

**BEAVERS, SETTLERS, AND SCIENTISTS:
ENTANGLEMENTS OF ENVIRONMENTAL SCIENCE AND
(IN)JUSTICE IN AUSTRAL PATAGONIA, 1940s-2020s**

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ABSTRACT

This dissertation examines how the production of scientific knowledges has been entangled with the making of inter-generational, environmental, interspecies, and memory (in)justices in Austral Patagonia, 1940s-2020s. I have studied science and more-than-human colonialism in Tierra del Fuego (TdF) by following the history of beavers, an environmental and political keystone species in the region. First introduced as a species symbolizing modernity in the 1940s, beavers are now being eradicated as an exotic invasive population that threatens native and pristine natures.

With ethnographic and archival sources and after more than a year living and working with scientists involved in the eradication project at the *Austral Center of Scientific Research* in Ushuaia, my research analyzes how established disciplines (statistics, geography, biology, archaeology) have coproduced the colonization and racialization of the natures, populations, and knowledges of TdF. However, the massive and scientized killing involved in eradicating beavers is encouraging political questions that, in TdF, have been historically harshly repressed.

Building upon interdisciplinary notions of memory, justice, and violence (social, environmental, intergenerational, interspecies), I examine the power of nature for re-politicization, or environmental knowledges in TdF are not only reproducing novel forms of coloniality but are also being mobilized in ways that construct demands over inter-species, intergenerational, decolonial, and environmental justice.

1. INTRODUCTION

1.1 Ghosts of the Beaverscene

In 1946, the Argentinian government decided to introduce twenty beavers (*Castor Canadensis*) from Canada in Tierra del Fuego, the southernmost tip of America. The beavers were captured, flown in, and introduced by Tom Lamb, a pioneer and descendent of an Anglican family who was known as *Mr. North*: he had restocked the beaver and muskrat populations that had almost gone extinct in Canada after violent organized fur trade and he had contributed to expanding the northern frontier of that country. My archival research shows how the Argentinian State's goal was multiple: a) to enrich and modernize the native fauna of a region that was considered empty and sterile, b) to industrialize by emulating the fur economies of regions with similar climates, and c) to assert national sovereignty in a territory with low presence of the state and with more foreign than national population.

By 1981, the introduction of beavers was declared "a mistake."¹ The fur industry had never been implemented and, in the absence of predators, the beavers' population had increased exponentially and occupied most rivers and streams of TdF, including on the Chilean side. Without producing industrialized vital surplus, beavers today are apocalyptic "ecosystem engineers": they design dams, organically modify rivers, flood lands, and kill native trees that, unlike the Canadian ones, are not able to recover after flooding.² Since the 1980s, regional institutions of both Chile and Argentina have designed measures to control

¹ Jorge Néstor Amaya, "Consideraciones Generales Sobre La Conveniencia de La Caza Del Castor [Castor Canadensis] En Tierra Del Fuego," *Fauna* 33 (1981): 11.

² Christopher B. Anderson et al., "Do Introduced North American Beavers *Castor Canadensis* Engineer Differently in Southern South America? An Overview with Implications for Restoration," *Mammal Review* 39, no. 1 (2009): 33–52.

the beaver population by promoting hunting, the fur trade, and the use of beaver meat for human consumption.

In 2008, after the arrival of new environmental transnational actors in the region, the approach of local control was displaced by one of habitat restoration through species eradication, an epistemological shift that qualified for significant international funding.³ By suggesting that beavers have driven the most impactful disturbances to sub-Antarctic forests in the Holocene, globalist knowledges and actors have gained legitimacy to transform the natures of the region towards sustainable and profitable futures. Specifically, Global Environmental Facility (GEF),⁴ the largest public organization funding global environmental projects, assigned eight million US dollars to Chile and eighteen million to Argentina to increase their national capabilities in the management of invasive species. Located in Washington DC, GEF categorizes its members as “developed” and “developing participants” and, while both can be donors, only those considered developing are recipients of GEF support as a way to “achieve global environmental benefits and fulfill their commitments under the main environmental conventions.”⁵ With two finalized projects for studying the feasibility of eradicating the beavers, my expert informants mostly think it is impossible: they cannot access some islands due to climate conditions, and they do not envisage funding and continuity for a problem that transcends national borders.

³ Christopher B Anderson, Catherine Roulier, and J Cristobal Pizarro, “Perspectives of Key Stakeholders on the Bi-National Agreement between Argentina and Chile Concerning the Eradication of North American Beavers and the Restoration of Affected Ecosystems,” *BOSQUE* 38, no. 3 (2017): 555–62.

⁴ The Global Environmental Facility is a transnational organization that unites UN agencies, banks, national entities, and NGOs, to support private and public environmental projects throughout 183 countries in the world. GEF was established after the 1992 Rio Conference to address urgent environmental problems, especially global biodiversity conservation.

⁵ “Countries (Participants),” Global Environmental Facility, accessed July 10, 2020, <https://www.thegef.org/partners/countries-participants>.



Figure 1.1. Ghostly landscapes of the Beaverscene

These ghostly landscapes are not only the materialization of beavers' capacities to invade and colonize new areas. They affectively provoke questions and sorrows to those of us who walk through a muddy land of fallen, flooded, dead trees laying like corpses. Trees who are today visible not only to beavers but also to citizens who are learning to value them as native, fragile, and pristine through scientifically mediated natures. These landscapes are also part of a more-than-animal environmental history of scientific, economic, and ecological designs of nature. The idea of environmental imaginaries that has dominated most of our recent socio-ecological research suggests a politics for promoting more sustainable futures at the face of the Anthropocene. Across social sciences, including STS, the language of desirable futures has become a mythical one for evaluating, funding, and ethically supporting any sort of knowledge. Built upon diverse modes of understanding human-nature interactions, this politics of nature, emergency, and the future has often gone unchallenged. My research joins the efforts of decolonial scholars who have shown how

these visions too often reproduce colonial, Eurocentric, and universalist worlds.⁶ Such worlds are more than academic, as they are today legitimating the increasing globalism of environmental sciences, politics, and capital, and, in Tierra del Fuego, benevolently implementing global agendas that displace local histories and make possible new forms of authoritarianism, commodification, and dispossession that go unquestioned.

In this context, beavers have become a keystone species, which in biology is defined by their vital capacities to transform entire ecosystems. However, beavers have become a keystone species beyond their biologies.⁷ In this view beavers live within ecosystems which also qualify as worlds of emergence and encounter between organisms and their environments. In what I call The Beaverscene, beavers have unquestionably been the main transformers of sub-Antarctic forests, but their concentration has also fueled significant transformations in the modes of ordering of environmental knowledges and practices.⁸ If the human has been the haunting figure central to the Anthropocene, the Fuegian beavers of the Beaverscene have haunted the futures of Tierra del Fuego. Likewise, the universalist connotation of its *-cene* has situated the region as a natural laboratory for globalist futures.

As I will unpack throughout this dissertation, the history of science, nature, and future making in the Beaverscene has not gone as peacefully as dominant discourses have made it seem. Examining the processes that have channeled these powerful narratives and

⁶ Zoe Todd, "An Indigenous Feminist's Take On The Ontological Turn: 'Ontology' Is Just Another Word For Colonialism," *Journal of Historical Sociology* 29, no. 1 (2016): 4–22; Andreas Malm and Alf Hornborg, "The Geology of Mankind? A Critique of the Anthropocene Narrative," *The Anthropocene Review* 1, no. 1 (2014): 62–69; Juanita Sundberg, "Decolonizing Posthumanist Geographies," *Cultural Geographies* 21, no. 1 (2013): 33–47.

⁷ Jessica L. Archibald et al., "The Relevance of Social Imaginaries to Understand and Manage Biological Invasions in Southern Patagonia," *Biological Invasions* 22, no. 11 (2020): 3307–23.

⁸ Mara Dicenta, "The Beavercene: Eradication and Settler-Colonialism in Tierra del Fuego," *Environment & Society Portal*, Arcadia (Spring 2020), no. 1. Rachel Carson Center for Environment and Society, accessed June 3, 2020, <http://www.environmentandsociety.org/node/8973>.

the tropes upon which they rest, I interrogate how dominant narratives have made disappear others to the point of making possible an apparent lack of conflict. Why does a plan for eradicating an entire species that is led by globalist actors and capital not entail significant public opposition in Tierra del Fuego? How has a horizon of massive killing, land appropriation, and displacement of local knowledges and natures become legitimate? And what silenced histories of violence and asymmetry have constituted this truth?

In this environmental ethnographic history, I attend to how colonial, authoritarian, and universalist socio-ecologies have been objectivized and reconfigured in Tierra del Fuego since the introduction of beavers as a national event in the 1940s. As an invasive species, beavers have settled along rivers while constructing inter-generational dams to secure their own environmental futures. Almost human, and almost technology, beavers have exceeded human politics and affectively troubled many of us, especially those who are in direct contact with them through hunting and who have been haunted by the ghosts of human exceptionalism. As a biological keystone species, they have been socialized as workers, monogamous, engineers, furbearers, and modernity builders, all aspects that, once animalized, have been naturalized through the sign of the beaver and its vitalities. A sign that is more than symbolic representation, as it is built upon beavers' agentic, technological, and social capacities to transform natures and futures. A sign that has encompassed beavers' ecologies to fuel a peaceful narrative of settler colonialism, nationalization, and scientization through the deemed innocence of the animal. A sign that, again exceeding human designs, has also become a ghostly figure that has traveled across colonial hemispheres, times, and analytical categories.

My critical analysis deconstructs historical and scientific structures of power in a region dominated by a narrative of integration and security. The ghosts of the Beaverscene

are disrupting that coherent truth, taking many of us to see what powerfully repressed histories of violence and dispossession have made other truths silent. In a reconstructive move, I have also paid attention to how the ghosts of the Beaverscene are bringing to light repressed histories that entail reparative possibilities. Rather than merely condemning how colonialism, racism, authoritarianism, and universalism have been naturalized, my ultimate question interrogates what comes after that. If every inclusion entails an exclusion, how have environmental sciences in Tierra del Fuego created some differences and disavowed others? And how are those disavowed natures, peoples, and histories of violence emerging in re-politicizing ways after long processes of naturalization? How have the ways in which nature has been known across time have produced economic, social, and environmental asymmetries? And how can environmental sciences contribute not only restorative natures but also reparative histories?

1.2 The Field Site: Tierra del Fuego

The archipelago of Tierra del Fuego is emplaced in the southernmost tip of America and it is administratively divided between Chile and Argentina. Its current name, “Land of Fire,” was given by Spanish explorers in the 16th century after seeing native fires on the coast.⁹

⁹ Sylvia Iparraguirre and Florian von der Fecht, *Tierra Del Fuego. Una Biografía Del Fin Del Mundo* (Buenos Aires: Nuevo Extremo, 2009).

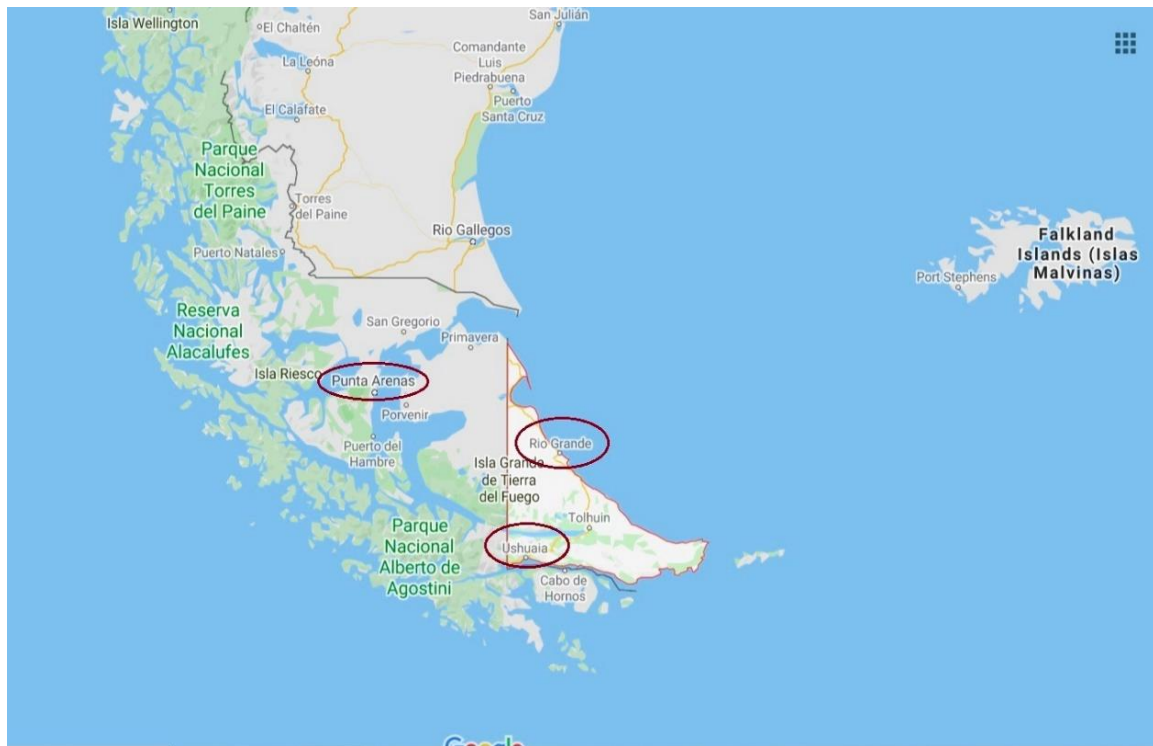


Figure 1.2. Map of Tierra del Fuego and its main cities, captured from Google Maps (2019)¹⁰

Map in fig. 1.2 shows the Chilean-Argentinian border at the end of their mainland, one that following the Andean mountains, breaks the vertical line that divides both states. The Argentinean province of Tierra del Fuego is constituted today by the Main Island of Tierra del Fuego (the triangle), some Atlantic islands, and Antarctica, with a total population of around 152,000. The two main cities within the main Island of Tierra del Fuego are Ushuaia, facing the Beagle Canal, and Río Grande, facing the Atlantic. Both cities have a population of around 65,000 each. The Chilean province of Tierra del Fuego constitutes only the left side of the Main Island and a small part of land to its left. Its total population is 8,000. However, TdF belongs to the Region of Magallanes and, in the centralized governance of Chile where regions have more power than provinces, it often makes sense to look at the

¹⁰ “Map of Tierra del Fuego and its main cities, Chile and Argentina,” Google Maps, accessed July 10, 2020, <https://goo.gl/maps/KA4TDZwzWDJCqw9u9>. Reproduced with permission (see Appendix A).

other three provinces next to TdF¹¹ which, together, make a population of 165,000, similar to the one of the Argentinian TdF.

Holocene Times: People lived here before Tierra del Fuego, Chile, or Argentina existed. Archaeologists agree that human colonization occurred between 10500 and 7000 BP, but do not agree if the colonizers came from the North or from the Southern Pacific.¹² At first, these human groups formed short term occupations that expanded when climate conditions ameliorated during the Holocene, around 9000 BP. With warmer lands and the rise of sea levels, people also faced new biogeographical barriers such as the Strait of Magellan and the Beagle Canal that, after a long process of geological fractures and deglaciation, separated the Main Island of TdF from the continent.¹³ These peoples, who were now separated from the continent, were the ancestors of the groups that, after colonial encounters, came to be identified as native.¹⁴

Despite the complexity of clans and interethnic relations, indigenous differentiation has been mostly grouped into Kawésqar and Yaghan peoples, who were maritime hunter-gatherers and passed most of their time in their canoes collecting clams and mussels, and Aonik'enk, Manek'enk, and Selk'nam, who went further inland and hunted like guanacos and rheas.¹⁵

¹¹ Magallanes, Última Esperanza, and Antártica.

¹² Luis Alberto Borrero, "The Prehistoric Exploration and Colonization of Fuego-Patagonia," *Journal of World Prehistory* 13, no. 3 (1999): 321–55.

¹³ Borrero, 347.

¹⁴ Ethnographers and explorers who arrived into the region started to assign names to them and tried to classify them according to languages, skulls, morphology, or territories.

¹⁵ Flavia Morello et al., "Hunter-Gatherers, Biogeographic Barriers and the Development of Human Settlement in Tierra Del Fuego," *Antiquity* 86 (2012): 71–87; Martín Gusinde, *Los Indios de Tierra Del Fuego. Vol. I* (Buenos Aires: Centro Argentino de Etnología Americana, Consejo Nacional de Investigaciones Científicas y Técnicas, 1982); Luis Alberto Orquera and Ernesto Luis Piana, *La Vida Material y Social de Los Yámana* (Buenos Aires: Eudeba, 1999).

Imperial Times: In 1520, the fleet of Magallanes landed in the Strait that later would bear his name. Because the Spanish Empire was seeking a route towards Indonesia, and given the harsh climate conditions,¹⁶ the region did not provoke much interest to the Empires until the 18th and 19th centuries, when the Strait became a geopolitical and scientific space for advancing European civilization. Scientists, moved by images of the last Edenic places in an industrialized world, became crucial to expanding the empires' access to the hostile lands of TdF, now turned sublime. Fitz Roy and Darwin arrived at the beginning of the 19th century to name and measure Fuegian lands, seas, species, and peoples with British nouns and methods.¹⁷

By the end of the 19th century, missionaries were able to settle and, with that, indigenous peoples started to struggle in their lands. After various attempts,¹⁸ the Anglican Thomas Bridges successfully opened a Mission in Ushuaia and, after him, other Anglicans and Salesians arrived to civilize and integrate the natives into the modern values of sedentarism, work, and education. While they also argued their attempts to protect indigenous peoples from miners and farmers' genocide, the method of confinement often

¹⁶ Guillermo Giucci, *Tierra Del Fuego: La Creación Del Fin Del Mundo* (Ciudad Autónoma de Buenos Aires: Fondo de Cultura Económica, 2014), 70. Distance and climate conditions required excessive efforts, as proved by the death of a group of 338 Spanish people who had arrived and tried to settle but, without supplies and uncommunicated, most of them died.

¹⁷ Giucci, 123. Tierra del Fuego became a reference in Darwin's collections and taxonomies for international scientific networks.

¹⁸ British imperialism partnered not only with science but also with Anglican projects of evangelization around the world. The president of the Patagonian Mission, Allan Gardiner, died of starvation in the Beagle Canal during his third attempt to settle. In 1856, the first successful mission was settled in the Falkland Islands, where no indigenous peoples lived before. From there, the missionaries Thomas Bridges and his adopted father were able to meet with Fuegians while learning the Yaghan language. In 1869, Bridges and his father opened another mission in indigenous lands in the Ushuaia Bay. Since 1880, Catholic Salesians arrived with similar intentions, opening missions in Isla Dawson, in Chile, and Rio Grande, in Argentina.

accentuated their deaths when smallpox and rabies came accompanying settlers and soldiers.¹⁹

Sheep-Laird Sovereignty: Since the 1880s the region has been colonized by a farming oligarchy that transformed socioenvironmental relations. In 1881 Argentina and Chile signed a Boundary Peace Agreement that divided the Main Island of Tierra del Fuego by a straight line. In 1845, Chile had designated Punta Arenas as a penal colony. In 1884, with concerns over British invasions, Argentina sent a military expedition and occupied the Anglican mission in Ushuaia, establishing the National Territory of Tierra del Fuego. However, the annexations came with a lack of a presence and resources in an underpopulated area that was far from the executive centers. The government let the private sector act on its own after corrupt agreements between the national elite and European capitals, without promoting land distribution or indigenous reserves as it had in other national territories. This provoked an extreme concentration of land and power by giving special benefits to a small number of families.

The first family was that of the missionary Bridges who, after the state occupation, decided to abandon the mission for raising sheep. The government donated two thousand ha of Yaghan lands to him in recognition of his evangelical services.²⁰ Soon after, other

¹⁹ After a fire in the Salesian church of Punta Arenas, they moved to the main Island with the goal of protecting and civilizing indigenous peoples, mostly selk'nam in an area where settlers like Julio Popper and José Menéndez expanded their businesses while killing or sending to kill native peoples and, with them, any kind of territorial questioning.

²⁰ E. Lucas Bridges, *Uttermost Part of the Earth. The First History of Tierra Del Fuego and the Fuegian Indians* (London: Random House, 1987); Miguel A Mastroscello, *La Economía Del Fin Del Mundo. Configuración, Evolución y Perspectivas Económicas de Tierra Del Fuego* (Ushuaia: Editorial Cuatro Vientos, 2007). With that, Bridges became triple pioneer for having opened the first mission and the first estancia in Tierra del Fuego and for bringing the first cows and sheep. He brought a sheep herd from the Falkland Islands and four Romney Marsh breeding males from the UK. His descendants expanded his influence by opening a second ranch of 50000 ha near Rio Grande, an extension that would look small in comparison the lands occupied by the families that arrived soon after.

Europeans started to expand their owned sheep – along with their dominance over an economically binational territory whose labor and raw wools were capitalized in Europe. Sheep trade in TdF constituted what fur trade had in the Hudson Bay: a colonial exchange based on genocide, “accumulation by dispossession,”²¹ and environmental degradation.

Sheep added value to arid lands that were deemed sterile and useless – with little capital investment, all costs could be externalized into nature’s carrying capacities. With land concentration there was no need to import or enhance pastures, as sheep could freely move for grazing in a territory with dispersed resources. By 1910, 50% of worldwide killed sheep for global markets came from TdF.²² By 1911 all the central territory of TdF was owned by four stock corporations who were associated also through marriage.²³ By 1920, lairds owned more than 1,500,000 ha and occupied another 1,500,000 ha of public lands.²⁴ Sheep radically altered indigenous environments. By the end of the 19th century, most human natives had escaped to the south of the Island, had been killed by the oligarchic families who paid bounties to “hunters” for natives killed, or had been confined in the missions as their last resource for survival.

²¹ David Harvey, “El Nuevo Imperialismo: Acumulación Por Desposesión,” in *El Nuevo Desafío Imperial*, ed. Leo Panitch and Colin Leys (Buenos Aires: CLACSO, 2004), 99–129.

²² Susana Bandieri, “Inversión Multiimplantada: Tierras, Comercio y Finanzas En La Patagonia Austral,” *Investigaciones Socio Históricas Regionales* 13 (2015): 20–40.

²³ Enrique C E Livraghi, *Los Ovejeros Del Fin Del Mundo y Su Relación Con La Tecnología. Percepciones Acerca de Las Reservas Forrajeras Para Uso Estratégico Invernal* (Ushuaia: Facultad Latinoamericana de Ciencias Sociales Argentina, 2011); Alberto Harambour, *Soberanías Fronterizas: Estados y Capital En La Colonización de Patagonia (Argentina y Chile, 1830-1922)* (Valdivia: Ediciones de la Universidad Austral de Chile, 2019); Mateo Martinic, “Recordando a Un Imperio Pastoril: La Sociedad Explotadora de Tierra Del Fuego (1893-1973),” *Magallania* 39, no. 1 (2011): 5–32; Osvaldo Bayer, *La Patagonia Rebelde* (Buenos Aires: Planeta, 1997).

²⁴ Bandieri, “Inversión Multiimplantada: Tierras, Comercio y Finanzas En La Patagonia Austral,” 28–31.

The above scenario started to be perceived as problematic at the beginning of the 20th century. On one hand, workers in all Southern Patagonia, who had sheltered anarchist ideas from European exiles, started to demand rights through unionizing and striking. Despite the reformist character of the Argentinian government of the time, the power of the oligarchy coopted the state, ultimately killing hundreds of workers between 1919 and 1922, in a barely populated region.²⁵ On the other hand, an expansionist state started to problematize this economy: capitals was kept privately without contribution to the state or the region, for the model was based on male temporary workers, mostly poor Chilean immigrants, who promoted neither infrastructure nor population growth.²⁶

This climate provoked efforts from the state to reverse the situation while nationalizing each territory in ways that put an end to its binational trajectory. In 1925, The Argentinian government tried to take back the public lands that were occupied by the oligarchy. Some were reserved for state industries and national parks, others were looted for farmers, and the poorest ones became indigenous reserves.²⁷ Lairds responded by occupying them back using their power.²⁸ They also created the Rural Association of TdF to defend

²⁵ Tulio Halperín Donghi, *Historia Contemporánea de América Latina* (Madrid: Alianza Editorial, 2005), 330–35.

²⁶ Mateo Martinic, “El Poblamiento Rural En Magallanes Durante El Siglo XX. Realidad y Utopía,” *Magallania* 34, no. 1 (2006): 5–20; Anuario Estadístico de Tierra del Fuego 2010, Instituto Provincial de Análisis de Investigación, Estadística y Censos (Tierra del Fuego, 2010): 32–33, accessed July 10, 2020, <https://ipiec.tierradelfuego.gob.ar/wp-content/uploads/2016/01/Anuario-Estad%3%adstico-2010.pdf>. In the region of Magallanes, by 1906 there were 2061 men and 626 women. In the Argentinian side, there were 570 men for each 100 women.

²⁷ Livraghi, *Los Ovejeros Del Fin Del Mundo y Su Relación Con La Tecnología. Percepciones Acerca de Las Reservas Forrajeras Para Uso Estratégico Invernal*, 50.

²⁸ Eulogio Frites, *El Derecho de Los Pueblos Indígenas* (Buenos Aires: INADI, 2011), 11. In 1953, the author met some Fuegian selk’nam in Buenos Aires. They had traveled to denounce landowners who had moved their fences and taken over their assigned territories in Tolhuin, TdF, since 1925.

their property and privilege.²⁹ However, the less favorable governmental laws, reduction in wool prices after the world wars, and the opening of the Panama Canal (1914) that significantly decreased the use of the Strait of Magellan, ended up making oligarchs willing to sell part of their lands and diversify their activities into a meat processing company, logging and fishing activities, and supermarkets.³⁰ These activities promoted infrastructure and services such as hospitals and schools, leading to the creation of urban cities where most of the population of TdF is now concentrated on the Argentinian side. In 1958 a similar law was enacted in the Chilean TdF, but unlike the Argentinian one, it failed to bring settlers and to distribute justice, as divided farming lands were occupied by inexperienced workers who ended up selling them back. Today they are mostly occupied by absent landholders.³¹

Oil and Navy Times: At the beginning of the 20th century, and with eugenic discourses, Argentina became concerned over the specter of a TdF made of foreign citizens, languages, and traditions. In addition to distributing lands to national settlers to “argentinize” TdF, the state started to promote industrial economies that would link economic progress with nationalism in a national context of agriculture and livestock decline after the world wars. In Ushuaia, a penal colony had promoted the biggest demographic growth of the city, which passed from having a population of 300 in 1895 to one of 1,500 in 1914 and 5,000 in 1947, when the penal colony was closed for humanitarian

²⁹ Livraghi, *Los Ovejeros Del Fin Del Mundo y Su Relación Con La Tecnología. Percepciones Acerca de Las Reservas Forrajeras Para Uso Estratégico Invernal*, 51.

³⁰ Bandieri, “Inversión Multiimplantada: Tierras, Comercio y Finanzas En La Patagonia Austral,” 37. Menendez and Braun opened a meat processing company in Rio Grande and some offices for import and export in Buenos Aires.

³¹ Peter Klepeis and Paul Laris, “Contesting Sustainable Development in Tierra Del Fuego,” *Geoforum* 37, no. 4 (2006): 505–18; Martinic, “El Poblamiento Rural En Magallanes Durante El Siglo XX. Realidad y Utopía,” 14–16.

reasons. The prison had leveraged a logging industry and services but, most importantly, it had institutionalized a national administration.³²

In 1943, TdF passed from being a National Territory to become administered as a “Maritime Government,” letting the Navy be the main actor for planning and building infrastructures in a region considered to be in need of tutelage given its lack of population, presence of foreign threats, and lack of political autonomy.³³ Unlike the rest of the national territories in Argentina, TdF did not become a province until 1991, conserving a territorial identity linked to the military as the driver of infrastructures, industries, and modernization, despite the military’s dependence on indigenous guidance for finding possible roads.³⁴

During the 1950s, the implementation of industries, especially energy ones, required capital that the state lacked. As in other parts of the country, TdF opened its oil deposits to foreign companies that would bring their technologies while paying monthly bonuses.³⁵ Oil extraction helped the regional administration that could barely get 7% of expenses from taxes. By 1961, the petrol industry contributed 97% of the total incomes in the Argentinian TdF.³⁶ With the bonuses, local administration created roads, hospitals, houses, and an airport, all of which promoted small industries for gas, tourism, and logging. However, this

³² Mastroscello, *La Economía Del Fin Del Mundo. Configuración, Evolución y Perspectivas Económicas de Tierra Del Fuego*, 70–80.

³³ Martha Ruffini, “Políticas de La Memoria. El Estado y La Construcción Identitaria Durante Los Primeros Gobiernos Electivos: Río Negro, 1955-1976,” *Boletín Americanista* 1, no. 72 (2016): 109–30; Mario Arias Bucciarelli, “Abordajes y Perspectiva En Torno a Los Territorios Nacionales En Argentina . Un Itinerario Conceptual y Empírico Sobre La Producción Historiográfica Más Reciente,” *Boletín Americanista* 1, no. 72 (2016): 17–33.

³⁴ The main road between Ushuaia and Rio Grande was finally opened after the Selk’nam Luis Garibaldi Honte showed a traditional path to cross the mountain range.

³⁵ Conrado Santiago Bondel, *Tierra Del Fuego (Arg.): La Organización de Su Espacio* (Ushuaia: CADIC, 1985), 19.

³⁶ Mastroscello, *La Economía Del Fin Del Mundo. Configuración, Evolución y Perspectivas Económicas de Tierra Del Fuego*, 100.

infrastructure was still insufficient for regional subsistence: on one hand, the oil industry reproduced labor that was mostly masculine and temporary and, on the other hand, oil was exported raw, without processing and thus without generating surplus value.

Industrial Assembly Times: During the 1970s, and still with concerns over Chilean threats, the navy government asked for a plan that would bring national immigrants to TdF. In 1972, a law for Industrial Promotion catalyzed the transformation of a territory with deficits into one of significant industrial production. The law excluded TdF from paying import customs and export taxes. The economic opening of the country to foreign companies during the last military regime, following the Chicago School, had the effect of increasing national debt and impoverishing its population. Many companies located in the exceptionally governed TdF as a way to evade foreign competitors, as these had to pay taxes. This regulation made it even more costly to produce electronics and appliances assembled in TdF in were cheaper than imported ones.³⁷ Even when the economy closed again after the dictatorship, TdF was still advantaged by having a whole national market given the lack of competitiveness. Since then, TdF has become the office of big national chains that supply national electronics and appliances.

The number of industrial plants passed from sixty to 156 in a decade (1974-1985).³⁸ Meanwhile, population in TdF passed from thirteen thousand to seventy thousand, a fivefold increase, in twenty years (1970-1991). Demographic growth promoted expansion of

³⁷ Daniel Azpiazu et al., *Promoción Industrial y Desarrollo de Empresas Nacionales. Algunos Casos Paradigmáticos; Consolidación Oligopólica o Diversificación Al Amparo de Incentivos Públicos.*, Programa de Fortalecimiento Institucional de La Secretaría de Política Económica (Buenos Aires: FLACSO, 2010); Mario Roitter, *La Industrialización Reciente de Tierra Del Fuego* (Buenos Aires: Consejo Federal de Inversiones, 1987).

³⁸ Daniel Azpiazu and Bernardo Kosacoff, *La Industria Argentina: Desarrollo y Cambios Estructurales, Economía*. (Buenos Aires: CEPAL, 1989), 52.

the cities, sometimes through informal settlements and a politicized citizenship that achieved provincial autonomy in 1991. On the Chilean side, it was not until 1999 that a similar regulation was applied but, with lack of a longer state trajectory, it promoted illegal extractive activities more than population growth.³⁹ This context helps explain how global environmental actors arrived in the Chilean TdF in search of sustainable liberal economies.

Times of Nature: The presence of US biologists in Patagonia during the 1970s had already promoted links between conservation, tourism, and private interests in the region.⁴⁰ Along with global conservationist ideas, the decentralization of research from universities as a way to depoliticize science during the last military regime, had created research centers like the one in Ushuaia, in where scientists arrived with the goal of studying nature and wildlife beyond politics. They also arrived with cultural and economic capital from the city, while escaping from it and transforming nature into a valuable commodity.⁴¹ With time, whales and seals passed from being a fur resource to be protected for tourism and conservation during the 1980s and 1990s. Increasing environmental awareness, and with the decline of sheep demand, this process generated interest in sustainable development by displacing industry with tourism.

During the 1990s, tourism was mostly national, and had grown with the opening of a ski resort in Ushuaia. However, the national crisis of the 2000s impoverished the whole

³⁹ José Vera Giusti, "Magallanes: Dinámica Económica y Demográfica 1960-2006; Leyes de Excepción Para El Desarrollo; Qué Hacer y Qué Evitar.," *Magallania* 36, no. 2 (2008): 63–78.

⁴⁰ Sergio A. Kaminker and Julio E. Vezub, "Los Orígenes Del Centro Nacional Patagónico Durante Los Años Setenta. Desarrollismo y Políticas Científicas En Dictadura y Democracia," in *Conocimiento, Paisaje, Territorio. Procesos de Cambio Individual y Colectivo*, ed. Hebe Vessuri and Gerardo Bocco (Río Gallegos: Universidad Nacional de la Patagonia Austral, 2014), 327.

⁴¹ Juan Carlos et al., "Reconfiguración Espacial y Modelos de Apropiación y Uso Del Territorio En La Patagonia Chilena: Migración Por Cambio de Estilo de Vida, Parques de Conservación y Economía de La Experiencia," *Revista de Geografía Norte Grande* 64 (2016): 187–206.

country and made it cheaper for foreigners. Within a decade (1992-02), employment in tourism increased to thirty percent and touristic demand during high season in Ushuaia grew from 35,000 to 126,000.⁴² Tourism became the new horizon for development, one in which experts and policy makers concentrate efforts to optimize nature through brands such as “door to Antarctica” and “the End of the World.”

On the Chilean side the commodification of nature was more driven by global than by national actors who started to buy large portions of lands for conservation. These neocolonial actors acquired lands that rather than relying on state stewardship or philanthropy, proposed liberal models of nature and wildlife conversation that would reject logging, mining, and hydropower, and that would be funded by selling carbon credits to northern countries and by creating an elitist ecotourism.⁴³ To this end, in 2002, US-based deep ecologists and owners of a rich outdoor gear industry acquired 250,000 ha of Chilean lands in Patagonia for only seven million US dollars.⁴⁴ In 2004, Goldman Sachs donated three hundred thousand ha of land in Tierra del Fuego to the Wildlife Conservation Society (WCS), a US-based NGO. The financial firm had acquired them in payment of a debt from a US logging company that had gone bankrupt due to US and Chilean environmental activism against logging.⁴⁵ Adopting the Selk’nam name, the WCS opened Karukinka Park out of the

⁴² Liliana Artesi, *Desarrollo Turístico En Ushuaia* (Buenos Aires: CEPAL, 2003).

⁴³ Daniel Norberto Blanco and José María Mendes, “Aproximaciones Al Análisis de Los Conflictos Ambientales En La Patagonia. Reflexiones de Historia Reciente 1980 - 2005,” *Ambiente & Sociedade* IX, no. 2 (2006): 52. The Kyoto Protocol (1992) to reduce greenhouse gas emissions globally, agreed a market system in which countries exceeding their quotas of emissions could compensate it by developing mitigating activities in developing countries.

⁴⁴ Carlos et al., “Reconfiguración Espacial y Modelos de Apropiación y Uso Del Territorio En La Patagonia Chilena: Migración Por Cambio de Estilo de Vida, Parques de Conservación y Economía de La Experiencia,” 194.

⁴⁵ Barbara Saavedra, Javier Simonetti, and Kent Redford, “Private Conservation: The Example That the Wildlife Conservation Society Builds from Tierra Del Fuego,” in *Biodiversity Conservation in the*

desire to protect native species from mining, exotic species, and industry. This model, which has been able to obtain significant international funding for managing exotic species, is also based on selling carbon credits and promoting elitist scientific and global tourism, or what is known as “seven stars tourism” through adventure, experience, and luxury tents. Nature is the main driver for making the region visible and attractive. Through foreign capital, this enhancement of native natures has sometimes been accompanied by conspiracy fears over their hidden religious, geopolitical, or economic intentions.

These neocolonial actors helped transform industrial agendas towards more sustainable ones through visions of a commodified nature linked to foreign international agendas.⁴⁶ The shift from controlling beavers to eradicating them was imposed by the Chilean subsidiary of the WCS project. While today beavers are central to environmental concerns, in 1996, local citizens perceived beavers as the less relevant problem, privileging the problems of human logging, garbage disposal, construction, and fires. This meant that, while increasing awareness of the risks of deforestation associated with logging, the implementation of more sustainable and value-adding logging activities was displaced by a discourse of native forest protection and carbon credit provision. Since the 1990s in both sides of TdF, the contemporary “Patagonian Imaginary” has displaced livestock and energy imaginaries towards a tourism of experience and global environmentalism.⁴⁷

Americas: Lessons and Policy, ed. Eugenio Figueroa (Santiago de Chile: Universidad de Chile, 2011), 357–92.

⁴⁶ Blanco and Mendes, “Aproximaciones Al Análisis de Los Conflictos Ambientales En La Patagonia. Reflexiones de Historia Reciente 1980 - 2005,” 47-69; Dalma Albarracín, “Colaboraciones Científicas Internacionales En El Extremo Austral. Desafíos Planteados Por La Creciente Internacionalización de La Producción Científica En Tierra Del Fuego,” in *Conocimiento, Paisaje, Territorio. Procesos de Cambio Individual y Colectivo*, ed. Hebe Vessuri and Gerardo Bocco (Río Gallegos: Universidad Nacional de la Patagonia Austral, 2014), 343–68.

⁴⁷ Marcos Mendoza et al., “The Patagonian Imaginary: Natural Resources and Global Capitalism at the Far End of the World,” *Journal of Latin American Geography* 16, no. 162 (2017): 93–116.

1.3 Decolonial Science Studies

1.3.1 *Settler Colonialism in Latin America*

As Patrick Wolfe has argued, settler-colonialism is a structure of invasion, not an event.⁴⁸ This means, first, that settler-colonialism does not come to an end once states are emancipated from colonial rules. Second, because settlers do not only accumulate capital and labor force from the distant metropolises but also arrive to stay, settler-colonialism operates by a logic of disappearing, killing, displacing, integrating, or silencing “the native.” As a structure, what constitutes the native and what is to be erased is a constant struggle that takes many forms, not all of them genocidal. Third, it is a more-than-human structure. As Alfred Crosby described when explaining the “ecological imperialism” of transoceanic colonialism, humans and nonhumans supported one another’s expansion at the expense of native populations.⁴⁹ This is what occurred when humans, sheep, cows, and beavers settled in Tierra del Fuego.

Settler-colonialism differs across territories and times according to the resources that are at stake and the governing forms that are used to secure them.⁵⁰ As in North America, Latin American countries have tended to disavow their own structures of “internal colonialism,” a notion that addresses how postcolonial states turned colonialist to assert

⁴⁸ Patrick Wolfe, “Settler Colonialism and the Elimination of the Native,” *Journal of Genocide Research* 8, no. 4 (2006): 387–409.

⁴⁹ “Ecological Imperialism: The Overseas Migration of Western European as a Biological Phenomenon,” in *The Ends of the Earth. Perspectives on Modern Environmental History*, ed. Donald Worster and Alfred W. Crosby (Cambridge: Cambridge University Press, 1988), 103–17.

⁵⁰ Claudia Briones, *La Alteridad Del “Cuarto Mundo”: Una Deconstrucción Antropológica de La Diferencia* (Buenos Aires: Ediciones el Sol, 1998).

their previously negated sovereignty.⁵¹ Within postcolonial studies, imperialism has been traditionally defined as the power exercised by metropolises over their dominated though distant territories, and colonialism as the power exercised through also invading and settling in those territories.⁵² In postcolonial countries, however, the history of displacement, settler-colonialism, nation building, and transnational relations has complexified that description.

Because settler-colonialism is a structure of invasion and elimination,⁵³ dominance based on racial classifications does not disappear once states are emancipated. Often, they build their previously negated sovereignty upon their own forms of softer colonialism and expansionism. With collective identities that have been for a long time inferiorized by colonial empires, Latin American states have also struggled to affirm themselves. Through colonial encounters, race had come to codify differences between Europeans and others while introducing new racial categories to differentiate people. This mechanism organized labor a continuum that privileged the more “whitened” and which classified and inferiorized Blacks, Mestizos, and Indians as disposable labor.⁵⁴ Given the entrenched colonial racialization of mestizos, natives, and Spaniards since colonial times, these identities negatively mediated the promotion of a collectivity otherwise at the times of emancipation.⁵⁵

⁵¹ Pablo González Casanova, “El Colonialismo Interno,” in *De La Sociología Del Poder a La Sociología de La Explotación. Pensar América Latina En El Siglo XXI*, ed. Marcos Roitman and Pablo González Casanova (Ciudad de México: CLACSO, 2006), 185–205.

⁵² Edward Said, *Culture and Imperialism* (New York: Vintage, 1994).

⁵³ Wolfe, “Settler Colonialism and the Elimination of the Native,” 387-409.

⁵⁴ Aníbal Quijano, “Coloniality of Power, Eurocentrism, and Latin America,” *Nepantia: Views from South* 1, no. 3 (2000): 537.

⁵⁵ Hebe Vessuri, “Latin America: A Commentary,” in *The Cambridge History of Science: Modern Science in National, Transnational, and Global Context*, ed. Hugh Richard Slotten, Ronald Numbers, and David Livingstone (Cambridge: Cambridge University Press, 2020), 810–22.

Within the Southern Cone (Argentina, Chile, Uruguay), nationalist discourses helped disavowing military campaigns against indigenous peoples. National emancipation processes did not come accompanied by decolonization and native peoples were not integrated. Instead, it came accompanied by a constant process of social whitening that has denied its own diversity through notions of European mestizaje and hybridization.⁵⁶ In Argentina, the power of foreign landowners and the national elite contributed to an extreme concentration of lands that promoted the endurance of violent and oligarchic regimes until the 1940s, leaving barely any possibilities for indigenous reserves and collectives.⁵⁷ This elite governance also perpetuated the “white settler obsession with Europe” reproduced by the Southern Cone, one that not only aims at eliminating the native-other, but also the native-self as a proof of whiteness.⁵⁸

Against this, Silvia Rivera Cusicanqui asks us to embrace rather than deny our own mestizaje.⁵⁹ If coloniality and memory are constituted by an accumulation of past and present contradictory histories, she argues, contemporary forms of racism and exploitation are reproduced by our own implicated mestizo identities, partly invader, partly invaded. Asserting our mestizo identities enables us to see how we are implicated in reproducing colonial discrimination which, for Cusicanqui, lays in denying humanity to the colonized ones who do not adapt to the dominant society.⁶⁰

⁵⁶ Richard Gott, “Latin America as a White Settler Society,” *Bulletin of Latin American Research* 26, no. 2 (2007): 269–89.

⁵⁷ Quijano, “Coloniality of Power, Eurocentrism, and Latin America,” 563.

⁵⁸ Gott, “Latin America as a White Settler Society,” 270.

⁵⁹ Silvia Rivera Cusicanqui, *Violencias (Re)Encubiertas En Bolivia* (La Paz: Piedra Rota, 2010).

⁶⁰ Rivera Cusicanqui, 10.

In Tierra del Fuego, the white fiction is built upon the idea that there are no more indigenous peoples. First colonized by European explorers, traders, and missionaries, TdF was nationalized by Chile and Argentina at the end of the 19th century. Both states negated then their own populations by arguing that Europeans had already killed all the natives.⁶¹ This myth, as I show, has strongly been shaped by and in turn shapes the making of scientific knowledges in TdF. On one hand, in a territory that has historically been governed as a geopolitical enclave and a natural reservoir, science has been a key element for reproducing colonial asymmetries. On the other, in a territory that is related to multiple centers and peripheries and which today attracts the biggest amount of transnational scientific cooperation in all of Argentina,⁶² scientists have also struggled to affirm their own belonging and authority in ways that often actualize old colonial tensions in new terms.

1.3.2 The Coloniality of Science in Latin America

Peruvian sociologist Aníbal Quijano argues that the constitution of “America” aided a racial axis of power based on the pair modernity/coloniality.⁶³ He understands the phenomenon of globalization as a continuation of that form of global power. As two sides of the same coin, Quijano and others have shown how there would not be modernity without coloniality and neither Europe without America.⁶⁴ Eurocentric modernity started with

⁶¹ Mariela Eva Rodríguez and Mónica Michelena, “Memorias Charrúas En Uruguay: Reflexiones Sobre Reemergencia Indígena Desde Una Investigación Colaborativa,” *ABYA-YALA: Revista Sobre Acceso á Justiça e Direitos Nas Américas* 2, no. 2 (2018): 183; Claudia Briones, “Mestizaje y Blanqueamiento Como Coordenadas de Aboriginalidad y Nación En Argentina,” *RUNA* 23 (2002): 61–88.

⁶² Pablo Kreimer, “Colaboraciones Científicas Internacionales En El Extremo Sur,” in *Diálogo Filosófico Interdisciplinario* (Ushuaia: UNTDF, 2018).

⁶³ Quijano, “Coloniality of Power, Eurocentrism, and Latin America,” 533.

⁶⁴ Aníbal Quijano, *Colonialidad Del Poder: Globalización y Democracia* (Lima: Sociedad y Política Ediciones, 2001); Walter D. Mignolo, *Local Histories/Global Designs: Coloniality, Subaltern Knowledges,*

America as a “new space/time constituted materially and subjectively.”⁶⁵ On one hand, it provided the people, lands, and resources that made possible the capital accumulation that produced the modern world-system. On the other, America imparted to America an inferior identity relative to European superiority. The colonization of America produced the experience of European superiority and the one of subalternity in colonized territories. At the center of this dialectical process was the European disavowal of its constitutive others. While Latin America received, resisted, and reconfigured colonial knowledges, Europe magically constructed itself without the American experience, as “exclusive bearers, creators, and protagonists of that modernity.”⁶⁶

Not only life, labor, and reproduction but also scientific knowledges were permeated by this new axis of power. While western STS is increasingly attending to this, postcolonial scholars across the world have been studying these processes since the 1960s. Historians of technology have traditionally denounced how science and technology have been used for dominating postcolonial regions through transport infrastructures, agricultural technologies, or modes of international cooperation.⁶⁷ Science scholars have claimed that our theories and identities are invalidated as inferior, local, specific, and non-universal, as well as how European modern science made non-western knowledges inferior in the process of

and Border Thinking (Princeton, NJ: Princeton University Press, 2012); Enrique Dussel, “Europa, Modernidad y Eurocentrismo,” in *La Colonialidad Del Saber: Eurocentrismo y Ciencias Sociales. Perspectivas Latinoamericanas* (Buenos Aires: CLACSO, 2000).

⁶⁵ Quijano, “Coloniality of Power, Eurocentrism, and Latin America,” 547.

⁶⁶ Quijano, 542.

⁶⁷ Marian Aguiar, *Tracking Modernity. India's Railway and the Culture of Mobility* (Minneapolis, MN: University of Minnesota Press, 2011); Vandana Shiva, *The Violence of the Green Revolution: Third World Agriculture, Ecology, and Politics* (Lexington: University Press of Kentucky, 1989); Didier Fassin, “Another Politics of Life Is Possible,” *Theory, Culture & Society* 26, no. 5 (2009): 44–60.

producing western superiority.⁶⁸ In many ways, the global South tends to provide data, resources, raw materials, and a labor force to the globalist sciences that privilege Europe and North America as sites of theory and surplus production.⁶⁹ This skewed economy is today intensified by globalist and capitalist mechanisms of scientific recognition, validation, and authority that privilege metropolitan scholars and institutions over peripheral ones.⁷⁰

When western scholars and activists started to demand a science with and for society during the 1970s, Latin America had already a long trajectory of doing so. The Economic Commission for Latin America was created in 1948 as a United Nations regional commission that would foster Latin American development. With the social liberation climate of the 1960s (which would later be erased and repressed through violent globalist policies and state terrorism), the Commission questioned the diffusionist model of science and progress, along with thinkers who proposed “Dependency Theory.”⁷¹ For them, global asymmetries

⁶⁸ Partha Chatterjee, *Nationalist Thought and the Colonial World: A Derivative Discourse* (Minneapolis, MN: University of Minnesota Press, 1993); Achille Mbembe, *On the Postcolony* (Berkeley, Los Angeles, and London: University of California Press, 2001); Silvia Rivera Cusicanqui, *Un Mundo Ch'ixi Es Posible: Ensayos Desde Un Presente En Crisis* (Ciudad Autónoma de Buenos Aires: Tinta Limón, 2018); Dipesh Chakrabarty, *Provincializing Europe: Postcolonial Thought and Historical Difference* (Princeton, NJ: Princeton University Press, 2008).

⁶⁹ Walter D. Mignolo, “Epistemic Disobedience, Independent Thought and Decolonial Freedom,” *Theory, Culture & Society* 26, no. 7–8 (2009): 159–81; Silvia Rivera Cusicanqui et al., “Debate Sobre El Colonialismo Intelectual y Los Dilemas de La Teoría Social Latinoamericana,” *Cuestiones de Sociología* 14, no. e009 (2016): 1–22, <http://www.cuestionessociologia.fahce.unlp.edu.ar/article/view/CSn14a09>; Jean Comaroff and John L. Comaroff, “Theory from the South: Or, How Euro-America Is Evolving Toward Africa,” *Anthropological Forum* 22, no. 2 (2012): 113–31.

⁷⁰ Hebe Vessuri, “O Inventamos, o Erramos”. *La Ciencia Como Ideafuerza En América Latina* (Bernal: Universidad Nacional de Quilmes, 2007); Pablo Kreimer, *Ciencia y Periferia. Nacimiento, Muerte y Resurrección de La Biología Molecular En La Argentina* (Buenos Aires: Eudeba, 2011); Vessuri, “Latin America: A Commentary,” 810-822; Lea Velho, “The ‘Meaning’ of Citation in the Context of a Scientifically Peripheral Country,” *Scientometrics* 9, no. 1–2 (1986): 71–89.

⁷¹ Fernando Henrique Cardoso, Anibal Pinto, and Osvaldo Sunkel, eds., *El Pensamiento de La Cepal. Colección Tiempo Latinoamericano* (Santiago de Chile: Editorial Universitaria, 1969); Fernando Henrique Cardoso and Enzo Faletto, *Dependencia y Desarrollo En América Latina* (Buenos Aires: Siglo XXI, 1977); Immanuel Wallerstein, *The Modern World-System I: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century* (New York: University of California Press, 2011).

limited the growth of developing countries, which should rather promote their own forms of development. During the 1970s, some questioned science and even development itself, an approach later known as the Latin American Science and Technology Thought (LATSTD).⁷²

Scientists during the 1950s-80s were often implicated in militant speeches.⁷³ They were concerned with national political urgencies, aiming at addressing the problems of technological dependence, the lack of innovation, and the role of science in peripheral territory.⁷⁴ While some demanded stronger governance of science to serve national interests, others questioned the very nature of science. For Varsavsky,⁷⁵ science was a form of doing politics by itself, what Latour later would refer to as “science by other means.”⁷⁶ During the 1980s, the constructivism turn that pushed western activists and scholars to demand socially based sciences had a different effect in Latin America, which had already been doing that. More than politics, social constructivism offered a frame for locally professionalizing those concerns.⁷⁷

⁷² Adriana Feld, *Ciencia y Política (s) En Argentina (1943-1983)* (Bernal: Universidad Nacional de Quilmes, 2015).

⁷³ Pablo Kreimer and Hebe Vessuri, “Latin American Science, Technology, and Society: A Historical and Reflexive Approach,” *Tapuya: Latin American Science, Technology and Society* 1, no. 1 (2017): 21.

⁷⁴ Kreimer and Vessuri, 21. Among them, the authors mention the work of Jorge Sabato, Oscar Varsavsky, Amílcar Herrera, José Leite Lopes, Simon Schwartzman, Marcel Roche, Máximo Halty Carrere, Miguel Wionczek, Arturo Rosenblueth, Alejandro Nadal Egea, and Francisco Sagasti,

⁷⁵ Oscar Varsavsky, “*Hacia Una Política Científica Nacional*”. (Buenos Aires: Periferia, 1972). The Argentinian mathematician and philosopher of science Oscar Varsavsky, while still aligning with the calls for a science that served the interests of the Nation (as had been called for since the independence of Argentina), questioned the importation of European science and its capitalist mode of production. Varsavsky demanded the cultural independence he deemed necessary for producing nationally useful science. Hence, while the dependency school demanded science policy, Varsavsky questioned the nature of science itself and focused on his own form of doing politics.

⁷⁶ Bruno Latour, *The Pasteurization of France*, trans. Alan Sheridan and John Law (Cambridge, MA: Harvard University Press, 1988).

⁷⁷ Kreimer and Vessuri, “Latin American Science, Technology, and Society: A Historical and Reflexive Approach,” 1-21. At that time, Latin America saw the institutionalization of STS in Mexico, Peru, Venezuela, Brazil, and Argentina.

The professionalization acquired by Latin American STS scholars during the 1980s came with two other processes: the partial loss of some of the political strength of Latin American STS and the complexification of asymmetries within increasingly globalist conditions of knowledge production.⁷⁸ These globalist conditions are mediated by the capacity of modern and northern countries to “have more power to direct globalization and its circulations given their economic, technological, and war forces.”⁷⁹ That power often leaves those in the south with the mere capacity to accompany the process, especially given the increase transnationalization of science that is displacing local agendas in deference to the globalist and northern interests embedded in north-south collaborations.⁸⁰ In Latin America, how to escape subalternity has been a permanent quest for science, policy, and scholarship.

1.4 Feminist Science Studies

My dissertation is indebted to a long history of feminist academic and activist work that has affected the way I have interrogated how the politics of eradicating beavers in TdF shapes and has in turn been shaped by other productions of death in the region. Feminist science studies has helped me conceptualize how science has justified its domination over peoples, animals, and natures, and to attend to how science in TdF is being haunted by that which has been for a long time erased, disappeared, and disavowed.

⁷⁸ Kreimer and Vessuri, 1-21.

⁷⁹ Rita Laura Segato, “Identidades Políticas/Alteridades Históricas: Una Crítica a Las Certezas Del Pluralismo Global,” *RUNA* XXIII (2002): 247.

⁸⁰ Albarracín, “Colaboraciones Científicas Internacionales En El Extremo Austral. Desafíos Planteados Por La Creciente Internacionalización de La Producción Científica En Tierra Del Fuego”; Ezequiel Sosiuk, “La Ayuda Científica Internacional, ¿resuelve o Crea Nuevos Problemas? El Proyecto de Desarrollo Pesquero de La FAO En Argentina,” *Trilogía Ciencia Tecnología Sociedad* 12, no. 23 (2020): 213–43.

1.4.1 *Who Knows, What, Where, and for Which Purposes?*

During the 1980s, feminist philosophers of science provided nuanced descriptions of the gendered, racialized, and classed nature of the reciprocal constitution of science and society.⁸¹ Carolyn Merchant showed how the constitution of modern science aimed at scientifically proving the assertions previously made in the name of God, including the hierarchies that justified domination among genders, species, or races.⁸² Merchant showed how values are exchanged between scientific and political worlds, including how the Catholic Inquisition methods of torture to isolate evil were translated into the laboratory practices of truth extraction developed by Francis Bacon.⁸³

Other US historians of science have shown how modern science promoted a gendered division of science, a masculinization of reason, and a justification for dominating women, nature, and emotions. Lorraine Daston and Peter Galison examined how Boyle's Air-Pump public experiments designed to prove the properties of air while killing bird, rats, and insects inside his pump, were also a way to assert the modesty of men knowing nature as opposed to the emotionally biased women who reacted to the killings they saw.⁸⁴ Londa

⁸¹ Evelyn Fox Keller, "Dynamic Objectivity: Love, Power and Knowledge," in *Reflections on Gender and Science* (New Haven and London: Yale University Press, 1985), 115–26; Hilary Rose, "Hand, Brain and Heart: A Feminist Epistemology for the Natural Sciences," *Signs: Journal of Women in Culture and Society* 9, no. 1 (1983): 73–90; Susan Bordo and Alison M Jaggar, eds., *Gender/Body/Knowledge: Feminist Reconstructions of Being and Knowing* (New Brunswick, NJ: Rutgers University Press, 1989); Helen E. Longino, *Science as Social Knowledge: Values and Objectivity in Scientific Inquiry* (Princeton, NJ: Princeton University Press, 1990).

⁸² Carolyn Merchant, *The Death of Nature: Women, Ecology, and the Scientific Revolution* (San Francisco: HarperColl, 1980).

⁸³ Carolyn Merchant, "Francis Bacon and the 'Vexations of Art': Experimentation as Intervention," *The British Journal for the History of Science* 46, no. 4 (2013): 551. Merchant shows how the values of the Catholic Inquisition used to torture women suspected of witchery in order to detect their evilness were translated into science. As a member of the British Court, Bacon translated the climate of suspicion and truth extraction into scientific experiments, including the idea of nature as "exhibiting herself more clearly under the trials and vexations of art than when left to herself."

⁸⁴ Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007).

Schiebinger also showed that the 18th century controversies around the representation of truth-to-nature sexualized human skeletons also embedded political struggles that used skeletons size to objectivize the superiority of men.⁸⁵

How objectivity legitimates domination is at the center of Feminist SS, which shows how truths achieved are affected by *who* knows. For instance, Longino and Doell have studied the gender biases underlying archaeological explanations of evolution in hunter-gatherer societies.⁸⁶ By favoring the importance of hunters for society, they obscured the hypothesis that also showed the relevance of gatherer women for leveraging social communication and complexification. Similarly, Emily Martin illustrated how biological understandings of egg and sperm were embedded with gendered cultural metaphors that naturalized gender and genderized nature.⁸⁷

In the everyday life of scientific communities, dominance is also exercised through “soft coercive mechanisms” embedded in habits, belonging, or initiation rituals in science.⁸⁸ Robert K. Merton described how the greater authority and status scientists have, the less their truths are questioned.⁸⁹ When Margaret W. Rossiter looked at this phenomenon, she

⁸⁵ Londa Schiebinger, “Skeletons in the Closet: The First Illustrations of the Female Skeleton in Eighteenth-Century Anatomy,” *Representations* 14, no. 1 (1986): 42–82.

⁸⁶ Helen E. Longino and Ruth Doell, “Body, Bias, and Behavior: A Comparative Analysis of Reasoning in Two Areas of Biological Science,” *Signs* 9, no. 2 (1983): 206–27.

⁸⁷ Emily Martin, “The Egg and The Sperm: How Science Has Constructed a Male-Female Roles,” *Signs* 16, no. 31 (1991): 485–501. Martin shows how, when science unsettled the classic tale of run and competition of spermatozooids to enter a passive ovule in the 20th century, research still reproduced gender inequality through scientific metaphors that rendered the ovule either as a caring mother or as a dangerous viper.

⁸⁸ Ludwik Fleck, *Genesis and Development of a Scientific Fact* (Chicago: The University of Chicago Press, 1979), 108. Fleck describes manuals and academic texts as initiation rituals for becoming an expert.

⁸⁹ Robert K. Merton, “The Matthew Effect in Science: The Reward and Communication Systems of Science Are Considered.,” *Science* 159, no. 3810 (1968): 56–63.

also saw that science tends to hide women and their scientific evidences through mechanisms that privilege masculinized combative styles of knowing.⁹⁰

These scholars have worked and fought for the inclusion of marginalized subjects as a not sufficient yet necessary step to strengthening objectivity. The US feminist philosopher Sandra Harding has argued that a *standpoint* science was not only necessary for gender equality but also for a “stronger objectivity.”⁹¹ She argued that subjugated subjects had privileged epistemic positions to perceive and know how oppressive systems operate given their lesser implication in the maintenance of interests to preserve them. Consequently, the multiplicity of reality can be better accounted for and acknowledged by making science able to *see* and *speak* multiple standpoints.⁹² As a method, the tenets of standpoint theory have been summarized by the US feminist historian of science Nancy D. Campbell: advocacy, studying up, coproduction, and reconstructing more equal alternative worlds.⁹³

The above approach provoked a long and fruitful conversation around subalternity, power, and science. How are subjugated subjects able to speak and be listened to equally within the language of power?⁹⁴ How can one see from below?⁹⁵ Is not speaking with others,

⁹⁰ Margaret W. Rossiter, “The Matthew Matilda Effect in Science,” *Social Studies of Science* 23, no. 2 (1993): 325–41.

⁹¹ Sandra Harding, *Whose Science? Whose Knowledge? Thinking from Women’s Lives* (Ithaca, New York: Cornell University Press, 1991).

⁹² Sandra Harding, *Objectivity & Diversity: Another Logic of Scientific Research* (Chicago, IL: University of Chicago Press, 2015).

⁹³ Nancy D. Campbell and Mary Margaret Fonow, “Introducing Knowledge That Matters,” *Frontiers* 30, no. 1 (2009): XI–XIX.

⁹⁴ Gayatri Chakravorty Spivak, “Can the Subaltern Speak?,” in *Marxism and the Interpretation of Culture*, ed. Cary Nelson and Lawrence Grossberg (Urbana and Chicago: University of Illinois, 1988), 271–313.

⁹⁵ Donna J. Haraway, “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective,” *Feminist Studies* 14, no. 3 (1988): 575–99.

of others, and for others mediated by power relations?⁹⁶ Amidst those conversations, Donna Haraway called our attention against the dangers of producing a romanticized view of the subaltern as a purely oppressed subject when researching power and science.⁹⁷ In her words,

feminist objectivity is about limited location and situated knowledge, not about transcendence and splitting of subject and object. It allows us to become answerable for what we learn how to see.⁹⁸

Haraway insisted that all knowledge is situated and never innocent, and that subjects are cut with multiplicity. She suggested an objectivity that did not ignore its politics, one that can be stronger by also being accountable for how we *see*, from where, for what, and with whom.⁹⁹

1.4.2 Spectralities and the Unknown

Building upon the politics of knowing, recent scholarship has wondered how to be responsible not only for how and what we *see*, but also for what and how we do *not see*.

Scholars of the “epistemology of ignorance” have shown how the structural unknowing of epistemically disadvantaged peoples and the realities that matter to them constitutes a way of asserting privilege.¹⁰⁰ Illustrative cases include the systemic ignorance of female bodies,

⁹⁶ Linda Alcoff, “The Problem of Speaking for Others,” *Cultural Critique* 20, no. 20 (1992): 5–32.

⁹⁷ Haraway, “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective,” 584.

⁹⁸ Haraway, 583.

⁹⁹ Haraway, 587.

¹⁰⁰ Nancy Tuana, “The Speculum of Ignorance: The Women’s Health Movement and Epistemologies of Ignorance,” *Hypatia* 21, no. 3 (2006): 1–19; Scott Frickel and M. Bess Vincent, “Hurricane Katrina, Contamination, and the Unintended Organization of Ignorance,” *Technology In Society* 29 (2007): 191–188.

indigenous configurations of kinship and biology,¹⁰¹ and racialized casualties of capitalism.¹⁰²

Embracing emotions as a site for engaging with the unknown, scholars have mobilized psychoanalysis to explore the effects and affections of that what is silenced.¹⁰³ The US sociologist Avery Gordon has explored how that which is silenced can take spectral forms that haunt us in the form of “ghosts.”¹⁰⁴ These ghosts are not unrepresented collectives in need of integration but rather real presences that exist on their own as a haunting. Like rumors, ghosts appear through disturbing symptoms that demand response, generally a reorganization of the social orderings that made invisible the ghost in the first place.

Drawing on the Affective Turn,¹⁰⁵ this dissertation interrogates the ways in which the mediation of knowledges by feelings and emotions can be sites for re-politization. When psychologists started to treat those who had been tortured, exiled, and persecuted during the last Argentinian military coup, they transformed the analysis of individual trauma into

¹⁰¹ K. TallBear, “Genomic Articulations of Indigeneity,” *Social Studies of Science* 43 (2013): 509–33.

¹⁰² Scott Frickel et al., “Undone Science: Charting Social Movement and Civil Society Challenges to Research Agenda Setting,” *Science, Technology & Human Values* 35, no. 4 (2010): 444–73; Abby J. Kinchy, Sarah Parks, and Kirk Jalbert, “Fractured Knowledge: Mapping the Gaps in Public and Private Water Monitoring Efforts in Areas Affected by Shale Gas Development,” *Environment and Planning C: Government and Policy* 34, no. 5 (2016): 879–99; Julie Guthman and Sandy Brown, “Whose Life Counts,” *Science, Technology, & Human Values* 41, no. 3 (2016): 461–82; Grace Kyungwon Hong, *Death beyond Disavowal. The Impossible Politics of Difference* (Minneapolis and London: University of Minnesota Press, 2015).

¹⁰³ Avery. Gordon, *Ghostly Matters: Haunting and the Sociological Imagination* (Minneapolis, MN: University of Minnesota Press, 2008); Hong, *Death beyond Disavowal. The Impossible Politics of Difference*; Banu Subramaniam, *Ghost Stories for Darwin: The Science of Variation and the Politics of Diversity* (Urbana: University of Illinois Press, 2014).

¹⁰⁴ Gordon, *Ghostly Matters: Haunting and the Sociological Imagination*, 20.

¹⁰⁵ Margaret Wetherell, “Affect and Discourse – What’s the Problem? From Affect as Excess to Affective/Discursive Practice,” *Subjectivity* 6, no. 4 (2013): 349–68; Wenda K Bauchspies and María Puig de la Bellacasa, “Re-Tooling Subjectivities: Exploring the Possible with Feminist Science and Technology Studies,” *Subjectivity* 28, no. 1 (2009): 227–28; Marie-Luise Angerer, Bernd Bosel, and Michaela Ott, *Timing of Affect. Epistemologies of Affection* (Chicago: University of Chicago Press, 2014).

the category of political trauma as a way to hold the state accountable for a collective history. This is what the Spectralities Turn has also enabled, an analysis of traumatic historical processes that go beyond anachronistic individual psychologies.¹⁰⁶ In analyzing ghosts this way, theorists do not seek to trace the ghost or the dead itself, but rather to use specters that haunt as do ghosts in ways that demand response.¹⁰⁷ Ghosts allow the study of how history and science have produced certain sedimentations, memories, exclusions, and possibilities.¹⁰⁸ Beyond individual lived experiences, attention to haunting can help us deal with traumatic pasts in their productive capacities. It can also help us trace how violence, trauma, and wounds are inherited by multiple generations re-doing memory work, regardless of whether they or their biological ancestors lived it or not, but just because they are haunted by something left unattended that compels them to demand justice today.¹⁰⁹

¹⁰⁶ María del Pilar Blanco and Esther Peeren, eds., *The Spectralities Reader. Ghosts and Haunting in Contemporary Cultural Theory* (London: Bloomsbury Academic, 2013), 50–55.

¹⁰⁷ Gordon, *Ghostly Matters: Haunting and the Sociological Imagination*, 182; Jacques Derrida, *Specters of Marx. The State of the Debt, the Work of Mourning and the New International*, trans. Peggy Kamuf (New York and London: Routledge, 2006).

¹⁰⁸ Blanco and Peeren, *The Spectralities Reader. Ghosts and Haunting in Contemporary Cultural Theory*, 2.

¹⁰⁹ Marianne Hirsch, "The Generation of Postmemory," *Poetics Today* 29, no. 1 (2008): 103–28; Blanco and Peeren, *The Spectralities Reader. Ghosts and Haunting in Contemporary Cultural Theory*, 74.

1.5 Methods and Data Analysis

1.5.1 Methods

This dissertation builds upon two years of fieldwork in Argentina, one of them in TdF. I conducted *archival research* in national¹¹⁰ and local¹¹¹ repositories as well as in digital archives.¹¹² I conducted sixty-five non-structured interviews of researchers, doctoral students, policy makers, and key local actors both in Chile and Argentina. I also attended political and scientific meetings related to binational agreements, environmental policy, invasive species regulations, and public outreach. During my time in Tierra del Fuego, I lived and worked with the scientists of the Austral Center for Scientific Research in Ushuaia. There, I collaborated with the Socio-Eco lab, helped students in their fieldtrips, and developed collaborations through research and publishing while creating friendships and becoming part of the social dynamics (including the conflicts) of the scientific institution. While in Buenos Aires, I attended conversations and meetings that helped me understand how history and politics have been memorialized.

The ethnographer enters the field with theoretical questions that must be reformulated in the encounter with the experiential realities of the studied subject. Prior to my arrival, my research on beaver eradication remained abstract, attentive to philosophical questions of nonhuman politics. During my archival research, I noticed the lack of

¹¹⁰ Archivo General de la Nación, Archivo Intermedio, Biblioteca del Congreso de la Nación, Biblioteca Nacional, Archivo del Museo de Ciencias Naturales Bernardino Rivadavia, Archivo Histórico Naval.

¹¹¹ Archivo del Museo del Fin del Mundo (Ushuaia), Biblioteca Sarmiento (Ushuaia), Biblioteca del Centro Austral de Investigaciones Científicas (Ushuaia), Archivo del Instituto de la Patagonia (Punta Arenas), Biblioteca de la Universidad de Magallanes (Punta Arenas).

¹¹² Infoleg, Infobae, S.I.P.A – CEDINPE.

documentation for the 1940's in Argentina and discovered that most folders dedicated to Tierra del Fuego had never been opened. This is what Marilyn Strathern called an "ethnographic moment," an insight that occurs when the ethnographer presents the lived experience of joining what is interrogated with what is understood in relational form.¹¹³

After visiting the national archives, which memorialize the consolidation of the Argentinian State, I visited the "Intermediate Archives" in Buenos Aires, which archives 20th century documents from the central administration. The difference was disturbing. The National Archive is located in a monumental building, staffed by expert curators, and requires the following of protocols, such as locking away personal items and using gloves for consulting. It receives around five hundred visits per month. The Intermediate Archive is located in an administrative building where researchers enter a small and precarious room for consulting, without protocols, and without expert guidance. It receives around eight hundred visits per year, most from citizens looking for the document that registered the landing of their European ancestors so that they could now ask for European citizenship. When docketts are brought, they are too often falling apart and covered with dust, especially those dedicated to Tierra del Fuego, which were clasped with strings that had never been opened and which fell apart when they were unlaced. It was difficult to establish friendship here, as I was asking for too many folders for workers who were multitasking. This archive was among the first ethnographic moments I registered, and where I gained insights into *how* the history of TdF, unlike the history of Argentina, came to be dominated by a few official voices.

¹¹³ Marilyn Strathern, *Property, Substance and Effect: Anthropological Essays on Persons and Things* (London: Athlone Press, 1999), 12.

1.5.2 Data Analysis

Extracting and assessing data are not separate realities in ethnographic research. Across the whole ethnographic temporality, analysis and exploration are in constant dialogue and iteration with each other, including at the writing stage. This does not mean that there is no order, but rather that the modes of ordering research are the outcome of iterative, open-ended, and interconnected processes of analysis and investigation. During this process, questions, interpretations, and arguments are in constant renegotiation, one that achieves closure only when writing and publishing deadlines mark an end.

Analysis becomes even more challenging and demanding at the writing stage, when we often struggle against our desires to represent a coherent world on one hand, and to describe all the unique events, experiences, and subjects we lived within themselves. I believe it is precisely along this tension that we produce narratives around how subjectivities, discourses, landscapes, or scientific facts emerge through discursive positions that make permanence and change possible through time and interactions.

The constant dialogue between analysis and exploration does not mean that ethnography seeks either holism or saturation. Ethnographers are oriented through theories and questions that must necessarily be open to the reformulations that experiences in the field demand from the ethnographer. In this sense, everything matters, but not in a deterministic way. Doing ethnography often puts us into being twenty four-hour, seven-day researchers who are constantly interrogating and testing interpretations whether at public meetings, museums, or small dinner gatherings. In this sense, as an anthropologist I tend to treat every instance of the field symmetrically in ways that shape and are shaped by my theoretical framework, research questions, and field demands. In the end, I have analyzed

only a small fraction of what has been experienced and recorded—a part that has been constituted by that which has been left behind.

Situational Maps: One of the first tools that I encountered for ordering social worlds relies on the creation of maps that signal relations among concepts, institutions, and actors through time. Situational Analysis¹¹⁴ builds upon Haraway’s notion of “situated knowledges,”¹¹⁵ which stresses how subject positions are always partial and always enacted in a place and time in specific relation to others. These maps help visualize ordered relations among more-than-human actors, collectives, and discourses. By routinely checking and reconstructing the maps, field data is organized into relevant relations across time.

