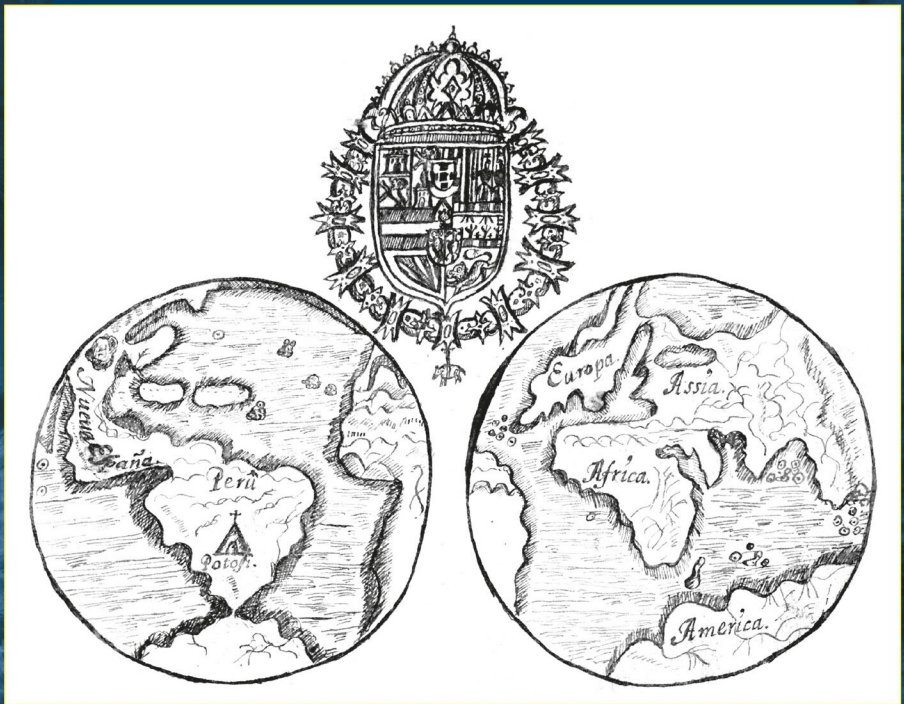


STUDIES IN GLOBAL SOCIAL HISTORY
STUDIES IN THE SOCIAL HISTORY OF THE GLOBAL SOUTH

POTOSÍ IN THE
GLOBAL SILVER AGE
(16th—19th CENTURIES)

EDITED BY
ROSSANA BARRAGÁN R.
& PAULA C. ZAGALSKY



BRILL

Potosí in the Global Silver Age (16th–19th Centuries)

Studies in Global Social History

VOLUME 49

Studies in the Social History of the Global South

Series Editors

Touraj Atabaki (*International Institute of Social History, Amsterdam,
The Netherlands & Leiden University, The Netherlands*)

Rossana Barragán (*International Institute of Social
History, Amsterdam, The Netherlands*)

Stefano Bellucci (*Leiden University, The Netherlands & International
Institute of Social History, Amsterdam, The Netherlands*)

VOLUME 3

The titles published in this series are listed at brill.com/shgs

Potosí in the Global Silver Age (16th–19th Centuries)

Edited by

Rossana Barragán R. and Paula C. Zagalsky



BRILL

LEIDEN | BOSTON



This is an open access title distributed under the terms of the CC BY-NC-ND 4.0 license, which permits any non-commercial use, distribution, and reproduction in any medium, provided no alterations are made and the original author(s) and source are credited. Further information and the complete license text can be found at <https://creativecommons.org/licenses/by-nc-nd/4.0/>

The terms of the CC license apply only to the original material. The use of material from other sources (indicated by a reference) such as diagrams, illustrations, photos and text samples may require further permission from the respective copyright holder.

This manuscript was copyedited by Jennifer Harris

Cover illustration: Arzáns de Orsúa y Vela, Bartolomé, “Historia de la villa imperial de Potosí: riquezas incomparables de su famoso cerro, grandezas de su magnánima población, sus guerras civiles y casos memorables” (1700). Latin American Travelogues. Brown Digital Repository. Brown University Library. <https://repository.library.brown.edu/studio/item/bdr:371585/>. Credit: John Hay Library

Library of Congress Cataloging-in-Publication Data

Names: Barragán R., Rossana (Barragán Romano) editor | Zagalsky, Paula C., editor.

Title: Potosí in the global silver age (16th-19th centuries)

Description: Leiden ; Boston : Brill, [2023] | Series: Studies in global social history, 2590-3144 ; Volume 49 | Includes index.

Identifiers: LCCN 2022043627 (print) | LCCN 2022043628 (ebook) | ISBN 9789004528673 (hardback) | ISBN 9789004528680 (ebook)

Subjects: LCSH: Silver mines and mining—Bolivia—Potosí—History.

Classification: LCC HD9537 .P68 2022 (print) | LCC HD9537 (ebook) | DDC 354.3/90984—dc23/eng/20221026

LC record available at <https://lccn.loc.gov/2022043627>

LC ebook record available at <https://lccn.loc.gov/2022043628>

Typeface for the Latin, Greek, and Cyrillic scripts: “Brill”. See and download: brill.com/brill-typeface.

ISSN 2590-3144

ISBN 978-90-04-52867-3 (hardback)

ISBN 978-90-04-52868-0 (e-book)

Copyright 2023 by Rossana Barragán R. and Paula C. Zagalsky.

Published by Koninklijke Brill NV, Leiden, The Netherlands.

Koninklijke Brill NV incorporates the imprints Brill, Brill Nijhoff, Brill Hotei, Brill Schöningh, Brill Fink, Brill mentis, Vandenhoeck & Ruprecht, Böhlau, V&R unipress and Wageningen Academic.

Koninklijke Brill NV reserves the right to protect this publication against unauthorized use.

This book is printed on acid-free paper and produced in a sustainable manner.

María Ullivarri, in memoriam
To our dear friend who united and inspired us with her strength



Contents

Acknowledgments IX
List of Maps, Figures, and Tables x
Notes on Contributors XIV
Glossary XVII

Introduction

The Age of Silver 1

Rossana Barragán R. and Paula C. Zagalsky

PART 1

Geology, Sacred Spaces, Political and Technical Knowledge

- 1 Potosí Revisited
Toward a Pre-Hispanic Potosí 51
Thérèse Bouysse-Cassagne
- 2 The Potosí Mita and the Geological Foundations of a Colonial Debate 106
Heidi V. Scott
- 3 Reading along the Administrative Grain
Knowledge Production and the Investigation of Refining Improvements in Late Sixteenth-Century Potosí 140
Renée Raphael

PART 2

Environmental History and Labor

- 4 Water for the Monarchy of the World
Mitayos and Maestros of Colonial Potosí Hydraulic Works 175
Julio Aguilar
- 5 The Market of Small Freedoms
Labor Negotiation in Seventeenth Century Potosí 210
James Almeida

PART 3

Flows, Heterogenous Producers and Agency

- 6 The Silver of Potosí, 1580–1630
*The Beating and Pumping of One of the Hearts of Early
 Globalization* 245
 Mariano A. Bonialian
- 7 Lords of Mines and Mills during the First Great Silver Boom of Potosí
 (1569–1610) 276
 Paula C. Zagalsky
- 8 A Silver Bank
*The Renaissance of Potosí and the Heterogeneous World of its Producers in
 the Eighteenth Century* 314
 Rossana Barragán R.

PART 4

Local, Regional and Global Impacts

- 9 Local Links behind a Global Scandal
The Audiencia de Charcas and the Great Potosí Mint Fraud, ca. 1650 359
 Masaki Sato
- 10 The Hangover
Global Consequences of the Great Potosí Mint Fraud, c. 1650–1675 388
 Kris Lane
- 11 From the Ratio to Rothschild
*Silver and Quicksilver—Recovering the Past for the Future in Nineteenth-
 Century Potosí (1800–1858)* 425
 Tristan Platt
- Index 483

Acknowledgments

This book has been possible thanks to the commitment of several people and institutions: first, the Conference of the *Asociación de Estudios Bolivianos*, which gathered us in a long session on Potosí in 2019 where the idea of this book was raised. Thanks to our colleagues who share with us our love for Potosí that marvels us and hurts us. They supported the first attempts to think about this book and helped us to arrive at publication. Thanks to all of them.

We would like to thank the reviewers and the valuable insights of Saúl Guerrero, Alejandra Irigoien, Jane Mangan, and Märtti Parssinen. Aad Blok supported us in different ways through the whole process, together with Carlos Contreras, Ad Knotter, Carlos Marichal, Filipa Ribeiro Da Silva and Mariejose Spreunweg, and gave us valuable comments on the Introduction. Roxana Nakashima and Kris Lane gave us their advice. Thanks to Stefano Belluci and Touraj Atabaki, responsible for the sub-series “Studies in the Social History of the Global South.” Marcel van der Linden, Karin Hofmeester, and the research department of the International Institute of Social History have always been a source of inspiration.

Thanks to Federico García Blaya, we have the edited images of the cover and back cover, but also the maps in the Introduction to this book. Thanks also to Lorena Rodríguez and the project PICT 2019-04311 of the University of Buenos Aires, who helped us to finance these maps. We are also grateful to copy editor Jenn Harris and editor Wilma de Weert. We would also like to thank Wenddel Scholma and Alessandra Giliberto, who followed and enabled the book through the whole process.

