as the mechanism through which such relationships were bolstered and maintained. As Chinese buyers penetrated these networks and began buying directly from the miners, new forms of both cooperation and conflict emerged. In response to this, Brazilian wholesalers developed new tactics for establishing and negotiating price, particularly with foreign buyers. Negotiation remains an important way that price—and various forms of social value embedded within it—are enacted and made stable. In this sense, price reflects culture and political economy (see Guyer 2009), while leveraging this represents Brazilians’ strategies for gaining and maintaining market edge.

Theorists concerned with exchange and the circulation of goods for the past century have observed that objects are never neutral things, and as Igor Kopytoff (1986) points out, an object is a “culturally constructed entity endowed with culturally specific meanings and classified and reclassified into culturally constituted categories” (1986:68). In classical economic anthropological debates, categories often refer to whether an object is a gift or a commodity, or perhaps in flux somewhere betwixt and between (see Tsing 2015). I have shown here that prices, like objects, are culturally constructed entities and become imbued with all sorts of communal obligations. In Marcel Mauss’s description of the gift, he explains, “to give something is to give part of oneself . . . while to receive is to receive part of someone’s spiritual essence” ([1925] 1967:10). The types of relationships that gifts either engender or limit define them, while to not give or to not receive is a withholding of spiritual or gifts’ sacred essence. In Marxian terms, to retain rather than give a gift renders it profane. For quartz crystals bound for the world’s New Age and metaphysical healing markets, this plays out in similar, but unique ways. The process offers important insights to the specifics of how markets emerge and transform as new, differently positioned actors garner unique forms of power.
In his critical reflection on the materiality of moral metalanguage in markets, Web Keane has argued that marketplace negotiating is ostensibly a readily recognized speech genre: “It tends to follow rather strict procedural rules such that, although a given encounter unfolds in real time, and thus with some degree of uncertainty, it is also highly repetitive and predictable . . . And, like a game, it provides both formal properties for the process and stereotyped modes of authority for the actors” (2008:34). While bargaining may illuminate shared (or disparate) language ideologies, we might also take into consideration the broader political and economic impact that such games have on the lived realities of global trade. For some, the ‘Chinese problem’ represents Brazil’s long-standing place in the world order as global mineral-producer under threat, while for others, the ‘Chinese chance’ offers a way to shore up resources, experience, and social connections against foreign buyers that – whether they like it or not – are seemingly there to stay. How the market continues to transform as a result of this is emergent and strategically enacted through every cup of cafezinho offered, every handshake extended and each deliberate avoided eye contact between potential trading partners.

60 While preparing the final edits for this dissertation, I discovered the work of Shih Hsiang Sung (2014), an anthropologist who explores the topic of crystal exchange in central Minas Gerais from the perspective of Chinese buyers in the region. My explicit framing of “before the Chinese” vs. “after the Chinese” is to show that markets transform, and that there are complicated global social and cultural and economic forces that underlie such transformations.

61 Miners too are sometimes referred to as cristaleiros, and most cristaleiros (buyers) were miners at one time or another.

62 Somewhat in contrast with this heightened regulation are claims that in the early part of the century, Lula’s government was pro-trade and made it easier to export stones, particularly to China, a key trading partner of Brazilian mine material.

63 This number does not reflect market segmentation, but instead illustrates the path of industrial-grade material. Various wholesalers throughout Minas Gerais that I spoke with claimed that between 50-70% of their business now comes from Chinese buyers.

64 Shih Hsiang Sung notes, “Chinese buyers usually come to Brazil once or twice a year and stay in Curvelo (nearest city to Diamantina) for one or two months. Most of them came to Brazil as independent buyers rather than purchasers for large corporations, so their capital is limited” (Shih Hsiang 2014:78).

65 Again, I would refer readers to Schwartz (1985); Russell-Wood (1982); Weinstein (1983); Topik (2010).

66 Most recently, U.S. political instability has fueled uncertainty with Brazilian currency markets, and the BR Real has fell more than 9% against the dollar since early November 2016 (Bevins and Rigby 2016). Many economists speculate that things will continue to remain unstable in the region until it becomes
clear what approach the Trump administration will take toward Latin America. What seems certain, however, is that if the U.S. retreats from Latin American markets, particularly Brazil, China will remain nearby ready to take on a more central role in shaping commodity markets, particularly quartz markets in the decades to come.

Though very different ethnographic contexts, the Brazilian quartz markets share much in common with Kris Peterson’s work on the smuggling and money laundering between Chinese and Nigerian pharmaceutical markets and how this shapes particular configurations of transcendental power, authority, and illicitness.

In Minas Gerais many regional wholesalers sell in Reais, though some with international experience may quote prices in dollars. This is contrasted with the south of Brazil, where business is exclusively conducted in dollars.
Chapter Four: Phantasmic Value

INTRODUCTION

Miguel, Carlos, and I let out a collective moan as the door of the 52’ semi-trailer swung open and we faced our task for the day: unload and organize an unruly mess of pallets, barrels and large wooden boxes strewn about the trailer. Express delivered from Houston, the container had been filled with 20,000 kilos of crystals from Minas Gerais and was nearly two weeks late in arriving to us at the Tucson gem and mineral show.

I thought that I had watched Carlos’ workers load this container as we sipped hot cafezinho together a few months earlier in Corinto, Brazil— a small interior town in Minas Gerais, and the epicenter of the state’s crystal industries. It was early February, and I was confused— the container before us looked like a different container altogether.

I asked Carlos what had happened, and he shook his head, “Oh no, this isn’t the same container; the ship broke down in Jamaica and so they had some guys unload and reload all this material onto this semi-trailer so they could drive it right off the ship in Tucson, and it still didn’t arrive on time!” Carlos was clearly perturbed. Despite hourly calls to the shipping company to monitor the container, it was first delayed in U.S. customs in Houston, and then sent to the wrong address in Tucson.

Figure 4.1 Barrels of crystals in Minas Gerais bound for the Tucson gem and mineral show
Shipping debacles are not uncommon for the thousands of dealers from around the world who import their mineral wares for the annual Tucson gem and mineral show. Amid the chaos, customs protocols and their enforcement (or lack thereof) varies from year to year and from one U.S. port of entry to another. For example, many Brazilians with experience importing to the U.S. understand that Customs officials in the Port of Long Beach often clear containers that other ports might inspect more closely– or that paying more for air shipment may have a greater cost-benefit impact over time if it means that goods will arrive within a specific timeframe.

Carlos waited with a forklift at the trailer’s edge as Miguel and I set to work with a hand-operated hydraulic pallet jack inside the intermodal unit, maneuvering pallets of stacked barrels and custom made wooden crates. For a variety of reasons, most large Brazilian wholesalers ship their merchandise wrapped in newspaper and arranged into 20 gallon steel drums stacked on top of each other– typically 10-12 drums per pallet total, depending on weight. In contrast to cardboard boxes– the preferred packing material for many global goods, but which often become wet on the high seas and disintegrate during unloading– steel barrels offer layers of physical and legal protection. In the most vulgar sense, wrapping and packing crystals into drums, and then labeling and stacking drums on a pallet and loading them into a container is a process of transforming crystals (which previous chapters have shown are made highly morally and socially valuable) into legible, traceable, and calculable export commodities. The papers and barrels that house them however, provide more than protection from the jostling of the high seas and potential damage during shipment, they effectively conceal and protect crystals from the gaze of the bureaucratic state– these packing materials become tabernacles of value.

In his *longue durée* study of shipping containers in the Mediterranean, archaeologist Andrew Bevan theorized the role of “container materialities” and their role in preserving and
transporting value of liquid commodities. He begs that we not be seduced by the “apparent homogeneity of modern shipping containers into overlooking the regional variations and historical dynamics in their different forms” (2014:405). The Brazilian steel drums we encountered in that container represent not only a unique regional practice, but what Anne Meneley has referred to as a “husk of material reality” that play a key role in the abstraction, obfuscation, and transformation of value (Meneley 2014).

Drums and containers are more than just shipping vessels or tabernacles of value that cameo in theaters of exchange while passing through Brazil, Jamaica, Houston, and Tucson, and they are more than just “market devices” (Munesia et al. 2007) that make exchange possible. These materials engender, obscure, and make visible unique forms of market risk and what I call “phantasmic value”— an illusionary likeness of market value that is required to move crystals around the world.

Much of the anthropological work on gemstone and mineral markets foregrounds the material properties of stones and privileges the relationship between their form and social meanings (or value)⁶⁹. However, in this chapter I take a different approach and instead analyze the materialities around crystals, such as packing materials, shipping containers, and documents.
required to move them. I argue that these materialities shape unique forms of value along specific points of this commodity chain. These objects, their materialities, and the practices and meanings associated with them are all too often over-looked features of the market. I show that working synergistically, newspapers, documents, and containers constituted a sort of black box that enables phantasmic value (and the value transformations associated with it) to function within this market.

Fundamental to my argument is an acknowledgement that newspaper, steel drums, containers, and documents are not static, inert objects. Writing against mechanistic, constructionist, and dualistic concepts of inert matter, Henare et al. (2007) have called for a methodological retooling of how “things” are encountered ethnographically and encourage anthropologists to “take ‘things’ in the field as they present themselves, rather than immediately assuming that they signify, represent, or stand for something else” (2007:3). In short, Henare et al. argued for material theory to emerge through objects, not simply through engagement with them, and for scholars question the relations that objects have between each other through a new metaphysics.70 This chapter builds on this perspective by ethnographically interrogating the materialities involved in crystals’ transformation from moral minerals (somewhere between gift and commodities) to spiritual commodities bound for New Age consumers in the American Southwest. I show that central to this material-semiotic shift are not just the exchanges through which crystals move, but how ancillary materialities such as packing materials and shipping manifests lubricate the slippage between materials and materialities and mitigate emergent forms of market risk and possibility.

I begin by interrogating the various documentary requirements involved in moving crystals from the interior of Minas Gerais through global circuits which require several different
parallel forms of value that are often completely disembodied from price-paid and price-sold. A key aspect of this involves the logistics revolution of the past 50 years and in particular the shift to containerization and intermodalism, which has transformed how goods are moved around the world. Next, I interrogate how packing paper and the practices associated with risk mitigation act as unique sorts of market materialities that both mitigate and engender market risk. Lastly, I return to tracing documentary practices on the other end of the commodity chain in the US. I show how such market practices illuminate hidden aspects of the market as well make legible and stable temporary forms of price–they make phantasmic value possible.

**DOCUMENTING VALUE/S**

Officially, quartz crystals mined, transported, and sold in Brazil should be documented from the moment they are extracted. All minerals, including subsoil resources, belong to and (at least hypothetically) are regulated by the Brazilian state. However, many wholesalers have suggested that at least 95 percent of the minerals they deal with do not have the proper documentation. Two primary documents - the Nota Fiscal (an official invoice) and the *Certificado do Origem* (Certificate of Origin) - are required at the initial stages of stones’ social journey. The *Nota Fiscal*, as the name suggests, is a type of invoice or transactional document which makes legible the legitimacy of commercial acts in Brazil. Specifically, it shows that transactions fall within taxable domains. The physical document itself must be printed by an official government printer (or more recently can be filled out online, if the website is functioning on a particular day), and necessarily includes a company’s tax number, the tax information of the recipient, a full description of product or services being sold, the unit price, quantity, total sum amount, and the variable tax rate based on the actual commodity being transacted or transported. As a way to regulate the flow of contraband and illicit commodities,
Brazilian law stipulates that no goods may travel on federal highways without a formal *Nota Fiscal*.