Field Notes: Analysis as a constant practice took a key role in the field notes, which I updated almost every day with general memos and a table that allowed me to distinguish between observations, my own feelings and emotions, interrogations, and preliminary interpretations. Fieldnotes enabled constant translation between theory and the field and between English and Spanish.

Interviews and Conversation Guides: While I conducted preliminary interviews even before my arrival, I did not start to conduct formal interviews until I had been in the field for two months. Most of my interviews were not conducted until after I had been in the field for at least six months. My goal was to have a sense of the languages, norms, and values that mattered to the scientists with whom I was working to prepare better the interviews. Only that way could I facilitate meaningful conversations that translated back and forth between my theoretical frame and the social world of my research.

¹¹⁴ Adele Clarke, Carrie Friese, and Rachel Washburn, eds., *Situational Analysis in Practice: Mapping Research with Grounded Theory* (Walnut Creek, CA: Left Coast Press, 2015).

¹¹⁵ Haraway, “Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective,” 575-599.

For this, I constructed conservation guides that, rather than conducting a questionnaire, organized my interview into themes and subthemes I would cover.¹¹⁶ This guides contained a few pre-defined elaborated questions only when I wanted to compare how different subjects defined a concept. While every interview is mediated by research imposition and power relations,¹¹⁷ designing guides rather than questionnaires helps the ethnographer cultivate the habit of reflexivity not only before and after but also during the interview. During a guided conversation, the interviewer can more easily reflect on how the emerging topics relate to the broader research, to the social and individual trajectory of the subject, and to other visions and viewpoints; at the same time, it imposes less the connections of the researcher by structuring the conversation around the social world maps that the informants, in that situation, create. Guides are not just more loose questionnaires to be applied differently but rather a tool that helps being reflexive over the questions and its effects during the interview. With organized themes and subthemes, my guides connected my analytic categories with the ones that would probably use the informant and, when they emerged, I would deepen into them.¹¹⁸

I sometimes introduced my theoretical questions so that we could be reflective together, as when we discussed the justifications, we reproduce to obtain grants. We often lived insightful moments together gathered in expressions like “I had never realized this.” In

¹¹⁶ María Isabel Jociles, “La Entrevista Abierta: Sobre Las Imposiciones y Las Normas Del Preguntar,” in *Entre Virajes y Diluvios: La Teoría Social y El Método Ante Los Dilemas de La Sociedad Global*, ed. Gonzalo Alejandro, Juan Mora Heredia, and Javier Pineda Muñoz (Ciudad de México: Universidad Autónoma del Estado de México, 2005), 173–202; Dean Hammer and Aaron Wildavsky, “La Entrevista Semi-Estructurada de Final Abierto,” *Historia y Fuente Oral* 4 (1990): 23–62.

¹¹⁷ Pierre Bourdieu, *La Miseria Del Mundo* (Madrid: Akal, 1999).

¹¹⁸ For example, when interrogating how Tierra del Fuego was mobilized as a social, natural, and scientific laboratory, I would converse with researchers around their trajectories as scientists in the region, their motivations to come, or their participation in social activities.

this sense, data analysis has been collaborative and continuous, as each interview was built upon insights from previous ones. I transcribed most of the interviews in their original language (Spanish), and I translated only the excerpts used.

Interactive Database: I attained a good infrastructure for data analysis, consisting of a “research” folder with four interconnected spreadsheets including policies, contacts, research tasks, annotated readings, and archival sources, each of which were marked with key words and which could be ordered by location, date, and theme.

Coding, Theming, and Clustering: I analyzed interviews, fieldnotes, and archives word by word and with colors to mark themes, questions, and meanings, such as “what does efficiency mean here” or “when is the word bicho used, by whom, and in which contexts.” Simultaneously, I ran the whole set of interviews in Iramuteq, a free software for text analysis that is based on the Alceste method and which statistically analyzes the structure of the text and of lexical worlds.¹¹⁹ In other words, it hierarchizes the distance and repetition of text segments to show how they are distributed. While I ended up not using this method for my research given my lack of expertise and my hesitation at relying on a mathematical tool for discourse analysis, the software helped me visualize how lexical worlds emerged together even if in the form of negations (such as animal invasion and native peoples) and separations (such as science and justice).

From the categories and clusters obtained by manual and mathematical coding, I created themes: invasion, killing, science, nativeness, remoteness, beavers, settler

¹¹⁹ Martha de Alba, “El Método ALCESTE y Su Aplicación Al Estudio de Las Representaciones Sociales Del Espacio Urbano: El Caso de La Ciudad de México,” *Papers on Social Representations* 13 (2004): 1–20; Max Reinert, “Une Méthode de Classification Descendante Hiérarchi- Que: Application à l’analyse Lexicale Par Contexte. Les Cahiers de l’analy- Se Des Données,” *Les Cahiers de l’analy- Se Des Données* 8, no. 2 (1983): 187–98.

colonialism, and disavowal. I compiled the data—quotes, readings, archival texts, and notes—into the thematic folders and tested them through maps and preliminary writing until, not without modifications, I reached the structure that I present in this dissertation. This method transformed my preliminary theoretically guided structure into one that builds upon the social worlds that I examined.

Tracing Ghosts: To trace the disavowal of racism, colonialism, and authoritarianism in TdF I studied the exclusionary effects of scientific processes in the region by looking at two interconnected realities: how and what came to be excluded from the realm of knowledge and how scientific communities, practices, and epistemologies are haunted by those very exclusions. To this end, I analyzed those instances in which powerful affects such as fear and anger mediated presences and absences that were dealing with oppressive pasts. I focused on that which the social world I analyzed tended to displace: the appearance of troubling ghosts.

Specifically, I annotated how and when actors responded with insecurity, indifference, defensiveness, authority, or with an intellectualization of politics. I registered whispers, tears, silences, loud voices, eye contact, or laughter. For instance, when I first heard that the idea of eradication should be hidden by the one of restoration to avoid “public noise,” it was from a manager who, while saying that, stopped looking at my eyes and reduced the tone and pace of his speech. Hiding the infrastructuring of death was not only a way to objectivize death but also something that troubled some managers in ways that brought many histories to the surface, including the suffering of beavers, the authoritarianism of science, and the fear of putting conflict upfront. It also brought up what haunted many hunters and me—demands of something ungraspable about how to respond

to beavers' death responsibly. To include myself, I also registered my own reactions not only to others but also to certain images, landscapes, spaces, or documents.

Ecology and conservation are deeply emotional fields.¹²⁰ My research though, did not focused on emotions themselves but on how often my informants expressed the efforts to keep excluding certain things. Sometimes, however, these affective responses were accepted by others or me in ways that recognized ghostly mediated demands. Building upon affect scholarship,¹²¹ my analysis gave a central role to those instances and ethnographic moments in which emotions were accepted, that is, when they had effects among people and when they led actors, including myself, to be self-reflexive and exploratory.

As a method for interrogation, tracing ghosts followed instances in which disavowal was challenged through emotional demands. My own question "how did notions of efficiency displace the minimization of suffering?" was not a cold one, but an angry and scared one. Haunting, as a method for interrogation, comes not from an intellectual abstract procedure but from an affective path along which hunters told me of their intimate practices of killing with trembling voices, insecurity, and fear. Hunters who told me with anger that they had been displaced from the project along with the pain of beavers. Beavers' and hunters' suffering haunted me, too, while I worked in a context in which I could not "oppose" eradication. Others responded differently to being haunted, and denied beavers

¹²⁰ Charis Thompson, "When Elephants Stand for Competing Philosophies of Nature: Amboseli National Park, Kenya," *Complexities: Social Studies of Knowledge Practice*, 2002, 166–90; Dolly Jørgensen, *Recovering Lost Species in the Modern Age. Histories of Longing and Belonging* (Boston, MA: MIT Press, 2019).

¹²¹ Sara Ahmed, "Collective Feelings: Or, the Impressions Left by Others," *Theory, Culture & Society* 21, no. 2 (2004): 25–42; William Reddy, *The Navigation of Feeling* (Cambridge, UK, New York: Cambridge University Press, 2001); Cynthia Margarita Tompkins, *Affectual Erasure: Representations of Indigenous Peoples in Argentine Cinema* (Albany, NY: State University of New York Press, 2018); Gordon, *Ghostly Matters: Haunting and the Sociological Imagination*, 20-22.

killing, either by reframing it as restoration or by focusing on efficiency, a denial that enabled them to escape accountability.

As an ethnographer, I made decisions that privileged certain stories over others and in relation to my research. Broadly, I first chose to center those instances in which ongoing disavowal penetrated the most mundane scientific practices, including leisure activities or public outreach. This was my method for illuminating how certain modes of scientific authority and authoritarianism leads to disavowal and erases possibilities for change. Second, I chose to center the instances in which affective interpellations were accepted in ways that made actors reflect upon their actions rather than disavowing them or becoming defensive. These instances were not the most recurrent or the most influential, yet I centered them because they have the potential to promote social and collective resistance to the police state of science in Tierra del Fuego and for the reparation of repressed violence in a region that: i) has the names of genocidal people who never apologized on streets, museums, and shops; ii) believes that indigenous peoples became extinct once they stopped being genetically and linguistically “pure”; iii) asserts that the last military coup did not arrive in the region; iv) calls those who massively kill beavers for their eradication “restorationists.”

Assessment: for evaluation and validity I constantly tested my interpretations through time, writing,¹²² peer-review,¹²³ and “collaborative editing.”¹²⁴ My data was triangulated across different sources: archives, videos, documents, participant observation, interviews, affective responses, academic literature, and ethnographic moments.

1.6 Dissertation Outline

This dissertation follows the history of science and nature in Tierra del Fuego since the introduction of beavers in the 1940s. I call this period the *Beaverscene*, as that characterized by the significant alterations that beavers have produced in Fuegian environments together with other non-animal settlers. I have examined the Beaverscene guided by one research question: How has science shape and been shaped by colonial, authoritarian, and universalist politics? A question that is unfold into two more nuanced ones: how have scientific knowledges, practices, and communities objectivized and naturalized the production of violence and exclusion, including the massive eradication of

¹²² My expert doctoral committee has continuously demanded the strengthening of some of my questions and interpretations while providing tools for strengthening this work whether historically, theoretically, or ethically.

¹²³ Throughout my research, have presented papers and received peer-review feedback at the Latin American Science and Technology Studies Meeting (Santiago, Jul 2018), the Meeting of the Latin American Council for Social Sciences (Buenos Aires, Nov 2018), the Geography colloquium of the University of Buenos Aires (Aug. 2019), the FLACSO doctoral school of STS (Quito, Aug 2019), the Society for Social Studies of Science (New Orleans, Sept 2019), the STS colloquium of the Rensselaer Polytechnic Institute (Troy, Sept. 2019) the Society for the History of Technology (Milan, Oct. 2019). I have also published articles in *Environment & Society*, *Conservation Biology*, and *Science as Culture*.

¹²⁴ Richard Horowitz, “Just Stories of Ethnographic Authority,” in *They Read What We Write: The Politics of Ethnography*, ed. Carolyn Bretel (Westport, CT: Bergin & Garvey, 1993), 131–44. I let some informants to read and edit my interpretations. In addition, I co-authored and co-presented papers with some of my informants, a path that helped us translating each other’s ontologies. I also created a blog in which I shared my ongoing insights with my informants.

beavers? And how that which has been naturalized and excluded through various historical processes is haunting the production of science?

Responding to these questions, my dissertation shows how contemporary environmental sciences are constructing notions of indigeneity that enable the scientific and transnational governance in Tierra del Fuego. These notions are built upon understandings of nature that actualize older colonial visions and which have been continuously displacing species and populations while legitimating novel ecosystems and economies. For instance, when state sciences aimed at developing TdF by introducing useful foreign species and native settlers, they defined native as born in Argentina. When oligarchs and pioneers saw their privileged threatened by the expansion of the state and its colonization plans, they defended their privileges by starting to define themselves and their cattle as Fuegians, a category previously reserved to the indigenous peoples.

My dissertation describes how science has contributed naturalizing dominant histories, identities, and landscapes while silencing the displacement of others in which that dominance was based upon. For example, the idea that all indigenous peoples had been already killed when the state started to colonize TdF, promoted a peaceful vision on the introduction of species and populations, one that disavowed the conflicts that emerged. This idea is today constantly actualized not only by the sciences that negate indigeneity to descendants but also by scientific communities that deny epistemic, social, and historical conflicts.

By attending to how scientists and knowledges are today haunted by those histories of exclusions through troubling ghosts, weather in the form of contradictions or in the form of recognition, my dissertation opens up possibilities for reparation. We, social scientists, have shown the many ways in which naturalizing something empties it of history and

politics. This dissertation shows how those naturalizing processes have occurred but goes beyond that to examine a politics of the postnatural.

Through an analysis of the ghosts that haunt scientists today, I also show how wounded subjects, natures, and histories emerge after processes of exclusion, naturalization, disavowal, and supposed eradication. They are not the biological or ecological descendants, but the present actualization of those memories and natures. For instance, indigenous communities that are starting to assert their negated collective identity are doing so out of the realization that they had been negated through a myth that deemed them extinct to the point of making themselves believe so. And while scientists are promoting the eradication of beavers through scientized and capitalistic notions of indigeneity that continue disavowing indigenous communities and their historical projects, many in these communities are reconfiguring notions and embracing the eradication of beavers as a project for decolonizing nature beyond environmental restoration.

This dissertation is constructed upon three interrelated characteristics of history. First, an understanding of the past both as contemporary accumulations and actualizations of various historical horizons and which are often presented as contradictions. Second, I understand memory as inter-generational and collective, not belonging more to those who are biological descendants of the ones memorialized. Third, I built upon spectral studies to understand that while ghosts are historical, they are not dated and that, therefore, they disrupt history. In consequence, this history is often not chronological.

Chapter 2, *Whitening populations and the introduction of species*, introduces the political climate of Argentina during the 1940s and how the national government introduced beavers in TdF as a way to promote a fur industry in the region, as well as to modernize, nationalize, and civilize its natures and populations as a way to expand national power over the

territory. Examining the politics of population of the time, I argue that the eugenic biological discourses of the beginning of the 20th century did not end during the 1940s as many scholars have argued. Rather, racializing knowledges and classifications were reconfigured in behavioral and environmental terms.

Chapter 3, *Making tropes with scientific cartographies*, examines the institutionalization of the discipline of geography in Argentina and its production of nationalist materials such as school text, propaganda materials, and cartographies. I show how these knowledges contributed a national colonization of TdF that imagined it as an empty land to peacefully with species and populations. I also show the mechanisms used to disavow local realities and political differences, including the environmentalization of racialized differences. Rupturing the drive to order history chronologically, the chapter ends comparing the environmental futures designed by state cartographies of the 1940s-50s with the ones used today by local scientists.

Chapter 4, *Pluricentric Science: Managing more-than-animal invasions*, studies how beavers and their ecologies legitimated the introduction of transnational environmental knowledges in Argentina and TdF. I examine how the globalist controversies that characterize the science of invasion biology has been reconfigured locally. While invasion science situates TdF as a natural laboratory for globalist agendas, locally it legitimates scientists to manage and define notions of indigeneity, belonging, and nature. This analysis enables me to complexify nature-culture and center-periphery distinctions through the idea of pluricentrism: the ways in which invasion science has been organized plurally in TdF responds to the construction of different epistemic agreements that respond not only to scientific methods, values, and ontologies, but also to global, national, and local histories of violence, recognition, and exclusion.

Chapter 5, *"It is (not) about killing:" Life-sciences beyond disavowal*, studies the design and implementation of a transnational project for eradicating beavers in the whole Austral region. I show how the apparent lack of public opposition to the plan breaks down when looking closely at how scientists, hunters, and beavers encounter each other through killing practices. The chapter examines how the project is erasing not only beavers but also the knowledges and practices of those who had been killing and living with beavers locally for a long time through notions of civilized and efficient killing. Examining how hunters are haunted by beavers' suffering in ways that question not only human-animal relations but also the histories of colonialism and genocide of TdF, I also show how killing responsibly demands encounter, personal reconfigurations, and a capacity to account for our own disavowing practices. Beavers and hunters lead me to conclude how a transnational design of eradication in big areas can neither be accountable nor successful in its own goals.

Chapter 6, *Postnatural and the politics of naturalization*, examines what happens after naturalizing oppression based on race, territory, populations, and death through scientific knowledges, or how a postnatural politics might look like in TdF. I describe how scientists daily struggle to validate their knowledges and identities in a context of transnationalization but also in a context that is questioning scientific implications with reproducing global and colonial agendas rather than local interests. In many ways, scientific reconfigurations of nativeness are today helping validate scientific authority and legitimacy in intervening nature while scientizing and environmentalizing notions of indigeneity. However, despite the increasing power of transnational actors and knowledges over Fuegian territories and despite the peaceful acceptance of their visions over sustainable futures, the ghosts of the Beaverscene are opening critical ruptures by showing how the history and future of beavers and of nature are more than environmental and scientific matters. Moreover, it is precisely

the innocence, naturalness, and objectivity assigned to that which has been naturalized, what is enabling repressed histories to have a voice from a safer place, one that is enabling not only environmental restoration futures but also contemporary articulations of justice based upon other historical reparation memories.

I finish with an *epilogue* that suggests possibilities for environmental sciences to contribute memory and reparation beyond liberal and culturalist politics.

1.7 Contributions for Pluricentric Science & Technology Studies

This dissertation contributes with methodological and theoretical insights for a decolonial, located, and convivial STS. The literatures mobilized in this dissertation reflect my own trajectory as an Argentinian-Spanish scholar with a PhD in the United States. As a diaspora scholar, I understood how racism operates by impregnating people with non-whiteness through more than biological orderings. We embody racialized landscapes.¹²⁵ I also understood how my temporary US experience taught me to speak and incarnate the language of power. When I moved to the south of America, that power made me a scientist who was at times more easily recognized and at times more easily suspected of bringing foreign interests.

The geopolitics of technoscience has been contested by postcolonial and by Latin American scholars for decades, often using the language of centers and peripheries within global networks of knowledge production. Decolonizing STS with and for Latin America has examined old questions to reflect on our own discipline, or who makes science, for what,

¹²⁵ Rita Laura Segato, *Contra-Pedagogías de La Crueldad* (Ciudad Autónoma de Buenos Aires: Prometeo Libros, 2018), 90.

where, and with whom: with Latin American scientists? With Latin American scientists but global agendas?¹²⁶ For Latin America but with social actors that bring other ways of knowing?¹²⁷ For Latin America with northern scientists?¹²⁸ By creating South-South alliances?¹²⁹ Who sets up the agenda?¹³⁰ And who gets the benefits and recognition for the scientific labor?

More recently, European and North American STS institutions are bringing the question of power beyond our object of study to reflect on how our own discipline is strongly Eurocentric in its use of topics, literatures, methods, and concepts. To challenge this, some have suggested a provincialization of ST by treating non-western STS and the circulation of concepts symmetrically.¹³¹ Challenging the risk of nationalism when approaching that non-western realities, others have also called for a transnational STS that carefully examines how nation-states mediate technoscience across the world.¹³² Out of exchanges between North and South American scholars, the journal *Tapuya* was created in 2017 to welcome trans-Latin American standpoints on STS with access to English readers. In

¹²⁶ Leandro Rodríguez Medina, "Construyendo Periferia: Un Microanálisis de Objetos Subordinantes Como Tecnologías Epistémicas," *Sociológica* 29, no. 83 (2014): 9–46.

¹²⁷ Arturo Escobar, *Designs for the Pluriverse. Radical Interdependence, Autonomy, and the Making of Worlds* (Durham, NC: Duke University Press, 2018).

¹²⁸ Iván da Costa Marques, "What Can Science and Technology Studies Do with and for Latin America?," in *Contributions to Alternative Concepts of Knowledge*, ed. Michael Kuhn and Hebe Vessuri (Stuttgart, Germany: Ibidem Press, 2016).

¹²⁹ Boaventura De Sousa Santos, *Conocer Desde El Sur, Para Una Cultura Política Emancipatoria* (La Paz: Plural editores, 2007).

¹³⁰ Pablo Kreimer, *Science and Society in Latin America: Peripheral Modernities* (New York: Routledge, 2019).

¹³¹ John Law and Wen-yuan Lin, "Provincializing STS: Postcoloniality, Symmetry, and Method," *East Asian Science, Technology and Society: An International Journal* 11 (2017): 211–27.

¹³² Kim Fortun, et al., "Open Panel, 4S/EASST 2020: Transnational STS: Theories, Practices, and Pedagogies," Society for Social Studies of Science, accessed June 3, 2020, <http://www.stsinfrastructures.org/content/open-panel-4s-2020-transnational-sts-theories-practices-and-pedagogies>.

Tapuya, one can read not only STS works in Latin America but also challenging conversations on how to decolonize and decentralize STS.

However, despite the possibilities that a transnational and provincial STS bring for including and integrating non-western STS into western conferences, syllabuses, and journals, these notions still assume that the global prevails over the local. Assuming that globalization is inevitable, is Eurocentric;¹³³ it is an imaginary based on a western experience that disavows the variety of modernities in postcolonial territories. This assumption understands that local realities are weak at the face of inevitable globalizing forces and that local cases should provide global concepts, including in STS. The question, for Escobar, lies in examining how difference is denied or produced through economic, social, and environmental hierarchies.¹³⁴

Hebe Vessuri has recently argued for a convivial STS in Tapuya.¹³⁵ Conviviality aims at escaping the capitalization of difference through concepts that reproduce the production of otherness by incorporating peripheries to hegemonic science. Rather than using stable and universalizing categories of difference such as race, class, or gender, a convivial STS calls for flourishing our capacities to invoke difference. A convivial STS lies not only in the power of those inhabiting borderlands and otherness to embrace their difference and resist the discipline of normative structures. It also requires the cultivation of alterity by scholars and scientific devices, including articles and syllabuses, which all have subordinating powers.

¹³³ Arturo Escobar, *Más Allá Del Tercer Mundo, Globalización y Diferencia* (Bogotá: Universidad del Cauca, 2005), 11.

¹³⁴ Escobar, 125.

¹³⁵ Hebe Vessuri, "Crises That Mismatch Canons in Science: Provincialization, Transnationality, Conviviality?," *Tapuya: Latin American Science, Technology and Society* 2, no. 1 (2019): 26–31.

How then to symmetrically recognize other STS histories, scholars, and terms? How to grant ontological respectability to located knowledges?¹³⁶ I learned from my research on the production of environmental sciences in Tierra del Fuego that they are neither peripheral nor local but rather *pluricentric*. This means that out of all of the analytical processes with which I engaged, I found at least three differentiated temporal configurations of environmental research that were organized through local, national, and global boundary makings in Tierra del Fuego. Those boundaries not only produced different ontologies, but also inclusions and exclusions that were shaped by the production of hierarchies within the environmental, social, cultural, historical, and political through which scientists, scientific artifacts, and knowledges traveled.

While the project for restoring the natures invaded by beavers presents itself as a unified binational project, I found a world made of temporary stable alliances and enmities that were often organized beyond disciplinary, institutional, and national boundaries. Together local hunters, scientists, and policy makers, along with transnational knowledges, organizations, and funding, went about eradicating species in ways responsive to the Fuegian histories of military and authoritarian governance; they also aimed to make TdF central to global environmental research. Other scientists allied with other local and global networks focused on managing value conflicts while measuring and scientizing these different valuations in response to the local history of TdF as a natural laboratory for scientific governance.

This work contributes to the challenging conversations towards a decolonial, located, and convivial STS. Fleck understood the making of thought collectives through two

¹³⁶ da Costa Marques, "What Can Science and Technology Studies Do with and for Latin America?," 130-131.

concentric circles, the esoteric one of experts and a bigger one that includes the exoteric society.¹³⁷ He also gave account of the various modes of exchange among both circles, understanding that the coercive mode of influence of thought collectives increased the further it traveled, often assuming the form of taken-for-granted realities. Moreover, the way exoteric circles communicate to thought collectives reduces difference, as they respond back to those assumed realities.¹³⁸ My research builds upon Fleck's analysis to propose a pluricentric analysis that goes beyond one science and one society to examine the production of various circles and to challenge the reduction of difference in the ways science and society coproduce each other.

In my analysis in TdF, I found that the making of power and environmental science is organized into four distinct and temporal socio-scientific environmental thought-collectives. Those configurations are not the result of vertical trajectories of scientific production and could not be interpreted as global or peripheral without losing with that the relevance of everyday scientific practices in the production of asymmetries in TdF. Environmental sciences in TdF are what I call *pluricentric*, a term that helps understanding multiplicity without losing sight of the making of power and temporal dominant structures.

A pluricentric analysis of science can support us, scholars of science studies with an interest in power and asymmetries, in finding ways to give account of the structuring capacities of power while escaping Manichean visions that prevent us from cultivating a politics of difference and alterity itself. While STS has demonstrated how science and society co-constitute each other, the social and the scientific have been conflated through a language

¹³⁷ Fleck, *Genesis and Development of a Scientific Fact*, 104-110. Fleck introduced the concepts of "thought style," or the particular predisposition to see and act in particular ways, and "thought collective," or the community of people who participates in thought collectives.

¹³⁸ Fleck, 140-45.

of symmetry that has weakened our capacities to not only examine the science of STS, but also the social of STS. As a method, pluricentrism demands not theoretical symmetry, but political commitment to rigorously attend to the more-than-scientific makings of centers, clusters, or circles. If the way science receives social influences is already purified of difference, as Fleck argues, how can we not take for granted that purified reality and reconstruct alterities and conflicts?

A pluricentric analysis, therefore, demands thoughtful and “impure” analysis of both the making of science *and* the making of society, and of the ways in which thought styles demarcate cultural, social, historical, and epistemic boundaries. At the same time, and by attending to these socio-scientific boundaries, a pluricentric analysis cultivates borderlands as a method for tracing how science codifies and silences difference. To this end, pluricentrism does not apply universalizing categories of power (no matter how democratizing they are) to sites of analysis, but instead uses methods for letting them emerge. Rather than capitalizing difference, pluricentrism demands attachment to places and histories. It brings questions that already carry multiplicity such as: what centers and peripheries technoscientific settings create? What differences are produced, and which ones are silenced? How are those differences organized?

Emergence in socio-scientific sites provides a method for structuring worlds in ways that emphasize the politics of multiplicity and place. If Eurocentric sciences, including STS, otherize and provincialize non-western scholarship and territories, a pluricentric analysis highlights how cases are never mere examples of theory and how non-western scholarship is never a copy or an *other* of canonical science. Instead, cases and territories produce theory. Therefore, a pluricentric analysis does not detach concepts from their site of production,

instead granting “ontological respectability,”¹³⁹ as Ivan da Costa Marques would put it, to the places and histories of scientific production.

How would pluricentrism analyze the contemporary emergence of a canon for decolonial and indigenous STS in the United States? First, by following what constitutes that territory through organizations, conferences, journals, and universities within that country as well as through the exchanges maintained with foreign and diaspora scholars and with domestic BIPOC scholars and activists. What does a US decolonial STS differentiate, center, deny, or disavow? What methods, scholars, texts, and canons are being normatively established? Who participates in decolonial infrastructures and with whom? What territories and collectives are being compared and which separated?

Pluricentrism does not invoke calm resolution but rather alterity as the goal of a politics in science itself. Beyond cold knowledge, as Avery Gordon would put it,¹⁴⁰ pluricentrism never leads us towards calm acceptance, but instead calls upon us to question our taken for granted realities across social and scientific worlds. As a method, it enables us to attend to how the configuration of scientific centers is based upon boundary makings that always imply exclusions. The challenge then becomes attending to those exclusions in places, histories, and knowledges—not merely to deconstruct what has become dominant, but to promote memory, justice, and reparation in our everyday making of socio-scientific knowledges. If I asked in Tierra del Fuego how can environmental sciences contribute to reparative justice, I ask us, too, how can STS contribute less patriarchal, racist, colonial, and Eurocentric research, communities, and societies? How can STS scholars and conferences

¹³⁹ da Costa Marques, “What Can Science and Technology Studies Do with and for Latin America?” 130-131.

¹⁴⁰ Gordon, *Ghostly Matters: Haunting and the Sociological Imagination*, 8.

promote a diversity that does not already capitalize upon and provincialize difference, while deadening vitality?

2. WHITENING POPULATIONS AND THE INTRODUCTION OF SPECIES

He brought teachers from the United States
because here, nobody knew anything,
and sparrows, because the gross local birds
had made people sick
with their inopportune migrations
saying tweet tweet when it was other the answer,
or maybe the question.¹⁴¹

“In South America, we are all European descents” (President of Argentina Mauricio Macri (2015-2019) to defend a free trade agreement with the European Union, 2018).

In this chapter, I explain why the introduction of beavers in Tierra del Fuego in 1946 was a nationally significant event that was even recorded and shown in every cinema of Argentina. At that time, the Peronist Government (1946-1952) aimed at strengthening the state through authoritarian visions, with an emphasis on planned economies and national integration. Tierra del Fuego, which had been nationally annexed in 1884, was still envisioned as a deserted, foreign land given its lack of population and state institutions.¹⁴² Given the perceived foreignization of the territory, institutions sought to introduce Argentinian born settlers. Given the perceived lack of humans, animals, and infrastructures in Tierra del Fuego, the region became a significant other for the state in which to design modernity from scratch. In that context, the military organized the introduction of twenty Canadian beavers into Tierra del Fuego with the goal of creating a fur industry that would support the local economies of national settlers. However, as beavers were not just any

¹⁴¹ Rafael Urretabizkaya, *Informe Sobre Aves y Otras Cosas Que Vuelan* (San Martín de los Andes: Ediciones de la Grieta, 2011), 42. Unless otherwise noted, all translations are my own.

¹⁴² See Chapter 1.

species, they became the perfect sign of a nation that sought to engineer useful, northern species and populations that would reproduce the values and landscapes of work, family, and modernity.

Since the peronist government aimed at integrating the peoples that oligarchic regimes had before racially inferiorized, the poor and the workers, many have argued that it put an end to the racist discourses of previous oligarchic regimes.¹⁴³ As does every politics of inclusion, this carried its own forms of exclusions. My analysis of the Argentinian politics of population of the time shows that racializing asymmetries rather than disappearing were reconfigured in behavioral terms. If eugenic knowledges had classified people as inferior based on their environmental biologies, or those better adapted to particular territories, state sciences during the 1940s and 1950s developed social engineering notions that reconceptualized those environmental classifications through notions of deviance, laziness, social order, or health. Through softer mechanisms of violence, colonial racism continued operating by both perpetuating an obsession with descending from Europeans,¹⁴⁴ and by inferiorizing those who did not adapt to the project of the modern and industrial state.

In Tierra del Fuego, these classifications were negotiated across more-than-human relations. Like the monogamous and industrious beavers that would later colonize TdF, sheep, trout, muskrats, or seals were also objects of nationalization. They not only displaced human and nonhuman communities, but also helped the state to legitimate its sovereignty by providing animal signs that naturalized the nationalization of TdF. Oligarchic settlers who had practically owned all the lands and capitals of the TdF since the end of the 19th

¹⁴³ Susana Novick, *Política y Población: De Los Conservadores Al Peronismo* (Buenos Aires: Instituto de Investigaciones Gino Germani, Facultad de Ciencias Sociales, UBA, 2018).

¹⁴⁴ Gott, "Latin America as a White Settler Society," 269-289.

century, saw their power and privileges threatened by a state who sought to redistribute and appropriate some of them. Not without conflict, settlers responded by claiming ownership and belonging to TdF by expressing their knowledge and ties to its natures, environments, and productive species. By claiming to be the people who was there before the state, settlers started to appropriate the category of Fuegians who had previously been reserved to indigenous peoples.

In those negotiations, settlers defended their belonging by referring to the animals and natures of TdF. Their native and white identity was the result of more-than-human relations of work, reproduction, and breeding of the species and environments of TdF. They claimed that they had been the first who opened the path to productivity, the ones who resolved the indigenous problem, the ones who purified the races and animals of the region, and the ones who first valued a damned land. At a time when previously racialized oppressed populations became deviants who did not adapt to the symbolically and economic lower ranks of industrial and livestock production, oligarch settlers and animals coproduced their whiteness. I show in this chapter how settlers negotiated their belonging and whiteness by proving their becoming with superiorly racialized animals through symbolic and material practices of work, knowledge, breeding, affect, and reproduction.

2.1 National Signs in the Postcolonial Expansionist State

The first two governments of Juan Domingo Perón (1946-1955) aimed to end the failed and violent governance of Argentina since its emancipation from the Spanish colonial rule. As other modern states, the goal of Argentinian governments since the 19th century had consisted on organizing the material and economic relations of its territory not merely

through coercive mechanisms, but through the integration of its population and movements.¹⁴⁵ As a postcolonial state, the symbolic organization of the collective that accompanied modern states, was perceived as still in need of construction at the beginning of the 20th century. Unlike European states that had built their strength and industrialization processes along the figures of the nation, Argentina was trying to affirm its own collective identity that was still wounded by the Spanish Empire occupation.

The First government of Perón achieved both, the expansion and legitimation of the state as well as its self-assertion through the construction of its own sovereignty towards the world and towards its internal populations through the construction of upper national ideals and the organization of the economy.¹⁴⁶ As did other governments of the 1950s that were trying to recover their economies after the war, Perón organized a planned economy that intervened and coordinated every realm of the social, economic, and cultural lives of Argentines. To this end, science was nationalized and institutionalized.¹⁴⁷

However, the unification of the collective that enabled the organization of this modern state, was also built upon the appropriation, integration, and erasure of internal

¹⁴⁵ Óscar Oszlak, *La Formación Del Estado Argentino. Orden, Progreso y Organización Nacional* (Buenos Aires: Planeta, 1997); Michel Foucault, *Security, Territory, Population. Lectures at the Collège de France, 1977-78*, trans. Graham Burchell (London: Palgrave Macmillan, 2009).

¹⁴⁶ While implementing socialist policies for its citizens, the Peronist government also sought to promote economic liberalism with measures that aimed at finding a place within the asymmetrical international market. Perón's government designed a form of national socialism that rejected not only the colonial legacies of the international relations and institutions after the World Wars, but also the Socialist International for also being imperialist towards the nation-states then known as *Third World countries*.

¹⁴⁷ Diego Analía Busala Hurtado de Mendoza, "De La 'Movilización Industrial' a La 'Argentina Científica': La Organización de La Ciencia Durante El Peronismo (1946-1955)," *Revista Da SBHC* 4, no. 1 (2006): 17–33. If, until then, scientists in Argentine had been mostly European expats who studied and collected materials to produce theories in their home countries, at the beginning of the 20th century, Argentinian based scientists, started to promote scientific professionalization. With the creation of the Argentine national science foundation CONICET in 1958, science also became associated with the interests of the state.

differences. The expansionist character of the government organized the systematization of its knowledges and the appropriation of territories that, while inside its dominion, had not yet been effectively integrated into the economic and symbolic power of the state. The Peronist government continued the organization of military occupations, colonization plans, land distributions, and national education; while not imperialist, its sovereignty was highly linked to the colonial expansion of the nation.

The first years of his government were accompanied by economic prosperity, but at the end of the 1940s, the international fall of prices and reduction of trade challenged the export model. At that time, the discursive, iconographic, and propagandistic work for making the body politic of the New Argentina gained even more relevance as the economic measures of land distribution were more difficult to carry out. State iconography became a powerful strategy for making the state visible. Figure 2.1, from a history manual, shows the then common inclusion of the pictures of the presidential couple in school materials.



Figure 2.1. Juan Perón and Eva Perón in a textbook (1952)¹⁴⁸

¹⁴⁸ Gobierno Argentino, *Síntesis Geográfica de La República Argentina* (Buenos Aires: Servicio Internacional Publicaciones Argentinas, 1952), 115–116, Colecciones Especiales Fonds (BPP972), Archivo de la Biblioteca del Congreso de la Nación, Buenos Aires, Argentina. Reproduced by permission of Biblioteca del Congreso de la Nación (see Appendix A).

Following the international climate and the ongoing claim of centralized governance, Perón designed two Quinquennial Plans [(1947-1951) and (1952-1957)] to regulate capitals, taxes, and imports. The plans instituted social policies and social participation to increase the standard of living and the capacities of the government to protect its population. The Plans provided guidance for creating institutions and regulations in each social area.

Although land expropriations included in the First Plan were welcomed by many as a way to end with the social and economic problems of latifundismo, they mostly implied the nationalization of communication, and transport systems, credit and funding, and the establishment of national parks. Lands were also bought from private companies and landowners to later redistribute them into small farms, creating a nationalizing morality and discourse that bought private lands for National Parks, farms, and national infrastructures.¹⁴⁹ While some indigenous communities saw the expropriation as an opportunity to reclaim some of their lands and free themselves from working for sugar and cotton landowners, the government silenced their protests and demands.¹⁵⁰

However, while more than sixty expropriations were debated in the senate, only a few were executed, leaving the most concentrated lands untouched. Critics to latifundismo referred more to the lack of exploitation of lands rather than to its extension itself.¹⁵¹ With

¹⁴⁹ Ximena A. Carreras Doallo, "Discurso y Política Forestal En El Peronismo Histórico . Entre La Protección Al Ambiente y El Productivismo , 1946-1955," *Estudios Rurales* 6, no. 11 (2016): 131–52.

¹⁵⁰ Sabrina Rosas, "Violencia e Invisibilidad Indígena: La Cuestión de Los Pueblos Originarios Durante El Primer Peronismo," *Anuario Del Instituto de Historia Argentina* 16, no. 1 (2016): 1–12.

¹⁵¹ Javier Balsa, "Discursos y Políticas Agrarias En Argentina, 1920-1955," *América Latina En La Historia Económica* 19, no. 3 (2012): 98–128; Julieta Bouille, "El Fin Del Latifundio En La Argentina Peronista de Los Años '40: ¿un Proyecto Nacional?," in *VI Jornadas de Sociología. Facultad de Ciencias Sociales, Universidad de Buenos Aires* (Buenos Aires: Acta Académica, 2004), accessed November 10, 2019, <http://www.aacademica.org/000-045/490>; Adrián Alejandro Almirón, "El Primer Peronismo y La Política de Tierras En Un Espacio Subnacional y Marginal: Continuades y Rupturas En El Territorio Nacional Del Chaco y La Provincia Presidente Perón (1946-1955)," *Revista Territorios & Fronteiras* 11,

the economic crisis and the inflationist environment of 1948, the discourse against latifundismo and pro-expropriation, forced Perón to change his policies and moderate his discourse to calm down both landowners and producers. By the Second Plan, in 1952, Perón strengthened the moralizing and discursive strategy around the value of the Nation and rural life while decreasing land policies he now deemed as utopian. Through this iconography, not only the nation but also authoritarian modes of ordering, gendering, racializing, and classing populations were normalized. It is in this context that the introduction of beavers and the recording of the event to be shown in every cinema of Argentina entailed national significance.

2.2 Canadian Beavers Settle in Tierra del Fuego

In 1946, the Argentinian government of Perón hired Tom Lamb, a Canadian hunter, to bring twenty-five couples of beavers to the southernmost region of Argentina. By train, plain and hydroplane, he moved them from Moose Lake in Canada to the Fagnano Lake in the Argentinian TdF. The state had multiple goals: a) to enrich the native fauna of a territory that was considered empty, sterile, and to lack diversity by bringing in a useful, modern, and western species, b) to promote regional development with a fur industry that imitated one of the northern regions with similar climate and to c) assert national sovereignty in TDF through a colonization carried out by human and nonhuman species.

The introduction of symbolic species from northern geographies like beavers, but also reindeer and muskrat, was a tool for the national government to achieve its dreams of modernity and sovereignty by using nature as a resource for nation building through the

no. 1 (2018): 262–78; Tulio Halperín Donghi, *Una Nación Para El Desierto Argentino* (Buenos Aires: Centro Editor de América Latina, 1982).

agroindustry model.¹⁵² However, the fur industry was never effected after the beavers' release. As with so many other innovations in remote areas, the beavers created ruination more than development. In 1981, their introduction was deemed "a mistake" with severe ecological impacts.¹⁵³ With a current estimated population between 60,000 and 100,000,¹⁵⁴ initial beavers passed from being a "useful species," an imported technology of modernization-colonization, to being considered the maker of an environmental disaster, "ecosystem engineer[s]"¹⁵⁵ who were responsible for producing apocalyptic landscapes that threatened the "pristine" natures of TdF. The beavers and their associated activities were rendered an invasive exotic species.

2.2.1 The Colonial Legacies of the Canadian Beavers

The initial twenty beavers came from a region in Canada that had almost seen the species extinguish. Tom Lamb, the Canadian settler who flew the beavers to Argentina, had before reintroduced the species into his region by bringing some beavers from New York. Accounting for that history and the beavers themselves, Laura Ogden has suggested to consider beavers in TdF not only as invasive but also as a "diasporic community."¹⁵⁶

¹⁵² Juan E. Vilaseca, *Tierra Del Fuego. Conferencia Pronunciada En El Centro Naval, 1948*, Biblioteca [918(829.0) VIL349], Archivo del Museo del Fin del Mundo, Ushuaia, Tierra del Fuego, Argentina. In this conference in TdF, Vilaseca argued that it was thanks to the Navy and its civilizing rather than exterminating mission that Tierra del Fuego stopped being poor, being the beavers an example of the mentioned modern progress.

¹⁵³ Amaya, "Consideraciones Generales Sobre La Conveniencia de La Caza Del Castor [Castor Canadensis] En Tierra Del Fuego," 7.

¹⁵⁴ Mariana Fasanella et al., "Assessing Genetic Variation and Population Structure of Invasive North American Beaver (*Castor Canadensis* Kuhl, 1820) in Tierra Del Fuego (Argentina)," *Biological Invasions* 10, no. 5 (2007): 673–83.

¹⁵⁵ Christopher B. Anderson et al., "Más Que Un Ingeniero de Ecosistemas. Impactos Ambientales, Restauración Ecológica y La Dimensión Social Del Castor.," *La Lupa* 5, no. 7 (2015): 4–9.

¹⁵⁶ Laura A. Ogden, "The Beaver Diaspora," *Environmental Humanities* 10, no. 1 (May 1, 2018): 63–85.

Tom Lamb, the Canadian hunter, was the son of an Anglican who worked for the Department of Indian Affairs in Canada. He was called “Mr. North” for expanding the northern frontier and of Canada.¹⁵⁷ Like British missionaries in Tierra del Fuego, in Canada Lamb built a commercial and natural empire in a region inhabited by indigenous peoples, becoming known as “the Northern Empire Builder.”¹⁵⁸ Lamb the frontier man, like the *estanciero*¹⁵⁹ of TdF, built a masculine project to intervene and civilize unknown and difficult natures while using modern technologies for flying, trapping, fishing, hunting, and trading with the racialized Indians from what he called “traditional guts.”¹⁶⁰ Like Thomas Bridges in TdF, Tom Lamb believed in “nonviolent” methods for civilizing indigenous peoples by providing them with western forms of work and education.

He also became concerned about the worrying extinction of beavers and muskrats in the region due to massive and violent fur trading in Europe. He convinced the Canadian government to give him an Island from which he could try a novel method for increasing those rodent populations. After watching closely how beavers engineer their ecosystems with dams and dikes, he emulated the system in the island and succeeded in retaining the necessary water for muskrats, a model that was later applied by the state.

¹⁵⁷ David Landman, “We Move Anything, Anywhere,” *The Argosy*, July 1959, 24-29, Tom Lamb Fonds, Lambair Archives, Manitoba, Canada, accessed August 8, 2019, <http://www.lambair.com/page27/page36/page45/files/Argosy-July-1959.pdf>.

¹⁵⁸ Hubert Beyer, “May Not Return at All, Tom Lamb Warns Canada,” *Winnipeg Free Press*, January 30, 1965, Tom Lamb Fonds, Lambair Archives, Manitoba, Canada, accessed August 8, 2019, <http://www.lambair.com/page33/page26/files/Freepress%201965.pdf>.

¹⁵⁹ Estanciero refers to the person living in “estancias” which are the Patagonian configurations of ranchos or farms that emerged when the Chilean and Argentinian national governments started to promote southern colonization by granting lands to foreign capitals, especially British, who organized sheep farms at the end of 19th century.

¹⁶⁰ Landman, “We Move Anything, Anywhere,” 25.

In his property, Lamb hired Cree Indians and Metis for trapping muskrat and beavers, as well as for working in the gardens with his wife. However, once pelt prices fell, he focused on other businesses like cattle, dams, mining, and flying while recommending the government to build ranches for the Indians.¹⁶¹ Like in TdF, state internal colonialism was assembled by white ranchers and pioneers who were able to fulfill the state's need for controlling indigenous regions. With political voice, Lamb was listened by the state:

There's more than a million acres of land like this between The Pas and Grand Rapids. It's one certain way we could help the Indians and Metis here, and we could, at the same time, develop this region into one of the richest cattle lands in the whole country.¹⁶²

Intertwining notions of race and empire, the history of Tom Lamb is entangled with eugenic thoughts of white superiority and his desires to have more white people in his lands, along with wishes to conserve indigenous peoples and traditions from whitening processes. In his narratives, he described himself as builder of a "cattle empire" made of around a thousand "white-faced beauties" in a land inhabited by "few whites," "Indians," and "the Military."¹⁶³

With his pioneering character, Lamb also funded a flying company which mainly served government survey parties, mining companies, and sportsmen. He became known for flying animals like pigs, chickens, or lynx.¹⁶⁴ After implementing the muskrat system to increase their population in his lands, he also restocked the beaver population in the Manitoba lake that had almost gone extinct after intense extractive fur trading. For that, he

¹⁶¹ Murray McKenzie, "They Call Him Mr. North," *The Star Weekly*, February 7, 1959, 7. Tom Lamb Fonds, Lambair Archives, Manitoba, Canada, accessed August 8, 2019, <http://www.lambair.com/page33/page26/files/Tom%20Lamb%20-%20Mr%20North.pdf>

¹⁶² McKenzie, "They Call Him Mr. North," 8.

¹⁶³ Tom Lamb, *A Story by Tom Lamb* (Moose Creek, MB: Lambair, 1961), Tom Lamb Fonds, Lambair Archives, Manitoba, Canada, accessed August 8, 2019, <http://www.lambair.com/page33/page26/files/A-Story-by-Tom-Lamb.pdf>.

¹⁶⁴ Lamb, *A Story by Tom Lamb*, 109.

brought specimens from New York, making him think of the animals as “immigrants.”¹⁶⁵ Becoming a local hero for bringing back the beavers, his story with the beavers was told in children’s tales. However, in introducing beavers, Lamb was not only heroically *restoring* a native nature, but also coproducing whitened histories and a landscape that had been made through asymmetrical relations among settlers, Indians, beavers, and the state. In one of his quotes, one can see how his memories have erased the knowledges appropriated from his indigenous friends, “Malichi Ross and I flew beaver, examined beaver, talked beaver, and wrestled beaver.”¹⁶⁶

Lamb’s children continued pioneering the family through archiving their current projects and memories at Lambair.com. They continued with the airline and with other activities related to cattle, mining, and exploring territories. Tom, who had been awarded for his support to Northern development, keeps being posthumously recognized in tales and statues that celebrate his heroic narrative in making the North.

2.2.2 Mr. North and His Beavers Fly to the South

According to a Canadian article, it was Eva Perón, the spouse of the “ex-dictator” Perón who had the idea to bring the beavers to Argentina.¹⁶⁷ Lamb was then asked to transport a colony of beavers 10,000 miles away, to the Andes. The flying beavers posed one more adventure to Lamb, who had to capture, transport, and release them in TdF.

Interestingly, despite the scientific ongoing work on species acclimatization in TdF by

¹⁶⁵ Lamb, 110.

¹⁶⁶ Lamb, 110.

¹⁶⁷ Landman, “We Move Anything, Anywhere,” 27. Juan Domingo Perón was widely understood as a key president of Argentina, while the US banned him and framed him as a Dictator once he started the policies of import-substitution.

Argentinian scientists, documents seem to show how the release area for beavers, was decided in the moment of arrival. Lamb had first chosen a tree-rimmed lake that was not appropriate because, as a pilot told him, it was Chilean territory.¹⁶⁸ Nonetheless, as he heard afterwards, beavers later crossed to Chile anyway.

In a letter from Tom Lamb written two decades after the beavers' release, he recalled he was hired given the difficulties that the Canadian institutions had found to ship the beavers.¹⁶⁹ They had directed the order to Lamb, the man who "flies, traps, ranches where the experts said it couldn't be done, and who will move anything by land, water or air."¹⁷⁰ Lamb asked for 650 Canadian dollars for each beaver to fly to Ushuaia, a city he only knew for its penal infrastructure of the time, and which he could never spell correctly in his letters. Once he got the money, he tried to capture the fifty beavers asked but given the weather conditions of the time, he and his Native Canadian worker could only get twenty.

The trip was exciting for Lamb. He saw the President of the US Harry Truman at the New York airport. He also had fun when the beavers chewed their container in the airport of Miami, and he saw them running around "girls standing on top of the tables." He also enjoyed a week sailing through the Beagle Canal until finding a place to release the beavers, a week during which he became friends with the former governor of TdF, Fidel Anadón, who he described as having "killed eight men during Perón's election."

¹⁶⁸ Landman, "We Move Anything, Anywhere," 27.

¹⁶⁹ Correspondence from Tom Lamb to Harold Wells November 21, 1969, Tom Lamb Fonds, Lambair Archives, Manitoba, Canada, accessed August 8, 2019, <http://lambair.lamb-thielen.com/resources/ArgenBeaverswells.pdf>.

¹⁷⁰ Landman, "We Move Anything, Anywhere," 27.

There, he met the Captain “Fleece,”¹⁷¹ who would later go to the Moose Lake for ten caribous, ten moose, and two hundred muskrats, given that Lamb was not allowed to go by the Canadian government; he had been accused of contributing to the stocking of foreign countries with precious game animals. After the successful trip, Lamb recalls that a Scotch descendent in TdF sent him pictures of a beaver dam that had flooded out a million sheep, alpacas, and lamas. Neither this, nor the crossing of the beavers to Chile, were of concern to Lamb; he “did the job that was asked” without provoking trade competition with the Manitoba furs and, for it, he had earned 13,000 Canadian dollars plus 2,000 dollars to spend in the city and, as he describes, buy diamond rings and wine.

2.2.3 The Beavers Become a National Event

From the Argentinian’s state point of view, the importation of beavers was not just one more adventure but an event of national relevance. As such, it was recorded by the national weekly newsreel *Sucesos Argentinos*, a state-controlled series created in 1938 to link private cinema with politics. In 1943, the 18,405 Decree declared it obligatory to show the newsreel in every city before every cinema show.¹⁷² With the government of Perón (1946-1952), its production gained more funding and protection.

Sucesos Argentinos had a very particular style that aimed at promoting a sense of objectivity in defining the interests of the Nation. This was mostly achieved by erasing the personalization of the narrator, as if the voice came from outside, while highlighting the power of images to speak for themselves. These films also followed the basic rules of

¹⁷¹ According to my archival research, he could be the captain *Flyess* who later participated in the release of muskrats in TdF.

¹⁷² José Pablo Carro Aiello, “La Nación Peronista En *Sucesos Argentinos*,” *Sociedad Hoy* 17 (2009): 63–74.

propaganda: clarity, simplicity, and homogeneity, all through an emotive speech that was reinforced with music. For Wernecke,¹⁷³ *Sucesos Argentinos* predominantly used referential, conative, emotive, and poetic voices, as well as redundant and bombastic adjectives, superlatives, synonyms, and metaphors. Wernecke has claimed that *Sucesos Argentinos* promoted the state, its agenda, and its official discourse by linking the news to the interests of the Nation in such a way that the voice of the narrator became linked to the government itself. In addition, the actors represented were institutions and public authorities, and the recorded news was always related to the nation as a totality.

Differences within the nation were crystalized through archetypes of ideal behaviors such as the rural life as a reservoir of morality and tradition. These archetypes represented the values of progress, modernity, expansion, work, morality, education, dignity, hygiene, efficiency, and the "*fuerzas vivas*," which were the basic units of the Peronist society and which included workers parties, unions, and organizations. At the same time, and with the support of statistics, *Sucesos Argentinos* celebrated and objectivized technology, the Church, and the military.

In what follows, I examine the film *Sucesos Argentinos* "A Flight to the South,"¹⁷⁴ that recorded the beavers' trip as well as other archival audiovisuals and texts. Following visual¹⁷⁵ and ethnographic methodologies, I show how the species introduction was more

¹⁷³ Fernando Javier Wernecke, "El Noticiero *Sucesos Argentinos* y El Rol de La Propaganda Política Durante El Peronismo Clásico," in *IV Congreso de Estudios Sobre El Peronismo* (San Miguel de Tucumán: Red de Estudios sobre el Peronismo, 2014), 1–9, accessed October 2019, <http://redesperonismo.org/articulo/el-noticiero-sucesos-argentinos-y-el-rol-de-la-propaganda-politicadurante-el-peronismo-clasico/>.

¹⁷⁴ Antonio Ángel Díaz, "Sucesos Argentinos No 432: Vuelo Al Sur," 1947, Departamento de Cine, Audio y Video Fonds (439.C16.1.A), Archivo General de la Nación, Buenos Aires, Argentina.

¹⁷⁵ Stuart C. Aitken and Leo Zonn, *Place, Power, Situation and Spectacle: A Geography of Film* (London: Rowman and Littlefield, 1994); Dona Schwartz, "Visual Ethnography: Using Photography in Qualitative Research," *Qualitative Sociology* 12, no. 2 (1989): 119–54; Theo Van Leeuwen and Carey

than a means for setting a fur industry in TdF. With figures like horses, suits, hydroplanes, spouses, the military, or Chile, these sources show how, in coproduction with other human and nonhuman population politics, settling beavers in TdF was part of a racializing thought style that utilized social statistics, mapping, and emerging audiovisuals to design the New Argentinian Body through a strategy of excess.

Living a “peripheral modernity,”¹⁷⁶ Argentina was at that time both celebrating and fearing the future as a modern project that was producing accelerated changes in its population, institutions, and social relations. Given that context, racialized population politics in TdF did not aim at eradicating the natures and societies of the region that represented one of the last savage corners of the country but rather its perceived and lamented erasure came by the excess of numbers. It is not that the classified natures and societies of TdF disappeared but rather they became statistically nonrepresentative.

The film starts with adventure-like music, a horse, and a horse rider, a symbol of the American conquest against the Indian. In the episode of the beavers, the opening image shows the side face of the horse with the rider in the center, leaving an incomplete tree to their side. In this way, the *creole* hero with his horse comes towards us while leaving nature behind and is later accompanied by other figures of progress: a boxer, a car rider, a ballerina, and the military. The peripheral modernity of Argentina and its colonized south did not

Jewitt, *Handbook of Visual Analysis* (London: Sage Publications, 2001). I study how newsreels created images that mediated territorial and national perceptions, identities, and power relations.

¹⁷⁶ Beatriz Sarlo, *Una Modernidad Periférica. Buenos Aires, 1920 y 1930* (Buenos Aires: Nueva Visión, 1988); Mary Louise Pratt, “La Modernidad Desde Las Américas,” *Revista Iberoamericana* LXVI, no. 193 (2000): 831–40. For Pratt, the idea of developed-underdeveloped was an “structural relation of subordination that, far from being suppressed by the system, it constitutes it.” Modernity in these terms, constitutes relations of *contradiction* between the promises of freedom and its negation in postcolonial regions, of *complementarity* between centers and peripheries, and of *differentiation* by identity crisis within peripheral regions that have modernization without modernity.

hide its nonhuman companions, the horse becoming a key figure of progress and nationalization for “the work of men,” as often shown in the illustrations from school texts and propaganda materials.

It then shows the newsreel name, *First Latin American Cinematographic Newsreel* within a globe that places America at the center and which is rounded by metal chains. In the minute 00:29, just when the American map is shown with thick lines and a United States relatively smaller than the standard *Mercator* map (see fig. 2.2), the voice starts narrating:

Our Navy, with the aim of enriching the Argentinian fauna, acquired twenty beavers in Canada, who have made an extraordinary aerial trip from Moose Lake /mus like¹⁷⁷/ in Manitoba /Manitowa/ through Miami, Rio de Janeiro, to Buenos Aires.



Figure 2.2. Beavers and America¹⁷⁸

¹⁷⁷ As Lamb who misspelled Ushuaia, the voice fails to pronounce the name of the lake in English.

¹⁷⁸ Screenshot from Díaz, “Sucesos Argentinos No 432: Vuelo Al Sur.” Reproduced by permission of Archivo General de la Nación (see Appendix A).

Not surprisingly, bringing beavers as a species working in the North of America, would be thought to work in the South, especially after North American sociologists had compared TdF with the Hudson Bay in Canada in terms of latitude and business possibilities.¹⁷⁹ Beavers in the hands, gloves, and shoes of Tom Lamb (fig.2.3) were, in the film, bringing these possibilities.



Figure 2.3. Tom Lamb feeds the beavers¹⁸⁰

In the video, this fauna is enriching and “valuable.” The government invested 120,000 Argentinian pesos in total, or 6,000 pesos for each beaver. When explaining the price of the beavers, the voice questions the audience “do you realize?” as a way to provoke the public to ally with the enterprise. Then, the video establishes one of the contradictions of the modernization of the TdF nature when the film shows how the “Fuegian fauna is incalculably rich” while showing images of seals and sea lions. Reproducing Darwin’s ghosts around the sterility and lack of natural diversity in TdF,¹⁸¹ the introduction of beavers was a way to enrich what was considered then a *poor nature* for lacking useful, charismatic, and abundant species.

¹⁷⁹ Carl Cleveland Taylor, *Rural Life in Argentina* (Baton Rouge: Louisiana State University Press, 1948).

¹⁸⁰ Screenshots from Díaz, “Sucesos Argentinos No 432: Vuelo Al Sur.” Reproduced by permission of Archivo General de la Nación (see Appendix A).

¹⁸¹ Anne Chapman, *Darwin in Tierra Del Fuego* (Buenos Aires: Imago Mundi, 2006). When Darwin traveled from the exuberant Galapagos to TdF, he described the last as sterile, hostile, and desolated, inhabited by “primitive” and “savage” humans and animals.

This claim is today contested by contemporary ecologists who define the Fuegian ecosystem as particularly rich precisely because of its fragility, that is, for containing assemblages made of few species and small populations. The designing the Nation during the 1940s was marked by productive tension between modernity through importing northern immigrants, cultures, technologies, and animals, and conserving and valuing national ones. Within this tension, and as the newsreel shows, introducing beavers responded to both the disparaging of the Fuegian fauna as poor, unproductive, and in need of intervention, while at the same time, valuing that very same Fuegian nature by using a Fuegian but nationally useful species, the seals.

Modernization projects in Latin America are entangled with contradictions: since modernity proposes a freedom that is at the same time restricted in peripheral regions, collective and regional identities are captured between desires of *receiving* modern and Eurocentric futures while, at the same time, suffer constant recognition crises due to the disavowal of their own difference and history. The Canadian beavers arriving from the North to promote a northern industry and landscape brought with them this sort of contradiction: to enhance Argentinian nature with northern species was a path for progress that, while inscribing the Argentinian nature into modern designs, threatened to erase their own difference and value, a sentiment that was responded with the praising of Argentinian native-defined fauna.

When moving the beavers from Canada, the film first shows the plane in the air,¹⁸² letting only some people and trees to be shown from the distance, while highlighting the development of air transport technologies of the period and the pilots transporting the load.

¹⁸² They used various planes, including the hydroplane Catalina 2P10 to drop the beavers in the lake.

Images show cities and landscapes from above while also showing the plane flying like a bird in the sky. Then, the film stresses governmental work for progress through the trip and showing images of the urbanity of Buenos Aires, the richness of the Pampa's lands, its rivers, and the mineral richness of Comodoro Rivadavia, the capital of oil production where "engineering has won the areas covered by water through the installation of expensive oil extraction towers that provide us with its mineral wealth."

After flying Buenos Aires and Patagonia, the travelers arrive to Ushuaia, the capital city of TdF, described as an "urban center with rare natural attractions," and depicted as advancing in building infrastructure and materials, as shown by the image of five small houses and a horse rider with some cows grazing in front of them. It then shows the Church, the Military Base, and the Waterfalls of *Monte Olivia*, which, the narrator says, will be used for electrical energy.

With the music of adventure playing in the background, the hydroplane reaches the Fagnano Lake as the chosen site for releasing the beavers, showing Tom Lamb's face, the lake, and three men wearing suits (fig.2.4). Their suits not only represented the authority of civilization, but also the professionalism of scientific knowledge. At that time, scientists and explorers did not wear the informal and branded mountain gear as they do today. Instead, as one of my older informants told me, they had to wear suits even if exploring whales in the middle of the ocean. In the film, the narrator also stresses the weight of science when releasing the beavers in the most suitable area for the species.



Figure 2.4. Beavers release¹⁸³

In this version of modernity, gender and nationalism were key categories for the coproduction of nature and society. Beavers were not only fur but also bearers of sexual morality: the narrator highlights the adequacy of the monogamous and heteronormative beavers who, at the same time, were a fitting icon for the values of work and “conjugal fidelity” in the progress of the nation:

It is interesting to highlight the conjugal fidelity of these animals. They get married only once in their life and, if fatality deprives them from their chosen company, they do not repeat ever again. Like little widows they reach the end of their days.

Bringing beavers was also a way to populate and enhance TdF with the selection of useful, modern, and northern species in a land considered poor or lacking population. Settling productive species in alliance with the interests of the Nation state and occupying the landscapes of southern TdF with animals that industriously embodied values was also a way to assert national sovereignty in a territory previously managed by indigenous peoples and native species. It was, therefore, also a semiotic-material intervention towards whitening the landscapes and populations of the austral region by a central state. As the film shows, once the beavers are left, the team and the plane leave the region and the outsiders return to their homes, except the beavers. In line with the rest of the film production that does not show any close caption of TdF and its inhabitants, as if it was empty, the

¹⁸³ Screenshots from Díaz, “Sucesos Argentinos No 432: Vuelo Al Sur,” Reproduced by permission of Archivo General de la Nación (see Appendix A).

governmental project asserts its authority to design the futures of the distant region which is, once again, mystified:

They are freed. Happy and hoped freedom. They will enrich the fauna of the area, as they will in a near future do the reindeers of Saint Georgia and other species for which the climate of these landscapes is suitable...Mission is over, and beavers are in the hands of God.

The government ended the film and left the beavers in TdF. Beavers were protected from hunting so that the initial population could reproduce enough to enable their industrialization. Yet once left and government gone, their industrialization never occurred. As with many other innovations in remote regions that are designed by distant centers, the modern project ruined the post-industrial landscapes of TdF. The initial twenty beavers, imported, useful, and modern, would later become an invasive *population* of around one hundred thousand or more, a perceived *overpopulation* that the fragile ecosystems of TdF could not sustain.

2.3 Eugenics and the Politics of Species and Populations

2.3.1 *When the Demographic Problem is Underpopulation*

The so-called *demographic problem* of the Argentinian Republic referred not so much to the concerns associated with overpopulation, but rather to the perceived *lack* of people *and* the perceived *excess* of foreign people. After its independence in 1816, the Argentinian State promoted immigration policies as a means for industrializing and populating the country.¹⁸⁴ Focused mostly in opening its doors to European citizens, “the massive immigration period” (1870-1929) attracted the largest numbers of immigrants in the history

¹⁸⁴ Novick, *Política y Población: De Los Conservadores Al Peronismo*.

of Argentina.¹⁸⁵ Europeans were seen not only as a tool for *modernization*; in addition to economic reasons, they were thought to also bring *modernity*. The foundational character of immigrants for the sovereign state was expressed in the 1853 Constitution, as declared in Art. 25:

The federal government will promote European immigration; and may not restrict, limit, or encumber with any tax the entry into Argentina to any foreign who comes to work the land, improve industry, and introduce and teach the sciences and the arts.

Between 1930 and 1945, the international economic crisis and the World War decreased the number of foreign immigrants and capital received, while it increased the amount of internal migration. Since receiving population had been a key policy for strengthening the economy and morality of the Nation, the multiple authoritarian and repressive governments of this period agreed in seeing the population crisis as a central concern.¹⁸⁶ If, until then, Argentina's economy had grown through exporting agricultural products, the 1930s not only reduced the amount of immigrants but also of trade volume, export prices, and entrance of foreign capitals.

To the crisis, the Argentinian government enacted interventionist politics that, while envisioned as temporal and reactive in the context of the crisis, initiated the constant paradox that still marks Argentinian's economy across socialist and neoliberal governments: how to regulate internal production, exports, and imports within an asymmetrical international market. In the 1930s and given the end of the favorable context for exporting agricultural products, a strategy in which many Latin American countries had specialized, the Argentinian State reacted by promoting its own industrial sector through an import-

¹⁸⁵ José Panettieri, *Inmigración En Argentina* (Buenos Aires: Macchi, 1970).

¹⁸⁶ Karina Inés Ramacciotti, "El Museo Social Argentino y El Primer Congreso de Población de 1940," *Sociohistórica* 13–14 (2003): 231–36.

substitution scheme. If imported products were substituted by nationally produced ones, the economy could continue growing by increasing the internal market as well as the employment and consumption rates.¹⁸⁷

During the 1940s, the state dreamed a strong and cohesive nation that would put an end to the history of violent and discredited governments. While immigration was still seen as a key economic element for industrializing the whole territory, having a population that was composed of more foreign than native-born citizens had started to be considered not only as a gift but also as a problem. Foreign immigrants were not only bringing socialist and anarchist ideas, but they were also threatening a culturally cohesive society. Organizing and centralizing those concerns, Perón regulated this tension through a politics of selective immigration that would substitute the discourse of open doors by one of “doors ajar”¹⁸⁸ and which would mostly focus on attracting Italian and Spanish citizens, given their assumed cultural similarities. The 1949 Constitution left unmodified the article around promoting European immigration but, in his discourses during the same year, Perón qualified it:

The demographic policy has deserved a very special care given its influence over the future of Argentina. The dispersion of efforts has been corrected by centralizing the immigration services that previously depended on various administrative centers. (...) Population, the essential basis of the moral existence of the state, demands a vigilant vigilance and a careful planning regarding the selection, channeling, and settling of immigrants.¹⁸⁹

Susana Novick¹⁹⁰ has argued that the focus on population until the 1940s was mediated by eugenic discourses that sought to exclude races judged “inferior” and which, often,

¹⁸⁷ Novick, *Política y Población: De Los Conservadores Al Peronismo*, 18-22; Halperín Donghi, *Historia Contemporánea de América Latina*, 431-460.

¹⁸⁸ Novick, *Política y Población: De Los Conservadores Al Peronismo*, 193.

¹⁸⁹ Juan Domingo Perón, *Discursos, Mensajes, Correspondencia y Escritos: 1949* (Buenos Aires: Biblioteca del Congreso de la Nación, 2016), 345.

¹⁹⁰ Novick, *Política y Población: De Los Conservadores Al Peronismo*, 13-37.

comprised racialized rural and industrial workers. For her, this changed with the Peronist government that sought to govern for *the* excluded ones, the workers, hence workers as included and protected. My research, however, shows that while there was a change from racial and eugenic discourses towards one of integration and optimization, the criticism of the category of race did not end the practice of racializing and colonizing others.

The climate under the peronist government transformed the conditions and discourses in which many workers had been made inferior and disposable citizens, as Novick has argued. However, racialization practices continued in many ways. On one hand, discourses and policies produced during the 1940s, persisted in the still surviving idea that the government should enhance lands and populations considered unpopulated, uncultivated, and unindustrialized or, in other words, with low state presence, industry, and civilized populations. On the other, those policies continued strengthening mechanism for selective immigration as a mechanism for enhancing the Argentinian society by promoting the arrival, reproduction, and protection of populations with certain origins and behaviors and not others.

In addition, by centering the figure of the worker, all other forms of integrating the state as citizens other than capital or landowners and workers, fell outside state's intelligibility, another way to contribute to the silencing and unprotection of all those nonincluded in the state visions of productivity, often including indigenous populations, deviant migrants, and afro-Argentinians. Furthermore, previously disposable workers became a central figure for the governance of the state in a way that stabilized their racialized attributes to the category of workers. Previously disposable workers became valued and protected but entangled with old eugenic values embedded in enhancing populations for the common good.

The emergence of Patagonia and especially of TdF as the ultimate frontier in wherein to assert the state's sovereignty, which had been previously denied by the Spanish colonial rule, was essential for the self-asserting goals of the state. By nationally colonizing the *south*, TdF was then imagined as a new land free of the old mistakes, a laboratory in which to start from scratch and display utopic plans for starting a new life. Through the incorporation and governance of the natures, peoples, animals, plants, genes, seeds, and landscapes of TdF, they also entered an interplay of identifications and negotiations with the national categories that classified them.

In the history of the state protecting the nation from global capitals, it has often been disavowed how the nation-state itself has been a source not only of integration but also of violence. If until the 1930s these racial taxonomies were explicit and violent, the 1940s redefined them in terms of optimization, efficiency, and progress. While this new context introduced vital changes in terms of benefits and protection for citizens, workers, and families, it also actualized old racializing practices through different methods, knowledges, and imaginaries.

2.3.2 The Postcolonial Native is Born: Argentinizing Populations

Colonialism in TdF began during the 16th century with commercial intentions, especially given the potential of the Magellan Strait to connect the Atlantic with the Pacific oceans at the time of the spice trade. Despite the intentions to settle, the conditions of the region made attempts to fail, producing the death of entire villages and ship crews. During the 17th and 18th centuries, commercial interests fell to leave space for rival military interests among Spain, Britain, Netherlands and France, as well as for scientific explorations that used

the distant Tierra del Fuego “as a laboratory to examine human society.”¹⁹¹ Savage trade was replaced by a quest for civilization, a morality entangled with the studies of Fitz Roy and Darwin who measured the territory and collected species and rocks from the *New World*. As Giucci describes, Tierra del Fuego became then a reference for Darwin’s global research network.

During the 19th century, missionaries started to settle in the island for the first time, marking a key event since remaining in the land contributed “to transform a region that is situated in the end of the world, verified through the colonizer, where daily and communication necessities prevailed.”¹⁹² At the same time, also during the 19th century, a new period of trade colonialism began in search of gold and profitable species, while also anthropologists and journalists accounted for the natural and social characteristics of the region, “not to colonize or evangelize but to examine.”¹⁹³

This variety shows how TdF colonizing activities were multiple. Giucci’s last chapter explores the promotion of communication technologies in the island since the 1940s and the end of the island’s isolation. However, for some reason, Giucci’s history disavows how particularly the first half of the 20th century opened a period for a new form of state-organized colonization. At that time, the censused population of the Argentinian TdF started to increase exponentially, as I show in table 2.1 using data from the census of Tierra del Fuego.¹⁹⁴

¹⁹¹ Giucci, *Tierra Del Fuego: La Creación Del Fin Del Mundo*, 112.

¹⁹² Giucci, 173.

¹⁹³ Giucci, 240.

¹⁹⁴ Anuario Estadístico de Tierra del Fuego 2010, Instituto Provincial de Análisis de Investigación, Estadística y Censos (Tierra del Fuego, 2010): 32–33, last accessed July 10, 2020, <https://ipiec.tierradelfuego.gob.ar/wp-content/uploads/2016/01/Anuario-Estad%c3%adstico-2010.pdf>.

Table 2.1. Population growth in TdF (1895 - 2010)

National Census	Population	Proportional Variation
1895	477	n/a
1914	2504	424.9
1947	5045	101.5
1960	7955	57.7
1970	13,527	70
1980	27,358	102.2
1991	69,369	153.6
2001	101,079	45.7
2010	126,190	24.8

Harambour has argued that the colonization of TdF was done by the Chilean and Argentinian States in building their sovereignties through the transformation of the structures of property.¹⁹⁵ In that process, like in the Northern Canada of Tom Lamb, the national authorities allied with the European elite families that governed the region to achieve national presence and centralization. Since the settler colonization of TdF occurred through the politics of the National state, its population politics embodied both historical tensions of the demographic problem: a perceived lack of population and, at the same time, a perceived excess of foreign people. This tension went beyond human populations and it was actually coproduced between nature, technologies, settlers, and the state.

Since the 1930s crisis, Patagonia and Tierra del Fuego became key repositories of hope that the crisis could be overcome through organized economies. And with the Peronist strengthening of the Nation state, the Fuegian lands passed from having been *occupied* and governed by European rich settler families who, nonetheless, are still celebrated,¹⁹⁶ to being

¹⁹⁵ Alberto Harambour, "Soberanía y Corrupción. La Construcción Del Estado y La Propiedad En Patagonia Austral," *Historia* 50, no. 2 (2017): 556.