We are thankful for our friends and families, who are always with us, and to the people of Potosí who made possible this “silver age” at the origin of the modern world.

Rossana Barraquán R. and Paula C. Zagalsky
Amsterdam/Buenos Aires, 2022

Maps, Figures, and Tables

Maps

- 0.1 Global silver connections: major locations 9
- 0.2 Potosí and the south of the viceroyalty of Peru 24
- 4.1 Reservoirs of Potosí 178
- 10.1 Maritime trade routes in the age of global silver 392
- 11.1 Quicksilver flows between Europe, America, and the Far East 432

Figures

- 0.1 Potosí today. 2
- 0.2 Silver production in Potosí, 1545–1810 (in millions of pesos of 272 maravedíes). 4
- 0.3 Gazette bullion shipments and registered silver output, 1581–1805, by decade in millions of pesos of 272 maravedíes. 16
- 1.1 The *Otorongo*, God of the Antisuyu in Guaman Poma de Ayala. 73
- 1.2 Gold plaque from Lake Titicaca. 77
- 1.3 The Puquina and Uro Colla Worshiping the Titicaca with the Sun in the background by Murúa. 81
- 1.4 The Colla Queen, *Capac Comege*. Guaman Poma de Ayala, *Coronica de Buen Gobierno* [1615–1616]. 84
- 5.1 Chimney of one of the Potosí mint's cospel-cutting workshops (*hornaza*). 219
- 6.1 Production and circulation of registered silver: Potosí, Peru, and Mexico, 1570–1610 (in millions of pesos). 255
- 6.2 Annual value of Chinese merchandise Imports in the Philippines made by *junks* (in millions of pesos). 267
- 7.1 Silver production in Spanish America, 1521–1660 (in millions of pesos of 272 maravedis) 277
- 8.1 Summary of molds of semi-refined silver and small cones, in marks of the *capchas* and *trapiches* from the city of Potosí and miners from the surrounding provinces sold to the *Banco de Rescates* from May 1754 until December 1774. 324
- 8.2 Marks sold to the bank by *azogueros*, *capchas* (*k'ajchas*), *trapichero* and miners from outside the city, 1754–1804. 327
- 8.3 Genealogy of the Conde de la Casa Moneda. 332
- 8.4 *Trapiche*, half-moon-shaped boulder, and flywheel in Potosí in 2019. 335

- 8.5 *Trapiche* according to the engraving by Jean Baptiste Scotin at the French National Library. 336
- 8.6 Silver production between 1685 and 1799 in Potosí, Oruro, and Pasco. 347
- 8.7 Income from the Royal Treasury of Potosí (total, quintos/diezmós, and azogues) between 1685 and 1800. 347
- 9.1 Potosí's registered silver output versus coin mintage in pesos, ca. 1570–1810. 360
- 10.1 First page of Philip IV's October 1, 1650, decree recalling Potosí pesos 397
- 10.2 April 1645 Genoa decree regarding debased "Spanish reales" 403
- 10.3 1649 Genoese receipt for confiscated "old-style" Peruvian pieces of eight 404
- 10.4 Title page of 1652 Antwerp Coin Ordinances 408
- 10.5a Images of Mexican and Peruvian pesos with suspect marks, declared "billon" 410
- 10.5b Images of Peruvian pesos with suspect marks declared "billon," cont. 410
- 10.6 June 19, 1651, decree by Elector Friedrich Wilhelm banning Peruvian "reales" 413
- 10.7 A so-called Pine Tree Shilling minted in Boston by John Hull 415
- 10.8 A 1652 "column"-type Potosí piece of eight from the wreck of the *Vergulde Draeck* 417
- 10.9 A 1651 Mexican piece of eight from the wreck of the *Vergulde Draeck* 418
- 11.1 Ratio of mercury sales to silver purchases, bank of Potosí, 1800–1822 445
- 11.2 Mercury sales and prices in the Potosí mining bank, 1800–1822 446
- 11.3 "Bodies [of mineral flour] and their signs, words in Quechua, their translation" 462

Tables

- 0.1 Estimates of bullion shipments from the Indies to Europe 1501–1805 (by decade in millions of pesos of 272 maravedís). 38
- 0.2 Distribution of treasuries in millions of pesos, 1580–1620. 11
- 0.3 Structure of Tierra Firme trade in millions of pounds in 1686. 12
- 0.4 Commodities shipped to America in pesos, 1784–1796. 19
- 3.1 Witnesses in the 1587 and 1588 investigations and their connections to Potosí's mining and refining industries 148
- 6.1 Production and circulation of Potosinean silver, 1570–1630 (in millions of pesos). 252
- 6.2 Trade values at Buenos Aires port (in pieces of eight). 256
- 6.3 *Peruleros* in the Philippines and China, 1580–1601. 264

- 7.1 Major beneficiaries of the 1578 Potosí *mita* (receivers of consignments of between 60 and 22 *mitayos*) 293
- 7.2 Women miner beneficiaries of the 1578 *mita* 296
- 7.3 Women miners, 1582 297
- 7.4 Women miner beneficiaries of the 1610 *mita* 299
- 7.5 Comparison between the 1578 and 1610 *mita* distributions 300
- 7.6 Major beneficiaries of the 1610 Potosí *mita* (receivers of consignments of between 137 and 40 *mitayos*) 301
- 8.1 Silver from mining by *azogueros* and *k'ajchas* (*capchas*), *trapiches*, and surrounding provinces between 1754 and 1774 in marks. 325
- 8.2 Silver marks (eleven dineros, two grains) from *azogueros*, *k'ajchas* (*capchas*), *trapicheros*, miners, and *azogueros* from outside the city between 1770 and 1811 (1801). 326
- 8.3 *Azogueros* according to the number of marks and pesos sold in 1762. 329
- 8.4 Primary proprietors of mines and refining mills in 1779. 330
- 8.5 Silver purchased by the *Banco de Rescates* of Potosí in 1754, 1757, and 1762. 340
- 8.6 Places of origin of the silver sold in Potosí in 1754 and in 1757. 341
- 8.7 Groups of *trapicheros* by gender, according to the quantity of silver sold in 1762. 343
- 9.1 The main culprits and their fines (peso of eight reales). 371
- 9.2 Participants in the card game with each *oidor*. 374
- 9.3 The state of the officials of the Audiencia de Charcas after the *visita*. 375
- 9.4 Amounts of *donativos* collected by Azaña in each province. 376
- 9.5 Donation providers of more than 100 pesos (of eight reales) in Potosí. 378
- 11.1 Annual quicksilver demand by viceroyalty, as seen from Spain (in Spanish quintals of 100 pounds). 441
- 11.2 Silver purchases and quicksilver sales in the bank of Potosí, 1800–1822. 443
- 11.3 Mill heads working on the Potosí Rivera in 1819. 448
- 11.4 Mill heads active on the Potosí Rivera in 1830, with owners, refiners and weekly production (in boxes of 50 quintals). 454
- 11.5 “Approximate calculation, based on office books which the bank ministers have formed of the weekly sales made by the miners of the department, and of their probable quicksilver consumption” (1833). 455
- 11.6 Costs of amalgamating one box of fifty quintals of silver ore in the Guariguari mill (owner Salvador Fullá) in 1828, excluding cost of mining, selection (*palliris*) and transport down from mine to mill. 460
- 11.7 Marriages of heirs to mill “of the Muñoces”. 463

- 11.8 Eight individual ratios of the Rivera of Potosí by mill and refiner November 1837–January 1838. 465
- 11.9 Silver sales to the bank, by producer, June 1856 (in marks). 467
- 11.10 Destination of Californian quicksilver production in 1871. 474

Notes on Contributors

Julio Aguilar

Julio Aguilar has a PhD in History at UC Davis (2022). He is a 2022–2023 post-doctoral fellow of the Environmental Humanities Program of the Mahindra Humanities Center at Harvard University. He is a research associate at the Center for Historical Studies-Universidad Bernardo O'Higgins.

James Almeida

is visiting Assistant Professor of Latin American history at Oberlin College beginning in July 2022. He earned a certificate in Latin American Studies from Harvard University in 2022. Almeida recently published "Suspicion Possession: Policing Silver and Making Race in Colonial Potosí," in the *Colonial Latin American Review* (2021, vol. 30, no. 4).

Rossana Barragán R.

is Senior Researcher at the International Institute of Social History. She is Professor of History at the Universidad Mayor de San Andrés (UMSA) and she was Director of the Archivo de La Paz. She published *Espacio Urbano y Dinámica Étnica; Trabajo y Trabajadores en América Latina (Siglos XVI–XXI)* (ed.); *Potosí Global. Viajando con sus primeras imágenes (1550–1650)*. She wrote in *Hispanic American Historical Review*, *International Review of Social History*, and *Mundos do Trabalho*. She is completing a book on the social history of labor in Potosí.

Mariano A. Bonialian

is Researcher at CONICET, Argentina. He specializes in Economic History of colonial Hispanic America in the context of globalization, sixteenth to eighteenth centuries. He is the author of *La América española: entre el Pacífico y el Atlántico. Globalización mercantil y economía política, 1580–1840*; *China en la América colonial. Bienes, mercados y comercio y cultura del consumo. Desde México hasta Buenos Aires*; *El Pacífico hispanoamericano. Política y comercio asiático en el Imperio español (1680–1784)*. *La centralidad de lo marginal*.