Further complicating matters for smalltime crystal wholesalers, a *Nota Fiscal* for quartz crystals may only be issued with in conjunction with the *Certificado de Origin*—a document issued by the Ministry of Mines and Energy (MME) verifying that the transacted material originates from an authorized and regulated mining claim. The registration and upkeep of mining claims is meant to be exhaustive and prospectors must undergo an intense application process with the National Department of Mineral Production (DNPM), the Ministry of Mines and Energy (MME), and the National Environmental Regulatory Agency (EBAMA). In total, the process often takes several years and can exceed costs of $60,000, not to mention the countless notarized signatures and yearly payments to these and other regulatory agencies. The process also requires landholders and claim-holders to maintain extensive extraction records for tax purposes, and a scheduled (taxable) distribution of royalties to landowners if claims are run by a 3rd party. For most prospectors and property owners, it is simply unreasonable to spend time and energy to secure the long chain of documentation needed to extract, sell, and move crystals legally, particularly when it is possible—and more profitable—to do so without the proper documents. In short, for landowners, letting people prospect on your land without documentation is easier and more lucrative. In rural locales such as the interior regions of Minas Gerais where enforcement of mining code or environmental regulations are rare, clandestine mining just makes good business sense.

In addition to a complicated regulatory apparatus, taxation mechanisms in Brazil are particularly prohibitive for the legal sale of stones, and thus overtly shape how mineral value is negotiated, enacted, and even obscured. The international business community has long
struggled with the bureaucratic regulatory apparatus of the Brazilian state, which has been ingeniously designed to insulate itself from neoliberal schemes that have rocked many of its South American neighbors.

“The taxes alone would kill us!” one informant complained as we sat outside his warehouse deep in Brazil’s crystal country. “First, you would have to pay 12 percent when you buy from the miner, then if you want to move the material to another state, you pay again, then if when you decide to sell, you pay another tax, or if you want to export then you pay another tax. In the end, you pay more in taxes than you paid for the crystals in the first place!”

Misrepresentation and concealment have long been studied as strategies through which people and organizations undermine the reach of the state, and mining in Brazil has historically been fraught with such practices (Simmel 1904; Coutin 2015; Walsh 2010; Ferguson 1999). Many wholesalers have only a vague understanding of what the actual tax burden would be if they conducted business transparently, but the idea that they would be obligated to pay anything became politically salient amid massive corruption scandals in the Federal government during my fieldwork from 2014-2016. In addition to being self-conscious acts of rebellion at a corrupt state, for many Brazilian cristaleiros, tax and document avoidance was framed in a long history of obfuscating the surveillance authorities’ powers: it’s just how things have always been done.

History can illustrate this point. To improve flow of resources from the interior of Brazil to ports in Rio de Janeiro and Sao Paulo during the 18th and 19th century, colonial administrators built the Estrada Real or “Royal Highway.” Built on an expanding ideology of mercantilism, the roads were constructed as authorized routes to control the movement of people and goods– and in the case of Diamantina, gold and diamonds. Now a paved federal highway (BR-367), the Estrada Real weaves below the hills of Caba Saco and winds up the Jequitinhonha
valley to Diamantina. It is one important material artifact that continues to frame how value and risk are conceived in contemporary mineral networks. Most wholesalers and brokers chose to guard their concealment practices, which have as much to do with protecting industry secrets as it does with shielding themselves from the watchful eye of Brazil’s sprawling bureaucratic state.

A highway patrol checkpoint on BR-367 on the outskirts of Diamantina is one such place where documentation matters, or should matter. Such checkpoints—similar to weigh stations in the US—have been established throughout Brazil to ensure that goods, persons, and vehicles are properly documented as they travel on Brazilian federal highways. Many regional wholesalers moving quartz crystal without proper documentation choose to use a Nota Fiscal from a previous transaction, or to pay a friend to write a false document to “prove” that the goods they are moving are duly taxed and regulated.

As one wholesaler confided when asked about the Federal Agents who frequently looked in the beds of their pickup trucks: “For most of them, quartz is just quartz—they don’t know the difference between a laser crystal, a rutilated crystal, or a regular crystal. They don’t know anything about the value of stones, and they don’t know which material comes from which mine.” As each type of crystal he mentioned is at Caba Saco and each type has dramatically different market value, it would be illogical for wholesalers to declare different types of material from a single source. Concealing through omission on documents is the easiest (and clearly the most profitable) option.

Anthropologist Matthew Hull (2012) has argued for restoring the analytical visibility of documents, “to look at, rather than through, them,” and to treat them as mediators by exploring how—as Bruno Latour has suggested—they “transform, translate, distort, and modify the
meanings they are supposed to carry” (Latour 2005:39; Hull 2012:253). The Nota Fiscal and the Certificado de Origem distort, modify and abstract the meanings of the crystals they represent on their journey from illicit to licit networks. Thinking through these documents as distinct types of materiality offer a way to understand how these forms enact—and are enactments of—all kinds of political ethical, and economic value as well. Prices, signatures, official ledgers—and indeed, documents’ very production—index the rich social networks required for crystals to move from Brazilian crystals centers to export centers throughout the country (see Hetherington 2008). Moreover, they index a movement from the underground to global customs regimes that is as much geographical as it is bureaucratic, political, social, and even spiritual.

In the case of laser crystals which I followed from Caba Saco to the U.S. Southwest, documents crystalized and made legible a relationship between form and meaning (Keane 2003), and between ‘price’ and ‘value’ (Çalışkan 2009; Guyer 2004). Documents also mediate relationships between illegality and legality, between reality and fiction, and between the various actors involved in Brazil’s crystal networks. The majority of crystals which end up in North American New Age markets pass through one of several circuits in Minas Gerais, and documentary practices in which the various middle men in these circuits are engaged enable them to distribute a range of taxation, shipping, and economic risks among themselves. In this sense, documents are a unique form of materiality in that they at once mitigate and generate market risk. Working together, documents, containers, and packing materials draw together new actors, new ambitions, and new values—and in doing so, shape a global commodity scape.

CONTAINING RISK

Tucson, AZ and Denver, CO are the sites of the world’s largest and second-largest gem and rock shows, and thus are the primary North American destinations for Brazilian quartz
crystals. Intermodal container shipments often arrive first at ports in Houston or Long Beach/Los Angeles and are then driven by semi-truck or transported by rail and delivered directly to show spaces or in our case, to storage locales.

Intermodalism— the ability to load a shipping container at one locale and send it to nearly any other location around the world cheaply and efficiently without having to unload the cargo—has revolutionized worldwide logistics industries over the last 50 years and with them, nearly all global markets. The move to containerization not only increased the speed and global reach of goods (indeed, crystals from Brazil move further and faster than ever before), it also made moving commodities infinitely less complex for smalltime manufacturers, thus less expensive. To this end, containerization dramatically reshaped the global economy (see Bonacich and Wilson 2008). If we broadly define globalization as the expansion of economic activity that increasingly transcends national boundaries or borders, then the shipping container emerges as an ideal object to understand this materialist shift.

In his historical analysis of the shipping container, Mark Levinson asks: “What is it about the container that is so important? Surely not the thing itself . . . . The standard container has all the romance of a tin can. The value of this utilitarian object lies not in what it is, but in how it is used” (2006:21). Within the fields of economics and the social sciences, the container remains both over-looked and under-analyzed, in part because it is so unexceptional. As Levinson points out, “it has no engine, no wheels, no sails; it does not fascinate those captivated by ships and trains and planes, or by sailors and pilots. It lacks the flash to draw attention from those who study technological innovation” (2006:41). However, for anthropologists, the container is interesting in that it is an important site of social, political, material, and market conflict.
Brazilians shipping their wares to gem shows in the U.S. often consolidate their merchandise with other wholesalers who have both the documents and experience to export large containers legitimately. For example, Carlos’s container was in fact filled with several dealers’ material. This particular container was interesting in that to fill it, these dealers had conspired against their main market rival— an American living in Brazil who is admired for his market savvy and simultaneously despised because of the advantages it yields him. For this shipment, the Brazilians he typically consolidated with had lied, saying the container was full, and that he would have to wait for the next one.

From the American’s perspective none of these Brazilians would have been able to ship anything had it not been for his initial guidance in navigating complex global logistics regimes, let alone been able to pack containers so that they are appropriately balanced. This specialized knowledge remakes containers as a unique market materiality embroiled in unique market risks.

Containers packed with stacked barrels on pallets leaving Brazil often have a declared value of $10,000 or so U.S. Dollars, whereas they might have a market value of $100,000-$500,000. While low-quality quartz may have a market value around $2 per kilo, other varieties of quartz such as rose quartz

**Figure 4.3** A steel drum full of Caba Saco laser crystals waiting to be unpacked at a Tucson gem show.
or rutilated quartz could be worth thousands of dollars per kilogram. The market valuation of clear rock crystal is often based on color, clarity, formation, and extraction location. In a customs zone, the valuation of special quartz prices would simply be impossible without an expert; even experts cannot account for how prices are often subjective fictions which only reflect what someone is actually willing to pay in that particular moment (see Gell 1998; Guyer 2004).

In her ethnographic work on global ports, Brenda Chalfin (2006; 2007; 2010) has argued for increased focus on the objects, techniques, dispositions, and ways of knowing that accompany regulatory power and commercial governance within customs regimes. Unsurprisingly, containers become key actants in the dramas of the global spaces. Chalfin observed that central to customs agents’ daily practices is a comprehensive collection and documentation of every commodity container moving across national borders. As crystals remain hidden in barrels stacked within containers, they are allowed to pass only because they have been classified based on a description of their properties, not their actual properties. A curious tension emerges: crystals remain concealed within containers until Tucson, however their movement requires them to be evaluated. In this context, valuation is profoundly different than at any other point in the commodity scape.

At U.S. ports of entry, “transaction value” is the primary appraisal method used to determine ad valorem duties. Described as “price actually paid or payable” for merchandise sold for exportation to the US. This value is stated on a particular customs entry summary form (CBP form 7501) which “fully discloses the true prices, values, quantities, rebates, drawbacks, fees, commissions and royalties, and is true and correct, and that all goods or services provided to the seller of the merchandise either free or at reduced cost are fully disclosed.” (CBP 2006:16). If customs agents are unable to immediately assess transaction value of the goods in question, they
can access records for the transactional values of “identical merchandise,” defined as similar shipments of the same goods between the same (or similar) parties through an extensive archive of transaction records. All told, customs and border patrol actually have several primary methods of calculating value beyond transaction value—such as appraisement value, transacted value, deductive value, and computed value—most of which are predicated on valuation rulings from previous shipments. These rulings become official policy and serve as a type of legal formalism through which future tariffs are assessed and enforced in relation to goods—or at least declared goods. Phatasmic value—while it emerges from one of these other CBT valuation mechanisms, is temporary, ephemeral, and evaporates after goods clear the port of entry.

Prior to the shipping and logistics revolution of the mid-1950s, unloading a break-bulk ship might have taken longshoreman several days to a week. Today, a single large container ship can be unloaded in a few hours, and some of the world’s largest ports have the capacity to handle at least 10,000 full containers in a typical workday (Bonacich and Wilson 2008:52; Levenson 2006:29). While sensors, X-ray inspection, and chip-tracking have revolutionized the industry since creation of the Department of Homeland Security in the early 2000s, containers continue to be utilized for smuggling a variety of undeclared illicit cargo from drugs, to arms to humans—and indeed, even stones.

More important than smuggling though, is that many (possibly most) crystals are often intentionally mislabeled to avoid import fees and export taxes. The volume of material moving through ports simply makes it simply impossible for even the most careful examiners to access the guts of Brazilian containers, let alone the drums that occupy them. For the purposes of moving goods through port, a crystal is a crystal is a crystal. Through a materialist critique, shipping containers not only play a central role in both speeding up and disseminating the global
flows of goods (in this instance, crystals), they also importantly mitigate all sorts of legal and economic risk in a market dogged by obfuscation.

Indeed, containers embody far more than the “romance of a tin can,” they are fundamental aspects of market making, and value-making. They serve as a sort of mobile, liminal space within which crystals are loaded as one type of object, are embedded with new sorts of ephemeral values and meanings during their journey, and emerge at the end of their journey new types of objects all together. The container does more than increase the velocity of moving goods from production sites to end consumers; containers and intermodalism have drawn in new actors, new livelihoods, new aspirations, new technologies, and new market logics into a New Age commodity-scape.