¹⁹⁶ Missionaries, traders, and landlords who extracted and displaced the landscapes and populations of TdF during the 19th century and who also participated in the assassination of around 1500 workers when attempting to organize for their workers' rights during the 1920s events known as the Tragic Patagonia or the Rebel Patagonia. For example, Julius Popper is narrated as a pioneer in the Museum

included and governed by the interests of the central state. Since then, the state colonization of TdF has been hegemonically defined as nonviolent, non-enforced, and noninvasive but rather as a peaceful process based on the making of continued public work.¹⁹⁷ This account of prosperity harmonically joins indigenous peoples, missionaries, farmers, and immigrants in their making of identity, industry, and property.

The state however, still saw settler families as an impediment for the National interest, given their connections to the British and other European colonial powers, as well as for the concentration of lands and capital that contributed neither to the maintenance of the state nor to workers' improvement of living conditions. The government then promoted for redistributing those lands and economies through a colonial politics of land expropriation that included the design of colonies for farming families, the expropriation and redistribution of land, and the facilitation of improved living conditions in those isolated areas. Seeking to correct the politics of indiscriminate immigration with selective and distributed population, the government produced a system for selecting settlers according to the interests of the state.

At the beginning of the 20th century, both the Chilean and Argentinian States dialectically produced their national interest and fear over TdF, out of an imagined conflict between both countries over the austral regions. However, Argentina did spend more resources in filling the region with national institutions and cities. As a resource and promising land, Patagonia and TdF also became sites for imagining external threats:

of the End of the World and the biggest mountain gear shop in Ushuaia has his name, despite him being known for his violence in the organization of indigenous hunt.

¹⁹⁷ José Cabezas, *Presencia Argentina En El Canal de Beagle* (Buenos Aires: Bamba, 1978), 3–5, Biblioteca [982 (829.0) CAB 791], Archivo del Museo del Fin del Mundo, Ushuaia, Tierra del Fuego, Argentina.

whether Chileans taking over Argentinian lands, international companies acquiring lands for dubious purposes, or the development of political revolutions by internal enemies.

If European travelers had described TdF as an exotic and dangerous territory, its national colonization actualized that dichotomic production of the region as either a dreamland or a damned land. Those who were willing to settle were promised fortunate futures that, once settled, also became the prize for resisting the negative conditions. As I will show in chapter 6, these imaginaries are reproduced today in the form of protection laws, territorial demands, and identity struggles of belonging.

Colonization laws aimed to increase productivity, nationalism, and “dignify the family” through promoting small-owned farms and technical schools.¹⁹⁸ The colonization project would be highly mediated with expert knowledges. The settlers would consist of “native workers,” “immigrants *if needed*” “indigenous peoples,” and “former prisoners,” and their ranked selection would benefit farming professionals, Argentinian-born or residents, and families with children. The government would protect and forgive some debts to indigenous peoples that accepted nationalization.¹⁹⁹ Intellectuals also suggested the selection of European immigrants (my own italics):

Nothing opposes immigration; the country would have only advantages *except for inconvenient immigration* from the political or racial point of view. A European and healthy immigration cannot but economically and socially benefit the country (...) 500,000 immigrants would imply 2,000,000 Argentinians in one generation.²⁰⁰

¹⁹⁸ Asociación Colonia-Escuela Argentina, “Ante Proyecto de Ley Creando El ‘Consejo Nacional de Colonización,’” 1932, Juan B. Justo Fonds (Box 38, Doc. 29), Archivo General de la Nación, Buenos Aires, Argentina.

¹⁹⁹ Raúl Scalabrini Ortiz, “Decreto Condonando Deudas a Los Aborígenes Que Ocupan Tierras Fiscales En TT. NN,” 1936, Ministerio del Interior Generales Fonds (Box 42, Folder 25169 A36), Archivo Intermedio, Buenos Aires, Argentina.

²⁰⁰ Oficina de Estudios Económicos de la Unión Industrial Argentina, “¿Conviene La Inmigración?,” 1930s, Juan B. Justo Fonds (Box 39, Doc. 213), Archivo General de la Nación, Buenos Aires, Argentina.

In 1946, the adjudication of pastoral lands within National Territories like TdF, privileged settlers according to the criteria that I reproduce in table 2.2.²⁰¹

Table 2.2. Points system to evaluate settlers (1946)

Status	Points
Married	20
Legitimate Child	10
Argentinian Child	5
Up to 20 years age	5
Native Argentinian (born in the territory)	10
Naturalized Argentinian	8
Foreigner	5

Selecting was a means to *Argentinize* the country, a national concern that played a key role in TdF. The population composition of TdF justified national discourse around the threats of foreign peoples and the perceived *chilenization* and *anglicization* of the South. At the beginning of the 20th century, the Argentinian TdF had been populated by Chileans and Croatians that worked in factories and sheep farms. In Ushuaia in 1947, half of its two thousand inhabitants were not Argentinians.²⁰² In 1914, only 927 people of the 2,504 had been born in Argentina, and there were only 374 women.²⁰³ In 1947, two thousand people had been born in Argentina while three thousand had been born outside Argentina, and there were 3,634 men and 1,346 women. In 1960 the nationality statistics are reversed, and more than four thousand people were born in Argentina, while less than four thousand were born outside Argentina, of which 5,279 were men and 2,676 women.

²⁰¹ Ministerio del Interior, "Decreto 15673 Sobre La Adjudicación de Tierras Fiscales Pastoriles En Territorios Nacionales," 1946, Ministerio del Interior Generales Fonds (Box 13, Folder 28339A). Archivo Intermedio, Buenos Aires, Argentina.

²⁰² Julio E. Rodríguez, *Historias de Vida de Ushuaia* (Ushuaia: El Diario del Fin del Mundo, 1999).

²⁰³ Anuario Estadístico de Tierra del Fuego, 2010, 32-33.

While contemporary statistics of the past distinguish between Argentinians and foreigners, the statistics on which they are based, as I found in my archives, gave more importance to certain nationalities. For example, in 1927²⁰⁴ and 1933,²⁰⁵ it was important to highlight how many Chilean people there were, not only by distinguishing them from “other nationalities” but also by capitalizing the category, as shown in the statistics done in Patagonia by the military in 1927 (see fig. 2.5).

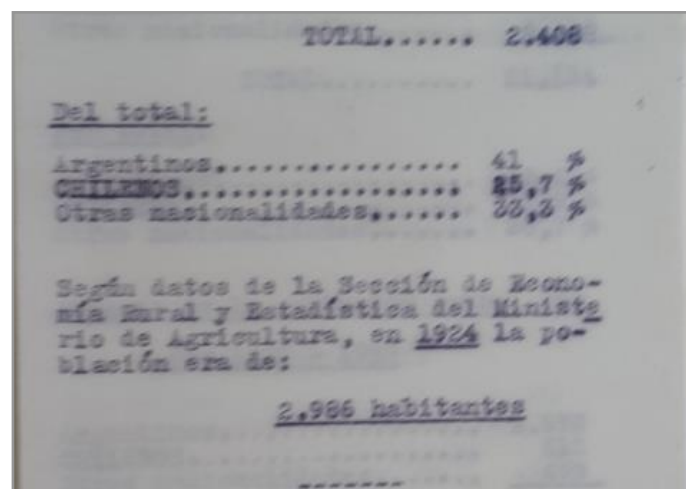


Figure 2.5. Nationality and population of TdF (1927)²⁰⁶

At that time, only one third of the Fuegian population was considered Argentinian and two thirds foreign, half of them Chilean. That population composition legitimated the military governance of the territory, a reason used by the military government to deny city rights and elective systems in the region.²⁰⁷ At the same time and by the same census of 1920,

²⁰⁴ Coronel Juan F. Ferrari, “Datos Estadísticos de La Patagonia,” 1927, Juan B. Justo Fonds (Box 63, Doc. 29), Archivo General de la Nación, Buenos Aires, Argentina.

²⁰⁵ “Censo de La Patagonia,” 1933, Juan B. Justo Fonds (Box 63, Doc. 1), Archivo General de la Nación, Buenos Aires, Argentina.

²⁰⁶ Juan F. Ferrari (coronel), “Datos Estadísticos de La Patagonia,” 1927, Juan B. Justo Fonds (Box 63, Doc. 29), Archivo General de la Nación, Buenos Aires, Argentina. Reproduced by permission of Archivo General de la Nación (see Appendix A).

²⁰⁷ “Censo de La Población de Ushuaia,” Gobernación de Tierra del Fuego, 1932, Ministerio del Interior Generales Fonds (Box 19, Folder 29333-T). Archivo Intermedio, Buenos Aires, Argentina. In relation to the census of 1932 in Ushuaia, the governor of TdF, the captain Jorge Siches, and the Police

there were around 6,500 cows, 5,900 horses, and 677,000 sheep. In the following years, the concern for the foreign continued affecting the colonization of Patagonia: In 1945, the driving side was changed to the right to de-anglicize Argentina.²⁰⁸ In 1942, Argentina fueled non-British carbon resources, and in 1946 other measures like nationalizing the railway system sought also the same goal.²⁰⁹ In addition, not only people but also nature, technologies, species, and landscapes were to be argentinized, a process that, once *naturalized*, made the nation more obdurate.

By naturalization, I mean the coproduction of argentinizing colonization and population politics with more-than-human lives and landscapes. While during the Spanish colonial rule only Spanish-born people could occupy governing roles, the emancipatory-colonizing process aimed to reverse that logic by requiring Argentinian-born citizens. As a report on the Internal Security in Tierra del Fuego tells in 1942,²¹⁰ the patria was threatened by “anti-Argentinian activities” that were riskier in this region and which could be corrected with Argentine-born citizens. However, to promote the permanence of settlers in the region, people needed nonhuman companions that would also stay. In 1948, the Navy of TdF

Head argued that it was taken by three people without any method but asking in the streets and then making some arithmetic. Given that most of the people were state workers from the prison and temporal workers as well as foreigners who do not stay or know the local needs, so they are not allowed to vote. The ministry decided to delay the creation of the city of Ushuaia and keep its management through the foment Commission.

²⁰⁸ Daniel Balmaceda, “Cuándo Dejamos de Manejar a La Inglesa,” *La Nación*, September 22, 2014, accessed July 10, 2020, <https://www.lanacion.com.ar/sociedad/cuando-dejamos-de-manejar-a-la-inglesa-nid1729203>.

²⁰⁹ Fernando Coronato, *Ovejas y Ovejeros En La Patagonia* (Buenos Aires: Prometeo, 2017).

²¹⁰ Gobernación de Tierra del Fuego, “Reporte Sobre Seguridad Interna de Tierra Del Fuego,” 1–14, Ushuaia, 1942, Ministerio del Interior Secretos y Reservados Fonds (Box 4, Doc. 32), Archivo Intermedio, Buenos Aires, Argentina. Due to the especial conditions of TdF (isolation, foreign population, strategic emplacement, lack of defense), these threats were seen as more dangerous than in the rest of the country. As response to the threat, the governor of TdF demanded the Interior Minister support to strength the police by argentinizing it with Argentinian-born citizens.

recommended the national government to continue populating the distant region with Argentinians and with livestock, agriculture, and profitable species like fur bearers.²¹¹ The Navy argued that, in case of military conflict with Chile, there would not be people enough to defend the patria, not only because there were few settlers but also because many of them were foreigners.

In addition, the 1881 limits agreement had divided TdF in a way that forced Argentinian siders to pass through Chile in order to reach the Argentinian mainland. The Navy was afraid that, if a conflict occurred, Chile could easily block the border and isolate the island by impeding the Argentinian Government to send more troops or provisions. Highlighting the geopolitical value of TdF, the Navy demanded more Argentinian human and nonhuman population in the island so that, if needed, they would and could fight for the patria.

With those recommendations and with the success of previous experiences of species introductions in the country, the until then profitable market of fur trade, and the global context of nature colonization that happened in other countries,²¹² it made sense to introduce the selected Canadian beavers to TdF as they would later reproduce themselves within the national territory and contribute to the national interests. These beavers, like the foreign immigrants, would later come to be seen not only as promising newcomers but also as threats (invasive species) to the nativized populations of TdF.

²¹¹ Ministerio de Marina, "Estudio de La Posición Estratégica Del Territorio Nacional de Tierra Del Fuego," 37, 1948, Tierra del Fuego Fonds (DEHN 200), Departamento de Estudios Históricos Navales, Buenos Aires, Argentina.

²¹² Andrew Stuhl, *Unfreezing the Arctic. Science, Colonialism, and the Transformation of Inuit Lands* (Chicago: The University of Chicago Press, 2016). Between the two World Wars, Danish scientists tried to create a reindeer industry in the Arctic in an effort to domesticate both Inuit communities and landscapes, a project that also failed in its industrial intention.

2.3.3 *Eugenics, Environmental Biologies and Industrial Moralities*

At the end of the 19th century, the journalist Payró was asked for a reportage on the South. He wrote down his thoughts while traveling next to a European woman who had just arrived in Argentina:

Here there is a brave woman who comes from one hemisphere to the other in search of a partner (...) She is sat in front of me, an Argentinian man, the national type that attracts new countries and new races to come (...) She will become a Patagonian settler and contribute to our history: she is the new energy that will construct the powerful energies of work in Patagonia (...) This strong weaker sex, has already displaced the intelligent and strong indigenous Tehuelche women in Patagonia, a scarce specimen today. Those remaining, work now at the German and British estancias that are scattered in the desert forming nucleus for future civilization. This European woman will be in front of the indigenous one who has been persecuted by the frontier troops, but which today is fulfilling her ethnic duties, and in front of the mestiza, born from the encounters among Indios and Christians. They are all giving a land they had been preparing for a long time for this transition. This woman, like others, come from outside through a continuous and imperceptible immigration to cooperate with the evolutive task as feminine members of the masculine civilizations that have risen within analogous climates.²¹³

Payró wrote his reportage at the end of the 19th century and his description of the changes that European settlers would bring to the nation's future were not only related to its economic development but also to an *evolutionary*²¹⁴ component that would slowly erase what were then considered inferior races to give rise to stronger populations. While the policies of the 1940s were not built upon explicit social Darwinist racial thoughts, they did in part continue the same logic while erasing the racial debate.

²¹³ Roberto Payro, *La Australia Argentina. Excursión Periodística a Las Costas Patagónicas, Tierra Del Fuego e Isla de Los Estados*, (Alicante: Biblioteca Virtual Miguel de Cervantes, 2001), Section IX, accessed September 6, 2019, <http://www.cervantesvirtual.com/nd/ark:/59851/bmccj8b5>.

²¹⁴ Betina Ferrante, "La Australia Argentina: Territorio, Cartografías Simbólicas y Literatura," *Hermeneutic* 16 (2017): 107–21. Payró offered exotism and novelty to the readers of the cities while suggesting social Darwinist notions of population.

Peronism redefined the eugenic discourses towards inclusion, equity, and social justice.²¹⁵ However, I argue that the foreclosure of the very idea of race, attributed to rejection of the category by the international scientific community after the Second World War,²¹⁶ did not end with the institutionalized practices that racialized pasts and futures through its planned economies and designs. On the contrary, the foreclosure of race as a constituting category of the national project contributed to the erasure of communities that were not included in the visions of the future Argentina in a way that was now more difficult to question given the discourse of inclusion and social justice that placing workers at the center brought.

If the 1930s eugenic discourse mobilized ideas of useful populations for creating superior races and explicitly erasing the useless and weaker ones, the population politics of the 1940s replaced social Darwinism with behavioral and moralizing discourses that envisioned population around the values of work, the family, and the duty and right to know (and to own) the patria. Rather than a landscape made of given biologies, this behavioral racialization was something to be consciously constructed. These values, however, already entailed visions of racialized bodies, practices, and histories that became disavowed, because they responded to different histories of violence and inequality.

²¹⁵ Novick, *Política y Población: De Los Conservadores Al Peronismo*, 173-215; Enrique Garguin, "Los Argentinos Descendemos de Los Barcos': The Racial Articulation of Middle Class Identity in Argentina (1920 – 1960)," *Latin American and Caribbean Ethnic Studies* 2, no. 2 (2007): 161–84; Ezequiel Adamovsky, "Ethnic Nicknaming: ' Negro ' as a Term of Endearment and Vicarious Blackness in Argentina Vicarious Blackness in Argentina," *Latin American and Caribbean Ethnic Studies* 12, no. 3 (2017): 273–89.

²¹⁶ Jenny Reardon, "Post-World War II Expert Discourses on Race," in *Race to the Finish: Identity and Governance in an Age of Genomics* (Princeton, NJ: Princeton University Press, 2005), 256; Harvey Comier, "Ever Not Quite: Unfinished Theories, Unfinished Societies, and Pragmatism," in *Race and Epistemologies of Ignorance*, ed. Shannon Sullivan and Nancy Tuana (Albany, NY: State University of New York Press, 2007), 59–76.

From European Superiority to the Duty of Knowing the Patria: The government of Perón aimed at promoting industrialization and social policies, including the regulation of salaries, housing, employment, subsidies, credits, or education. In 1945, Argentinian workers earned the right to paid vacation, a measure that implied both, the right to rest and travel and the “duty of knowing the patria.”²¹⁷ Social tourism was a means to activate the national economy while, at the same time, promoting the knowledge of the different regions by its citizens was a way to, also, to develop the National sentiment. To this end, the government introduced images describing how citizens had now the right to go on vacation as well as the duty to do so for promoting the economy and for knowing the Argentinian territories.

Like western models, Argentina had promoted the creation of national parks since the 1930s,²¹⁸ following the North American model, not only to protect natural resources against savage extraction from private actors, but also to ascribe national ownership to non-industrialized, non-farmed, and non-urbanized natures. Accompanying them, in TdF there were roads, military bases, official discourses and visits, and checkpoints. However, unlike western geographies that reserved nature for the elites,²¹⁹ the Peronist Argentina socialized its natural reserves and monuments for everyone, everyone here meaning all social classes and not just the illustrated higher classes in capacity to appreciate and respect nature.

²¹⁷ Ximena A Carreras Doallo, “Parques Nacionales y Peronismo Histórico La Patria Mediante La Naturaleza,” *Estudios y Perspectivas En Turismo* 21, no. 5 (2012): 3.

²¹⁸ Eugenia Scarzanella, “Las Bellezas Naturales y La Nación : Los Parques Nacionales En Argentina En La Primera Mitad Del Siglo XX,” *European Review of Latin American and Caribbean Studies* 73 (2002): 5–21; Gabriela Núñez, “La Región Del Nahuel Huapi En El Último Siglo. Tensiones En Un Espacio de Frontera,” *Pilquen* 17, no. 1 (2014): 1–14; Doallo, “Parques Nacionales y Peronismo Histórico La Patria Mediante La Naturaleza,” 1–14.

²¹⁹ Denis Cosgrove, *Geography & Vision: Seeing, Imagining and Representing the World* (London: I.B. Tauris, 2008), 28. During the 1920s and 1930s, Europe expanded a passion for knowing the national lands, promoting the creation of youth associations and clubs like the Boy Scouts to know and praise the nation through its nature while encouraging healthy bodies.

However, and as the North American model, the project for all meant without some others who, at the same time, were otherized for not participating in the national project. For indigenous peoples who had been the sovereign communities of TdF for a long time, the nationalization of nature was also a means to dominate their lands and borders.²²⁰ And from the savage assassination and imprisonment of indigenous peoples by missionaries and traders, the Fuegian lands started to be admired, contemplated, climbed, and owned by the citizens who had the right to work and the duty of making the patria through their vacation. The project seemed unquestionable, for the violent histories against indigenous peoples were now replaced by integration narratives that welcomed the native peoples to become part of a nationalist project that had already made them inferior:

Teachers and other allied professionals should elevate the fallen spirit of the native. The native has been before persecuted by traffickers who often covered their spoliations under the mask of civilizing or helping them. It is time they receive real and firm help, which would consist on giving them advantages in parity with the other home immigrants, seeking to wake up those who lived dormant and tormented strengths, gradually transforming them into modern citizens: more agile and useful to our society.²²¹

To be protected and visible, peoples and communities had to integrate into state goals in ways that could also be taught and shared to vacating families. Along with populations, natures also became nationalized. Developing Patagonian tourism was materialized through narratives, infrastructures, and designs, that reproduced the European landscapes in which their white and middle classes went to find nature. Labelled as the “Argentinian Great

²²⁰ Norberto Fortunato, “El Territorio y Sus Representaciones Como Recurso Turístico. Valores Fundacionales Del Concepto de ‘Parque Nacional,’” *Estudios y Perspectivas En Turismo* 14, no. 4 (2005): 314–43.

²²¹ Ramón Clyde Torres, *Ciudades de Invierno y Verano*, 1954, 135, Colecciones Especiales Fonds (BP389/2a), Biblioteca del Congreso de la Nación, Buenos Aires, Argentina.

Switzerland,” the *Argentinian* Patagonia was imagined as made of “panoramas, mountains, valleys and lakes with pure air” which, with the help of nature and experts:

will show to the peoples of the World the degree of efficiency, culture, unity, and prosperity of Argentina, through its almost 150 years of Republican life. Hence, directing the works, only Argentinian professionals should participate.²²²

“Europeanizing Argentina,” its natures, and populations, did not end with the eugenic thoughts to enhance the Argentinian race. It was also made through the importation of entire houses,²²³ furniture, and style by previous Patagonian settlers that valued the TdF through its modernized natures. At the end of the 19th century, Roberto Payró, the journalist who did a national reportage on TdF, named his publication *The Australian Argentina*.²²⁴ He claimed that it deserved the name for being the most austral land of America and that, like in Australia, colonies had prospered while disease exterminated indigenous peoples.

In 1954, Torres saw the country of the beavers, Canada, as a model for improving Argentina, as a way to modernize the region through “northern designs,” or paths for modernity which are based in intervening natures and societies to replicate Northern ones.

In his text, Torres suggests TdF as a small Canada for tourism based on its climate similarity:

Before the 1914-1918 war, winters were a nature’s punishment in Canada...but since 1920, the working Canadians using touch and intelligence, transformed their lakes and harsh winters in joyful and profitable, transforming its countries, lakes, forests and frozen rivers in an immense pre-Antarctic stadium for sports like ski, hunting, fishing, etc. Foreigners came, now locals and foreigners united to celebrate the winter and cold as a fairy tale.²²⁵

²²² Ramón Clyde Torres, *Ciudades de Invierno y Verano*, 1954, 110–120. Colecciones Especiales Fonds (BP389/2a), Biblioteca del Congreso de la Nación, Buenos Aires, Argentina.

²²³ In Ushuaia, the Casa Beban belonged to the Croatian family of Fortunato Beban who, while living in the Chilean city of Punta Arenas, had ordered the premade house to Sweden.

²²⁴ Payro, *La Australia Argentina. Excursión Periodística a Las Costas Patagónicas, Tierra Del Fuego e Isla de Los Estados*.

²²⁵ Torres, *Ciudades de Invierno y Verano*, 122.

Here, Torres did not mention any hierarchies around racialized bodies, but he disavowed that both fur trapping and winter sports such as ice hockey or tobogganing were already part of the activities of the Canadian First Nations which were later appropriated by settlers. By foreclosing any relational encounter between settlers, visitors, and natives, the importation of Canadian landscapes came along importing western values associated to the romanticizing of nature as a scape of the industrial decay: youth clubs, resorts, sports, summer colonies, and moral behaviors.

If nowadays there are certain norms on how to behave within natural sites that are associated with classing and racializing practices and bodies,²²⁶ the then ideal Argentinian family on vacation was not only an achieved working right but also a symbolic structure for constructing citizen archetypes. In Tierra del Fuego, these archetypes served to assert the power of settlers and whiten citizenship by associating nature with the bourgeois experience of wilderness. From those times, social clubs, and vacation, are still today tying whiteness, belonging, and class.²²⁷

From Racialized Biologies to Moralized Behaviors: The social Darwinism that grew during the 19th century around the globe aimed at “producing a superior society by regulating reproductive landscapes—promoting the reproduction of some groups (positive eugenics) while curtailing the reproduction of others (negative eugenics).”²²⁸ Despite not having as much relevance as in Europe, eugenic thoughts gained legitimacy in Argentina

²²⁶ See Chapters 5 and 6.

²²⁷ The Club Andino of Ushuaia, for example, organizes social activities and training to know the regional landscapes, natural beauties, build paths, and help tourism. In order to become affiliated, a person needs to apply through an invitation by a member with at least four years of belonging.

²²⁸ Banu Subramaniam, *Holy Science. The Biopolitics of Hindu Nationalism* (Seattle: University of Washington Press, 2019), 98.

during the crisis of the 1930s as a way to resolve the problems of asymmetrical progress by rejecting the weaker ones and strengthening the white race.²²⁹

In this period, an explicit reference to the Argentinian race was debated but, rather than being built on the Mendelian genetic conceptualizations dominating in Germany or Britain, Argentinian concepts of race came closer to Lamarckian notions that included the environment.²³⁰ An increase of hygienic and prophylactic policies aimed at reinvigorating the Argentinian race through enhancing life standards, morality, and physical condition.²³¹

However, given the perceived lack of population in Argentina, the eugenic organizations of the time rejected Malthusian arguments and saw them as an imperialist form of thought that would harm Argentinian development. Hence, rather than reducing population, these societies proposed to increase native births instead of immigrants while incorporating hygienic and moralizing discourses.²³² At the same time, to invigorate the race, intellectuals like Bunge suggested policies to foster children, marriage and family, especially among higher classes.²³³ Debates sought to dignify women as mothers and wives, men as fathers, and children as the future of the Republic.²³⁴

With the Peronist government, while legislation to improve an Argentinian race through promoting legitimate marriages and higher classes births disappeared, the population politics continued racializing immigrants according to their ethnic, ideological,

²²⁹ Novick, *Política y Población: De Los Conservadores Al Peronismo*, 55.

²³⁰ Novick, 39.

²³¹ Novick, 38–40.

²³² Novick, 160.

²³³ Ramacciotti, “El Museo Social Argentino y El Primer Congreso de Población de 1940,” 235.

²³⁴ Marisa A Miranda, “La Biotipología En El Pronatalismo Argentino (1930-1983),” *Asclepio* LVII, no. I (2005): 189–218. The associations of Eugenics and Bio-typology of Argentina became inscribed in the demographic strategies that were constructed in Italy since 1932.

and productive characteristics. In addition, even if the Quinquennial Plans and the governmental legislation did not include explicit eugenic discourses, many of the people who had participated in the 1940s population debates later occupied positions in the Peronist institutions, as shown by the case of Ramón Carrillo who presided over the Health Department (1946-1954) during the Peronist government.²³⁵ In his Social Medicine plan, Carrillo continued protecting child-bearing and marriage, or benefiting children of marriage that were legitimately constituted.²³⁶ Through policies for protecting the health of the worker and with that, the economy, subsidies to child-bearing, privilege to family men, to large families, eugenic teachings, and feminine labor regulation continued regulating the population life of Peronist Argentina.²³⁷

The modernization project during the peronist government, consisted of engineering, industrializing, optimizing landscapes, lives, and history, putting the figure of the worker at the center, as representing the collective against the excesses of industry and landowners. This discourse entangled race and capital for it did not call upon private capital to exploit Patagonia, but rather upon the state as the only economic actor. Entangling capital and race,

²³⁵ Ramón Carrillo designed two Public Health Analytic Plans (1946-51 and 1952-58) in which medicine considered aspects such as biologies, housing conditions, climate, historical and economic conditions, factory conditions, etc. Besides, with his plans, the government designed an infrastructure of Hospitals across the regions and sustainable funding to subsidize people with low resources in order to guarantee access to a public health system.

²³⁶ Ramacciotti, "El Museo Social Argentino y El Primer Congreso de Población de 1940," 236; Miranda, "La Biotipología En El Pronatalismo Argentino (1930-1983)," 195-205.

²³⁷ Victoria Haidar, "'Todo Hombre En Su Justo Lugar': La 'Solución' Biotipológica Al Conflicto Entre Productividad y Salud (Argentina, 1930-1955)," *Salud Colectiva* 7, no. 3 (2011): 218. At that time, the Italian "bio-typology," or the study of synthetical biotypes of internal and external processes of the body, was conceived as the discipline that would translate British social Darwinism into the Latin world (Italy, Spain, and also Argentina).²³⁷ Carrillo proposed the study of biotypes to increase productivity and, in that sense, Peronism continued the eugenic discourse through its sanitary policies.

Peronism also mobilized the concept of “human capital.”²³⁸ The structure as expressed in the II Quinquennial Plan, located *human capital* at the top, followed by protection of *the family*, and followed by protection of *the female* (Constitutional equality, family function, and active participation).

If Human Capital-Family-Woman were the core of the Nation, they were to be promoted by regulating birth and mortality rates, immigration, and underpopulated areas. Placing human capital at the center of society was also linked to the selection of bodies for productivity. This capital would be enhanced by the state and reproduced by woman, Christian values, and family morals at home.²³⁹ Aborigines, while aimed at being protected, would only if accommodating to this model of family, otherwise they would be kept outside. Through social, working, and family policies, this capital would be prevented from unhealthy immigration, communism, and biological decline.²⁴⁰ As Haidar argues, the scientific social medicine plan that implemented social hygiene, while promoting a holistic vision of medicine, also had a tendency to intervene and experiment with workers, women, children, criminals, young people, and the military.²⁴¹

However, as Rita Segato has argued, this construction of identity followed an homogenizing discourse that imagined a fictional, uniform ethnicity.²⁴² That fiction was also

²³⁸ In the Second Quinquennial Plan places human capital at the core of the organizing structure and defines it as measures to elevate the material and spiritual standard of living of the national community.

²³⁹ Ministerio de Educación de la Nación, *Los Cursos de Cultura Ciudadana y El Segundo Plan Quinquenal* (Buenos Aires, 1953), 18, accessed July 10, 2020, <http://www.bnm.me.gov.ar/giga1/documentos/EL003629.pdf>.

²⁴⁰ Haidar, “‘Todo Hombre En Su Justo Lugar’: La ‘Solución’ Biotipológica Al Conflicto Entre Productividad y Salud (Argentina, 1930-1955),” 319.

²⁴¹ Haidar, 319.

²⁴² Segato, “Identidades Políticas/Alteridades Históricas: Una Crítica a Las Certezas Del Pluralismo Global,” 251.

based on real genocide campaigns against indigenous peoples conducted not only by landowners in distant lands, but also by the state during the presidency of Domingo Faustino Sarmiento,²⁴³ as well as during the presidency of Juan Domingo Perón.²⁴⁴ Nationalizing meant to make otherness invisible and to erase particularities as well as the traces of the materials that constructed this homogeneity. Unlike the US, argues Segato, in which the construction of alterity was based on the recognition of difference that was at the same time segregated and hierarchized, in the construction of the National Argentina, alterity was erased and defined as a European selected population.

This disavowal of difference was also expressed in textbooks. As one can see in the texts used to teach History and Geography, ideas of migration and races of humans were as important as those of animals such as the sheep. For example, in “Argentinian History and Geography,”²⁴⁵ the economy is divided in territories, population, and commerce of goods. Within the population description, attention is paid to “races”: “white, indigenous and black (very low).”²⁴⁶ In this section the book displays numbers that cover complex processes of

²⁴³ Osvaldo Bayer et al., *Historia de La Crueldad Argentina* (Buenos Aires: RIGPI, 2010). “The Conquest of the Desert” was the 19th century military advance over the Pampa and Patagonia lands and the state genocide of the until then, sovereign indigenous peoples who lived in them. Although there were previous campaigns during the government of Juan Manuel de Rosas (1833-1834) and through the orders of coronel Bartolomé Mitre (1855), the “Desert Campaign” was officially coined through the orders of coronel and President Julio A. Roca (1878-1885). With Roca, the Argentinian State incorporated enormous land tracts that were before indigenous lands and initiated the organized extermination and confinement of indigenous peoples. Through the discourse of Civilization and the metaphor of the Desert, these campaigns obscured the genocidal component while, at the same time, contributing to the myth of extinction that would later disavow the lives of indigenous peoples.

²⁴⁴ Valeria Mapelman and Marcelo Musante, “Campañas Militares, Reducciones y Masacres. Las Prácticas Estatales Sobre Los Pueblos Originarios,” in *Historia de La Crueldad Argentina*, ed. Osvaldo Bayer and Diana Lenton (Buenos Aires: RIGPI, 2010), 105–30.

²⁴⁵ Fernando Leónidas Sabsay and Mario Manuel Vázquez, *Historia y Geografía Argentinas* (Buenos Aires: La Facultad, 1952), Colecciones Especiales Fonds (BPP972), Archivo Biblioteca del Congreso de la Nación, Buenos Aires, Argentina.

²⁴⁶ Sabsay and Vázquez, 357.

colonization and erasure. If in 1852 there were 900,000 inhabitants divided into 9,0000 *whites*, 585,000 mestizos, 90,000 *indios* and 135,000 *mulatos* and *blacks*, a century later there was a 90% of white population out of 18,000,000 inhabitants.

In TdF, the process of national colonization read those who were already living in in the region prior to its nationalization either as invisible, a threat, or a resource of national identity. Population politics pursued at the same time to conserve and to eliminate those forms of life, both forms that negated non-nationalized populations. This process built upon a disavowal that operated through *excess* rather than through direct extermination. If the previous non-settler disorganized colonialism consisted of violent practices of exchange, usurpation, and genocide, the internal colonialism in TdF during the 20th century consisted more than in the elimination of the other, in occupying and staying, in such degree that statistics are reversed.

This operation of making the other invisible, or disappeared as they became pre-history, is itself a eugenicist tool based upon the use of statistics. These statistics, now objectified through the erasure of racial categories, continued supporting a vision of evolution that placed the entrance of the white man, and his companions, as the path for civilization, for a superior society, and for the beginning of history. And, as Harambour has argued, because the native was “disappeared,” Patagonia and TdF were constructed as empty, and became available to be filled with sheep and other animals.²⁴⁷

²⁴⁷ Harambour, “Soberanía y Corrupción. La Construcción Del Estado y La Propiedad En Patagonia Austral,” 555–596.

2.3.4 *Racializing Species, Naturalizing Racism: Settlers Become Fuegians*

Attachment to nature and the environment is often mobilized for claiming belonging, identity, and indigeneity.²⁴⁸ At the same time, animals have been dualistically used to assert privilege, either by animalizing and thus stigmatizing human collectives, or by applying animal or plant metaphors to social phenomena for the purpose of naturalization.²⁴⁹ Animal metaphors make a powerful to innocence, one that hides the material, relational, and historical dimensions that constituted the sign.²⁵⁰ However, when animals constitute signs, they entail not only symbolic world makings, but also an unstable material, for there is no symbol or metaphor without material and experienced referent in reality.²⁵¹ In Tierra del Fuego, animals and humans became settlers together. Animal signs, like the national beaver or the Patagonian sheep, helped obscure the histories of violence and exploitation that constituted the narrative of progress.

Multi-species scholars have also considered how distinctions between animals and humans are the result of co-constitutive processes of differentiation with zones of contact.²⁵² Within those human-animal borderlands, animals became crucial partners for negotiating

²⁴⁸ Yuka Suzuki, *The Nature of Whiteness: Race, Animals, and Nation in Zimbabwe* (Seattle; London: University of Washington Press, 2017); Jean Comaroff and John L. Comaroff, "Naturing the Nation: Aliens, Apocalypse, and the Postcolonial State," *Social Identities* 7, no. 2 (2001): 233–65.

²⁴⁹ Andreas Musolff, "Immigrants and Parasites: The History of a Bio-Social Metaphor," in *Migrations: Interdisciplinary Perspectives*, ed. Michi Messer, Renee Schroeder, and Ruth Wodak (Wien: Springer-Verlag, 2012), 249–58.

²⁵⁰ Nicole Shukin, *Animal Capital: Rendering Life in Biopolitical Times* (Minneapolis and London: University of Minnesota Press, 2009).

²⁵¹ Shukin, 1-10.

²⁵² Donna J. Haraway, *When Species Meet* (Minneapolis, MN: University of Minnesota Press, 2008); Jacques Derrida and David Wills, "The Animal That Therefore I Am (More to Follow)," *Critical Inquiry* 28, no. 2 (2002): 369–418; Rosi Braidotti, *The Posthuman* (Cambridge, UK: Polity Press, 2013); Dominic O'Key, "Animal Borderlands: An Introduction," *Parallax* 25, no. 4 (2020): 351–57.

whiteness and privilege in Tierra del Fuego. When the state made more effective its presence in the region, especially since the declaration of TdF as a Maritime Government in 1943, its goal was to expropriate part of the lands, power, and capitals from foreign settlers and nationalize them by bringing in national settlers and industries. The native, for the state, was then the one born in Argentina. Beavers, among other introduced species, became a powerful sign for knotting those multiple goals, as they would bring the industrial futures designed for a national and modern colony in Tierra del Fuego composed of families, work, and industry. Oligarchic settlers, who saw their privileges threatened, responded by claiming nativeness themselves: they were the ones who had been there before the entrance of the state, they were the original peoples of TdF. To prove their belonging, they often mobilized the knowledge and ties to nature that the state and their national settlers lacked. Both, state officers and settlers, claimed their disputed belonging by mobilizing animals not just as metaphors, but also through the visualization of the transformations they had carried together across landscapes, bodies, and environments.

Animals and peoples made whiteness together not just rhetorically, but also through practices of labor, grazing, breeding, engineering, feeding, and dying. At a time when the power of the concept of biological race was being scientifically diminished for justifying oppression among populations, animals became crucial for reconfiguring the terms of oppression. Indigenous peoples and poor immigrants started to be described as either lazy or deviants, given their lack of adaptation to sedentary work and discipline.²⁵³ This stigmatization was not only the result of the national industrial imaginaries but also the

²⁵³ Ana Cecilia Gerrard, "El Sigilo En Las Metáforas Del Viento: Los Selknam y La Retórica de La Desaparición," in *XI Congreso Argentino de Antropología Social* (Rosario, 2014), 1–21, accessed July 10, 2020, <http://cdsa.academica.org/000-081/493.pdf>; Halperín Donghi, *Una Nación Para El Desierto Argentino*.

materialization of more-than-human asymmetrical relations: while oligarchs and the military obtained all the animal capital, if any lands were given to indigenous peoples, it was the less productive. If any work was available to them, it was the one with lower material and symbolic value. In that context, people whose biologies had been historically racialized to justify domination, started to be classified through their non-adaptative behaviors. However, the racialization of animals was not delegitimized. Its practice not only did not disappear but rather became more professionalized and valued along with the institutionalization of rural associations and their exchange of knowledges, technologies, and exhibitions, all of which circulated nationally with the improvement of transport and communication technologies. In that context, by owning, knowing, and winning the animal superior races and breeds, settlers and estancieros were constructed too as racially privileged. Their shared and coproduced whiteness was a zone of symbolic exchange that was materially produced through practices of companionship, affect, economic relations, knowledge, and labor.

The erasure of racial categories and the consequent disavowal of racialized practices after the World Wars did not occur within the world of nature, animals, or plants. Moreover, the explicit racial and genetic enhancement of nonhuman populations, species, and individuals in Argentina, helped coproduce racial discourses through the innocent depoliticized materials of nonhuman nature. Animals and landscapes helped thinking to continue in explicit racial terms that were now translated into moral discourses addressing practices and behaviors. In addition, animal companions helped legitimate categories of belonging of the people who had come from outside with them. By qualifying animal lives within national visions of territory (the Patagonian sheep, the Argentinian cow, the Fuegian beaver) and modernity (the Patagonian oil industry, the Argentinian cereal, the Fuegian

sawmill), peoples engaged in those activities became, with them, legitimated and naturalized, and at some point, they became native, part of the territories.

Nonhuman animals, in this way, helped reconfigure ideas of purity, foreignness, and nativeness, as it occurred with the appropriation of the term Fuegian that was before assigned to the Indian and is now used by the pioneering families to refer to themselves in opposition to newcomers. As documentaries and newsreels showed, the introduction of humans in the south was accompanied with the introduction of animals.²⁵⁴ The narratives of the pioneers²⁵⁵ are filled with descriptions of the settled industries, livestock, and urbanizing processes as a way to legitimate their participation in the construction of the current socioenvironmental TdF.

Alfred Crosby has argued that the mass of European emigrants that succeeded in taking over the lands of North and South America, as well as Australia and New Zealand, had to do with the ecological and biological conditions of these places.²⁵⁶ In Argentina, like the beavers, other species like muskrat, goats, reindeer, or rabbits were introduced in TdF accompanying the population politics of different periods.

The government also showed the release of muskrats in another newsreels, describing the animal as “contributing with real population of TdF with useful species,

²⁵⁴ Newsreel “Sucesos de Las Américas 155,” 1948, Departamento de Cine, Audio, y Video (559.C16.1.A); newsreel “Reportaje a Tierra Del Fuego,” n.d., Departamento de Cine, Audio, y Video (1220.C16.1.A), Archivo General de la Nación, Buenos Aires, Argentina.

²⁵⁵ Julio E. Rodríguez, *¡Yo Estuve Allí! Historias de Vida de Ushuaia* (Ushuaia: Imprenta Integral Ushuaia, 2008); Dánae Fiore and María Lydia Varela, *Memorias de Papel: Una Arqueología Visual de Las Fotografías de Pueblos Originarios Fueguinos* (Buenos Aires: Dunken, 2009); Thomas Bridges, “La Tierra Del Fuego y Sus Habitantes,” in *Boletín Del Instituto Geográfico Argentino*, 1853, 221–41; María Cecilia Belotti, *Legados Fueguinos. Ushuaia. Vivencias de Los Lugareños* (Tierra del Fuego: Talleres Gráficos de la Gobernación de Tierra del Fuego, 2009).

²⁵⁶ Crosby, “Ecological Imperialism: The Overseas Migration of Western European as a Biological Phenomenon,” 103–117.

source of richness for the future.”²⁵⁷ If sheep had made arid territories of Patagonia become valuable, beavers and muskrats with their furs were transforming the damned land of TdF into a promising one.

This was of course not a novel phenomenon of the 1940s. Already during the 1870s, there had been acclimatization experiments with trees and seeds in TdF. With industrialization, however, not only these species became carriers of modernity, but also Argentinian workers. As a documentary illustrated and described “our sheep, from Patagonia, because of its wool quality and race, they have conquered the international markets” (fig. 2.6).



Figure 2.6. Whitening with animals and natures (1920s)²⁵⁸

In a textbook from the 1950s that classifies Patagonia as “sterile” and inapt for “agriculture,”²⁵⁹ sheep are said to be the white gold of the territory, one that goes hand-in-hand with the black gold or oil. Patagonia, at that time, had 45% of the Argentinian sheep, a population of around “20,000,000 heads or 60,000 Tn of wool.” And within that

²⁵⁷ Newsreel “Sucesos de las Américas, Nuevos Huéspedes,” n.d. Departamento de Cine, Audio, y Video. (904.C35.1.A), Archivo General de la Nación, Buenos Aires, Argentina.

²⁵⁸ Valle, “Por Tierras Argentinas,” 1926, Departamento de Cine, Audio, y Video. (360.C16.1.A), Archivo General de la Nación, Buenos Aires, Argentina. Reproduced by permission of Archivo General de la Nación (see Appendix A).

²⁵⁹ Fernando Leónidas Sabsay and Mario Manuel Vázquez, *Historia y Geografía Argentinas* (Buenos Aires: La Facultad, 1952), Colecciones Especiales Fonds (BPB972), Archivo Biblioteca del Congreso de la Nación, Buenos Aires, Argentina.

industrialized population of numbers, like the humans, productivity here is made and observed through races. While the *Lincoln* race was considered the most productive, it was not resistant to the cold weather of the South. For that reason, most of the 20,000,000 heads of Patagonian sheep, were from the *Argentine Merino*, *Australian Merino*, or *Corriedale* races, a mix of Merino and Lincoln and a species that was often exhibited in livestock fairs during the 20th century in Argentina. As shown in propaganda images and school textbooks, sheep were subjected to enhancement and companions for pride-making, constituting its mediated nature what was known as “white gold.”

Sheep had come to Patagonia with the Spanish during the 16th century, who brought the race *Churra*, and the African sheep from Canary Islands. From both of them, the *Pampas* and *Criolla* races emerged as producing more and finer wools. In the 19th century, the British had introduced the *Merino* sheep to a country without capacities for extensive sheep production.²⁶⁰ In 1846, Patagonia started to be fenced trading intensified with the perfecting of frigorific technologies and the arrival of British companies that concentrated power and infrastructures.

In connections with the Argentinian and Chilean states, TdF was occupied by sheep and by the companies sheep worked for, especially the *Sociedad Explotadora de TdF* (SETF) and the José Menéndez’s family oligopoly²⁶¹ which, through arranged marriages, planned the genocide and extermination of indigenous peoples and workers, as well as with the connivance of a state that needed them and their capitals to establish presence in the region.

²⁶⁰ Coronato, *Ovejas y Ovejeros En La Patagonia*, 107-179.

²⁶¹ The family of José Menéndez, who was then known as the *Patagonian King*, still conserves economic and political power in TdF through their companies and political relations. Besides, the idea of becoming a king in those remote areas still remains and some *estancieros* believe their sacrifice in their lands gives them rights to govern their land and protect them from foreign extractive companies or foreign undesirable animals like the beavers.

Not only were indigenous communities assassinated, imprisoned, or forced to work in the ovine industries with which they had no previous experience, but were also displaced by the animals that were transforming *empty* lands into farmed lands.

However, in addition to occupying land, sheep introductions continued to show the quest for enhancing race, as shown in the introduction of Merino and South-downs races to enhance criollo stocks or the *Negrette* sheep. These experiments were also accompanied by exhibitions, conquests, and journals that shared knowledges and admiration of the improved races and their pioneers. They were also accompanied by the interests of sportsmen, zootechnical and genetical knowledges, breeders, national and European sanitary laws, warrants, and the census. In addition, roads and trains facilitated exchange.

While the selection of human immigrants substituted racial categories for behavioral ones and possibilities for adapting to the culture of Argentina, animal enhancement showed increasing racialized knowledges and interventions that were linked to ideas of belonging and nationality. There were exhibitions in which rural men dressed to go to the city and show their best products to demonstrate the Argentinian richness. In 1946 the journal edited by the landlords of TdF, *Argentina Austral*, writes about the II Livestock Exhibition of the Rural Association of TdF, which was celebrated in the installations of José Menéndez's estancia.²⁶² The ceremony remains today and exhibits industrial, commercial, and artisan products. In the 1946 event, the president of the Rural Society highlighted the work of the pioneers:

We, settlers and farmers of Rio Grande have lived the evolution of TdF from the times of an absent state. We have seen the construction of roads and infrastructures, that, nonetheless, are still non efficient enough for the isolated characteristics of this

²⁶² "Las Exposiciones de 1946," *Argentina Austral XVII*, no. 178 (1946). Hemeroteca (H.6288). Biblioteca del Congreso de la Nación, Buenos Aires, Argentina, 11–23.

region. We need security to continue this progress, we need a future in which exploitations are rationally constituted to keep seeing the breeds we have now.²⁶³

Eduardo Irazoqui, representing the governor of TdF continued the opening speech:

Even if I do not know enough about livestock, I know it has more than trading components; it also enacts morality and progress. Livestock is the source of our national wealth and, in this small territory of TdF, it has international relevance. This ceremony represents the patria; it has moral sign for it spreads the purification of our races, the ones that, as you all know, have a deserved enormous international prestige. The national flow, in this sense, is grandiose, and I know there is no need to talk about it here because it is by everyone known. I will just mention our desires to produce an even more purified and refined race to achieve, in direct form, the aggrandizement of Argentina, a shared concern by everyone but especially by us, the ones who, from this remote Fuegian corner, are paying honorable and respectful tribute.²⁶⁴

Breeding followed the logics of environmental eugenics. In 1947, another article of *Argentina Austral* explained that the rationale for breeding was not to bring the best race of sheep to the world, but rather to breed those that would be best adapted to particular territories.²⁶⁵

Racial types were defined by the skulls, pigments, wools, or antlers. The purity of race was defined through standards defined by the breeders of the original countries and were based on the economic value of their characters, production, constitution, and resistance. However, also aesthetic values were included. In Argentina, sheep had to be selected to produce racial homogeneity. To this end, those with “racial, physical, or productive defects” had to be discarded while the good ones had to be inbred. Especially when races were “forming” and differences were harming, “good character” needed to be fixed through inbreeding but, because close relatives could transmit bad characters, as soon as any pathological symptom

²⁶³ “Las Exposiciones de 1946,” 11–23. The journal had opened in 1929 and it was edited by the *Sociedad Anónima Importadora y Exportadora de la Patagonia*.

²⁶⁴ “Las Exposiciones de 1946,” 20.

²⁶⁵ José M. Rodríguez Escalada, “Para Mejorar Nuestros Ovinos,” *Argentina Austral XVIII*, no. 190 (1947): 10–14. Hemeroteca (H.6288). Biblioteca del Congreso de la Nación, Buenos Aires, Argentina, 11–23.

or “faulty, defective, or ill” animal appeared, “we must refresh the blood and look for an outsider reproducer.”

Beavers’ invasive vitalities helped building new economies in TdF by vowing progress for certain modes of living. Settler humans and nonhumans contributed racializing natures and populations in TdF by legitimating each other’s modes of production, work, and power. Until the 1940s, settlers in TdF had arrived accompanied by flexible state policies that sought to attract any European with capital enough to settle, industrialize, and civilize the region.

Settlers had often used violence in negotiating their belonging with the indigenous peoples. They had done it in their own terms given the absence of state institutions. During the 1940s, those more-than-human settlers had to also undergo negotiations with a state that sought to appropriate and redistribute settler powers for its own expansionist and nationalist interests. At that time, the state enacted laws to select immigration, both human and nonhuman. Since then, being able to survive in the Fuegian climates and having capital enough to do so was not enough, as they also had to speak and embody Argentinian languages and public interests.

At that time, the human and nonhuman populations and natures imported from Europe, had to also be nationalized. This meant not only the selection of origins and physical characters but also the design of values and behaviors. To enroll settlers into the peronist project, animals and peoples had to either contribute their private capitals to the state and the national economy or be exemplary sacrificed workers. In this vision, beavers’ vitalities symbolized the perfect national animal by bringing northern values, work, engineering, and family life.

As an imperial design, however, this colonial history was followed by ruination and decay. As I will show in chapter 5, those privileged human and nonhuman settlers became later problematized by the displacement of industrial modernities by visions of sustainable modernities. In this process, valued pioneer settlers who helped building nationality and modernity in TdF, live today between recognition as subjects from the past and their precarious present identity as second-class citizens who do not enroll well in the values of nature conservation and global science and tourism.²⁶⁶ Along with them, estancias are being abandoned or sold to eco-tourist agencies, beavers are being eradicated by transnational organizations, and sheep are reaching the limits of their imperial vitalities by producing new deserts borne of their overexploitation of grass.²⁶⁷

²⁶⁶ Mattias Borg Rasmussen, "Institutionalizing Precarity: Settler Identities, National Parks and the Containment of Political Spaces in Patagonia," *Geoforum*, 2019, Date Last Accessed July 10, 2020, <https://doi.org/10.1016/j.geoforum.2019.06.005>.

²⁶⁷ Coronato, *Ovejas y Ovejeros En La Patagonia*, 107-179.

3. MAKING TROPES WITH SCIENTIFIC CARTOGRAPHIES

Hello,
I am the one who appears in the statistics
and I appreciate it,
I would make it with less, you know
but I teach my boys
to wear their cousin's clothes,
that the bread is not thrown away
without trying
to transform it into pudding or a toast.
Well, here I am,
I am the inhabitant of Patagonia
I come
for my square kilometer.²⁶⁸

In Tierra del Fuego, beavers not only occupy river streams, flooded lands, and dead forests, but also the most urban landscapes: they belong through warning signs, shop windows, people's customs, advertisements, local poetry, graffiti, comics, and touristic maps. They even name the most important ski resort in Ushuaia, *Cerro Castor* (Beaver Hill). Frequently, beavers are an object of conversation among tourists, local citizens, and experts in informal contexts. While tourism companies used to offer beavers sightseeing fieldtrips, they are now adapting to their eradication and showing their abandoned dams and impressive death forests. In public meetings on the environment, hardly ever beavers are not brought up.

²⁶⁸ Urretabizkaya, *Informe Sobre Aves y Otras Cosas Que Vuelan*, 46.



Figure 3.1. Wooden beavers in a local bakery

Paradoxically, a species deemed invasive and exotic and which is under a project of eradication, is highly entrenched into policy, scientific, and cultural narratives of TdF. Highly symbolic, charismatic, and visible, known beavers in TdF have become powerful boundary objects that help coordinate and negotiate different knowledges, actors, and politics across time. In this chapter, I examine how figuring beavers has been entangled not only with local identifications but also with the production of worlds with scientific knowledges and practices, including the making of different cartographies.

In Chapter 1, I showed how the introduction of twenty Canadian beavers into Tierra del Fuego in 1946 was an event of national significance. It was entangled with wider eugenic and racializing practices that were coproduced among humans and nonhumans through practice. These practices were also entangled with disputes over privilege and power in TdF that were often played in terms of belonging through ties to racialized animals and natures that produced different modes of whiteness and indigeneity. This practices sedimented

histories and environments that are today reconfigured and responded, as historical horizons still disputed in the present through new modes of science and the environment.

If knowing territories are ways of producing them, what kinds of beavers' territories have scientific maps created and to what extent have those realities traveled? In this chapter, I examine the production of three types of scientific cartographies and their scientific and social effects that produced different beaver spaces in TdF during the 1940s, the 1980s, and the 2010s. I show how these maps produced different worlds and territories that are entangled with the history of beavers in TdF and with different historical, environmental, and scientific modes of distributing and managing populations.

I show how state geographers during the 1940s designed simplified cartographies that had the power to teach and integrate remote regions like TdF into the expansionist project of the state while naturalizing political differences and asymmetries. When scientists settled in the area, they started to create more complex cartographies that would help them know and manage the natures and species of Tierra del Fuego. While this experience was considered a form of knowledge integral to the field during the 1980s, the increasing transnationalization of science is now privileging the use of one-view maps mediated by high technologies such as drones, satellite images, and computer modeling programs.

Through visual and discourse analysis, I argue first that proof-maps of the 1940s aimed at integrating citizens into the modernizing project of the state by making visible the power of humans and the nation to intervene in nature. While contemporary multi-species cartographies show the complexity of human-nature interactions, they displace citizens and the state from environmental decision-making and elevate scientific sovereignty over a re-naturalized nature. Second, and following the history of the beavers in Tierra del Fuego, I argue that the contemporary efforts made by scientists to know, map, and eradicate a

species now deemed invasive, demonstrate that beavers have settled in the region in far more autonomous ways than other introduced species, like sheep or cows. Multi-species cartography has the power to illuminate how attempts to integrate nonhumans into human modes of ordering nature and politics requires a deep and intimate knowledge of how species territorialize the region in their own ways.

To conduct my analysis, I have analyzed the narratives and visual materials constructed by geographers and presented in school textbooks and governmental propaganda during the 1940s-1950s as well as the maps and aerial images used by local scientists and transnational environmental organizations to present their work in public meetings. My choice of those materials is partly based upon the assumption that it is precisely when science is communicated to the non-scientific community that one can better see the common sense that guides the normative values of a discipline.²⁶⁹

3.1 State Geography in Argentina: National, Popular, and Possibilist

In Argentina, the institutionalization of geography emerged out of political and epistemological conflicts. During the 1940s and 1950s emerged the category of the “national and popular intellectual”²⁷⁰ to refer to those scholars who based their scientific authority not so much on the contents of their research as on their engagement with the *pueblo*.²⁷¹

²⁶⁹ Fleck, *Genesis and Development of a Scientific Fact*, 104-120; Frank Fischer, *Democracy and Expertise* (New York: Oxford University Press, 2009); Sheila Jasanoff, *Designs on Nature: Science and Democracy in Europe and the United States* (Princeton, NJ: Princeton University Press, 2007).

²⁷⁰ Federico Neiburg, *Los Intelectuales y La Invención Del Peronismo* (Buenos Aires: Alianza Editorial, 1998), 60.

²⁷¹ The definition of *pueblo* made by the Peronist movement and government relates to the history of colonialism that had previously made inferior those considered mestizos, criollos, gauchos,

Evaluation hence placed engagement with the publics as a central criterion. Since 1943, and especially during the second presidency of Perón after 1952, many intellectuals and professors considered as not aligned with the government and its ideology were displaced, substituted, or fired from universities, associations, and public institutions. Some student associations denounced the expulsion of 1,250 professors from the University of Buenos Aires, claiming that it violated the university principle of autonomy.²⁷² At the same time, those who were set aside and identified as “antiperonists,” considered their “peronist” substitutes as not truly teachers but rather as bureaucrats of low academic profile.²⁷³ After 1952, the governance of morality and thought became more central and repression more intense. The government closed some academic institutions, teachers in elementary schools started to be overseen, and cultural activities required prior authorization.

Geographers divided their ethical and epistemic positions too. Those supporting the nationalist and socialist government defended a popular geography to be taught to children and citizens against an encyclopedist and descriptive one, accused of not engaging with human and national development. In this way, traditional geographers who privileged physiography and the study of geological processes were identified as antiperonists for not supporting either the government or the new popular geography. While the defeat of the government of Perón in 1955 implied a University Reform that erased all the peronist symbology and politics from teaching, including geography texts, still contents, regional divisions, and nationalist epistemologies remained practically untouched until the 1980s.²⁷⁴

aborigines, or black. All those non-white people had become industrial and rural workers and were the object of inclusion in peronist discourses through the category of the worker.

²⁷² Neiburg, *Los Intelectuales y La Invención Del Peronismo*, 160.

²⁷³ Neiburg, 167. They were named *profesores flor de ceibo*, in reference to the national flower.

²⁷⁴ Nahuel Montes, “Geografía Argentina Para Un Lector Imaginado,” *Questión* 1, no. 41 (2014): 237.

For nationalist intellectuals, geography as “the science of the state,”²⁷⁵ could not remain descriptive: it had to consider human, economic, and social dimensions and pursue the unification of the republic. Geographers would receive support and funding through a centralized organization that, in turn, should advise the state in its internal and external defense threats. The chosen institution was the Argentine Society of Geographical Studies (GAEA), which had been established in 1922 and which was able to impose its vision of a popular geography that opposed to the tradition of physical and descriptive geography.²⁷⁶ Popular geography during the 1950s, aimed at “not limiting knowledge to enumerations, inventories, and distributions.”²⁷⁷ Their vision aimed at politicizing nature and geographers, rather than highlighting nature itself, had to also affirm the work done by the people, a way to enroll citizens and especially children in *their* lands by showing “the increasing power of men over nature, to the point of being able to modify the physiognomy of the comarcas.”²⁷⁸ With children at the center, geography had a patriotic and civilizing mission to integrate regions, citizens, and activities into a project of nation-making through nature:

Children need to be impressed by how men carry on the work of creation.... each generation has provided with something, each of us collaborates in some geographical labor on the earth for a better arrangement of human earthly dwelling.²⁷⁹

²⁷⁵ Jorge A. Giovanelli, “La Realidad Geográfica y Los Intereses Del Estado,” *Anales de La Sociedad Científica Argentina* 141–142 (1946): 71.

²⁷⁶ Pedro Navarro Floria and Fernando Williams, “La Construcción y Problematización de La Regionalidad de La Patagonia En Las Geografías Regionales Argentinas de La Primera Mitad Del Siglo XX,” *Scripta Nova. Revista Electrónica de Geografía y Ciencias Sociales* XIV, no. 322 (2010), accessed July 10, 2020, <http://www.ub.edu/geocrit/sn/sn-322.htm>.

²⁷⁷ Lorenzo Dagnino Pastore, *Geografía Económica. Para V Año de Las Escuelas de Comercio* (Buenos Aires: Crespillo, 1951).

²⁷⁸ Ernesto Lapuente, *Hombres, Tierras y Ocupaciones. Temas de Geografía Humana Para Los Grados Superiores de La Escuela Primaria* (Buenos Aires: Ediciones La Obra, 1954), 10.

²⁷⁹ Lapuente, 11.

Children, as figures of the future, doubly legitimated popular science, as they needed simplicity and clarity. At the same time, they became the object of narratives that condensed the past to be overcome and the future to be made through the hand of humans and the organization of the state. Geography, in Argentina, was not so much organized along the nature-culture tension but more through the one nature-state, a tension that tended to obscure internal differences and asymmetries within the country.

3.1.1 Designing and Naturalizing Regional Differences

Argentina is today divided into twenty-three provinces or federal states and one autonomous city, Buenos Aires. It is also divided into eight geographical regions. Unlike other countries, Argentinian regions do not oppose their particularity to the nation but are rather a way to conceive internal variations in as a unified whole.²⁸⁰ These differences are defined by a few natural and physical features that are often fetishized, and which help identify each region's contribution to Argentina. As many authors have argued, the making of geographical regions through nationalist values contributed naturalizing political differences and obscured conflicts between territories, populations, and provinces.²⁸¹

An advertisement of the National Bank of Argentina published in 1949 (see fig. 3.2), illustrated the ideas behind the regional geography of the time: each region presented

²⁸⁰ Alejandro Benedetti, "Los Usos de La Categoría Región En El Pensamiento Geográfico Argentino," *Scripta Nova* 13, no. 286 (2009), accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-286.htm>.

²⁸¹ Benedetti; Silvina Quintero, "Geografías Regionales En La Argentina. Imagen y Valorización Del Territorio Durante La Primera Mitad Del Siglo XX," *Scripta Nova* 6, no. 127 (2002), accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-127.htm>; Barsky, "Auge y Ocaso de Las 'Regiones Geográficas Argentinas' de Federico Daus: De Un Pasado Con Certezas a Una Actualidad de Fragmentación," in *Anuario de La División Geografía 2000-2001*, 35–48. Luján: Universidad Nacional de Luján, 2001.

clearly unique representative characteristics that distinguished and complemented each region through landscape, climate, industry, agriculture, livestock, infrastructures, and human types. As the advertisement indicated, “Serving the Country,” the complementarity of each region enabled financial support for its particular form of productivity. Once optimized, the productivity of each region contributed to the standard of living for the whole nation.



Figure 3.2. Regional archetypes “serving the Country” (1949)²⁸²

²⁸² Ministerio de Finanzas de la Nación, “Al Servicio Del País,” *Argentina. Revista Mensual* I, no. 10 (1949). Own picture taken from the journal. In the public domain, reproduced under permission of the Argentinian Copyright Law (see Appendix A).

What and how were the bases for distinguishing eight regional partitions, and who led these visions of wholeness and partition? While regionalism in other countries was built as a demand for autonomy from the National state,²⁸³ in Argentina, regions are constitutive of the Nation. Regions in Argentina organize “sub-national entities to offer holistic interpretations over the whole territory and society of a country.”²⁸⁴ Each region embodies certain fetishized particularities that, rather than altering, contribute to the total richness of the country through the nationalization of difference.

The legitimation of the geographical region during the 1940s also emerged out of epistemic and political conflicts. In 1923, the GAEA had officialized the concept of “natural region” to classify subnational areas based on physiographical rather than political and human features. Three years later, in 1926, the GAEA divided the Argentinian map into six regions.²⁸⁵ A decade later, in 1936 and alongside the emergence of a popular, patriotic, and human geography, GAEA members agreed that regional distinctions had to go beyond physiography and include human activities and national progress. Rather than natural regions, they named them “geographic regions” resulting from the articulation of nature and society. In 1948, state geographers increased nationalized territorial difference from six to eight regions.

²⁸³ Benedetti, “Los Usos de La Categoría Región En El Pensamiento Geográfico Argentino,” accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-286.htm>.

²⁸⁴ Quintero, “Geografías Regionales En La Argentina. Imagen y Valorización Del Territorio Durante La Primera Mitad Del Siglo XX,” accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-127.htm>.

²⁸⁵ Quintero, “Geografías Regionales En La Argentina. Imagen y Valorización Del Territorio Durante La Primera Mitad Del Siglo XX,” accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-127.htm>. The regions are *Gran Región Andina*, *Mesopotamia Argentina*, *Llanuras Chaco-Bonaerenses*, *Mesetas y Altiplanicies Patagónicas*, *La Tierra del Fuego Extra-Andina*, *Las Islas Malvinas*.

The concept of region was absent in official geography before 1920. Until then, most European explorers and naturalists had romantically identified the whole of Argentina with the flat Pampas.²⁸⁶ As a reaction to that homogenizing foreign glance, some geographers started to systematize distinct zones. Among them, one student of Vidal de la Blache studied Argentinian natures as having not only physical features but also a history of relations with humans. From France, Vidal had helped consolidating the school known as Regional Geography, one that aimed at overcoming the divide between Human and Physical Geography by suggesting that the continuous relations between humans and the physical space resulted in the conformation of regions with unique characteristics. The environment, in his affirmative view, gave possibilities for human development rather than constraining it. Expanding the Vidalian affirmative view of nature as enabling possibilities, Vidal's student in Argentina ruptured the identification of the country with flat landscapes by methodically describing the diversity of landscapes and industrial and farming possibilities in the country.²⁸⁷ Later, and connected to Vidalian networks,²⁸⁸ the Argentinian geographer Federico Daus helped to crystallize both an Argentinian school of regional geography and a regionalized Argentinian territory.

²⁸⁶ A vast area in the center of Argentina characterized by its plain landscapes and absence of forests.

²⁸⁷ Quintero, "Geografías Regionales En La Argentina. Imagen y Valorización Del Territorio Durante La Primera Mitad Del Siglo XX," accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-127.htm>.

²⁸⁸ Barsky, "Auge y Ocaso de Las 'Regiones Geográficas Argentinas' de Federico Daus: De Un Pasado Con Certezas a Una Actualidad de Fragmentación," 35–48; Floria and Williams, "La Construcción y Problematización de La Regionalidad de La Patagonia En Las Geografías Regionales Argentinas de La Primera Mitad Del Siglo XX," accessed July 10, 2020, <http://www.ub.edu/geocrit/sn/sn-322.htm>.

3.1.2 *Environmentalizing Population Politics*

State geographers also theorized human difference as a result of ecological adaptation. In Chapter 2, I showed how eugenic thoughts in Argentina followed Lamarckian notions that coupled race not so much with genetics as with the environment. Geographers also contributed to environmentalizing racialized asymmetries in two ways. On the one hand, they classified immigration according to types and benefits. On the other, their understanding of “human types” associated progress with environmental adaptation.

As described in chapter two, immigration was seen during the 1940s both as having the beneficial effect of civilizing and industrializing the population, and as a threat to the maintenance of a cohesive and unified nation. As the general and teacher that gave his speech in 1946 argued, immigrants carried with them their “vital space,”²⁸⁹ or the

patria, race, traditions, feelings, and doctrines that go beyond national borders to cross the air or the ocean in order to settle in other territories, as if the patria widened through space.²⁹⁰

Against the entrance of other vital spaces, in regions with many immigrants, the state had to “send the military to make them feel the national authority,”²⁹¹ geographers had to make maps and censuses, and schoolteachers had to help nationalize children and foreigners.²⁹²

²⁸⁹ Giovanelli, “La Realidad Geográfica y Los Intereses Del Estado,” 62–86. He meant the German notion of *Lebensraum*, a military interpretation of Ratzel’s ideas around territorial expansion to justify German occupation of Eastern Europe between 1890 and 1940. Giovanelli had learned about these ideas during his trip to the French colonies in Morocco and applied them negatively, as the need here not to expand Argentina but to defend itself from other expansions.

²⁹⁰ Giovanelli, 78.

²⁹¹ Flavia Fiorucci, “El Campo Escolar Bajo El Peronismo 1946-1955,” *Revista Historia de La Educación Latinoamericana* 14, no. 18 (2012): 139–54.

²⁹² During the second presidency of Perón, after 1952 that increased the weight of discursive politics over economic redistribution, teachers were required to teach the patriotic project to its students, especially immigrants.

Following Svampa, Perla Zusman²⁹³ has argued that education programs both considered European immigrants as a threat to national unity that also revitalized rural and native imaginaries, and as a path to civilization balanced with desires to integrate traditions. Europeans were also seen as carriers of anarchism and communism, a threat that put at risk the project of peaceful collaboration between the owners of land and capital, the workers, and the state. Responding to this, educational contents were designed to nationalize and so *melt* the differences between native people, now defined as those born in Argentina, indigenous peoples, and immigrants.²⁹⁴

Within their published geography manuals, geographers were more prescriptive and less argumentative than in their conferences or professional publications. They used direct, closed, and non-referential discursive statements on immigration. In the textbook *Geography of Argentina. Human Part*,²⁹⁵ written by Daus, the history of Argentinian population followed an evolutive line starting as indigenous, then colonial and Hispanic, to end as Argentinian. Objectivizing the racialized concerns around immigrants and indigenous peoples, the manual presented a table classifying immigration: types of immigrants, statistics according to their origins, and advantages and disadvantages.²⁹⁶ In this table, foreigners were figured as good for the economy and *the race* by generating “crossings and avoiding degenerations produced by the practice of endogamy” that could also be prejudicial for affecting the “spiritual unity of the Nation” or for enabling the entrance of “pernicious elements.”

²⁹³ Perla Zusman, “Una Geografía Científica Para Ser Enseñada. La Sociedad Argentina de Estudios Geográficos (1922-1940),” *Documents d’Anàlisi Geogràfica* 31 (1997): 171–89.

²⁹⁴ Zusman, 174.

²⁹⁵ Federico Daus, *Geografía de La Argentina. Parte Humana* (Buenos Aires: Estrada, 1983).

²⁹⁶ Daus, 14.

Daus explained that sometimes immigration had to be avoided: in periods of crisis, when groups are endogamic, when they keep ties to their traditions and habits, when they don't fit the economic necessities of the country, or when they "have physical defects, are delinquents, or ideological extremists."²⁹⁷ Immigrants also had different characters. Italians were valuable for being "strong and uncomplaining," good people for making difficult works such as the construction of railroads;²⁹⁸ Spanish people, although often wanting to merely save money and return to Spain, were good for being culturally and racially similar to Argentinians; "the French element" was described as enriching the nation with intelligent investors who started big companies; and while British peoples were good at farming, they did not assimilate well and often kept their language.

After teaching the characteristics of foreign and internal immigration, Daus' manual also described the national "population characters," which were understood as products of Argentinian environments. These environments included the history of European immigration, mostly Spanish and Italian, that unlike other Latin American countries, had made Argentina white.²⁹⁹ In a post-colonial country, however, whiteness was the result of historical exchanges between the environment and its population and, above all, needed to be proved. Argentinian population had passed from being indigenous to having been populated with immigrants and later criollos and mestizos, and to finally have become white Argentinians thanks to the melting that the organizing central state had facilitated.³⁰⁰

²⁹⁷ Daus, 14.

²⁹⁸ David Fideleff, *Geografía Económica Nacional, Población e Inmigración* (Buenos Aires, 1917), 431, accessed July 10, 2020, http://bibliotecadigital.econ.uba.ar/download/tesis/1501-0057_FideleffD.pdf

²⁹⁹ Daus, *Geografía de La Argentina. Parte Humana*, 20.

³⁰⁰ Lapuente, *Hombres, Tierras y Ocupaciones. Temas de Geografía Humana Para Los Grados Superiores de La Escuela Primaria*, 33.

Because race emerged out of colonized landscapes that were constantly made non-white regardless of skin or hair color,³⁰¹ geography defined the Argentinian population through coetaneous contradictions that aimed at affirming themselves in front of the colonial gaze and, at the same time, escaping the mirrors in which they could never be recognized. Those tensions were, like regional differences, explained as difference within a unity that was such “in its heterogeneity and which sustains the existence of the Nation.”³⁰²

Celebrating its own mestizaje, a school manual affirmed racialized notions of diversity:

the American spectacle, populated by individuals coming from all the European nations and from many areas of Asia and Africa, whites, yellows, blacks, or red skins, aborigines or mestizos; with their hundred languages and their diverse religions and traditions; ...a lesson of the power of human solidarity and the benefits gained through cooperation, tolerance, and good will.³⁰³

At the same time, human geography reproduced colonial visions over indigeneity by trying to erase it, often by using statistics. As this quote shows, numbers helped foreclose indigeneity either by making inferior their proportion in relation to white people, or by denying the purity of those who could be identified as indigenous:

it is estimated that those Argentinians with indigenous blood are less than 5% of the total population. Of those, pure indigenous according to the census of 1965 are around 70,000, a 0.3% of the Argentinian population.³⁰⁴

Blood, environmental adaptation, melting, and historical evolution were all used to prove Argentina’s whiteness. In another geography manual for schools,³⁰⁵ even transport communications had whitened Argentina. They had influenced human composition by

³⁰¹ Segato, *Contra-Pedagogías de La Crueldad*, 90.