Thérèse Bouysse-Cassagne

is Research Director (*emeritus*) C.N.R.S. / CREDA, IHEAL, Université Sorbonne Nouvelle Paris 3. She is author of *La identidad aymara (siglo XV–XVI)*; *Lluvias y cenizas, dos pachacuti en la Historia*; *Saberes y memorias en los Andes*; and *Qaraqara-Charka, Mallku, Inca, Rey en la provincia de Charcas (siglos XV–XVII)* (with T. Platt and O. Harris).

Kris Lane

is F. V. Scholes Professor of History at Tulane University in New Orleans, USA. He is author of *Potosí: The Silver City That Changed the World* (2019), *Colour of Paradise: The Emerald in the Age of Gunpowder Empires* (2010), and *Quito: 1599: City and Colony in Transition* (2002). Lane is completing a book on the Potosí mint fraud of the 1640s.

Tristan Platt

is Emeritus Professor at the University of St Andrews. He is the author of *Estado boliviano y ayllu andino; Qaraqara-Charka: Mallku, Inca y Rey en la provincia de Charcas; Defendiendo el Techo Fiscal*.

Renée Raphael

is Associate Professor of history at the University of California, Irvine. Author of *Reading Galileo: Scribal Technologies and the "Two New Sciences"* (Johns Hopkins University Press, 2017), she has published numerous articles on Galileo, the history of the book, and early modern universities. Her current research focuses on mining and bureaucracy in the early modern Iberian world and has appeared in *Renaissance Studies* and *Journal for the History of Knowledge*.

Masaki Sato

is a PhD candidate in Latin American history at Tokyo University. He is also Assistant Professor of Spanish at Keio University, Japan. His research focuses on the colonial government in the viceroyalty of Peru during the time of fiscal crisis under king Philip IV (1621–1665).

Heidi V. Scott

is Associate professor of History at UMass Amherst. She is author of *Contested Territory: Mapping Peru in the Sixteenth and Seventeenth Centuries* (2009), and articles in journals that include *Geoforum*, *Hispanic American Historical Review*, and *Istor: Revista de Historia Internacional*. She is completing a book manuscript titled "Mining Places and Subterranean Spaces in Colonial Spanish America."

Paula C. Zagalsky

is Researcher at CONICET and Teaching Assistant in Universidad de Buenos Aires, Argentina. She was doctoral and postdoctoral fellow of CONICET (2006–2013), postdoctoral fellow of the Mairie de Paris IHEAL/CREDA, Sorbonne Nouvelle-Paris 3/CNRS (2013) and AMEXCID postdoctoral fellow at the Colegio

de México (2016). She has published articles in *International Review of Social History*, *Mundos do Trabalho*, *Chungará*, among other journals. Her first book *Obedecer, negociar y resistir. Tributo y mita indígena en Potosí, siglos XVI y XVII* will be published in Perú in 2023 by the Institute of Peruvian Studies and the Central Reserve Bank of Peru.

Glossary

adit horizontal mine tunnel

abasto monopoly food supply contract for a city

alvará Portuguese royal decree (like Spanish *cédula*)

amalgamation mix of silver with quicksilver or *azogue*

apiri Indigenous ore carrier, mine haulers (Quechua *apay*: transport, carry)

aras interest on certain church loans or mortgages

Arica Pacific port for Potosí silver exports and quicksilver imports

asiento official agreement that granted one or many merchants the right to monopolize a trade route or product

audiencia (also real [royal] *audiencia*) royal court or Spanish district with judicial and administrative jurisdiction over a wide territory. It was one of the most important governmental institutions within the territory of a viceroyalty (e.g., *Real Audiencia de La Plata*)

avería Spanish transatlantic shipping tax imposed on merchants or merchandise on Indies trade; it covered the costs of providing armed protection for merchant shipping in the sixteenth and seventeenth centuries. It was based on the appraised value of goods

aviador lender or supplier of quicksilver and other mining credits

ayllu Andean kin group, basic Andean social unit. An *ayllu* has jurisdiction over a territory and a political authority or *curaca* (Quechua *kuraka*). It is now known as a community. Also used as a unit of measurement in the silver mines of Potosí: loads weighing five *arrobas* each or twenty-five pounds or 11.34 kilos

azogue old Spanish term for mercury (Arabic *az-zauq*)

azoguero(s) literally, person who refines silver with mercury or *azogue*. Refiners of silver and owners of mines and refining mills, members of the mining guild

Banco de Rescates bank that bought silver from producers. Potosí Royal Mining Bank of San Carlos; after 1825, National Bank of Silver Purchases (*Banco Nacional de Rescates*)

barreteros hewers, pickmen, ore cutters. Mine workers whose main task was to cut the ore with hammers, cradles, and bars (Spanish *barretas*)

cabeza de ingenio hammer mill in a hydraulic silver purifier. The water-driven wheel can turn one or two heads, depending on whether the shaft extends to one or to both sides of the wheel

cabildo city council, composed of councilmen (called *veinticuatro*s in Potosí), magistrates (*alcaldes ordinarios*), and a variety of other officials

- cajas de aguas* water distribution units
- camellones* cultivation technique that uses the artificial elevation of the land to capture water for crops
- cancha* courtyard or corral in front of the pithead (*bocamina*) where *apiris* deposited the ore brought up from inside the mine. On the *cancha*, the metal pieces were separated from the useless debris before being transported to the mills (*ingenios*)
- Carrera de Indias* Atlantic circuit that connected the ports in Spain, Seville, and Cadiz with the ports in Spanish America, Havana, Santo Domingo, Nombre de Dios, Portobelo, the Isthmus de Panamá, Veracruz, and Cartagena de Indias. The convoy operated every year or two years. The ships from Peru would go from the port of the Callao toward the north to reach the Atlantic circuit
- Casa de Contratación [de las Indias]* the “House of Trade of the Indies” was established by the Crown of Castile in 1503 in the port of Seville (and transferred to Cádiz in 1717) as a Crown agency for the Atlantic circuit trade of the Spanish Empire
- cédula* royal decree
- chacaneador* In Potosí, Indigenous worker who transports metals from the *cancha* to the mills using llamas (Quechua: *chacnani*)
- charqui* jerked llama flesh or beef
- chicha* maize beer
- chuño* freeze-dried, pressed potato
- cochas* see *q’ochas*
- columna* literally “column” or “pillar,” a reference to the Pillars of Hercules that appeared on redesigned Potosí coins beginning in 1652
- corpa* high-grade ore. The word also designated the piece of metal that the workers took with them, a practice not legal but accepted by custom since the sixteenth century in Potosí
- corregidor* governing royal magistrate in charge of the *corregimiento* district (province)
- correspondido* ratio between pounds of quicksilver and amalgamated silver marks. Official Potosí ratio of 1 pound to 1.6 marks in the nineteenth century
- counterfeiting creation of false coins using cheap materials, e.g., silver- or gold-plated copper
- cumuri* Indigenous worker in charge of transporting minerals from the *canchas* to the refining plant or *ingenios*, with donkeys or llamas
- cyanide chemical compound used in silver refining

- debasement systematic extraction of precious metals from official coinage, usually ordered by princes or governments in times of fiscal crisis; face value is retained, but intrinsic value is lost
- diezmo* silver tax paid to the Spanish Crown consisting of a tenth or tithe percentage
- drophammers iron- or copper-headed for crushing mineral ore
- encomienda* Spanish grant to reward conquerors conferring them the right to demand tribute and forced labor from the Indian inhabitants of an area
- entero de la mita* total annual contingent of *mitayo* workers; the fulfillment of the *mitayo* workers; total number of individuals present to perform the *mitayo* work
- fanega* Castilian dry measure of approximately 55.5 liters
- Feria de Portobelo* official fair or market where goods were exchanged among traders from Lima and the Iberian peninsula that arrived in galleons
- forastero* means literally “person who is from outside,” a migrant. Migrant Indigenous workers settled outside of their community (*ayllu*) of origin, in another community in the countryside or in a city
- gremio de azogueros* guild of miners and mills owners, collective body of the most important owners of the mines and refineries in Potosí
- guaira, guayra, huaira, huayra* (Quechua) wind
- guairachina, guayrachina, huairachina or huayrachina* (Quechua) small furnace of native Andean design to smelt the ore fed from the wind that ran down the slopes of the hill
- guairador* operator of a *guairachina*
- hornaza* furnace, cospel-cutting workshop
- huaca, waka, guaca* (Quechua) sacred site; for the Spanish, a cache of treasure
- Huancavelica Cinnabar and quicksilver mine in Peru
- Huantajaya Peruvian silver mine in Iquique, Tarapacá
- huelga* in Spanish, means literally “strike.” In this period, it meant someone who was in rest or in leave. The total annual contingent of *mitayo* workers was divided into three contingents of laborers. In principle, everyone worked for one week and “rested” (in *huelga*) for two weeks. The *mitayos de huelga* were the two thirds of the total *mitayo* contingent in Potosí who “rested” per week (not obliged to do *mitayo* work)
- ichu* thatch-like *puna* grass
- ingenio* refining plant, large ore-crushing mill, silver processing mill. In New Spain, called *hacienda de minas*.
- Iquique name of a place rich in nitrates
- junks Chinese trade ships