However, while containers may appear to be sealed from the gaze of the bureaucratic state, they are certainly not sealed from the physical world—rain and moisture of the open seas in particular. As Miguel, Carlos and I unloaded the tractor-trailer, we discovered first hand why 35 gallon barrels and cardboard boxes are not used to ship crystals: boxes disintegrate under weight when wet. Like shipping containers, barrels also are not waterproof, and more than once I opened a barrel to find damp newspaper or worse, a crystal-newspaper soup.

CRYS'TALS’ HUSKS

Several days later on a dry gusty Tucson afternoon, we all squinted as dust, small bits of gravel and packing material swirled violently through the large circus-sized event that housed my friends’ show booth. Swept up in the gales were torn and crumpled scraps of newspaper from around the world including Moroccan weeklies, Brazilian tabloids with women in bathing suits, Sanskrit advertisements from India, and even obituary pages from The Tennessean—Nashville’s local daily gazette. Most dealers acknowledge that newsprint is the premiere material to protect
crystals. For Brazilian wholesalers, newspaper is unique in that it mitigates a variety of transportation risks. Precisely as Meneley (2014) points out, newspaper acts quite literally as a material husk— one that protects crystals from bumping against each other, and one that mitigates risks associated with hiding crystals’ properties— properties that may be more valuable than might have been claimed on customs forms.

In the context of a global market, newspapers offer a unique way to interrogate the materialities of market making, and could even bring new meaning to social theory around Benedict Anderson’s (1983) notion of “print capitalism.” Anderson famously describes the role of newspaper in constructing nations as communities through which people come to imagine themselves as a part of a bounded, coherent society. In the context of an event tent in Tucson, what could newspaper tell us about how culturally disparate mineral dealers are drawn together into a new global economy through complex economic, material, and social arrangements? How might newspapers offer some situated insight into economies, markets, and cultures that become unified within a global mineral market? As they are wrapped around crystals and stuffed into cavities between stones, newspapers play a key role in mitigating the risk of transport to and from global sales events—in doing so, newspaper mitigates some key risks of globalization.

I learned the hard way that effectively wrapping crystals is an embodied skill which takes both time and mastery through bodily techniques— one can not haphazardly throw newspaper into barrels and drop crystals in (see Mauss 1992). Indeed, I ruined many flawless crystals and was berated by my bosses and customers for not wrapping in thick enough layers of newspaper, or not making cushy enough nests for stones to rest in, or not creating a tight enough crystal-newspaper matrix to prevent movement inside barrels during travel. Such embodied, sensual
forms of skill are hinged on the ability to adapt to the type and size of crystal, and the weight and texture of newspaper. (For example, Brazilian tabloids adverts are thicker, more rigid, and tear easier than U.S. newsprint adverts).

Ironically, while newspapers protect crystals bar none, they are particularly damaging to the people whose job it is to use them. Each year at the Tucson show, my body would be run ragged after only a week of unloading and unwrapping crystals. Along with the predictable backaches and dust-inflicted sinus infections, Tucson’s dry dessert air conspired with newsprint to suck the moisture from our nail beds, causing them to mercilessly crack and bleed. No matter how much lotion or coconut oil we slathered on our hands, newspaper’s parching qualities won out. More than once I left streaks of blood on crystals I’d unwrapped, or on money and sales receipts I’d exchanged with customers—stains of a petit bourgeois market. To counter the
dehydrating effects of ink and newsprint, we sometimes wore neoprene gloves, which tended to
tear or break after a few minutes. Other times we would wear bulky Home Depot work gloves
that would have to be removed for detailed tasks. One of the pair would inevitably go missing
during the shuffle of our fourteen-hour workdays. These examples point to newspaper's curious
material paradox: it mitigates certain types of market risk, while simultaneously creating new
hazards—particularly for those of use who used them daily.

In the introduction to their edited volume, “New Materialisms,” Coole and Frost (2010)
succinctly outline a path for new materialist thinking in the 21st century. They first suggest an
ongoing ontological reorientation informed by and resonating with developments in the natural
sciences characterizing matter as vibrant and agential. More importantly, however, they outline
new critical and non-dogmatic re-engagements with political economy where the material
relationships of everyday life and sociopolitical structures are being exposed through new non-
anthropocentric perspectives. This line of thinking is curiously paralleled by Dophijn and van dur
Tuin (2012) who also open a new cartography of object study by tracking engagements with
materials as complex, pluralistic and open processes rather than stable, static, “things.”

Whether one categorizes this line of thinking as New Materialism, neo-materialism,
object-oriented ontologies, or material engagement theories, these attempts to rethink matter
have brought about new debates regarding human-material and material-material relationships,
especially concerning the nature of pluralistic and multiple realities (for examples see Mol 2002,
Barad 2007; Harman 2002; Blaser 2010). Central to these perspectives is the understanding that
scholars— and ethnographers in particular— would do well to question agency and the essence of
what it means to be a thing (see Bogost 2010). It is precisely the thingyness of newspapers that
makes them ideal ethnographic objects: they at once enable all sorts of market, political, and
exchange functions, while simultaneously imparting various sorts of other risk to human and non-human actors.\textsuperscript{80}

As the printing date of newspapers pass, their \textit{raison d'être} elapses. They are no longer central to conveying information, shaping public discourse, shoring up political support, or curating public imaginaries as Anderson might suggest. But in their trash-ness, a new use-value emerges as they take on a new function as a market device. In this new role they outperform all other materials. While unwrapping, selling, and re-wrapping crystals during three Tucson shows, I had at times become so desperate for newspapers (which tended to be in short supply) that I would try to substitute literally anything flat and paper-like that I could find, from shipping invoices to plastic sheets to cardboard. Unequivocally, nothing works as well as newspaper. In this context, newspapers are a new type of salient market and economic materiality, and while materially they may seem similarly to other documents (shipping manifest, tax receipts, etc.), they preserve and bolster value in fundamentally unique ways.\textsuperscript{81} To this end, newspapers enable new relationships between crystals’ properties and their various market, phantasmal, or “negotiative” values.

\textbf{BUREAUCRATIC MATERIALITIES}

I once asked a Brazilian broker how crystals without proper documentation were able to make it through Brazilian export inspections, to which he smiled, “Well, there are a lot of ways, but usually you have to know a guy.”

While the price is considerably higher, some stone dealers prefer to ship their most valuable (and falsely valued) freight by air. They assume that due to the urgency and the imagined legitimacy of air travel, stones will face less scrutiny. Likewise, having connections at Belo Horizonte’s Tancredo Neves International Airport certainly facilitates the process. Indeed
the “social relations of circulation” in the West can be as important as they are in other parts of
the world (see Carrier 1994; and especially Tsing 2015). However, whom you know does not
always suffice in U.S. customs regimes. U.S. documentary requirements importantly draw in a
network of different network or actors, market practices, and cultural and economic logics. For
the thousands of vendors from around the world who need to import thousands of tons of
minerals by air to Tucson during a two-week window in January and February, the Tucson
International Airport is ground zero for the convergence of many market materialities and the
site of unique market struggles.

My Brazilian friends found me valuable for helping them navigate the bureaucracy and
drama that shipping agents represent. One day as my Brazilian boss and I were waiting for a
broker to retrieve a bill of lading to clear our shipment with customs, we overheard an angry
phone call from a customer to a private logistics agent.

“I’m sorry, but it’s not our fault,” the shipping agent barked through the phone. “They’re
checking everything now. It’s not us, it’s Delta [Airlines] and U.S. Customs and Border Patrol.”
The shipping specialist apologized several more times obligatorily, hung up and looked at us
wide-eyed as he exhaled, “Jesus.”

Concerned for my boss who spoke little English, I apologized for eavesdropping and
asked what he meant that they were checking everything now. Was it just paperwork or were
they checking inside the shipments too? “Well, I know they’re checking all paperwork, and
they’re starting to check some air shipments too.” Not only was customs backed up clearing
merchandise because of heightened scrutiny of paperwork, Delta Airlines– who was a major
shipper from Brazil that year– cut their staff at the receiving terminal from six to about half that.
Merchandise was slow coming out normally, but particularly slow this year due to additional
inspection. This was devastating to some Brazilian sellers, who—because of the backlog—didn’t receive their material until the final days of the show. Many wholesalers put everything on the line for the Tucson show, and expenses including lodging, show space fees, car and truck rental, display supplies, food and miscellaneous costs can total upward of $20,000USD. Paying these expenses out of pocket without selling merchandise left some wholesalers broke and with large unpaid bills in Brazil that year.

The Tucson shipping agent pointed to a memo he had taped to the cinderblock wall of his office; it had been faxed from a Denver-based import company. Apparently, customs officers at the Denver Gem and Mineral show six months earlier began closely inspecting gem and mineral imports to ensure that the recipients had not only the proper paperwork, but corresponding visas which allow them to make transactions with their imported merchandise. The memo claimed that they were still waiting to hear about what sorts of visas will be accepted, but that the past scenario (where nearly anyone could have a shipment cleared for gem shows by proving they were an exhibitor) was no longer the case.

Under the new rules, foreign wholesalers must have either a U.S. B1 business visa and/r a proper tax ID number. The memo explained that if you have neither of these, “the only option you have is to temporarily import your shipment and then export it within a year. Under this entry you would not be able to sell your goods at the trade show, but rather display them as samples and export everything after the show.” The un-consolatory email ended with the author acknowledging this may raise many questions: “I can tell you that this is a fluid situation and that we're still obtaining information from customs about trade-show imports from importers.”

The fluidity of import situations leaves many in limbo, producing a type of bureaucratic precariousness and affective insecurity, especially common to border-zones (see Navaro-Yashin
Given the high transport fees and outrageous import taxes from the Brazilian government, the “trade-show display” option is simply unreasonable for the majority of wholesalers. Many however, go with this option, hoping against hope—or betting against bureaucratic efficiency—that there will be no consequences the following year. In this sense, documents and the legal injunctions they embody become affectively loaded materialities that mediate the relationships between law, subjectivity and statecraft. They also directly shape the market by helping dictate who will get to sell their material at the Tucson show, for how long, and under what conditions. Documents in this context become central actors in the process of value making and market-making. As Annelise Riles has suggested, “the form of documents makes manifest a reality of levels and levels of realities” (Riles 2000:73) which in the global stone market, represents a trans-border, trans-material reality that stretches down the Estrada Real all the way to the Tucson International Airport.

I could see my boss became increasingly impatient as we waited for the shipping agent; I broke the tension with questions for the agent that my boss’s limited English skills wouldn’t allow him to ask—particularly, what had changed?

“Last year, things were a mess because of the port closures in Long Beach. All these folks’ material was stuck out on the ocean and they wanted it to be here at the airport. People

Figure 4.6 A letter from an import specialist explaining profound changes in CBP policy
called everyday asking if we could just fly it in from the ship; a lot of them barely spoke
English.” He gave me a knowing glance trying to build some sort of solidarity. “Imagine trying
to explain why their goods never made it to port– explain that their livelihood was stuck out at
sea because of a strike. Most people have no concept of what a strike means here. They kept
calling and asking if their stuff would make it to Tucson before the show ended and I didn’t have
an answer! Yes? Maybe? Probably not?”

Ironically, as he told me this story, I recalled my prior year working at the Tucson show.
Driving home one night from an exhausting day of lifting and moving crystals, a short clip on
National Public Radio’s “Market Place” program aired, explaining how the work stoppage at the
ports of Long Beach and LA created a ripple effect which was reverberating through different
commodity supply chains. I almost ended up in a wreck as I fumbled with my recorder trying to
capture the segment and recalled the year prior how others had been affected by not being able to
receive their stones for the Tucson show– those folks indeed felt those ripples personally, and
deeply.

The shipping agent explained that for international brokers such as himself there is a
professional as well as personal obligation to get people their goods. In short, social relationships
matter. However, for U.S. Customs officers, the incentive and commitment to mutuality is not
shared. “They’re not local, they aren’t from here. They don’t really get how important the gem
show is to Tucson, and to these people. This show brings a ton of money to the state. They don’t
care about the local economy, they’re just following protocol,” the agent complained.

For customs agents, the proper documents– whether packing slips, shipping manifests,
receipts, or billing invoices– become the legal and social markers between licit and illicit goods,
and between criminals and legitimate business folks. Even if a container or a drum is never
opened for inspection, meticulous document inspection becomes the vetting process through which people and products pass through frontiers to markets (Navaro-Yashin 2007).