³⁰² Daus, *Geografía de La Argentina. Parte Humana*, 91.

³⁰³ Lapuente, *Hombres, Tierras y Ocupaciones. Temas de Geografía Humana Para Los Grados Superiores de La Escuela Primaria*, 10.

³⁰⁴ Daus, *Geografía de La Argentina. Parte Humana*, 20.

³⁰⁵ Pastore, *Geografía Económica. Para V Año de Las Escuelas de Comercio*, 387.

allowing more people to see the world and adopt “more refined habits,” accumulate progress, and create “blood bonds.” In this text, races, like rocks, melt through transport technologies. By building infrastructures, the state had also:

melted the most diverse races and configured the new generations with the stamp of the individual and racial inheritance...an Argentina with its own characteristics and in which ascending origins got dissolved.³⁰⁶

The incorporation of Argentinian regions into the state project was then also justified in the name of foreign threats. At the same time, many geography manuals described not only Argentinian but also European and North American geographies and industrial societies, often with great detail.³⁰⁷ European science was celebrated for having expanded the empire of coal and iron as well as the white race into rich regions that lacked the ability to optimize their natures.³⁰⁸

Whiteness and development were tied through oil, culture, and immigrants. In integrating immigrants and regions to the nation through processes that aimed at whitening peoples and landscapes, purifying colonial classifications of indigeneity, and, at the same time, affirm the limits of the Argentinian State, its character, and its history. In addition to whiteness and immigration, geography also environmentalized racialized visions across the world. The idea of human types argued that the physical environment was the most influential factor in explaining racial and populational differences across regions.³⁰⁹ Hence, they argued that abundance has not always produced progress, as happened in the tropics

³⁰⁶ Pastore, 387.

³⁰⁷ Pastore, 316. In the manual, cities and events of the United states are fully described, including the development of areas such as Boulder or the Hudson.

³⁰⁸ Pastore, 316.

³⁰⁹ Lapuente, *Hombres, Tierras y Ocupaciones. Temas de Geografía Humana Para Los Grados Superiores de La Escuela Primaria*, 8.

where many resources precluded people from developing their own capacities. Civilization was explained not only as given by a rich environment, but also as a result of adversity, of sacrifices that humans had to make in efforts to survive harsh environments.

With these racializing visions, geography taught that Andean peoples had stronger hearts, and that Amazonian aborigines were underdeveloped due to their environment.³¹⁰

With the same arguments, other manuals explained why some people had survived in very hard conditions through adaptation. In this way, “Black Africans” had survived in Brazil, Central America, Antilles, and the South of the US, while they had “mostly disappeared in the area of Río de la Plata,” to which they had not adapted. Condescendingly, geography manuals explained how races and civilizations were distinguished not by intellectual superiority, but by having “more or less possibilities to develop.”³¹¹

In Argentina, human types explained the nomadic character of men living along rivers or the changes in the character of the gauchos who, having traditionally rejected rural work for the Spanish association of it with serfdom,³¹² had become rural and industrial workers after European immigrants fenced all the lands. At the same time, those Europeans had brought with them their settling “habits,” more used to having “comfortable houses and books to read.” The notion of human types environmentalized colonial relations of slavery, indigenous labor and resistance, capitalist extraction, land appropriation, and animal industrialization. Through human geography, the lack of rights for mestizos and gauchos

³¹⁰ Lapuente, *Hombres, Tierras y Ocupaciones. Temas de Geografía Humana Para Los Grados Superiores de La Escuela Primaria*, 50-70.

³¹¹ Lapuente, 55.

³¹² Lapuente, 54. The aversion of the gaucho for rural work, had come from the Spanish conquerors that, when entering Argentina with their imagined blood superiority and the limiting of owning and governing functions to white peoples, had left that task to aborigines and African slaves, initiating with that an association with inferiority and rural work.

was due to their nomadic character. If they were nomadic, it was also because agriculture was “more difficult to defend than a livestock troop”³¹³ if attacked by indigenous groups. When gauchos started to work in farms, this was explained not through historic economic relations, but as a result of adaptation. With geographic knowledges, the reorganization of racism into behavioral terms that I described in Chapter 2, was complemented with the environmental racialization of geographies.

3.1.3 Geographic Synthesis: Politicizing Nature and Naturalizing Society

Daus had graduated from the National Institute of Secondary Teachers in 1922, entered the GAEA in 1925, and become its president in 1949. As a geographer identified with the making of a popular science, he conducted research, published numerous books including *Geography and the Argentinian Unity*,³¹⁴ taught at schools and universities, occupied appointed political positions, and led various institutes and military commissions.³¹⁵ Out of the political and epistemic controversies between popular and encyclopedist geography, he built a particular *synthesis* between the German school of physiography and French Regional possibilism—while agreeing on the importance of environmental influences over the human, he envisioned designing societies by intervening in natures.

Through this synthesis, Daus suggested that the industrial and farming activities that defined each region were a product of human adaptations to given environments. For him, the nation was a product of the history of human and environmental adaptations, one that

³¹³ Lapuente, 53.

³¹⁴ Federico Daus, *Geografía y Unidad Argentina* (Buenos Aires: Nova, 1957).

³¹⁵ Marcelo E. Lascano and Susana I Curto, “El Territorio Como Puente Entre La Cultura y La Política, Parte I: Trayectoria Institucional de Federico A. Daus 1922-1957,” *Revista Do Departamento de Geografia - USP* 26 (2013): 38–68.

the state was merely uniting, not imposing.³¹⁶ Hence, with a planned economy and a strong state, those natures could be optimized. And because they were natural adaptations, regional diversity tended to obscure the political and administrative asymmetries that had also constituted them, including differences over autonomy and funding across region.

Regionalism helped explain conflicts emerging from the expansion of the state and its politics of centralization. The inclusion of the regions into a *single national* project made visible economic, demographic, and political differences. On one hand, the naturalization of those differences through symbolic representations of the regions re-signified them as productive and complementary for the functioning of the state. As explained in a school text, a regional map:

shows the surface of logging, grazing, livestock, and industry, all of which constitute a lush fiscal collection that is accomplished through activities of production, performance, and utility, and which allows to see the percentual contribution of each comarca to the general income of the nation.³¹⁷

On the other hand, nationalization provoked new experiences of alterity. Distinctions between the capital and the interior, between urban and rural areas, between agricultural and industrial poles, between closeness and remoteness, or between white and criollo lands, all contributed to the configuration of new forms of inequality, identity, and negotiation. For instance, remote identification of frontier regions helped their citizens to demand economic and social benefits based on the negative identifications that they, unlike people in other regions, had to suffer: isolation, lack of population, harsh climates, or distance to the centers of international trade and communication routes.

³¹⁶ Gabriela Cecchetto and Perla Zusman, *La Institucionalización de La Geografía En Córdoba. Contextos, Instituciones, Sujetos, Prácticas y Discursos (1878 - 1984)* (Córdoba: Universidad Nacional de Córdoba, 2012), 44.

³¹⁷ Pastore, *Geografía Económica. Para V Año de Las Escuelas de Comercio*, 12.

In addition, despite the efforts to make visible the diversity of the whole territory, the previous identification of Argentina with the center and the Pampas, survived through a new conceptualization. Now, it was not that the whole territory was represented as the Pampas but rather that the Pampas were represented as the central part of an entire national and material organism. Following the organicist metaphors of German physiography, Daus compared the national territory with a living organism, one that needed a thinking head, or capital, along with the rest of its articulated parts, or the regions.³¹⁸ Making the capital-head superior, industrialization had to go “from the head to the extremities.”³¹⁹

The capital receives the influence of the regions, which having discordant tunes and keys, have to be adapted to the national individuality and returned back as a chord. They have to then be distributed throughout the whole territory to avoid them being neither drowned out notes nor voices without an echo.³²⁰

This harmonized territorialization had a hierarchical structure that rendered Buenos Aires a head with “superior natural conditions” given by its unique position in the center, its diversity, and its centralization of communication built upon natural channels.³²¹ Buenos Aires, in this way, facilitated the circulation of people, ideas, habits, and goods as a thinking head that metabolized difference, and returned it back in the form of “spiritual and material conditions of national unity.”³²² This metabolic organism was made of lines and corridors that transformed difference into complementarity and cohesion from Buenos Aires, becoming the capital that received immigrants, rural traditions, goods, and identities to later

³¹⁸ Federico J. Fritzsche, “La Geografía y El Mito de La Naturaleza Nacional: Un Ensayo de Interpretación de ‘Geografía y Unidad Argentina’ de F. Daus,” in *Primeras Jornadas Platenses de Geografía II* (La Plata: Universidad Nacional de la Plata, 1993), 138–52.

³¹⁹ Federico Daus, *Fisionomía Regional de La República Argentina* (Buenos Aires: Nova, 1971), 189.

³²⁰ Daus, *Geografía y Unidad Argentina*, 158.

³²¹ Daus, *Fisionomía Regional de La República Argentina*, 186.

³²² Daus, 188.

redistribute circulations after being re-signified into national, modern, and whitening signs. To teach and naturalize the geographic synthesis of the nation, state geographers designed a particular kind of cartography.

3.2 Proof Maps: Making the National Territory of TdF

In addition to films, magazines, and public exhibitions, the peronist government funded and publicized a wide variety of maps. On one hand, geographers supported the state in providing maps and statistics for military, industrial, and defense purposes. They helped strengthen state capacities to organize and govern recently annexed territories and populations while giving sense to the differences emerging from those processes. On the other hand, geographers selected and designed the contents that would be included in school manuals. They did it based on the need to teach the national territory to children, immigrants, and the broader society. State cartographies at the time, helped affirm national sovereignty and identity through authoritarian visions that disavowed local realities in order to promote national ones.

Cartographies are productive representations that can alter realities, set up or foreclose agendas, promote bonding and identity, or division and rupture, or be used for demands and negotiations. During the 19th century, the need of the nation-states to scientifically know their territories helped to consolidate a professionalized cartography that sought precision against handicraft mapping.³²³ How measurements and standards are achieved through human and nonhuman agentic capacities has been well studied in actor-

³²³ Denis Wood, *Rethinking the Power of Maps* (New York: Guilford Press, 2010).

network terms.³²⁴ However, the state-science maps of the 1940s that I analyze are not the ones pursuing accuracy and geodesic standardization but rather the ones that used simplified cartographies in ways that also produced and affected realities.

In Argentina, a special cartography arose during the 1940s that aimed at constructing national unity and uniformity by providing visions of the nation to Argentinians, immigrants, and settlers in isolated regions and specifying the contributions of their particular regional contributions to the totality.³²⁵ Mapping this geography made visible the hierarchization of regions and the aims to erase the multiplicity of centers that various histories of colonial exchange had produced, including Patagonia and Tierra del Fuego as ports of trade with Europe. As the map in figure 3.3 shows, from a national visual encyclopedia of the state and national progresses of the 1950s, the government's works expanded from the center to the whole territory—a vision that made the center more than a mere region but also the maker and circulator of values.

³²⁴ Bruno Latour, *Science in Action* (Cambridge, MA: Harvard University Press, 1987); Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999).

³²⁵ Claudia Soria, "La Propaganda Peronista: Hacia Una Renovación Estética Del Estado Nacional," in *Políticas Del Sentimiento. El Peronismo y La Construcción de La Argentina Moderna* (Buenos Aires: Prometeo, 2010), 39.



Figure 3.3. Centralized circulations (1950)³²⁶

Patagonia was rendered more remote, isolated, and peripheral than it had been before. At the same time, Buenos Aires was placed in charge of metabolizing regional differences and translating them into national signs, which was a route not only to expanding the nation but also Buenos Aires itself. It became the legitimate and standard body of culture, civilization, and race. In these progress maps, Buenos Aires was the receiver of European/white immigration, and the distributor of this whitening population into internal migration.

³²⁶ Gobierno Argentino, *La Nación Argentina Libre, Justa y Soberana* (Buenos Aires: Peuser, 1950), 800, accessed October 25, 2019, <http://www.peronlibros.com.ar/sites/default/files/pdfs/patriajustasoberana.pdf>. In the public domain, reproduced under permission of the Argentinian Copyright Law (see Appendix A).

These maps are known as “logo-maps,”³²⁷ “cartoids,”³²⁸ “cartoon maps,”³²⁹ “proof maps,”³³⁰ or “progress cartography.”³³¹ With simplistic traces and drawings, they mixed scientific cartography and art, scientific conventions and popular representations; of past, present, and future visions; of evidence and design. As evidence, proof maps of state sovereignty, they represented the works of the state in the country, even those that were projected for the future. With the figure of the worker at the center, either the human laborer or the nonhuman cow or sheep, Argentinian cartographies of progress bore similarities to the Russian Stakhanovism³³² movement of the 1930s, which had fetishized the worker as the hero of the nation for making possible the collective will. Like Russian propaganda, Argentinian maps stylized workers, nature, and extractive technologies.

These aestheticized cartographies also defied conventions and often did not follow scientific norms and scales, but this did not make them less scientific, for they were

³²⁷ Benedict Anderson, *Imagined Communities* (London: Verso, 1991), 175–76. The national map, or “map-as-logo” was defined by Anderson as “pure sign,” an avatar that was reproduced in every realm of social life, penetrating the popular imagination by being “instantly recognizable, everywhere visible.”

³²⁸ Nikolay Smirnov, “Meta-Geography and the Navigation of Space,” e-flux, 2019, accessed July 10, 2020, <https://www.e-flux.com/journal/101/271896/meta-geography-and-the-navigation-of-space/>. For the Russian geographer Rodoman, as quoted in Smirnov, geo-cartoids are “diagrams depicting a real or imaginary territory more simply, without necessarily complying with the rules of classical cartography—for instance, without projection or scaling, and with exaggeratedly straightened lines.”

³²⁹ Guillermo Cicalese, *La Nación Argentina Justa, Libre, Soberana: Un Atlas Nacional Para Representar El Mundo Peronista. Un Ensayo de Interpretación*. (Mar del Plata: Universidad Nacional Mar del Plata, 2018), 26, accessed December 10, 2019, <http://nulan.mdp.edu.ar/2958/1/cicalese-2018.pdf>. Argentinian cartoon maps used characters, vignettes, or symbols and were first used in tourism and advertisement to later by expanded to governmental and teaching materials. Cartoon maps often included the ridiculing of the oligarchy and the millionaire.

³³⁰ Cicalese, 29. Proof maps are those which are accompanied by statistics and tables with the aim of verifying territorial realities.

³³¹ Cicalese, 29. As proof maps, they represented the achievements made by the quinquennial plans. As Cicalese shows, mapped images verified the government as the necessary foundational actor for the transformation of the country, which was now abandoning its first nature.”

³³² Cicalese, 28.

produced through scientific communities, technologies, and knowledge. Their scientific rhetoric was not one of neutrality and description but rather one based on informal semiotics and bombastic narratives that appealed directly to the reader as a necessary part of the map. They were not realist maps used by scientists, the military, or citizens looking for spatial orientation, but rather maps that oriented the individual, the region, and the collective to be positioned as part of the nation.

As logo-maps, they visualized not only what existed but also all that was to be made. As design tools, they represented the expansionist and military goals of the state to expand and protect its sovereign spaces in mapped ways that presented them as already existing. These maps became tools for effecting state-mediated belonging and identity, while also producing emerging contradictions and differences that would be later used to make claims and demands. Despite the homogenizing desires printed in progress cartography, multiplicity did not fail to arise, as it was expressed by an impressive amount of maps that included different divisions according to populations, nonhumans, industry, economic zones, rivers, forests, political divisions, sheep races, or infrastructures, among many others.

Progress cartographies represented the designs of nature, people, industry, and the environment but, interestingly, they also represented multiple designs of memory and future. Often, those designs also reproduced and actualized colonial and racial modes of knowing, ordering, and designing territories. As I will show in the previous section, those colonial knowledges were not so much based on biologized differences, but rather on an environmentalized difference, one that, as the particular regional and human geography of the time argued, determined human types, animal races, and productive landscapes.

Why was there such an intense interest in mapping the territory through various taxonomies and modes of ordering that overlapped and crosscut each other? And why was

the government making official all those divisions if it saw difference as a threat to unification? Seeing exhibitions, posters, school texts, and propaganda books, one finds plenty of diverse logo-maps that contradict the homogenizing drive. Depending on the map, one could be in one region or another, in a province, in an economic pole, in a land of cows or aborigines, in an unpopulated area, or in an oil extraction land.

It seems that, despite the agreement that regionalization obscured difference,³³³ or thanks to it, multiplicity emerged. While those maps were motivated by desires for clear-cut distinctions and modes of ordering, the heterogeneity of differences provoked the creation of many distinctions. And while they were all coordinated as diversity within the nation, a closer look at them shows the multiplicity of territories, spaces, landscapes, natures, identities, and politics that were constantly emerging in coproduction with the nation.

3.2.1 Mapping and Nationalizing Austral Patagonia

Tierra del Fuego remained imagined as an empty spot for a long time due to the lack of successful settlement in the area, with most who had passed through seeing it mostly from the ocean.³³⁴ It was not until after 1840 with the Chilean and Argentinian nationalization of TdF that it started to be more often represented and included on the national maps. However, it is after the 1930s when Patagonia and Tierra del Fuego became

³³³ Quintero, "Geografías Regionales En La Argentina. Imagen y Valorización Del Territorio Durante La Primera Mitad Del Siglo XX," accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-127.htm>; Perla Zusman and Sandra Minvielle, "Sociedades Geográficas y Delimitación Del Territorio En La Construcción Del Estado-Nación Argentino," in *V Encuentro de Geógrafos de América Latina* (La Habana, 1995); Benedetti, "Los Usos de La Categoría Región En El Pensamiento Geográfico Argentino," accessed December 10, 2019, <http://www.ub.edu/geocrit/sn/sn-286.htm>; Barsky, "Auge y Ocaso de Las 'Regiones Geográficas Argentinas' de Federico Daus: De Un Pasado Con Certezas a Una Actualidad de Fragmentación," 35–48.

³³⁴ Harambour, "Soberanía y Corrupción. La Construcción Del Estado y La Propiedad En Patagonia Austral," 562.

key territories wherein to express sovereignty and the national desires of industrial, agricultural, and population expansion. If America had been the European frontier, Patagonia became the Argentinian and Chilean ones.

Patagonia and Tierra del Fuego, with low state presence, constituted not only peripheral and remote lands, but also a central region for producing a nationalist vision of alterity. In its otherness, Patagonia became the key territory of concern over Chilean expansion, the desert, the problems of isolation and lack of communication, as well as those of population, industry and agriculture, and state institutions. Argentina justified the possession of TdF not only by arguing the proximity and presence of its bases in the region,³³⁵ but also by envisioning the Argentinian “natural projection to the austral oceans” that called for its nationalization.³³⁶

That natural projection was reaffirmed by the generation of symbols and relations sustained by the idea that TdF was empty, a vision that motivated national colonization plans over a land dreamed as a desert in were to design natures and societies from scratch. This image re-actualized Darwinian ghosts³³⁷ over a TdF lacking civilized human and nonhuman populations and previously national military campaigns in the Pampas that, by being known as a “Desert Conquest,” disavowed their genocidal constitution. Despite the effective annexation of Tierra del Fuego by Argentina in 1884, cartographies of the country still represented the region as an empty area during the 1940s, as it can be appreciated in figures 3.3, 3.4, and 3.5, extracted from geography manuals of the time.

³³⁵ Daus, *Geografía de La Argentina. Parte Humana*, 8.

³³⁶ Daus, *Geografía y Unidad Argentina*, 40.

³³⁷ See Chapter 2, Section 1.3.3.

The map on figure 3.4, published in a manual to be distributed across Argentinian embassies around the world, represented the population distribution according to the state census of 1947. The census was one of the first tools to respond to the perceived “demographic problem” of the country, or the idea that there was a lack of population enough to optimize the national territory as well as an excess of non-nationalized immigrants and indigenous peoples who threatened the national project.



Figure 3.4. Mapping nationalized and homogenized population inequalities (1952)³³⁸

³³⁸ Gobierno Argentino, *Síntesis Geográfica de La República Argentina* (Buenos Aires: Servicio Internacional Publicaciones Argentinas, 1952), 86, Colecciones Especiales Fonds (BPB972), Archivo de la Biblioteca del Congreso de la Nación, Buenos Aires, Argentina. Reproduced by permission of Biblioteca del Congreso de la Nación (see Appendix A).

With clear icons like these cartographies, the state legitimated the centralization of colonization plans that included expropriations, land distribution, and nationalization of capitals. By selecting external immigrants according to their cultural and economic adequacy for the country and each region, the state also aspired to homogenize and purify the country with modern and whitening population. As geographers explained, immigrants were a tool for accelerating progress, as they were “already educated and prepared.”³³⁹

The short comparative booklet called *What children used to see and what children will see*, shown in figure 3.5, illustrates the process of making TdF for national colonization, known by state geographers as the “Second Conquest of America,”³⁴⁰ shows, redistribution dreams were less based on optimizing industry and agriculture by promoting settlements and infrastructures across the country. This map, as a map of the future, already shows a nationally inhabited TdF. These progress-maps verified the politics of the project while reducing the complexity of governing populations, foreclosing other understandings of redistribution, and obscuring the production of alterities and new asymmetries associated to settler-colonial enterprises.

³³⁹ Lapuente, *Hombres, Tierras y Ocupaciones. Temas de Geografía Humana Para Los Grados Superiores de La Escuela Primaria*, 57.

³⁴⁰ Lapuente, 58.



Figure 3.5. The making of Argentinian population. Past and futures. (1950s)³⁴¹

Fig. 3.5 shows a divided map. To the left and representing the past, people are concentrated in few areas and a charming landscape without signs of industry. It shows what children used to see until the arrival of Perón and his politics, “an insufficient population that is concentrated in the big cities,” and “extensive zones that are either uncultivated or inadequately cultivated.” The image to the right, the future, shows that what children will see and become, shows an Argentinian map that has people everywhere, a farmed landscape accompanied by road and housing infrastructures, and, on the top, an image of a modern, nuclear, heterosexual, white family that has the amenities of western

³⁴¹ Juan Domingo Perón, *Lo Que Los Niños Veían...Y Lo Que Verán*. Plan de Gobierno, 1947-1951 (Buenos Aires: Gobierno de Argentina, n.d.). Colecciones Especiales Fonds (B.P.B 922 VOL: U). Biblioteca del Congreso de la Nación, Buenos Aires, Argentina. Reproduced by permission of Biblioteca del Congreso de la Nación (see Appendix A).

societies, including urban dress, domestic technologies, tourism, as indicated by the plane that helps people travel, and state support.

Along with humans, the state promised species and plants that would help settlers survive. Settler-Colonialism includes the introduction of settlers with novel species, organisms, diseases, infrastructures, and economies that tend to displace native ones either through direct violence or through softer mechanisms (education, militarization, and integration).³⁴² Despite the history of ranchers and missionaries having concentrated a lucrative extensive sheep farming project whose population had expanded across the whole territory, multi-species colonization in the Argentina of the 1940s, still represented TdF as an empty space ready to occupy (see fig. 3.6).

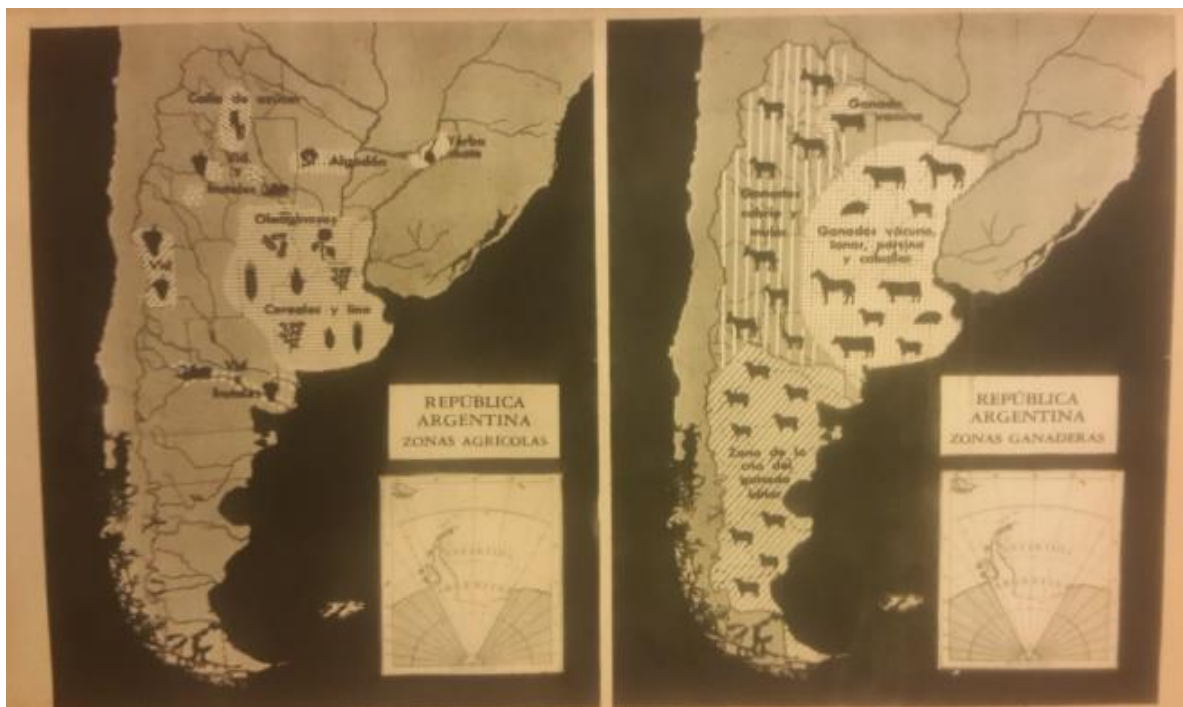


Figure 3.6. Distributing and *argentiniz*ing multi-species populations (1950)³⁴³

³⁴² Wolfe, "Settler Colonialism and the Elimination of the Native," 387–409; Silvia Rivera Cusicanqui, *Oprimidos Pero No Vencidos. Luchas Del Campesinado Aymara y Quechwa 1900-1980* (La Paz: La Mirada Salvaje, 1984); Crosby, "Ecological Imperialism: The Overseas Migration of Western European as a Biological Phenomenon," 103–117.

³⁴³ José Carlos Astolfi, Bautista Aizcorbe, and Alberto E.J. Fesquet, *El Trabajo En La Zona Agropecuaria* (Buenos Aires: Kapelusz, 1950). Colecciones Especiales Fonds (B.P.B41 VOL: U)

Animal distribution in Argentina was accompanied by logo-maps and racialized statistics that distinguished density areas, meat quality, fur color and other features like their head, performance, weight, origin, or introduction date.³⁴⁴ These multi-species maps, like the population ones, helped verify the national state project by distributing races and species within their most suitable environmental vital space. At the same time, the nationalization and regionalization of species (the Patagonian sheep, the Mendoza grape, the Pampas horses), also helped at the task of naturalizing political differences by providing natural signs that would facilitate the formation of a productive and nationalized difference. As is the case with every sign, these images were part of world-making processes, what Haraway would describe as figuration of material and semiotic tropes;³⁴⁵ they helped materialize politicized environments made of millions of national sheep, cows, and cereal grains.

Tierra del Fuego, however, as a territory without humans, plants, infrastructures, or animals, was represented as available and in need of intervention. The lack of adequate population in terms of numbers (few people and few species) and quality (too many foreigners and too few useful and modern species), served to justify decree 5626, which modified the administration of TdF to make it a Maritime Region governed by a Navy Officer (as described in Chapter 1). This militarized state of exceptionality continued until 1991, when it finally achieved its status as a province but, until then, it was governed as a resource, a geopolitical enclave, and a scientific laboratory. As such, its colonization was designed authoritatively, accompanied by military bases and politics that envisioned an

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³⁴⁴ Daus, *Geografía de La Argentina. Parte Humana*, 108.

³⁴⁵ Donna J. Haraway, *Modest Witness@Second Millennium. FemaleMan Meets OncoMouse: Feminism and Technoscience* (London: Routledge, 1997), 130–50.

island region that could be completely planned. The dream was to “concentrate in just one hand the management, study, and solution of the civil and military problems of the territory, avoiding dispersion of efforts.”³⁴⁶

The plan included settlers, infrastructures, farming, communication, tourism, and acclimatization of species such as reindeer and beavers, activities that would emphasize the politization of a nature to be designed and with it, a society to create:

We work to increase the natural possibilities of that remote piece of patria we are regaining and to incorporate it to the magnificent development of all the activities of the country in the expansion of its full potential.³⁴⁷

It was through this mode of diagramming Argentina that twenty Canadian beavers (*Castor Canadensis*) were introduced from Canada into Tierra del Fuego. The state goal was multiple:

a) to enrich and modernize the native fauna of a region that was considered empty and sterile with modern and aesthetic species, b) to industrialize the region and support settlers by emulating the fur economies of northern regions with similar climates, and c) to assert national sovereignty in a territory with low presence of the state and with more foreign than national population.

The trip of the beavers to TdF, shown in figure 3.7, had such a national character that it was recorded and shown in the state’s newsreel in every city. Metabolized by the expansionist and industrialist politics of Buenos Aires as the head in which administrative decisions were taken, beavers were introduced without accounting for the local conditions and knowledges that, unlike Canadian ones, made it difficult to prosper in fur trapping and trading.

³⁴⁶ Presidencia de la Nación, *La Nación Argentina Justa, Libre y Soberana*, 503.

³⁴⁷ Presidencia de la Nación, 503–4.



Figure 3.7. Canadian beavers flying to Tierra del Fuego (1946)³⁴⁸

However, unlike sheep and cow, beavers were not integrated into human modes of ordering nature, society, and the economy. Once twenty beavers were released, the species population was protected to promote their reproduction. However, as it happens with many innovation projects in remote regions, their population was never industrialized and, with a suitable environment and an absence of predators, beavers expanded and, by the 1980s, the beavers' population had increased exponentially and occupied most rivers and streams of TdF, including on the Chilean side. Without producing industrialized vital surplus, beavers today are apocalyptic "ecosystem engineers": they industriously design dams, organically modify rivers, flood lands, and kill native trees that, unlike the Canadian ones, are not able to recover after flooding.³⁴⁹ Since the 1980s, regional institutions of both Chile and Argentina, designed measures to control the beaver population by promoting hunting, the fur trade, and the use of beaver meat for human consumption.

³⁴⁸ Díaz, "Sucesos Argentinos No 432: Vuelo Al Sur," 1947, Departamento de Cine, Audio y Video (439.C16.1.A), Archivo General de la Nación, Buenos Aires, Argentina. Reproduced by permission of Archivo General de la Nación (see Appendix A).

³⁴⁹ Anderson et al., "Do Introduced North American Beavers *Castor Canadensis* Engineer Differently in Southern South America? An Overview with Implications for Restoration," 40–41.

3.3 Mapping and Knowing with Beavers

The institutionalization of science in Tierra del Fuego promoted another kind of scientized mapping of the region. The opening of the national research center CADIC in Ushuaia in 1981, during the last military cup, was entrenched with militarized forms of organization of science and with authoritarian values at a time when biology was the prioritized discipline for the region.³⁵⁰ At the same time, CADIC was also nationally envisioned as a geopolitical strategic center in which to produce knowledges that would serve to defend, know, and appropriate the region from possible sovereign conflicts with Britain and Chile. In this context, pioneer researchers who arrived to stay, engaged mostly with biological, ocean, archaeological, and geological research. They developed epistemologies of the natural sciences that helped them know the region through its natures and, with that, helped legitimate their presence and activities.

At that time, beavers helped scientists know the region beyond its urban and agricultural frontiers. When scientists started to intervene in the beaver population, which had been ungoverned since their liberation, scientists did not represent simplified cartographies of beavers but rather maps that acknowledged the beavers' territoriality across riparian and mountain areas that had been produced through generations of Argentinian-born beavers. Through field exploration, statistics, pictures, and drawings, scientists drew maps and pictures that, during the 1980s, would help officers and park guards manage the beaver population locally. First by hand and then printed, as figure 3.8

³⁵⁰ Fabiana Bekerman, "La Política de Descentralización Del Conicet y El Fortalecimiento Del Espacio Científico En La Patagonia Durante La Última Dictadura Militar Argentina," in *Conocimiento, Paisaje, Territorio. Procesos de Cambio Individual y Colectivo*, ed. Hebe Vessuri and Gerardo Bocco (Río Gallegos: Universidad Nacional de la Patagonia Austral, 2014), 287–313.

shows, these maps aimed at representing and making sense of beavers' modes of ordering nature, society, and territory on their own terms. Given that, unlike sheep or cows, beavers had not been integrated into human economies, these maps also showed the autonomous capacities of once introduced beavers to produce forms of territoriality that exceed human politics and designs of nature.

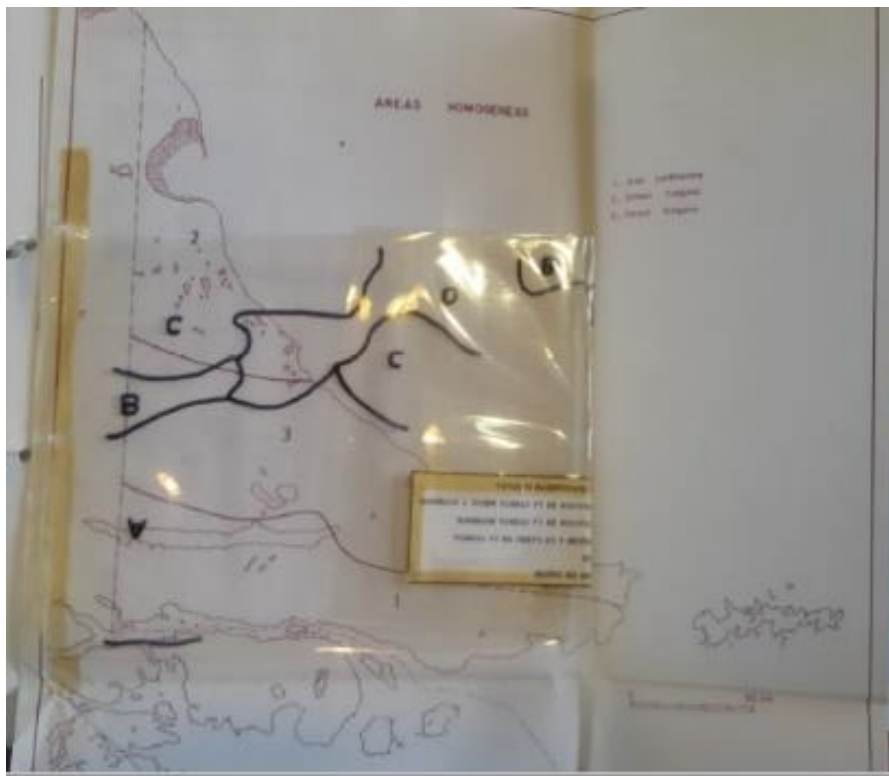


Figure 3.8. Mapping and knowing beavers' autonomous occupation (1989)³⁵¹

At that time, local researchers drew maps and pictures after flying over the region and walking along eight river streams, a study that they could do given the interest of the province in funding them. Their study was shared with park guards and the local authorities asking for a plan to control the beaver population. As Julio told me in an interview, they did a map of populational density that was, at that time, oversized, due to

³⁵¹ Marta Lizarralde, Julio Escobar, and Oscar Bianciotto, *El Castor (Castor Canadensis) En Tierra Del Fuego: Efectos de Alteración Ambiental y Su Aprovechamiento Como Recurso Natural* (Ushuaia: Centro Austral de Investigaciones Científicas, 1989). Picture courtesy of the authors.

their lack of previous knowledges. Out of those visions, scientists in TdF were able to report on beavers, environmental associated degradation, and the possibilities of beavers as a natural resource. They draw maps such as the one in figure 3.8, using the map of the Argentinian-side only of TdF as the background and painting rivers with zoned areas. These areas divided basins and management following beaver modes of settling so that efforts to hunt beavers should be concentrated in areas with high abundance, high environmental impact, and reasonable human accessibility.

These reports presented the different patterns of beavers' territoriality, occupation, expansion, and mobility. Attending to the long history of beavers' territory-making, scientists were able to recommend forms of intervention that responded to each pattern and according to the perceived environmental damage, beaver abundance, and access possibilities. In 1989, they wrote a technical report on beavers, their environmental alterations, and the possibilities of beavers as a natural resource.³⁵² They draw maps for making sense of beavers' occupation:

A: Low beaver abundance, low environmental impact, and regular accessibility. They suggest not to promote hunting.

B: Medium beaver abundance, high impact, and bad accessibility. The efforts needed do not justify hunting.

C: Medium beaver abundance, high impact, regular accessibility. Suggest population control.

D: High abundance, medium impact, bad access. Without a good fur market, intervention is not justified.

E: High abundance, high impact, good accessibility. Promote hunting.

³⁵² Lizarralde, Escobar, and Bianciotto, 22.

From that study, they also published a technical report containing their work from 1992-1993 in which they digitalized the map as shown in figures 3.9 and 3.10. In those maps of the 1980s-1990s, scientists represented beaver occupation, active and abandoned dams, dead trees, impact, and peats. In addition to technical reports, Marta Lizarralde published what later became the reference article that opened beaver research in Tierra del Fuego: *Current status of the introduced Beaver (Castor canadensis) population in Tierra del Fuego, Argentina*.³⁵³

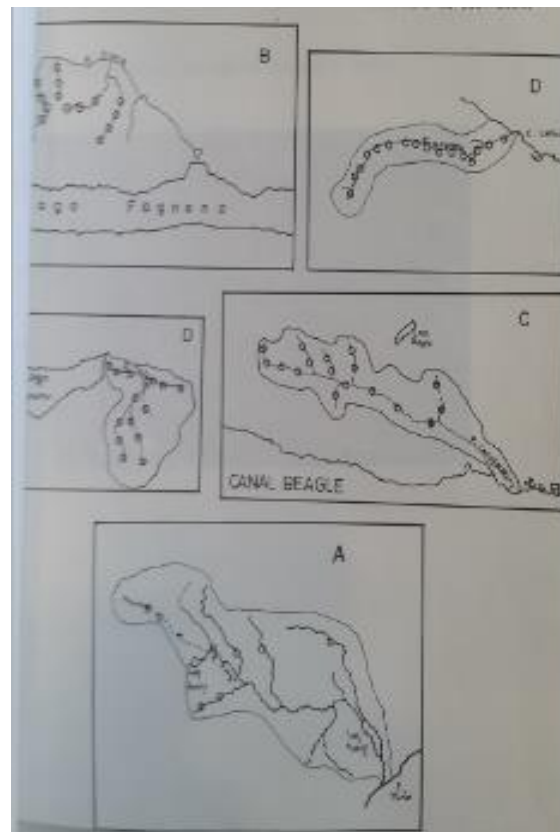


Figure 3.9. Mapping beaver's occupation of basins (1980s)³⁵⁴

³⁵³ Marta Lizarralde, "Current Status of the Introduced Beaver (*Castor Canadensis*) Population in Tierra Del Fuego, Argentina," *Ambio* 22, no. 6 (1993): 351-58.

³⁵⁴ Lizarralde, Escobar, and Bianciotto, *El Castor (Castor Canadensis) En Tierra Del Fuego: Efectos de Alteración Ambiental y Su Aprovechamiento Como Recurso Natural*, Appendix. Own picture taken and reproduced with permission of the authors.

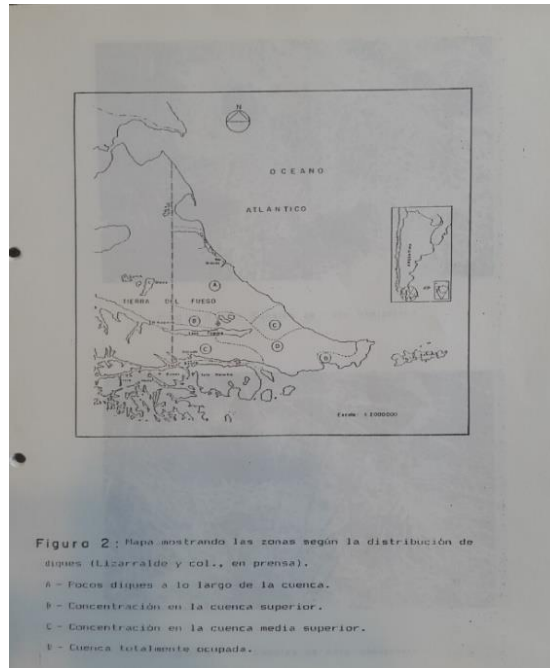


Figure 3.10. Mapping dam's distribution (1980s)³⁵⁵

These scientists-carpenters, mostly biologists, approached beavers' natures and territories with the goal of knowing it. Their cartographies aimed at helping scientists themselves make sense of the until then scientifically unknown history of beavers and nature in TdF. Because beavers had reproduced their biologies and environments in ways autonomous from human societies—the fur industry had never been implemented and, unlike sheep, beavers were not entangled into industrial and colonial modes of production—they became a key species through which scientists could explore and know the territories in which they settled. Because scientists lived there, their goal was not to create maps that would enable a later return, as imperial colonial maps had done in the past. Hence, these maps were not produced from a distant center but rather from within Tierra del Fuego, in collaboration with locals, park rangers, and the military, and through laboratory and fieldwork practices of coordination that characterize environmental research.

³⁵⁵ Lizarralde, Escobar, and Bianciotto, *El Castor (Castor Canadensis) En Tierra Del Fuego: Efectos de Alteración Ambiental y Su Aprovechamiento Como Recurso Natural*, Appendix. Own picture taken and reproduced with permission of the authors.

Since the main goal of these maps was to know beavers' territoriality, population, and distribution, in order both to know the territory and to locally control the damages beavers cause to infrastructures and environments, they did not achieve a great level of mobility. State cartographies of human and nonhuman populations and regions, while representing very fixed realities with visions from above, were actually very mobile across national and regional territories, helping with these cartographic visions to construct those national and regional realities. On the contrary, the maps of the beavers' territoriality developed by local scientists during the 1980s remained artifacts that would help scientists themselves to know beavers and territories, without intention to make them circulate across national and transnational institutions or across publics.

Rather, what were made "immutable mobiles,"³⁵⁶ were the knowledges for controlling species in human-nature conflicts. Because there was not previous scientific experience on beavers in TdF, these local scientists reached out to North American experts and scholarship to make sense of the Fuegian beavers. Since beavers are not an exotic but a native species in the north of the continent, what those experts brought were knowledges for managing everyday conflicts generated by the coexistence of beavers and humans. With that scientific background and with the charismatic consideration of beavers in TdF at the time, local scientists created maps that showed the history of beavers in the region that were built from the beavers' own modes of doing territory. Learning to see beavers, these scientists became locally known as "the beaver guys," not for seeing like beavers see, but for seeing with and through them by sharing environments, territories, affects, and scientific practices, as the maps above show.

³⁵⁶ Bruno Latour, "Visualisation and Social Reproduction: Opening One Eye While Closing the Other... A Note on Some Religious Paintings," *The Sociological Review* 35, no. 1 (1987): 15–38.

3.4 War Maps and the Making of Transnational Natures

With the increasing transnationalization of science that required standardizing processes for making knowledges mobile beyond local borders, scientists in Tierra del Fuego started to question the limits that national politics imposed on science. As a response to the history of nationalist state science, researchers in Tierra del Fuego started to challenge the imposition of political structures that would limit scientific possibilities. At CADIC, researchers tend to highlight the “irrationality” of this nation-based border for managing the territory rather than following its “natural” configurations, whether beaver distribution or waste disposal. In a conversation around the project of beaver eradication, a biologist explained political borders as an obstacle for making science and managing the environment:

It is shocking how we keep publishing trimmed maps in our works. If you look, you see how the Tierra del Fuego analyzed by Argentinian scientists shows only the Argentinian triangle, while Chileans show the other side. How are we going to work together this way? Also, interpretative systems differ, GIS systems are different, we cannot even overlap our maps. [researcher, personal communication, 14 March 2019].

The researcher talked about the mapping of TdF through “trimmed-map,” which represent only the Argentinian side of the region, a land split from the Chilean side. This map in the form of a triangle, has also become an identity symbol that is reproduced in the form of a clear triangle to represent the region.³⁵⁷ This triangle, which actualizes the Chilean-Argentinian geopolitical conflict by expressing the sole Argentinian sovereignty and

³⁵⁷ Carlos Masotta, *Insularidad y Fuga. Problemas de Localización En La Tierra Del Fuego* (Buenos Aires: Universidad de Buenos Aires, 2010).

excluding the Chilean presence, is also, today, problematized by scientists working in the region, who describe TdF as made of one natural region and two political units.³⁵⁸

Scientists, whether geographers or biologists, point here to the conflicts produced when coordinating forms of mapping and territorializing. At CADIC, the managing of the environment is thought to be constrained by the borders of political frontiers towards cooperation and standardization. Outrage arises from scientists who see solutions blocked by policy makers and political borders. While some of them claim more flexibility for science to operate, others argue for integrative models of science and governmentality across political borders, particularly when risk and vulnerability transcend them.³⁵⁹ Through this vision, nature should be depoliticized in order to be known and governed.

However, this cosmopolitics not only universalizes local contexts in ways that tend to reproduce the power of hegemonic centers of knowledge and influence production,³⁶⁰ but also affirms that the problem relies in the *political* division of *natural* units—as if scientific biogeographical maps were not political. Understanding science and politics as coproduced³⁶¹ and ecologies as relations among natures, humans and non-humans, scientists, and technologies,³⁶² reveals that the Argentinian and Chilean TdF takes boundary making as a

³⁵⁸ Andrea N. Raya Rey et al., “Even at the Uttermost Ends of the Earth: How Seabirds Telecouple the Beagle Channel with Regional and Global Processes That Affect Environmental Conservation and Social-Ecological Sustainability,” *Ecology and Society* 22, no. 4 (2017), accessed July 10, 2020, <https://doi.org/10.5751/ES-09771-220431>.

³⁵⁹ Ulrich Beck, *Risk Society: Towards a New Modernity*, trans. Mark Ritter (London: Sage Publications, 1986).

³⁶⁰ Bruno Latour, “Whose Cosmos, Which Cosmopolitics? Comments on the Peace Terms of Ulrich Beck,” *Common Knowledge* 10, no. 3 (2004): 450–62.

³⁶¹ Sheila Jasanoff, *States of Knowledge: The Co-Production of Science and Social Order* (Routledge, 2004).

³⁶² Isabelle Stengers, *Power and Invention: Situating Science* (Minneapolis, MN: University of Minnesota Press, 1997).

critical device for telling the multiple and pluricentric histories of modernization, colonialism, and differentiation of the Fuegian territories, including national ones.

In this context, while nationalist geography maps obscured the internal multiplicity of TdF in their expansionist drive, these biologized visions that aim at resolving the constraints of political boundaries, do not exactly respond to those histories of nationalism and internal colonialism but rather try to erase them. The drive to govern beyond political borders intensified with the arrival of new environmental transnational actors who came to the region during the 1990s with the goal of implementing a transnational project for eradicating beavers in 2008 at the expense of previous local research.

Global Environmental Facility (GEF), the largest global public organization funding environmental projects, assigned 18 million US dollars to Argentina to increase their national capabilities in the management and eradication of invasive species. When the strategy of population control changed to eradication during the late 2000s, transnational modes of knowing and funding came along with high technologies such as drones, tablets, and satellite technologies. With this, hand-made maps started to be replaced by one-view high definition maps that were produced with technologies that already carried military practices, especially drones, satellite imaging, and computer modeling systems and that would produce a territory for large-scale eradication of beavers.

The communication of the eradication project to the publics has highlighted the restoration of nature as the ultimate goal, strategically instructing participants to avoid hate, kill, and war languages that, they argue, would produce the wrong impression of working against singular species rather than ecosystems.³⁶³ However, it is in through the organization

³⁶³ See Chapter 5.

of the project that a war-strategy emerges from the coordination of territories, technologies, and knowledges of invasion. As the eradication strategy describes, its goal is to generate “the ability to scale this colony-by-colony removal up to whole catchments, larger management zones, and whole islands.”³⁶⁴ It does so by optimizing the use of killing technologies such as traps, explosives, or dogs, and by coordinating small-scale with large-scale visions of “invaded” territories in which “is not the numbered killed what counts, but the number left.”³⁶⁵ As one of those war and trimmed maps show, from the Chilean side of TdF, cartographies are now designed not to know beavers’ patterns of occupation, but rather a diagramming of an invasion of “the beaver”, in singular, for its eradication (see fig.3.11).

³⁶⁴ John P. Parkes et al., “Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options,” *Landcare Research Contract Report: LC0708/084*, 2008, 47, <https://www.islandconservation.org/wp-content/uploads/2018/10/Control-of-North-American-Beavers-in-Tierra-del-Fuego-Feasibility-of-Eradication-and-Alternative-Management-Options..pdf>.

³⁶⁵ Parkes et al., 47.

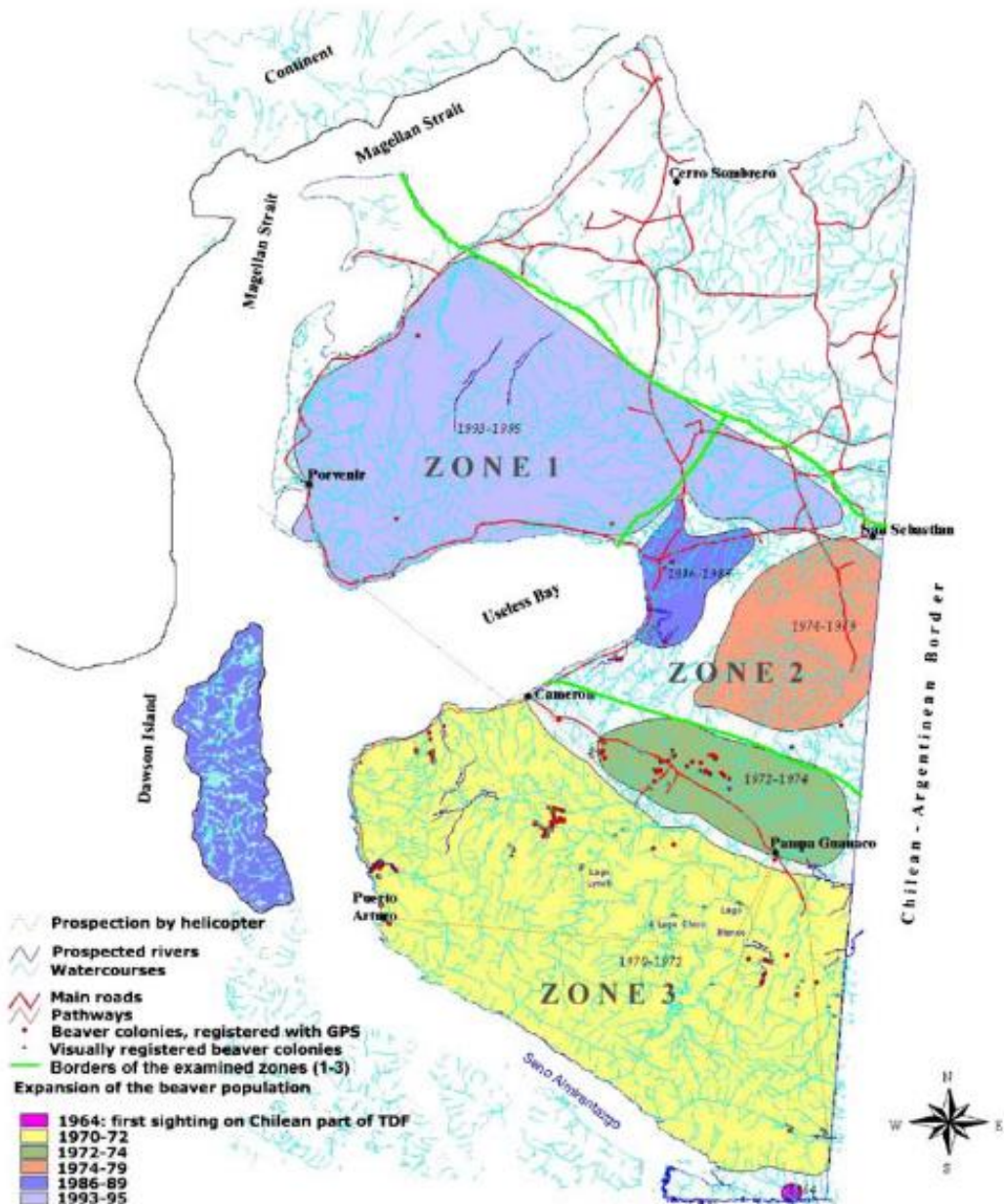


Figure 3.11. Expansion of beaver in the Chilean part of TdF³⁶⁶

³⁶⁶ Oscar Skewes et al., "Abundance and Distribution of American Beaver, *Castor Canadensis* (Kuhl 1820), in Tierra Del Fuego and Navarino Islands, Chile," *European Journal of Wildlife Research* 52, no. 4 (2006): 293. Reprinted by Permission from Springer Nature Customer Service Centre GmbH: [Springer Nature] [European Journal of Wildlife Research] [Abundance and Distribution of American Beaver, *Castor Canadensis* (Kuhl 1820), in Tierra Del Fuego and Navarino Islands, Chile, Oscar Skewes et al.], [COPYRIGHT] (2006). Permission attached in Appendix A.

With them, scientific interests and technologies shifted from knowing beavers themselves to detecting them for the purpose of war. These cartographies privileged again the laboratory over the field for the scientific construction of knowledges over nature. As one beaver expert told me in Tierra del Fuego (2019), interpreting these maps “comes with experience,” an experience that no longer refers to knowing places and species, but to knowing how to manage military imaging technologies:

it is incredible, how with just an image I see all what is going on there. Hmm, well, it is not just the image; according to it I may go closer or not, but I know that potentially there are beavers, with a helicopter. But with a drone it gives me even more possibilities to get closer, though I have to potentially know where to shoot images to optimize the tool and not go through every place.



Figure 3.12. Beaver presence with Google Earth. Photo courtesy of Julio Escobar (2018)³⁶⁷

³⁶⁷ Reproduced under Google Earth copyright permissions (see Appendix A).

These cartographies, as Julio argued, also transform the relationship of the scientist to the studied territory. If state geographers designed their maps of the south as responding to the nationalist project of regionalization, in ways that homogenized the region and hid its multiplicity, drones and satellite technologies are also detaching scientists from the lived landscapes. Recognizing these shifts, Julio valued the science they did during the 1980s and which was now being deemed obsolete:

Technology absorbs us, drones or planes are tools, one has to know that the tool is necessary for certain things. (...) Today, researchers just go out there, fly, and then look at the GPS and see the image...and then you ask them "do you remember when we saw...?" I can take you to every place I have been through the same path I took and tell you how it was...if you do not incorporate all that, the GPS or the plane, it facilitates but you need to know how to use it.

What those mapped lands from the air do, as well, is to provide a basis for diagramming eradication. They, like the maps of the 1940s, help actualize knowledges of total control by reducing territory to one view, to one eye, to one problem.

As if the island could be totally seen from far enough away, and then, everything would be known for total eradication, even though most researchers admit that total eradication of the beaver population is an impossible hope. These images, as Julio told me, "show all that is happening there, all the activity." They help detect, plan, and control re-invasions in a land that is not lived by humans.



Figure 3.13. Area impacted by beavers, from above. Own detection with Google Earth (2020)³⁶⁸

Maps for intervening beavers during the 1980s constructed intimate forms of relation with the life and death of the species and its own history and territoriality. As one hunter told me, satellite maps and species management mega-projects are not compatible with embodied relations that, even when killing, recognize nonhumans as autonomous others.

For this experienced hunter who daily designs his maps and registers in the field:

Everything has to be done with mud from there, with sticks and branches from there, all the environment has to be similar. I have to construct a passage for the trap that the beaver likes, how he likes, with adequate space for him. If you do not cover well the sides, he can pass in between the lateral and the resorts and the jaws could take him a leg. That is why constant revision is key, if a beaver was trapped by the leg, or a tail, or an arm and you do not go, he is going to be like that for nine days.

In contrast, researchers designing beaver eradication and satellite maps expressed a very different relation with them, one based on one-view images of the problem and the species:

³⁶⁸ Reproduced under Google Earth copyright permissions (see Appendix A).

To kill all beavers at first sight so as not to educate them, and to do this as quickly as possible, ideally within a few days. To do this the area must be saturated with devices.³⁶⁹

3.4.1 *Making Scientific Sovereignty*

Unlike regional mapping from the center, these maps did not have a nationalist, educational, and integrative function and, while they started to show the multiplicity of landscapes, life, and territorialities that composed a lived TdF, as the maps shown on the right,³⁷⁰ their complexity also became more detached from the animals studied, from the publics and from the broader community. Through time, expert cartography of/in TdF became a scientific device that helped with knowing territories, organizing interventions, and, by becoming more difficult to interpret, exerting scientific authority. Since those who could legitimately claim to know the territory well also had the capacities shown by the maps and technologies used, scientists started to construct their authority to know and to make decisions about interventions into the natures of TdF.

Through these maps, scientists are gaining legitimacy to govern the natures of Tierra del Fuego, deemed now as an environmental and beyond political borders and infrastructures. The development of complex maps for studying the movements and ecologies of Tierra del Fuego, enables novel forms of intervention, including binational and transnational structures and mega-projects for managing environmentalized conflicts that, with technologies for modeling possibilities, are mostly focused on intervening futures. At the same time, by presenting complex maps not around beavers' ecology and population

³⁶⁹ Parkes et al., "Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options," 23.

³⁷⁰ Lizarralde, Escobar, and Bianciotto, *El Castor (Castor Canadensis) En Tierra Del Fuego: Efectos de Alteración Ambiental y Su Aprovechamiento Como Recurso Natural*, 24.

dynamics but maps on beavers associated damage and victims such as native trees, not only into scientific texts but also into public meetings that often go unexplained, these maps also contribute asserting scientific sovereignty over the governance of Fuegian natures they can know and interpret. As one graduate student narrated,

Damage is impressive when seen through satellite images, although just in the riparian areas because here you can also see some damage in the waterfalls made by a giant lodge and how water is not crystalline... one can't but think how forests and rivers would be without the lodge.

Only a few have access to satellite images that are the ones which truly show the damage and which, therefore, generate scientific concern and responsibility for their care. Displacing the history of conviviality between beavers, trees, and citizens in the region, aerial images used to promote acceptance of eradicating politics clearly deny any sort of integration with the lived experiences that locals have had for a long time with beavers and trees and which have been made of knowledge, admiration, struggle, and concern.

Through time, expert cartography of/in TdF became a scientific device that helped with knowing territories, organizing interventions, and, by becoming more difficult to interpret, exerting scientific authority. This authority was not only esoteric,³⁷¹ or among the scientific community, but also along exoteric circles, or within the broader Fuegian community. Since those who could legitimately claim to know the territory well also had the capacities shown by the maps and technologies used, scientists started to construct their authority to know and to make decisions about interventions into the natures of TdF.

³⁷¹ Fleck, *Genesis and Development of a Scientific Fact*, 100–160.

3.5 Scientific Cartographies in Tierra del Fuego and the Cultivation of Alterity

As these more-than-human cartographic practices show, the one-time politicization of nature achieved by state scientists as a way to design prosperous and modern futures by designing natures that would, in turn, influence society is now being disputed by scientized forms of understanding nature. In this sense, the re-naturalization of nature pursued by scientists as a way to transcend political and institutional constraints to understand “pure natures,” is constituting an affirmation of scientific sovereignty over socio-environmental management. Moreover, and understanding that artifacts, scientific facts, and knowledges are always shaped by politics, the construction of detached knowledges that drone and satellite cartographies make is also enabling detached forms of governance that are promoting the eradication of an entire species without holding science accountable for it, as I will show in Chapter 5. Comparing these scientific cartographies that have represented power, beavers, and Tierra del Fuego in different ways is also a way to show the production of those realities and how it has been achieved through knowledge, technologies, and discourses. In table 3.1, I gather the main differentiation items of the three processes of map-making to show how they produced more or less powerful realities in Tierra del Fuego that today coexist in contradictory ways.

Table 3.1. Comparing three types of scientific cartographies in TdF

	1940s	1980s	2010s
Goal	Progress Maps	Control Maps	War Maps
Who Made Them	State Scientists	Local Pioneer Scientists	Transnational Scientific Organizations
For Whom	National Citizens	Scientists	Local, National, and Global Publics
Mobility	Nationally Mobile	Laboratory only	Local, National, Global
Nature Representations	National, Industrial, Political	Unknown Nature	Global Threat and Environmentalism
Nature	Nationalize Regional Difference	Develop Local Natures	Globalize Nature
Nonhuman Lives	Nationalize Animals for Production	Beavers Territoriality and Boundary Making	Lengas and Beavers: Victims and Villains of the Anthropocene
Nonhuman Technologies	Drawing, communication, print	Helicopters, pictures, drawing, statistics	Drones, Satellites, Modeling, ICT
Power	State Sovereignty: Proof Maps	Pioneers Legitimacy	Scientific Sovereignty: Proof Maps
Environment	Environment shapes society, intervene nature to design society	Nature-Human Conflicts	Society shapes environment: change social attitudes to preserve nature
Population	Distribute Populations and circulations	Control Damages	Distribute Life and Death globally, biodiversity
Nonhuman Technologies	Drawing, communication, print	Helicopters, pictures, drawing, statistics	Drones, Satellites, Modeling, New TIC
Funding	State	Local Province	Transnational Funds
Native	Native is the one who transforms the environment. The Argentinian children	Native is the one who knows nature, the locals	Native is Nature itself, and the one who protects natures, the scientists
Scientists	Frontier Men	Beaver Guys	Global Experts
Beavers	National Sign	Local Problem	Exotic Invasive
TdF	National Laboratory to colonize, national resource	Local Region to Live and know	Global Natural and economic resource and Laboratory
Agency	Nature's Agency as Possibilism	Beavers agency recognized, admired	Nature's Agency as a threat

As the table shows, scientific cartographies produce distances, co-dependencies, relations, centers, and peripheries. They are built on different conceptions of the future, memory, and territory. For instance, cartographies during the 1940s aimed at visualizing the works of the state towards industrial and national societies possible only after the emancipation of Argentina and the institutionalization of national sciences that led to more diverse territorial representations than those made by scientists from the European empires. At the same time, the expansionist national project that state geographers helped produce entailed its own powerful extractions and exclusions, including the recognition of local realities that were disavowed by an authoritarian state.

STS analyses of scientific cartographies have paid attention to how space is made within more-than-human networks. Latour's description of the construction of maps aimed at demystifying the power of scientists as exceptional humans with the capacity to make universal science and know from everywhere.³⁷² Disengaging from the question of how cartographies construct or represent realities, or as a path to resolve the question, he focused on the networks in which maps are done. In this approach, Latour showed the complexities of negotiating standards for making maps mobile and compatible, that is, for making them understandable anywhere but within existing knowledge conditions.

On one hand, Latour's analyses that aim at making science mundane, often tend to reinstate that mystification by giving all the weight to the scientific products, regardless of their more-than-human and more-than-scientific production. In my STS analysis of the histories of cartographies with beavers in Tierra del Fuego, I aim at giving the same weight to the social as I do to the scientific. On the other hand, Latour's analysis of scientific

³⁷² Jeppe Strandsbjerg, *Territory, Globalization and International Relations. The Cartographic Reality of Space* (UK: Palgrave Macmillan, 2010), 60.

cartographies was based on a particular imaginary of science mappings, the one that enables scientists to visit an unknown field site for their expeditions. This vision still carries imperial notions of science, and not surprisingly, his analysis of science in Brazil has been criticized by Brazilian STS scholars for not seeing the asymmetrical relations that those projects entailed between European and local scientists.³⁷³ In this chapter, I did not look at the maps created for scientists to locate themselves in unknown territories, but to the production of maps that helped them make sense of the technoscientific, social, and natural worlds in which they lived.

This practice of sense making also had persuasive effects, as every scientific narrative does, including the bombastic terms of the state geographers during the 1940s and the scientized languages of transnational knowledges. To various degrees, these maps helped at constructing realities that had more or less power to affect others. In this sense, and following Latour's contribution on mobility and world making, I found that those maps that were produced with large-scale technologies and politics became very mobile and capable of constructing dominant territories. The maps created during the 1940s, helped produce nationalist visions through diagramming the nature of regions and populations. Tierra del Fuego, represented as an empty and ready-to-occupy space, became a laboratory space through which the state asserted its sovereignty. This Fuegian territoriality is still today actualized both locally and nationally through demands and discourses that keep producing TdF as a desert in need of exceptional state protection.

The environmental cartographies of the 2010s, which aim at affirming a transnational scientific sovereignty beyond state boundaries, have also proven to be extremely mobile.

³⁷³ Carlos Henrique Fioravanti and Léa Velho, "Fungos, Fazendeiros e Cientistas Em Luta Contra a Vassoura-de-Bruxa," *Sociologias* 13, no. 27 (2011): 256–83.

Their aerial visions of damage, victims, and disaster invoke sorrow, reaching most of the local citizens of Tierra del Fuego in ways that have helped them understand not so much what is pictured, but the need for scientific protection of nature. Beyond Tierra del Fuego, those cartographies have also reached national and transnational contexts that have been able to locate them through the discourses of global environmentalism. With transnational technologies such as drones and satellite images, these cartographies have globalized and helped creating the native natures of TdF and with that, the legitimacy of scientists to define and protect what constitutes as native.

On the contrary, cartographies developed during the 1980s by the just-arrived settler scientists did not reach the same level of mobility. Deemed as obsolete science by the new transnational modes of knowing nature in TdF, this research was also accused of being inefficient by the experts who arranged the project for beavers' eradication. The latter argued that the methods of previous researchers and park guards were too time-consuming in the face of the necessity to reach and intervene in large areas. They also argued that promoting economic or affective relations with beavers through love, hunting, fur-industry, or tourism, were all impediments for solving the problem of beavers, as they would support procreation by beavers.³⁷⁴ In this context, the concept of mobility enables us to see the power of scientific maps to produce dominant territories through more-than-human negotiations. At the same time, if we want to also explore what worlds are made more livable, for whom, and with whom, for "living and dying well together,"³⁷⁵ other terms such as multiplicity and difference might be more productive. If the goal is to cultivate alterity and multiplicity of

³⁷⁴ Parkes et al., "Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options," 24.

³⁷⁵ Donna Haraway, *Storytelling for Earthly Survival*. Directed by Fabrizio Terranova. New York, NY: Icarus Films, 2016.

worlds to make them more inhabitable for more beings, then we might try also scholarly paths for distinguish modes of producing authoritarian and universalizing worlds, technologies, and sciences, from those that help producing difference, attachment, and curiosity with others.

4. PLURICENTRIC SCIENCE: MANAGING MORE-THAN-ANIMAL INVASIONS

4.1 Living, Dying, and Knowing the Beaverscene

Beavers are classified as semi-aquatic rodents and as mammals for the (female) species breast-feeding capacities.³⁷⁶ They have been often described and admired as a monogamous species that maintains heterosexual and mononuclear forms of biological kinship. Their families, or colonies, tend to live together and occupy a pond or a succession of ponds along river streams while sharing a common food supply. With anthropomorphizing terms, scientists have observed the family composition as made of a father, a mother, and their brood under two years, those who have been born in the current and the previous reproductive period. Once beavers age to around two years old, they leave to form their own family and settle, a period during which, alone and swimming long distances, they suffer the highest mortality rates.

In TdF, each family has an average of five members and each litter an average of 3,37 animals and no more than one a year, procreation occurring in winter and births in spring.³⁷⁷ Fuegian beavers live a maximum of fourteen years and weigh around ten kilograms if young and twenty three if adults. In TdF, coming from the initial twenty beavers, they are said to be in pretty good genetic condition despite the intense endogamy they suffered, which could have boosted the spread of genetic diseases. They eat tree bark, leaves, and

³⁷⁶ Thomas Laqueur, *Making Sex. Body and Gender from the Greeks to Freud* (Cambridge, MA: Harvard University Press, 1992). In 1758, Carl Linnaeus proposed the notion of “mammal” to define the zoological species to which Homo Sapiens belonged, defined by the fact of having mammary glands, a concept that helped intertwining the ideals of motherhood with breast-feeders.

³⁷⁷ Marta Lizarralde, Julio Escobar, and Guillermo Deferrari, “El Castor Austral,” *Investigación y Ciencia* 379 (2008): 58–64.

branches, a grazing that is more perceptible during spring and summer while one can see more cut trees in autumn, when beavers store them under water as a winter supply. They build dams to retain water in order to protect their lodges, often creating a succession of dams to reduce the strength of the stream from above. For that reason, they prefer meadows, as it becomes easier for them to retain water. In order for them to start settling, they need near access to materials in the river sides.

Their ears and nose have valves that plug up when under water and, along with their lungs, they can keep the air for up to 15 minutes under water. They can also close their lips under their incise teeth so that they can keep chewing under water. As a rodent, they not only eat cortexes and cut trees for their constructions but also chew trunks and branches to file and shorten their constantly growing teeth. Their tail not only helps them swim but also to steer and balance in water and outside, or as a lever to help them reach higher branches. They are also used to make noises to warn others to keep away from danger.

Beavers, genus *Castor*, have inhabited the Northern Hemisphere for a long time. In Europe, their presence has been dated up to 5 million years ago and, in North America, up to 2 million years.³⁷⁸ Before Europeans arrived in North America, the beaver population amounted to between 60 to 400 million individuals, and occupied all the aquatic habitats from the Arctic to the North of Mexico.³⁷⁹ Today, only two species of the family *Castoridae* exist, the Eurasian beaver, *Castor fiber Linnaeus*, and the North American beaver, *Castor canadensis Kuhl*, which seems to have derived from the former. Although both species are

³⁷⁸ Lizarralde, Escobar, and Deferrari, 58–64.

³⁷⁹ Bruce W. Baker and Edward P. Hill, "Beaver (*Castor Canadensis*)," in *Wild Mammals of North America: Biology, Management, and Conservation. Second*, ed. George A. Feldhamer, Bruce Carlyle Thompson, and Joseph A. Chapman (Baltimore, MD: The Johns Hopkins University Press, 2003), 288–310.

physically similar, they have speciated through “chromosomic reordering”³⁸⁰ due to a modification in their chromosomic set. However, their chromosomic difference was not acknowledged until the 1970s, during a second wave of beaver reintroductions in Europe.³⁸¹ Aware of the difference and moved by ecological drives to restore lost native ecosystems, scientists found that the North American beavers reintroduced in Europe during the 1930s for industrial purposes had displaced the native Eurasian ones:³⁸² there were 10.000 North American beavers and 2.000 native ones. Since then, European scientific communities have been debating the possible eradication of the North American beavers that, paradoxically, had been brought from their previously colonized lands.

The *Castor canadensis* bears in its name the intertwined history of fur-bearing beavers, the First Nations, and the European colonization in the constitution of the Canadian nation-state. It is not possible to explain the history of this country without at least partially narrating the history of the beavers. Not in vain, beavers have become the Canadian national symbol.³⁸³ As described in Chapter 2, along with the expansion of European settlers, beavers became a key source of “accumulation by dispossession.”³⁸⁴

The exploitation of their fur and other derivatives, such as castoreum, was held for smuggling, war, murder, genocide, being the flagship practice of the French and British

³⁸⁰ Lizarralde, Escobar, and Deferrari, “El Castor Austral,” 58–64.

³⁸¹ Howard Parker et al., “Invasive North American Beaver *Castor Canadensis* in Eurasia: A Review of Potential Consequences and a Strategy for Eradication Review Article Invasive North American Beaver *Castor Canadensis* in Eurasia: A Review of Potential Consequences and a Strategy,” *Wildlife Biology* 18, no. 4 (2012): 354–65.

³⁸² Bart A. Nolet and Frank Rosell, “Comeback of the Beaver *Castor Fiber*: An Overview of Old and New Conservation Problems,” *Biological Conservation* 83, no. 2 (1998): 165–73.

³⁸³ Glynnis Hood, *The Beaver Manifesto* (Toronto: Rocky Mountains Books, 2011); Chantal Nadeau, *Fur Nation: From the Beaver to Brigitte Bardot* (London and New York: Routledge, 2001).