- kajchas, k'ajchas, capchas* or *cagchas* (Quechua) self-employed workers, also named “weekend ore thieves” or mine raiders by the employers or mine and refining owners. Small-scale miners, refiners, and ore collectors
- kuraka* (Quechua) or *curaca* Andean native lord (also *cacique*)
- labor, labores* mines in the mountain of Potosí
- Laguna Lobato* a lagoon 5 kilometers from Potosí
- lamas* slimy residues from the amalgamation process
- maravedí* originally it was an Iberian coin and since the fourteenth century, it was the smaller unit of account, the thirty-fourth part of a real. 1 real = 34 maravedís
- minero* mine overseer, administrator
- minga, mingado* hired Andean mineworker, free worker (versus *mita* worker)
- mita* in Quechua, “a turn or a period.” A *mita* worker refers to a man who works in its turn or period. The *mita* system is a rotational labor draft, a forced migration work regime
- mitayo* *mita* worker, *corvée* worker or unfree worker.
- New Almadén Californian quicksilver mine
- oidor* judge; member of a real audiencia.
- pallar, palliri* (Quechua *pallay*: to gather, to collect). Picking abandoned pieces of metal bearing material from the discarded ore. The worker performing this task
- pancada* market, fair, or trade system where the Chinese offered Asian products to Manila’s authorized people to buy and ship to Mexico in a Manila galleon
- pasquinade* anonymous, satirical poster or pamphlet critical of government policy
- pataca* Portuguese term for select silver coins, sometimes applied to Spanish pieces of eight
- patacón* Spanish or Spanish-American peso of eight reales or “piece of eight” (pl. *patacones*)
- pella* amalgam of silver and mercury that remains after the “soup” of ore, mercury, salt, water, and sometimes other “ingredients” has been washed away during the silver purification process
- peruleros* agents and factors who traveled to external markets to represent the interests of Lima’s investors
- peso de a ocho* “piece of eight” or silver coin worth eight reales or 272 maravedís, weighing one ounce (approximately thirty grams), subdivided into eight reales of thirty-four maravedís. One peso = eight reales = 272 maravedís. The *peso ensayado* had 450 maravedís
- peso ensayado* “assayed” peso or accounting unit worth 450 maravedís

- piña* “pineapples.” Pinecone-shaped silver ingot; conical molds of semi-refined silver, sold by refiners to the bank
- pongo* (Quechua *punku*, “door”) Indigenous supervisor, associated with the notion of gatekeeper, a guard in the mines
- pragmática* royal decree with immediate force of law (also spelled *premática*)
- puna* high Andean plateau
- q’ochas* (Quechua), *cochas* cultivation technique also called *chacras hundidas*; used to depress or excavate the land to flood crops and store water for times of drought. *Cocha* also refers to small ponds used to wash the ores and minerals
- quintal* hundredweight, approximately 46 kilograms
- quinto* silver tax paid to the Spanish Crown consisting of a fifth or 20%
- rancherías* Andean barrios or townships of Potosí
- real casa de la moneda* the royal mint
- relaves* re-washings of the silver-amalgam mixture
- repartimiento* in the context of Potosí’s *mita* system, the periodic allocation, by the viceroy or some other authority, of contingents of laborers to the owners of mines and mills
- repasiri* (Quechua) workers who, frequently barefoot, mixed the pulverized ores of silver with water, salt, and mercury. Indigenous trampers of mineral flour during amalgamation
- rescate, rescatar* to rescue, to recover and to buy silver production
- rescatistas* small-scale purchasers of ores from producers
- ribera* the main stream of water that ran at the foot of the mountain of Potosí. The refining plants were built around the *ribera*
- serraf* money changer in India, purchaser of incoming coins and bullion (English “shroff”)
- silver coinage coinage can be strong (*fuerte*) and weak (*feble*)
- Silver Trail or *la ruta de las pastas* contraband from Chichas via Salta to Valparaiso
- socavón* horizontal tunnel (adit)
- oroche* high-altitude sickness; lead sulfide or galena (La) Superba nickname for Genoa, attributed to Petrarch
- stamping mills hydraulic *ingenios* with drop-hammers for crushing mineral
- supay* “soul of the ancestor”; trickster god (see *tío*)
- tacana* blackish mineral, abundant in silver
- tío* God of the underworld, mine interior deity
- trapiche* generic name for rudimentary stone mills, artisanal ore-crushing mills or grinding mills
- trapichero* people who own trapiches

vara linear measurement of 0.838 meters

vellón billon or copper coinage, using alloy of a precious metal with a majority base metal content. Used chiefly for making coins, medals, and token coins

visita visit or inspection to record and control different types of resources (material and human). Also, the administrative control procedure over crown officials

visitador overseer, Hispanic government official in charge of controlling processes or districts. For example, *visitador del cerro* (overseer of the mountain)

wampum seashells used as currency by native North Americans

yanakuna (Quechua) or *yanacona* (Spanish) Andean servant, non-*ayllu* person

Introduction

The Age of Silver

Rossana BarraGán R. and Paula C. Zagalsky

“I am the rich Potosí, I am the treasure of the world, I am the king of the mountains and the envy of kings”.

Legend of the first coat of arms of Potosí, granted by Charles V on January 28, 1547.

•••

“If I were to pay you, Sancho,” replied Don Quixote, “according to what the greatness and quality of this remedy deserves, the treasure of Venice and the mines of Potosí would be too little to pay you; you take the tact of what you carry of mine, and set the price at every whip.”

MIGUEL DE CERVANTES SAAVEDRA, *Don Quixote de la Mancha*, 1605.

••

Potosí—the treasure of the world and envy of kings since the sixteenth century—was the maximum expression of fortune, although insufficient for Sancho’s invaluable services to Don Quixote.¹ The name of Potosí originally designated the imposing red, pyramid-shaped mountain at an altitude of 4,090 meters above sea level (see Figure 0.1); its mines allowed the development of the city of Potosí, which extended from the foot of the mountain, to become an important industrial center with a population as large as London or Paris. Its wealth, which has become almost legendary, contrasts with its conditions of exploitation, which continue to this day.

1 The metaphor of a Golden Age is frequently used for different periods. For Spanish America, the metaphor of a Silver Age could be useful for the period between the sixteenth and eighteenth centuries, although the production of gold was also important. Richard Von Glahn spoke also of a “silver century” in the early sixteenth due to the importance of Japanese silver. See Richard Von Glahn, *Fountain of Fortune: Money and Monetary Policy in China, 1000–1700* (Berkeley: University of California Press, 1996), 114. We thank our reviewers for their valuable comments. We are very grateful to Carlos Contreras, Ad Knotter, Carlos Marichal, Filipa Ribeiro Da Silva and Mariejose Spreunweg for their reading and fruitful insights. We are responsible for the text.



FIGURE 0.1 Potosí today
PHOTOGRAPH TAKEN IN JUNE 2008 FROM THE ROOFTOPS OF THE SAN FRANCISCO CHURCH BY PAULA C. ZAGALSKY

The silver from Potosí and Spanish America was central to the birth of long-distance world trade and the first wave of globalization.² Between 1500 and 1800, Spanish America contributed approximately 150,000 tons of silver to the world. Some have even estimated that it supplied 85% of the world's silver and 71% of its gold.³ Over this extended period, both minerals were crucial in exchanges between Europe, Africa, and Asia.⁴ Gunder Frank as well as Flynn

2 See Dennis O. Flynn and Arturo Giráldez, "Born with a 'Silver Spoon': The Origin of World Trade in 1571," *Journal of World History* 6, no. 2 (1995): 201–21; Bernd Hausberger, *Historia mínima de la globalización temprana* (México: El Colegio de México, 2018).

3 See these estimations in Rossana Barragán R., "Potosí's Silver and the Global World of Trade (Sixteenth to Eighteenth Centuries)," in *On the Road to Global Labour History*, ed. H. Roth (Leiden–Boston: Brill, 2017). Overall, Gunder Frank estimated that Spanish America produced 17,000 tons of silver in the sixteenth century, 42,000 tons in the seventeenth century, and 74,000 tons in the eighteenth century. Gunder Frank, *ReOrient*, Maps 2.1 and 3.1; see Rossana Barragán, "Potosí's Silver," 78. Following Cross, the percentage of world production was 68.5% in 1600, 84.4 in 1700, and 89.5 in 1800. Harry E. Cross, "South American Bullion Production and Export, 1550–1750," in *Precious Metals in the Later Medieval and Early Modern Worlds*, ed. J. F. Richards (Durham: North Carolina University Press, 1983), 403.

4 Arturo Giráldez, "Born with a 'Silver Spoon': China, American Silver and Global Markets during the Early Modern Period" (PhD diss., University of Amsterdam: Faculty of Humanities, 1999), 31–32; Ward Barrett, "World Bullion Flows, 1450–1800," in *The Rise of Merchant Empires: Long Distance Trade in the Early Modern World, 1350–1750*, ed. James D. Tracy (Cambridge: Cambridge

and Giráldez have highlighted the importance of Asia, and particularly China, in the global flow of silver.⁵ Gunder Frank's book *ReOrient* claimed the existence of a single global economy in which "the wheels of this global market ... [were] oiled by the worldwide flow of silver."⁶ The result was that all continents participated in a continuous direct and indirect exchange of goods on a scale that left a deep and lasting impact.