**PHANTASMIC VALUE: Rock, Geological Samples, Earth, or Stone**

As crystal containers move through U.S. customs areas, they also move through an entirely new valuation scheme that may or may not have anything to do with their material properties, but that depends entirely on a *description* of their properties. Containers are seldom physically inspected, and thus it is the documentary form alone through which ad valorem import duties are assessed, shipments are cleared, and statistics about them are generated. In this sense, the constellation of newspapers, drums, containers, and documents synergistically sustain the world’s quartz markets.

The Harmonized Tariff Schedule was adopted by the Bureau of the Census in 1989 to identify and classify material moving through U.S. Customs. As new import and export codes for various quartz crystals were adopted, the classification of quartz crystals changed. A U.S. Geological Survey memo from that time points out that “the import code for Brazilian crude pebble, which represented nearly all lasca imports recorded, was eliminated. Although this material probably continued to enter the United States, the new code system aggregated several categories making information about specific materials unavailable.” This change mattered for statisticians and official government recorders whose job it was to document and convey accurate knowledge about mineral resources entering the US. It also mattered for Customs agents tasked with understanding the variation of material listed on shipping manifests, invoices, receipts, and value declarations. Moreover, it especially mattered to wholesalers who were expected to pay duties on certain types and forms of imported quartz. By hiding crystals within
rolls of newspaper and drums and containers, packing lists and other forms of documentation enable a sort of transparency or bureaucratic gaze seeking to penetrate the shipping materialities.

Just as different varieties of quartz have different market prices, so to would they have different transactional values in U.S. customs regimes—at least in theory. To ensure goods move efficiently through ports (and because to do so often is just good business sense), Brazilian wholesalers often simply label the variety of crystals on their packing lists, invoices, and manifests as “rock crystal” or “rock, geological samples, earth or stone.” This is not incorrect, nor is it particularly deceptive, since containers leaving Minas Gerais bound for U.S. gem shows often contain all of the above. However, to do so is to assign a phantasmic value—an illusionary likeness of value that wholesalers often hope against hope will not be more closely inspected.

Clear quartz is a duty-free mineral, whereas purple quartz (amethyst), or yellow quartz (citrine) are accompanied by a 10.5 percent duty, ad valorem. (Piezoelectric quartz, optical quartz, and synthetic quartz are likewise assessed a three percent ad valorem duty). Similarly, some types of clear crystal—when cut—are to be subjected to a yet a different duty scheme

Figure 4.7 Example Bill of Lading showing how materials are designated as “rock, geological samples, earth, and sand”
altogether. Officially, the U.S. International Trade Commission specifically provides these recommendations to importers:

“When packages contain goods of one kind only, or when the goods are imported in packages the contents and values of which are uniform, the designation of packages for examination and the examination for CBP purposes are greatly facilitated. If the contents and values differ from package to package, the possibility of delay and confusion is increased.” (CBP 2016)

While customs officers inspecting a container may be able to tell the difference between purple crystals and clear crystals, most would have no idea how to accurately assess the market values of the vast range Brazilian quartz materials. Furthermore, valuation specialists are frequently overburdened with more pressing shipping assessments, especially around smuggling and counterfeits. It could be said that it is simply easier for everyone involved— and the market more broadly— if crystal imports are simply declared as “rock crystal,” or some variation of stone or earth.

Like the Nota Fiscal in Brazil, this declaration carries with it a sort of parallel value— what I refer to as phantasmic value— distinct from crystals’ general market value, and distinct from actual price paid. As Brenda Chalfin (2010) observed in a Ghana port, this practice displaces “the connection between customs authorities and the actual objects being transacted, [and] such documentary requirements take on a proxy materiality as they come to stand for both the goods transacted and the process of transaction itself” (2006:253). Documents in this instance— as well as the packing materials associated with them— dephysicalize crystals from their material properties, which make them valuable on the market and also disincentivizes the actual physical assessment of crystals— it homogenizes Brazilian stones’ exceptional variability (see Maurer 1999:372).
By not accurately distinguishing between different types of quartz— and its myriad forms, colors, and origins—official documents prioritize a bureaucratic (transactional) value that reflect neither the social value, exchange value, use value, or market value of the crystals packed away in newspaper and containers arriving from Brazil. Koray Çalışkan, in his ethnography of global cotton markets has argued that a market’s “documentary realm relies on a correspondence between things and their representations” (2010:82). However, in this instance, bureaucratic value is made legible, traceable, and calculable alongside imported mineral commodities. Documents are scrutinized without a container or barrel being opened or the goods they represent ever having been unwrapped from their newspaper husk and physically inspected. In the case of Brazilian crystals passing through international customs regimes, documents generate an ephemeral, disembodied value— a phantasmic value.

As objects that convey value, documents come to matter as legal formalisms belied by the human-power of the Department of Homeland Security’s Commodity Specialist Division and its agents. This attention to documents— and the various abstracted proxy values or parallel values they convey— elicits materialist concerns about the relationship between objects form and meanings (or values) associated with them (see Keane 2005; Meneley 2008, Ferry 2013). Brazilian quartz crystals bound for North American gem shows become de-coupled from their actual qualities, histories, and potentialities, and instead become linked to systems of bureaucratic administrative control— albeit temporarily. Through this process, they become reconstituted as new objects, subjects, and socialites all together (see Steiner 2001; Chalfin 2006).
CONCLUSION

In tracking the legal identity of art and various aspects of law at ports of immigration, Christopher Steiner (2001) has suggested that the “classification of objects at the interstitial nodes of national borders provides a unique opportunity to witness a highly politicized form of categorization and the emergence of definitions of value out of the very liminality engendered by transit and passage across formal boundaries” (2001:212). In their journeys from the underground to international mineral shows, crystals—like art—necessarily pass through increasingly formalized zones, which imbue them with all sorts of unique values. More specifically, the different ways they are both obscured and made legible—through packing techniques and through classification categories—generates these unique forms of value.

The Brazilian Nota Fiscal, the Certificado de Origem, shipping manifests, and various bills of lading do more than highlight price at various nodes of a commodity circuit; they index a journey that is at once geographic and spatial as it is economic and bureaucratic. These market materialities draw together diverse actors, new livelihoods, and new aspirations as they collaboratively enable crystals to move safely throughout a commodity scape. They enable a container to be loaded in Corinto, unpacked in Jamaica, and repacked and express delivered to Tucson safely and securely—albeit to a wrong address. In facilitating such a journey, these materialities afford opportunities for my Brazilian friends to make money, and to define themselves against each other in a market fraught with bitter competition. Indeed, statements such as “did you see what so-and-so brought this year” wouldn’t even be possible without the market materialities that allowed them to move.

Just as a container is more than a tin can, a newspaper is more than a free packing material and transport documents are more than official papers riddled with numbers and
descriptions. Each of these market devices works with others to form a type of market materiality that at once hedges against and engenders new forms of risk—and along with it, new opportunities to create value. In a market where value is often defined by the material qualities of an object itself, or the types of materiality it engenders, interrogating proximate materialities and proximate phantasmic values can illuminate much about the various types of market risk that people face, and their different ways of mitigating them.

While watching over my friends’ crystal booth as they were out for lunch one afternoon, a couple in their mid-40s perused our crystals. As I finished wrapping an order to be shipped out, I glanced up to find them both with their outspread hands hovering about six inches above a polished quartz crystal point. This is of course commonplace in Tucson, and even show visitors with little understanding of New Age beliefs mockingly try out such tactics just to see if they “feel anything.” After several minutes I peaked up again as they suspended a small crystal pendulum just above the crystal point. As the pendulum dangled, they waited for a clockwise or counterclockwise spin to verify a question they had asked. Finishing my task, I walked over to ask if they needed help, and the woman pulled out a tuning fork and was holding it over the crystals. “No we’re good right now” she smiled. “We’re just making sure we get the right one” they replied, making clear they wanted to be left alone. I sauntered off to look busy while I kept an eye on them. The woman then lifted the 12” crystal in her hands, and with her eyes closed, held it close to her heart.

“I think this is the one,” she whispered as she brought the crystal over to me. “This is a traveler. How much is it?” I put it on the scale and informed them it would be just over $100USD. “Perfect,” she replied, explaining that they were energy healers, on the road all the time, needing a crystal with grounding and protective energy. “This is the one,” she assured me.
Theorizing along structuralist lines, Marshall Sahlins suggested that “to understand why people want to buy things, we have to understand the place that thing has in a larger code of meanings” (1976:121). To more fully understand value and market transformation, the next chapter tracks how phantasmic value gives way to market and unique forms of phenomenological value as stones move from wholesalers to new age healers.

69 This of course explicitly refers to the fantastic scholarship by Ferry (2005; 2013); Walsh (2003;2010); Brazeal (2017); Calvão (2013) and many others whose thinking about stones’ circulation has paved the way for this project.
70 For important perspectives I point the reader to Alaimo and Hekman eds. 2008; Coole and Frost eds 2010; and Dophijn and van dur Tuin eds 2012 as well as Kohn 2013.
71 As Koray Çalışkan has noted in his ethnography of global cotton markets spanning three continents, “the site of the global cotton market is not geographical, it is documentary and technological,” located in a variety of indices, reports, and shipping manifests, and in containers themselves (2010:128).
72 While the Estrada Real (and presently, BR-367) may have been a key market infrastructure that once facilitated the concealed movement of precious goods from Brazil’s rich soil to European aristocracy and beyond, intermodal containers and steel drums now provide a type of crucial mobility infrastructure that facilitate the movement and concealment of mineral resources from Minas Gerais’ interior to spiritual consumers in the American Southwest, and beyond.
73 Georg Simmel (1906) has suggested that secrecy undergirds all human relations— and as today’s new focus on economic transparency in global trade might suggest— secrecy plays an increasingly important role in many aspects of global markets, from quasi-legal modes of production to the levers of final consumption. The new push toward blockchain technologies to monitor global shipping regimes might be seen as a direct result of this lack of transparency.
74 Peterson (2014) similarly illustrates how importing and logistics practices shape specific businesses, but also forge the market more broadly.
75 In the US, this responsibility falls on the U.S. Customs and Borders Protection and the U.S. International Trade Commission. Transaction histories are recorded and agents are expected to review this history through an online Interactive Tariff Database where officers and importers can search and request tariff classification rulings from a reference manual that the USBP brags is “the size of an unabridged dictionary” (website quote). The database, while comprehensive, also links to a massive Harmonized Tariff Schedule— an archive of robust classification and duties rulings associated with tens of thousands of commodities issued by the Director of the National Commodity Specialist Division. Of the many “regimes of value” (Appadurai 1986) through which crystals pass, perhaps none is more esoteric than their valuation through U.S. customs offices where they are bureaucratized through a seemingly rational and subjective process of descriptive classification (see Steiner 2001).
76 In contrast to much of the social scientific work on value, containerization and the logistics revolution, I attempt to offer a different perspective on how value emerges as goods are exchanged.
77 While the other valuation methods by which imported merchandise is assessed include appraisement value, transacted value, deductive value, and computed value. In total, there are at least 5 primary classification systems used by USITC to find commodities values which include:
• Harmonized Tariff Schedule Online Reference tool
• Commodity Translation Wizard
• HTS/SIC/NAICS/END-USE Descriptions
• Compiled HTS-NAICS Concordance Files
• North American Industry Classification System (NAICS)

It is through these systems that various types of appraisement, transacted, deducted, and computed value are generated.

As Bill Maurer rightly suggests, the global logistics industry is poised to be disrupted by the adoption of blockchain and other cryptographic technologies which promises increased efficiency and transparency in supply chains but also the threat of exposure and verifiability for Brazilian stone importers (personal communication, 2017).

These approaches—by no means as homogeneous or as unified as I am suggesting here—draw from, hedge against, and unite a diversity of philosophies including performativity, sociologies of everyday life, phenomenology, and (non-dogmatic) Marxian critiques of international economy and political geographies (Coole and Frost 2010:6).