³⁸⁴ Harvey, “El Nuevo Imperialismo: Acumulación Por Desposesión,” 99–129.

colonization in that part of the continent, with the Hudson Bay Company as its most influential enterprise.³⁸⁵ Fur trade, and especially beavers' trade, highly altered the economic and ecological relations of Canada by, among other things, introducing mass hunting. While indigenous communities had a long history of beaver trapping and coexistence, massive hunting pushed younger generations to leave aside other productive and traditional activities to enroll in the more temporarily profitable activity.³⁸⁶ Through fur trade, European settlers institutionalized asymmetrical Atlantic commercial exchanges that enabled the economic growth of Europe, while extracting the native natures of Canada to the point of leaving beavers almost extinct.

Although today the fur industry in Canada is barely significant and beavers are a protected species, the country has recognized the weight of this past by promoting the beaver as a national symbol in a way that, as national, subtracts the colonial and racializing relations between human and nonhuman settlers and native populations. As Nicole Shukin states,

The beaver had been transubstantiated into a symbolic currency long before its "official" signing-in in 1975. In 1678, the Hudson Bay Company imprinted the beaver on the shield of its coat of arms. An eighteenth-century silver Canadian trading token valued at 10 beaver pelts was smelted in the totemic shape of a beaver. In 1851, the first Canadian postage stamp, the "Three Penny Beaver," was put into circulation. And in 1920, the Hudson Bay Company published a magazine titled *The Beaver*, which remains in circulation today.³⁸⁷

First as a raw material and then as a sign, the beaver occupies a central place in the constitution of the state and its society in places such as Canada. A recent report announced that a group of scientists sequenced the map of the beaver genome as a gift in

³⁸⁵ Verena Andernatt Conley, *The War Against the Beavers. Learning to Be Wild in the North Woods* (Minneapolis, MN: University of Minnesota Press, 2005); Nadeau, *Fur Nation: From the Beaver to Brigitte Bardot*, 1-27; Shukin, *Animal Capital: Rendering Life in Biopolitical Times*, 233.

³⁸⁶ Shepard Krech III, ed., *Indians, Animals, and the Fur Trade: A Critique of Keepers of the Game* (Athens: University of Georgia Press, 1981).

³⁸⁷ Shukin, *Animal Capital: Rendering Life in Biopolitical Times*, 233.

commemoration of Canada's 150th anniversary.³⁸⁸ The symbol does nothing more than remember the immense debt of that country to that great rodent. After the fall of the fur industry, the product of an intense slaughter that almost extinguished the beavers, these became subjects of protection.

It is beavers' physical and behavioral characteristics that have historically made them such a relevant species for both ecosystems, and industry.³⁸⁹ Beavers who travelled to Patagonia were extracted from some of those Canadian reserves in the province of Manitoba after Tom Lamb had reintroduced them from New York. And while in Canada and North America beavers also provoke conflicts with human populations that are managed through various policies and technologies, their ecological modifications are mostly considered positive. In fact, beavers have been considered allies for climate change, as are good water retainers in times of drought,³⁹⁰ a characteristic that is being stressed by ecologists across North America who are proposing the introduction of beavers as a more ecological water-supply technology. In TdF, however, their activities are modifying the environment in ways that significantly harm not only daily human activities, but also entire ecosystems. In the 1980s, local scientists began to assess the epoch I call the Beaverscene, they found that beavers were the main disturbers of sub-Antarctic forests.

³⁸⁸ Juanita Bawagan, "Sequencing the Canadian Beaver Genome," CIFAR, 2017, accessed July 10, 2020. <https://www.cifar.ca/cifarnews/2017/02/13/sequencing-the-canadian-beaver-genome>.

³⁸⁹ Hood, *The Beaver Manifesto*, 31.

³⁹⁰ Hood, 31.

4.1.1 Beavers Spread, Settle, Colonize, Water

The twenty beavers introduced in the north-eastern side of Fagnano Lake (or Cami), around the Claro River,³⁹¹ the area signaled in figure 4.1, TdF in 1946 expanded from the release area until occupying most of the river streams in TdF with a non-censed population of decans of thousands.



Figure 4.1. Beavers release area in 1946 marked with Google Maps³⁹²

Beavers' spread is explained through their own biology and behavior as a species. In association with humans and technologies, their relocation from one time and space to another, or their *dispersal ability*,³⁹³ allowed them to be transported from Canada to TdF and survive. After that, their capacity to swim long distances, made possible their border

³⁹¹ Alejandro G Pietrek and Laura Fasola, "Origin and History of the Beaver Introduction in South America," *Mastozoología Neotropical* 21, no. 2 (2014): 355–59.

³⁹² "Map of Tierra del Fuego, Chile and Argentina," Google Maps, accessed July 10, 2020, <https://goo.gl/maps/KA4TDZwzWDJCqw9u9>. Reproduced with permission (see Appendix A).

³⁹³ Daniel Simberloff and Marcel Rejmánek, eds., *Encyclopedia of Biological Invasions* (Berkeley: University of California Press, 2011), 154. Dispersal ability refers to the relocation of individuals and populations from one time and space to another.³⁹³ It studies locomotory abilities, climate assistance, or passive dispersal like human transport technology. In plants, dispersal can occur through biotic and abiotic mechanisms that move them long distances and population growth.

crossing to other islands, including Chilean ones. Their “invasion stages,” or how they have colonized, established, and spread,³⁹⁴ have been studied across Chile and Argentina in attempts to measure their population growth across time, their migration channels, and their colonization patterns.³⁹⁵ Without presenting a “lag time” of spread due to initial obstacles related to distances or lack of mating options, by November 1947, tracks of adult beavers had already been joined by those of juveniles³⁹⁶ and, following a north western course along the Claro River, beavers reached Yehuín (Jhuin) Lake by the mid-1960s.³⁹⁷ In 1963 they had spread to several rivers draining into Fagnano Lake.³⁹⁸ In 1969, they crossed the Beagle Channel and colonized the Isla Navarino, expanded to the rest of the archipelago, through península Dumas, Isla Hoste, and then Isla Dawson in the Pacific Ocean and, from there, to the rest of islands in the channel (see fig. 4.2).

³⁹⁴ Simberloff and Rejmánek, 465.

³⁹⁵ Skewes et al., “Abundance and Distribution of American Beaver, *Castor Canadensis* (Kuhl 1820), in Tierra Del Fuego and Navarino Islands, Chile,” 292–296; Giorgia Graells, Derek Corcoran, and Juan Carlos Aravena, “Invasion of North American Beaver (*Castor Canadensis*) in the Province of Magallanes, Southern Chile: Comparison between Dating Sites through Interviews with the Local Community and Dendrochronology,” *Revista Chilena de Historia Natural* 88, no. 3 (2015): 1–9, accessed January 20, 2020, <https://doi.org/10.1186/s40693-015-0034-6>; Lizarralde, “Current Status of the Introduced Beaver (*Castor Canadensis*) Population in Tierra Del Fuego, Argentina, 351–358”; Marta Lizarralde, Julio Escobar, and Guillermo Deferrari, “Invader Species in Argentina: A Review about the Beaver (*Castor Canadensis*),” *Interciencia* 29, no. 7 (2004): 352–56; Petra K. Wallem et al., “Identificación de Los Mecanismos Subyacentes a La Invasión de *Castor Canadensis* (Rodentia) en el Archipiélago de Tierra Del Fuego, Chile,” *Revista Chilena de Historia Natural* 80, no. 3 (2007): 309–25.

³⁹⁶ Elio Massoia and Juan Carlos Chebez, *Mamíferos Silvestres Del Archipiélago Fueguino* (Buenos Aires: Literature of Latin America, 1993).

³⁹⁷ Juan Daciuk, “Notas Faunísticas y Bioecológicas de Península Valdés y Patagonia, IV. Estado Actual de Las Especies de Mamíferos Introducidos En La Región Araucana (Rep. Argentina) y Grado de Coacción Ejercido En Algunos Ecosistemas Surcorderos,” *Anales de Parques Nacionales* 14 (1978): 105–30.

³⁹⁸ Juan Carlos Godoy, *Fauna Silvestre. Evaluación de Los Recursos Naturales de Argentina* (Buenos Aires: CFI, 1963).

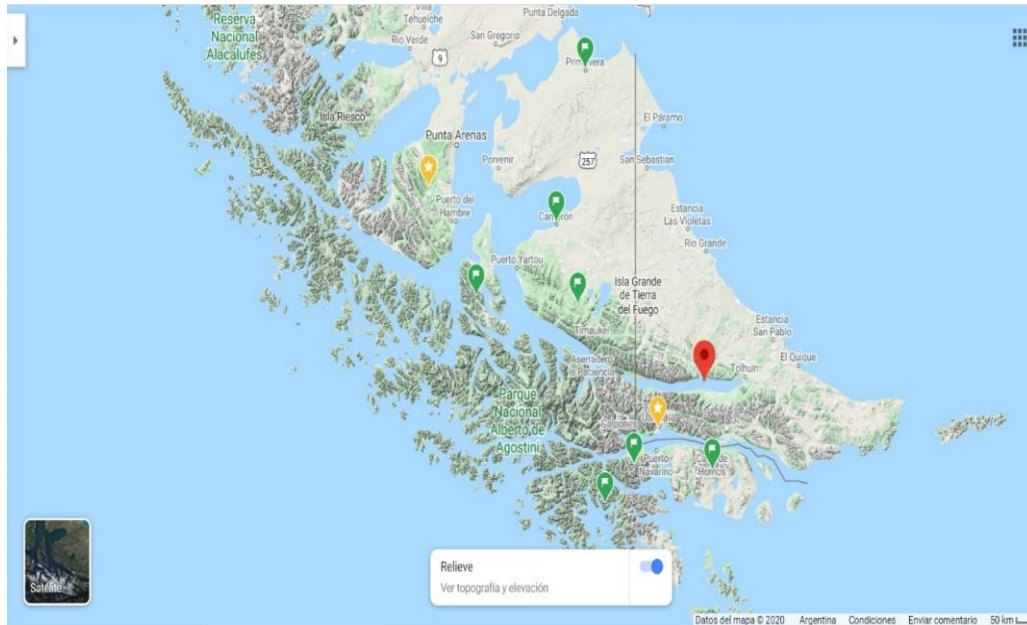


Figure 4.2. Beavers settling across the lands of TdF marked with Google Maps (2019)³⁹⁹

Biologically, beavers are *reproductive invaders* that, like rabbits, have high fecundity and survivorship rates. Thanks to their flexibility to adapt to other habitats, food supplies, and ecologies, or their *invasive behavior*,⁴⁰⁰ beavers adapted well to the rivers, mountains, and trees of TdF. While mostly concentrated in the forest areas with abundant and intricate drain systems, they have also settled in steppe and tree line areas where, in lower densities, they have been able to create ponds out of small water reserves and construct their dams and lodges using even sheep bones. They have even settled in an old mine that, after being abandoned and filled with water, beavers used temporarily.

³⁹⁹ “Map of Tierra del Fuego, Chile and Argentina,” Google Maps, accessed July 10, 2020, <https://goo.gl/maps/KA4TDZwzWDJCqw9u9>. Reproduced with permission (see Appendix A).

⁴⁰⁰ Simberloff and Rejmánek, *Encycl. Biol. Invasions*, 20. An example of social behavior is the one of unicolonial ants. Unicoloniality happens when connected networks exchange members freely, and because they do not compete, colonies can spend their energy in interspecific competition rather than in intraspecific competition. Another aspect that helps species succeed in invading has to do with mutualist behaviors, when species benefit from each other, as it happens with humans and fishes like the carp or the trout.

Their settling behavior does not necessarily follow anthropocentric forms of efficiency and optimization; they often settle in poor habitats that are chosen just for being unoccupied by other colonies.⁴⁰¹ In North America, they mark their territory and borders with scent mounds made with castoreum, a glandular secretions that was once used for human perfumes. Despite the lack of this practice by the Fuegian beavers, a group of biologists and artists experimented with these mounds with the goal of communicating and possibly constructing borders by building on the smell of beavers.⁴⁰² Results, however, were not consistent.

The beavers' spread also responds to the *enemy release hypothesis*, or the lack of natural predators in the new territories that enabled them to not only be uneaten, but also to have more time to reproduce by not having to undertake strategies to protect themselves. Beavers in TdF started to build their lodges offshore, aware of the lack of risks due to the absence of predators. Despite lacking predators, in TdF, the beaver population reached its maximum growth during the 1980s due to the *carrying capacities* of the environment.⁴⁰³ However, since some individuals have been found in Chilean mainland, beyond the islands and archipelagoes, concerns over their spread in the southern cone have justified designs that aim to eradicate them.

⁴⁰¹ Bart A. Nolet and Frank Rosell, "Territoriality and Time Budgets in Beavers during Sequential Settlement," *Canadian Journal of Zoology* 72, no. 7 (1994): 1227–37; Ruairidh D. Campbell et al., "Territory and Group Sizes in Eurasian Beavers (*Castor Fiber*): Echoes of Settlement and Reproduction?," *Behavioral Ecology and Sociobiology* 58, no. 6 (2005): 597–607.

⁴⁰² Giorgia Graells et al., "Dear Enemy: Interspecies Communication through Artisanal Scents," *Ensayos* (Tierra del Fuego: Ensayos, 2017), accessed July 20, 2020, <https://ensayostierradelfuego.net/tag/dear-enemy/>.

⁴⁰³ Parkes et al., "Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options," 14.

In addition to their biological invasibility, beavers have co-inhabited with Fuegian species and geomorphologies in asymmetrical patterns that have significantly altered entire ecosystems. In the 1980s, local scientists began to assess the epoch I call the *Beaverscene*: they found that beavers were the main disturbers of sub-Antarctic forests. The fur industry had never been implemented and, with an absence of predators, the beavers' population had

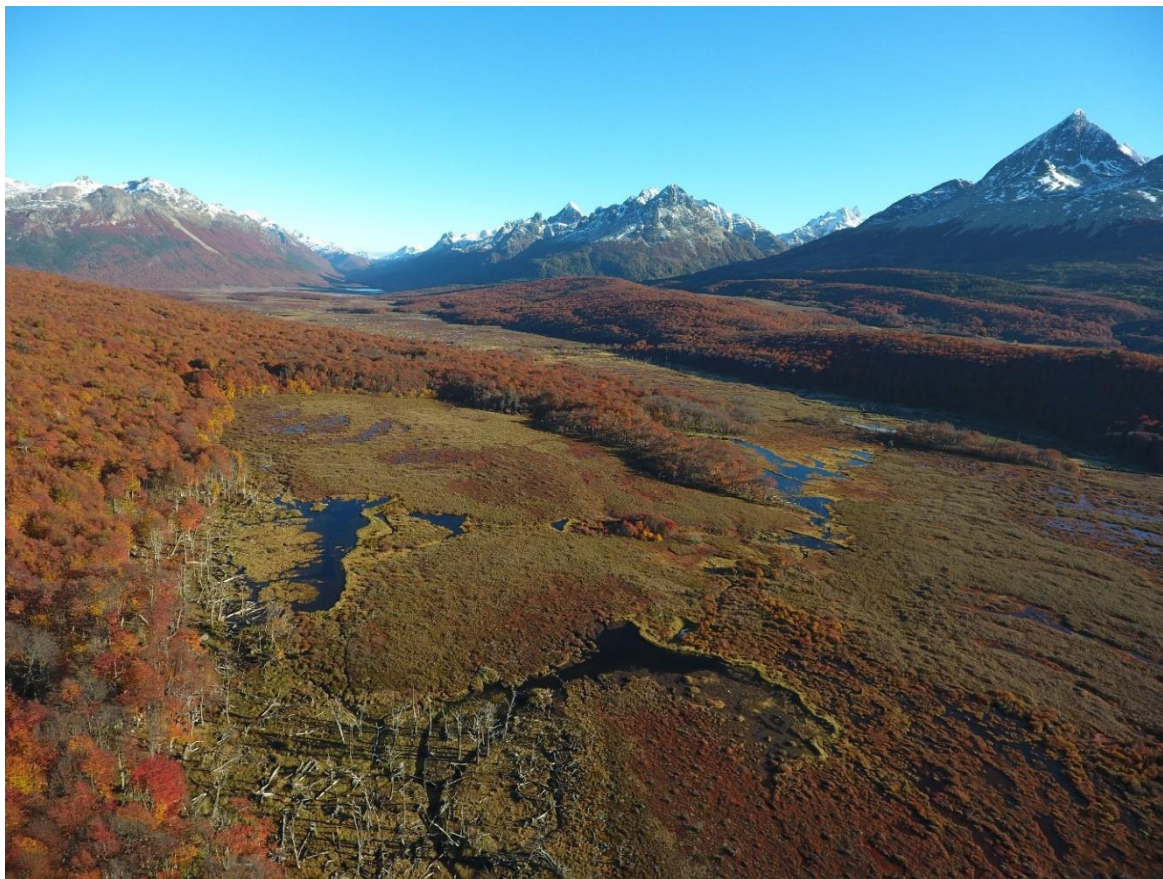


Figure 4.3. Riparian area affected by beavers. Photo Courtesy of Julio Escobar (2018)

increased exponentially and occupied most of the river streams of TdF, including the Chilean side. Without producing industrialized vital surplus, beavers today are narrated through apocalyptic and dystopian environmental discourses.

As *foundation species* in their native range, they are one of the species who can contribute the most to the biomass of an ecosystem and its structure. As a *keystone species*, like wolves, they can highly impact the ecosystem even if not being abundant. As *transformer*

*species*⁴⁰⁴ that can affect complete ecosystems, when they are invasive, they can damage entire ecosystems. As *ecosystem engineers*, like carp, they can modify the whole structure or function of an ecosystem.

In TdF, beavers design dams, organically modify rivers, flood lands, and kill native trees that, unlike the Canadian ones, are not able to recover after flooding.⁴⁰⁵ They affect hillside forests, mostly in riparian areas, but also humid peatbogs. It is when making ponds, whether in flat or terraced lands, that they increase the meadows and flooded lands. Hence the moment when they settle is the moment of their highest ecological impact.⁴⁰⁶ The modification of rivers and organic structures results from their grazing and tree cutting activities, which provokes an accumulation of organic materials that ends up modifying the chemical composition of water, soil, and sediments in the ponds and riparian areas. Comparing the organic composition of occupied and unoccupied ponds, a study showed that ponds with beavers presented 7 times more carbon, 3.5 times more nitrogen, and 1.85 times more phosphorus.⁴⁰⁷ These multiplicative effects have drawn more attention to global research on beavers in TdF as possible agents of carbon sequestration.

However, the most perceived damage associated to beavers' activities is forest decay. Dead trees in TdF are not only seen by scientists in their fieldtrips but are often seen also by locals and tourists when practicing trekking and even from the road. Beavers eat, chew, and cut Fuegian native trees, mostly *lengas*, *Nothofagus pumilio*, *guindos*, *Nothofagus betuloides*, and

⁴⁰⁴ Simberloff and Rejmánek, *Encycl. Biol. Invasions*, 668.

⁴⁰⁵ Anderson et al., "Do Introduced North American Beavers *Castor Canadensis* Engineer Differently in Southern South America? An Overview with Implications for Restoration," 40–41.

⁴⁰⁶ For that reason, it is sometimes better to control a population in an occupied area than to aim at eliminating it without success and provoking them to move to a new area.

⁴⁰⁷ Lizarralde, Escobar, and Deferrari, "El Castor Austral," 63.

ñires, *Nothofagus Antarctica*. The lengas constitute the main food supply of beavers. Their abundance helped beavers' expansion while being the only kind of *Nothofagus* that is consumed at a faster rate than they can be replaced.⁴⁰⁸ Most of the lengas do not die from chewing, but rather because of flooding caused by the beaver dams. Unlike in North America, where the sedimentation and flooding produced by beavers help species proliferate and trees grow back faster, also given the warm temperatures of summer, in TdF lengas need at least twenty years to return. Lengas only regenerate through seeding and

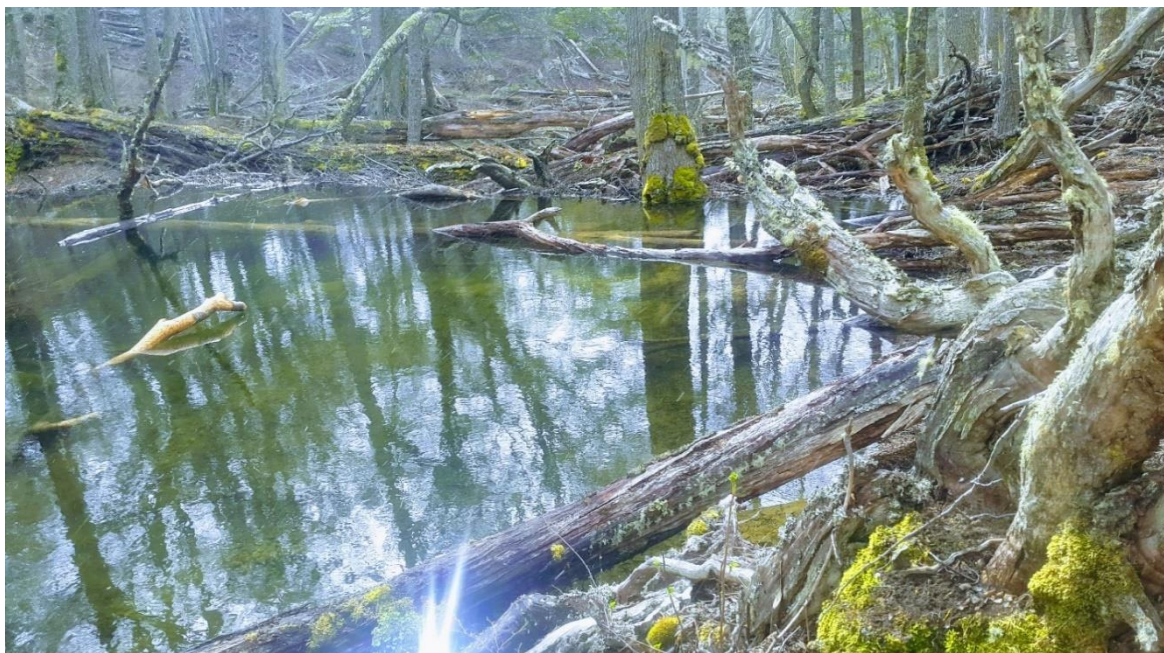


Figure 4.4. Beavers' pond in Tierra del Fuego (2018)

once beavers abandon a site it is very difficult for these seeds to germinate in a land full of grass, sediments, and hydric saturation.⁴⁰⁹

⁴⁰⁸ Wallem et al., "Identificación de Los Mecanismos Subyacentes a La Invasión de *Castor Canadensis* (Rodentia) En El Archipiélago de Tierra Del Fuego, Chile," 318.

⁴⁰⁹ Guillermo Martínez Pastur et al., "Understorey Succession in *Nothofagus* Forests in Tierra Del Fuego (Argentina) Affected by *Castor Canadensis*," *Applied Vegetation Science* 9, no. 1 (2006): 143.

Having removed the native forests next to the banks of most of the Fuegian rivers, North American beavers are argued to “engineer differently in South America.”⁴¹⁰ In TdF they attack only forests that have not been exploited by humans, and thus they have caused the biggest alterations to sub-Antarctic forests in the Holocene. Having impacted these lands to the same extent as European colonizers, the difference is that beavers affect areas inhabited by a “unique species assemblage,”⁴¹¹ which are the only ones protected against



Figure 4.5. Remains of one native tree (2018)

logging. However, despite the alarmism, a recent study shows that there are more areas impacted by chewing than by flooding, so that actual forest recovery is much more feasible than was previously thought.⁴¹²

⁴¹⁰ Anderson et al., “Do Introduced North American Beavers *Castor Canadensis* Engineer Differently in Southern South America? An Overview with Implications for Restoration,” 33–52.

⁴¹¹ Jonathan J. Henn, Christopher B. Anderson, and Guillermo Martínez Pastur, “Landscape-Level Impact and Habitat Factors Associated with Invasive Beaver Distribution in Tierra Del Fuego,” *Biological Invasions* 18, no. 6 (2016): 1679–88, <https://doi.org/10.1007/s10530-016-1110-9>. It measured forest covers rather than beaver presence through satellite technologies.

⁴¹² Henn, Anderson, and Martínez Pastur, 1679–1688.

Along with the increasing damage of lengas caused by beavers' ecosystem, the symbolic value of the native tree has also changed. Lengas had for a long time been considered weak and inferior in comparison to foreign woods, a perception that resulted from settler encounters with lengas that were ill because of the invasion of *teredos*, a wood worm, that made them lose their structural resistance by creating channels inside.⁴¹³ To enhance the value of local trees, local regulations today limit the entrance of foreign woods that sometimes pass the border without going noticed. At the same time, local businesses are now producing high design goods made of lenga wood that are branded as authentically Fuegian, including furniture and mate jars that are used as gifts in scientific conferences. Once scientists in TdF have settled enough to obtain a house, they also fill it with books on the history of TdF as well as with furniture made of lenga. As when many Argentinians let others know the origin of their commodities when they are nationally produced, from shoes to shampoos, when one visits these houses, lenga objects are often mentioned and displayed to the ignorant visitors as a marker of belonging to the region through an affinity with local knowledge and a contribution to the local natures and politics.

4.1.2 Knowing and Controlling: TdF as a Pluricentric Global Laboratory

The Beaverscene is comprised of apocalyptic landscapes of abandonment and more-than-animal invasive interventions. But this scene of ruination is not only accomplished through the beavers' capacities to colonize new areas. Beavers were regulated towards protection for their economic, aesthetic, and cultural value until 1981, when local

⁴¹³ José Cabezas, *Presencia Argentina En El Canal de Beagle* (Buenos Aires: Bamba, 1978), 15, Biblioteca [982 (829.0) CAB 791], Archivo del Museo del Fin del Mundo, Ushuaia, Tierra del Fuego, Argentina.

governments first enabled their hunting. Since the 1980s, regional institutions of both Chile and Argentina have designed measures to control their population in similar ways, first following a plan for controlling populations and promoting the trapping and trading of fur and meat diets, and then, with the entrance of international actors, a binational vision of eradication managed by international and local scientists and organizations.

The first studies to determine the spatial distribution of beavers in the South of Chile and Argentina were reported in 1963 and 1964.⁴¹⁴ In 1974, the general Augusto Pinochet subscribed to the Convention on International Trade in Endangered Species of Wild Fauna and Flora,⁴¹⁵ which attempted to limit trading of protected animals, including the beaver. In 1975, a Chilean botanic ecologist already mentioned the threats that introduced species like beavers posed for keeping the homeostasis of “pristine” landscapes.⁴¹⁶ In 1980, two Chilean biologists analyzed the environmental impact of beavers in the Navarino Island, suggesting that their population could actually be benefiting some aquatic birds and riparian grazers.⁴¹⁷ In 1981, their introduction was declared a mistake with severe ecological consequences.⁴¹⁸

From then on, beavers started to be configured in reports and policies in TdF as dangerous species that had negatively altered the landscape by cutting trees, building dams and canals, and modifying diversity. In a binational environmental treaty between Chile and

⁴¹⁴ Amaya, “Consideraciones Generales Sobre La Conveniencia de La Caza Del Castor [Castor Canadensis] En Tierra Del Fuego,” 1.

⁴¹⁵ Convención sobre Comercio Internacional de Especies Amenazadas, de Fauna y Flora Silvestre, Ministerio de Relaciones Exteriores, Biblioteca del Congreso Nacional de Chile, March 25, 1975, Decreto 141.

⁴¹⁶ Edmundo Pisano, “Características de La Biota Magallánica Derivadas de Factores Especiales,” *Anales Del Instituto de La Patagonia (Chile)* VI, no. 1–2 (1975): 123–37.

⁴¹⁷ Walter Sielfeld and Claudio Venegas, “Poblamiento e Impacto Ambiental De Castor Canadensis Kuhl, En Isla Navarino, Chile,” *Anales Del Instituto de La Patagonia* 11 (1980): 247–57.

⁴¹⁸ Amaya, “Consideraciones Generales Sobre La Conveniencia de La Caza Del Castor [Castor Canadensis] En Tierra Del Fuego,” 7.

Argentina, beavers were defined as a an “exotic invasive species” that had caused great damage.⁴¹⁹ During the 1980s and 1990s, scientists, local administrations, and foresters from National Parks in both Chilean and Argentinian TdF, initiated strategies for controlling the beaver population. Those included the regulation, promotion, and capacitation of hunting for commercial purposes, the import of trapping technologies, the funding of studies to determine the quality and exploitation of beaver fur and meat, as well as economic studies to optimize the national and international beaver fur trade.

With the entrance of new environmental transnational actors in the region between 2000 and 2004, mainly the Wildlife Conservation Society (WCS), the paradigm of control shifted to one of eradication. WCS had received a big mass of land (275,000 ha) in the Chilean side of the TdF, today known as Parque Karukinka. Those lands belonged previously to a tree logging company, Trillium, which had gone bankrupt after environmental denounces against the logging of such an extensive area.⁴²⁰ Once bankrupt, those lands were acquired in the form of debt by the investment company Goldman Sachs Group, which, after various failed projects with the lands, donated them to WCS. For this, Goldman Sachs received the 2006 Secretary of State’s Award for Corporate Excellence (ACE)

⁴¹⁹ Tratado entre Chile y Argentina sobre Medio Ambiente, August 2, 1991, accessed July 10, 2020, https://www.uach.cl/externos/epicforce/pdf/legislacionchile/acuerdos_inter/trat_chile_argen_medio_a mb.pdf

⁴²⁰ Klepeis and Laris, “Contesting Sustainable Development in Tierra Del Fuego”; Peter Keller, “Transboundary Protected Area Proposals Along the Southern Andes of Chile and Argentina: Status of Current Efforts Introduction: Chilean and Argentine Area Efforts in Patagonia,” in *Watson, Alan; Sproull, Janet; Dean, Liese, Comps. Science and Stewardship to Protect and Sustain Wilderness Values: Eighth World Wilderness Congress Symposium; September 30-October 6, 2005 Symposium* (Anchorage, AK: Fort Collins, 2007), 248; Julia Amrock, “Challenges for Private Sector Conservation: Sanderson’s The Future of Conservation in Tierra Del Fuego,” *Indiana Journal of Global Legal Studies* 13, no. 2 (2006): 599–510; David R Tecklin and Claudia Sepulveda, “The Diverse Properties of Private Land Conservation in Chile: Growth and Barriers to Private Protected Areas in a Market-Friendly Context,” *Conservation and Society* 12, no. 2 (2014): 209–10.

which was delivered by Condoleezza Rice in Washington DC. WCS, without previous presence in Chile or experience in owning and managing lands, transformed them into a National Park.

When becoming aware of the problems associated with the beaver population that inhabited the Park, WCS centered the species at the core of its expert agenda, one that was most constructed along the lines of the international knowledges of biodiversity conservation that placed invasion biology and eradication at the core. While species control responds to local knowledges around hunting and conflict, invasion biology responds to international interests. While the scientists and foresters who had been working on the problem since the 1980s argued that they could possibly have succeeded in continuing to acquire the capacities that were under way, the entrance of new international actors in the region pushed for a perspectival change.

WCS was able to enroll local actors in a change of perspective through various mechanisms. First, to counter the perspective of population control, it started to circulate the idea that enhancing hunting would always perpetuate the problem because hunters would have interests in maintaining beaver populations. Evaluating the previous experiences as a failure, it was argued that they did not work due to the low prices offered for beaver furs in the international market, the lack of motivation for hunters to enter wild and remote areas, and the lack of trapping and controlling knowledges in the region.⁴²¹

Second, in a meeting in 2006 in Punta Arenas, they brought transnational experts from New Zealand that, having participated in other eradication projects and succeeded, such as the eradication of goats in Galapagos, were able to inspire the scientific community

⁴²¹ Lizarralde, "Current Status of the Introduced Beaver (*Castor Canadensis*) Population in Tierra Del Fuego, Argentina," 358.

in TdF who did not believe it could be possible to eradicate the beavers.⁴²² Once more or less convinced, they organized a feasibility study in which transnational experts from New Zealand, the United States, Canada, and Australia, came to TdF to evaluate the possibilities of eradication, taking into account social, economic, technical, and biological aspects. In two weeks, they evaluated the problem and exchanged experiences with scientists and local actors. Their report concluded that eradication was feasible, but difficult, because a whole set of conditions would have to be achieved, including the creation of a permanent binational structure to organize and fund the project.⁴²³

After years of local and international work in TdF, the governments of Chile and Argentina signed a binational agreement in 2008 for the “Restoration of southern ecosystems affected by the invasion of North American beaver (*Castor canadensis*).”⁴²⁴ They agreed to look for funding separately, given that each country’s administrative procedures made it difficult to present the same project for two countries. While Chile asked for a smaller fund from GEF, Argentina in 2013 asked for a bigger one that would include a national strategy for invasive species, in which beavers were one of its components.

With those recommendations and with dreams of international funding for advanced environmental research in TdF, invasion biology became a frame of global interest. WCS not only provided a push for that frame but also expertise in how to navigate global grants.

⁴²² Member of CADIC, Personal Communication. (2019).

⁴²³ Parkes et al., “Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options,” 47.

⁴²⁴ Acuerdo entre la República Argentina y la República de Chile sobre la Restauración de los Ecosistemas Australes Afectados por el Castor Americano (*Castor Canadensis*), Santiago de Chile: Ministerio de Relaciones Exteriores, Comercio Internacional y Culto de Argentina y Ministerio de Relaciones Exteriores de Chile, 2008.

With this shift, first Argentina in 2012⁴²⁵ and two years later Chile,⁴²⁶ each obtained funding for a project to build capacities in how to restore the landscapes affected by beavers through funding from the Global Environmental Facility (GEF), which projected more than eighteen million US dollars for Argentina for a project that would cost more than twenty-two million, and more than five million to Chile for an estimated cost of eight million US dollars. Both projects became approved for a working plan of four years, from 2016 to 2019. With two projects for studying the feasibility of eradicating the beavers about to end, my expert informants mostly think it is impossible to carry out their task: they cannot access some islands during hard climate conditions, and they do not see funding and institutional continuity, especially for a problem that transcends national borders.

In this way, the Beaverscene is not only made by apocalyptic beavers, biology, sociology, and ecology, but also by a history of imperial failed adaptations and multiple abandonments. The beavers' introduction ignored local geographies; beavers abandon areas when they have extracted all their supplies and then move on to colonize and highly affect a new area, letting their abandoned dams be destroyed by weather and the absence of their work over time, until a time that will let water run again. The introduction of new international actors came with the erasure of the population control approach and the knowledges already acquired; the end of the international funds makes it difficult to continue with the once-new approach of eradication.

⁴²⁵ "Strengthening of Governance for the Protection of Biodiversity through the Formulation and Implementation of the National Strategy on Invasive Alien Species (NSIAS)," Global Environmental Facility, 2012, accessed July 10, 2020, <https://www.thegef.org/project/strengthening-governance-protection-biodiversity-through-formulation-and-implementation>.

⁴²⁶ "Strengthening and Development of Instruments for the Management, Prevention and Control of Beaver (*Castor Canadensis*), an Invasive Alien Species in the Chilean Patagonia," Global Environmental Facility, 2014, accessed July 10, 2020, <https://www.thegef.org/project/strengthening-and-development-instruments-management-prevention-and-control-beaver-castor>.

4.2 Globalist Science of Invasion

When the projects offered their bidding, WCS was chosen to manage the project in Chile and the local province with public scientific institutions in Argentina. When coordinating the projects, not only national and cultural differences were contested or reproduced but also perspectives coming from NGOs, policy makers, and scientists from academia. In addition, different values and epistemologies in each institution or park emerged. In the next section, I will analyze the science of invasion in TdF as established upon the beaver problem as one that is configured as *pluricentric*: first, it is made through various research groups that significantly differentiate what has to be known, how, and for which goals and values. Second, those groups relate with multiple exoteric circles within the broader local, national, and transnational community. Invasion science, in this way, cannot be easily approached in terms of paradigms or streams. Rather, it is made through knowledges, practices, and values that tend to create various centers, from species management to interdisciplinarity, and which are cut crossed with broader social values and norms, from conservationism to scientism.

Invasion science in Tierra del Fuego not only required transboundary environmental governance to address a population that moves across Chile and Argentina, but also required multiple levels of coordination between regions, the state, and transnational organizations. Hence, coordination sometimes required to reproduce some centers and borders while creating new ones: while WCS became a central organism of governance in the Chilean TdF that displaced the power of state organisms when designing and funding measures to control the beavers, in Argentina that power was maintained within the local province and the local scientific institutions. The multiple meetings maintained between the

institutions at both sides also created forms of regional collaboration that shared its austral identity regarding each state capital. At the same time, national regulations for implementing policies in each country, made experts of each side of TdF to often respond through nationalistic visions that reified national differences among experts located in each side of the region.

However, the relevance of beavers as a problem of global relevance and interest, and the characteristics of TdF as a global natural laboratory, also made it to be at the center in each country for developing national regulations over invasive species and biodiversity conservation. In this view, it is not that Chile or Argentina sought to preserve the natures of their exotic and remote regions but rather that those regions themselves allied with transnational knowledges and funding to push the state to do something, now not against the entrance of foreign capitals but with them.

While the introduction of beavers had a markedly top-down perspective coming from nationalist sciences that promoted internal colonialism from a unique center, their eradication breaks this verticality and presents a plurality of centers in dispute that present other geometries of power and coloniality. In a sense, beavers are the producers of invasion science, funding, and knowledge in the Southern Cone. TdF and the beavers are the ones provoking and mobilizing a whole set of practices and national and international sciences into constituting Invasion Conferences, journals, and management strategies. At the same time, those knowledges came from transnational actors and were used as a way to get funding for global interests. Nonetheless, those were reconfigured and recreated in ways that, because of the history of TdF, respond to invasion science as a more-than-animal phenomena.

4.2.1 *The Globalist Institutionalization of Invasion Ecology*

Invasion science is, for most scholars, part of the broader science of ecology. Ecology, in the southern cone, has been recognized as a discipline itself since the 1970s, and built upon previous works from European and national naturalists studying animals and plants relationally since the 18th century.⁴²⁷ In Europe, ecology was defined first by German biologists at the end of the 19th century as the science which studies relations between an organism, an understanding followed by Carl Linnaeus, who described it as the study of the “economy of nature,” one in which species contributed each there to maintain a balanced nature.⁴²⁸ For Alexander Von Humboldt, ecology studied the environment of each species as well as the relations of symbiosis and antagonism with others, giving rise, with that, to the ecology known as “centered in one species.”

Following this history of ecology from the global North, at the beginning of the 20th century, scientists from the United States joined Europeans and started to study communities and populations. During the 1920s, the botanist Frederic Clements, influenced by North American naturalists, suggested that ecologists should study the “history of nature” in order to show how successive plant alliances ended up modifying landscapes.⁴²⁹ With Charles Elton as the most recognized scientist, the New Ecology of the 1930s studied communities through concepts such as the food chain, the species population pyramid, or the ecological niche. During the 1940s, the officialization of the term “ecosystem” became the

⁴²⁷ Fabián M. Jaksic, Pablo Camus, and Sergio A. Castro, *Ecología y Ciencias Naturales. Historia Del Conocimiento Del Patrimonio Biológico de Chile*. (Santiago de Chile: DIBAM Dirección de Bibliotecas, Archivos y Museos, Centro de Investigaciones Diego Barros Arana, 2012), 13.

⁴²⁸ Jaksic, Camus, and Castro, 15–17.

⁴²⁹ Jaksic, Camus, and Castro, 18–19.

main object of ecology, and which was defined as the study of the “all the interactions among the physical environment and the species that inhabit it.”⁴³⁰

Following in this line of study, the Odum brothers led the development of the school of ecosystem ecology during the 1950s. Placing thermodynamics at the center of their science, they studied how nutrients circulated among the living and non-living elements of an ecosystem, understanding relations between and among energy fluxes, with concepts such as productivity, efficiency, and ecosystem metabolism.⁴³¹ In addition, the weight of thermodynamics contributed the use of mathematical methods that, for the complexity of the systems, demanded computational models. While the Odum brothers studied ecosystems, others studied populations in ways that also linked computation and modelling, as “they better obey mathematic laws.”⁴³² Since the 1970s, some ecologists started to criticize the consequent mathematization and robotization of nature for reducing the world to numbers that escaped reality. Among those critics was Daniel Simberloff, who had studied island biogeography with E.O. Wilson; Simberloff reconfigured ecology while developing invasive science research.

Those mathematical and computational models were reflected in the establishment of invasion biology. In 1980, participants in the Stellenbosch Conference in South Africa went on a fieldtrip and observed pine forests that were expanding without affecting local vegetation, an event that helped them reconfigure the notions of exotic species to better

⁴³⁰ Jaksic, Camus, and Castro, 21.

⁴³¹ Jaksic, Camus, and Castro, 21.

⁴³² Christopher Anderson, personal communication, June 2019.

understand invasibility.⁴³³ In 1982, the Scientific Committee on Problems of the Environment (SCOPE) leveraged the interests of Stellenbosch and organized a global project named the Scope Program on the Ecology of Biological Invasions. With globality at the center, they motivated an increase in quantitative data around invasive species and their effects. Reciprocally, because modeling and quantitative analysis were at the center of the 1980s, scientists focused on them saw also an application field in invasion studies. In addition, the numbers and modeling of an alarming future helped gain strength through funding and support of the study of invasion science (IS).⁴³⁴

The establishment of IS research during the 1990s has been attributed to at least two events. First, the Stellenbosch Conference anecdote related above took on the status of an origin story. In 1982, the Scientific Committee on Problems of the Environment (SCOPE) leveraged the interests generated at Stellenbosch into a globally organized project named the Scope Program on the Ecology of Biological Invasions.⁴³⁵ Besides these two events, the amount of data that was becoming available on invasive species also provoked interest because it allowed quantitative analysis and modeling to occupy the center of ecology at the end of the 1980s and beginning of the 1990s.

Within ecology, IS studies the biological and ecological impacts caused by non-native species when settling and expanding. Broadly, a species becomes invasive when being foreign to a particular territory, or exotic, it *also* causes ecological *or* economic harm.

⁴³³ Daniel Simberloff, "Charles Elton, Neither Founder nor Siren, but Prophet," in *Fifty Years of Invasion Ecology. The Legacy of Charles Elton*, ed. David M. Richardson (Oxford, UK: Wiley-Blackwell, 2011), 11–24.

⁴³⁴ Ninad Avinash Mungi and Qamar Qureshi, "On the History, Politics and Science of Invasion Ecology," *DIALOGUE: Science, Scientists, and Society* 1, no. 1 (2018): 1–17, <https://doi.org/10.29195/DSSS.01.01.0009>.

⁴³⁵ Simberloff, 11–24.

Invasion biology studies the way species are introduced; how they spread and establish themselves in foreign ecosystems; their capacity to harm other species through competition; as well as mechanisms for controlling them and managing their population. As a young thought collective, it has gained public support for addressing the problems of invasive species, mostly economic costs, and environmental degradation, including the threats they represent to local and global forms of biodiversity.

When an invasive species settles and spreads, it often does so by displacing and transforming native species and ecosystems. Invasion science attends to how to intervene and restore modified landscapes and, while most invasions are only addressed once they have produced irreversible damage, it also studies how to predict species and ecosystem capacities to invade or be invaded. With the aim of preserving ecosystems from invasion or reducing the damaging effects of those, invasion science is mostly filled with biologists and ecologists while, being highly normative, it is also intertwined with management, policy, economics, and communication knowledges. It is also intertwined with knowledge of biodiversity, and the need to manage it.

The concept of biodiversity first appeared in 1968 in the book *A different kind of country*, written by Raymond F. Dasmann (Franco 2013, 22), although it did not gain popularity until the 1980s.⁴³⁶ As a term with multiple uses and definitions,⁴³⁷ it broadly refers

⁴³⁶ José Luiz de Andrade Franco, "O Conceito de Biodiversidade e a História Da Biologia Da Conservação: Da Preservação Da Wilderness à Conservação Da Biodiversidade," *História (São Paulo)* 32 (2013): 21–48; Cheryl Lyn Dybas, "Biodiversity: The Interplay of Science, Valuation, and Policy," *BioScience* 56 (2002): 792–98; Alice Vadrot, *The Politics of Knowledge and Global Biodiversity* (London and New York: Routledge, 2014). In 1980, Thomas Lovejoy coined the term "biological diversity;" in 1986, "biodiversity" was the title that Walter G. Rosen gave to a national forum, an abbreviation that started to become common. In 1988, E.O. Wilson popularized it by publishing a book named "Bio-Diversity."

⁴³⁷ Vadrot, *The Politics of Knowledge and Global Biodiversity*; Aiko Huckauf, "Biodiversity Conservation and the Extinction of Experience," *Mitt. Arbeitsgem. Geobot. Schleswig-Holstein Hamb* 65 (2008): 329–44.

to the variety of life in all its forms (cells, genes, populations, species, ecosystems). Entangled with calls for action, the knowing and governing of life through biodiversity knowledges transformed ways of policing nature: from protecting particular valuable species such as the polar bear, to preserving biodiversity as a value in and of *itself*. In 1992 in Rio de Janeiro, 155 states signed the Convention on Biological Diversity (CBD) which regulated biodiversity while defining “invasive alien species” as those “whose introduction and/or spread outside their natural past or present distribution threatens biological diversity.”⁴³⁸

Invasion Ecology grew exponentially during the 1990s, when academic publications on the topic gained greater currency as measured by citations (see fig. 4.6). In a sense, for life scientists, invasion is to biodiversity what, for anthropologists, globalization is to cultural diversity. Both are concerned with the tensions between change and conservation and with the asymmetries produced through the acceleration and increase of circulations; both propose conservation efforts that assume that neither culture nor nature can be restored or kept intact without being dead. As figure 4.6 shows, constructed after searching academic words containing the words “invasion biology” and “anti-globalization” in English and Spanish, invasion science citations grew during the 1990s in parallel to citations around “anti-globalization.” For some scholars, invasion biology is itself a product of the Anthropocene era,⁴³⁹ a conscious endeavor to restore ecosystems.

⁴³⁸ The Convention on Biological Diversity and Invasive Alien Species, 2009, accessed July 10, 2020, <https://www.cbd.int/idb/2009/about/cbd/>.

⁴³⁹ Paul Robbins and Sarah A. Moore Moore, “Ecological Anxiety Disorder: Diagnosing the Politics of the Anthropocene,” *Cultural Geographies* 20, no. 1 (2013): 3–19.

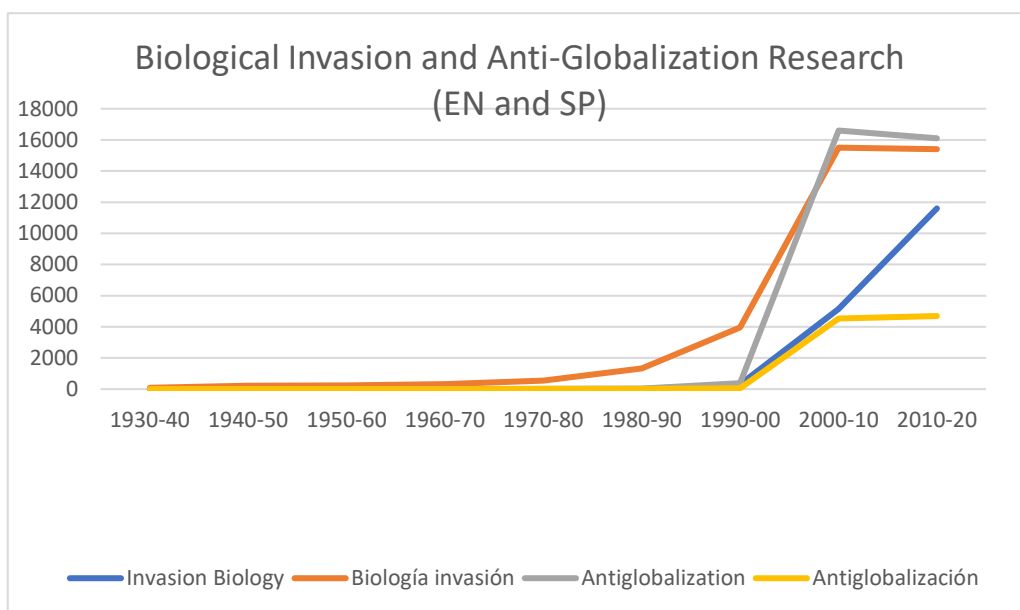


Figure 4.6. Amount of academic publications containing "invasion biology" or "anti-globalization," both in English and Spanish.

Most publications cite as original source the work of Charles S. Elton who, right after the two world wars in the 1950s, warned about the risks of species movements and invasions to other countries.⁴⁴⁰ Elton had published his book *Animal Ecology* in 1927. After studying Arctic populations, he proposed the concepts of the “ecological niche” and the “food chain.”⁴⁴¹ From 1926 to 1931, he had also worked as a biological consultant for the Hudson Bay Company in Canada, where he studied the extinction of fur-bearing animals, including beavers, using the records of trappers from 1736.⁴⁴² In 1958, Charles Elton, as one of the leaders of the New Ecology and of the science of invasive alien species (IAS), delineated the increasing circulation of species as a threat:

when contemplating the invasion of continents and islands and seas by plants and animals and their microscopic parasites, one's impression is of dislocation,

⁴⁴⁰ Charles S. Elton, *The Ecology of Invasions By Animals and Plants* (London: Chapman and Hall, 1972).

⁴⁴¹ Charles S. Elton, *Animal Ecology* (Chicago: The University of Chicago Press, 2001).

⁴⁴² Peter Crowcroft, *Elton's Ecologists: A History of the Bureau of Animal Population* (Chicago, IL: University of Chicago Press, 1991), 4–5.

unexpected consequences, an increase in the complexity of ecosystems already difficult enough to understand let alone control, and the piling up of new human difficulties.⁴⁴³

While his work on invasions had been mostly silenced for four decades, it became the pioneering citation for the emergence of the 1990s invasion science. As argued in the book *Fifty Years of Invasion Ecology: The Legacy of Charles Elton*⁴⁴⁴, Elton examined the success of some species to invade territories as an evolutionary outcome that was often intertwined with human activities. He suggested distinguishing “natural” from “anthropogenic animal movements.” Out of this, he conceptualized a theory that distinguished invasions from ecological succession, or the replacement, disappearance, and spread of species within ecosystems due to natural evolution processes. Invasion, therefore, constitutes a non-natural change. While species have become distinct across time and the globe, human or non-natural activities were strongly modifying those differences.

4.2.2 Scientific Wars: Neutral vs. Value-Laden

In 2011, 18 scientists published “Don’t Judge Species by their Origins” in *Nature*,⁴⁴⁵ arguing that the threats of invasive species have been overstated and that invasion biology builds its own epistemology in the assumption that we can know what were the native conditions to restore. In their view, we should accept species and practice “novel ecologies,” because many invaders have actually had positive impacts. The article was contested by another group of scientists who argued that the problem was not about exotic or aliens per se since native species could also behave as invaders—as had happened with coyotes, who

⁴⁴³ Elton, 50.

⁴⁴⁴ David M. Richardson, ed., *Fifty Years of Invasion Ecology. The Legacy of Charles Elton* (Oxford, UK: Wiley-Blackwell, 2011).

⁴⁴⁵ Mark A. Davis et al., “Don’t Judge Species on Their Origins,” *Nature* 474, no. 7350 (2011): 153–54.

expanded exponentially helped by the disappearance of wolves and the modification of their habitats.⁴⁴⁶ The point, for this group, was not the construction of the category but that those who are invaders have effects that require urgent action in response, action that can be delayed by this sort of reflexivity around terms and values because, as the Encyclopedia for Biological Invasions starts,

as you read this, thousands of species of plants, animals, fungi, and microbes have been or are being transported by humans to new locations, whether deliberately or inadvertently.⁴⁴⁷

With those alarmist visions, these scientists critique those biologists who are making efforts to analyze the values embedded in invasion science, often accusing them of losing time while species are moving fast. In addition, they also accuse them of doing bad social science, weak and out of place, for not having the strong social science background they should make “philosophical and sociological” studies, as my informants said.

Robbins and Moore⁴⁴⁸ have analyzed this controversy in psychoanalytic terms. They group scientists into two groups: those who are afraid of the negative influence of humans on earth, or “anthrophobes,” and those who are too humble and fear human values in one’s own science, or “autophobes.” Hence, while some scientists express their concern over the anthropogenic spread of invasive species and advocate for the urgency of repair, others, such as those who published the 2011 article, are concerned with the implications of our values in the sciences we make.

⁴⁴⁶ Simberloff and Rejmánek, *Encycl. Biol. Invasions*, 95.

⁴⁴⁷ Simberloff and Rejmánek, xxiii.

⁴⁴⁸ Robbins and Moore, “Ecological Anxiety Disorder: Diagnosing the Politics of the Anthropocene,” 4.

One of the researchers who has been most extensive in critiquing the social science approach to questioning the values of invasive science for retarding urgently needed scientific responses is Daniel Simberloff. Both Simberloff and Wilson were born in the United States surrounded by people who would encourage them to appreciate nature. In a recent TED Talk, Wilson explained how he cultivated his advocacy for nature through different species. As a teenager, he got various (male) periods:

As a little boy, and through my teenage years, I became increasingly fascinated by the diversity of life, I had a butterfly period, a snake period, a bird period, a fish period, a cave period, and finally and definitively, and ant period.⁴⁴⁹

Through this attention to various species and especially ants and other insects, he is considered to have coined the term *biodiversity*. In his Ted Talk, he defined what he calls “hidden biodiversity”, that which is still unknown by science and which is objectified by the claim that *we* know over five thousand species out of the 1,5 million that have been estimated. Biodiversity then is connected to this knowledge, one that has increased thanks to technologies that allow access to remote regions or mapping the genetics of animals. Technologies and remotization are the basis of this understanding of nature, which is in turn the basis for a novel frontier, “the biological frontier,” defined by Wilson as unlimited if small creatures are considered.

With Daniel Simberloff as a graduate student, they developed the theory of *Island Biogeography*,⁴⁵⁰ which argues that islands are privileged sites for studying biological theories due to their isolation (allowing scientists to study speciation, community structures, distribution, trophic relations, and changes because if they are there, it means they are from

⁴⁴⁹ Edward O. Wilson, “My Wish: Build the Encyclopedia of Life,” Ted Video (United States, 2007), accessed July 10, 2020, www.ted.com/talks/e_o_wilson_on_saving_life_on_earth/details.

⁴⁵⁰ Daniel Simberloff, “Equilibrium Theory of Island Biogeography and Ecology,” *Annual Review of Ecology and Systematics* 5 (1974): 161–82.

there), and their “biotic depauperization” because species that would not survive in other more connected biotas, would not survive. Due to its isolation, relations among species can be easily inferred.⁴⁵¹ For those reasons, islands have been privileged sites for experiments, as natural laboratories for testing pest control. Besides, islands are deemed fragile and vulnerable to human destruction and extinction. From the study of evolution, it is easier to study species morphology, behavior, and niches. Wilson and Simberloff have themselves critiqued their own theory, mostly because it depended on “the size of the island and its distance to immigration sources,”⁴⁵² which shows a dehistoricized ecology as if the initial conditions did not matter for the ways in which arrivals unfold. Apart from being ahistorical, Simberloff’s later experiments contradicted his own theory by showing how most insects constituted temporal assemblages rather than regular forms of specialization.⁴⁵³ Through his research, Simberloff contributed stabilizing an invasion biology strongly associated to notions of isolation, species origins, and movements, all of which ended up privileging species classification based on origins and damage for evaluating and intervening ecosystem interactions.

From a very different standpoint, Brendon M.H. Larson has deeply addressed how these classifications are mediated with values. With a background in an Interdisciplinary Program at UC Santa Barbara, he works at the University of Waterloo in Canada, in the

⁴⁵¹ Today, in Tierra del Fuego, roads are surveilled by police check points at every entrance of the towns as well as in every road intersection. Because of its size, there is a sense that movements can be easily controlled just by checking who comes in and out. In fact, there is the common speech that says that in TDF you can leave your car on since nobody will steal it, they cannot take it out of the island. At control checks they are supposed to watch over drugs, nature resources, and tourist expeditions.

⁴⁵² Kim Sterelny and Paul E. Griffiths, *Sex and Death: An Introduction to Philosophy of Biology* (Chicago and London: The University of Chicago Press, 1999), 259.

⁴⁵³ Daniel Simberloff and William Boecklen, “Santa Rosalia Reconsidered: Size, Rations, and Competition,” *Evolution* 35, no. 6 (1981): 1206–28.

School of Environment, Resources, and Sustainability. He has a trajectory of collaborating with philosophers, anthropologists, and other social scientists besides biologists and ecologists, including people in Tierra del Fuego. In 2020, he organized a panel for the EASST/4S conference of Science & Technology Studies. Larson, like Wilson and Simberloff, was given various awards and recognitions since a child. His publications range from journals of environmental science and management, public press, the journal *Biological Invasions* edited by Simberloff, the journal *Nature and Culture*, and the journal *Environmental Values*. Across his writings, he has studied citizens and experts' perceptions and values of the natural world, as well as the metaphors used in invasion science and their effects, as I show in the next section.

It has been argued that most critiques on invasion biology have been addressed to its values and not its knowledge.⁴⁵⁴ Exceptionally, some of the hypotheses commonly accepted in invasion biology have also been questioned as not having enough evidence, including the belief that invasive species are more easily established and spread on islands than in continents.⁴⁵⁵ Addressing those values, the main issues debated have been concentrated around the native-alien distinction and the use of militaristic metaphors.

The Native – Alien Distinction: Social scientists around the globe have critically responded to the epistemic discourses of invasion science, arguing that nationalist and xenophobic values are reproduced by classifying species according to their origin and

⁴⁵⁴ David Munro, Jamie Steer, and Wayne Linklater, "On Allegations of Invasive Species Denialism," *Conservation Biology* 33, no. 4 (2019): 797–802.

⁴⁵⁵ Jonathan M. Jeschke Lorena Gómez Aparicio Sylvia Haider et al., "Support for Major Hypotheses in Invasion Biology Is Uneven and Declining," *NeoBiota* 14 (2012): 1–20.

migration.⁴⁵⁶ The idea that there is an original nature to restore reinforces a romanticist view of nature, without history and without humans.⁴⁵⁷ Within this frame, if a species is defined as non-native and harmful at any level, it will be eradicable; this is what Braverman⁴⁵⁸ refers to as “purity management,” a technology that might be preventing the possible benefits that alien species might provide. IS engages with a nature that is ahistorical, one that neglects change, as if by eliminating alien species, ecosystems could return to the past.

Acknowledging the impossibility of a return, many ecologists are embracing the concept of “novel ecosystems,” which suggests that consideration of inventive methods for engaging with natures that have always been impure and have always coevolved with humans.⁴⁵⁹

Within the science of invasion, Larson acknowledged these critiques, arguing that we have inherited old terminologies that have gone unquestioned.⁴⁶⁰ While invasion notions were based on scientific observations, they were embedded with nationalist values:

Native once meant anything not produced directly by artifice, including feral animals and naturalized plants (...) Natives and aliens have been subdivided by uncertainty of origin and degree of naturalization. The familiar “invasive species” may have first appeared in the colonial journal *The Indian Forester* in 1891. Over the

⁴⁵⁶ Susanna Lidström et al., “Invasive Narratives and the Inverse of Slow Violence: Alien Species in Science and Society,” *Environmental Humanities* 7 (2015): 1–40; David I. Theodoropoulos, *Invasion Biology. Critique of a Pseudoscience* (Blythe, CA: Avvar Books, 2003).

⁴⁵⁷ Davis et al., “Don’t Judge Species on Their Origins,” 153–154; Jamie Lorimer, *Wildlife in the Anthropocene. Conservation after Nature* (Minneapolis: University of Minnesota Press, 2015); Kristin B. Hulvey et al., “Incorporating Novel Ecosystems into Management Frameworks,” in *Novel Ecosystems: Intervening in the New Ecological World Order*, ed. Richard J. Hobbs, Eric S. Higgs, and Carol M. Hall (Oxford, UK: Wiley-Blackwell, 2013), 157–71; William Cronon, “The Trouble with Wilderness; or, Getting Back to the Wrong Nature,” in *Uncommon Ground: Rethinking the Human Place in Nature*, ed. William Cronon (New York: W. W. Norton & Company, 1995), 69–90.

⁴⁵⁸ Irus Braverman, “Is the Puerto Rican Parrot Worth Saving? The Biopolitics of Endangerment and Grievability,” in *Economies of Death: Economic Logics of Killable Life and Grievable Life* (Oxon, OX: Routledge, 2015), 73–95.

⁴⁵⁹ Erle C Ellis and Navin Ramankutty, “Putting People in the Map: Anthropogenic Biomes of the World,” *Frontiers in Ecology and the Environment* 6, no. 8 (October 1, 2008): 439–47.

⁴⁶⁰ Brendon MH Larson, “Thirteen Ways of Looking at Invasive Species,” in *Invasive Plants: Inventories, Strategies and Action. Topics in Canadian Weed Science, Volume 5*, ed. David R. Clements and Stephen J. Darbyshire (Quebec: Canadian Weed Science Society, 2007), 131–56.

ensuing century, many other categories and terms were proposed, but most were rarely used or forgotten.⁴⁶¹

Larson is pointing out the historical and institutional construction of invasive as a category that responds to a complex reality but which, by being mostly associated to origins, tends to obscure the complex dynamics involved in species and ecosystems relations. For him, new terms should be proposed that account for complexity in more useful terms,

The concept of permanently attaching taxa to places survived the Darwinian revolution and remains contentious as twenty-first century ecologists address notions of wildness, balance, propriety, nostalgia, and fears of irreversible change."⁴⁶²

Engaging with the arguments of novel ecosystems, in the journal *Alternatives*, he has argued for intimacy with invasive species, an argument that resonates with the multispecies scholars claiming the flourishing of "awkward creatures"⁴⁶³, the racialization implicit in "trash-labelling" certain species,⁴⁶⁴ the need to "de-stigmatize insects"⁴⁶⁵, or the commitment to "move beyond good and bad narratives."⁴⁶⁶ In a similar way, Larson reflects on the demonization and otherization of invasive species to justify their control. In his words,

many who oppose these species only recognize the few non-native species they have been taught – and taught to dislike – rather than having a deeper knowledge of the species around them.⁴⁶⁷

⁴⁶¹ Matthew K. Chew, "Invasion Biology: Historical Precedents," in *Encyclopedia of Biological Invasions*, ed. Daniel Simberloff and Marcel Rejmánek (Berkeley: University of California Press, 2011), 370.

⁴⁶² Chew, 371.

⁴⁶³ Franklin Ginn, Uli Beisel, and Maan Barua, "Living with Awkward Creatures: Vulnerability, Togetherness, Killing," *Environmental Humanities* 4 (2014): 113–23.

⁴⁶⁴ Kelsi Nagy and Phillip David Johnson II, eds., *Trash Animals: How We Live with Nature's Filthy, Feral, Invasive, and Unwanted Species* (Minneapolis and London: University of Minnesota Press, 2013).

⁴⁶⁵ Angela Last, "Who's the Pest? Imagining Human-Insect Futures Beyond Antagonism," *Science as Culture* 23, no. 1 (2014): 98–107.

⁴⁶⁶ Lidström et al., "Invasive Narratives and the Inverse of Slow Violence: Alien Species in Science and Society," 4.

⁴⁶⁷ Brendon Larson, "Friend, Foe, Wonder, Peril: Invasive Species Are All of These," *Alternatives* 34, no. 1 (2008): 15–17, accessed July 10, 2020, <https://www.alternativesjournal.ca/energy-and-resources/friend-foe-wonder-peril>.

Some claim that, since the goal of invasion science is to protect biodiversity by managing invasions, the meaning and characteristics of “non-native” or “invasive” have been left free to the interpretation of each scholar.⁴⁶⁸ For Larson, these distinctions are not only relative but also too simplistic given the variety of responses required for each species and ecosystem.⁴⁶⁹

Metaphors and Militarism: Others have questioned how the influence of Charles Elton in invasion science has been translated from his militaristic context.⁴⁷⁰ This position shows that Elton’s militaristic metaphors originated from his experiences in Britain during WWII, where Elton was hired to assist on the eradication of rats and mice as pests, or the “war against rats” that was constructed as saving the country from food losses. Militaristic metaphors deploy terms such as enemy, pest, or invader, and critics of this metaphoric system argue that war does not well represent the reality of invasion. The adoption of war metaphors speaks more about scientists themselves than about the species they study. In addition, scientists who think in terms of war metaphors may reproduce social values that tend to be racist, nationalist, and xenophobic in ways that influence different social worlds beyond biology. Moreover, these metaphors contribute to enhancing particular relations and bodies while obscuring others.

⁴⁶⁸ Mungi and Qureshi, “On the History, Politics and Science of Invasion Ecology,” 1–17.

⁴⁶⁹ Larson, “Thirteen Ways of Looking at Invasive Species,” 131-156.

⁴⁷⁰ Mark A. Davis, Ken Thompson, and John Philip Grime, “Charles S. Elton and the Dissociation of Invasion Ecology from the Rest of Ecology,” *Diversity and Distributions* 7 (2001): 97–102; Brendon Larson, *Metaphors for Environmental Sustainability. Redefining Our Relationship with Nature* (New Haven and London: Yale University Press, 2011).

Along these lines, Larson has used the work of feminist historian of science Evelyn Fox Keller, who studies metaphors and the attribution of meanings to ecological concepts.⁴⁷¹ For him, those meanings are socially coproduced as they circulate in ways that open alternative interpretations through “larger metaphoric webs” that interact with histories of racism, xenophobia, and discrimination. Larson studied the use of “progress,” “competition,”⁴⁷² “barcoding,” and “meltdown” in ecology and invasion science. Invasional meltdown refers to how invasive species facilitate each other’s invasions.⁴⁷³

Although Larson acknowledged the power that this metaphor has to activate peoples’ concern, he also showed how it can promote negative visions of nature and be ineffective by being too alarmist to allow people do anything. In addition, this sort of “advocating with fear,”⁴⁷⁴ like in other wars-against, ends up contributing moral values against foreign bodies and diseases. In his view, science should create other metaphors beyond fear and apocalypse.

This critique of metaphors used in invasion science has drawn response. For Roger L. Kitching, such insights as Larson’s are too “subjective,” and draw connections between social and natural worlds without evidence. To counter the idea that Elton’s science was influenced by the world war, Kitching argues that Elton used that language *before* he worked

⁴⁷¹ Brendon Larson, *Metaphors for Environmental Sustainability. Redefining Our Relationship with Nature* (New Haven and London: Yale University Press, 2011).

⁴⁷² Larson, *Metaphors for Environmental Sustainability. Redefining Our Relationship with Nature*, 83. In studying competition he brings the exchanges that Darwin and Wallace had around the term. While Darwin had initially proposed the idea of “law of struggle,” Wallace suggested the change to avoid people’s misunderstanding it with competition, and Darwin changed it for “survival of the fittest,” an option that ended up producing the feared effects. For Larson, this example shows how later research overlooked relations of symbiosis among species and organisms and how it also coproduced social values of competition.

⁴⁷³ Simberloff and Rejmánek, *Encycl. Biol. Invasions*, 360.

⁴⁷⁴ Larson, *Metaphors for Environmental Sustainability. Redefining Our Relationship with Nature*, 161.

on the war against rats.⁴⁷⁵ In the same line, Simberloff recognizes the pressing context of war in which Elton lived and worked, but stressed that Elton's use of "militaristic" language responded not to the context but to his work on eradicating animals like muskrat in Britain.⁴⁷⁶

Leaving aside the questioning on how militarist language in IS originated, one can see how Elton was haunted by war as a scientist. He had been studying pests like rats and mice, acknowledging that industry needed pest control and game conservation studies of single species rather than communitarian ecology. Understanding ecology and ecosystems was, for him, a struggle between the industrial understanding of animals as populations for production or eradication, and a more interactive understanding of the evolution of populations in relationship with their environments. Just as the geographers of the Argentinian 1940s concerned themselves with designing nature to synthesize the human and the environment, Elton was concerned with the synthesis of population and environment. Yet the data he had gathered was regarding exotic or pest species, and therefore he tried to pursue his interests while working mostly with single species. In a sense, "pests" are the origin of species.

4.3 Pluricentric Science of Invasion from/in/to Austral Patagonia

Once transnational environmental actors and invasion knowledges and funding arrived and spread in TdF as a way to address the beavers' conflict, scientists from TdF also

⁴⁷⁵ Roger L. Kitching, "A World of Thought: 'The Ecology of Invasions by Animals and Plants' and Charles Elton's Life's Work," in *Fifty Years of Invasion Ecology. The Legacy of Charles Elton*, ed. David M. Richardson (Oxford, UK: Wiley-Blackwell, 2011), 3–10.

⁴⁷⁶ Richardson, *Fifty Years Invasion Ecol. Leg. Charles Elt.*, 11–24.

used their funding to promote national networks and regulations for the management of Exotic Invasive Species (EIS). The First National Workshop of Invasive Biology and Conservation of Biodiversity took place in 1998 in Bahía Blanca, Argentina.⁴⁷⁷ Four years later, universities started to develop technologies for monitoring and organizing information. Nationally, the Argentinian GEF has four components, one of them the explicit pilot project to eradicate beavers in TdF, and the other three being the building of: i) institutional capacities; ii) regulatory and financing mechanisms; and iii) the protocols for managing EIS. Through this structure, both Chile and Argentina prioritized seven invasive species to address in addition to beavers.⁴⁷⁸

In April 2019, I attended the first national meeting for the management of EIS that, with funding from the GEF, took place within a luxury hotel with good food and drinks despite the recent cuts to environmental issues in Argentina at that time. The goal was to congregate experts around the country for three days to take decisions over how to organize a national structure on EIS that would meet once a year. This goal was not achieved, given the lack of time dedicated to that issue and the, participants argued, a lack of preparation that left many experts without knowing about the event.

Each region and species have a different history. Regarding the red-bellied tree squirrels in a city nearby Buenos Aires, experts highlighted their success in transforming the public's positive views of the species by teaching in schools, providing propaganda bags, creating amateur videos, and stressing the damage they do by always communicating the

⁴⁷⁷ Sergio Zalba, Alberto Scorolli, and Sandra Fiori, *Manejo de Invasiones Biológicas y Conservación de Biodiversidad Conclusiones Del Taller Nacional*. Bahía Blanca: Universidad Nacional del Sur, 1998.

⁴⁷⁸ In Argentina: didymo seaweed, red-bellied tree squirrel, tamarisk trees, giant African snail, bullfrog, and the privet. In Chile: rabbit, wild pig, muskrat, yellow jacket wasp, blackberry, and *espinillo* trees.

event in which, one day, a whole neighborhood went without electricity for one hour due to a short circuit cause by a squirrel (never mentioning whether or not the squirrel died).

From a National Park located in the North of Argentina,⁴⁷⁹ experts presented their successful project to eradicate wild pigs, despite their eradication having created a now problematic increase of deer. Since they also had problems with poaching, foresters designed a project in which they, not without difficulties, achieved the enrollment of poachers into the goals and values of the Park. Poachers registered and became hunters of the wild pigs in the park at their cost, in a work that enabled them to continue enjoying hunting while gaining status for contributing to conservation efforts. In addition, they used the wild pigs' meat to feed school children in the town. At the meeting, a forester presented the plan, a hunter his method, and a biologist presented her analysis of efficiency by bringing complex graphics that analyzed how much time and cost was spent to hunt at different times. While each of them argued to be the leading expert of the plan, as they later and separately told me, their entitlement was justified by actively denying the bringing of others down. They all highlighted, to me, the important role others had to enable the group's success and legitimacy.

Through beaver ecology in TdF, the history of scientific institutions, the value of the region as a natural laboratory of global interest, the appropriation of lands by transnational environmental actors and knowledges, a whole set of species, practices, meetings, regulations, norms, and values started to become nationally standardized while, incipiently, structuring a novel niche for research in Argentina as well as in Chile in parallel with increasing awareness and problematization of invasive species by the public.

⁴⁷⁹ Parque Nacional El Palmar, Ubajay, Entre Ríos.

4.3.1 Knowing for Controlling: Evolution and Local Collaboration

In 1980, before CADIC opened its doors, two biologists researched beavers in the National Park of TdF, in Ushuaia.⁴⁸⁰ They studied the distribution, density, and effects of beavers and published a report through the National Parks National Service, which branded every page with the logo “knowing the patria is a duty. Preserving its natural resources, an obligation.” They obtained their data through a field study of two months, the information a forester and husband gave them, and the areal pictures the Navy had taken in 1970. They also contested the idea of beavers forming an anthropomorphized family as the one defined generally by scientists and which I introduced above.⁴⁸¹

For these biologists, colonies are composed by a group of beavers who share a river, a food supply, and a common dam. However, they disagree with the idea of the “typical colony” made of an individual family, parents, and brood up to two years. Following many authors, they argue that there are too many deviations from that ideal to consider it typical, and that colonies vary seasonally and annually.⁴⁸² All their references, being the first study undertaken in the global South, came from studies of beavers in North America. They suggested and achieved the design of a project to control the beavers in the National Park of TdF, in Ushuaia.⁴⁸³

⁴⁸⁰ Patricia Marconi and Ana Balabusic, “Distribución y Abundancia Del Castor En Tierra Del Fuego Con Especial Referencia a Su Efecto Sobre Los Ecosistemas,” (1980). Biblioteca. Archivo del Museo del Fin del Mundo, Ushuaia, TdF, Argentina.