Potosí has been one of the main axes of this world economy since 1545, intensely mined for at least two and a half centuries. Potosí was in the Audiencia de Charcas, first as part of the viceroyalty of Peru, with its center in Lima, and since 1776 as part of the viceroyalty of the Rio de la Plata, with its center in Buenos Aires. Potosí contributed 61% of the silver produced in southern Hispanic America from 1545 to 1810.⁷ The peak of its production was between 1580 and 1630, when Potosí produced 81% of the official silver of the viceroyalty of Peru and up to 60% of global production.⁸ Potosí recovered in the second half of the eighteenth century, especially from 1730 onwards (Figure 0.2).⁹

-
- University Press, 1990), 224; Richard L. Garner, "Long-term Silver Mining Trends in Spanish America: A Comparative Analysis of Peru and Mexico," *American Historical Review* 93, no. 4 (1988): 898–935; Alejandra Irigoin, "Global Silver: Bullion or Specie? Supply and Demand in the Making of the Early Modern Global Economy," LSE Economic History Working Paper Series 285 (2018a); Alejandra Irigoin, "The New World and the Global Silver Economy," in *Global Economic History*, ed. Tirthankar Roy and Giorgio Riello (London: Bloomsbury, 2019), 271–86; Artur Attman, "American Bullion in the European World Trade: 1600–1800," *Acta Regiae Societatis Scientiarum et Litterarum Gothoburgensis–Humaniora* 26 (Göteborg: Kungl., 1986); William S. Atwell, "International Bullion Flows and the Chinese Economy circa 1530–1650," *Past & Present* 95 (1982): 68–90; Kirti N. Chaudhuri, *The Trading World of Asia and the English East India Company: 1660–1760* (Cambridge: Cambridge University Press, 1978); Von Glahn, *Fountain of Fortune*; Dennis O. Flynn, "Born with a 'Silver Spoon'"; Carlos Marichal, Steven Topik, and Zephyr L. Frank, *From Silver to Cocaine: Five Centuries of Latin American Economic History, 1500–2000* (México: El Colegio de México, 2017).
- 5 See particularly Dennis O. Flynn and Arturo Giráldez, "Cycles of Silver: Global Economic Unity Through the Mid-Eighteenth Century," *Journal of World History* 13, no. 2 (2002): 391–427; Dennis O. Flynn and Arturo Giráldez, *World Silver and Monetary History in the 16th and 17th Centuries* (Aldershot: Variorum, 1996).
- 6 André Gunder Frank, *ReOrient: Global Economy in the Asian Age* (Berkeley: University of California Press, 1998), 30, 52, 55.
- 7 Calculated from data extracted from: TePaske, *A New World of Gold and Silver* (Leiden: Brill, 2010), 142–212.
- 8 Giráldez, "Born with a 'Silver Spoon'," 201–21, 209.
- 9 Garner, "Long-term Silver Mining Trends"; Tandeter, *Coacción y mercado: la minería de la plata en el Potosí colonial, 1692–1826* (Buenos Aires: Editorial Sudamericana, 1992); TePaske, *A New World*, 142–212; Barragán R., "Potosí's Silver and the Global World of Trade." It should be noted that during the period of the first Potosí boom (1580–1630), silver production from some nearby mines was counted as coming from Potosí as it was registered at the same royal treasury, especially before the creation of the Caja Real de Oruro in 1607. See María Concepción Gavira Márquez, *Población indígena, sublevación y minería en Carangas* (Lima: Instituto Francés de Estudios Andinos, 2008).

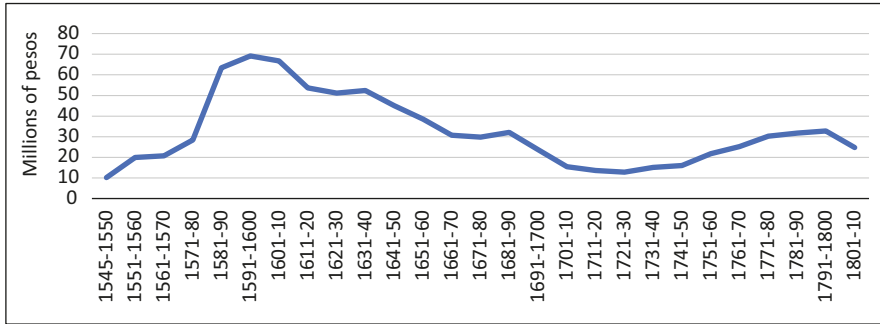


FIGURE 0.2 Silver production in Potosí, 1545–1810 (in millions of pesos of 272 maravedies)
SOURCE: BARRAGÁN AND ZAGALSKY BASED ON DATA EXTRACTED FROM
TEPASKE, *A NEW WORLD*, 142–212

Silver became so ubiquitous that the word “dollar” traces its origins to this time: the thaler referred to the silver coins minted in Jáchymov (*Joachimsthal*) since 1520 and to the Spanish coin of eight reales known as the Spanish dollar. Irigoin has asserted that the peso was the most successful world currency, known in France as the piaster; the *duro* or “hard” peso in Spain; and in the English world, it was referred to as a royal and/or Spanish dollar.¹⁰

Flows of silver across the world are part of the narratives of globalization’s early history. The complex ways in which different resources were put to work in the mining centers of production, however, do not have the same visibility—somehow it is still assumed that circulation is global but production is merely local. This book, *Potosí in the Global Silver Age (16th–19th Centuries)* seeks to

10 “In the Early modern period, a coin of silver made in the New World was the base on which prices and exchange rates were established in far distant places as Leghorn (Livorno) ... Bourbon Island, Surat, Manila, Macao, Cadiz, Havana.” See Alejandra Irigoin, “Rise and Demise of the Global Silver Standard,” *Handbook of the History of Money and Currency*, ed. S. Battilossi et al. (Singapore: Springer, 2018), 2. The author underlined that this currency lasted more than two centuries before a gold standard came to define the classic economic globalization of the late nineteenth and twentieth centuries, with the British pound and the US dollar. See also Carlos Marichal, “El peso o real de a ocho: moneda universal de España y América, siglos XVI–XVIII,” in *El camino hacia el euro: el real, el escudo y la peseta* (Madrid: Banco España, 2001) and particularly Carlos Marichal, “The Spanish-American Silver Peso: Export Commodity and Global Money of the Ancien Regime, 1550–1800,” in *From Silver to Cocaine: Latin American Commodity Chains and the Building of the World Economy, 1500–2000*, ed. Carlos Marichal, Steven Topik, and Zephyr L. Frank (Durham and London: Duke University Press, 2006); Elena María García Guerra, “Itinerarios mundiales de una moneda supra nacional: el real de a ocho o peso durante la edad moderna,” *Studia Historica: Historia Moderna* 28 (2006): 241–57. The success of the Spanish peso was also based on the quality of the coins minted over more than three centuries. Marichal, Topik, and Zephyr, *From Silver to Cocaine*, 39–40.

foreground the entangled infrastructure and political economy that configured a new human and environmental landscape. We refer to the following dynamic processes: 1) the use of local knowledge, but also the adoption and innovation necessary to achieve the important transformations that took place; 2) the intervention (agency) and interests of different actors (workers, entrepreneurs, and authorities); and 3) the articulation and interrelation of different spaces. This volume also seeks to reunite production and circulation, while at the same time underlining the changes over the past 300 years that allowed for important economic changes and the emergence of capitalism.

To analyze this center of the global world between the late sixteenth century and the first decades of the nineteenth century, in 2019, eleven scholars from Argentina, Bolivia, Chile, the United States, France, Japan, and Great Britain came together in Sucre, Bolivia, to discuss their most recent research published now in this volume.

In the first section, the reader travels through geology, sacred spaces, and technical knowledge; through environmental history and labor in the second section; flows, heterogeneous producers, and their agency in the third; and local, regional, and global impacts in the fourth section.

The mountain of Potosí was linked to the ancestors and the cult of the Sun, being part of a vast sacred space that had been exploited long before the Hispanic conquest. The knowledge of its geology was interwoven with labor policies and technical practices and innovations were registered in administrative colonial texts (see the first section). Silver production was made possible through an impressive hydraulic infrastructure built by Indigenous workers, artisans, and authorities, while the minted coinage was based in enslaved and coerced labor, although with some margins for negotiations (second section). The silver flows to Asia in the early period were in part in the hands of Peruvian merchants and traders, while its production was held by a diverse group of entrepreneurs who received quota assignments of coerced workers (*mitayos*). In the eighteenth century, the heterogeneous world of producers included small and artisanal mining and traders (see the third section). The local, regional, and global impacts of the mint fraud of the seventeenth century are carefully analyzed, while the sourcing of mercury in the first half of the nineteenth century reveals the important continuities but also changes introduced after the dissolution of the Spanish Empire (fourth section). Each of these contributions situates Potosí as a hub with local, regional, and global connections.¹¹

11 There are certainly a multitude of topics that have not yet been explored on the city of Potosí, such as the history of justice; art production such as painting, theater, literature and architecture, ritual and festival life; and demography.