Karen Barad’s (2003, 2007) work on material discursivity reworks post-humanist notions of performativity to confront the politics of bifurcating subjects and objects, knowledge and ontology, and agential nature of such entanglements. Barad explicitly stays away from the terms “agent” and “actant” because she suggests they contradict her theory of relational ontologies. Since she is attempting to displace the notion of independently existing individuals, Barad argues that agency must simply exist in varying degrees. In line with philosophical engagements with object-oriented ontologies, Barad refers to “onto-epistemologies” as entanglements of matter and meaning which call into questions fundamental dualisms which divide nature and culture. Rather, she highlights how the so-called subject, the so-called instrument, and the so-called object of research are always already entangled, and how measurements are the entanglement of matter and meaning. Through what she terms, “thingification” or the turning of relations into ‘things’ ‘entities’ or ‘relata,’ Barad argues for an agential realist ontology that rejects the metaphysics of relating worlds and things. Though Barad’s experiences are anchored to her work in laboratories, I suggest “thingification” provides an insightful way to approach the synergistic relations between newspaper, risk, and value.

Parallel to New Materialist endeavors are the metaphysical writings of scholars refusing to privilege human existence over the existence of nonhuman objects (Bogost 2012; Braver 2007; Harman 2002, 2011; Morton 2010, 2013; Bennet 2009). This rejection of anthropocentrism and call for a renewed speculative metaphysics (Harman and Latour 2009) claims its philosophical roots in scholars ranging from Heidegger, Deleuze, Merleau-Ponty, and Bruno Latour, among many others.

For scholars committed to speculative realism and the eschewing of Kantian obsessions with human cognition, theories of object-oriented ontologies offer a way to critically approach objects and relations, rather than with the human-world correlates (see Harman 2002). Generally, these scholars pit themselves against scientific naturalism and social relativism while philosophically aligning their work with post humanist endeavors in theorizing relations between things and new subjectivities of the human mind (Morton 2012).

I build upon theories of object-oriented ontology to explain—ethnographically—how it may be that relations between packing materials, crystals, documents, and containers are as important as human-crystal relationships in this network, despite not being as sexy.

In her interrogation of counterfeit documentary practices in Turkish-Cyprus, Navaro-Yashin argues that documents are “the material objects of law and governance, [as] capable of carrying, containing, or inciting affective energies when transacted or put to use in specific webs of social relation” (2007:81).

For cristaleiros preparing shipments in Brazil, or waiting in Tucson for material to arrive, documents “messy and excessive potentialities” bring about a range of experiences such as panic, terror, and hope reflecting the inherent risk involved in concealing and revealing material to international border specialists (Navaro-Yashin 2007:9). They are affective materialities. For many wholesalers who see themselves as playing by the rules, there is often a disjuncture between their aspirations to be legitimate global international stone dealers and the actual experience of their labor as illicit smugglers. As Susan Coutin has written of undocumented migrant’s clandestinity as a type of “hidden, yet known” aspect of migrants’
social life, “when they are clandestine, migrants embody both law and illegality” (2005:198). Like migrants, international wholesalers (and the goods they circulate) also embody both lawfulness and unlawfulness. In fact it is this kinetic tension that enables them to do what they do— and indeed, enables the global crystal market to function.

Likewise, Steiner evokes McMaster’s (1995) term “border zone” as a “deterritorialized space, pregnant with possibilities, situated between two different cultural systems, where values and meanings are negotiated, transformed, and rearranged” (2001:209).

Crystals’ materiality— and how it is enacted in different places at different times by different people in different ways (see Mol 2002)— depends exclusively on a range of unique key market infrastructures such as BR-367 (the historic Estrada Real), intermodal cranes and docs, container ships, weather, work slowdowns, and mechanical apparatuses that animate crystals’ journey, and indeed come to animate crystals themselves. Charmaine Chua’s ethnography of life on a container ship profiled in a blog series titled “The Slow Boat to China” on The Disorder of Things blog (https://thedisorderofthings.com/2015/01/05/the-slow-boat-to-china/) offers a compelling contemporary adventure in the transcontinental, intermodal movement of goods and people and offers a way to think through all the important infrastructural concerns that are needed to move goods between places.
Chapter Five: Lithic Medicine and a Naked Emperor

Pass not the shapeless lump of crystal by,
Nor view the icy mass with careless eye:
All royal pomp its value fare exceeds
And all the pears the Red Sea’s bosom breeds.
This rough and unformed stone with out a grace.
Midst rarest treasure holds the chiepest place.
- Claudian c.370–404 AD

INTRODUCTION

On the final day of my first gem and mineral show in November 2012, which I detailed in this dissertation’s introduction, I watched a middle-aged woman I’ll call Sally purchase $600 worth of rough green stones with pink highlights (ruby in fuchsite) from a small dealer in a Santa Ana Holiday Inn hotel room. Intrigued why someone would spend such a sum on stones, I followed her down the hall and after some small talk, asked Sally about her purchase. At the heart of my inquiry was how she knows what she knows about stones.

“Well, there are manuals of course,” Sally responded, “but mostly, you just have to feel it.” She explained that she holds a certification from a well-known crystal healing instructor, and now practices crystal healing on her own in Orange County. Sally has honed her ability to feel which stones are best for her practice. Guiding me through how to hold a rock in my left hand, close my eyes, and feel sensations throughout my body, she explained that “knowing” has now simply become a matter of corporal attunement. At stake in such a practice is how subjective encounters with stones get patterned into larger market practices and discourses—put another way, such individual, subjective experiences arguably become an important aspect of market making. Indeed, nearly every crystal healing manual I have analyzed may outline specific practices, but will always include a disclaimer to the tune of, “But don’t trust what I say,
discover for yourself what crystals can do.” Experimentation and self-discovery of evidence is a fundamental aspect of how value is generated, and how the market is formalized and made legitimate for many people.

Several weeks later, I found myself lying face up on a massage table at a crystal healing course in Orange County as the instructor Deborah, and her student, Terry, methodically held a small quartz crystal pendulum over each of my seven chakras. They had begun the healing session by checking the movement of the pendulum to verify if my chakra energy was indeed flowing out appropriately. Deborah explained that a stopped pendulum indicated blocked or stagnant energy, a counterclockwise-spin suggested blocked or stagnant energy flow, and a clockwise spin suggested all was functioning as the cosmos had intended.

Terry had started between my legs, systematically moving up my from my crotch along my bodily meridian toward the crown of my head– migrating from the sacral, the solar plexus, the heart, throat, and the third eye chakras. After making an initial assessment, finding that my throat and base chakras needed attention, Deborah had selected smoky quartz crystals to place between my legs, and tumbled blue lace agate for my throat. These stones were laid upon my body to help modify the chakra’s energy flows.
After 15 minutes or so Terry removed the crystals, and began rechecking my chakras. Deborah had come over to verify Terry’s findings, suspending a small quartz pendulum on a chain above my groin explaining to her student as the pendulum magically started to move on its own (with perhaps some wrist movement): “Okay, see how it’s starting to spin clockwise now? That means the chakra is aligned. It’s always important to retest the chakra after you remove the stones to verify that that they’ve actually done their work.”

One way to read this playful yet earnest encounter is to see Deborah and Terry engaging in a type of scientific pragmatic boundary work as Donna Haraway might suggest; transforming crystals into complex mediators between the scientific and the spiritual, the physical and the esoteric, between nature and culture, and between the scientific and spiritual, the material and the esoteric, between nature and culture, and between object and soul (see Zhan 2009). Using crystals as technologies of testing and verification, Deborah’s quartz pendulum becomes a diagnostic tool that represents how metaphysical (faith-driven) and scientific (empirical) ways of knowing are generatively linked through crystal healing. As instruments, crystal pendulums rely on a classic idiom of truth: proof, external from subjective experience. And in constructing this proof, knowledge domains about chakras (and systems of knowing and verifying) collide with the lives and experiences of those who make mineral markets—those who move crystals from mine to healing table. Knowledge is both embodied and legitimated through assembling all sorts of eclectic knowledge practices which come reflect and shape the logics that sustain the market.

In this chapter, I trace how New Age stone knowledge is generated, how it moves, and what is at stake as people personalize, politicize, and capitalize upon it. I begin by outlining—in the broadest strokes I can—how nineteenth century concerns with energy and matter made their way into the stone world. Though this I introduce Natasha, a well-known New Age author and
crystal healer whose work has profoundly shaped the New Age crystal healing market for nearly 30 years. Natasha’s perspective illuminates how bodily experiences get patterned into broader market forces, and thus come to shape global stone markets. Embodied meaning-making practices sit in tension with New Age’s practice of articulating spiritual traditions and rendering them meaningful in new contexts. This tension offers a way to explore how notions of color and light healing became tied with Hindu conceptions of chakra systems – or at least Western interpretation of chakra systems. Social theories of how New Age articulates (as in links) distinct traditions offer useful ways to explain how such knowledge-making practices are cobbled together, and how these practices make minerals morally, legally, and spiritually valuable in global spiritual markets in the twenty-first century.86

This chapter is undergirded by one key acknowledgement: in many ways, New Agers are seeking to answer similar questions about matter and spirit that were fundamental to the Enlightenment, Victorian, and Edwardian scientists who came before them – and to which much of their epistemic and cosmological inquiries are anchored. If Galileo wrung enchantment out of matter by dropping objects (stones, among other things) out of his tower, then New Agers might be seen as engaging in a project seeking to re-enchant or re-mystify matter by explaining the mechanistic and spiritual forces that guide it through form and function. For many healers, stones represent a re-enchantment of the invisible forces that shape our daily lives – they re-re-enchant a market that for some is mystical and otherworldly, and others is rational and economic.

BUILDING KNOWLEDGE

Animism – the idea that objects, places and creatures may possess distinct transcendental essences – remains one of anthropology’s most enduring and most borrowed theories. Not unlike mesmerism – a nineteenth-century interest in magnetism and a natural force imbued in all living
or animate things—animism seeks to answer questions about the unseen forces that shape the world. Stones are unique social objects whose properties philosophers and theorists have puzzled with for centuries. Touching these traditions, both the archaeological and ethnographic records are filled with countless examples of how people around the world attempt to engage the transcendent through stones. For classic examples, one can look to Franz Boas’s famous documentation of Native American traditions, including uses of crystals, or to James Frazier’s “Golden Bough” which cites a range of Naturalist explorers and early anthropologists, such as Alfred Howitt’s travels in South Wales. More recently, scholars working on topics as diverse as artisanal mining in Africa (Walsh 2010), channeling spiritual entities in the U.S. (Brown 1999), and crystal healing in the UK (McClellan 2006; 2013) have demonstrated how people in vastly different contexts continue to make meaning by engaging with stones’ purported intrinsic powers.

In addition to early anthropological interest in stones, the notion that stones have energy (metaphysical as well as piezoelectric) was of also of profound interest to American mineral enthusiasts in the nineteenth century—many of whom were already well acquainted with crystals’ affective powers from first-hand experience. For example, mineralogist and gem collector George Frederick Kunz (1865-1932) was among the first to write about crystals’ parallel metaphysical energies alongside their piezoelectric properties. In addition to serving as President of Tiffany and Co. in New York, Kunz curated the Natural History Museums’ precious stone exhibit as well as elite mineralogical exhibits at the world’s fairs in Paris, Chicago and Atlanta. Though Kunz was self-taught and had no formal training, he went on to become an active contributor to the fields of both anthropology and mineralogy—particularly by espousing the distinct energies that stones possess. For example, in his oft-cited book, The Magic of Jewels
and Charms, Kunz points to a renewed awareness of stones’ affective and epistemic powers in the early twentieth century:

“The electric or magnetic gems, tourmaline, amber and loadstone, possess not only great scientific interest, but demonstrate the fact that a certain energy really does proceed from some of these fair, ornamental objects, an energy that produces a positive action from without upon the human body. This may well serve to make us less resolutely skeptical as to the possible presence in gemstones of some other forms of emanation not as yet susceptible of scientific determination.” (Kunz 1915:51).