⁴⁸¹ See section 4.1.2.

⁴⁸² Patricia Marconi and Ana Balabusic, “Distribución y Abundancia Del Castor En Tierra Del Fuego Con Especial Referencia a Su Efecto Sobre Los Ecosistemas,” (1980). Biblioteca. Archivo del Museo del Fin del Mundo, Ushuaia, TdF, Argentina.

⁴⁸³ Parques Nacionales, “Proyecto de Control de La Especie Exótica Castor Canadensis En El Parque Nacional Tierra Del Fuego” (1980). Biblioteca [599.32(829.0) PRO5199]. Archivo del Museo del Fin del Mundo, Ushuaia, Tierra del Fuego, Argentina.

While the project was not operationalized, the research went without much conflict partly given that one of the biologists was married to one of the foresters. It aimed at eliminating beavers through trapping and shooting the beavers, avoiding their heads (as skulls are vital for studying population dynamics) in selected areas of the park, asking trappers to write down sex and age, and measures and to break down dams and lodges. The control would be carried by the foresters, requiring just two rifles for the whole 1-year long project.

Since 1988, Marta Lizarralde started to study beavers' ecology, genetics, and impacts. She is the director of the laboratory of Molecular Ecology in CADIC and, since 2005, also directs a genetic laboratory in Buenos Aires. Lizarralde has gained various research projects, most of them from national organizations and CONICET, and is currently the vice president of the Argentinian Association of Ecology. She has participated in some international meetings and research groups and has visited the United States three times.⁴⁸⁴ Beyond biology, she has taken courses around Science Policy, Academic Writing, and Gender, Science, and Technology.

In the 1980s, and interested more in genetics than in ecology, she also developed research in trapping, fur trade, and controlling, as she needed to collaborate with politicians and foresters to ask them for samples and give something in return. In fact, since the 1980s, collaboration between CADIC and National Parks has produced continued reports around the population dynamics. When foresters hunt beavers and give samples to scientists, they

⁴⁸⁴ Through a bilateral cooperation agreement between CONICET and NSF, she has gone to the University of Minnesota (2017), as a visiting scholar to the school of Life Science in Arizona State University (2014, 2016, and 2018), and a postdoc visiting in UC Berkeley (2009-2010).

analyze their age and sex, data that helps explain if they are new beavers, if they are reproducing more, or not. The strategy to control, a mix of interests and actors.

In this line, her work to study beaver population dynamics, areal and land studies, satellite images and census in autumn in the basins of Isla Grande, which terrains were colonized and their population dynamics: population size by averaging dams in each basin, active colonies used by each family in a year, number of members per colony (a data provided by trappers), dam extension, the potential accumulation of sediments, a cartography of ponds to study the pattern of occupation in each basin, and eco-genetic studies.⁴⁸⁵

More recently, Lizarralde has moved beyond beavers to study invasive species more broadly, proposing, for example, a classification of invasive species in Argentina according to their level of risk and impact, with different actions associated with each of these aspects.⁴⁸⁶ In her view, and despite the current predominance of the eradication strategy, only the Asiatic squirrel, reindeers, and donkeys would be considered for eradication given their biology and our capacities.⁴⁸⁷ Likewise, muskrats, beaver, rabbits, wild pigs, or deer should be managed through strategies of control and cats and dogs with mitigation measures.

Unlike other sites and projects, her team has been collecting and studying beavers in the National Park of TdF since 1988. Her research on conservation genetics aims at broadly minimizing genetic deterioration, making reservoirs, preserving endangered species and controlling invasive ones. With beavers, her team used live or dead specimens to get

⁴⁸⁵ Lizarralde, Escobar, and Deferrari, "El Castor Austral," 58–64.

⁴⁸⁶ Marta Lizarralde, "Especies Exóticas Invasoras (EEI) En Argentina: Categorización de Mamíferos Invasores Y Alternativas de Manejo," *Mastozoología Neotropical* 23, no. 2 (2016): 267–77.

⁴⁸⁷ Lizarralde, 267–77.

samples of blood, reproductive tracts, skulls, and fresh cut tissues (liver, spleen, muscle) and later studied their chromosomes.⁴⁸⁸ The implications for control come from the information given by each beaver that, taken from a particular place, can show how beavers move by studying how young or old they are in each site. Since Fuegian beavers had been isolated and all came from the same initial twenty, genetic research values this population to study speciation. In addition, since beavers are a problematic species to eliminate, they also provide a unique opportunity to collect a great number of samples, which is rarely common or easy among wild mammal studies.

While Lizarralde also managed to bring experts from North America who helped design a strategy for studying beavers that would be “sellable”⁴⁸⁹ and for improving trapping knowledges, her focus on genetic research and its engagement with the control strategy demanded by foresters, led her and her team to focus more on managing conflicts between local actors, or how to collaborate having different goals and forms of knowing nature. Since this required a permanent local presence to gain trust and exchange knowledges, members of her team have also been recognized for developing deep knowledges around beavers *in the field*, or as many scientists told me, “the real beavers’ guys.”

At the same time and through local requirements and national funding, they also developed expertise and reports around hunting methods, trapping regulations, fur trading, and beaver meat. In a colloquium around beavers and invasive species at the University of

⁴⁸⁸ They found that Fuegian beavers had the same karyotype as those in the North except in the sexual chromosomes, the X austral is more variant and totally metacentric (it produces arms of same longitude).

⁴⁸⁹ Researcher, personal communication (2019).

Tierra del Fuego in 2018, one local teacher and state officer asked, “how did we pass from “bringing chefs and learn how to cook beavers to eradicating them?”

4.3.2 Knowing for Restoring: Eradication and Transnational Research

The initial director of the eradication project in the Argentinian side of TdF was the biologist Adrián Schiavini, who is also the head of a laboratory in the area of Ecology and Wildlife Conservation at CADIC and who had also been the Director of CADIC (2007-2011). Moved by nature documentaries of the 1970s and a teacher who had taught him about ecology and evolution in a religious school and during the 1970s, he grew his passion for biology. After studying biology at the University of Buenos Aires during the years of the last military dictatorship,⁴⁹⁰ he graduated in 1983 and escaped the big city of Buenos Aires, arriving in TdF in 1985. There, and at least for his first year, he was the only graduate student within an institution with barely 10 members. At that time, making science in TdF was marked by remoteness from the centers of knowledge production, given the absence of internet, of direct phone lines, and the times it took to obtain scientific articles from abroad or to publish in them.

He arrived collaborating with archeologists in studying the use of sea lions by past human communities by analyzing remains at human archeological sites, the project from which he defended his dissertation in 1990. Always inspired by an interest in human-nature

⁴⁹⁰ In an interview, Adrián shared the difficulties of those years marked by silence and police presence in the university and the marks it left not only on society but also in the scientific community. As he told me, a permanent crack was installed as a “back noise” at universities among those who left and those who stayed. While the former distrusted people who stayed as accomplices of the military regime, those who stayed tended to implicate those who left as having the resources or luck enough to have been able to leave.

relations, he then started to develop a trajectory that implied studying multiple species and problems in the region. While many natural scientists tend to specialize in a species or area, Schiavini's focus on human-nature relations and conflicts enabled him to become involved in a variety of research topics, dissertations, and environmental management projects.

From sea lions during the 1980s, he also studied, along with the dissertation work of his advisees, seabirds, dolphins, fisheries, and penguins during the 2000s, mink and beavers since 2010 and, recently, native *guanacos* and the just declared exotic wild dogs. In addition to his personal interests, he also recognized the influences of the pressure to publish, especially when he started his career. After years in TdF, his interests became more focused on applied knowledges for orienting and planning public policies that responded to environmental problems in the region.

Schiavini first became involved with the beavers around 2005, when sitting in a meeting with policy makers and other social actors who were analyzing the failures of previous strategies to control the beavers' population. With the absence of Marta Lizarralde, who had departed Tierra del Fuego to open her laboratory in Buenos Aires, Schiavini became the local referent scientist when ideas of eradication started to settle. Once eradication was thought to be a possibility, Schiavini, who was also the Director of CADIC at that time, became the person who welcomed and guided the team of experts that came to evaluate the feasibility of eradicating beavers. During the 2010s, he co-authored papers and reports describing the project of eradication in collaboration with state officers of Chile and Argentina, and with managers of WCS. The project was installed in the international scientific community of eradication sciences with the absence of Marta Lizarralde, who is extensively referenced for providing data around the population dynamics and

environmental impacts of beavers, but whose name was associated with the initial strategy of control, the one that was to be overcome.

Through those papers, eradication science is defined as a tool “for significant and durable conservation outcomes.”⁴⁹¹ In Austral Patagonia, these hoped-for aspirations include restoring ecosystems and their ability to provide ecosystem and economic services to human wellbeing. In addition, eradication entangles local concerns with international interests on biodiversity.⁴⁹² Eradication science focuses beyond techniques for controlling beavers to studying management in broader scope, including the coordination of management needs, private funds, and public goals. This vision, therefore, requires intense planning and, in the case of beavers, a plan that includes development, capacity building, eradication and restoration, surveillance, biosecurity and evaluation. The celebrated shift of vision from controlling to eradicating also provides and requires other kind of funding, as the plan estimates a cost of thirty to forty million US dollars, not including initial phases and post-surveillance activities.

In 2015, once the funds were approved and accepted by the Argentinian administration, Adrián Schiavini, who had pushed for and written the project, was chosen as the project manager until 2017, when the provincial administration took the role. Nowadays, and after the project’s completion, which will be discussed in more detail in chapter 5, he is leading a new project with wild dogs in Tierra del Fuego. As with the beavers, he does not remember how he ended up leading this project that started to be discussed in 2009. Considered as harming the environment and the economy of local

⁴⁹¹ Fernanda Menvielle et al., “American Beaver Eradication in the Southern Tip of South America: Main Challenges of an Ambitious Project,” *Newsletter of the IUCN/SSC Invasive Species Specialist Group* 29 (2010): 9.

⁴⁹² Menvielle et al., 9.

landowners for attacking sheep herds, wild dogs were placed into the category of exotic invasive species with Schiavini leading the policy change. For this, the distinction between domesticated and human-supervised dogs over unsupervised wild or stray dogs, whether rural or urban, was his main argumentation.

Schiavini's laboratory employs researchers and technical personnel who used to work with Marta Lizarralde; they were able to provide knowledge and experience to the team, while also benefiting from the wide increase of resources that this vision shifts provoked. In association with the eradication project, Schiavini has had two doctoral students that, in addition to participating in the planning, setting, and coordination of the pilots, also conducted two independent research topics. One of them studies beavers' demography by analyzing the age of beavers through the study of their teeth, which have marks that show various processes along the life of the animal. For this, he has boiled almost one thousand beaver heads, a very valuable number for mammal research, and a very well-known fact by the rest of the researchers at CADIC, who got used to beaver cooking smells. The second fellow is studying the efficiency of eradication by comparing the pilots of 2014 with those of 2017, and measuring the time to free an area of beavers either per night or per hunter visit, considering types of traps, their weight, and their different regulations.⁴⁹³ They highlight the need to understand the efficiency of eradication not as hunting more beavers in less time, but rather as hunting fewer beavers each time, or the efforts needed to eliminate the last individual of a colony.

⁴⁹³ Pablo Jusim et al., "First Test for Eradication of Beavers (*Castor Canadensis*) in Tierra Del Fuego, Argentina," *Biological Invasions* 22 (2020): 3609–19.

4.3.3 Knowing for Integrating: Socio-Ecology and Managing Conflicts

Christopher B. Anderson, in his early 40s, studies Austral Patagonia at the intersections of biology, ecology, and social sciences. As a transnational and transdisciplinary scholar, he encourages and organizes exchanges at CADIC by receiving visiting students from different disciplines and by participating in international research projects and grants. He welcomed me to his laboratory as a visiting scholar at the Socio-Ecological Studies Group at CADIC, a collaboration that included working space and subsidized accommodation shared with other graduate students. During my stay and beyond, he has offered me continuous mentoring support⁴⁹⁴ and ongoing possibilities for collaboration.⁴⁹⁵

While most researchers at CADIC arrived to TdF in order to escape the city, Anderson, went further. Like many other US ecologists, he became interested in studying nature through his childhood experiences in a rural area of North Carolina. He also had a close relative being the first woman professor of biology at the University of North Carolina during the 1950s, when students were all male. This helped him see science as historically situated. Having studied beavers and the effects of removing dams in the US, he went to the Chilean side of TdF as a bag packer and at the end of the 1990s. He then entered the Institute

⁴⁹⁴ This included not only answering my questions around biology or ecology or the history of the beavers in the region, but also affective and institutional support for better navigating my stay at CADIC.

⁴⁹⁵ In his group, I contributed an evaluation of their coordination through an ethnographic assessment of the infrastructures, meanings, and affective dimensions of their interdisciplinary practices. My analysis was shared with the group in a reflective form that helped its members become more aware of the transformations their participation in the group had promoted. It was also included in a co-authored book chapter that is under review. I also collaborated on a co-authored paper around sociotechnical imaginaries and species introduction in TdF. I presented twice in the Socio-Eco colloquium and once at CADIC. In addition, I went to the field sites of one of Anderson's fellows in a way that helped me better understand how they connected their office work with their work in the field, while also being useful in helping them gather their samples faster.

of Ecology at the University of Georgia in 2001, where he decided to do his dissertation on beavers in Austral Patagonia.⁴⁹⁶

After the trips, he moved to the small city of Puerto Williams, on the Navarino Island. Anderson worked at the Ethnobotanic Omora Park studying ethnobiology, indigenous knowledges, tourism, and nature conservation. In 2008, he obtained a postdoc from the Chilean Milenio Institute of Ecology and Biodiversity. After 12 years working with Chilean natures of TdF he left the area and, in seeking where to settle with his partner, who is also a biologist, he moved to Ushuaia in 2012. Since the 2000s, he has published research on native and invasive species, restoration, and ecological theory and methods, including studies in “long-term socio-ecological research (LTSER),”⁴⁹⁷ ecosystem services, perceptions, and conflict management.

Within biology and ecology, he studied the engineering capacities of the beavers in TdF in comparison to their effects in North America, suggesting that strategies to restore the natures of TdF should focus more on the “ecology of native ecosystems rather than the biology of this invasive species *per se*.”⁴⁹⁸ In addition, he is also directing a graduate student project that examines how different industrial activities within forests in TdF are affecting some of the invertebrates that live in nearby rivers, which, in turn, serve as bioindicators.

⁴⁹⁶ Christopher B. Anderson, *Linking an Exotic Ecosystem Engineer with Its Community and Ecosystem-Level Impacts: The Role of Introduced Beavers in the Cape Horn Biosphere Reserve, Chile*. (Athens, GA: University of Georgia, 2006).

⁴⁹⁷ Helmut Haberl et al., “From LTER to LTSER : Conceptualizing the Socioeconomic Dimension of Long-Term Socioecological Research,” *Ecology and Society* 11, no. 2 (2006): art. 13, <http://www.ecologyandsociety.org/vol11/iss2/art13/%0ASynthesis>; Christopher B Anderson et al., “Integrating Science and Society through Long-Term Socio-Ecological Research,” *Environmental Ethics* 30 (2008): 295–312. LTSER includes the analysis of perceptions and representations of nature and society, socioecological metabolisms, land uses, governance and decision making, and communication and transdisciplinary.

⁴⁹⁸ Anderson et al., “Do Introduced North American Beavers *Castor Canadensis* Engineer Differently in Southern South America? An Overview with Implications for Restoration,” 39.

The Group of Socio-Ecological Studies that he leads works around environmental science, communication, policy, and ethnography with the goal of improving conservation and restoration measures; at the same time, the group promotes reflexivity around the politics of their own science within global networks, including scientometrics analyses.⁴⁹⁹ Through these lenses, invasive beavers are a socioecological phenomenon with other meanings and management tools. For Anderson, while science vastly knows about the distribution, genetics, and population dynamics of beavers, we still lack knowledge about how socio-political relations and institutions enter into ecological problems. This lens, for the socio-ecological group, poses a new “paradigm” under construction, one that includes human dimensions from and within ecology for a stronger objectivity and more efficient decision-making. While the inclusion of the human dimensions in this way might not be new for many, it is perceived as an important change for this group. As one of its members described to me,

there is not much theory behind in how to include the human in conservation because it is new, at least for biologists, probably sociologists always accounted for it, but since biologists are the ones who end up having the opinion in conservation, or the ones who take decisions... Like, thinking that you cannot leave 50 families without food by forbidding fishing was not thought 10 years ago. I do not want to magnify myself, but we are there, in the paradigm change.

This also makes Anderson “out of place,” as neither a pure biologist nor a pure social scientist. In his group, beavers as a socio-ecological problem has led to a project that includes beavers as a “boundary object”⁵⁰⁰ and as a problem to study socially and historically. As a boundary object, beavers must be studied by a multidisciplinary group

⁴⁹⁹ Catherine Roulier et al., “Estudios Sociales y Socioecológicos Sobre Restauración Ecológica: Una Revisión de La Literatura a Escala Global e Iberoamericana,” *Ecología Austral* 30, no. 1 (2020): 019–032.

⁵⁰⁰ Susan Leigh Star and James R. Griesemer, “Institutional Ecology, ‘Translations’ and Boundary Objects: Amateurs and Professionals in Berkeley’s Museum of Vertebrate Zoology, 1907–39,” *Social Studies of Science* 19, no. 3 (1989): 387–420.

comprised of biologists, anthropologists, media theorists, and social scientists. After two years of collaboration, each researcher used the group insights to construct their own research, including studies on how invasive species were covered by the media, how the problem of beavers was politically managed, how citizens valued invasive and native species, and the values embedded in conservation in TdF.

In November 2018, I participated in a symposium in which each participant presented its results. In addition and led by a graduate student from the US who visited the group, we also co-authored a paper on sociotechnical imaginaries around nature in TdF. For Anderson, in addition to providing deeper and more objective knowledges around invasive species, these kinds of collaborations also enable a way to value all of that which normally falls outside scientific works. In sum, while for the group of Marta Lizarralde coordination issues focused on relations between scientists and local actors such as foresters, and for the group of Adrián Schiavini it lay more on how to integrate international and local actors, institutions, and funding, for Christopher Anderson, studying socio-ecologies required as well thinking on how to coordinate knowledges across disciplines.

4.4 Settler and Transnational Native Natures

The “eradication paradigm,” as it was called by researchers in CADIC, was constituted upon a myth that required first, forgetting all what had been done before and, second, *believing* that eradication of beavers could be possible as a necessary condition to make it possible. At the same time, the introduction of transnational actors and funding not only implied erasing previous local knowledges, but it also constituted a possibility for strengthening them by mobilizing local knowledges as a way to obtain significant funding. This shift happened not without tension, one that was produced not only by the

asymmetrical relations between local actors and transnational organizations and modes of ordering science and management. In fact, Lizarralde had already brought in transnational actors, as when she invited Robert J. Naiman to CADIC, a very well-known researcher of ecology of rivers and their alteration by animals with work in the US, Australia, and Europe. When he went to CADIC,

he came and made a design in a blackboard, "this is what you have to sell" (...) they, Americans, "they sell you even a candy kiosk" but I was surprised to see how quickly he learned about here, he was able to see the problematic things and made a scheme with the beaver at the center.

The problem was not only then bringing outside knowledges into the situation, but rather having to erase all that had gone before, including people, who were left outside. It was when Marta left, when she abandoned her "*quintita*," that Schiavini engaged with local and transnational actors in pursuit of an eradication plan. As one researcher told me, when Lizarralde left, she left an "open niche," one that was later occupied by various scientists and, when she came back, it was weird as, in CADIC, they have

this thing of having their own...we called them *quintitas* (little farms), nobody can have what I cultivate, like some work with crustaceous and nobody else does it, some by topic and other by species, it makes sense but also we could collaborate, and when Lizarralde came back it was perceived that two people could not work on the same project...but then this enabled that many worked on beavers, once the niche was broken.

When the experts from New Zealand and Australia came to TdF to produce a report on the feasibility of eradicating beavers, they used Lizarralde's previous work to sustain their claims without her participating in the report. Neither she was present in any of the first meetings that designed the shift to eradication. As a researcher supporting and knowing beavers for controlling their population, the eradication plan came along erasing all what has been done before, the only way, the paradigm stated, to achieve a permanent solution since, as one scientist told me, either you are totally in eradication or you are not:

Eradication is eradication, is like you cannot be a little bit virgin, either you are virgin, or you are not, is like, you cannot eradicate a little bit.

Funding was a key factor in the “paradigm shift,” as experts call it. While the team of Lizarralde had gotten intermittent funding from different national and local sources, the eradication paradigm was able to get much more money with a stable form that included in the design the selection of areas that enabled them to ask for helicopters. Another researcher told me how GEF has a lot of money to do communication, but they spend much money without doing good research. As many of those who had been working with beavers for a while, those coming with the GEF project,

apply ideas and spend money, but they don't do that using information, because there is no information, so we get that information and hope they use it...but often they have to spend the money fast, in travel expenses...otherwise the money is lost.

However, that money was also critiqued, and the arrival of GEF was perceived by some as invasive. As a technician said, “with the GEF, it is all very beautiful, very yankee, but they do not have the experience we have,” a similar assessment a forester made about GEF,

We have been working on this much longer than these new organizations, they are often repeating what we already know...But we have it clear, we have our feet on the ground as we have always had, speaking about the same, same techniques, same discourse. Now we can allow ourselves to have a nice report with those actors, because their reports are *bacanos*,⁵⁰¹ they are beautiful, with cute maps and everything. We are going to have a good map, but we are going to continue working with our methods.

The shift was also legitimated through scientific facts constructed among the scientists defending eradication. They argued that previous control strategies had failed as it was proved by the authors who wrote the report on the feasibility to eradicate the beavers; they also argued that there was a growing confidence in carrying out more complex and wider

⁵⁰¹ Cool.

projects of eradication. And, since moved to the mainland, the threat of their expansion to the continent justified their eradication in the islands.

When Lizarralde was asked about killing beavers in an interview, she was told about hunting, a “massacre,” she responded:

not that much of a massacre, for that you should talk with someone that makes proposals for eradication. More than massacre, controlling implies the extraction of animals to use them with some criteria while determining which areas are better for removing. Besides, we follow animal welfare ethics like in Europe, and furs are less contaminant than synthetic materials.⁵⁰²

As a non-participant of the eradication agenda, she claims she does not believe in it. She argues that no plan can technically kill the 99.99% population of beavers that the eradication approach pursues. While eradication of areas or parks is possible, she argues only long-time measures to control populations can succeed at the level of provinces or regions.⁵⁰³ At stake was something that was constructed as a myth, a hope, a belief, a new foundational myth that erased the past and which could not be questioned, for eradication to work it had to be believed that it would work, or it would not work. As a technician told me,

I was the only one doubting eradication during the first meetings...but they told me, “good you discuss, but we need people who are convinced about eradicating in the project...”

The belief in eradication, as one researcher said, was an opportunity, “a gift” for the province,

Those opportunities...how don't we put more energy...we don't know if we don't try, how many people said we cannot eradicate, but “did you try? How do you know? There is opposition even here inside...without having tried. There is objective evidence, published, that size of islands in which eradications happen is bigger each time. And, even if we fail this test, we have to see what we can learn, not only how to trap, but also organize society, bureaucracy if you can domesticate it, how to

⁵⁰² Leonardo Moledo, “La Invasión de Los Castores,” *Página 12*, 2012, accessed July 10, 2020, <https://www.pagina12.com.ar/diario/ciencia/19-193565-2012-05-09.html>.

⁵⁰³ Lizarralde, Escobar, and Deferrari, “El Castor Austral,” 64.

communicate...each time we are more capable for managing the species even if not able to eradicate it, and that is a learning itself.

In a sense then, eradication, even if not possible, allowed for more funding to learn that it was not possible, than the controlling strategy allowed. But it requires belief. In fact, for those not believing in it, it was still a great opportunity to get beaver samples, to continue working. For others, the problem was that imposition,

each one wants to be the father of the creature [the project], while some say that nothing can be done, they don't really know if we can or not. But they just do not sit together, when they met for the project, very few people were convinced, and there weren't all those who should have been. It has to do with this place, its tradition. Every new person here wants to put what he brings, comes without incorporating anything from here and keeps the bonds with their previous institutions...and I don't know, generally, if you go somewhere with your knowledge, you give it for the other, so we learn together, you don't want to maintain just your previous bond, you can, but you have to incorporate the other. Here projects are designed to be followed, not to create discussion.

Those who did *believe* in eradication did it saying if all happens it is possible. However, they all pointed to the same problem, an understanding of politics and institutions as outside the reality, and the one that blocked the project, as if politics and institutions were not part of the ecologies they were intervening:

They (state officers) did not understand this was a gift! one that can make us international leaders; it is the first time that two countries join to think if it is possible to eradicate a damaging species.

For another researcher this had to do with how the project was initiated "from outside:"

Because it did not come from TdF, someone came with the idea and got the money from FAO and suddenly we got five million dollars and we did something, but nobody is going to do anything else. Eradication is impossible given our politics... And I thought I could do something but the maximum we can do is picking up garbage with a little bag.

Eradication does not enable other approaches to coexist, and for that, it has to erase not only beavers, but also the voices of those who show doubts or propose other methods. As a researcher described,

When the idea of eradication settled, eradication is not compatible with other concepts because it proposes eradicating and anything else is not eradicating. You could not talk any other thing. While other people wanted to keep talking control...eradication became dominant. It is in that context that the plans started. Then later they saw it was not that easy to eradicate so they started to say eradication but when they were asked, they responded well no, they are "pilots." It was also a way to justify their approach, but there is a delay between what they do and what they say they will do, they keep talking about eradication when they are actually still doing control, they are not even planning eradication. Eradication was actually never an option; they just bought the tale, but I do not think any of the people involved did actually ever believed in eradication.... Basin eradication does not exist, that is removal. When you exterminate a species in an area.

At the same time, eradication for the protection of native ecosystems managed by transnational actors and settler scientists installs a particular vision of nativeness and foreignness. When geographers who hailed from the center had mediated settler natures of TdF from the center, as I showed in chapter 3, they did it envisioning TdF as responding to the interests of the state. When CADIC opened in 1981 and scientists *moved* to TdF, the region started to become scientifically known not only from the distance, whether through European colonial explorations or national studies, but also from within. Rather than viewing the TdF as a promised land for the nation, scientists who arrived in the region often sought to escape the city and its politics, seeing it as a promised land also for themselves. Attracted to the exotic and pristine natures, landscapes, and species of the TdF, they valued the "exotic," seeing exotic species as rare and precious.

With their passion for science, they objectivized the transformation of natures while negotiating scientific authority with local identifications. Entangled with transnational values of conservation through scientific collaborations, scientists also contributed installing a scientific discourse over the Fuegian natures that aimed at erasing its industrial identity and replaced it with notions of biodiversity, sustainability, and eco-tourism. At the same time, reproducing the tension between dreamed and damn land that had traditionally

characterized TdF, scientists kept appealing to the remote and harsh conditions of TdF to obtain employment and housing benefits as a prize for their remaining in the region.

Epistemologically, they actualized TdF as exotic and vulnerable, as a reservoir of natural biodiversity for the world that required scientifically mediated protection and responsible exploitation. As a dependent land that had had to be surveilled by settlers who civilized savage populations, the state who controlled the savage capitalism of settlers and now, scientists who had to repair the excesses of an extractive and industrialist state. Scientists *in* TdF became responsible for its nature once the nationalist industrial view and its settlers were displaced by a view of sustainable futures and citizens. A new reconfiguration of indigeneity helped this shift to be supported. As those responsible for nature, they also promoted particular versions of native natures, mostly environmental and scientized, while hiding other versions which, by being protected and valued by them, also helped legitimate their presence and their commitment to the region in ways that reached beyond pure scientific interest.

In a public colloquium on beavers and invasive species, scientists argued that invasion is an intrinsic characteristic of the animal, embedded in their arrival and spreading species features. When I asked why then beavers are invasive and sheep are not, I was answered only after a long and tense silence: "Sheep is a domestic animal." Hence, while many species were introduced at the same time, some were deemed domestic, such as cows, horses, goats, and sheep, and others were not so categorized, such as deer, rabbits, muskrats, mink, wild pigs, or beavers. In fact, when defining Exotic Invasive Species, in Chile they are considered

foreign species which its introduction and spread threatens indigenous biological diversity. IEE are one of the three main causes of species extinction along with habitat modification and overexploitation.⁵⁰⁴

Whereas in Argentina they are defined as,

plants, animals, or microorganisms that, having been moved beyond their natural distribution limits, are able to establish and spread spontaneously within the new environments in which they are introduced, causing severe impacts on biological diversity, culture, the economy, and public health.⁵⁰⁵

Animal introductions came about through humans' invasions, as colonialist expeditions were accompanied by animals in the roles of pets, cattle, or game, brought along for company, entertainment, ornamentation, work, and food supply. Besides, once established, colonial empires would seek to industrialize occupied territories with animals and plants with which they had expertise and experience, while also importing those species that were desired by the metropolis. Agriculture itself reorganized the distribution and expansion of species, and was accompanied by methods for biocontrol, or the introduction of species to control pests. Some groups even formed "acclimatization societies" to introduce desirable exotic animals and plants, whether for feeding population, or for feeding aristocratic and scientific interests.

More recently, there has been an interest in calling on the problems of animal liberations, including pets, and climate change, which makes better environments for certain species. Other introductions have been classified as accidental, if moved through some technology of transportation, or spontaneous if the movement is unknown. Hence, through human-animal alliances, some invasions are promoted when changes due to agriculture,

⁵⁰⁴ "Especies Exóticas Invasoras En Chile," Ministerio de Medio Ambiente, Santiago, accessed November 2019, <https://especies-exoticas.mma.gob.cl/>.

⁵⁰⁵ "Especies Exóticas Invasoras," Ambiente Argentina, Buenos Aires, accessed September 26, 2019, <https://www.argentina.gob.ar/ambiente/biodiversidad/exoticasinvasoras>.

livestock or industry create edges between the original and the new areas, edges where invasive species tend to start spreading to the native ecosystems. Agriculture is studied as providing “a sink for invaders.”⁵⁰⁶ Because it serves as a means for excluding many organisms from areas disturbed by agriculture, which has the effect of opening up space for other species who can inhabit such areas under those conditions.

When I asked why beavers were invasive and sheep were not, official definitions helped to calm the tense silence that resulted. In TdF, invasive species relate to a whole set of social, ecological, and multi-species relations that address modern notions of productivity. Today, wild dogs in Ushuaia have become a problem for attacking sheep herds. Scientists were able to declare the dogs as exotic invasive species by appealing not to their origins, but upon the grounds of whether they were watched or not watched by humans. While biodiversity has served as the keystone notion to legitimate conservation practices, in TdF like in many other places, management of invasive species has mostly addressed those species that affect production more than those species that affect biodiversity.⁵⁰⁷

Invasion science tends to consider native species those which have been in a region since the colonial period. While they are aware of the political consequences of that temporal cut, it goes unquestioned, as something that cannot be questioned. Should it be questioned, or so the story goes, we will not be able to intervene anything. I observed this kind of futility unfolding at another colloquium in Punta Arenas where, when scientists were communicating progresses in protecting the huemul as a native species, a Kawésqar indigenous activist yelled that they should rather be working in ending mines and salmon

⁵⁰⁶ Simberloff and Rejmánek, *Encycl. Biol. Invasions*, 8.

⁵⁰⁷ Jan Dutkiewicz, “Important Cows and Possum Pests: New Zealand’s Biodiversity Strategy and (Bio)Political Taxonomies of Introduced Species,” *Society and Animals* 23, no. 4 (2015): 387.

fisheries that had a great impact on animals and that, in fact, “those animals you are protecting, were not here before.” The presenter interrupted her with a condescending smile, and said they already knew what she was saying, and that her perspective as an indigenous group was considered in their work.

When settler science takes the lead in restoring the natures of colonial pasts by intervening in the name of native species deserving conservation, it contributes to silencing the voices of those who have been displaced and erased due to human and nonhuman settler introductions, their accompanying histories, and the knowledges that legitimated them by erasing and inferiorizing those to be silenced. In addition to silencing, the protection and valuation of native species such as the lenga renders those trees a cultural patrimony for identity making. Lenga wood is readily available for settlers to build their houses. After artistic work and native inscription is cleaned of the violence that those lengas had before witnessed and coexisted with, lenga furniture becomes available to offer symbolic and material proof of belonging. Those valued native natures are envisioned through images, trekking, maps, histories, and interventions that, constructed through scientific knowledges, legitimate those who engage with them well, while excluding those who do not know them well enough.

4.5 Pluricentric Sciences, Natures, and Politics

In *Genesis and Development of a Scientific Fact*, Ludwik Fleck introduced the concepts of “thought style,” or the particular predisposition to see and act in particular ways, and “thought collective,” or the community of people who participates in thought styles. Knowledge, for Fleck, was a thought constraint or a predisposition to see in particular ways mediated by collective agreements. In that process, knowledge styles and changes occur

through the exchanges between “esoteric,” and “exoteric” circles of the wider society.⁵⁰⁸

Since scientists often belong to several exoteric circles but only a few esoteric ones, thought collectives are made of “many such intersecting circles” and, ultimately, scientific authority depends as much in scientific validity as in public opinion.⁵⁰⁹

Objectivity, or what Fleck called facts, emerged only as the result of historically and socially situated continuous exchanges between those circles, which could be based on more or less democratic relations between science and the broader society. Fleck’s account enables a more nuanced view of the relations between science and society than the contemporary language of “coproduction,”⁵¹⁰ which has recently achieved so much influence over the field of STS, one that accounts for reciprocity between science and society in the production of visions, values, norms, and futures. With Fleck, how science and society are co-constituted attends to the sociological structures in which scientists are embedded at the same time it enables the interrogation of how values, epistemologies, objectivity, and history are co-produced through practice.

When analyzing the science of invasion in TdF I encountered not only several exoteric circles, the ones that will be explored in the next two chapters, but also various dynamic esoteric circles. In TdF, the management of invasive species is at the same time a science of population control, management, collaboration, and communication, and a science of eco-genetic and evolutive research; it is a science that articulates itself in various distinct articulations of the global-local division through transnational funding, local applicability, national policies, and knowledge circulation and reconfiguration; it studies

⁵⁰⁸ Fleck, *Genesis and Development of a Scientific Fact*, viii.

⁵⁰⁹ Fleck, 105.

⁵¹⁰ Jasanoff, *States of Knowledge: The Co-Production of Science and Social Order*.

species in their origins, their effects, and their alliances. Building upon Fleck and his readers,⁵¹¹ as well as on decolonial approaches to colonialism as made of co-existing contradictions and articulations of the tension between the global-local poles, I have shown how the science of invasion in TdF is made not only of several exoteric circles, but is also itself a *pluricentric* thought style.

Understanding invasion sciences as pluricentric enables entering epistemic debates around its concepts, methods, metaphors, and values in a different way. While scholarship has critiqued the reductionist division between native-invasive species and the often racist values it can reproduce, pluricentrism does not only indicate, as Larson and others are arguing, that all science is value-laden, or engaged with exoteric circles, whether racist or conservationist, or ecologist. It also points out to how, oftentimes, accusations do not take into account that we might be looking at some circles and that, while we cannot address all, the fact that some people focus on how to eradicate species, does not mean that invasive science *is* eradication. At the same time, eradication does not only respond to concepts of invasion and biodiversity, but it is also produced through multiple exchanges with exoteric circles, including the history of violence, genocide, and disappearance that have configured the natures and histories of TdF.

In TdF, the pluricentric science of invasion is also made through whitening practices that depend upon making inferior others as a means to validate itself. In a territory marked by scientifically mediated multi-species settler colonialism, the introduction of the “eradication paradigm” has responded to and actualized various colonial historical horizons. First, eradication of non-domesticated non-industrialized environmental damage

⁵¹¹ Alexander Peine, “Challenging Incommensurability: What We Can Learn from Ludwik Fleck for the Analysis of Configurational Innovation,” *Minerva* 49, no. 4 (2011): 489–508.

was responsive to industrial pasts that designed TdF as a productive nature and promised land for the nation, one made from the sacrifice of more-than-human workers and industrial natures.

By epistemologically maintaining the ontological distinction between invasive beavers and industrial sheep, it becomes more visible how in TdF it is not the human-nature or the human-nonhuman divide what constitutes modernity, but the nationalized, industrialized, and optimized life versus the non-capitalized or surplus life, whether the latter comes in industrial or conservation forms. At the same time, promoting beaver hunting, paying per tail collected and brought to the city hall, reduces beavers to their damaging effects as a way to engage citizens in supporting their removal, brings also echoes of settlers and traders being paid for “hunting” native peoples in the region, a region marked by savage extractivism of human and nonhuman life and resources, moved by colonialist drives of possession and *making a killing*.

Eradication itself became a foundational myth in which people had to believe in order to make it happen. In that context, while nobody actually knows how eradication can be made complete, it has succeeded in operating through silence, punishment, and disavowal, like other foundational myths in the region, including the myth of extinction, the myth of remoteness, and the myth of national foundation. In TdF, people, including expert tour guides and old residents, do not know how eradication happens, if it was done, if it will be done. Not even at CADIC, scientists working outside the beavers’ project barely know how eradication is or is not being made. Nor do those working with beavers are questioning it. And when people do it, it is in a lower voice, as if they are scared to show doubt or contradiction without really knowing why.



Figure 4.7. Invasion Warnings in TdF (2018)

That foundational myth came along with transnational infrastructures, knowledges, and funding that very directly aimed at erasing all of what had been done before in order to succeed. Eradication constituted itself as modern, or superior, by means of delegitimizing, inferiorizing, and erasing previous local experiences, which were in retrospect deemed as primitive science. Rather than collaborating on improving trapping knowledges and fur production, a route for which most locals argued, a project of eradication was implemented despite peoples and scientist's disconformity. They were asked to believe in science. At the same time, it was also recognized how even if not possible, the paradigm of eradication was a "gift" for having brought an enormous amount of funding that a frame of population control could not have gotten. The believe was that even if beavers were finally not eradicated, the money could be used to significantly improve the previously discarded controlling techniques.

In TdF, scientists have played a continuous role in affirming national and transnational authority as part of on-going colonial exchanges, often actualizing the dichotomy invaded vs. invaders. Eradication and Invasion Science, however, question a simple understanding of centers and peripheries. The introduction of beavers in the 1940s to modernize Fuegian natures and landscapes was mediated by scientific knowledges that came from the center of the state and which, from a distance, designed the natures, territories, species, and populations of TdF.

The removal of beavers, on the contrary, came along with the reconfiguration of globalist notions of invasion that were used locally to later seek transnational actors and funding with which to organize a national structure and institutions around Exotic Invasive Species management. As the scientists who lamented having lost the opportunity to be a reference for the world by becoming the leaders of a binational wide eradication, TdF was partly central itself, for itself, for the Nation, and for the transnational scientific community. And this is because neither centrality, nor coloniality, nor otherness are ever pure. On the contrary, TdF is a hybrid of global, local, and national presences. Knowledges in TdF are entangled with multiple encounters among settlers, humans, nonhumans, silences, histories as well as with asymmetrically related global institutions. This means that science in TdF cannot be easily read as passing from colonial, to national, to transnational, as many Latin American historians of science have done,⁵¹² but rather as sciences that present multiple articulations of those ideals and which demand of us the production of less linear (and colonial) temporalities.

⁵¹² Kreimer, "Colaboraciones Científicas Internacionales En El Extremo Sur."

In restoring particular native natures and eradicating some introduced invasive species, settler scientists must also tackle their own notions of belonging and occupation. Scientists have amplified the ecosystem changes associated with beavers in such a way that TdF and its natures have become understood as pre-beaver, and post-beaver. In this way, scientists not only keep placing humans outside ecosystems, as if we were not another keystone species, but are also helping to construct a particular sense of nativeness and belonging that leaves unquestioned others. How, then, have beavers become such an enemy in TdF, and in whose terms have they been defined as such? How are settler scientists legitimating notions of belonging and privilege in a remote, nationally colonized region? How are scientists naturalizing more-than-animal colonial histories in TdF, both objectivizing and obscuring politics as well as making colonial natures? How do beavers open up h(a)unting questions beyond natural restoration, and move us towards historical reparation of pasts and futures?

5. “IT IS (NOT) ABOUT KILLING:” LIFE-SCIENCES BEYOND DISAVOWAL

5.1 Skeletons in the Garden

While biology is defined as the study of living organisms, its practice is often based upon the production of suffering and death to them. To study the effects of climate change, for example, aquatic insects of TdF are regularly “stressed” under high temperatures to test their resistance in the laboratories. In CADIC, biologists daily engage in the collection, observation, and manipulation of corpses and bodily remains. Not surprisingly, when biologists specialize in ecological studies, they frequently intervene in the lives and deaths of species and their relations with the environment. This governance of the life and death of species seeks to enhance and protect individuals and populations classified as endangered or productive, while increasingly abandoning, controlling, and killing those who threaten the former. Protecting biodiversity is, in this way, an ecological actualization of nonhuman biopolitics.

When I moved to Tierra del Fuego I learned how, when studying or intervening species and ecosystems, biologists often also manage both life *and* death. Despite it being a constitutive part of their scientific practices, many find it difficult to *kill* nonhuman animals and species in their laboratories. Acknowledging the complexities of killing for knowing, contemporary regulations, in Argentina, allow students not to kill if it goes against their ethics. Still, even when they are not making anyone die, biologists regularly receive already killed organisms and corpses to study, refrigerate, and manipulate. The dead, in biology, is the co-constitutive other of the living. In fact, scientists/workers at CADIC walk everyday through the hallways from their offices to the laboratories or refrigeration rooms with dead

insects or big dead crabs in their hands, without hesitating to stop to chat with a colleague, dead-crab in hand.

When writing in our desks, we would frequently be captured by a strong smell one did not get totally used to, the cooking smell of beaver heads being boiled as a way to detach their skins and furs from their bodies so as to gain their clean skulls. Beaver bones and teeth would also be part of many desk decorations, while some offices had piled boxes of valuable skulls for, who has that many samples of a big mammal? Nearby one could also see other researchers who were very concentrated in their microscopes trying to collect, identify, and register dead insects as valuable bioindicators of water and pollution dynamics. To conserve those insects, scientists often encountered difficulties in finding large amounts of proper bottles and ended up designing their own containers from materials on hand, negotiating with coworkers who consumed yogurt or drinks.

Sometimes, refrigerated corpses mattered with grief and sorrow, especially when animals like sea wolves were brought to the institute for a necropsy that would throw some information on their deaths when they happened under “mysterious circumstances.” Other times, the dead would be purposefully shown and exhibited through the circulation of images and descriptions of death and suffering: nostalgic dead trees, shocking bloody and injured sheep, or moving baby birds being bitten in their nests by minks, all interplays that mobilize nature as “red in tooth and claw” for orienting policy. This occurred when researchers tried to convince, or inform, as they say, policy makers or publics about the necessity to change our perspectives on some charismatic species who are severely damaging to others.



Figure 5.1. Picture of the installations of CADIC connecting offices and houses (2019)

During my stay, I lived in the houses for graduate students at CADIC, which are connected through corridors to each other and to the offices and laboratories so that scientists need not go outside as they move from home to work. Since pets were not permitted in the students' houses, our nonhuman companions were the specimens that researchers studied and collected as well as the vast amount of European rabbits who surrounded the institution, walked, ran, and built their burrows under the metallic infrastructures, and ate the grass and plants of the hill on which CADIC settles. European rabbits had been introduced during the 1930s in the Chilean side of TdF and their population reproduced and expanded until they were deemed a plague in the 1950s. Like France and Australia, Chilean authorities introduced the myxomatosis virus in 1954, which causes severe damage to European rabbits by provoking tumors in their eyes. While the virus avoids having to kill them, their death was no less violent. As a Chilean estanciero explained to me what he saw as a kid, rabbits "would go blind crashing against each other,

with the walls...it was very sad, but they started to die." After the virus did its job, the remaining population should have been shot, scientists told me.



**Figure 5.2. Rabbit burrow under my room
(2018)**

However, that part of the eradication plan was never conducted, and the surviving rabbits settled in the southern area of the island of TdF; many of them within CADIC lands where scientists design eradication plans. Running, chasing each other, and enjoying the sun, every day I would watch rabbits observing us and barely escaping from us, sitting in our balconies, eating our plants, and filling the hill with little pellets. Every night, I could hear many of them running behind my floor to hide from the packs of dogs or foxes attracted to them, who would then crash against my wall after the run and stay waiting for the rabbits. A few mornings, I could also see some fresh blood covering the snow.

During the second week of my stay, my human companions, the graduate students with whom I shared the houses, commented on a phone chat about the possibility of organizing the trapping or hunting of those rabbits, since they were eating “our” grass and plants. When a student felt compassion for the rabbits, she was rebuked and told that the rabbits were invasive. Although the initial chat did not end in any action, two days later, students organized a morning session to clean and care for the yard.

Although I had no experience, I joined the activity with enthusiasm as a way to integrate myself *into* the community, as well as experiencing the moral pressure to do it *for* the community. When I joined three other students, they gave me some gloves and told me what to do. Then, I found myself doing what I was told was the best thing I could do. With all the strength I had, I began cutting, pulling out, and piling strong “weeds” or non-planned plants, which were covering the beauty of the chosen “non-weeds” or planned plants. The more effort I put in, the less I talked with anyone else, and the more I found myself there, killing weeds without understanding the plants or the need for their elimination, in search group acceptance.



Figure 5.3. Rabbits in CADIC yards (2019)

5.2 Infrastructuring Eradication in Tierra del Fuego

Eradicating invasive species for the protection of native species and ecosystems has been studied as a form of actualizing biopolitics.⁵¹³ Biopolitics can be partially understood as the production of knowledge, power, and governance of individuals and populations as living beings that came along with the institutionalization of science and the state.⁵¹⁴ Biopolitical governance works through knowing bodies, communities, and populations (with statistics, taxonomies, monitorization, or anatomy) that are made legible for the sake of their optimization and protection. However, in knowing and protecting certain realities for certain goals and values, those who escape such classifications and legibility are positioned outside of power.

Biopolitics has also a deadly side: by enhancing and protecting certain lives, the rest are abandoned and made disposable.⁵¹⁵ Since the theorization of biopolitical regimes was produced from and in Europe, postcolonial scholars have pointed out the differences and co-dependency of European biopolitics and colonial “necropolitics,”⁵¹⁶ or how postcolonial regions have often optimized and enhanced the production of deaths and the geographies of disposability.

⁵¹³ Kristin Asdal, Tone Druglitrø, and Steve Hinchliffe, eds., *Humans, Animals and Biopolitics. The More-than-Human Condition* (Oxford, UK: Routledge, 2017); Paolo Bocci, “Tangles of Care: Killing Goats to Save Tortoises on the Galápagos Islands,” *Cultural Anthropology* 32, no. 3 (2017): 424–49; Thomas van Dooren, *Flight Ways: Life and Loss at the Edge of Extinction* (New York: Columbia University Press, 2014); Jamie Lorimer, *Wildlife in the Anthropocene. Conservation after Nature* (Minneapolis: University of Minnesota Press, 2015).

⁵¹⁴ Michel Foucault, *Society Must Be Defended. Lectures at the College de France 1975-76*, ed. Mauro Bertani and Alessandro Fontana, trans. David Macey (New York: Picador, 2003), 247.

⁵¹⁵ Giorgio Agamben, *The Open: Man and Animal* (Stanford: Stanford University Press, 2004); Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life* (Stanford: Stanford University Press, 1998).

⁵¹⁶ Achille Mbembe, “Necropolitics,” *Public Culture* 47, no. 1 (2003): 11–40.

Death has also become productive, especially in border cities like Mexico where capitalist contradictions are more visible. As Sayak Valencia has shown, “gore capitalism” creates a fascination for death that appeals the most vulnerable populations to affirm themselves through killing and trading with bodies, organs, and sex.⁵¹⁷ Beyond Mexico, many postcolonial states are governed through death.⁵¹⁸ Colonialist empires’ accumulation and extraction of capital through the dead bodies of indigenous peoples and African slaves in American mines and plantations funded the institutionalization of strong European states that would protect their workers.⁵¹⁹ In Africa and the Middle East, Achille Mbembe has shown how plantations were the first spaces of encamped and killed bare life that would later inspire European concentration camps.⁵²⁰ At the same time, this decolonial and postcolonial scholarship denounces how knowledges that have legitimated and made others inferior, or less than human, lies at the basis of making disposable populations.

Many scholars exploring how biopolitics governs nonhumans have pointed to the anthropocentric hierarchies that divide life along a continuum in which animality and humanity are two ideal extremes that co-constitute each other.⁵²¹ As a productive dichotomy, humanity and inhumanity are made dialectically through negative co-constitution: “the

⁵¹⁷ Sayak Valencia, *Gore Capitalism*, trans. John Pluecker (South Pasadena, CA and Cambridge, MA: Semiotext(e) and MIT Press, 2018).

⁵¹⁸ Mbembe, “Necropolitics,” 11–40; Mignolo, “Epistemic Disobedience, Independent Thought and Decolonial Freedom,” 3.

⁵¹⁹ Aníbal Quijano, *Colonialidad Del Poder: Globalización y Democracia* (Lima: Sociedad y Política Ediciones, 2001).

⁵²⁰ Mbembe, “Necropolitics,” 34.

⁵²¹ Braidotti, *The Posthuman*; Cary Wolfe, *Zoontologies: The Question Of The Animal* (Minneapolis and London: Univ Of Minnesota Press, 2003); Eben Kirksey, *Emergent Ecologies* (Durham, NC: Duke University Press, 2015); Haraway, *When Species Meet*, 134; Giorgio Agamben, *The Open: Man and Animal* (Stanford: Stanford University Press, 2004); James Stanescu, “Beyond Biopolitics: Animal Studies, Factory Farms, and the Advent of Deading Life,” *Phaenex: Journal of Existential and Phenomenological Theory and Culture* 8, no. 2 (2013): 135–60.

human," does not have a positive definition but is rather made against all that is not human. This distinction is constantly having to be remade. If the anthropological machine constantly produces disposable lives that are made nonhuman enough, the problem resides in making all that is made nonhuman killable.⁵²² Working through this problem, Haraway has wondered how to escape from making entire populations disposable by responding to the sufferings and killings we engage with and which are always towards someone, not something.⁵²³

However, when studying animal biopolitics, the assumption that the nonhuman is constantly made disposable falls apart. Those working and living with farmed animals, pets, or wildlife, have shown how knowing, qualifying, and valuing life does not follow an easy division between human and nonhuman, but rather is classified and hierarchized through a complex web of knowledges, industrial relations, values, and vital exchanges. In epidemics affecting livestock, for example, farmed sheep might receive more protection than pets while, in epidemics affecting humans, some pets might receive more care than some humans.

In managing biodiversity, species are enlisted as endangered or dangerous not for their (in)humanity, but for their value, contribution, and relations with the environment and society. In biodiversity regimes of knowledge and power, it is not the "anthropological machine,"⁵²⁴ or the mechanisms of protection/abandonment, that produce humanity/inhumanity. Instead, biodiversity knowledges and interventions know, manage,

⁵²² Cary Wolfe, *Zoontologies: The Question Of The Animal* (Minneapolis and London: Univ Of Minnesota Press, 2003).

⁵²³ Haraway, *When Species Meet*, 344.

⁵²⁴ Agamben, *The Open: Man and Animal*, 37.

and classify socialized nonhuman populations, whether wild, domestic, invasive, or protected, and their relations with humans and nonhumans. Vitalist scholars have suggested ways to think beyond the bios and the organic understanding of human life⁵²⁵ in order to think life as an ongoing materialization of interconnected vitalities that extend beyond humans, beyond organic life, and beyond personal temporalities. However, the problems that emerge for managing biodiversity in TdF have less to do with a posthuman ethics that enables us, as scientists, to consider and wonder about other nonhuman realities, as with a *postnature* politics that account for more-than-animal collectives in their social, embodied, and changing relations of power, memory, affection, production, and reproduction.

In this chapter, I engage with the long history of death and life-sciences to question how killings are done in the Beaverscene. Biologists studying death have traditionally split natural from artificial death as a way to try to explain the ultimate cause of death. Within this tension, scientists tried to distinguish natural from accidental deaths, or those produced by internal and external forces, as did Weismann when differentiating mortal living substances from potentially immortal parts.⁵²⁶ However, as material feminists have brilliantly shown, relations of interiority and exteriority are boundaries produced⁵²⁷ but not easily crossed. As Nancy Tuana puts it, the boundaries that separate nature and culture, or death and poverty in her analysis of Katrina, are divided by a “viscous porosity” that makes

⁵²⁵ Braidotti, *The Posthuman*; Elizabeth A. Povinelli, *Geontologies: A Requiem to Late Liberalism* (Durham: Duke University Press, 2016).

⁵²⁶ Sigmund Freud, *Beyond the Pleasure Principle* (London: Norton, 1922).

⁵²⁷ Michelle Murphy, “Chemical Regimes of Living,” *Environmental History* 13, no. 4 (2012): 695–703; Stacy Alaimo, *Bodily Natures* (Bloomington, IN: Indiana University Press, 2010); Karen Barad, *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning* (Durham, NC: Duke University Press, 2007); Donna J. Haraway, “A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century,” *Nature* 32, no. 1 (1991): 1–31; Elizabeth Grosz, *Volatile Bodies. Toward a Corporeal Feminism* (Bloomington, IN: Indiana University Press, 1994).

crossings difficult through our separated knowledges for nature and culture.⁵²⁸ Bearing this viscous porosity in mind, I analyze in this chapter the death and killing of beavers in TdF in ways that do not distinguish natural from artificial death, also extending my analysis to the death of trees provoked by beavers, and the death of beavers provoked by humans.

5.2.1 Killing Well and Disciplinary Initiations

At the Pontifical Catholic University of Chile, in Santiago, two biology PhD students developed a loving, partnering, and researcher relationship when Derek, originally from the south of Chile, met Giorgia. They both studied beavers in TdF, Giorgia paying more attention to the managing and social perceptions of beavers, and Derek developing modeling systems to predict their population dynamics. As part of their research, they were hired by the local province, and acquired a caravan to travel through TdF to observe beavers, evaluate their presence and movements, and conduct interviews and workshops with estancieros. In addition, they invited two film students from their university to capture some of their experiences. In 2014, Giorgia, Derek, and the beavers starred in a documentary originally titled “Beaverland.”⁵²⁹ The documentary showed their harsh living conditions in TdF, their learnings, their encounters with estancieros they interviewed and shared dinner with, including dishes made from beaver meat, and their work with beavers.

In one of the scenes, Derek leaves the caravan alone, puts on his water boots and grabs his rifle. He walks with the rifle over his shoulders accompanied by the sound of his feet over the tiny stones that cover the path until arriving to a beaver pond. He observes a

⁵²⁸ Nancy Tuana, “Viscous Porosity: Witnessing Katrina,” in *Material Feminisms*, ed. Stacy Alaimo and Susan Hekman (Bloomington, IN: Indiana University Press, 2008), 188–213.

⁵²⁹ Antonio Luco and Nicolás Molina, “Beaverland” (Chile: TFI Latin America Fund, 2014).

body-gripping trap he had placed before, empty. He keeps walking until reaching a wire trap he had placed on the top of a beaver tunnel next to the pond. Maintaining a certain distance with his body from the hole, he starts removing the branches to which he had attached wire, and, with distance and doubt in his face, he loads the rifle pointing to the hole where we can see a beaver tail. Derek keeps looking and moving around slowly, closing his mouth and, from the biggest distance he can, he puts the rifle into the cave. He awaits two seconds and then, with an explosion sound and smoke, he shoots. On his knees and with the help of pliers, Derek starts removing the cable of the trap from the stick while we can hear him breathing and murmuring. A beaver tail appears in the screen from the hole and, all of a sudden, the beaver makes sounds and Derek drops the cable and pulls back, scared "Ah, it's still alive. Fuck." The cable goes inside with the beaver trying to escape. Nervous, Derek takes his long rifle and, again with distance, points to the cave. On his knees to see better, he shoots one more time and walks around the cave. He finds another hole to the tunnel and shoots one more this beaver. He goes to the other side of that hole and shoots once again. He then walks around with a hand in his pocket waiting. Not knowing what happened with the beaver, Derek uses a branch to widen the tunnel, breathing heavily. He takes his rifle and walks back to the caravan pensive. When he opens the door, Giorgia is waiting for him:

Giorgia: What happened?

Derek: Well...I got the tail of the little beaver, and since I couldn't take him out [*at that moment, the door of the caravan opening with the wind makes a similar noise as a beaver tail moving*] I tried to shoot him like...

Giorgia: Was he alive?

Derek: Yes. But I didn't know that...So when I let go of the wire, he got away.

Giorgia: Oh, poor guy!

After that, they go back together to the site and look, while Giorgia exclaims, “Fuck! It has to show up somewhere, maybe later.” She then caresses Derek’s arm covered by his coat and looks at him pouting, “You did your best,” before kissing him. After that event, they go to another very well-kept dam where Derek starts pulling out branches and mud until opening a leak, when we can hear a strong noise of water flowing. He then sets up a camera next to the leak and goes back to the caravan. Sitting next to Giorgia, drinking something warm, they look at the computer, in a very tiny space. The quietness of the scene is suddenly broken by the little emotions expressed by both, Derek closing his hand, “yeah,” and Giorgia laughing content and then screaming when finally, she sees the beaver in the screen. She covers her mouth with her hand and looks intensely to the screen and to Derek, “Oooooohh!! Nice!!! Great!!!!” and then both move back surprised, “Ohhh, hahahaha, awesome,” when seeing the beaver there. They keep moving their hands and faces, being amazed by the beaver, and saying, “This is amazing. Oh, really something!” When their screen is shown in our screen, one can see a beaver methodically placing branches and moving them with his mouth and hands to cover the leak.

Like Giorgia and Derek, many researchers in TdF come escaping the city, often the contaminated Buenos Aires or Santiago de Chile. When they go to the field, that is, when they leave the office and laboratories to observe, collect, or measure trees, rivers, animals, plants, air, or residues, they also have to learn how to stay outside for hours, walk through peatbogs, snow, rivers, and ice, or climb high hills. In TdF, researchers stay on ships that require them not to sleep for forty hours in order to produce all the tests required to sample for depth and time. Others go to Antarctica for a month where they have to cope with silence for hours, days, and weeks. Others travel to *Isla de los Estados* where they have to wait for forty days until the next Navy ship can collect them, a time in which they have

to bond with their colleagues while living without showering, cleaning their dishes, or using their phones. There, they encounter animals looking at them at the face, animals who are not used to look at humans as a risk.

All those experiences require certain physical conditions that not everybody can meet equally. While many arrive having already had sport-related backgrounds, others start joining mountain clubs and gyms to get physically and socially fit. In Ushuaia, most students practiced climbing, skiing, swimming, or running. In addition, like Giorgia and Derek, some students arriving in TdF have to work with wild animals in their environment for the first time. On top of being physically fit, learning how to touch and manage animals is not an easy task and it initially comes with fear. Grabbing a penguin or a bird with care and security is not easy when doing it the first time. Placing an animal in an identification brand or outfitting one with a GPS is not easy either, as one is risking not only the animal's comfort but also the technology itself.

With Fuegian beavers, the initiation rite to become a researcher is even more tricky as, in addition to physical strength and security for collecting beavers, researchers must often participate in their killing in first person. And, like becoming fit and knowledgeable of the territory, killing beavers in TdF is also a rite of passage into their scientific community for graduates like Giorgia and Derek. While they have been initiated by others, they will not be recognized as independent scientists until they personally acquire experience in studying and, in this case, killing. With the uncanny film scene related above lived by Derek and shared with Giorgia, who remained in the caravan probably because of difficulties with actively participating in the shooting, the biologists could then go back to the estancieros, to the policy makers, and to their home university with legitimacy enough to speak for the beavers of Tierra del Fuego in Santiago de Chile. Such an initiation rite, however, does not

merely affect scientific recognition but also entails errors and wrongdoings that haunt researchers for a long time.

This is what happened to Pedro, one of the experts working at CADIC since the 1980s. When he joined the team to control beavers, he had to learn how to use and implement traps. The first time he used a cable wire like the one used by Derek (also called a snare or *guachi* in Patagonia from the Mapuche *wachi*), he did it wrong, like Derek. A snare is a kind of trap (see fig. 5.4) that is designed not to kill but to capture animals alive. Made of a wire that is attached to a stick, the snare tightens around the neck or the two front legs when the animal passes through the hole and, with his own movement, makes the cable tight around his body.

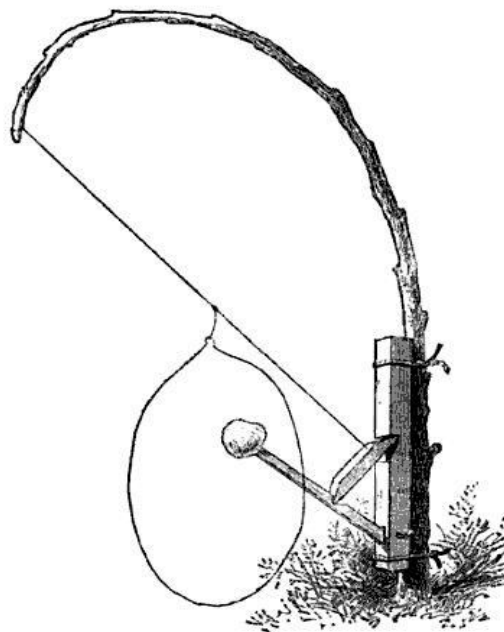


Figure 5.4. Traditional snare⁵³⁰

⁵³⁰ William Hamilton Gibson, "19th Century Knowledge Traps and Snares Portable Snare," Wikimedia Commons, 1882, accessed July 10, 2020, https://commons.wikimedia.org/wiki/File:19th_century_knowledge_traps_and_snares_portable_snare_1.jpg. In the public domain.

This old type of trap costs today around 2 US dollars each.⁵³¹ Since snares do not kill the animal, they should be checked regularly so as not to leave the animal trapped, alone, hungry, and stressed, or to be eaten by another animal. Stressed trapped animals can not only be eaten by others but also, as has happened with some Fuegian beavers, they can nervously chew their own trapped leg until they free themselves with one leg less. At the same time, because they do not kill the animal, snares enable the trappers to free the animal if a non-target species is captured by mistake. When Pedro set up one snare for the first time, his lack of experience produced unintended suffering. As he reminded me,

I did bestialities for lack of knowing, like letting a beaver half hanging in the middle, poor *bicho*.

With time, Pedro realized that it was better to set the snares in a way that allowed the beaver to go underwater while trapped, as water is the medium where they feel safer, calmer, and protected against predators. Still, when he worked to implement the project of control that aimed at selling beaver fur to Europe, he had to learn how to use killing traps, a lesson that was not easy for him either. In order to sell the fur of any animal to Europe, exporting countries have to use “humane traps” in the killing of a selected list of nineteen species, not just the one that is exported.⁵³² Expressing fighting against the use of leg-holding traps that provoked intense suffering in animals, Europe signed the Agreement on International Humane Trapping Standards with Russia and Canada that, while forbidding leg-holding or

⁵³¹ Parkes et al., “Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options,” 21.

⁵³² “Regulation Prohibiting the Use of Leghold Traps in the Community and the Introduction into the Community of Pelts and Manufactured Goods of Certain Wild Animal Species Originating in Countries Which Catch Them by Means of Leghold Traps or Trapping Methods,” European Union, 1991, Council Regulation (ECC) No 3254/91 of 4 November 1991, accessed July 30, 2020, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31991R3254>.

foot-holding traps, located body-gripping traps as the most humane trapping for most species given that they produce “instant” death to the animal.

5.2.2 Killing Efficiently

As part of their attempt to sell fur to Europe, those organizing a way to control the beaver population in TdF introduced body-gripping traps also known as Conibears for the name of the Canadian who constructed them in the 1950s. Body-gripping traps or Conibears are made of a rotating jaw that closes on the animal when it enters the space between the jaws. The Conibear pressures the animal so tightly that it precludes oxygen flowing to the lungs and blood to the brain. The result is unconsciousness followed by death in less than 360 seconds.⁵³³ Each trap costs today around 25 US dollars each⁵³⁴ and became the favorite method for capturing beavers when TdF passed from the aim of controlling to the aim of eradicating beavers with international funding. The experts that had come to the region for two weeks to evaluate the feasibility of eradication already recommended Conibears for their price and efficiency, given that snares required daily checking by hunters. When the aim is eradication from vast areas in difficult terrains and climates, daily checking becomes too high of a cost.

⁵³³ Parkes et al., “Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options,” 21.

⁵³⁴ Parkes et al., 21.

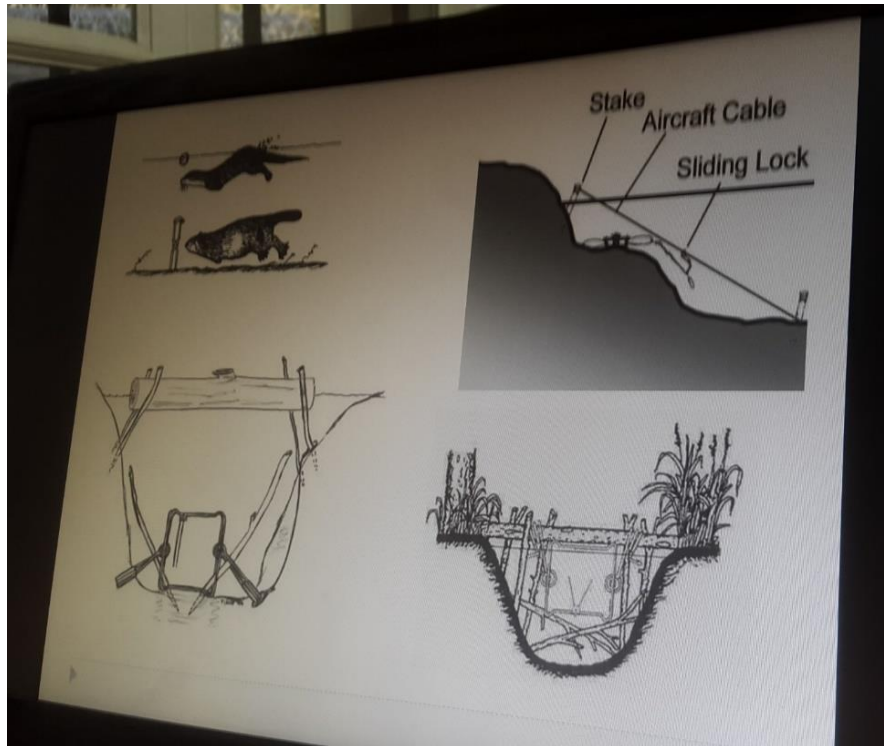


Figure 5.5. One hunter describing a body-gripping trap (2019)

As a discipline, eradication science envisions itself as growing, expanding from islands to bigger and more complex territories like Tierra del Fuego, which serves as an example of scientific capabilities acting beyond borders and achieving the cooperation of two countries that had historically constructed each other in conflict. As a highly applied science, eradication is defined as the necessary evil to protect biodiversity and the economy by organizing the removal of species, whether foreign or native, that severely threaten either environmental biodiversity *or* industry. As an incipient field, it has congregated scientists from around the globe in at least three international conferences held in New Zealand.⁵³⁵ With similar terminologies as those used by eradication planners in TdF, scientists met in those conferences to strength the pillars of eradication: operations, implementation, funding, communication, and learning. With pride, they celebrated the 86% success rate of the over a

⁵³⁵ Ecological restoration of New Zealand Islands (1989), International Conference on Eradication of Island Invasives (2001), and Island Invasives: eradication and management (2010).

thousand eradications attempted worldwide. With that percentage and the development of more sophisticated plans with larger areas involved, such as the eradication of goats in Galapagos and the beavers in TdF, they met to later spread the legitimacy of eradication as a powerful tool for conservation in their homelands:

we need large scale, ambitious programs to verify the potential of eradications, and at the same time to show the public and decision makers the results that can be obtained.⁵³⁶

When eradicating a whole species from a vast territory, designs of death are distributed across technologies, institutions, and calculations. Those calculations involve not only measures of efficiency but also a military diagramming of a territoriality to be erased. Rather than a view from within, planning eradication requires views from above, from a distance, mediated by maps as well as drones, aerial, and satellite images. While for park rangers and hunters, technologies consisted of traps, sticks, pictures taken with a phone, an a folder where to write down his daily activities, eradication managers count on helicopters, modeling programs, aerial views, statistical programs, and political meetings, all of which are required to scale up death “colony-by-colony removal up to whole catchments, larger management zones, and whole islands.”⁵³⁷

When the aim is eradicating from vast territories like TdF, efficiency measures the time to free an area, including amount of time spent by hunters to set up traps, check them, carry them, as well as the costs of feeding, paying, and training hunters. Eradication efficiency calculates costs, suffering, success, and time in ways that end up making animal

⁵³⁶ Piero Genovesi, “Are We Turning the Tide? Eradications in Times of Crisis: How the Global Community Is Responding to Biological Invasions,” in *Island Invasives: Eradication and Management*, ed. Dick Veitch, Mick Clout, and David Towns (Lincoln, NZ: Manaaki Whenua Press, 2011), 6.

⁵³⁷ Parkes et al., “Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options,” 47.

suffering invisible, obscured by statistics. By measuring many beavers, individual accidents become less significant since they are no longer measured in calculating efficiency. In fact, eradication demands the use of all means possible, including those forbidden by humane regulations that would “increase the risk of failure of eradication.”⁵³⁸ Intervening in vast areas requires the institutionalization of planning activities, technologies, data gathering and analysis, and obscures individual killings and mistakes through the distribution of tasks across every instance, especially when the person calculating the efficiency of killing per time, cost, and suffering, does it through statistical programs in an office after receiving information filed by hunters on a spreadsheet.

In the field, eradication of beavers is extensive. While in the Chilean Park managed by WCS, Parque Karukinka, volunteers are asked to set up traps, hired hunters are given snares, traps, rifle, and dogs. Dogs can either chase beavers so that hunters can shoot them or detect beavers remaining in an area that has been cleansed of them. While body-gripping traps, or Conibears, are relatively new to the region, rifles, snares, and dogs have long been used in killing beavers in Patagonia and TdF. Rifles, especially Winchesters, were the tool used by military campaigns to assassinate indigenous peoples in their conquest of the South at the end of the 19th century, as well as to assassinate workers at the beginning of the 20th century, and to hunt otters and sea wolves.⁵³⁹ Dogs also have a history of alliance with settlers and traders

⁵³⁸ Parkes et al., “Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options,” 7.

⁵³⁹ Rifles marked the genocide of indigenous peoples at the end of the 19th century, and of workers at the beginning of the 20th century in Patagonia

in TdF, as they were used to enter otter burrows and kill the otter once it was biting the dog faces with a metal stick, leaving Fuegian dogs with scars in their faces.⁵⁴⁰

The invisibilization of accidents and animal suffering by numbers and mega-institutions becomes more visible when observing the work of trappers in smaller areas they can manage without complex system programs. For David, the Chilean park ranger, efficiency lay in reducing the number of unwanted effects such as trapping native species or trapping a beaver in a way that made it suffer. He knows that no matter how well one sets a trap, one cannot avoid trapping native species, for “if the bicho wants to enter the trap, he enters.” In his practice, snares are more efficient:

If there is a nontarget species, it will not survive if trapped with a conibear. Besides, those traps are tested for animals gripped by the head or the thorax, but sometimes, they take a foot, and that is not going to give a 360-seconds-death as the manual says.

David knows the area in which he intervenes well, as he has been living there for six years while studying and trapping beavers, an experience that does not often occur when implementing a binational plan of eradication. In fact, David’s methods take too much time for a mega-project. As David explained me, he takes a lot of time to prepare his trap and the area around it:

Everything has to be done with mud from there, with sticks and branches from there, all the environment has to be similar. I have to construct a passage for the trap that the beaver likes, how he likes, with adequate space for him. If you do not cover well the sides, he can pass in between the lateral and the resorts and the jaws could take him a leg. That is why constant revision is key, if a beaver was trapped by the leg, or a tail, or an arm and you do not go, he is going to be like that for 9 days.