In this introduction for an English-speaking audience, we present an overview of how different actors of diverse empires and regions participated in the silver flows, trying to overcome the “methodological nationalism.” We aim to show the linkages between the Potosí highlands and the lowland coast, as well as the Pacific and Atlantic worlds, allowing a better comprehension of what we call the “Silver Age.” This complex global web is captured in this quote:

In the Atlantic so vast ... the *Carrera of Indias* was the umbilical cord that united the Old and the New World for more than three centuries ... Let us think in Potosí, an unlikely city far from the sea breeze, which supplies silver to Europe by means of the ships of the *Carrera* receiving the most precious fabrics from Brabant, Rouen and Florence. We could also think in Damascus, where its governor asks a Sevillian pilgrim if the fleet arrived late, as the lack of currency in the East is accused. The seas, without the inland to order them, are little more than water.¹²

We begin this history with the shipment of “treasures” of silver and gold from America to Spain, focusing on the global, regional, local, and micro levels. In the following section, *Vale un Potosí* [to be worth a Potosí],¹³ we provide a historiographical overview of the mountain and city since 1545, focusing on silver production. Finally, we introduce the work of our guest scholars, whose recent research contributes with diverse perspectives, new questions, and approaches to understanding Potosí in global history.

1 Silver Connections and Trans-imperial Involvement

Silver allowed multiple connections: between different spaces and scales (continents, kingdoms, and states) and between different actors (states and private individuals). But how much silver was produced? How much silver arrived in Europe or China? How much silver stayed in Spanish America? There is no simple answer, and this was also the result of the participation of other European powers. The Spanish Crown could not assure that all the minerals produced were registered; it could likewise not ensure its monopoly on the routes and transportation between America and Spain (through the *Carrera de Indias*), and neither

¹² Sergio Rodríguez Lorenzo, *La Carrera de Indias (La ruta, los hombres, las mercancías)* (Madrid: Esles de Cayón, 2015), 11.

¹³ Expression coined by Miguel de Cervantes Saavedra in *Don Quixote* to refer to something of extraordinary and inexhaustible wealth.

could it ensure that trade was only in the hands of its subjects.¹⁴ Hence, after presenting different estimates of the so-called American treasures (mostly composed of silver and, to a lesser extent, of gold), we will refer to the involvement of merchants from different European monarchies (whether they were traders, “pirates,” or “buccaneers”) and from Peru itself. In the seventeenth century, we highlight the silver flows outside official circuits, particularly to Asia, that became even more important in the eighteenth century with broad and intensive merchandise exchanges. Non-Spanish merchants, as well as merchandise from other monarchies and regions, became prominent in this period. Finally, we mention briefly the slave trade that linked monarchies and commodities.

1.1 *Treasure Shipments, “Piracy” and Trade*

Shipments of metals were reconstructed in the early and extensive works of Earl and Gladys D. Hamilton, published in 1930 for the period 1501–1650, and Pierre and Huguette Chaunu’s 1955 to 1960 volumes covered the period 1581–1660. These works, together with those of other authors (see Annex Table 0.1), refined the estimates. These evaluations of American silver and gold transports to Spain distinguish three stages: the first, of ascent, occurred between 1504 and 1610; the second, of recession, between 1610 and 1720, was characterized by the loss of control over this traffic by the *Casa de Contratación* in Seville; and, finally, that of growth from the end of the seventeenth century to the end of the eighteenth.¹⁵ The idea of a deep crisis in the seventeenth century (a recurring theme since the 1960s) was radically questioned by Michel Morineau, who used diverse sources—gazettes, consular reports, among others—to assert that there was not a continuous decline but rather repeated oscillations, revealing the problems faced by the Spanish Crown’s monopoly over intercontinental flows. From 1611 to 1700, undervaluation and smuggling were widespread (Figure 0.3) and, for example, in 1643, more silver arrived in Spain unrecorded than recorded.¹⁶ It is clear that the different estimates hide important unresolved issues, such as the amount of silver not registered, problems

14 García-Baquero pointed out that there should be an “absolute monopoly of commercial exchanges with the colonies ... by virtue of the right ... acquired by ... discovery and conquest” as well as the mercantilist theories and practices that wealth consisted of precious metals (our translation of the quote). See *Andalucía y la Carrera de Indias: Estudio Preliminar de Carlos Martínez Shaw* (Granada: Universidad de Granada, 2002), 31–32 and 35.

15 García-Baquero, *Andalucía y la Carrera de Indias*, 12–17. See Enriqueta Vila Vilar, *Sevilla y los hombres del comercio (1700–1800)* (Sevilla: Editoriales Andaluzas Unidas, 1989).

16 Michel Morineau, recalling Chaunu, pointed out that the practice of shipping silver without a detailed record, noting instead “to be recorded,” opened the door to concealment and fraud. Morineau, *Incroyables gazettes et fabuleux métaux. Les retours des trésors*

with sources, and the prominence of smuggling. Annex Table 0.1 reveals the difficulties and gaps in the task of reconstructing the transatlantic flows. John TePaske's data are based on the record of the *quinto* and *diezmo* tax (20% and 10% of officially recorded silver) and tend to be taken as low estimates.

The “treasures” of the shipments that circulated were under the administration of the *Casa de Contratación*, founded in 1503 for the *Carrera de Indias* and the *Flota de Indias* or “Spanish Treasure Fleet” of the Atlantic circuit. Morineau described the *Carrera de Indias* as

an immense affair that put on the brink half of Europe from Genes to Hamburg ... In 1686 ... a fleet from New Spain bring ... about 5 million piastres; the Gallions of Tierra Firme ... 9 million piasters ... On the basis of an alternation of convoys ... the merchandises value rose to a total of 21 million of livres *tournois* or 7 million piasters ... To fix the size ... of this traffic, it is worth to mention that it equaled two fifths of all the imports from Amsterdam in 1667–1668 and a little less than two thirds of its exports.¹⁷

The American “treasures” were shipped from Havana—where the New Spain fleet converged with the Tierra Firme galleons that were loaded with the silver produced in Potosí and transported to Callao, and from there to New Granada, Panama, and Portobelo.¹⁸ (Map 0.1) There were also connections to Asia.¹⁹ Bonialian and Hausberger thus use the concept, coined by Braudel, of

américains d'après les gazettes hollandaises (XVI–XVIII siècles) (Paris: Maison Sciences de l'Homme, 1985), 243–46. In the annual shipments of precious metals used by Marichal based on Morineau, there is a continuous rise, and the second stage of the crisis disappeared. Marichal, “The Spanish-American Silver *Peso*,” 33.

17 Michel Morineau, *Incrovable gazettes*, 263.

18 Tierra Firme was the generic name given by European cartographers and bureaucrats in the early colonial period to the coastal territories of northern South America. By extension, this name applied to the territory of South America, including Peru.

19 For the connection between the Americas and Asia, see William Lytle Schurz, *The Manila Galleon* (University of California, 1915); Woodrow W. Borah, *Early Colonial Trade and Navigation Between Mexico and Peru* (Berkeley: University of California Press, 1954); Woodrow W. Borah, *Silk Raising in Colonial Mexico* (Berkeley: University of California Press, 1943); Antonio Miguel Bernal, “La Carrera del Pacífico: Filipinas en el sistema colonial de la Carrera de Indias,” in *España y el Pacífico, Legaspi*, ed. Leoncio Cabrero, 485–525 (Madrid: Sociedad Estatal de Conmemoraciones Culturales, 2004); Marina Alfonso Mola and Carlos Martínez Shaw, “La era de la plata española en Extremo Oriente,” *Revista Española del Pacífico* 17 (2004): 33–53; Salvador Bernabéu Albert and Carlos Martínez Shaw, eds., *Un océano de seda y plata: el universo económico del Galeón de Manila* (Sevilla: Consejo Superior de Investigaciones Científicas, 2013); Carmen Yuste, *Emporios transpacíficos: comerciantes mexicanos en Manila, 1710–1815* (Mexico, Universidad Nacional Autónoma de México, 2007); Margarita Suárez, “Lima and the Introduction of Peru into the Global Trade of the 16th Century,” in *A Companion to Early Modern Lima*, ed. Emily A. Engel, 171–95 (Leiden: Brill, 2019); Mariano Bonialian, *El*

geo-historical axis, which differentiates a transatlantic novo-Hispanic axis; a South American transatlantic axis that linked Spain, Portobelo, and Lima through the Pacific, arriving by land to the Atlantic via Buenos Aires; the transpacific axis of the Manila galleons, from Mexico to the Philippines and from there to Canton (China); and, finally, the transpacific axis between El Callao, the Philippines, and Canton, which operated in some specific periods (1580–1600 and 1695–1718).²⁰

Given the difficulty in controlling the vast circulation of goods, “piracy” and trade flourished.²¹ Between 1575 and 1594, there were four English expeditions in the Pacific: those of John Oxenham (1576), Francis Drake (1577–1580), Thomas Cavendish (1586–1588), and Richard Hawkins (1593–1594). From the Spanish point of view, all foreign agents were considered pirates—that is, intruders, robbers, and criminals. Privateers conducted wartime raids under license from a monarch (or other governing body) while smugglers were well-armed merchants.²² English privateer attacks and plundering of Spanish ships and ports in the Americas increased in both the Caribbean and the Pacific.²³ Between 1570 and 1648, the presence of the Dutch in American waters was important, combining war, trade, and piracy.²⁴ Among them was merchant Jacques de Clerck (also known as Jacques l’Hermite), who served in the Dutch East India Company (*Vereenigde Oostindische Compagnie* or VOC), which in 1624 blockaded and attacked the port of Callao, in Lima.²⁵ The seventeenth century was the era of the buccaneers (English, French, Dutch, Danish) that ravaged the Caribbean Sea. Towards the 1680s, many buccaneers abandoned the Caribbean, which explains why between 1683 and 1694, incursions in the Spanish Pacific intensified. The legal and political context of the eighteenth

20 Mariano Bonialian and Bernd Hausberger, “Consideraciones sobre el comercio y el papel de la plata hispanoamericana en la temprana globalización, siglos XVI–XIX,” *Historia Mexicana* 68, no. 1 (2018): 203–7.