Kunz’s work is important because he bridges the spiritual, scientific, and aesthetic values of stones. His historical perspective cobbles together disparate stone therapy traditions from around the world. For example, Pliny the Elders’s foundational encyclopedic volume of stones and their properties, *Naturalis Historica*, is often described as the fount from which dozens of prescriptive texts emerged. These texts, known as Lapidaries, came to define the pharmacological use of stones and crystals for centuries. Early stone therapies in this tradition often co-existed with apothecary and other forms of homeopathic and herbal remedies, and represented early attempts to understand the essence of matter and spirituality embodied in stones. Lapidaries were important to Kunz in that they “blended classical thought with early Christian teachings and integrated elements of pagan traditions with the mineralogical knowledge of the ancient world” (Harris 2009:26), and provided a holistic historical perspective on lithic powers.

Drawing heavily from Kunz’s analysis of these lapidary archives, Historian Erin Harris (2009) has argued that it would be imprecise to relegate stone therapy to the realm of mysticism as it is more actually located within a long Western tradition of exploring the power and vitality of matter extending from Antiquity to beyond the Enlightenment. Additionally, Harris also nuances Kunz’s discussion, by demonstrating curious overlaps between Armenian, Indian, Chinese and Japanese medicinal stone therapy from the thirteenth to nineteenth centuries.
Such cross-cultural examples might demonstrate stones’ seemingly universal affective (or spiritual or moral) powers while also point to the extensive global exchange networks through which materials and knowledge have flowed. Throughout history, crystals and stones have indeed toed a curious line between the spiritual and the scientific, and between the esoteric and the material, and between the rational West and the mystical East. Kunz and Harris’s interest in this historical perspective offers insights into long-standing spiritual economies and different types of scientific, and aesthetic, and moral value emerge and are made legible at the site of the body.

**LEGITIMATING KNOWLEDGE**

I first met Natasha on a gorgeous spring afternoon in a Sedona, Arizona teahouse after being advised to connect with her by dozens of informants. As co-author of the best-selling crystal manual, *The Book of Stones: Who They are and What They Teach*, owner of a crystal healing certification school, and publisher of “Crystal Resonance Magazine,” Natasha’s work has come to inform much of popular crystal knowledge and practice. I found that it is common for stone shops around the world to place copies of her “Book of Stones” near merchandise to help customers understand the properties of what they are buying (and staff at these stores frequently complained to me that their motivation for keeping manuals nearby stemmed from exhaustion with customers constantly asking, “what is this rock good for?”).

Natasha had only recently relocated to Sedona from New England, in part to get away from the Northeast winters, but mostly to move on from very painful personal and professional baggage in the area. The decades following publication of her Book of Stones had been a personal and professional nightmare, as Natasha had been forced to distance herself from the book’s co-author Roger, while struggling to retain rights to their collective work.
Initially, Roger—a well-known New England stone dealer—had contracted Natasha to co-write alongside five top crystal authors from around the world. Natasha was excited by the potential collaboration which promised to showcase crystal healing’s great variation by contrasting these popular practitioners’ experiences. Natasha sent her writings to Roger, expecting them to be compiled with other healers; however, Roger had deceived her about having contacted other famous practitioners and published the book under his and Natasha’s name only. Moreover, for his own contributions Roger drew explicitly on what Natasha had already penned— at times borrowing her words directly. In addition to plagiarizing her intellectual property, Roger even went on to trademark several stones he had coined exclusively under his own name.

To add salt to the wound, in the decades since The Book of Stones’ first publication (after its success and his boom in business) Roger also filed a non-compete agreement against Natasha, preventing her from selling certain stones and from republishing anything similar to her/ their original work. The silver lining for Natasha has been Roger’s increasingly tainted reputation in the crystal world, particularly for his trademarking common stones, which many in the New Age community find ethically questionable at best.

While trademarking stones is nothing new – some claimed it originated with Tiffany’s in New York City in the 1920s under Kunz– Roger is accused of taking it to the extreme by branding and selling common landscaping quartz for up to $15 per gram ($6,800 per pound!). Roger’s trademarked stones include proprietary names such as “Sedonalite” “Healerite” “Magnifier Quartz” and “Shamanite,” along with detailed descriptions of their healing properties. Within New Age, the most frequent example healers offered me of unethical New Age branders was of an author-healer named Melody, who has had her lawyer send cease and
desist letters to shops selling material she had trademarked. In this case, since the material was not purchased from her, the shops had no right to use its name. Controlling supply and codifying knowledge in this instance not only consolidates authority within the market; it defines the boundaries of epistemology and power among those whose profession it is to heal.

If value creation is a process of making categories (Bowker and Star 1999) and demarking meaningful difference between them (Ferry 2013), then trademarking stones is an exercise in value-making bar none. Robert’s success lies in his ability to buy massive amounts of certain material while simultaneously publishing about these stones’ properties and meanings. Roger is simply capitalizing on what many stone retailers have done for years—finding healers who can articulate a stone’s meaning and publishing insight about it. However, for Natasha, such practices simply muddy the waters: “It’s hard for people to understand different crystal structures and how those structures make the energy different. Instead, people are really just buying the stories that people invent around stones.”

Story telling and story selling are of course at the heart of branding, and trademarking is one formalized way that brands are legitimated. To borrow from anthropologist Constantine Nakassis’s (2013) definition of a brand as “the relationship between a range of materially sensible object-signs (such as commodities, trademarks, slogans, etc.) and some imputed virtual commonality, dubbed by marketers as the brand’s ‘image,’ ‘essence,’ or personality,” then stones’ healing properties can be read not as attributes, but as histories (Nakassis 2013;111; see also Goldgar’s 2008 work on Tulip Mania). At stake in trademarking and branding stones— and the “cultural life of intellectual commodities” (Coombe 1998) more broadly— is how the politics of spiritual life and intellectual property converge to shape the various moral and spiritual economies through which stones pass on their journeys to healers.
Though often contested by New Age practitioners, Roger’s trademarking draws in new actors, new objects, new histories and new ideas into this diffuse global network, and in doing so makes minerals morally, economically, and socially valuable in distinct ways. Central here are the new forms of moral salience (or value) that minerals take on that are quite distinct from a previous example presented in other parts of this dissertation, such as the production of moral minerals at Caba Saco (see Chapter 2). New Agers have long been critiqued for the ways they’ve managed to commoditize spirituality, and how this tension plays out between Roger and Natasha is certainly not unique to their relationship.

For example, scholars of New Age have traced its transformation from an American counter-cultural movement (Basil 1998) to a mainstream spirituality, and often characterize New Age as a type of consumptive capitalism (Heeles 2008) or “religio-scientific consumerism” (Hess 1993) that defines itself simultaneously against and in relation to Western cultural and capitalist values. (Faber 1996; Hanegraaff 1996; York 1995). Sketching a social history of New Age’s root in the Human Potential movement and utopian experiments of the 1960s and 1970s, Michal Brown (1994) has argued that New Age has seemingly abandoned the quest for capitalist alternatives: “If anything, it celebrates capitalism by viewing money as just another form of ‘energy’ that can be transferred, acquired, or lost as a part of one’s personal evolution” (1994:12). Overt struggles over intellectual property in New Age are in fact quite ironic, given that New Age as a social and spiritual movement has a deep history of receiving criticism for its tendency to appropriate spiritual practices from around the world.

RE-ARTICULATING KNOWLEDGE (Collapsing color, light, and the chakras)

Crystals recently have re-emerged in popular culture and have carved out a niche for themselves in mainstream consciousness over the past few years. In addition to “The Great
Crystal Boom of 2017” documented by the New York Times, other pieces in Elle, Vanity Fair, and the LA Times point to a new cultural and market movement. For example, a marketing company, Ad Age, recently published an article “Rock On! Marketers Cash in on Crystal Craze,” in which author Adrienne Pasquarelli (2018) profiles how businesses are booming from the resurfacing interest in crystal energy. In Pasquarelli’s assessment, “the crystal craze is real and it's no longer cloaked in the crushed velvet, hippie head-shop aura of decades past. Despite little or no paid marketing, the practice of keeping precious rocks, whether attached to clothing, on a necklace or at a desk, has [again] become a mainstream movement.” (Pasquarelli 2018). This is as true in the U.S. as in Brazil.

The extent to which New Age has been popularized and globally disseminated came into sharp focus for me while sitting in a hut at Caba Saco as a miner pulled out a Portuguese version of Judy Hall’s Crystal Bible, and thumbed to the section on “Laser Quartz,” explaining how this is where he learned all he knows about healing crystals. Indeed, most contemporary crystal knowledge descends from a few key texts, most notably Katrina Raphael’s Crystal Enlightenment (1985); Crystal Healing (1987) and Crystalline Illumination (2010). Topping the list is also Judy Hall’s Crystal Bible (2005) and 101 Power Crystals (2010). The problem with the popularization of this knowledge for many older New Agers is that it emerges...
from a very specific interpretation of chakra systems— an interpretation that Natasha argues is “not all that old, and not all that accurate. What we are seeing now is a bastardization of a bastardization.”

For example chakras, Sanskrit for “wheels,” have been interpreted as a series of spiral vortices (energy centers) from which energy flows out along the bodily meridian. In Indian and Tibetan approaches to chakras, subtle energies embodied within are primarily activated through yoga and other embodied practices. In Natasha’s assessment, this translation is inaccurate and deceptive since there are dozens if not hundreds of tertiary and minor chakras, not just the typical seven as most New Agers would contend. India-based British colonial judge Sir John Woodrooffe (1965-1936), who had developed an interest in Sanskrit and Hinduism (particularly Tantra) during his time in India, was among the most important scholars to bring such eastern philosophy to the west. Woodrooffe’s (Avalon’s) most famous book, “The Serpent Power” reworked the concepts of Kundalini’s role on the chakra systems, what he originally interpreted as “divine cosmic energies in bodies” (1919:1), and caught the attention of psychologists, theosophists, and other cosmopolitan European spiritual seekers. Hinduism, as fed through Western Edwardian and Victorian lenses, addressed many of the same questions about materialism and the role of energies moving between sentient and non-sentient things that nineteenth-century Western scientists and theosophists were simultaneously puzzling through.

Writing alongside Woodroffe, British theosophist Charles Leadbeater’s (1927) “The Chakras” is often credited for distilling Hindu’s incredibly complex chakra system into easily readable schematics. Many of Leadbeater’s ideas were later taken up and built upon by crystal healing authors in the 1980s— though few actually attribute their ideas to him. Current dogma now suggests that the health of chakras diverges significantly from original Hindu teachings (i.e.
whether they are blocked, clear, and rotating in the proper direction). Leadbeater’s work ostensibly drew the chakra system away from its Asian roots by incorporating more generalized discussions of energy, often interchangeably with acupuncture and notions of energy meridians specifically from Chinese medicine.\textsuperscript{92} As New Age historian Catherine Albanese points out, this reformulation of Hindu practice into a pan-Asian phenomenon showed how “portable and culturally detachable the South Asian concepts actually were for Western spiritual seekers” (Albanese 2007:453, 455).\textsuperscript{93}

Among those taken by the explanatory power of Eastern thought was the young Swiss psychologist Carl Jung, who was struck by yoga’s liberating potential and envisioned a new form of comparative psychology. Jung’s work on Indian religion is limited to two key essays, “Yoga and the West” (1936) and “The Psychology of Eastern Meditation” (1948), however both made significant impact on scholarship and the eclectic spiritual practices already taking root in the West (through Transcendentalism, Spiritualism, and Theosophy among others). Jung in many ways is a New Age pioneer in that he resisted a naturalistic worldview and drew from an array of sources from\textit{Mana} to synchronicity. New Age scholar Sarah Pike notes that Jung’s theory of archetypes even continues to influence New Agers nearly a century later (see Pike 2004). Indeed, many New Age healers I spoke with over the years claim Jung’s work as foundational to the movement, despite not being able to recount specifically how.