David’s experience has shown him that body-gripping traps are not simple, either. He learned that one cannot just sit the trap and let it there, as it would easily fall down and

⁵⁴⁰ José Cabezas, *Presencia Argentina En El Canal de Beagle* (Buenos Aires: Bamba, 1978), 3–5, Biblioteca [982 (829.0) CAB 791], Archivo del Museo del Fin del Mundo, Ushuaia, Tierra del Fuego, Argentina.

work wrong by trapping legs, arms, or other species. Despite recognizing the need for more efficient techniques for intervening the vast territories of TdF, he also told me how eradication workers were placing many traps that often fell down. Not surprisingly, when the plan is directed by calculations of efficiency by managers and statisticians, numbers tend to rule over practice: better set up as many traps as possible, as they will at least kill beavers, rather than losing time with each trap, colony, and environment while beavers keep recolonizing sites. With David, a daily and careful managing of traps within the beavers' environment is less invasive than disseminating traps all over the territory in a short period of time. However, the amount of beavers that David and other park rangers trap, per year, reaches two to three, a small number that enables them to study well their marks, smells, lodges, and activities. When the goal is to eradicate, the design has to act strategically to eliminate beavers as an intelligent enemy:

To kill all beavers at first encounter so as not to educate them, and to do this as quickly as possible, ideally within a few days. To do this the area must be saturated with devices.⁵⁴¹

When Pedro and other scientists tried to teach efficiency to park rangers, the latter resisted. To the scientists, trappers and rangers are people who “do not understand,” given that, despite telling them how they could spend less effort and time in capturing beavers, they continued with their methodical observational techniques:

they do not understand that there is a time for search and a time for extracting. If you know when to trap, it requires less effort than checking every day.

However, when I met trappers and rangers, they did understand. They knew that when the goal is to eradicate a whole region, there is no time to study the patterns of each colony and

⁵⁴¹ Parkes et al., “Control of North American Beavers in Tierra Del Fuego: Feasibility of Eradication and Alternative Management Options,” 23.

beavers. They knew that, when there are so many beavers, passages, and tunnels, “you have to put traps anywhere” and act fast so that beavers do not have time to learn and respond. Despite their knowledge, they chose defending their methods against the imposition of the binational project goals. They liked following beavers every day.

5.2.3 Exploiting the Dead

Like David, who enjoyed knowing and killing beavers in their shared environment, other rangers, scientists, and citizens developed their own interests with the invasive beavers. Those passions often involved the exploitation of death products. Researchers at CADIC also developed their own interests around dead beavers’ remains. The team of Marta Lizarralde, who worked in eco-genetics, have been collecting and using beaver corpses since the 1990s. For them, it is a matter of opportunity. Given that beavers have to be killed anyway, their bodies can be used for developing population studies. Asking hunters to keep the bodies, once in CADIC, scientists boil them to take everything out, remove the teeth, and polish them. With polished teeth, they can calculate beavers’ age by reading the patterns of wear on their teeth as if reading the rings of a cut tree. Their data serves as the basis for planning control strategies, as it allows them to better know the distribution of beavers per basin by detecting if they are old beavers or young, dispersing ones. In addition, it helps them gaining a special place in evolution research:

It is also good for us, for the species, I have a thousand skulls, and I have a girl working in ontogenetic in another city who can see the skull modifications, it is like going through their entire evolutionary growth...it is just taking advantage of all these samples, of all the beavers being killed...a thousand samples is a very large number for a biologist, it gives your work consistency, it allows you to work at the level of population genetics, it ensures you having specimens of almost all ages...that is with eradication because when doing control with the national parks, they just hunted sex or eight per year.

In addition to obtaining scientific recognition for the number of samples, beaver remains also provided interest through their tails, furs, and meat. During the 1990s, when state officials, hunters, scientists, and park rangers collaborated to control beavers' population, they designed a program to incentivize beaver hunting. Hunters in Chile and Argentina

Proyecto Control de Poblaciones de Castor en Tierra del Fuego

Nº Continente	Fecha	Lugar de Pago	Procedencia Pistas	Cant. Pistas	Monto (\$)	Nombre Cazador	Nº Permiso
00001	04/05/2001	Tolhuin	Rio Valdez	10	50	C-3	
00002	11/05/2001	Tolhuin	Rio Valdez	12	60		
00003	17/05/2001	Rio Grande	Ea. Constitucion	9	45		
00004	17/05/2001	Rio Grande	Puente Inocencia	10	50		
00005	18/05/2001	Tolhuin	Rio Valdez	15	75		
00006	18/05/2001	Tolhuin	Lag. Bombilla	12	60		
00007	18/05/2001	Tolhuin	Agua Blanca	4	20		
00008	18/05/2001	Tolhuin	Agua Blanca	19	95		
00009	23/05/2001	Tolhuin	Lag. Blanca	18	90		
00010	23/05/2001	Tolhuin	Tolhuin	1	5		
00011	30/05/2001	Ushuaia	Lago Escondido	1	5		
00012	30/05/2001	Ushuaia	Ruta 1	5	25		
00013	30/05/2001	Ushuaia	Paganosa	3	15		
00014	30/05/2001	Ushuaia	Rio Mina	1	5		
00015	30/05/2001	Ushuaia	Lago Escondido	12	60		
00016	31/05/2001	Rio Grande	Ea. La Turbu	25	125		
00017	01/06/2001	Tolhuin	Agua Blanca	13	65		
00018	01/06/2001	Tolhuin	Laguna Blanca	5	25		
00019	06/06/2001	Ushuaia	San Pablo	11	55		
00020	06/06/2001	Ushuaia	Lago Escondido	36	180		
00021	06/06/2001	Ushuaia	Lago Escondido	27	135		
00022	06/06/2001	Ushuaia	Rio Mina	10	50		
00023	06/06/2001	Ushuaia	Ruta 1	13	65		
00024	08/06/2001	Tolhuin	Rio Valdez	15	75		
00025	08/06/2001	Tolhuin	Rio Yrigoyen	27	135		
00026	08/06/2001	Tolhuin	Ea. La Coquestra	2	10		
00027	08/06/2001	Tolhuin	San Pablo	11	55		
00028	08/06/2001	Tolhuin	Laguna Blanca	13	65		
00029	08/06/2001	Tolhuin	Agua Blanca	13	65		
00030	13/06/2001	Ushuaia	Lago Escondido - Bombilla	35	175		
00031	13/06/2001	Ushuaia	San Pablo	13	65		
00032	13/06/2001	Ushuaia	Lago Escondido	9	45		
00033	16/06/2001	Tolhuin	Laguna Negra	6	30		
00034	16/06/2001	Tolhuin	San Pablo	3	15		
00035	20/06/2001	Ushuaia	Calafates Palacios	7	35		
00036	20/06/2001	Ushuaia	San Pablo	11	55		
00037	20/06/2001	Ushuaia	San Pablo	1	5		
00038	20/06/2001	Ushuaia	Lago Escondido	18	90		
00039	20/06/2001	Ushuaia	San Pablo	13	65		
00040	20/06/2001	Ushuaia	Ruta 1	12	60		
00041	21/06/2001	Rio Grande	sin dato	7	35		
Subtotal al 27/06/2001					886		
00042	27/06/2001	Ushuaia	Lago Escondido	35	175		
00043	29/06/2001	Tolhuin	Laguna Negra	6	30		
00044	30/07/2001	Tolhuin	Rio Grande	2	10		
00045	11/07/2001	Tolhuin	San Pablo	7	35		
00046	12/07/2001	Rio Grande	Ea. San José	11	55		
00047	13/07/2001	Tolhuin	Tolhuin	3	15		
00048	20/07/2001	Tolhuin	Laguna Negra	4	20		

Figure 5.6. City's register of hunters and tails with hidden names (2001)

were paid per beaver tail delivered to the city council. While nobody knew how to answer me when I asked what the city council did with the tails, they did tell me about tail corruption. According to hunters and state officers today, some people in the city council colluded with hunters to write down more tails than were actually delivered so that they could both share the profits of the imagined tails.

To promote fur trading, the council brought owners of fur industries from Buenos Aires. However, they learned then that Fuegian beaver fur was of lesser quality than that of North American beavers living in North America, so that the prices would not be as

profitable. In addition to tails and fur, researchers investigated the possibility of exploiting beaver meat. In the Argentinian side of TdF, researchers developed an experiment with thirty beavers who were sent frozen to a laboratory in Buenos Aires where, after testing with hamburger patties, and baked beaver, beaver meat was considered edible, sanitary, tasty, and nutritious. With that confirmation, researchers delivered trapped beavers to Fuegian chefs, who prepared more gourmet options such as pastas, pates, and wontons to be presented at a local food annual festival. In the Chilean side of TdF, students from the University of Magallanes developed different meat studies. One evaluated the preparation of beaver *charqui*, or jerky, and its acceptability.⁵⁴² Another study concluded that the productivity of “exotic” meats like beavers, exotic here meaning nontraditional, posed a 50% utility, a percentage resulting from analyzing the amount of meat that remained once the animal was “desensitized, exsanguinated, skinned, eviscerated and with the head, limbs, and external genital organs cut.”⁵⁴³ Despite all these efforts, the fur and meat market did not become significantly profitable. In addition, the incentivization of hunting for profit provoked that many hunters killed beavers only in easily accessible areas. Moreover, non-organized killing provoked the remaining beavers to leave their lodges and ponds and relocate to other sites, constructing with that new dams.

5.2.4 Killing and Civilizing

Eradication managers justified the shift from control to eradication despite resistances and fights for legitimacy not only regarding the goals of the project but also the

⁵⁴² Carolina S. Bahamonde Gómez, *Alternativas de La Elaboración de Charqui a Partir de Carne de Castor Americano, Castor Canadensis (KHUL, 1820. Rodentia)* (Punta Arenas: Universidad de Magallanes, 2007).

⁵⁴³ Oscar Fabián Pailacar Asendo, *Evaluación Del Rendimiento Cárnico Del Castor (Castor Canadensis) En Tierra Del Fuego.* (Punta Arenas: Universidad de Magallanes, 2007), 14.

methods and knowledges involved. Since eradication involves planning, funding, and evaluating efficiency, for them, knowing how to place a trap is a “mere repetition technique,” while the real difficulty lies in planning a whole project that does not let anything to chance. Their biggest struggle consisted in shifting from a hunter’s perspective based on obtaining as many pieces as possible per day, to one of eradication focused on obtaining as few as possible, meaning that an area has been cleaned. The “classic hunters,” as the scientists called them, were to be transformed by the meanings of the recently arrived institutions. As one scientist told me,

It is not the number of individuals extracted that matters but any remaining that counts. And you have to plan that in advance, before letting any hunter go...the GEF allowed us that, for Chile and Argentina, to learn what can we do, not just managing a trap but creating a binational organization capable of cleaning animals from a site. With the tests, both countries can gather and respond, how did it go? Do we go for more? How? If we cannot eradicate, what can we do? Are we letting it stay? Are we going to build an anti-beaver wall?

With dreams of mastery through institutionalization, coordination, and planning involving walls, binational killing, and extraction, eradication entailed new relations of power and death in TdF. When Pedro, the scientist who had been working in CADIC since the 1980s, had to learn how to use conibears and give them to the hunters during the 1990s, his initiation had involved more than scientific circles. Like the initiation rites through fitting, proving, and killing, becoming a scientist involves more than one-time legitimacy. Scientists have to constantly be actualized, for as much authority as they have, experts “can no longer escape the bonds of tradition and of the collective; otherwise he would not be an expert.”⁵⁴⁴

To implement control, Pedro had to learn from hunters and acquire active experience. When Pedro started to collaborate with local hunters during the 1990s to

⁵⁴⁴ Fleck, *Genesis and Development of a Scientific Fact*, 54.

implement plans for controlling beaver population, he had to first gain the trust of the hunters. For that, he allied with a local poacher, gave him the body-gripping traps received by the local government, and collaborated in learning how to use them until they could give a workshop to the rest of the potential hunters, now with the legitimacy of being with a hunter. That legitimacy, however, came not without damage and sacrifice. Pedro had to prove his doubtful masculinity to rough men:

I had to find those guys, who are often dangerous. I have gone with them alone in the mountain and they have such knives! And look, it is the only way to see how they hunt. At the beginning they laughed at me so bad, it is how they treat each other. And then, you see they do some things, bestialities, animalities. They taught their kids the same...going with dogs there coming all bleeding, they use them for beavers or for guanacos even if they are protected. Dogs go there around the animals, chew them, bite them, circle them...they follow the beavers through their burrows, entering their canals, and then the hunters hit the beavers with blades...I don't know, it is bloody, you try to convince them there are easier ways, and how to do better for the animal, the dog, the beaver, oneself. You go slow trying to convince but with respect, you earn respect by doing and sharing what you have. I had to carry two big beavers hanging on my shoulders with a rope, one on each side, with that rough guy there looking... 20 kg each, and each of us walking like 6 km... but when they see that you can do it...you are in, the relation changes and they listen to you better.

Pedro is still haunted by the suffering of beavers he produced and in which his body suffered, too. When collaborating with hunters, Pedro the expert had to be initiated into the masculinity of Fuegian trappers. He was asked to prove his masculinity not so much by killing the beaver itself as by showing it and proving to other members of the fraternity that he could do it. And he had to prove it to old hunters whose status was being displaced by new settlers like Pedro who, rather than designing extractive and industrial natures and futures, were participating in the transformation of TdF as a region living on sustainability

futures and conservation values linked to science and tourism, or what has been called the “new Patagonian imaginary.”⁵⁴⁵

In the field with trappers, Pedro was initiated into the hunting practices of pioneers and estancieros who had been historically recognized for their and strength to settle and construct the national territory out of sweat and sacrifice, for working with their hands against the “desert.” Those pioneers were going through the process of becoming “second-class” citizens, recognized for their pioneering activities in the *past* but often “not for their current subject position,”⁵⁴⁶ displaced by the new values of conservation, sustainability, tourism, and science.

In CADIC, where subjects are today more easily recognized for their contribution to the values of conservation, estancieros are often viewed as isolated, rude, and sometimes brutal. Nonetheless, they are still landowners, and thus researchers have developed ties with them. While making estancieros inferior as the savage native settlers who were there before science and conservation arrived, scientists also reproduce their historical horizons of privilege and legitimacy by protecting their more-than-human imperial/invasive productive/extractive territories. That is what happened when the two Chilean biologists, Giorgia and Derek, visited the estancias and wrote down the educational level of their members or filmed their shocking treatment of sheep. In one of the scenes, they hold a closed capture of one of the estancieros claiming to be “the king of his land,” a king that had the right to govern his land as he wanted, against either foreign multinationals or foreign beavers who were not respecting him. In Argentina, estancieros are described also as those

⁵⁴⁵ Mendoza et al., “The Patagonian Imaginary: Natural Resources and Global Capitalism at the Far End of the World,” 93–116.

⁵⁴⁶ Rasmussen, “Institutionalizing Precarity: Settler Identities, National Parks and the Containment of Political Spaces in Patagonia,” 7.

illegally killing guanacos to feed their dogs and later demanding intervention against wild dogs attacking their sheep. However, estancias landscapes are also marked by imperial ruined landscapes of activities that are no longer productive, abandoned buildings, and spent fortunes. While many left their lands abandoned waiting for a good buyer, others have tried to adapt to sustainability and tourism.

Once the eradication funds arrived in Ushuaia, the project needed hunters to remove all the beavers from the seven pilot areas. Those who designed the plan already knew of the bloody histories in which “classic hunters” engaged and thought of them as rude men who used to be in the mountains for days with neither the discipline nor social norms. While those characteristics would be useful to help the group remain in harsh conditions, they could also pose problems if they hunted animals other than beavers, if they did not avoid cruel practices, or if they did not register well the information needed by scientists.

In addition, the classic hunters’ efficiency, or “success rate,” was based in obtaining as many game pieces per day while, for the eradication designers, that had to change towards getting zero, for that would mean an area was “cleaned.” To control the classic hunters, the teams were mixed with “young, disciplined, professional skilled people” like tour guides who had been in TdF for at least ten years, often escaping the city like the researchers. These young professionals were also able to be outside in the snow for a week and live in tents under hard climate conditions, and they brought with them their docility and their facility with technologies that enabled registration of all the data in the tablets: location, trap used, accidents, and distance walked.

While eradication science tried to domesticate and civilize wild hunters, it also provided high tech technologies for killing such as imported traps, quads, and helicopters. Some researchers in the city questioned the job given to the hunters, assuming it was too

hard and that many would do it just for the money in a jobless context. However, as my informants showed when describing their experiences, the job provided them with both the pleasure of the hunt and a recognized social status in TdF, as they did not have to hide their activities. Highlighting the risks that they had undertaken, some told me how their job was not meant for everyone. Some were surrounded by threatening packs of wild dogs and others had risked their lives falling into icy water and having to return to the camp wet in freezing temperatures. They could share all of it with the status of being involved in a conservation project that legitimated their killings as not responding to *mere* hunter pleasure, but as responsibly enabling the restoration of Fuegian natures.

5.3 Distributing Responsibility: Encounter, Avowal, and Reconfiguration

Derrida has interrogated the utilitarian logics behind scientific ethics that justify their interventions in terms of the greatest good possible, whether humanity, nature, health, or animals. Situating the ethics of decisions in a meta-narrative precludes responsible action and abstracts ethical decidability from each situation.⁵⁴⁷ Within this logic, scientific dilemmas have often proposed the creation of standards, protocols, and manuals of good practices. The logic of the greatest good for killing animals in science became especially accepted during the 20th century when social movements questioned animal experimentation practices and commercialization of laboratory animals for the interests of scientists.⁵⁴⁸

⁵⁴⁷ Jacques Derrida, "'Eating Well', or the Calculation of the Subject: An Interview with Jacques Derrida," in *Who Comes After the Subject?*, ed. Eduardo Cadava, Peter Connor, and Jean-Luc Nancy, trans. Peter Connor and Avital Ronell (New York: Routledge, 1991).

⁵⁴⁸ Kristin Asdal, "Subjected to Parliament: The Laboratory of Experimental Medicine and the Animal Body," *Social Studies of Science* 38, no. 6 (2008): 899–917; W.F. Bynum, "'C'est Un Malade': Animal

Through political exchanges that enabled society to enter laboratories, animal research was expected to be justified for its human utility and morally superior ends. In TdF, eradication planning justifies itself through this sort of logic, in this case not to enhance human health, but also that of other nonhuman species, ecosystems, and even nature itself.

To avoid public opposition and focus on the positive side of eradication, hunters were not called hunters but *restauradores*, or restorationists, as a way to highlight their environmental work, which was often pronounced accompanied by hands forming a quotation marks symbol. While scientists claim to know that the goal of the project is restoring ecosystems and not killing beavers, some also defend the use of the word restorationists as an “euphemism to not expose the hunters.” Euphemisms and metaphors play a key role in structuring eradication as they contribute to highlighting of some aspects, like conservation, while obscuring others, like killing. At the same time, by calling hunters *restorationists*, beavers and natures become more objective and scientized.

Enjoying hunters and restorationists who had a well-paid, adventurous, and hard experience, they were asked to go farther and deploy killing for the purpose of conservation. Rather than valuing their trapping knowledges, the central part, for scientists, was to make hunters kill for the sake of conservation. For David, the Chilean park ranger who preferred using snares, this meant “not hunting for the mere sake of hunting but creating sense.” He spoke out of experience; coming from a hunting family, he had created his own conservation sense after years of work in the parks, a sense that now placed him outside his original community when he questioned the hunting practices of his father and friends. For Pedro,

Models and Concepts of Human Diseases,” *Journal of the History of Medicine and Allied Sciences* 45, no. 3 (1990): 397–413.

the scientist who had had to learn from hunters in order to train them, sense lies not so much in the daily practices as in the bigger goal:

you can't lose the broader goal, like when foresters go hunting minks just for hunting, for me it loses validity you have to hunt for something you want to achieve, like foresters working with poachers with rifles, a barbarity...like once I was with a forester going for beavers with rifles and there were no beavers and he wanted to just hunt anything.

Nature restoration works as an abstract goal that is actually not possible or believable by the experts involved in its invocation. This goal makes the entire population and species of beavers in TdF killable in the name of a superior moral and "ethical" end. In this way, the traditional idea of divine or natural equilibrium and death for the community becomes actualized through conservation knowledges. However, when displacing responsibility from the relational production of knowledge between subjects into abstract, detached, and disembodied ethics, the necessary response required to act ethically is erased. Moreover, every ethical action constitutes a dialogue for the recognition of difference between asymmetrically related selves and others. They are asymmetrical in that power-mediated interests and actors make some more vulnerable than others and enable some to exercise greater influences with their actions than others.

However, eradication in practice displays a distribution of responsibilities beyond the logic of sacrifice of beavers as a killable species. Since eradication cannot be executed merely through protocols, technical fixes, or planning, when hunters, experts, students, or citizens kill beavers, they do it through embodied, relational, and grounded experiences. Attending to the uncanny experiences of killing beavers, those involved in killing are more or less directly and constantly interrogating the boundaries between themselves and the nonhumans that they encounter, often in ways that question their very humanity.

As they asked throughout my interviews with them: Can we kill animals that are almost as intelligent as humans? Can we kill after humanizing someone? If humans are humans for having culture and ethics, do we have to apply humane ethics to animals? Those questions, in TdF, not only affect what is known and how, but enters into the very production of natures, landscapes, and relations themselves. These questions mark paths for disappearance and flourishing. As the following table demonstrates, responsibility for killing was distributed across technologies, values, subject locations, knowledges, temporalities, and experiences, and each of these entities interrogated how to act responsibly in every situation or encounter, how to negotiate difference and identity, and how to cope with the anxieties of being responsible for what we know and what we don't know.

Table 5.1. Making death multiple in the Beaverscene

Ontology	Episteme	Ethics	Horizon	Death
Settler-colonialism	Industrial	Fur Nationalist	1940s	Skinned, not shot to conserve fur
Productivity	Economic – settler	Infrastructures Center-Periphery	2000s	Local methods, dogs, rifles, traps
Control	Individual – intimate Professionalization	Minimize suffering and nontarget	1990s	Snared
Conservation-Eradication	Species – clean Global Capital	Maximize efficiency Sustainability	2010s	Body Gripping traps
Eco-genetics	Science	Maximize Samples	2010s	Boiled, teeth
Hunting	Masculine – savage - pioneer	Maximize pieces and masculinity	1990s	Bloody, dogs, rifles, traps
Institutionalization	Geopolitical Transnationalization	Maximize collaboration	2010s	Helicopters, quads, drones

5.3.1 *Encountering Responsibility*

A central question remains, what does responsibility for killing someone look like in TdF? For Haraway, to act responsible when killing animals, requires encounter and curiosity for the other nonhuman, all of which can only emerge through practice rather than manuals and checklists:

Accountability, caring for, being affected, and entering into responsibility are not ethical abstractions; these mundane, prosaic things are the result of having truck with each other.⁵⁴⁹

Seeing responsibility as emerging through practice means that there are not ultimate universal notions that define more or less responsible actions for every situation, being, and form of knowledge making. Rather, *mattering*, as Haraway puts it, “is always inside connections that demand and enable response.”⁵⁵⁰ This means that if beavers would have entered the world of fur trade and industry, their life trajectory would have been very different. Their relationships with other humans and nonhumans might have been surveilled not for controlling the spread of beavers but rather their production of vital surplus. They might have become a symbol of pride for TdF, rather than being represented as demons devouring the natives species Their furs might have been cared for and refined, turned into goods like the wood from the lenga trees, their exoticism displaying the remoteness of TdF for consumption across the globe. People might well have developed other relations with those beavers, while co-constructing knowledges, technologies, and landscapes of fur trade, tanning, and design.

⁵⁴⁹ Haraway, *When Species Meet*, 36.

⁵⁵⁰ Haraway, 71.

However, the beavers of TdF never entered an industrial network of relations and their destruction, without the generation of surplus value, became too high of a cost for nothing in return. In the Beaverscene, it was not humans who were responsible for too much environmental damage that they were in need of control, but rather the settler beavers who, unemployed, continued extracting leaves, waters, branches, and trees for their reproduction and expansion. Beavers became invasive in their relationship with humans, not just with trees and rivers, as I showed in the previous chapter. And here, when humans intervened, we see a range of responses that went beyond checklists, ethical codes, or minimizing suffering.

Conversing with the logic of sacrifice that justifies beaver killing for nature restoration, Pedro responded to his own doubts and practices of killing beavers in different manners and with different projects and goals. While his idea of broader goals obscures the responsibilities trappers and hunters have been developing for years, it also responds to Pedro's anxiety about the sacrifice of beavers, who had not intended brutality and who he admired and loved. As he told me, having a broader goal helped him take some temporal comfort for his implication in killing what he sometimes thought were innocent beavers who just built their ecosystems. For David, the ranger, having a broader goal similarly helped him cope with the fact of killing animals he did not hate but rather loved. For him, hunting was not a hobby but rather a responsibility to stop destruction:

We look at the future and now what's going to happen if we don't act...it is the responsibility of doing something or there will be consequences...but here yes, we don't go publishing what we do either, not dead beaver pictures...we mostly talk about the damage they do, it is a bit demonizing of the beaver but then people don't look at the tender rat but at the dead forest.

While David and Pedro claim responsibility in their justification for killing the animals they love, for eradication managers and designers, beavers should not be hated either, but in a

different way. The communication strategy set through the GEF structure and funding insisted on not demonizing invasive species, as that would envision eradication as a “one species problem,” rather than as a more holistic nature restoration. Along that line, the project also created evasive communication guidelines that suggested not showing the charismatic aspects of exotic species, avoiding public mention of beaver eradication in order to “avoid generating noise,”⁵⁵¹ and calling hunters “restorationists.” That fear of opposition made it hard for me to enter the field whenever I mentioned the words “responsibility” or “death,” but sometimes also made it hard for hunters in Chile and Argentina to exchange experiences due to the generation of silences around hunting and eradication.

5.3.2 Responsibility and Difference

For Haraway, responsibility becomes possible only as conditional, never unconditional, since caring for some implies the exclusion of others. Rather than relativism, the realization of conditionality enables responsibility, from the very capacity to decide *and* not remain untouched from those decisions. In my research I found that being responsible implied not only the capacity to decide, but also the capacity to let relations transform and undergo reconfiguration. Scholars exploring the killing of invasive or damaging species for the protection of others have shown how eradication has opened and reconstructed instances of care. Van Dooren has shown how reactions against the killing of feral pigs in the name of conservation were explained through competing forms of care.⁵⁵² For some, protecting the pigs meant caring for their families and cultures; for animal activists it meant

⁵⁵¹ Manager, personal communication. 2018.

⁵⁵² Thom van Dooren, “A Day with Crows - Rarity, Nativity and the Violent-Care of Conservation,” *Animal Studies Journal* 4, no. 2 (2015): 1–28.

caring for the species. Van Dooren argues that all, families, activists, and experts, engaged in forms of “violent-care,” derived from letting some be abandoned, killed, or disposed of while protecting others. Examining the eradication of goats in the Galapagos to save indigenous turtles, Bocci has shown a similar dynamic in which hunters, families, and experts became entangled in different forms of care that were recombined through the socialites and biologies that the eradication of goats co-produced.⁵⁵³ Both Bocci and Van Dooren attend to the making of local nonhuman biologies, expanding to the nonhuman the critiques to one-biology visions that disavow the coproduction of biological knowledges, society, and materiality.⁵⁵⁴

In TdF, through sharing routines in the field, the laboratory, or in their offices, researchers become often attached to the species they work with, no matter if attachment comes through life enhancement, killing, or through conserving dead specimens. In TdF, the attachment is expressed through the pejorative/affectionate word *bicho*, the best translation of which is “critter.” The use of the word *bicho* to denote the species one works with, either in living or deadly encounters, denotes intimacy and knowledge with the species. The students with whom I worked told me how they started to use the word once they first went to the field or worked in a zoo, seeing it as something that, as one student said,

can be negative, as a nonhuman, as weird, ugly, different. For wild animals because we do not use it for dogs or cats, bichos are the ones you bake. Well yes, there is some affection on it, too.

The use of *bicho* marks a sort of appropriation that differentiates scientifically mediated relations from other kinds of human-nonhuman relations. In fact, one of the common tips

⁵⁵³ Bocci, “Tangles of Care: Killing Goats to Save Tortoises on the Galápagos Islands,” 441–442.

⁵⁵⁴ Margaret Lock, “The Tempering of Medical Anthropology: Troubling Natural Categories,” *Medical Anthropology Quarterly* 15, no. 4 (2001): 478–92; P. Sean Brotherton and Vinh-Kim Nguyen, “Revisiting Local Biology in the Era of Global Health,” *Medical Anthropology* 32, no. 4 (2013): 287–90.

students receive from their advisors is not to let the word come out when defending a paper or giving a public talk, as it is an informal word, a colloquialism, but they admit not even the eldest researchers can always avoid it. The appropriation extends beyond the interactions between researchers and species, also marking their specialized knowledge and their belonging in the scientific community. One day, after an interview about beavers trapping and hunting, I was talking about beavers with a friend. For the first time, and with all the recent knowledge acquired, I called them *bichos*, immediately feeling how the word anchored my appropriation of the knowledge of the species that the other person lacked. Affectively, my voicing of *bicho* showed not only the intimacy of my relations with beavers and scientists, but also a scientized form of detachment that came through their objectivization as a species.

Responsibility, in this view, not only entails encounters, but also relational reconfigurations that enable the transformation of socialities, biologies, and identities in ways that do not perform positions of mastery and superiority. As Triviño Caballero has shown in her analysis of experts appealing to conscientious objection, going through moral conflicts demands subject transformations, rather than the defense of fixed conceptions of morality and identity.⁵⁵⁵ Moreover, she also shows how people who live under oppressive situations often face more moral conflicts than those acting from more privileged locations and who are often more resistant to modify their moral conditions no matter the effects they have on others. From a materialist perspective on ethics, Triviño Caballero suggests privileging the position of those who bear the burdens and consequences of the ethical decisions at play.

⁵⁵⁵ Rosana Triviño Caballero, *El Peso de La Conciencia. La Objeción En El Ejercicio de Las Profesiones Sanitarias*. (Madrid: Plaza y Valdés, 2014).

In TdF, some were more open than others to questioning their assumptions and values when being haunted by questions of ethics and responsibility. Those in the planning and designing locations of the eradication project tended to dismiss the interrogations with which they were being confronted. As one expert narrated,

Now we have this movement with compassionate conservation, they are like whatever you do, do not kill, they perform an extreme respect to life. But I don't get it, what does it mean to coexist with the beavers? Do I accept his damage because he deserves to live? It does not make sense to me, with that argument, we should also leave Ebola live. Where do I put the limits? Where things have no eyes or fur? Now Argentina declared an orangutan as a nonhuman person [laughs] personas are human beings come on. It is dangerous, we risk go too far that we won't be able to kill animals for their rights.

While in most of my interviews I would have interesting exchanges with experts, hunters, and students, reflecting together upon the epistemes we used to justify our knowledge making as well as our engagements with death and killing, this did not happen with some of the recognized authorities in TdF, whether scientists or policy makers. For that same expert, the fact that some organizations in TdF opposed the eradication plan at first did not make him question his assumptions; rather, he responded by making them inferior and erasing them from the territory of inquiry:

We had some opposition, [smiles] but we told them ok, use your technique, we leave you an area not to mix each other and if it works, we take it. They never came back. Of course, if there was alternative, I would buy it if it is less cruel, but there is not.

In Haraway's terms, killing and making others suffering are practices that should "never leave their practitioners in moral comfort, sure of their righteousness."⁵⁵⁶ She does not refer to guilt, either, but rather insists on not letting operations of calculation and objectivization take responsibility. Likewise, when Pedro had to learn how to implement Conibears, he engaged with "dangerous" hunters, dogs, traps, and suffering beavers. Through their

⁵⁵⁶ Haraway, *When Species Meet*, 75.

deadly encounters of knowledge production, they negotiated meanings of suffering, masculinity, and ethical killing. While “bloody” hunters were undergoing transformations to more “humane” forms of trapping that located them, at the same time, as less civilized citizens, Pedro not only became a more legitimate Fuegian citizen embodying the truths of science and conservation, but also became a bit more savage by undergoing the masculinity proofs he was tasked with in order to be trusted. Above all, he had to learn how to trap.

At the same time, while undergoing negotiations over belonging and authority through killing, Pedro’s implication in beavers’ suffering did not let him go untouched. With time, he also reconfigured his methods for killing that attended to those who bear the material consequences of suffering through different killing practices—the beavers. Bearing with him the pain inflicted through his ignorance of beavers, Pedro started to develop a passion for beavers that made researchers joke that Pedro himself was “like a beaver.” In that history, Pedro learned what beavers liked, how they moved, how they suffered, how they learned, how they escaped or blocked the traps, how they died better under certain conditions. Along that path, beavers taught him their own Fuegian natures, ones in which water was key. In the same way, beavers taught David, the park ranger, that he was not exceptional, and neither were his human companions:

The problem is humanizing animals, we dress dogs and adopt beavers as pets. It happens because we humanize them, because they are smart. But humans are not the only smart ones.

David, after years studying and killing beavers, returned home a stranger. At home, he would now call out his friends and relatives if they were hunting for pleasure or throwing garbage in the countryside. He had come from a family that used to hunt and emigrated to the south of Chile where he worked as a cashier in supermarkets. When he saw the opportunity to work for conservation, he did it at first for the job. However, the fear of doing

it wrong made him be very attentive to what beavers had to show him. Studying them methodically before being able to trap them, they had made him reject other forms of hunting. Contrary to what experts argued about “classic hunters,” “bloody hunters,” or “Rambo hunters,” as they are sometimes called, they are often much more open to undergoing transformations than experts who, as Fleck puts it, “can no longer escape the bonds of tradition and of the collective,”⁵⁵⁷ for fear of not being recognized as experts.

Likewise, when the anthropologist Laura Ogden arrived to the Chilean side of TdF moved by uneasy emotions towards the eradication of beavers, her interpretations became even more complex once she met the concerned locals and the landscapes of dead and dying trees that made her grieve for them.⁵⁵⁸ In Chile, she met Giorgia and Derek, the two biologists who had filmed the documentary described above. With them and two artists, she conducted a two-week eco-tour through the areas that have been most severely affected by beavers in Chile. During the trip, they learned to wonder, to observe, experiment, and speculate the becoming of beavers in TdF as a species intimately intertwined with humans.

They designed beaver costumes to *dress like them*, placing cameras on them to see *like them*, and listening to the local population’s concerns about beavers. After that, they organized a two-week experiment in which they tried to create interspecies communication by learning to sense beaver castoreum, synthesized in a laboratory in Los Angeles. The synthesized smells would be put in jars in an artist installation in the US to make visitors travel to TdF from a beaver’s perspective. Those smelling liquids would later also be placed

⁵⁵⁷ Fleck, *Genesis and Development of a Scientific Fact*, 54.

⁵⁵⁸ Ogden, “The Beaver Diaspora,” 81.

in beaver territories in Chile, in order to observe the beavers' responses.⁵⁵⁹ While their project did not provide conclusive results on the beavers' responses, they went on thinking of beavers and themselves differently.

5.3.3 Responsibility and Reparation

In addition to encountering and undergoing the reconfigurations recounted above, TdF, also faces a history of disavowal, repression, and silence that is embedded in the making of science, politics, and subject formation in the region. Building upon psychoanalysis, disavowal can be read as a defense mechanism or as a response to the existence of contradictions, incompleteness, and differences. It occurs when a subject cannot bear the fact that the other can be good *and* bad or produce positive as well as unpleasant experiences. When unable to integrate both experiences into a whole person or object, selves might split, either into self or other, and oppose the world into either loving or hating relations. Through disavowal, the subject denies contradiction while at the same time knowing it exists. In a way, disavowal is the psychic mechanism of separating incompatible events.

Splitting is what some experts and students working with the eradication of beavers performed. In fact, beavers tend to produce that in humans, as they tend to be either admired as engineer heroes or hated as damaging species across the globe. What often makes beavers especially loved and hated is their almost human capacities to engineer

⁵⁵⁹ Giorgia Graells et al., "Dear Enemy: Interspecies Communication through Artisanal Scents," *Ensayos* (Tierra del Fuego: Ensayos, 2017), accessed July 20, 2020, <https://ensayostierradelfuego.net/tag/dear-enemy/>.

ecosystems and to damage them. Admired for being almost like humans, they are often also hated for that illegitimate position. As engineers, as David told me,

Their behavior was amazing, very smart, adapted, they knew very well their environment....and then like changing the chip and do trapping...it was difficult...

As one student who worked and admired Fuegian beavers responded, his work eradicating beavers had affected his views on nature and humans, while he claims to hate the beavers, he also learned to hate humans:

now being within eradication, I see everything as a problem, as something to eradicate, as a plague or a disease. We should eradicate many humans, because actually the definition of plague is anything that can damage the human, and what is more damaging to humans than humans themselves?

If this student had learned to envision nature and society through eradication knowledges, other had learned to know and evaluate beavers' damages in different terms. Those students who were not working around invasive species, either mentioned their shock when walking through landscapes of dead trees and small sticks that hurt you if you fall down, or their shock by encountering hunters with dead beavers in their hands. Those who worked around beavers and their effects without being involved in their eradication or in knowing them as species, were more prone to see them as an evil species.

When I accompanied some students to take samples from rivers, one told me how she was being "chased by beavers," meaning that they kept building dams in the sites she was sampling and how they forced her to continuously having to change her sample sites, as new beaver ponds affected the consistency of her data gathering across time. When seeing a dam, she looked at me, "do you see now why beavers are bad," while questioning what she believed was my approach to beaver killing. Seeing them as evil, however, does not imply killing. When I asked the group if we were going to do something with the beavers we were encountering, given that we were already there, another student responded:

No. One thing is believing and supporting eradication, and another is that I put the traps and be left holding the dead.

While those who most often deemed beavers as an evil plague were students, some experts too responded defensively when being asked about death, concretely when being asked how to bear with the responsibility for killing an entire species despite it being harmful:

No. It is not about killing, it is about restoring ecosystems and for that we have to remove them, because you cannot put them in another place. It is not that one gets up crazy to kill, it is that there is no other alternative.

For David, who had studied and killed beavers for years and never showed defensiveness to any of my questions, splitting was not the foregrounded defense mechanism. Rather, David emphasized that damage, death, and nature were part of a constant ongoing process, the value of which could not be stated once and forever:

I started to study them as something already integrated in the environment, not as good or bad, but as I had to study them...and here yes, it is not like in the US where beavers do a pond with little ducks, here there is a totally different visual impact, you have a pond and twenty-five dead trees and then dry and dead for twenty years... and yet some insects benefit from them, we have to measure.

Responsibility, in TdF, demands not only encountering and reconfiguring through practice, but also responding to historical mechanisms of disavowal towards all that has been erased, displaced, and silenced, made inferior, negated, and disposable. It requires an ongoing encounter with death beyond nature and environmentalism in order to respond to the reconfigurations and tensions that settler-beavers, estancieros, and scientists undergo together as they act together to keep obscuring all that they need to erase in order to organize their presents and their futures. In TdF, many futures have coexisted and settled to transform the desert, to modernize it, to industrialize it, to conserve it, for a future that keeps situating histories of violence in the past, as if they were not present today in the form of mediations and re-actualizations.

For being responsible, we are struggling now to respond to our own maintenance of disavowal. How do we make not better environmental futures, in a region that is filled with ruins of improving futures, but rather write better histories, memories, and pasts that do not disavow but instead reckon with the pasts that haunt us? How do we reckon with more reparative relations with past and present? How do we abandon visions of mastery that portray experts as savers of nature, the future, and its past to allow space for all what we are actively denying? How do we intervene in the Beaverscene without reproducing imperial infrastructures of knowledge, killing, optimization of suffering, and racialization of human and nonhuman populations? And how do we go beyond disavowal and the comforting Manicheism that impregnates our analysis of settler colonialism? How do we better understand the layers of colonial thinking that constitute us in ways that, today, make old privileged settlers inferior while continuing locating indigenous populations in the past? How, above all, do we respond beyond defense mechanisms that demand us to settle conflicts and rather seek forms to un-settle them?

5.4 Animal and Death Borderlands

When I moved to Tierra del Fuego I did it to research not only death and beavers, but also because I was moved by the silences that my own relatives had been actively producing out of histories of forced disappearance, violent killings, multiple dispossessions, and exile. The killing of beavers helped me not only to encounter the history of a country that had received and killed my family, but also a way to break those silences. Disavowal is a strong structure of resistance and, as such, not easily breakable. Thanks to the beavers, as boundary objects, I have been able to talk about Argentina, its politics, and its deaths with my relatives in Spain, as we are not directly opening up anything, we are *just* talking about

beavers. With the beavers, not only I have learned to grieve them differently, to love them differently, and to collaborate with the scientists who study them differently, I have also learned to, at least slightly, construct different memories, healing memories, that have enabled my silencing to be less defensive and more reparative. During my time in TdF I also learned to live with death in un-settling manners. After a few months there, I had to return home to accompany my father in his last days of life. With him, I encountered many questions and paradoxes that we shared in very special ways, and which also gave me more questions once I saw death in its making.

While this is not the place to talk about those moments, I will just narrate what un-settling death in Tierra del Fuego, with the beavers, meant to me, too. As my father had wanted to come to Ushuaia, I took part of his remains with me, with the rational and secure idea to leave them in some beautiful place amidst some beautiful words. However, days passed and not only had I not gone anywhere with him but, without realizing it, I had created a little altar in my room with him, some pictures, and some plants. I kept struggling with myself and disavowing the trouble of having death in my room, waiting to find the perfect moment and place in which I would carry on my plan. It was not coming. One day, at a snowy area with abandoned beaver dams and dead trees, I took my recorder along with me to think upon the beavers and my research questions. As I was trying to understand how to grieve beavers while acknowledging something had to be done about them, I realized what it meant to un-settle trouble. There would never be a perfect solution, neither for beavers nor for my father, no matter how much thinking I put on them. It was then that I could some days later finally take my loved one to the mountain and grieve him, not in the perfect way and not, as I was planning, in the way that would resolve his death.



Figure 5.7. Un-settling death and grieving with beavers in TdF (2019)

Restoring natures in Tierra del Fuego is, also, un-settling. While experts are taking the lead on what needs to be protected and what counts as native, they also know there are no solutions or perfect recipes. They know eradication is impossible. They know any killing is both innocent and non-innocent. At the same time, intervening in natures for mending environments is mediated by the reproduction of mastery narratives and colonial drives for designing natures for the future, all the while disavowing our own participation in maintaining silences that privilege us as experts and non-inferiorized citizens. In the next chapter I will show how, despite the naturalization of restoration and indigeneity that environmental restoration is co-producing, the very act of naturalizing reparation is opening possibilities for examining how invasion, in Tierra del Fuego, is more-than-animal and how restoration, is more than natural.

6. POSTNATURAL AND THE POLITICS OF NATURALIZATION

I, a Patagonian writer, do not adhere to the "pure nature, pure landscape" literature, I disclaim this obligation of the "*Ley del Coirón*⁵⁶⁰" that (outside Patagonia) seems to have wanted to impose on us.(...) I do not need to plant a coirón in my verses to belong to the Patagonian literature.⁵⁶¹

Patagonia, land of suffering angels, the bullets hurt you yesterday, oblivions hurt you today... Patagonia, destined for sacrifice, by those who look from afar. (...) Pregnant with myths, that are mixed with the wind and the breath of your children... Patagonia.⁵⁶²

6.1 We Have to Kill Them All

It is November 2018, spring in Ushuaia, and I am visiting the Museum of the End of the World, a local center that narrates the official history of the region: there was a proto-historical time, the time of indigenous peoples of *the past*, and a proper historical time, which comprises the process of conquest and *modernization* by white settlers.⁵⁶³ Uncomfortably, I start to feel how indigenous histories are placed in a past made *Other* and how, that temporality, is asking us to identify with western pioneers and settlers, including the most violent ones.⁵⁶⁴

⁵⁶⁰ The *coirón* is a gramine plant that is well distributed in Tierra del Fuego and the South of Patagonia.

⁵⁶¹ Luciana Mellado, "El Iceberg de Hemingway: Lo No Dicho Que Todo Lo Sostiene," *Argus-A* 3, no. 12 (2014), accessed July 10, 2020, <http://www.argus-a.com.ar/publicacion/530-entrevista-a-graciela-cros-el-iceberg-de-hemingway-lo-no-dicho-que-todo-lo-sostiene.html>.

⁵⁶² José Larralde, *Patagonia, A Las 11 - 1/4* (Argentina: DBN, 1999).

⁵⁶³ Arnoldo Canclini, *Tierra Del Fuego. De La Prehistoria a La Provincia* (Buenos Aires: Dunken, 2007); Arnoldo Canclini, *Así Nació Ushuaia. Orígenes de La Ciudad Más Austral Del Mundo* (Buenos Aires: Dunken, 2006). The philosopher and Baptist pastor Canclini, argues that history starts with the national presence in the territory, between 1825 and 1868, once the "white men" contacted indigenous peoples.

⁵⁶⁴ Danae Fiore and Ana Butto, "Fuegian Museums and Anthropological Discourses: A Comparison of the Representations of Indigenous Societies from Tierra Del Fuego in the Two Southernmost

As I continue walking through the museum, I ran into Mario, a person who identifies as descendent of the Yaghan indigenous community. He is in his forties and works at the museum and is explaining the history of TdF to a group of school students. Mario is challenging the history that the exhibited objects tell and making another one. He tells students how, in the past, his community used to use tree barks for their canoes without killing the trees, “not like *we* do today.” When the students visit finishes, I approach Mario to ask him for advice on my archival research. When I explain him that I was studying the histories of beavers, science, and coloniality in the region, he immediately responds:

oh yeah, beavers are a terrible problem. We have to kill them all. And we should not care about those humanitarian laws from outside,⁵⁶⁵ we need to use all the possible methods to eradicate them, they are cutting us down, fencing us.

I am shocked by his strong argument; I was not expecting it. I ask him for his thoughts on another perspective, one I had encountered in my interviews and which challenged the killability of animals based on their invasiveness. As one resident had told me,

what right we have to kill the beavers for harming the native land and the ecosystem? We all came here from outside; we all killed the natives; we all cut down and fenced the woods to build our houses.

When faced with this position, Mario hardens his face and directs each of his body's angles to me: feet, shoulders, eyes, cheekbones and, especially, eyes:

No, no, no. You know, we cannot kill humans with the laws we have today, it is neither legal nor ethical nowadays. But we can kill the animals, and they are destroying our landscapes, our nature who has been here forever. Of course, we can't do with the people who destroyed our nature, or are we going to go to Spain [where I come from as my accent reveals] and kill you all? We can't. But we have to protect nature. Our nature. You know, all the academics like you who are studying nature and thinking how to make it more productive and keep destroying it, you don't realize that in a second nature can respond. It can produce an earthquake or an

Museums in the World (Museo Del Fin Del Mundo, Argentina, and Museo Antropológico Martín Gusinde, Chi," *Museum Anthropology* 42, no. 2 (2019): 139.

⁵⁶⁵ He was referring to the European Union standards for humane trapping, those that require irreversible unconsciousness that leads to death in *less* than 300 seconds, or 5 minutes.

avalanche that will destroy those huge universities in the US or anywhere, with everyone inside. No. We definitely have to do it, but seriously, I heard the project had issues, we should all work together.

I am now even more shocked and paralyzed. I remain in front of him, looking at him, staying with the trouble, as Haraway would put it,⁵⁶⁶ of my Spanish accent and the historical horizons of colonialism that are mediating our encounter in the form of violence. While he is struggling to voice his neglected history, I am nagged by my own troubled pasts as someone who was born in Spain due to the forced exile and disappearance of my Argentine relatives. I am also struggling with the acknowledgement that the country that has memorialized the State Terror of the 1970s, has also *forgotten* the terror in which indigenous peoples had been living for centuries. For both, Mario and I, beavers mattered in haunting ways.

6.2 Myths, Ghosts, and Disavowal in the Beaverscene

In *Ghostly Matters*, Avery Gordon describes the ghost not as a disappeared or dead person, but rather as a social figure that haunts us through affect.⁵⁶⁷ In the book, Gordon explores historical figures and novels to show how writers, characters, or knowledges are haunted by that which has been silenced and repressed today.⁵⁶⁸ Through her cases, she compels us to study the realm of specters which, especially in fiction writing, help us better capture how disappearances are mattering today through feelings, craziness, or desires. Because emotions indicate an impact on us, they transform what she calls “cold

⁵⁶⁶ Donna J. Haraway, *Staying with the Trouble: Making Kin in the Chthulucene* (Durham, NC: Duke University Press, 2016).

⁵⁶⁷ Gordon, *Ghostly Matters: Haunting and the Sociological Imagination*, 8.

⁵⁶⁸ Analyzing the history of psychoanalysis, she describes the haunting absence of a woman who had theorized the death drive ten years before Freud. Gordon also explores a fiction novel that narrates the 1970s-80s Argentinian State terror that forcedly disappeared many of its citizens. In that chapter, Gordon shows the contemporary specters of that which was repressed by organized violence and how they are still alive despite having been transformed into history.

knowledge,"⁵⁶⁹ or the forms of academic and rational knowledge that tend to detach us from our subjects. It is precisely through affect that ghosts can lead us somewhere else, to enable us to see things that could not be seen before.⁵⁷⁰

Seeing what could not be seen before is also a way to connect the realities we keep separated. In psychoanalysis, this refusal to connect things has been also associated with various forms of splitting, of dividing either the self or the other, a mechanism that, in extreme, can lead to dichotomous ways of perceiving reality as all-or-nothing, as either someone to love or to hate, as either something good or bad.⁵⁷¹ In extremes, these splits become defense mechanisms *against* troubling experiences, particularly those that cannot be ever totally fully grasped due to multiple or contradictory experiences.⁵⁷² One of these splitting mechanisms is known as *disavowal*, which consists of denying something that has been experienced as traumatic. This form of denial, however, does not imply a complete negation; instead, it keeps it separated in the form of coetaneous contradictions. Disavowal means neither the rejection of contradictions nor the negation of reality. Disavowing is the act of knowing *and* at the same time, denying, both options coexisting without affecting each other. Therefore, disavowal can also be interpreted as the incapacity to respond by refusing to acknowledge.⁵⁷³

⁵⁶⁹ Gordon, *Ghostly Matters: Haunting and the Sociological Imagination*, 8.

⁵⁷⁰ Gordon, 98.

⁵⁷¹ In this line, the anthropologist Cecilia Gerrard has studied how, while archaeologists in TdF often acknowledge contemporary indigenous communities, at the same time, they neglect them when producing knowledge about them. Hence, rather than embracing the complexities of colonialism, identity, and reparation in collaborative ways, this Fuegian settler-archaeology either recognizes its subjects to gain access to recognition or negates them to be fully owners of their knowledge.

⁵⁷² Melanie Klein, *The Psychoanalysis of Children*, trans. Alix Strachey (New York: Grove Press, Inc, 1960); Hong, *Death beyond Disavowal. The Impossible Politics of Difference*, 1–10.

⁵⁷³ Rachel B. Blass, "La Conceptualización de La Escisión. Acerca de Los Distintos Significados de La Escisión y Sus Implicaciones Para La Comprensión de La Persona y El Proceso Analítico," trans. Anna

Ignorance is not the same as disavowal. STS scholars have thoughtfully explored how ignorance in science has historically neglected epistemically disadvantaged actors, knowledges, and research fields.⁵⁷⁴ Responding to this, activists and scholars have dedicated efforts to make visible traditionally obscured actors, territories, and fields. They have also represented subaltern knowers and knowledges by highlighting their scientific contributions or by providing tools for citizen and empowering science. In TdF, the anthropologist Cecilia Gerrard has studied how archaeologists have been disavowing indigenous communities by *either* neglecting their identities as descendants and thus not purely indigenous, *or* by recognizing them for validating their research.⁵⁷⁵

Disavowal diffracts the politics of visibility and the representation of silenced actors, giving us the impression that it is possible to see that which was previously excluded without challenging history. When being haunted by ghosts and disavowal, we are asked not for inclusion but rather for modification of the social relations that made ghosts disappeared. In Gordon's words, being haunted is a demand for "putting life back in where only a vague memory or a bare trace was visible to those who bothered to look."⁵⁷⁶ This is

Frank, *Aperturas Psicoanalíticas* 44 (2013), accessed July 10, 2020, <http://www.aperturas.org/articulo.php?articulo=819>; Kim Fortun, "Essential2life," *Dialectical Anthropology* 34, no. 1 (2010): 77–86.

⁵⁷⁴ Tuana, "The Speculum of Ignorance: The Women's Health Movement and Epistemologies of Ignorance," 1–19; Frickel et al., "Undone Science: Charting Social Movement and Civil Society Challenges to Research Agenda Setting," 444–473; Robert N Proctor and Londa Schiebinger, *Agnology: The Making and Unmaking of Ignorance* (Stanford: Stanford University Press, 2008).

⁵⁷⁵ Ana Cecilia Gerrard, "Los Selknam: Pasado y Presente Etnográfico XI Congreso Argentino de Antropología Social," in *XI Congreso Argentino de Antropología Social* (Rosario, 2014), accessed July 10, 2020 <http://cdsa.academica.org/000-081/154.pdf>. In this extreme, disavowal operates as a mechanism against difference by epistemologically negating indigeneity to descendants.

⁵⁷⁶ Gordon, *Ghostly Matters: Haunting and the Sociological Imagination*, 22.

what Hong has brilliantly showed in *Death Beyond Disavowal* when defining capitalism as a racial structure of disavowal, a way of “seeing and not seeing.”⁵⁷⁷

More than a problem of objectivity, disavowing constitutes a defense mechanism. Attending to disavowal differs from ontological and epistemological ethics, or what Barad would call the politics of cutting things together-apart.⁵⁷⁸ Responsibility in disavowing worlds moves us from the realm of objectivity and cold knowledge to place emotions at the center. Affect helps us to understand not only the effects of emotion but also the entrenched defense mechanisms that are mobilized in scientific production to justify oppression. By focusing on traumatized rather than situated knowledges, responsibility is driven by healing and reparation more than by objectivity. It comes from the engagement with the wounds from which disavowed actors emerge, an engagement that allows us to investigate realities that have an impact on us.

Accompanied by multiple hauntings, my dissertation has followed the instances in which disavowal has been reproduced and contested in ways that connect things previously apart: population and species politics; myth and science; race and the environment; beavers and settler-colonialism; animals and mapping; nature restoration and historical reparation; centers and peripheries. During these three years, I have lived with the ghosts of colonial, genocidal, and violent pasts in ways that have transformed my research and personal experiences. They emerged in unexpected places that challenged my taken-for granted realities. As inappropriate presences, they haunted me at encounters mediated by

⁵⁷⁷ Hong, *Death beyond Disavowal. The Impossible Politics of Difference*, 17. In the book, Hong shows how the liberal politics of affirming some racialized forms of life enables the continuing disavowal of others that are racially silenced or governed through death.

⁵⁷⁸ Karen Barad, “Diffracting Diffraction: Cutting Together-Apart,” *Parallax* 20, no. 3 (2014): 168–87.

discomfort, anger, grieving, shock, pain, and incommensurability. They transformed my research from questions around the production of better futures to the engagement with the making of more reparative pasts.

In this chapter, I have analyzed the various myths that have coproduced the sciences of TdF: remoteness, desert, invasion, and extinction. I explore how these have contributed naturalizing some of the histories of science, coloniality, and nature in Tierra del Fuego, while disavowing others. I have reconstructed these myths through an archival and ethnographic analysis that has attended to the ways in which simplified languages and images have contributed to the naturalization of politics, natures, and histories. I have built my analysis upon Barthes' understanding of myth as structured meanings and moralities that help to reproduce privileged truths and groups.⁵⁷⁹ For Barthes, "myth has the task of giving an historical intention a natural justification, and making contingency appear eternal."⁵⁸⁰ Myths naturalize historical processes by creating powerful images that encourage us to experiment with them as unquestionable truths and to structure them as normative schemes. As Barthes puts it,

Myth does not deny things, on the contrary, its function is to talk about them; simply, it purifies them, it makes them innocent, it gives them a natural and eternal justification, it gives them a clarity which is not that of an explanation but that of a statement of fact. (...) it organizes a world which is without contradictions because it

⁵⁷⁹ Roland Barthes, *Mythologies*, trans. Annette Lavers (New York: Farrar, Straus and Giroux, 1972), 140. Analyzing the power of the French bourgeoisie, Barthes claims that "The bourgeoisie is constantly absorbing into its ideology a whole section of humanity which does not have its basic status and cannot live up to it except in imagination, that is, at the cost of an immobilization and an impoverishment of consciousness. By spreading its representations over a whole catalogue of collective images for petit-bourgeois use, the bourgeoisie countenances the illusory lack of differentiation of the social classes: it is as from the moment when a typist earning twenty pounds a month recognizes herself in the big wedding of the bourgeoisie that bourgeois ex-nomination achieves its full effect." Moreover, argues Barthes, through myth, the bourgeoisie transforms its own historical process into a universal nature and morality that, through science and rationality, explains all humanity, transforming "History into Nature."

⁵⁸⁰ Barthes, 142.

is without depth, a worldwide open and wallowing in the evident, it establishes a blissful clarity: things appear to mean something by themselves.⁵⁸¹

When some researchers in TdF suggested I engage with indigenous myths as the only way to know their unwritten history, I decided to also approach the foundational myths that have coproduced our scientific and settler knowledges in the region, as a way of approaching the ghosts of the Beaverscene through myths, or forms of *depoliticized speech* that work essentializing social and historical processes rather than constructing implicated and transforming narratives. Myths constitute a “perceptible absence” by emptying realities rather than explaining them.⁵⁸²

In what follows, I examine how three different and complementary myths have coproduced the making of science, natures, and coloniality in TdF across time. First, I examine the *myth of extinction* that deems indigenous communities disappeared. Second, I explore how the *myth of the desert* produces an imagined TdF as an empty and endless laboratory. Third, I study the *myth of invasion* that has scientized and naturalized processes of more-than-human settler-colonialism. As a normative system, this mythical articulation of knowledge production has promoted the reproduction of imperial identities, conflicts, and politics that, today, are leading to the scientific appropriation of indigeneity notions. However, *after naturalizing* those myths for a long time, TdF is inevitably living today among the ghosts of that which has been disavowed, naturalized, and erased. Emerging from those wounded natures, subjects like Mario, with whom this chapter opened, are today mobilizing them in re-politicizing ways. This chapter concludes with suggestions for attending to the affective instances in which disavowed subjects, histories, and knowledges are responding

⁵⁸¹ Barthes, 143.

⁵⁸² Barthes, 142.

in transforming ways. They do not mobilize their demands against nature or for it, they do it after it, in postnatural political worlds.

6.3 The Myth of Extinction

On December 2018 I visited Estancia Harberton, one of the first Fuegian *estancias*.⁵⁸³

In 1886, the then Argentinian president Julio A. Roca had agreed to donate a land of 24,000 ha to Thomas Bridges, an Anglican missionary and frontier men, in recognition of his support to the Argentinian national interests. Bridges chose a beautiful area surrounded by lakes and in front of the Chilean city of Puerto Williams. His estancia specialized in sheep production and promoted an intense trade infrastructure between Tierra del Fuego, Britain, and, later, Buenos Aires. In addition, Bridges was also able to impact the orderings of life and nature beyond his property. Like the Canadian Tom Lamb, he described himself as a man of work, family, and God, all Anglican values that had led him to a live of sacrifice for civilizing the natures and peoples of TdF through giving them the opportunity to work.⁵⁸⁴ His intensely memorialized history made of the Bridges surname a Fuegian symbol of modernization and a very well researched figured by social scientists in TdF.

⁵⁸³ Coronato, *Ovejas y Ovejeros En La Patagonia*, 86; Julio Morosi et al., "Estancias of Buenos Aires Province, Argentina: Rural Heritage, Sustainable Development and Tourism," *International Journal of Heritage Studies* 14, no. 6 (2008): 589–94. Estancias is the name given to rural settlements for agriculture and livestock production in several Latin American regions. In Argentina, the estancias have transformed rural landscapes since the 19th century, although their political and economic power declined after the First World War. In TdF, they emerged when Chile and Argentina started to promote southern colonization by conceding lands to foreign capitals, especially the British, who organized sheep farms at the end of 19th century. Estancias are not only economic units but also the "populational genesis of the Patagonian territory and its incorporation into the Republic."

⁵⁸⁴ Joaquín Bascopé Julio, "Emergencia de Una Sociedad Original En El Último Confín de La Tierra. Sentidos Coloniales IV," *Nuevo Mundo Mundos Nuevos [Online]* 13 (2013), accessed July 10, 2020, <https://doi.org/https://doi.org/10.4000/nuevomundo.64974>.



Figure 6.1. Estancia Harberton (2018)

Intertwining western notions of God and civilization, Bridges also condemned the violence perpetrated against indigenous peoples, either as evil in the form of purposeful actions committed by European traders, or as unintentional actions such as those of the first missionaries who had contributed to propagating epidemics and death.⁵⁸⁵ To counter this necropolitical form of colonialism, he developed an integration approach for optimizing native lives. For him, native Fuegians were “as human” as western white peoples, the only difference consisting, for him, in their need of development. Bridges asked settlers to learn and conserve native languages and cultures, while integrating indigenous peoples into western social relations of work, schooling, and reproduction. With this shift towards integration, which disavowed its own forms of coloniality, violence, and death, the appropriation of indigenous labor force, knowledge, lands, and autonomy became morally acceptable.⁵⁸⁶

⁵⁸⁵ Bridges, “La Tierra Del Fuego y Sus Habitantes,” 221-241.

⁵⁸⁶ Giucci, *Tierra Del Fuego: La Creación Del Fin Del Mundo*, 185.

When local tourism professionals learn and reproduce Bridges' history today, they are circulating Bridges' historicized discourses that help actualizing settlers' privilege today.⁵⁸⁷ When visiting the estancia, which has been transformed into a touristic and educational farm, privilege is performed with researchers like me, students, and visitors:

The Bridges are a very important family for the economy and the configuration of the Island. And they were very pacific, they did not use violent methods against the Indians who, thanks to the Bridges, were able to work.⁵⁸⁸

While the Bridges colonialist *mission* cannot be equated with the military and trade missions carried in TdF, it shared with them the 19th century drives for civilization linked to expansion. By condemning evil genocide, the integration model installed the myth of the good settler. The myth, founded on the disavowal of its own form of violence, reconstructed the savage native into either the integrated same or the exoticized other. Moreover, the myth of the good settler moved violence into the past, into that mythical history of under-civilization that ended with the origins of the region. In that origin, economic, social, and symbolic struggles are left behind.

⁵⁸⁷ Tourism is one of the most valued careers in the region today, along with biology, archaeology, geology, or communication, it is one of the strategic paths promoted by the local government and institutions of higher education for promoting regional expertise and economy.

⁵⁸⁸ Public communication in a tour at Harberton. December, 2018.



Figure 6.2. Ruins of sheep industrial pasts at Harberton (2018)

As I was disquietedly walking through the Estancia and the performance of its myths and industrial ruins, I observed some of the living Bridges descendants cooking or working, as if they had become the exotic native peoples of the Island to be exhibited. I then entered a half private, half public cafe where I could have English tea and British scones accompanied by the Bridges archives, which were proudly exhibited in the form of press notes, books, pictures, maps, and paintings. I was surprised to find such material readily available here, and in a much more accessible way than the public archives of the region. While diving into the family's memories, I could not but wonder: who gets to *archive* and who gets to *forget* and be forgotten? Who curates their objects and who loses them? And which absences constitute these fabrications?



Figure 6.3. Settler's archives

With these questions in my mind and English tea in my guts, I continued walking through their farm, their gardens, and finally, their own cemetery. Right there, in front of their dead ones, I was first haunted by the myth I had left unquestioned before, the one that deems the native peoples of TdF extinct after violent genocide and epidemics. It was not a challenging discourse what I found in the cemetery, but rather the practices that made it. Among their beloved ones and in front of me, an unnamed tombstone read "Native. Found in 1965."



Figure 6.4. Native found in 1965 (2018)

The cemetery, captured in this picture, told me how someone had found a dead body not at the end of the 19th century, but in 1965. It told me how the body was not identified then and neither has it been today, either by the family or by the archaeologists who have been studying the history of indigenous peoples, even in this Estancia. It told me how, in 1965 in TdF, it was still possible to find someone dead and bury the person in a private garden. It also told me how, today, it is possible to *see* this event without seeing how it happened. It told me how this tomb contributed to constructing the myth I had been supporting by reproducing the history of a *peaceful* integration and the final disappearance of the native Fuegians.

After the tomb, I started to see how not only myself but also the scientists with whom I was working contributed to reproducing the myth of extinction, and how this myth helped affirming our privileges, including the right to speak for the native histories and natures of TdF. After the tomb, I started to study how this myth is practiced, which led me to an analysis of at least five interrelated processes:

The biologization of kinship: The biologization of indigenous kinship reduces difference to scientized classifications of life. In Tierra del Fuego, a biologically informed archaeology has led to the negation of indigeneity to those classified as descendants and therefore, as not *pure* enough in terms of blood, genes, language, and time to count as indigenous peoples.⁵⁸⁹ Anthropologists who came in search of “the last pure survivors” also coproduced this negation while gaining a reputation for having arrived on time to record and interview them *before they died*.⁵⁹⁰ Today, those identified as descendants with whom I talked explain their own contribution to their disappearance, after years of silence due to shame and fear.

The archaeologization of nativeness: Deemed *impure*, descendants today are not political or research subjects of interest to most Fuegian archaeologists. Instead, archaeology studies them in the past and through mythic figures such as “the Yaghan.” This epistemology cannot see an unnamed tomb as a research site or follow its trace in ways that could matter to subjects involved in research. Separated from that past, this archaeology does not feel the urge to share *their* sites and remains with indigenous communities, nor experience the urge to collaborate with them.⁵⁹¹ Instead, it constantly formulates

⁵⁸⁹ Gerrard, “El Sigilo En Las Metáforas Del Viento: Los Selknam y La Retórica de La Desaparición,” 2. As Gerrard puts it, once indigenous peoples were deemed extinct, the remaining subjects suffered “a second ethnocide,” the one that classified them as mestizos and descendants while denying indigeneity.

⁵⁹⁰ See for example the titles, pictures, and documentaries of Anne Chapman known as the recorder of “the last selk’nam.” Anne Chapman, *Los Selk’nam. La Vida de Los Onas* (Buenos Aires: Emecé, 1982); Anne Chapman, *El Fin de Un Mundo. Los Selk’nam de Tierra Del Fuego* (Buenos Aires: Vázquez Mazzini, 1989).

⁵⁹¹ Scientists often miss fruitful collaborations, as one famous Chilean biologist told me while recounting a story about an indigenous community found in a vast protected area that made it possible for archaeologists to find twenty times more sites they expected with the guidance of those who lived there.

justifications and defenses to claim itself the only objective voice, foreclosing paths for reparations and collaborations, as if they could challenge their privilege.

The objectivization of the past: Fuegian archaeologists write and defend in public meetings the claim that, because current descendants did not live in the past, their knowledges are biased and therefore not valid.⁵⁹² As one archaeologist told me,

we go to calm them down about us being here. We are foreigners who come to work on their past, so they like to know who we are, to know we are not taking their bones.

Hence, even when reading the work of past anthropologists in the region that integrated ethnographic methods, they do it with suspicion concerning the reliability of the biased materials.⁵⁹³ Through this understanding of history, the past becomes the “task of the archaeologist,”⁵⁹⁴ who will provide objective accounts by analyzing objects and remains, and by using technologies and machine learning.⁵⁹⁵ Within this active rejection to co-construct knowledge, these complex works often lose the opportunity to reach conclusions that could be more impactful for those being implicated. Even when working with descendants,

⁵⁹² Dánae. Fiore and María Lydia. Varela, *Memorias de Papel: Una Arqueología Visual de Las Fotografías de Pueblos Originarios Fueguinos* (Buenos Aires: Editorial Dunker, 2009); Jorge A. Suby, Atilio Francisco Zangrando, and Ernesto Piana, “Exploraciones Osteológicas de La Salud de Las Poblaciones Humanas Del Canal Beagle,” *Relaciones de La Sociedad Argentina de Antropología* 36, no. 12 (2011): 249–70.

⁵⁹³ Suby, Zangrando, and Piana, “Exploraciones Osteológicas de La Salud de Las Poblaciones Humanas Del Canal Beagle”; Orquera and Piana, *La Vida Material y Social de Los Yámana*; Ivan Briz Godinoab et al., “Towards High-Resolution Shell Midden Archaeology: Experimental and Ethnoarchaeology in Tierra Del Fuego (Argentina),” *Quaternary International* 239, no. 1–2 (2011): 125–34.

⁵⁹⁴ Luis Alberto Borrero, *El Poblamiento de La Patagonia. Toldos, Milodones y Volcanes* (Emecé, 2001); Suby, Zangrando, and Piana, “Exploraciones Osteológicas de La Salud de Las Poblaciones Humanas Del Canal Beagle,” 249–250.

⁵⁹⁵ José Ignacio Santos et al., “Effect of Resource Spatial Correlation and Hunter-Fisher-Gatherer Mobility on Social Cooperation in Tierra Del Fuego,” *PLoS ONE* 10, no. 4 (2015), accessed July 20, 2020, <https://doi.org/10.1371/journal.pone.0121888>. See for example this work that, through complex computing models that replicate hunter-gatherer behaviors concluded that native societies were more cooperative than competitive.

archaeologists often cannot collaborate and end up instead explaining their history to them or seeking validation.

The fetishization of native Fuegians: Streets and shops in TdF are named either with pioneers, national events, or indigenous words and peoples. As if conflict was a matter of a past that can be learned and consumed within the shops, they sell indigenous histories within stores branded with the names of indigenous peoples or those who perpetrated genocide. It is the case of the big supermarket Sociedad Anónima or the shop *Popper* that, when out of the shop most people recognize as the most violent settler of TdF, once inside, it is hard to see anything other than a good local brand of mountain gear. What is more, the same scientists who research indigenous histories are dressed in Popper clothes. From the streets to CADIC, the disavowal of descendants is complemented with their fetishization: research vessels named with indigenous words, walls decorated with dolls representing native peoples, pictures, books, paintings, tools. It is through these acts of knowing and not knowing that the same archaeologist who talks with descendants to calm them down, also exhibits them.

The disavowal of reparations: In Argentina, as indigenous activists are claiming today, genocide did not end with the constitution of the nation-state.⁵⁹⁶ Paradoxically, even the important memory work carried on to memorialize those forcibly disappeared during the 1970s and 1980s, including those in my own family, often acts as a whitening reparation

⁵⁹⁶ Mapelman and Musante, “Campañas Militares, Reducciones y Masacres. Las Prácticas Estatales Sobre Los Pueblos Originarios,” 105–130; Juan Chico, *Los Qom de Chaco En La Guerra de Malvinas. Na Qom Na LChaco so Halaataxac Ye Malvinas. Nque'emaxa Saimiguiñe* (Resistencia: Imprenta Kram, 2016). Indigenous peoples, mostly from the North of Argentina, were killed during the first peronist government and thirty years later sent to fight and die in the patriotic Falklands War. Additionally, the state terror practiced by the last military coup against its own citizens applied the same genocidal methods applied against indigenous peoples, including torture and disappearance.

by disavowing “the first disappeared.” In TdF, the disavowal of descendants adds another layer of silencing. While sometimes indigenous descendants are recognized when allying for a common environmental cause, the myth of extinction precludes reparations. As a Mapuche scientist told me in Punta Arenas,

if *we* are already extinct, even if they recognize the violence practiced by their ancestors, they think there is not much to do anyway, nobody to apologize to.

While settlers often recognize the violence committed *in the past*, disavowing contemporary practices of erasure and maintenance of the extinction myth justifies inaction. Like Bridges’ myth of integration, Fuegian official archaeology has its own legitimating myth, an article published in 1995 that argued that Fuegian natives were very well adapted to the environment and that arguments that they were there as a result of progressive displacement from the north were invalid.⁵⁹⁷ However, by recognizing previous oppressive epistemologies, contemporary ones have legitimated themselves without reflexivity. What is more, recognition of past violence not only provokes inaction but also, as Mario claimed, promoted liberal forms of recognition that leave social relations untouched. Sometimes, however, ghosts are able to mediate these expiations and lead us somewhere else, as happened between Mario and I; or as it happened in a punk show on a snowy night, on the sloping hill of a muddy mountain where young Fuegians were drinking, dancing, and continuously falling in the mud. Performing differently, many of us went noticeably into a trance when in that atmosphere Simón Radowitzky, one of the bands, started making metal noise in the mountain while roaring repeatedly: “we live in an Indian cemetery... of dead Indians.”