21 Kenneth R. Andrews, *The Spanish Caribbean: Trade and Plunder 1530–1630* (New Haven: Yale University Press, 1978); Kenneth R. Andrews, *English Privateering Voyages to the West Indies 1588–1595* (New York: Kraus reprint, 1986); Manuel Lucena Salmoral, *Piratas, bucaneros, filibusteros y corsarios en América* (Madrid: MAPFRE, 1992); Lane, *Pillaging the Empire: Global Piracy on the High Seas, 1500–1750* (New York: Routledge, [1998] 2016), 29–56.

22 Lane, *Pillaging the Empire*.

23 Roxana Nakashima, “La presencia inglesa en las costas de la Mar del Sur durante las últimas décadas del siglo XVI: ¿una amenaza espiritual en América?” in *Conocer el Pacífico: exploraciones, imágenes y formación de sociedades oceánicas*, ed. Salvador Bernabéu Albert, María del Carmen Mena García and Emilio José Luque Azcona (Seville: Editorial Universidad de Sevilla, 2015), 121–48.

24 Some of the most prominent Dutch pirates were Jacob Mahu, Oliver van Noort, Joris van Spielbergen, Wilhelm von Schoutten, Jakob Le Mayre, and Pieter Pieterszoon Heyn; see Lane, *Pillaging the Empire*, 57–88.

25 Lucena Salmoral, *Piratas, bucaneros, filibusteros y corsarios*.

TABLE 0.2 Distribution of treasuries in millions of pesos, 1580–1620

Years	For the king	%	For individuals	%	Total
1580	2,887,500	27.27	7,700,000	72.73	10,587,500
1581	1,650,000	24.47	5,094,151	75.53	6,744,151
1584	2,657,577	4.97	50,762,040	95.03	53,419,617
1586	1,100,000	40.00	1,650,000	60.00	2,750,000
1595	7,759,969	31.90	16,569,518	68.10	2,4329,487
1603	2,504,392	23.41	8,193,090	76.59	10,697,482
1606	1,688,416	24.83	5,112,650	75.17	6,801,066
1607	1,476,425	37.19	2,493,210	62.81	3,969,635
1608	2,841,331	28.96	6,970,103	71.04	9,811,434
1609	2,530,201	25.21	7,507,015	74.79	10,037,216
1610	2,684,000	33.33	5,369,000	66.67	8,053,000
1611	2,058,000	26.20	5,796,000	73.80	7,854,000
1612	3,504,657	37.50	5,841,038	62.50	9,345,695
1613	2,811,000	33.25	5,644,000	66.75	8,455,000
1614	3,028,892	31.69	6,528,816	68.31	9,557,708
1615	2,305,710	29.03	5,638,137	70.97	7,943,847
1616	2,252,459	26.02	6,405,473	73.98	8,657,932
1617	1,504,793	22.01	5,331,406	77.99	6,836,199
1618	1,622,736	13.25	10,623,736	86.75	12,246,472
1619	1,256,558	10.75	10,431,282	89.25	11,687,840
1620	476,342	10.00	4,288,210	90.00	4,764,552

SOURCE: MORINEAU, *INCROYABLES GAZETTES*, 102, TABLE 9

century was notoriously more hostile to pirates (known at the time as “freebooters,” mostly of Anglo-American origin).²⁶

1.2 *The Silver Coveted: Bankers and Merchants*

If the control of silver was difficult, it was also hard to keep the trade in the hands of subjects of the Spanish monarchy. Non-Spanish merchants managed to insert themselves into the mercantile networks through the silver destined

²⁶ Spain's long-standing fight against pirates was joined by other kingdoms: between 1716–1726, an English extermination campaign put them on trial and executed some 500 pirates. Lane, *Pillaging the Empire*, 4. See also Roxana Nakashima, “Contra los corsarios, al servicio de su Majestad: Expediciones inglesas por el Mar del Sur (1576–1594) en las informaciones de méritos y servicios de los vasallos del rey,” in *Felipe II y Almazarrón: la*

TABLE 0.3 Structure of Tierra Firme trade in millions of pounds in 1686

Countries	Tissus	Wools	Silks	Haber- dashery	Wax	Utensils	Divers	Total	%
France	6,329	1,540	790	1,945				10,854	39.79
Flanders	210	225		1,340				1,855	6.80
Great Britain	230	2,505		491	666			3,892	14.27
Netherlands	450	1,565			333		135	3,253	11.92
Hamburg	1,243							1,283	4.70
Genoa			3,283	1,060				4,543	16.65
Spain			800						5.87
<i>Total</i>	<i>8,462</i>	<i>5,835</i>	<i>5,323</i>	<i>5,026</i>	<i>1,329</i>		<i>800</i>	<i>27,280</i>	<i>63.04</i>

SOURCE: MORINEAU, *INCROYABLES GAZETTES*, 267, TABLE 44

for the Crown (from the taxes on production), which represented a third part, and the silver destined for private individuals, which was quantitatively the most significant (Table 0.2).

The money destined for the Crown generally paid off debts. Although the Fuggers, bankers of Emperor Charles V, only monopolized a fifth of the loans, they received privileged treatment until at least 1640. They managed the mercury mines of Almadén, a monopoly of the Crown, which, because of its importance for the amalgamation process used in the mining of American silver, gave them a strategic position. Since the end of the fifteenth century, they also had access to silver from Eastern Europe, selling silver and copper to Venice, the hub of German trade with its links to the east, the west (Lisbon), and the north (Antwerp).²⁷ Antwerp also played a key role in the Portuguese-led transcontinental trade in spices and in the export of textiles thanks to expanding German silver production between 1526 and 1535, in which the Fuggers were also involved.²⁸ Later, in the seventeenth century, the merchants and bankers linked to the Crown were mainly Italians (73%) and Germans (26%).²⁹

The silver of private individuals, on the other hand, paid for merchandise from different parts of Europe. Table 0.3 shows that in 1686, products from

construcción local de un Imperio global, ed. María Martínez Alcalde and José Javier Ruíz Ibáñez (Murcia: Universidad de Murcia, 2014), 311–29.

27 Mark Haberen, *The Fuggers of Augsburg: Pursuing Wealth and Honor in Renaissance Germany* (Virginia: University of Virginia Press, 2006), 95, 38, 49, 53.

28 Herman Van Der Wee, *The Growth of the Antwerp Market and the European Economy (Fourteenth–Sixteenth Century)*, T. 3 (The Hague: Martinus Nijhoff, 1963), 125, 131, 138.

29 Carlos Álvarez Nogal, *Los Banqueros de Felipe IV y los metales preciosos americanos (1621–1665)* (España: Banco de España, 1997), 24. On Antwerp, see Van Der Wee, *The Growth of the Antwerp*.

France accounted for almost 40%, with those from Genoa, Flanders, and the Netherlands also being important. This is why Spain was sometimes considered a “silver bridge.”³⁰

In addition to these global data, some microhistories are illustrative. Flemish Pedro de Colaert, who settled in Cadiz in 1638–1639, accumulated a fortune having his own galleon.³¹ He and his network had transactions between Andalusia and Amsterdam, carrying merchandise from Europe (Lille, Ghent, Rouen, Lyon, Cantabria, Brabant, Brittany, and Lorraine). They also had representatives in New Spain, Cartagena de Indias, and Buenos Aires.³² They carried out transactions with several people in the Indies who generally occupied important political positions, which explains part of their success.³³ The Colaert sons became even more involved by bringing iron and nails to Portobelo and Peru, in community with several merchants from the Basque country.

1.3 *Smuggling and Merchants’ Connivance*

The poor control of the route of the *Carrera de Indias* meant the leaking of silver from very early on, particularly towards Asia through the Pacific. Garner estimated the silver that flowed through this route at around 56.8 and 34.8 million pesos (officially and unofficially) for the period 1581–1645.³⁴ Chuan Hang Sheng estimated this trade during the sixteenth and seventeenth centuries, including smuggling, at 2 to 4 million pesos of silver annually (although there are much higher estimates).³⁵ Legal flows of Peruvian and Mexican silver in

30 Marina Alfonso and Carlos Martínez Shaw, “La era de la plata española en Extremo Oriente,” *Revista Española del Pacífico* 17 (2004): 37.

31 Manuel Bustos Rodríguez, *Burguesía de negocios y capitalismo en Cádiz: los Colarte 1650–1750* (Cádiz: Diputación Provincial de Cádiz, 1991), 69.

32 Bustos Rodríguez, *Burguesía de negocios*, 70–73.

33 They also had direct connections with America: in 1680 they sent a person to Potosí to collect more than 304,000 silver reales for products that had been shipped seventeen years earlier. Bustos Rodríguez, *Burguesía de negocios*, 54.