In parallel with late nineteenth and early twentieth century European interest in energy systems, the healing potential of light and color were also gaining cultural salience. One such healing technique known as \textit{Chromoray}, premised the notion that each color in the visible spectrum vibrated at the same frequency as certain illnesses, fit nicely with Eastern notions of Chakras and energy. Much of this work drew from nineteenth century physicist Edwin Babbit,
whose “Principles of Light and Color” (1896) influenced cohorts of experimenting young scientists tinkering with ways to improve the body’s healing capacities. Babbit’s *Chromolume*, an instrument (essentially a colored glass cylinder through which light is dispersed) founded upon physiological and chemical laws and oriented toward a harmonic arrangement of energy, played a central role in his healing modality. Babbitt lists dozens of ailments and cures; however, his treatment of “Feverish and Irregular Condition of the Sexual System” is worth outlining here:

> The green glass light should come over the small of the back and lower spine, the orange commencing at the lower part of the hips. This rule is of great importance, and will tend to save the patient from the fearful wreck that overtakes vast multitudes of mankind, and from a condition which, if not arrested in time, will baffle the power of all drugs to heal . . . there is a quiet, deep-reaching and marvelous power in regulated light to heal all such difficulties, as well as to build up exhausted nervous systems generally. (Babbitt 1896:346)

While color, light, and the Chakras were being spoken about in similar social and spiritual milieu during the late nineteenth and early twentieth centuries, it took several decades before such knowledge was codified in New Age, and later still until color and light became dogmatically linked with crystals. It took even several more decades after that until I found myself face up on a massage table in Orange County, California with colored stones littered about my body. Christopher Hill’s (1968) “Nuclear Evolution” was perhaps the first New Age spiritual text to explicitly tie chakra alignment with specific colors.
By the time New Age evangelist Shirley MacLaine had begun publishing in the mid 1980s, certain colors were already fully associated with specific chakras: “we can learn to heal ourselves simply by visualizing colors,” MacLaine wrote. “Each color has the power to set loose higher vibrations in our consciousness that can heal ailments of various parts of the body: blue for the problems of the throat, orange for the liver, green for the heart, yellow for the solar plexus and so on” (MacLaine 1985: 324-5; as outlined in Pike 2004:106). 94

While there remains no unified field of Chakrology (or whatever one might want to call such a field), it does not take much imagination to see how certain stones became linked with certain chakra practices in the spiritual milieu of the twentieth century. The newness of this phenomenon, as Natasha suggests, offers insight into how New Age knowledge emerges and transforms, and how forms of knowledge associated with it have led to the rise of a multibillion-dollar stone market. 95 At this point, the stone-healing-chakra-color knowledge is deeply entrenched in popular culture. For example, at a small taqueria in

Figure 5.4 A vending machine in Sedona, AZ selling mystic gemstones

Figure 5.5 Crystal pendants for pets sold at a boutique pet store in Laguna Beach, CA
Sedona, AZ, even quarter-feed vending machines offer colored stones with designated healing purposes. (Oh, if Pliny the Elder could see this!). Further, one can even buy chakra healing kits for pets in Laguna Beach, CA, or colored crystal water infusions in Diamantina, Brazil.

Ostensibly, colored crystals now have enough marketing power behind them to regulate a mood, mend a personality disorder, or even heal deep childhood trauma. One no longer needs to dole out thousands of dollars for crystal healing courses or an apprenticeship now that thousands of crystal healing “how-to” demonstrations are available on Youtube and private blogs– often with links to purchase specific types of stones for specific ailments. For example, when placed on the proper chakra, pink (rose) quartz will mend a broken heart, blue-lace agate (or really, any blue stone) will enable you to speak your truth, and citrine will cure boardroom. It is easy to see what Natasha is pushing back against– just google it!

Color, light, and the chakras have been drawn together in a way that is easily understood to most enthusiasts, and easily marketed to most practitioners. Discussing this convergence of ideas as “articulation” or linking (such as how a knee joint articulates) is a useful way to frame this (see Stuart Hall 1996). For example, one way to think about “holding together cultural logics without resolving them into a unitary whole” is through Tom Boellstorff’s (2003) notion of “dubbing culture” (2003:226). In using the metaphor of dubbing to explain how under globalization subjectivities are uniquely dialogically reconstituted, Boellstorff suggests that dubbing cultural logics is about assembling and articulating elements that remain distinct. A parallel concept of *bricolage* has also been employed. Similarly, Tim Choy (2011) explores the politics of expertise by critiquing how knowledge is circulated, translated and articulated with other knowledge. In Choy’s definition, articulation is a “linking together and enunciating relevance between disparate elements” (20011:93). Just as a leg is an articulation of a femur and
fibula, color-coded chakra healing is an articulation of many different knowledge practices which are distinct, although they move with and against each other to constitute the epistemological foundations: “which stone is good for what.” Such articulated knowledge however, fails to answer one fundamental question: How do you know?

**Re-EMBODIED KNOWLEDGE**

Claiming that the market has simply gone too far, Natasha is systematically trying to deconstruct prescriptive stone traditions and replace them with more embodied phenomenological based ways of knowing. If scientific epistemology is predicated on reason, experimentation, and validation, and religious epistemology is predicated on faith, then contemporary New Age is in many ways about finding a creative accommodation between the two. Scholars often define New Age as a self-spirituality, whereby personal experience is the fount from which knowledge of the universe (and self) emerges. If Descartes delegitimized the senses as a trustworthy way of knowing, New Age has reclaimed the senses as validation tools bar-none. Natasha in particular has re-defined herself professionally by pushing back against the brain-bound mind while advocating for a more embodied approach to knowing.

“The more that people rely on what they’ve memorized from books or tutorials, the less effective stones are going to be for them,” she claims. Accordingly, Natasha has developed a set of 55 cards—each with an image of a different crystal. These “Crystal Ally” cards are arbitrarily
categorized by elemental groups (earth, fire, water, wind, storm). In order to pick which crystals one should use— for a healing session, or for one’s own meditation— practitioners can either deal out cards in a tarot-like format, or just scatter them on a table and use their intuition to choose. Natasha created the deck to offer a new method of selecting healing stones, beyond a prescriptive book— a method that she finds deeply flawed. Through developing these cards, Natasha has de-centered “knowing” from the mind, and reoriented it within individual intuition and larger materialities and energetic forces.98

“It’s really more than just a picture of the stone, there is actually a type of photonic energy happening— some of the stones’ energy moves through the cards so that people can choose cards intuitively, or vibrationally,” Natasha suggests. Here, crystal energy may be best understood as both a force and process that has mystical qualities and social utility that are made meaningful and transformed through practice. In this sense, ways of knowing and ways of feeling collapse upon each other.99

This concern with energy and how it can be embodied in stones, and its potential known to healers catapults us back to the original questions at the Santa Ana gem show from which this project emerged: Namely how does one know what crystals to use? With Natasha’s system, experience and the interpretation of that experience is central to knowledge generation. As Thomas Csordas (1994) has observed, the experience of embodiment offers a way to explore the dialectic between perceptual consciousness (Merleau-Ponty 1960)
and collective practice (Bourdieu 1976, 1984). Central to this approach is a “hermeneutics of action” (Ricouer 1976) through which to explore the situated-yet-intersubjective nature of sensory experience (see also Haraway 1990). For sensory anthropologists, of course, the push has been against ocularcentric approaches, specifically question of the materiality of things through other inputs such as scent (Gell 1977) or sound (Helmreich 2007) or taste (Stoller 1989).

To this canon, I add the centrality of affective sensory relationships with stones, with their energies, and with the (healing) potentiality stored within them. Natasha’s card system upends the dogmatic tradition of New Age (of course there are manuals), while at the same time staying vulgarly close to its roots as a knowledge-practice that locates the self as the center of knowing.

It could be argued that a parallel movement has been happening in social theory over the past decade. With a renewed anthropological interest in reading bodily encounters with “things,” scholars have puzzled through ethnographic approaches to taking objects seriously on their own terms, while attempting to distinguish materials from concepts (Henare et al. 2006; Viveiros de Castro 2004). Since anthropologists cannot talk to crystals (or even to playing cards), we must focus our efforts on human experiences with crystals’ properties; this may serve as an intervention to disentangle analyses of objects from analyses of knowledge (Haraway 1997; Latour 1993). Scholars of phenomenology have treated the body as the starting point of analysis and the existential ground of culture (Csordas 2002; Desjarlais 2003; Stoller 1989; Merleau-Ponty 1945), and Natasha creatively and earnestly extends embodied approaches to materiality by forcing us to question if people are sensing the cards, the crystals, energy, or something else entirely.

For example, in his phenomenological approaches to materiality, archaeologist Chris Tilly has confronted the affective dimensions of “stoniness” by digging into Merleau-Ponty’s
flavor of phenomenology, suggesting that the body is the starting point through which meaning arises, and perception constitutes the bond between consciousness and the world. From an empiricist perspective, objects are thought to possess certain primary and secondary characteristics that are external to, and independent of each other (size, texture, shape, color). However, from a phenomenological perspective, such measurements are necessarily and inextricably interrelated. The color of a stone and the surface texture of a stone cannot be disentangled from each other, perhaps even when they are images on a card (see Webb Keane discussion on bundles of qualities, such as an apple’s redness in Keane 2005). Is it personal intuition, or is it the alignment of semiotic universes and other actors? Is it entirely subjective, is it locatable in the social, or is it in someway intersubjective—both personal and intimate and part of a broader energetic milieu?

Natasha’s experience offers a contemporary perspective on the complex ways that spiritual values, material objects, and the markets through which they are exchanged intertwine and sustain each other. For anthropologists, theorizing New Age energy presents a unique challenge as we come perilously close to a head-on clash between beliefs (in invisible forces such as energy) and critiques of such beliefs as secular skeptics. Moreover, we risk a full-on materialist reduction by focusing only on the seeming paradoxes of making money in the New Age. These tensions of course get at the methodological issues which undergird ethnographies of religious experience—namely tensions between skepticism and credulity that social scientists often tiptoe around (see Bowie 2006; Evens Pritchard 1973 on seeing ghosts in the field; Csordas 1993; Olkes and Stoller 1987). While healthy skepticism is necessary for ethnography, in order to truly understand how embodied knowledge is generated and comes to shape a market
one must abandon herself to the process (while of course occasionally coming up for air to critique it).

In my many years of working on this project, I was always surprised when academics (anthropologists, especially) would chuckle to themselves as I explained my research on New Age healing. New Age is apparently is a less-than-legitimate area in which to specialize, despite popular press pointing to a timely global movement. This is similar to a hostility that Michael Brown (1994, 1999) frequently encountered in his many years of research with New Age channelers. Brown explained that, “like most American Intellectuals, anthropologists are dismissive of the resolutely middle-brow quality of New Age thought, though we have no problem celebrating working-class peasant, or tribal cultures.” He goes on to suggest that anthropology’s antagonistic position toward new Age may actually rest on a recognition that like New Age, we too appropriate myths and rituals in our own writing, and that our authority in such matters is also called into question by others who also do so, for money. Brown wrote, “I pose these questions to suggest that we should examine our own mixed motives before we throw stones – or should I say healing crystals? – at those who would grab pieces of indigenous religions to enrich their own lives.” (1999:14 emphasis added).

Hurled healing crystals aside, New Age and Natasha’s ambitions to redefine stone knowledge deserves attention precisely because they are directly answering questions about the self and an unknown universe. Rocks are an ideal way to get to the heart of such questions in that their economic, spiritual, and social uses have persisted in most cultures since antiquity, and because New Age uses of them are also social and economic expressions of “an immensely changing world” (Iwersen 1999: 212). Nearly two decades after Brown’s writing, critiques about why New Age should be a valid field of ethnographic enquiry seem trite as anthropologists have
now taken to unpacking the logics and processes and histories that undergird any social phenomenon.

**CONCLUSION**

After graduating university, Natasha worked for several years as a research assistant on an SBIR-funded physics project (Small Business Innovation Research Program, a feeder to the U.S. government in the areas of R&D and high-tech innovation). The project’s aim was to etch holographic imprints onto quartz slices for a military communications program, enabling communication channels of vast distances using light, instead of cables. Natasha explained to me that because of quartz’s hexagonal structure, they were attempting to generate fractal patterns (in a sense, generating infinity) to ostensibly store data in transmissions that didn’t yet even exist. In many ways their work can be seen as a contemporary answer to the U.S. government’s radio crystal program in the 1940s which led to the emergence of Brazil’s quartz industries and fed into the increasingly popular idea that quartz has more than an abstract spiritual energy, but one to be harnessed for transmission and reception. The porosity of science and metaphysics frames much of the discourse and practice around New Age healing.