⁵⁹⁷ Luis Alberto Orquera and Ernesto Luis Piana, “La Imagen de Los Canoeros Magallánico-Fueguinos: Conceptos y Tendencias,” *RUNA* XXII (1995): 187–245.

As I have shown, the myth of extinction actualizes older foundational myths through the enactment of schemes for knowing and not knowing. As shown in chapters 2 and 3, proto ethnographers and missionaries had already naturalized the disappearance of indigenous peoples by the end of the 19th century and even during the 1940s. When the Austral Center for Scientific Research (CADIC) opened in the 1980s, it was headed by biologists; the lack of social scientists is still evident today.⁵⁹⁸ Working with a positivist archaeology and a dominance of biology, CADIC researchers have acquired the scientific power to speak for and protect the native peoples and natures of TdF—now deemed not exotic, as in the 1940s, but extinct and accessible only through science. The same archaeologists who were able to mobilize complex theories and technologies simultaneously took on simplified stances. As one doctoral researcher told me,

They say they are indigenous, but they use mobile phones, they use English words when telling you are their history, they don't know their language, they don't even know well how their ancestors cooked or lived.

If disavowal consists of negating known realities, archaeology in TdF is a structure of disavowal, one emerging from the traumatic experience of not finding the pure indigenous nature and people of which they dreamed when moving to a mythical land. At the same time, this defense mechanism ensures that our sciences continue actualizing white privilege. If the sciences of the 1940s and 1950s environmentalized race and exoticism, today's sciences are supplying tools for objectivizing disappearance.

⁵⁹⁸ Bekerman, "La Política de Descentralización Del Conicet y El Fortalecimiento Del Espacio Científico En La Patagonia Durante La Última Dictadura Militar Argentina," 287–313.

6.4 The Myth of the Desert

The only distant place is the one where no one goes.⁵⁹⁹

Too soon after my arrival to Ushuaia from the big city of Buenos Aires, I felt I had something to give, much that could be done in a place that seemed full of latent possibilities. At that time, the casino had closed, and residents were proposing ideas for utilizing the space. I became excited with the idea of presenting a project for a lively museum where citizens could exhibit whatever they considered relevant, including home utilities, feminist posters, music collections, or industrial machines. I also envisioned this as a place where I could organize a memorial for the Fuegian beavers. When very excitedly I shared the idea with a local friend, she soon responded:

you have no idea how to get things to work here. You cannot be another European coming here with their modern ideas without even knowing the place.

This piercing response told me to slow down, to pause for a bit and stay here where trouble had come. My friend had generously given me a cutting critique based on my deemed good intentions. I was, like others, arriving with the appeal of a pristine TdF in where I thought I could do something that, for some reason, I could not do where I came from.

The myth of the desert⁶⁰⁰ has discursively produced TdF as a no man's, no animal's, and no industry's land. Interacting with the myth of extinction, the desert helped to obscure the genocidal constitution of military and settler occupations. It became a necessary trope for

⁵⁹⁹ Urretabizkaya, *Informe Sobre Aves y Otras Cosas Que Vuelan*, 18.

⁶⁰⁰ See Chapters 2 and 3. The myth of the desert was built upon Chapter 2 explains how the idea of an empty TdF enabled its internal colonization through designing whitening species and populations. Chapter 3 describes how state geographers contributed national expansion with knowledges and cartographies that made Patagonia and TdF as an empty land in where to affirm and legitimate national sovereignty.

a “white myth of origin,”⁶⁰¹ one that denied existence before arrival. The desertification of the south also became a necessary myth for performing settler privilege, one that *sees* emptiness but *not* the draining of soil and species diversity caused by extensive farming. By negating, disappearing, and making inferior all that was there before, the desert opened dreams of expansion and promised a laboratory land for experimenting without the burdens of the past. Today, this laboratory land has become a site of struggle in which ownership, rights, and governance are negotiated through fear, conflict, and exception.

6.4.1 *Negotiating Rights in the End of the World*

TdF is worldwide known as “the end of the world,” and Ushuaia as the “most austral city of the world.”⁶⁰² For Giucci, the construction of the end of the world is explained upon the different experiences of remoteness that explorers, settlers, and missionaries had in TdF.⁶⁰³ For him, remoteness actually ended with the Chilean and Argentinian nationalizations of the region, which brought communication infrastructures. In his words,

⁶⁰¹ Gerrard, “El Sigilo En Las Metáforas Del Viento: Los Selknam y La Retórica de La Desaparición,” 10.

⁶⁰² While *australity* has been an official recognition based on its distance to the Antarctic, it has nonetheless been lost in 2019 when Puerto Williams, a small city in the Chilean side exceeded the 2,000 inhabitants required to administratively become a city. Since then, Chile has displaced Argentina from the use of that southernizing category of TdF and has advanced, like Argentina, in expanding its southern frontier. To this end, Chile has also created a milestone to define its own middle in what was previously considered the south, the region of Magallanes, a way of making visible Antarctic ownership while centering the south.

⁶⁰³ Giucci, *Tierra Del Fuego: La Creación Del Fin Del Mundo*, 70–173. Analyzing the chronology of colonial events since the 16th century in TdF, Giucci shows how Europeans needed far and exotic places to find purity in places other than their industrializing societies. First attempts to settle in the region resulted in hundreds of peoples dead due to their inability to survive by merely placing crosses and fortresses. All those events, argues Giucci, kept motivating multiple interests in the region, most of them moved by its configuration as an *Other* that could explain or expand civilization. When the Bridges family settled with their own evangelizing project, they brought with them the experience of staying rather than merely visiting. Bridges lived the experience of being in the “uttermost part of the world”, the verified “end of the world” from the settler perspective, one expressed in communication and provision daily needs.

Ushuaia is today a “completely modern city,” one that has computers, Internet, telephones, and scientists.⁶⁰⁴ However, while these modernizing infrastructures have substantially transformed how distance is experienced, remoteness has not disappeared. On the contrary, it has survived and permeated identity and political disputes that reproduce the expansionist dreams of the past.



Figure 6.5. Crossing the Fuegian border between Chile and Argentina (2019)

Remoteness did not disappear in the 20th century. Frontier settlers that had easily acquired extensive lands deemed savage and remote during the 19th century and essentially abandoned by the state were, during the 1940s, still negotiating their rights to an exceptional territory to which the state then laid claim. The state (in the form of a naval administration) reconfigured the Fuegian desert by governing the region as a national resource in need of control due to its distance, lack of population, and geopolitical interests. The nationalization of TdF constituted a threat to the power of settlers who, in response, continued mobilizing

⁶⁰⁴ Guicci, 286.

remoteness in order to demand ownership and rights that would help assure national desires to industrialize:

To finish this work of expansion in the southern territories, a firm and secure life is needed for its inhabitants. (...) It is needed for those who inhabit and work the land to end having a precarious possession and be given ownership. (...) National development is only possible if we can feel the most basic basis of a healthy and organized society, through land ownership.⁶⁰⁵

While settlers were trying to avoid the national expropriation of lands, the military government of TdF was trying to become a settler itself as a way to enlist TdF in the patriotic mission of uniformization. The state saw these frontier settlers and their *savage* governance of TdF as a problem to homogenize through nationalization. What had been first practiced with indigenous peoples was now returned to settlers in need of integration and civilization.

As one of the Fuegian maritime governors and later Marine Minister said:

I will join all those who, in this fertile corner of our homeland, elaborate wealth without a pause. And, while creating alliances and bonds, we will also talk about old problems and, by making them a common issue, we will look for the urgent way to solve them, in the name of the Patria and the Navy.⁶⁰⁶

After recognizing how settlers had helped expand the southern frontier, the minister listed problems that called for state intervention: schools, roads, and hospitals. He continued,

Today, thanks to this magnificent conjunction formed by the people and the Navy, working in common embrace of the greatness of the Patria, we can proudly say that we have fulfilled our duty and that Ushuaia and the entire island are already a magnificent reality.⁶⁰⁷

Not without conflict, the negotiation of power between pioneers and the military built upon foundational ideas of the remote that reified a new myth of origin, the desert as the absence

⁶⁰⁵ "Las Exposiciones de 1946," 19.

⁶⁰⁶ Fidel Anadón, "La Tierra Del Fuego y El Contraalmirante Fidel L. Anadón," *Argentina Austral XVIII*, no. 183 (1946): 39. Hemeroteca (H.6288). Biblioteca del Congreso de la Nación, Buenos Aires, Argentina.

⁶⁰⁷ Fidel Anadón, "La Tierra Del Fuego y El Contraalmirante Fidel L. Anadón," *Argentina Austral XVIII*, no. 183 (1946): 40.

of the state. After this actualization of the desert as myth made Ushuaia begin with the state,⁶⁰⁸ both its remoteness and the imperial separation of centers and peripheries continues via meddling with political struggles in the region. TdF today has the highest state salaries in all of Argentina.⁶⁰⁹ Teachers and state workers, including security forces, politicians, and legislators, retire younger and with having less social security contributions in TdF.⁶¹⁰

Pioneer scientists who moved to Ushuaia when CADIC opened its doors 1981, have since then received the higher salaries of the national research institution CONICET.⁶¹¹ In Ushuaia, researchers also mobilize remoteness when negotiating rights with the central administration. In one of those meetings, I saw how Fuegian scientists were able to obtain an extra holiday week after having argued they deserved it for three reasons: they took more time than others to arrive and come back from any touristic destination; they lived in a region with high suicide rates; and they were exposed to climate conditions that often made it hard to arrive at the workplace. Often, the same desert that articulates the dreams of researchers who leave the city is also mobilized as problematic when negotiating work rights and scientific recognition.

⁶⁰⁸ See Chapter 2.

⁶⁰⁹ For example, a CONICET postdoctoral researcher in the city of Buenos Aires earned 440 US dollars per month in January 2019, one in Tierra del Fuego during the same period of time earned 662 US dollars.

⁶¹⁰ "Régimen de Jubilaciones y Pensiones Para El Personal de Los Tres Poderes Del Estado Provincial: Modificación," Gobierno de Tierra del Fuego, 2016, accessed July 20, 2020, <http://www.saij.gob.ar/LPV0001572>.

⁶¹¹ Bekerman, "La Política de Descentralización Del Conicet y El Fortalecimiento Del Espacio Científico En La Patagonia Durante La Última Dictadura Militar Argentina," 298.

6.4.2 *The Social Laboratory*

The endless frontier that has driven many colonial enterprises across the world has its own configuration in a TdF that is made of islands. As a land of promise, it produced a land to be conquered that, for being isolated from continental lands, could be especially controlled. This islanding political imaginary, when entangled with the idea of emptiness, provoked laboratory modes of knowing and governing. These laboratories sought more modern futures that, without carrying the burdens of the past, enacted promises of perfectly controlled designs. While *desertifying* silenced peoples, natures, futures, memories, and knowledges, national and transnational settlers constituted visions of an endless social, natural, and scientific laboratory in which to try, implement, test, design, and innovate from scratch.

This island imaginary envisions the region as an isolated area that, unlike complex metropolises, can be governed through an architecture of individual and social total control. With *few* roads, the emplacement of checkpoints at city borders and road intersections gives the illusion that all movements can be registered. This *islandic* governmentality is well reflected in the local saying that defends the region as one of the safest in the world, one in which people who go shopping leave their cars on since, “who would steal any car if there is no way to escape the island without being controlled?” As if identifying and checking cars would totally preclude from illegal transportation of goods, peoples, and animals and, with that, avoid the spread of informal settlements, epidemics, plagues, trafficking, and poaching. However, invasive species, slums, and global pandemics are proving the impossibility of controlling the unexpected responses of life assemblages. What is more, even the same scientists who help design those policies find ways to go unnoticed when moving their organic samples between TdF and other international laboratories.

The islandic imaginary is also embedded in CADIC, an infrastructure that not only registers people's movements but also signifies scientific life through the militarized architecture of a panopticon. CADIC opened its doors during the last military coup and as part of a national strategy to decentralize and depoliticize research by displacing it from universities.⁶¹² At a time of geopolitical conflicts with Chile and the UK, the institution that opened in Ushuaia would also help protect the Beagle Canal by conducting studies that would provide useful knowledges and legitimate sovereignty by funding and publishing Argentinian research. In that context, CADIC institutionalized authoritarian scientific relations, always in contact with the military for conducting fieldtrips, and hierarchical modes of ordering disciplines, since then led by biological and geophysical disciplines.⁶¹³

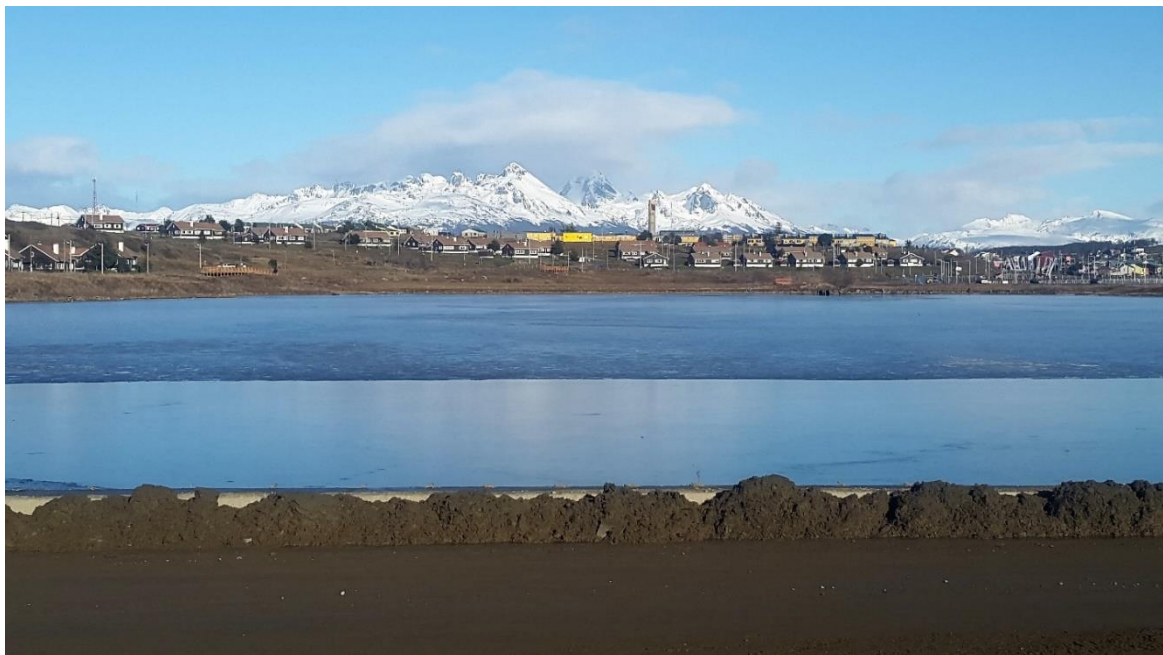


Figure 6.6. CADIC, the yellow buildings, viewed from Ushuaia's downtown (2019)

⁶¹² Bekerman, 287–313; Sergio A. Kaminker and Vezub, “Los Orígenes Del Centro Nacional Patagónico Durante Los Años Setenta. Desarrollismo y Políticas Científicas En Dictadura y Democracia,” 317–339.

⁶¹³ Bekerman, “La Política de Descentralización Del Conicet y El Fortalecimiento Del Espacio Científico En La Patagonia Durante La Última Dictadura Militar Argentina,” 287–313; Albarracín, “Colaboraciones Científicas Internacionales En El Extremo Austral. Desafíos Planteados Por La Creciente Internacionalización de La Producción Científica En Tierra Del Fuego,” 343–368.

CADIC rises on the top of a hill, right in front of the city. It settles over a land that condenses the white and national myth of origin of TdF, long populated by Yaghan communities, then appropriated by Anglican missionaries and, in 1884 and under an Argentinian flag, acquired by the military as a way to assert national sovereignty in a region threatened by British settlers from the Falkland Islands. In 1970, the army donated 20 ha of land to build a research institution.⁶¹⁴ Out of those different visions of the future, CADIC is today emplaced in the “Lower Mission” neighborhood, one shared by military families.



Figure 6.7. Lower Mission neighborhood and CADIC's entrance (2019)

Out of those visions too, CADIC opened its laboratories with adjacent houses that were designed to host temporary researchers with their families and housemaids given the perceived lack of infrastructure in the city. These houses connect to each other and the laboratories by a long common corridor that enables scientists to work at any time no matter the climate conditions. With the consolidation of the center and the increasing number of permanent researchers and graduate students, the houses were transformed into shared

⁶¹⁴ Bekerman, “La Política de Descentralización Del Conicet y El Fortalecimiento Del Espacio Científico En La Patagonia Durante La Última Dictadura Militar Argentina,” 296.

homes for students and postdoctoral fellows. At that time, researchers learned how to collectively acquire land and build their neighborhoods. Students, like me, considered temporary residents, would have a subsidized home to share with others.



Figure 6.8. Views of the city from the scientists' houses (2018)

This architecture affects the modes of working, living, collaborating, and making knowledge at CADIC. While the city of Ushuaia, emplaced in the mountains, barely receives direct sunlight, CADIC's privileged location receives all the light TdF can give. Atop the hill, it also embeds the puritan ideals of a science that thinks itself separated from society. With military visions, its narrow and empty hallways are corridors in which no chatting or discussing occurs.



Figure 6.9. Corridors at CADIC

When living in this infrastructure, people often express their experiences as difficult to manage. While the houses offer very cheap housing, they also provide a sense of being watched by the institution, a watching that integrates private life into public governmentality. As one just arrived couple commented,

It is strange. We have been living together for fourteen years but in these three months, we have been fighting more than in our whole entire time together.

Their fights in a reduced space only added stress to their bond as a couple. In these houses, everyone knows who is or not at home. In the little rowhouses for couples, they can hear each other's conversations and daily routines, including the amount of times someone walks their dog, stays working, or organizes gatherings. The bigger houses for students, first designed for families, have huge picture windows that allow a full view of the city, the mountains, and the movements of our colleagues which are, in this way, not only registered by the security guard but also by a vigilant community.

This perception of being watched and the entrenched drive to overseeing provokes an extremely accusatory and conflictual ecosystem across researchers. The environment demands constant watchfulness, including the watching of higher ranks such as laboratory heads, the institution director, or even institutional psychologists from the central administration of CONICET. The latter are asked to determine official resolutions when mediating everyday life attacks, crying outs, and humiliations that, often, mobilize accusations that intertwine scientific production, personal life, and resource struggles. Ultimately, the social laboratories that were first practiced with indigenous peoples with the creation of reserves end up institutionalizing architectures of control that were later actualized with Argentinian citizens.



Figure 6.10. Hilled entrance to CADIC's housing and research Facilities (2019)

6.4.3 *An Endless Natural and Scientific Laboratory*

With their footsteps
the earth itself
is paved.
To obtain a good average
of pure, prodigious, and holy children
it is indispensable
land of desert
gardens of rushes,
and rationed water
barely enough
to wash the wounds
of their broken feet
for their parched lips.⁶¹⁵

TdF itself is also performed as a natural and scientific laboratory, a vast territory for practicing natural sciences in one of the world's most pristine wild regions. Barely urbanized, scientists here more than anywhere can develop a sense of scientific ownership over the lands and seas they study. Science today also benefits from the conservation and sustainable tourism goals that orient recent massive land acquisitions by wealthy actors who are shaping a displacement from farm production towards the economy of conservation led by transnational organizations.⁶¹⁶ This new scenario not only emplaces old settlers as secondarily primitivized citizens but also offers legitimacy to scientists whose work aligns

⁶¹⁵ José Rabinovich, "Huellas," in *Luz de Eclipse* (Buenos Aires: El Hombre, 1972), 40–44.

⁶¹⁶ Elizabeth Royte, "Historic Gift Helps Chile Protect Switzerland-size Land Area," *NatGeo*, March 15, 2017, accessed July 10, 2020, <https://news.nationalgeographic.com/2017/03/historic-gift-helps-chile-protect-10-million-acres/>. See for example the three National Parks opened in Chile after the enormous acquisition of land by a wealthy North American couple who owned two mountain gear companies, Patagonia and The North Face, the latter a striking name for a brand expanding in the global South. See also the land of Caleta Maria, which is also owned by a couple who decided to acquire an old estancia that was up for sale because its owners could not send their children to school from it. Another couple bought it and transformed it into a land for sustainable ecotourism and scientific research while promoting the conservation of indigenous memories [personal communication, March 2019].

with globalist interests and aspirations. An actualization of the myth of the desert, the construal of TdF as an endless laboratory fences off natures and territories in novel ways that allow them to escape previous forms of occupation. Consequently, these processes permeate the negotiation of boundaries in which scientists affirm their authority, relevance, and legitimacy.

As an endless natural laboratory, scientists in TdF are able to manage the life and death of exotic and native species such as beavers, mink, dogs, trees, lobsters, birds, and fish. We nonscientists are also able to navigate the Beagle Channel and observe fish, whales, seals, or the migratory activities of birds. We can learn how to grab penguins and watch them by sticking geolocation devices on them. We collaborate with local and transnational scientists to optimize a ship expedition in which each researcher measures different aspects such as geophysical movements, the trophic systems of different species, or the effects of pollution or climate change on different species. We may even learn how science is being used to promote transnational economic agreements. Some can also experience dramatic and dangerous expeditions in the ocean in order to arrive at impossible cliffs and once there, collect rich mountain samples. Others can also live on one of the uninhabited islands and fence it off in order to observe the survival of birds once their nests are protected from predators. Constantly expanding science to the most unreachable areas, species, and deep oceans, scientists can also in the process develop a sense of ownership that comes with the experience of being the only one can see what is being known. What is more, this ownership is reinforced with the bordering capacities of technologies for recording, accessing, measuring, trapping, guiding, or separating.



Figure 6.11. Replacing sediment traps in science territories (2018)

The emplacement of scientific artifacts also scientizes the site. They become part of the landscapes of TdF that, while serving processes of experimentation, eradication, observation, or conservation, also mark and delimit scientized territories. As happens with other territories, such as the police station, the square in which teenagers hang, or the tourist bar, one can easily experience a sense of non-belonging that reifies and reinforces the mysticism of science: that you are there to know the true nature of TdF. These signs themselves enact the relevance of the scientized Fuegian natures and, at the same time, of those who can interpret them.

However, as a site of permanent struggle for legitimacy and ownership, the placement of these artifacts and their ownership is often disputed. Often, beavers, rabbits, or strong winds destroy archeological sites or flood sediment traps. Sometimes, residents made inferior through the differential power performed by local scientists, include themselves as part of the community by showing their relatedness to the institution or to researchers. Other residents, however, challenge the local agreement to admire scientists as especial

humans by spreading rumors about them or critiquing their exclusionary practices, saying, “they don’t mix with us, with the city, they just take what they need for themselves. Many just come and leave without even walking the city.”



Figure 6.12. Knowing, measuring, and territorializing Fuegian rivers

At the same time, these disputes often permeate more formal contexts. For example, at the construction of a new coastal road opposed by many, negotiations for the road were displaced by negotiations for belonging and ownership. In the crowded stadium, people in front of the stage already performed difference by sitting in groups of worker unions, scientists, concerned citizens, and political parties. At the back, a group of manly men in informal clothes and haircuts sat with serious faces, drums, sticks, and big banners supporting the road. During the plenary various scientists opposing the road defended their local scientific authority by either proving their local residence or by supporting *the native*

natures of the region. At the same time, politicians in support of the road accused scientists of using the island for themselves without regard of local peoples:

Scientist 1: [with very strong North American accent]: I am a researcher at CADIC, and I am an Argentinian citizen. I have been studying Tierra del Fuego for twenty-five years and I have been teaching for fifteen years.

Politician 1: Scientists do not think on the local community and our need of development; we need to work, and this route will not only bring jobs but more tourists. Or should the Beagle Canal be just for scientists? Only for some visitors? [workers in the back clap and use their drums with noticeable noise]

Scientist 2: I have been studying the Fuegian biodiversity for over fifteen years. We want to develop the region, but without destroying it. Especially the Beagle Canal, which *here* [looking at the previous politician] is not pronounced in English /Bee-gl/ but rather in Spanish /Bi -guh/.

Politician 2: This is about democratizing the island, giving more access to Fuegians, allowing those living far to be able to arrive on time to the hospital, to have more police and security.

Scientist 3: I have been working here since 1975, I am not against the route, but we must plan it well, and we, the experts, have not been consulted.

Politician 3: Already the Pope Francisco said it, men are part of the environment. And the worst environmental impact is having no jobs for our children.

Worker: I am one of the children of those who arrived in 1976, we know there must be development to have a sense of belonging to this territory.

Estanciera 1: I join the claims of archaeologists, we cannot ruin our heritage. Already with the current road that ends in our house we had people grabbing our wood, and that is how we decided to open our house in an organized manner. We opened a museum and an educative ranch. We offer our home for school visits for free and we have a very reduced price for residents. We are Fuegians, we have been here for 140 years, my ancestors took care of the Fuegian nature. I am very sad [crying]. This town is treating us... now you want to cut cross our property and all its heritage.

During the public audience, scientists, settlers, citizens, and politicians all reproduced the myths of the desert and the endless frontier to legitimate their positions. People claimed to have authority based on time of residence in the endless laboratory, which had brought them more truthful knowledges and years of sacrifice in the region. Scientists, mobilizing values of conservation over older industrial values, displaced previous settlers whose

missionary projects of national and industrial expansion did not lead to true knowledge of the natures of the region. Appropriating notions of nativity and indigeneity, scientists defended their right to manage Fuegian natures even as older settlers and farmers sell their lands to transnational corporations. However, as I have shown throughout my dissertation, older forms of power never fully disappear, but are instead transformed or displaced. As in the case of the disputed road, older forms of power are not completely erased.

The issue becomes even more complex when we consider that Tierra del Fuego is the Argentinian region that receives the biggest number of international researchers and collaborations. As Dalma Albarracín argued, this noticeable international activity is mostly translated into co-authored papers and not into empowering alliances.⁶¹⁷ She shows how the technological and global asymmetries that mediate these collaborations end up privileging global agendas over local ones. In this context scientists at the end of the world have to constantly negotiate their laboratory site as either exotic and pristine and therefore of interest for globalist knowledges, or as a national territory or local province in need of research for improving its conditions. As a globalist laboratory, it knows natures that present unique characteristics for explaining processes of global interest. In this way, the Fuegian science that already carries various souths, can be recognized or seen within hierarchical modes of globalist scientific production. On the other side, that recognition can be counterproductive when seeking local and national validation. To that, scientists often respond by engaging with the region as a province with its own problems to resolve.

⁶¹⁷ Albarracín, “Colaboraciones Científicas Internacionales En El Extremo Austral. Desafíos Planteados Por La Creciente Internacionalización de La Producción Científica En Tierra Del Fuego,” 351.

My research shows how colonialism is distributed and performed across nature and society and beyond those who are considered as the invaders. Colonialism as a structure is maintained by all though, of course, with different degrees of power and vulnerability. Building upon Albarracín's argument, I saw how in TdF, the lack of empowering collaborations was not only enacted by those coming from more privileged centers of knowledge production. They were also coproduced with the local defense mechanisms of exclusion that have characterized a region performing the role of the desert. Because the endless frontier offers a landscape of constant newcomers in search of expanding their own frontiers, those already living there do so under constant threat of erasure. Entrenched in histories of colonialism, desertification, and extinction, this fear is rarely a site of empowerment but is rather one of anger and defensiveness. While scientists promote collaborations with people outside, once they come to stay, they often push outsiders and more dense collaborations away.

This sense of permanent exclusion is glimpsed in the active isolation of visitors or foreign researchers, a reaction anchored in the disavowed histories of colonial intervention, innovation, and settlement. The response reproduces the same imperial categories of belonging that generated genocide, grabbing, and disappearance in the first place, and built upon epistemologies of erasure that threaten scientists with their own erasure. The project of beaver eradication is based on forgetting all that had gone before, including the scientists involved. When negotiating my entrance to the institute, I was told I had to "pay the toll" by committing to co-publishing with them. What appeared to me as a professional opportunity to collaborate was for them a way to assure that I was not going to be once again, another European who comes in with modern ideas, takes what she needs, and leaves.

6.5 The Myth of Invasion

The myth of the desert and the fear of erasure follows the logic of the imperial categories of invader - invaded. In a region that disavows the wounds of colonialism and erasure, the constant arrival of newcomers, immigrants, tourists, animals, or scientists is perceived as a threat. Actualizing old myths, visions of invasion today translate these tensions into novel forms of coloniality, globalization, and environmental ruination. The most significant way in which science is affirming its legitimacy in TdF works through the institutionalization of a new myth. By placing the risk of invasive species at the center of this new myth, legitimate sciences appropriate concepts of indigeneity. The myth of invasion reduces these phenomena to matters of scientized and naturalized forms of environmental reparation.

6.5.1 *Normalizing Suffering*

Legendary children, their souls
are fortified and strengthened
the more inclement
the more stones
the more thirst and hunger
the more their feet
flow blood
the more abundance
in their gardens
of thistles, tangles, weeds,
malaria, paludism.
From thistles,
their bread is succulent and blessed...⁶¹⁸

⁶¹⁸ Rabinovich, "Huellas," 40–44.

Remote areas are often filled with innovators, ruins of the past, and production of futures.⁶¹⁹ Residents tend to feel the anxiety of being far away and in constant flux, represented by incomers. In TdF, notions of invasion added a new layer of anxiety that was often translated into the naturalized forms of racialized and classed exclusions.

In 2018, I attended a meeting for regulating recycling in TdF, which was part of a binational workshop to promote scientific collaborations between Chile and Argentina. While taking minutes during two intense days, I observed how racist and classist ideologies became the authorized voices not by common agreement but mostly by the support of our unchallenging silences. While xenophobic orientations went uncontested, more socially just proposals were immediately rejected as utopian aspirations in a region full of ruins where nothing gets ever maintained. During deliberations over how to organize recycling, and despite the lack of recycling infrastructures in the island, final resolutions were tacitly designed against immigrants. As one of those authorized voices proposed,

They come here just to make money, ¡they don't even know the mountains we have! Yes, it is a disaster, we should do like in Germany [*silence among us while I exchange looks with a Chilean attendant*]: they send you to the gas chamber if you throw a stub in the street. This is what happens, I know some neighbors who came here recently, and they looked like normal people, they dress well and everything, normal, but then they left their stuff in the street. I know it because I went there, and they are so smart that they left their names on some of the thrown notebooks. [*People laugh while I scramble in my chair and, still, remain very silent, a hard silence that was making my body very stiff*]. I called them in the name of the city

⁶¹⁹ Ann Laura Stoler, *Imperial Debris: On Ruins and Ruination* (Durham, NC: Duke University Press, 2013); Edwin Ardener, "'Remote Areas,'" *HAU: Journal of Ethnographic Theory* 2, no. 1 (2012): 519–33.

and threatened them, if they do not clean their garbage, I was going to publish everything on the media.

A meeting that had started describing the history of failure with local recycling plants ended up concluding with suggestions for punishing policies against citizen behaviors. When I later approached these dominant voices to better introduce myself, I mentioned how it could be difficult for newcomers to know the region, its mountains, especially when newcomers lack local friends who can infuse them into those values with their own passion and knowledge. At that point, my interlocutor got nervous, defensive, and less polite to me:

That makes no sense. We have been here for more than twenty years, and it was really difficult for us to adapt too when we came, in the 1980s, when this was even more empty than now, and we adapted.

At the end of the workshop, one of my female and young colleagues and I were asked to share the proceedings of the meeting not only with the whole group of attendants but also with politicians, researchers, and visitors who came for the closing event.



Figure 6.13. Workshop on binational science (2018)

In TdF, this production of racism and classism actualized old imperial categories of oppression and integration. It acknowledged how the industrial promotion regulations of the 1970s and 1980s provoked high rates of urbanization, industrialization, and population growth. Given the history of planned colonization of the region, the citizen rights and benefits I mentioned above are often perceived as a compensation for suffering, as the prize for remaining in a hostile land. Through this organization of social welfare according to time of residence in the region, belonging is often disputed in ways that are translated into policy. This interplay is well illustrated by how old categories of belonging remain meaningful in TdF, which classified citizens as: *Nacidos y Criados (NyC)* or born and raised; *Venidos y Quedados (VyQ)*, or arrived and stayed; *Traídos a la Fuerza (TaF)*, or brought by force such as the military; *Negros y Mierda (NyM)*, or black and shit; and *Trabajadores Golondrina*, or temporary workers. Categories such as NyC or VyQ serve to organize difference and identity in Tierra del Fuego in ways that help residents legitimate themselves against newcomers in various defined ways. Local scholars have shown that these different narratives are mobilized at convenience in contradictory ways that help maintain privilege.⁶²⁰

These categories are also entrenched in scientific knowledges and communities, and identities. Throughout my interviews with local scientists, researchers reproduced that linear history of the region, noting how in the 1980s,

The people who came did not care; they came to make money. Before, they were European scientists or military who came and left but it was ok, the *others* came

⁶²⁰ Mariano Hermida, Mariano Malizia, and Peter Van Aert, "Migración e Identidad: El Caso de Tierra Del Fuego," *Identidades* 10, no. 6 (2016): 34–52; Mariano Hermida, Mariano Malizia, and Peter Van Aert, "Ser Fueguino. Un Estudio Sobre Migración y Construcción de Pertenencia," in *X Jornadas de Sociología. Facultad de Ciencias Sociales* (Buenos Aires: Acta Académica, 2013), 1–19, accessed March 10, 2020, <http://www.aacademica.org/000-038/692%0AActa>.

because they wanted, but for economic reasons, which made environmental relations different. This people did not go fishing or climbing, they did not incorporate nature.

At CADIC, the constant arrival of newcomers and international scientists reproduced the same territorial logics of invasion. What in science studies has normally been interpreted as material struggles or “resource-relationships”⁶²¹ were refashioned as moralized disputes expressed via intense emotional conflicts that sometimes turned violent. Within the institution, rumors, affect, conflict, anger, vulnerability, and social isolation were part of the routine of knowledge production. I started to pay attention to these forms when I was told that the reason I was being ignored and excluded had to do with not belonging to CONICET: I was not going to stay as long as the others.

This reproduction of institutional hierarchies was not a mere exclusion of the just arrived or the foreign, but also a defensive response to the protection of resources: I was not *the same* not only because of my institutional category but also because, as I was not going to stay as long as they, I was going to benefit from their achievements for free: household items like cutlery, plants, decoration, blankets, or wall hangings but also the social resources they had constructed with effort. Just as with settlers who came to an attractive region and grabbed resources to add surplus later in their home centers, residents were uncomfortable with having to share and give all away for free. In that context, the exclusion of newcomers became a normative response.

These defense mechanisms aimed at protecting resources and status from newcomers and their potential capacity to erase accumulation. In CADIC, it is common to keep research areas and laboratories separated into what were called “little parcels.” This

⁶²¹ Karin Knorr-Cetina, *The Manufacture of Knowledge* (Exeter, UK: Pergamon, 1981), 83–87. In her analysis of resource struggles, Knorr-Cetina argues that these relations are moved not by what is already there but rather by what “could happen in the future,” that is by promises and expectations.

parceling of research into species or areas protects ownership by association and actively defends against intruders. This mechanism was activated when I came to study beavers and was first perceived as threatening to those who were formerly recognized as representing social science within the institution. I also witnessed this process happening in shocking ways to many other researchers who entered the institution while I was there, and who were displaced, watched, uninvited, isolated, and even pushed out. As when one colleague said to another about a newcomer, “Who does she think she is, no, no, no, this court is already occupied,” exclusion became a defense against invaders by utilizing the same logics. In this context, invasion not only constructed a simplified image of the environmental problems associated with animal introductions, but also one for the movement of researchers and their configuration of autochthony and privilege.

6.5.2 Environmentalizing Indigeneity

Those imperial categories are also coproduced and legitimated through naturalized notions of the environment and the Fuegian natures. In CADIC, newcomers often experience barriers to join sports clubs or to access remote sites that older residents know, a practice that adds to exclusion by the lack of knowledge about the area. As Carlos Masotta puts it, these conflicts over belonging in TdF are often mobilized as nature metaphors.⁶²² In his dissertation, Masotta points that penguins have become a sign for defining nativeness and beavers for symbolizing foreignness. One local poet mobilizes this in more capturing terms describing how the native fox is a *NyC* (born and raised), and the beaver is a *VyQ* (arrived and stayed). In his poem, the beaver tells the fox:

⁶²² Masotta, *Insularidad y Fuga. Problemas de Localización En La Tierra Del Fuego*, 130.

And who are your ancestors, those who exterminated the native peoples or those who settled and built this city?... You will be a victim of your own desire and isolation.⁶²³

Nature and culture, in coproduction, conform to environmentalized racial and class relations. In this work, I have furthered Masotta's claim to examine the work of this metaphors and how they operate beyond symbolic realms. As in the policy meeting that ended with suggestions for punishing those who do not recycle, newcomers are often attacked for not knowing the hegemonic productions of nature that, today, relate to scientized notions of conservation and tourism. Newcomers are blamed for destroying nature by cutting trees to build houses and promoting the spread of invasive species such as wild dogs, who are today classified as exotic and made into objects of eradication measures. The dogs are said to result from newcomers bringing them and leaving them after departure. While no domesticated, wild, exotic, and eradicable dogs are associated to the problem of immigrants, abandoned dogs who are put up for adoption are associated with old residents, as conveyed by a recent public campaign that asked for adopting "old settlers at the city kennel."

In line with Masotta's thesis, my research around beavers also showed how they were intense participants in the making of history and society. When interviewing a young politician from a local conservative party about environmental policies, she responded that beavers should not be as important as they are:

The main problem for the protection of our natures are newcomers. They come here without care for the territory and just open the mountain, cutting trees to build their informal houses without respecting anything. And then they live there, it is gross, they do not even have cloacal systems so when it rains it all falls down the mountain.

⁶²³ Héctor Bravo, *Calafateando* (Ushuaia: Utopías, 2017).

When I brought here the argument of those local citizens who questioned our rights to kill the beavers given that we all came through invasion, she separated the two realities:

That is different. My family came here during the 1940s, it is a different thing from how current migrations do not respect us. It is different, the others were Indians.

Again, rather than responding to the ongoing history of colonial horizons, I was responded to with defense and disavowal, with a mechanism that was able to recognize and, at the same time, keep separated the realities of newcomers today from newcomers in the 1940s.

This disavowal is maintained with the help of myths that environmentalized social relations and mobilized natures as objective and non-biased truths. This party member was reacting, as many Fuegians do, against newcomers as undesirable, dirty, polluting, and uncivilized immigrants. But she also signaled the prioritization of scientific natures in contemporary politics, pointed out how the colonialist racialization of natures, animals, peoples, and societies in TdF was today actualized in similar older terms, as those shown in figure 6.14.

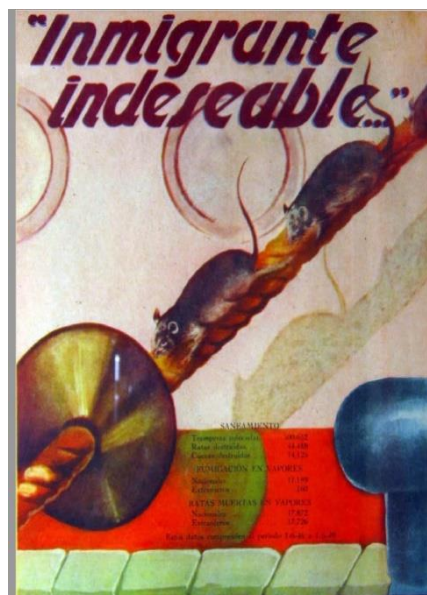


Figure 6.14. Rats as “undesirable immigrants” (1950)⁶²⁴

⁶²⁴ Gobierno Argentino, *La Nación Argentina Libre, Justa y Soberana* (Buenos Aires: Peuser, 1950), 346, accessed October 25, 2019,

Comparing immigrants with plagues and unwanted animals with immigrants is not a uniquely Fuegian discursive strategy. In the US for example, the 1940s eradication of foxes was narrated as a campaign to protect the nation from foreign predatory capitalism.⁶²⁵ During the days of the First World War, California's campaign to kill squirrels was framed as a patriotic mission that would kill an agricultural enemy who was eating soldiers' food.⁶²⁶ In the Falkland Islands, campaigns against invasive species often frame intruders as Argentinian. In TdF, the eradication of beavers has also become a site of struggle with multiple effects and significations.

As a fetishized symbol, beavers have become boundary objects in which are condensed disavowed relations over coloniality, invasion, and belonging. As a demonized species, the beavers condense responses against newcomers as undesirable immigrants. They are situated at the nexus of race, invasion, and erasure, as expressed in the local saying of the three plagues of TdF, the three *C's*: *Castores, Conejos, y Cordobeses* (beavers, rabbits, and people from Córdoba, a city in the north of Argentina). Fetishized beavers, rabbits, and immigrants are conflated into environmentalized or scientized terms that obscure the reproduction of racist and classist knowledges and privileges that decades of colonialism have institutionalized in TdF. Today's mythification of beavers reinforces these repertoires of response to inferiorized others or predatory newcomers. As a Chilean truck driver who drove me across the border told me,

<http://www.peronlibros.com.ar/sites/default/files/pdfs/patriajustasoberana.pdf>. In the public domain, reproduced under permission of the Argentinian Copyright Law (see Appendix A).

⁶²⁵ Donald Worster, *Nature's Economy: A History of Ecological Ideas (Studies in Environment and History)* (Cambridge: Cambridge University Press, 1994).

⁶²⁶ Dave Gilson, "In 1918, California Drafted Children Into a War On Squirrels," *Atlas Obscura*, 2016, accessed July 10, 2020. <https://www.atlasobscura.com/articles/in-1918-california-drafted-children-into-a-war-on-squirrels>.

Why such a mess with beavers. We have to kill -----, and -----, immigrants, not beavers.⁶²⁷ And also, rich Chileans. They are plague, they all buy in the US.

The driver, like the politician I talked with, mobilized nature to attack inferiorized others, as well as upper class elites who get to decide what natures, what politics, and in which terms matter. It is a common practice to mobilize how upper classes take advantage of the commons as a way of restricting access for everyone and, especially, the lower classes. Nonetheless, this response against the upper classes and experts is not surprising for an old settler, who transports oil from one country to another and passes most of his time in a very old truck. The relevance of the beaver eradication project placed these settlers at its center, as they owned many of the lands and had to be convinced to collaborate with the scientists. As shown in chapter 5, these settlers, drivers, and workers that came to TdF with the promise of industrial futures are now seen as uncivilized, problematic, and uneducated, as people who do not like to conform to social order. At the same time, wealthier settlers go less challenged when the same scientists who seek to protect indigenous natures and biodiversity do not contest agriculture and sheep farming—despite it being an important driver of the ruination of nature.

Through nature, beavers, and the myth of invasion that naturalizes and scientizes notions of indigeneity in TdF, old disputes are actualized in contemporary terms. Scientists are acquiring increasing legitimacy to speak and protect these natures and, with that, becoming themselves *native* over and against newcomers (who do not know these natures) and older settlers (who are rendered in primitive terms). As one scientist told me, “love for the native is what unites us, not the exotic.”

⁶²⁷ I have omitted the two nationalities mentioned by the person who drove me intentionally.

This way of talking about history in TdF, organizes a world made of narratives of disappearance, extinction, morality, and truth that barely leave space for questioning or commemorating their multiplicity. Understanding depoliticization as the impossibility to transform, myths act by immobilizing the world. This mythical system is not an innocent one, for the depoliticization of certain realities contributes different interests and truths. In addition, by making those truths and morals natural and un-situated, they are often read as *the truth* and not as truths for some, in certain contexts, and in some historical contexts. At the same time, myths also provide forms to reassure, or erase, belonging.

Precisely because of their intense fetishization, beavers became a very fruitful boundary object to discuss not only old myths, but also that which has been disavowed by them. Because of the work that myths perform in naturalizing and making apparently innocent histories of violence and displacement, some mobilize those objective natures to speak the unspeakable. And precisely because what has been erased has never fully disappeared, ruined and wounded natures and subjects are emerging today in re-politicized forms, allowing the ghosts of disavowal that have been haunting TdF for a long time to be taken seriously.

6.6 Postnatural

Mario opened this chapter with an *anger* that responded to these disavowing myths and emerging as a response to his encounter with me, with my scientific authority, and with my Spanish accent. This anger issued from processes of erasure, integration, and extinction. This encounter with Mario has haunted my research and my very self, since then affecting my questions, particularly those directed to the powerful mythical discourses I had been involved in reproducing. Attending to Mario's response, I wondered how he, after having

been made naturally, objectively, and violently extinct, had re-politicized his disappearance and emerged in a post-extinction world. In other words, how are subjects, histories, natures, and knowledges being remade after the naturalization of erasure and violence? How are postnatural politics emerging in colonial worlds? This is not to question how subjects are contesting or resisting disappearance and coloniality, but rather how, after having gone “extinct,” new wounded and political subjects emerge. How do wounded natures, knowledges, and histories make their appearance along those subjects? After instituting and objectivizing knowledges that naturalized and environmentalized race, territory, death, and coloniality through statistics, modes of production, cartographies, animal breeding, nature design, or species and populations management, how are those very notions being mobilized in post-naturalizing ways that construct decolonial claims and demands for reparation? And how is science today enabling forms of ecological restoration that go beyond nature and open possibilities for historical reparations?

While STS and feminist scholarship have brilliantly shown how naturalizing something is a powerful way of depoliticizing it, the politics of the Beaverscene are showing something else: *after* a long history of naturalizing the colonial myths that have legitimated various settler’s privileges, it is precisely the deemed depoliticized character of Fuegian natures what is enabling the repressed to speak in re-politicizing terms. This speech becomes even more visible at a time in which environmental sciences in TdF have largely gained power through the institutionalization of invasion knowledges for eradicating beavers. The approach to invasive species implemented in TdF has mobilized concerns over the protection of deemed indigenous natures more than over the economy; at the same time,

while the scientization of indigeneity is not new,⁶²⁸ the massive killing involved in eradicating beavers is encouraging political questions that, in TdF, are haunted by disavowed colonial processes of disappearance and genocide. In this last section, I show how environmental knowledges in TdF are enabling paths for reparation that go beyond nature in three ways: through the power of affection that objectivized landscapes of the Beaverscene enact; with the ghosts of silenced disappearance and genocide that haunt the eradication of beavers in TdF; and with the possibilities that objectivized and deemed depoliticized natures bring for talking the otherwise repressed and untalkable.

Affective Landscapes of the Beaverscene: In responding to beavers biologized capacities to invade,⁶²⁹ natural and naturalizing sciences in TdF are inevitably confronted with the futures of colonial, industrial, genocidal, and transnational pasts that are demanding the transformation of biologizing knowledges and policies.⁶³⁰ At the same time that new transnational actors are reproducing colonial myths and practices over deserted and primitivized lands and populations, they are also becoming aware of their taken responsibility for repairing natures that were colonially mediated. Even more, competing discourses on eradication,⁶³¹ are encouraging epistemic and political conversations that navigate the tensions of a Tierra del Fuego as a global natural reservoir and a control sample for testing pristine values, and a local territory with ongoing histories that are being

⁶²⁸ See section 1.3 of this chapter on the archaeologization of indigeneity and the myth of extinction.

⁶²⁹ See Chapter 4, Section 4.1.1 on beavers' biological capacities to invade due to their dispersal abilities, their reproductive ecology, and their ecosystem engineering behaviors.

⁶³⁰ See Chapter 4, Section 4.3 on how research communities are mobilizing social, historical, and political knowledges to respond to the Beaverscene. These include demands for integrating social and ecological dimensions in science, reflexivity around the values that science is promoting in the region, or implicated research that demands reparations amidst the scientific collaborations with racism and colonialism.

⁶³¹ See Chapter 5.

disputed by beavers' ecologies. Starting to fear but also recognize those, mourning and managing landscapes of the Beaverscene is opening paths for knowing beyond disavowal.

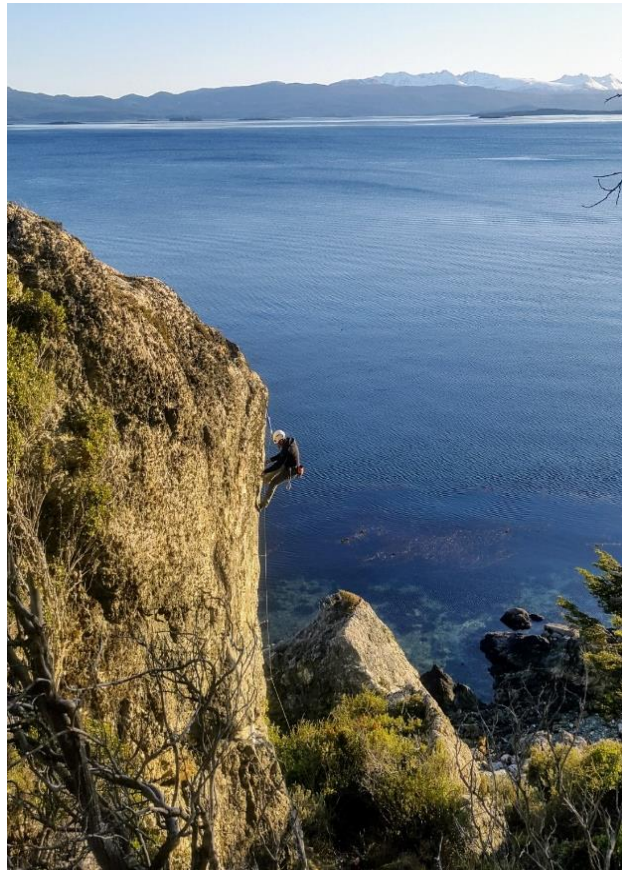


Figure 6.15. Whitening landscapes (2018)

Landscapes are ideological and can be used to obscure racial and class privilege.⁶³² As figure 6.15 captures, scientism and conservationism can enact visions of a nature to be experienced for some and in certain ways while contributing hiding the multiplicity of struggles that have produced it as such. However, landscapes can also potentially connect memories with the present by their emotional and evocative productions of anxiety, shame,

⁶³² Abby Hickcox, "Green Belt, White Cit : Race and the Natural Landscape in Boulder, Colorado," *Discourse* 29, no. 2 & 3 (2007): 236–59; Cosgrove, *Geography & Vision: Seeing, Imagining and Representing the World*; Cronon, "The Trouble with Wilderness; or, Getting Back to the Wrong Nature," 69–90; Flora Guzmán, *Memorias Del Paisaje: Microtoponimia de La Quebrada de Purmamarca* (San Salvador de Jujuy: Editorial de la Universidad Nacional de Jujuy, 2004); Hebe Vessuri and Gerardo Bocco, eds., *Conocimiento, Paisaje, Territorio. Procesos de Cambio Individual y Colectivo* (Río Gallegos: Universidad Nacional de la Patagonia Austral, 2014).

or grief.⁶³³ As it is occurring with the ruined landscapes of the Beaverscene, they can promote desires to do something, to know, and to reconstruct. Contemporary artistic engagements with the Anthropocene are showing these capacities.⁶³⁴ However, Anthropocene apocalyptic visions that foster implicated emotions and rethinking, is also reproducing globalist white futurisms. Instead, landscapes of the Beaverscene, in their situatedness, locally demand not visions of the end of the world as a global future human extinction, but rather re-attachments to processes of extinction and disappearance that are today actualizing colonial pasts.



Figure 6.16. Landscapes of the Beaverscene (2019)

⁶³³ Jennifer K. Ladino, *Memorials Matter: Emotion, Environment and Public Memory at American Historical Sites* (Reno: University of Nevada Press, 2019).

⁶³⁴ Heather Davis and Etienne Turpin, *Art in the Anthropocene. Encounters Among Aesthetics, Politics, Environments and Epistemologies*, Open Humanities Press (London: Open Humanities Press, 2015).

Landscapes of the Beaverscene that have been produced and known through processes of colonial naturalizations are, after being naturalized, helping re-politicizations that respond to implicated anger, despair, perplexity, shock, conflict, and grief. In a postnatural Beaverscene, deserts and extinctions are emerging in a multiplicity that escapes the power of myths to naturalize them. Given the impactful perception and visibility of landscapes of the Beaverscene, they are helping to question the very silences in which those colonial notions are based.

The history and ecology of beavers is not only questioning who has, and what has been defined as native, but also who and for what has been silenced in those scientized discourses themselves. After nature, these re-politicized natures are opening possibilities for transforming relations and identifications beyond the invaders-invaded colonial ontology that structures myths and disavowal in TdF. Given the weight of science in the region, it is a naturalizing structure that has strongly operated through practices of objectivization and which is today fostering transformations for decolonizing knowledge by reinventing scientific, indigenous, and settler natures and identifications. In a postnatural Beaverscene, seeing what has been for a long time silenced is ultimately opening paths for reparative knowledges.

Colonial Ghosts of Eradication: The development of invasion science that beavers facilitated, as had a very specific translation in Tierra del Fuego, one that more than focusing on the economic effects of invasive species, is fostering redefinitions and transformations around notions of indigeneity and coloniality. Like it happened with other sciences, including anthropology and archaeology, environmental scientists are today redefining notions on indigeneity in ways that position them as the legitimate actors to manage what has been defined as native histories and natures of the region. This asserting of privilege is

also based upon displacing older settlers, natures, and indigenous communities from the project of modernizing sustainable and native natures. However, unlike other sciences, the centrality of beavers as a keystone species damaging native ecosystems has also put death and killing at the center of environmental sciences. In a region that keeps silencing rather than healing the wounds of older genocides and massive killings, the resonances of those with eradicating an exotic and invasive species becomes almost inevitable. It is what happens when today scientists are able to recognize themselves as becoming native and exotic with the beavers, when they question the hierarchies that invasion categories propose, or when they struggle to eliminate the past in order to justify their implicated killings.

Through those hauntings and killings, people are contemporarily partially recognizing a negated conflict. That conflictual claims for decolonial reparation are being listened is one first step for doing something else. Even if disputed, they are scaping processes of archaeologization and naturalization. The continuous processes of erasing, suffering, and shaming in which colonialism inhabited, repressed, and silenced many natures and populations, is today gaining voice and visibility. It is not a pure visibility of that which was before but rather one that emerges as resulting with processes of repression and naturalization themselves. Moreover, the mere fact that they are becoming conflictual, implies already a recognition of those silenced others. In the postnatural Tierra del Fuego, conflict and recognition go hand by hand, the question following being what comes after anger and recognition.

Naturalness Enables Re-politization: The Beaverscene is also opening possibilities for been able to speak the unspeakable. It is what occurs when indigenous activists are been able to be seen and listened. When I moved to TdF to study beavers I did it at the same time I started a long investigation on my family history, including the finding of those silenced

papers that had grabbed my mother's history, rights, and belongings. I had always lived in a heavy silence of that which could not be spoken, a silence that emerged from the successful repression of the history of state terror that has erased Latin American possibilities for producing a different world. That silence rendered difficult and paralyzing the memorialization of that which hurt. While studying the beavers of TdF and its history of science, coloniality, peronism, and death, I realized that I had started to open some of those silences within my own family. Those nascent openings were perhaps reassured by my scholarly position and voice, as I could finally speak without being paralyzed from fear of the unknown. Beavers became not only a species introduced for colonizing and industrializing TdF, that were now being eradicated from this territory through actualized forms of scientific coloniality. Beavers were also an innocent object that was initially empty of the histories and politics that troubled us in repressed forms through fear, silence, and tension. Beavers enabled me to speak the unspeakable when translating it into research terms, when displacing our dangerous topics of concern into beavers' matters.

In TdF, as my conversation with Mario showed, they enabled the disavowed histories of coloniality to be questioned. Because beavers are strongly fetishized and their history widely naturalized as an invasion, it is precisely because of that naturalization and out of that naturalization that repressed ghosts are making their appearance in the form of "nature." Once deemed as innocent, objective, and void of politics, nature can now be used to speak the otherwise unspeakable, repressible, and punishable in re-politicizing terms. Mario's history, daily disavowed and negated in forms that actualize its unprivileged epistemic and material subject position, is able to make its appearance not through the language of representation, which still leaves the social ordering of extinction untouched, but rather through those naturalized natures. It is precisely that naturalized environment

that enables repressed histories to make their appearance by mobilizing seemingly objective and innocent natures from non-innocent, pure, or romantic situations. As when Kawésqar activists in Punta Arenas, the Chilean side of TdF, collaborate with science in seeking common environmental causes while also challenging scientific assumptions on nature and politics, Mario in Ushuaia is also mobilizing scientific knowledges to politicize the archaeologized and environmentalized history.

When Mario fiercely demands all of us *to kill all the beavers* without regard for those *foreign humanitarian laws*, he is situating environmental restoration at the axis of historical reparation. Today, in a postnatural TdF, the same colonial science and knowledge that helped dominate and displace communities and modes of social ordering is now also enabling decolonial claims that are neither innocent nor pure, and which suggest not *just* the restoration of nature, but the reorganization of current social and natural relations that are built upon previous violent erasures and disappearances. Not surprisingly then, and upon these demands, I found biologists and ecologists provided with methods and epistemes for asserting modernity so as to legitimate their voices as those most legitimate to define, protect, and manage the native, to be captured by an urge to do something more.

Ghosts are present specters, neither dead nor alive, and neither past events not contemporary ones but fantasized presences that haunt us with troubling effects. They demand “staying with the trouble”⁶³⁵ rather than resolution; a path for love against empire that can never have recipes;⁶³⁶ a re-politization of the wounds and the silenced that conveys

⁶³⁵ Haraway, *When Species Meet*, 83.

⁶³⁶ Frantz Fanon, *Black Skin, White Masks*, trans. Charles Lam Markmann (London: Pluto Press, 2008).

no idealizations over that which emerges from damage;⁶³⁷ a politics for failed embodiments that help erode truths and disobey epistemologies;⁶³⁸ a politization of the mark of the border and its failed separations;⁶³⁹ a politics against purity and against the promissory as those verification truths that tend to erase others with their imperial visions of wholeness, totality, and the future.⁶⁴⁰

They suggest attending to our postnatural world that does not go for another future as Mario suggests, neither green, nor modern, nor even postnatural. They demand slowing down for putting together what is taking that much cost to keep separated, to confront disavowal as a defense mechanism that keeps producing colonial repetition. They show possibilities for better memories and pasts. They create a chance for us, scientists responding to ecological ruination to also respond *with* harshly repressed decolonial claims that are crying out continuous repairing.

⁶³⁷ Gloria Anzaldúa, "La Conciencia de La Mestiza: Towards a New Consciousness," in *Feminism and Race*, ed. Kum-Kum Bhavnani (Oxford: Oxford University Press, 2001), 93–107.

⁶³⁸ Segato, *Contra-Pedagogías de La Crueldad*, 137; Mignolo, "Epistemic Disobedience, Independent Thought and Decolonial Freedom," 15.

⁶³⁹ Donna J. Haraway, "The Biopolitics of Postmodern Bodies: Determination of Self in Immune System Discourse," in *Feminist Theory and the Body. A Reader*, ed. Janet Price and Margrit Shildrick (London: Routledge, 2017), 203–14; Roberto Esposito, *Immunitas. Protección y Negación de La Vida* (Buenos Aires: Amorrurtu, 2009); Anzaldúa, "La Conciencia de La Mestiza : Towards a New Consciousness," 93–107.

⁶⁴⁰ Mike Fortun, "For an Ethics of Promising, or: A Few Kind Words about James Watson," *New Genetics and Society* 24, no. 2 (2005): 157–74; Derrida and Wills, "The Animal That Therefore I Am (More to Follow)," 399; Alexis Shotwell, *Against Purity Living Ethically in Compromised Times* (Minneapolis: University of Minnesota Press, 2016).

EPILOGUE: ENVIRONMENTAL SCIENCE AND SOCIAL REPARATION?

In this dissertation, I have traced a history of knowledge production over the natures of Tierra del Fuego that is entangled with the making of (in)justices. I have particularly examined the borderlands of scientific natures to better understand the endurance and intersection of inter-species, inter-generational, colonial, and environmental injustices across time. I have shown how the making of science in TdF is intertwined with the reproduction of forms of privilege and exclusion that respond to various historical horizons.

To do this, I have followed the beavers in TdF, a species that has been not only a biological keystone, but also one that has created historical, political, and affective connections to “complex, collaborative practices for making and passing on culturally interesting patterns.” As Haraway puts it in her evocative account of the game of “cat’s cradle,” string figures like beavers enable us to trace and respond to the different ways in which humans and nonhumans are tied together.⁶⁴¹ String figures enable us to think those knotted forms beyond the stabilized analytic categories of nature, history, science, or society. Like Haraway, I have aimed at examining the discursive emergence of subjects and worlds through processes of knowledge making that are also entangled with broader symbolic and material histories.

As a powerful sign, beavers have helped to juxtapose various whitening truths, powers, and histories in Tierra del Fuego since the 1940s. Whitening emerged from practices for enhancing the biologies, morals, and labor of peoples, natures, organisms, technologies,

⁶⁴¹ Donna J. Haraway, *Primate Visions: Gender, Race and Nature in the World of Modern Science* (New York and London: Routledge, 1989); Donna J. Haraway, “A Game of Cat’s Cradle: Science Studies, Feminist Theory, Cultural Studies,” *Configurations* 2, no. 1 (1994): 59–71.

and societies. Whitening, in Argentina, emerged from the productive tension between importing foreign and more modern immigrants, cultures, and knowledges, and its nationalization and homogenization. What came to be defined as modern and enhancing, has been changing through time, provoking constant displacements and conflicts around legitimate futures, visions, and natures.

As charismatic keystone species, beavers also anchored scientists, institutions, and peoples in attempts to make sense of processes of economic, political, and environmental change. They have aided me in reconstructing those histories when I asked how science has been knowing and making natures in Tierra del Fuego, and what have been the consequences of those knowledges for enabling some worlds and discouraging, forgetting, and repressing others. In particular, I have studied how eugenics, geography, ecology, and biology have studied the environment through modern epistemologies that have rendered natural all that which has been known as part of nature. Through processes of naturalization, histories of violence, racism, and privilege have been legitimated as peaceful and natural processes. Through these processes, the whitening of nature not only racialized “invasive species,” but also naturalized the structuring of racism.

Beyond Haraway, I have provided tools for deepening attention to the unmaterial, to the ghosts of that which is being denied and unrecognized in the production of those entangled worlds. Like string figures, ghosts can take us to interrogate the conditions in which highly asymmetrical and authoritarian relations emerge. With the beavers and other ghosts who haunt the Beaverscene, I have deconstructed a history of truth and power making in TdF that demands opening spaces for conflict and recognition for less authoritarian reconstructions. These reconstructions, I have suggested, do not request acts of denaturalization that would maintain nature as natural. Rather, they are based upon the

recognition of all what has become natural and now, postnatural. Beyond the politics of recognition, the ghosts of that which has been naturalized as inferior, gone, and inhuman as well as superior, true, and legitimate, demand us to understand the processes that produced those kinds of differentiations in the first place, as well as to think what can we do to enable more multiple processes of alterity making while recognizing that there is no pure victim, pure science, or pure truth. That is, in ways that enable to affirming the emergence of partial and wounded subjects, natures, and truths that are re-politicizing nature.

When I affirm that nature is offering us possibilities for reconstructing histories in TdF, my argument can easily be misunderstood as suggesting that people need to become environmental experts to make their voices heard. However, I suggest quite the opposite and argue that we, as scientists, can become more (or less) than experts. This possible misunderstanding should be taken seriously since liberal notions of politics and citizenship can actually reproduce authoritarianism and asymmetries in the name of the environment. In fact, indigenous peoples are increasingly asked to prove their ties with the environment in order to be recognized.⁶⁴² Moreover, when listened to on these terms, recognition occurs only insofar as such claims serve the interests of environmental organizations and agendas that are rarely beneficial to those who live in the territories on which interventions are mounted.⁶⁴³ The terms on which liberal expertise is negotiated are provided by a transnational and multicultural paradigm that recognizes ethnic differences insofar as they do not entail territorial demands.⁶⁴⁴ It has been shown how organizations who work against

⁶⁴² Suzuki, *The Nature of Whiteness: Race, Animals, and Nation in Zimbabwe*, 102.

⁶⁴³ Claudia Briones et al., "A Perspective from the South of the South, (Patagonia, Argentina)," *Latin American and Caribbean Ethnic Studies* 2, no. 1 (2007): 77.

⁶⁴⁴ Peter Wade, "Mestizaje, Multiculturalism, Liberalism, and Violence," *Latin American and Caribbean Ethnic Studies* 11, no. 3 (2016): 327.

universalizing socioeconomic rights are often linked to those who promote this kind of cultural diversity.⁶⁴⁵

As a group of anthropologists and indigenous activists in Argentina have claimed, demanding that peoples become experts already conscripts them into a neoliberal model of citizenship and participation, the one that in western scholarship has been studied through forms of biological citizenship.⁶⁴⁶ These scholars and activists work for transforming the spaces of participation so that non-liberal agendas can be organized and unrepresented peoples can occupy the spaces they need to occupy. I join their efforts for opening up spaces in more democratic ways, but I do from another perspective that conjoins efforts to make more convivial worlds, as Vessuri would put it.⁶⁴⁷ How can science not only include and collaborate with vulnerable populations and their demands, but also foster practices that account for the implications of science and scientists in reproducing exclusion?

To this question, the field of whiteness studies and the Latin American decolonial project both illuminate my argument. Since the 1980s, whiteness studies have shown how not only minorities and vulnerable populations are racialized, but also how white persons are made to constitute normalcy.⁶⁴⁸ Hence, we might not only study and objectivize those who are excluded through racializing processes, but also how are those who benefit more from these performative classifications are racialized in co-constitutive ways. In Latin

⁶⁴⁵ Briones et al., "A Perspective from the South of the South, (Patagonia, Argentina)," 74.

⁶⁴⁶ Briones et al., "A Perspective from the South of the South, (Patagonia, Argentina)"; Nikolas Rose and Carlos Novas, "Biological Citizenship," in *Global Assemblages: Technology, Politics, and Ethics as Anthropological Problems*, ed. Aihwa Ong and Stephen J. Collier (Wiley-Blackwell, 2005), 512.

⁶⁴⁷ Vessuri, "Crises That Mismatch Canons in Science: Provincialization, Transnationality, Conviviality?," 27.

⁶⁴⁸ Teresa J. Guess, "The Social Construction of Whiteness: Racism by Intent, Racism by Consequence," *Critical Sociology* 32, no. 4 (2006): 649; Melissa Steyn and Daniel Conway, "Introduction: Intersecting Whiteness, Interdisciplinary Debates," *Ethnicities* 10, no. 3 (2010): 283–91.

America, scholars have also shown how the emergence of modernity was dependent on forms of coloniality, or how the experience of becoming civilized, European, and developed emerged only dialectically against those classified as inferior and savage.⁶⁴⁹

Similarly, the production of injustice and exclusion in Tierra del Fuego has been dependent not only in the making of some peoples, natures, and territories naturally powerful or extinct, but also on the making of others as modern, legitimate, and normative. In TdF, those distinctions have often operated by situating the former in a past to be overcome and the latter in a future to be made. Hence, a postnatural politics does not erase subjects from our analysis as a way to deconstruct the myth of mastery that make scientists emerge as powerful subjects. Instead, it includes them as equally capable and accountable for the production of exclusion. Rather than only working for a politics of inclusion of those who are dominated within a system that already organizes peoples through hierarchies, we ought to also study how those classifications are made and with which consequences. Furthermore, to reconstruct other orderings, I have showed the relevance of healing for science.

This is what a theory from TdF can teach us by illuminating ways to examine how science, justice, and citizenship can look differently. Since Latin American subjects and sciences are never fully granted the category of universality, whiteness, and dominance within the global chains of knowledge production, they become keystone species, complex figures for understanding how knowledge and racialization are strung together. That outside glance contributes a way for Latin American peoples to deny their own production of racism and inequality as colonized subjects. At the same time, that outside glance and the

⁶⁴⁹ Quijano, "Coloniality of Power, Eurocentrism, and Latin America," 533–580; See Chapter 1.

need to constantly prove legitimacy and whiteness shows how racial categories, power, and privilege are identifications in constant dispute and negotiation. The reality of the dynamic between denial and recognition demands not only response in Tierra del Fuego, but also in other geographies that, in studying inequality and reproduction, often already situate themselves as the naturally superior science, territory, and whiteness. In this way, a Latin American decolonial STS, for instance, can inform studies of science in the US not only by showing a different reality or by showing how the promotion of sustainable futures in the North is partly based upon the occupation of territories and agendas in the south. It can also inform by providing analytical questions that come from other political configurations and, with that, encourage novel analyses. Such experiments would include interrogating the ways in which myths of origin in North American society have been reproduced by science or the ways in which transnational organizations are displacing local agendas, or the ways in which some North American peoples have been put into the past through projects of eradication that very much resemble those discussed in this dissertation.

I conclude with my last question with and for Tierra del Fuego, which relates to the possibilities of an environmental science that can contribute to healing justice. I argue that environmental sciences can embark on projects that entail liberation not only from dominated perspectives, but also from the very boundaries to which power is subjected. With scholars of memory, I assume that those who reconfigure political demands that respond to violent histories of the past are not those classified as authentic subjects, victims, or relatives who lived terror. On one hand, it is important that those who have suffered repression to the point of silence are able to reformulate their histories and speak. On the other, it is also important we do not capitalize upon or commodify victimization and demand those with terrifying histories behind them become victims. As memory scholars

have shown, transgenerational trauma “is not limited to the intimate embodied space of the family” but rather is collectively experienced generational history.⁶⁵⁰ This is liberating: not only can authentic victims reconstruct memory, but science, settlers, and institutions can be included in that ongoing project of re-membering and re-making.

With this work, I aim at embracing symmetry and pluricentrism in science. Multiple centers and peripheries are produced from every territory; every territory is central and peripheral in various ways. These differentiations are made of scientific and social dynamics that shape each other. In Tierra del Fuego, this implies that scientists can participate in reparative work not only in their free time, as many do in Argentina given the history of violence and the magnitude of the reparative work to be done, but also by putting at risk their own epistemologies, authority, and identifications. Letting science in Tierra del Fuego recognize the conflict, dispute, and demands that take so much effort to keep denying, is what I call healing.

Environmental sciences are particularly relevant in a region that has historically been governed through the definition and intervention of nature and indigeneity. Other scholars have already shown how studying indigeneity and not only indigenous peoples can help understand relational processes because, often indigeneity is done more in relation to non-indigenous subjects than it is to Original Peoples and places.⁶⁵¹ This is what I have shown in this dissertation, by tracing how privilege has been negotiated through notions of nature and indigeneity across time. Accounting for these realities, in this context, has the potential to liberate environmental sciences in Tierra del Fuego from having to continuously produce

⁶⁵⁰ Hirsch, “The Generation of Postmemory,” 6.

⁶⁵¹ Sarah A Radcliffe, “Geography and Indigeneity I: Indigeneity, Coloniality and Knowledge,” *Progress in Human Geography* 41 (2015): 220–29.

and maintain the boundaries of the natural and the denied, as well as from having to justify and defend power from anxious and guilty positions. This work goes beyond recognizing the values that each epistemology entails. It is a liberation project that demands a locally situated scientific accountability not only for the healing of those whose voices have been repressed, but also of those whose voices have been authorized in authoritarian forms.

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2018 - "Año del Centenario de la Reforma Universitaria"

N° 1037

Buenos Aires, 12 de septiembre de 2018

Por la presente dejo constancia que en el día de la fecha, DICENTA, Mara de PASAPORTE XDV114879, en representación de Rensselaer Polytechnic Institute / Conicet, con domicilio en 110 8th St, Troy, NY 12180, EE. UU. , ha adquirido copias del material de audio de archivo consignado en la Planilla de Solicitud de copia 1075/0 adjunta a la presente. El Archivo General de la Nación otorga el derecho de **uso limitado** de la copia de dicho documento público en condiciones de fidelidad al original en custodia del Archivo General de la Nación la cual será utilizada para la realización de una tesis doctoral y sus respectivas publicaciones referidas al tema manejo de especies en Tierra del Fuego (1940-2000's) producidas por Mara Dicenta, las cuales serán presentadas en Argentina y EEUU a partir del primero de enero de 2019.

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Buenos Aires, 15 de julio de 2020.-

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Portions Fig. 1 Expansion of beaver in the Chilean part of TDF

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