In her analysis of New Age epistemology, Julia Iwesen has drawn out such tensions, arguing, “many esoteric currents claim the knowable (in the sense of objective and scientific knowledge) is merged with the unknowable (those areas usually reserved for belief and faith). One of the main challenges of esotericism for contemporary scholars is the refusal of the fundamental presupposition that these two conceptions of knowledge are, according to the scientific worldview, separate” (2007:5). Anthropologist and STS scholar David Hess, has a different take, and has suggested that in an attempt to redeem their marginal subjectivity within New Age circles, crystal healers often strategically translate and articulate metaphysical and
scientific knowledge to legitimate their practices. Hess’s point - that crystal practitioners (in particular) productively weave together the physical and the esoteric, the scientific and the spiritual - seems obvious. It fails, however, to expand one key point; namely that New Age itself emerges from a long tradition of practice and theory seeking to rectify the authority of both science and religion in society. Natasha, in her own way, points to how contemporary New Agers rework the authority of these knowledge systems through the private sphere of consumerism, and in doing so, re-centers an enchantment of the material world through subjective experiences, namely through consumption.¹⁰²

However, to leave the analysis there overlooks the open and participatory ways of envisioning, producing, and disseminating crystal knowledge in the twenty-first century. Natasha’s pushback against the tenets of New Age’s understandings of energy and its relationship with bodies and stones is more than a negotiation of her own social position in the process of commodification and marketization which requires her to struggle for status, to rethink pedagogy and learning, and to redefine expertise while reaching out to broader audiences. In bucking against the dominant narrative of stone therapy (that arguably, she helped codify), Natasha brings in new actors, creates new opportunities and epistemological battlefields where careers and reputations are at stake.¹⁰³

To draw out this point, in her ethnography of the globalization of Chinese Medicine, Mei Zhan (2009) urged anthropologists to critically interrogate the social and historical processes that come to constitute the boundaries of rational/irrational, knowledge/belief, natural/cultural, universal/local, and advocates for an interrogation of how our informants may transform such boundaries in creative ways. Natasha provides a contemporary and poignant example of how New Agers actively blur and police such boundaries as she ekes out a humble existence for
herself in the American Southwest. As such, Natasha is engaged in a type of scientific, pragmatic, and phenomenological boundary work—transforming crystals into complex mediators between the scientific and the spiritual; the physical and the esoteric. The impacts of this boundary work extend far beyond Sedona, and impact the lives of the people she has trained, their clients, and the commodity networks through which the material to do so flows.

In addition to her Healing Certification Program, Natasha has recently added a new Certification offering: the Becoming the Human Crystal Program. Structured as a bi-weekly online program, participants receive 25 crystals, 19 studio recorded mediations, one-on-one Skype calls, and six months of unlimited personal support. Natasha explains that it is not about becoming a human crystal, but becoming the human crystal:

“The human crystal is a multi-faceted and complex thing that includes the physical, emotional, mental and spiritual levels and combines them into a single vibrating structure. This structure generates everything from your physical body to the life experiences from which you learn.... Like any crystal that has become resonant with energies other than its own, your human crystal may need clearing and vibrational attunement for you to clear your old experiences, break habits and patterns and move into a more personally empowered co-creative state.” (Natasha 2018)

In New Age cosmologies, crystal energy occupies a curious middle ground between living and physical worlds, hovering between materialistic and spiritualistic realms. By blurring distinctions between social and nature worlds, and between humans and non-human actors (Haraway 1997; Strathern 1980; Viveiros de Castro 1996), Natasha asks us to call into question what is life (crystals grow, after all, and are considered alive by some; see Margulis 2000; Bennet 2010). Given that these understandings vary greatly depending on one’s social position or location, this claim has immediate significance to anthropologists, and feminist materialists concerned with the bifurcation of knowing and being, and the distinction between concepts and materiality (Coole and Frost 2010; Mol 2002).
Through this ontological blurring of rational/irrational, nature/culture, and knowledge/belief, Natasha invites a deeper reflection into our own humanity. In doing so, she also invokes a moment of pause to ponder our own materiality and our multi-facetedness (or multi-facetity?), as well as a reflection on the role of quartz in everyday life, and a crystal healing market that she inadvertently helped create. Natasha’s invitation to reflect offers a moment of insight into how the physical, emotional, mental and spiritual aspects of my ethnographic research might converge into “a single vibrating structure.” That structure might be this document, it might be the market, or it might be me. To return to that Santa Ana Holiday Inn– the inception of this project– Natasha’s mediation provokes a deeper inquiry than “how you know,” it is more about how you be. Crystals in this sense are not simply good to think with, as this evocation goes far beyond epistemology. For the millions of people who like to have stones around them (and pay good money to do so), crystals are good to be with.

86 Throughout this dissertation I also draw implicitly from Annemarie Mol’s work. Representing a shift from epistemological to what she terms a “praxiographic” inquiry Annemarie Mol’s (2002) study of practices illustrates how diseases are “enacted,” effectively destabilizing a seemingly natural subject-object divide.

87 Franz Boas’ (1930) work in “The Religion of the Kwakiutl Indians” playfully documents quartz in a ritual involving the Fool and Shaman’s in a Making-Alive ritual in the American Northwest Kwakiutl tradition along with dozens of other examples in William Lyons’ (1996) “Encyclopedia of Native American Healing”. As mentioned Frazier’s chapter “The Magical Control of the Weather” has many interesting cross-cultural examples about the role of stones in various rain and weather divination practices (1922:76).

88 While it took nearly a century before crystals were to become one of the most common spiritual objects in North American New Religious movements, by the end of the nineteenth century quartz crystals had already established prominence in both scientific and theosophical communities– in part because crystals evoked questions about vitalism, animism, energies, and the emerging questions about the relationship between mind and matter. By the time that French physicists Jacques and Pierre Curie (husband of Marie Curie, discovered of polonium and radium), discovered crystals’ piezoelectric properties many vitalists who had long suspected that power or magnetism flowed within and between objects welcomed even more validation of their evidence.

89 In the “Memoirs of the International Congress of Anthropology,” Kunz describes several dozen of the important lithic pieces he has worked with, and even notes that Captain Burton, the famed British explorer mentioned for his early visits to Brazil’s diamond mining region, is said to have carried with him a star sapphire which “proved to him a talisman of unexampled power which the people (particularly in the heart of Arabia) believed would render him all possible assistance in case they incurred his vengeance” (see Wake 1894:270).

http://farlang.com/books/robert-boyle-essay-on-virtue-of-stones-and-gems

91 I should clarify that no one I spoke with or encountered (Natasha included) has been able to articulate the specific legal obligations around this. But how she (and others) imagine and narrate this experience

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has shaped approaches to commerce, the market, and spiritual practice more broadly. Of central importance is how profoundly this experience affected Natasha. In the decades since, she has been forced to reinvent herself as a practitioner, an author and as a healer while being careful to walk on eggshells around Roger’s empire.

96 It is also important to mention Alice A. Bailey’s influence on the international esoteric movement as well. Bailey’s introduction to India with the British army as a an evangelist in the early twentieth-century propelled her to Theosophy and interpretations of Tibetan Buddhism. As the author of 20 post-Theosophic texts in the twentieth century, Bailey is often credited with popularizing the term “New Age”– though it was coined sometime in the late nineteenth century (see Pike 2004 for a robust history).

97 From a functionalist perspective, one might argue that New Age stripped down all the complex social and regulatory functions of Eastern religion and kept the Upanishads and yoga program as ways to regulate and expand the self.

98 This was later taken up by others such as Rosalyn Bruyeres (1994) in her classic text, “Wheels of Light.” The notion that certain color crystals can interact with chakras in pre-determined ways has become a foundational principle of crystal healing.

99 Many often point out that the crystal market boomed with MacLaine’s appearance on the cover of Time magazine, however there were many factors that made such a boom possible. For example, an important New Age fair, known as the first “Crystal Congress” which took place in Los Angeles, California in the fall of,1987. Featuring over 100 exhibitors and workshops on healing, crystal skulls, and other metaphysical topics relating to stones, the Crystal Congress is also often cited as the birthplace of the modern crystal movement as it brought important ideas and people together in one place for the first time. While some people I spoke with were in attendance, they recall very little about the event, and there is relatively scant information in the public domain.


99 Erin Harris’ (2009) historical exploration of European lapidary medicine curiously offers a similar and unexpected example of this by explaining how “these texts often ask readers to apply their skills of perception and discernment to the theological arguments presented in the same skillful manner that a lapidary judges the nature and quality of gemstones” (2009:144). This is significant in that it points to a tension between the codification of knowledge in lapidary texts (of which very few people could access, yet alone read), the reliance on a type of meditative or embodied intuition through which stone knowledge might emerge (and thus be accessible to everyone). Natasha’s push for new stone practices is somewhat similar, and can be seen as her way to possibly resolve this tension– at least in her own life.

99 Natasha’s method is particularly interesting in that it both hedges against the dogma of codified New Age healing knowledge (and her own success in that genre), while also tapping into the meditative approaches of knowing oneself and knowing the world of which Theosophists such as a Bailey and Leadbeater, and later Jung, were outspoken proponents.

In terms of value, Natasha’s thinking might alight with George Simmel and Arjurn Appadurai’s theories of value and exchange which encourage us to think about how subjective judgments get patterned into larger systems of value. It is useful here to think about awe-inspiring, impactful commodities such as Apple computers, where use-value is marginal. Other examples, such as art markets and designer goods, also represent value circuits dealing with subjective judgments and desire that seem to exceed standard economic theories (see Gell 1998; Miller 2005; Myers 2001).

99 Anthropologists in the field frequently experience things beyond the edge of rationality that they are unable to easily explain away, and I am no exception here (see Olkes and Stoller 1987; E. Turner 2005; Csordas 1993). Should I dismiss my informants and my experience as pathological or as illusions of the mind? Paul Stoller asks, “if anthropologists are to produce knowledge how can they ignore how their own sensual biases affect the information they produce?” (1987:7). It would surely be unwise to fall into the well-trodden tracks of much of the anthropology of religion (which is essentially secular in orientation), and it would be similarly foolish to follow in Carlos Castaneda’s footsteps. Since experience is not universal (Desjarlais 1994; Tilley 2014) my task then is develop a method that can account for the diverse
ways that people (ethnographer included) encounter things that beg a more nuanced understanding of spiritual and economic life (Bruner and Turner 1986; Geertz 1986:374; Keane 2008; Throop 2003).

100 Within New Age, the primacy of experience has been linked to a type of extreme self-sacralization, or self-spirituality where individual practitioners give personalized twists to “existing symbols, objects and metaphors”... Such a claim has rightly been critiqued by sociologists who claim that isolated individuals, can’t codify cultural practices. This tasks anthropologists with documenting “how precisely spirituality is socially constructed, transmitted, and reinforced in the spiritual milieu” of contemporary western society (Besecke 2005:194; Aupers and Houtman 2006: 219),

101 Lee has argued that “paranormal experiences with magic, however, should they occur, are relevant to anthropological considerations because they provide an important corrective to the abstractive thrust in theoretical endeavors and demonstrate that other dimensions of magic await our exploration” (Lee 1987:70). Carlos Castaneda is an extreme example here, however most anthropologists have some odd experience in the field, either serendipity, or something beyond coincidence that they choose to hold sacred. I am no exception here and my massive stone collection may suggest that affective or phenomenological encounters with rocks could somehow some how be related.

102 Indeed for decades, STS scholars such as Sandra Harding (1998) and Cory Hayden (2003) have generatively explained science as trans-local, open-ended processes and networks of knowledge, identity and community formation.

103 Mei Zhan’s 2009 Other Worldly provides a parallel discussion of Chinese medicine healers and how practices change as Traditional Chinese Medicine is “worlded.”
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