34 Richard L. Garner, “Where Did All the Silver Go? Bullion Outflows 1570–1650: A Review of the Numbers and Absence of Numbers (2006),” accessed May 1, 2022, 16, 18, <https://www.insidemysdesk.com/pnp/silvergo.pdf>. The figure of 56.8 million pesos is taken from Engel Sluiter, *The Gold and Silver of Spanish America* (Berkeley: Bancroft Library, University of California, 1998). The total of 34.8 million pesos comes from the sum of official silver records with Hamilton data from John J. TePaske, “New World Silver, Castile and the Philippines, 1590–1800,” in *Precious Metals in the Later Medieval and Early Modern Worlds*, ed. J. F. Richards (Durham: North Carolina University Press, 1983), 425–45.

35 Chuan Hang-Sheng, “Trade between China, the Philippines and the Americas during the Sixteenth and Seventeenth Centuries,” in *Metals and Monies in an Emerging Global Economy*, ed. Dennis O. Flynn and Arturo Giráldez, (Aldershot: Variorum, 1997), 845–85. Flynn and Giráldez proposed much higher estimates: 5.5 million pesos annually for the period 1581–1700—see Dennis O. Flynn and Arturo Giráldez, “China and the Manila Galleons,” in *Japanese Industrialization and the Asian Economy*, ed. A. J. H. Latham and Heita Kawakatsu (New York: Routledge, 1999), 71–90.

the eighteenth century have been appraised at an annual average of 800,000 pesos, although there are higher estimates.³⁶ Bonialian and Hausberger conclude that the direct circulation of silver between America and China through the Pacific axis would have reached considerable dimensions, threatening, at specific junctures, shipments of silver to Europe through the main transatlantic axis.³⁷ Mariano Bonialian states in this volume that between 1590 and 1630, 2 to 3 million pesos per year were shipped directly from Peru to China; between 30% and 50% of that was from Potosí. The port of Buenos Aires has also played a fundamental role in non-legal flows since its foundation in 1580, linking Potosí and the inland market.

In addition to the role of non-Spanish merchants, that of Peruvian merchants was particularly important. Margarita Suárez followed the itineraries, strategies, and global connections of a prominent group of them in Lima.³⁸ The Pacific route to and from the Philippines supplied the continent with Asian goods at low prices, allowing high profit margins in short time spans, as opposed to the Atlantic circuits governed by the long terms of the fleet and galleon system (the return on Atlantic investments took between five and six years).³⁹ The Peruvian merchants bought the Asian products in Portobelo, sold them in Lima, and could therefore exert greater control over the production and export of silver, to the detriment of the interests of the metropolitan companies, particularly the Consulate of Seville.⁴⁰ The ships went from the ports of the “South Sea” (Pacific) to the north loaded with cocoa, wine, vinegar, and silver, returning to Peru with Asian and European merchandise (acquired in Mexico City) and local products (tar, wood, indigo, Mexican silks, and balsam and Campeche wood). Peruvian merchants maintained trade with the Philippines, where they had their agents, known as *peruleros*.⁴¹

36 The sum of 800,000 pesos derives from Barrett’s estimate of an annual export of 15–21 tons of silver averaged by year from figures offered by Humboldt (Barrett, “World Bullion Flows,” Table 7.6, 248–49). Carmen Yuste estimated an annual average per galleon of 30–33 tons: Carmen Yuste, *El comercio de la Nueva España con Filipinas, 1590–1785* (México: Instituto Nacional de Antropología e Historia, 1984).

37 Bonialian and Hausberger, “Consideraciones sobre el comercio,” 218.

38 Margarita Suárez, *Comercio y fraude en el Perú colonial: las estrategias mercantiles de un banquero* (Lima: IEP Ediciones, 1995); Margarita Suárez, *Desafío transatlántico: mercaderes, banqueros y el Estado en el Perú virreinal, 1600–1700* (Lima: Fondo de Cultura Económica-Instituto Francés de Estudios Andinos-Instituto Riva-Agüero, 2001); Margarita Suárez, “El Perú en el mundo atlántico (1520–1739),” in *Compendio de historia económica del Perú 11: Economía del período colonial temprano*, ed. Carlos Contreras (Lima: BCRP IEP, 2009), 229–311.

39 Suárez, “El Perú en el mundo atlántico,” 258–69; Richard L. Garner, “Where Did All the Silver Go?” 27–28.

40 Suárez, “El Perú en el mundo atlántico,” 241.

41 Mariano Bonialian, “Peruleros en Filipinas y en el Oriente, 1580–1610,” *Illes i Imperis* 23 (2021): 185–211.

Peruvian merchants were able to combine Atlantic and Pacific trade along with land and sea traffic (with the ownership of ships), a pattern that continued until the eighteenth century.⁴² Credit was key and the constitution of seven banks in Lima in the first half of the seventeenth century reveals the formation of powerful mercantile, productive, and financial consortiums.⁴³ Mariano Bonifacio argues, in this volume, that these *peruleros* were global agents moving across the European and Southeast Asian markets. One of the interesting cases he presents is that of Juan Núñez de Anaya, a wealthy merchant from Potosí on his way to the Philippines.

If trade and routes went north and towards Asia through the Pacific, the silver from Potosí also went to Buenos Aires, in the south, opening to the Atlantic. Here, the so-called legal *navíos de registro* were much less numerous than other non-legal vessels. Between 1648 and 1702, only thirty-four registered ships arrived while 200 vessels traded illegally. Zacarías Moutoukias has argued that the mechanisms, circuits, men, and goods involved were part of the same phenomenon of simultaneous legal and illegal trade.⁴⁴ France encouraged the settlement of Pacific islands at the end of the seventeenth century, with the prospect of increasing trade with Chile and Peru, outside the system of fleets and galleons. The French also tried to sell their products directly to the Peruvian coasts in exchange for Potosí's silver.⁴⁵ The rise of the Bourbons and the authorization of the trade of African slaves in favor of France in 1701 facilitated its presence in the region.

In this context, between 1660 and 1700, smuggling helps explain the different estimates of American silver as shown in Figure 0.3: unofficial records (gazettes in blue) show more silver than official records (registered silver output in orange).

In the eighteenth century, the share of metals was still high in relation to other commodities: between 1715 and 1778, silver accounted for 76% of trade

42 Mariano Bonifacio, *La América española. Entre el Pacífico y el Atlántico. Globalización mercantil y economía política, 1580–1840* (México: El Colegio de México, 2019); Cristina Ana Mazzeo, *El comercio libre en el Perú: Las estrategias de un comerciante criollo, José Antonio de Lavalle y Cortés, 1777–1815* (Lima: Pontificia Universidad Católica del Perú, 1994); Suárez, "El Perú en el mundo atlántico."

43 Baltazar de Lorca, Juan Vidal, Juan López de Altopica, Diego de Morales, Juan de la Plaza, Bernardo de Villegas and Juan de la Cueva are some of the names of the most powerful Lima merchants (Suárez, "El Perú en el mundo atlántico," 248–49).

44 Zacarías Moutoukias, "Burocracia, contrabando y autotransformación de las élites: Buenos Aires en el siglo XVII," *Anuario IEHS: Instituto de Estudios histórico sociales* 3 (1988): 213–48.

45 Carlos Malamud, *Cádiz y Saint Malo en el comercio colonial peruano (1698–1725)* (Cádiz: Diputación provincial de Cádiz, 1986).

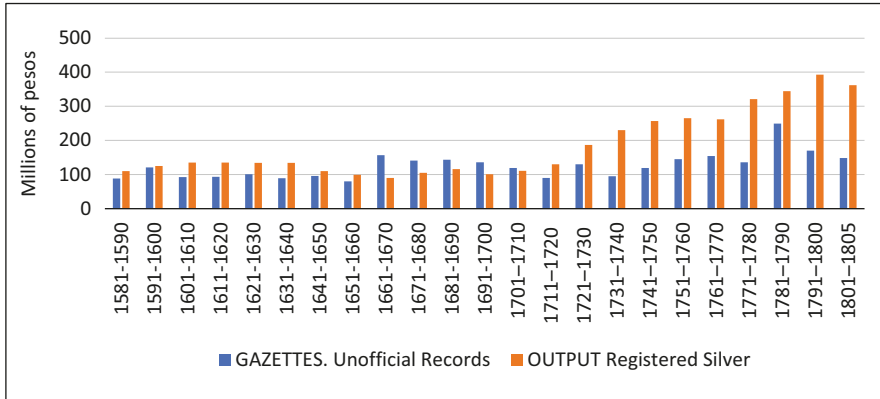


FIGURE 0.3 Gazette bullion shipments and registered silver output, 1581–1805, by decade in millions of pesos of 272 maravedies

SOURCE: TEPASKE, *A NEW WORLD*, 315. THE DATA ON THE GAZETTES ARE FROM MORINEAU BUT HAVE BEEN TAKEN FROM TEPASKE

while other products made up 13% and gold 10%.⁴⁶ Another estimation established that between 1747 and 1796, bullion accounted for 71.9% and other products for 28.1%.⁴⁷

Legal and illegal trade in the Hispanic ports of the Caribbean Sea intensified, and there was also an increase in silver production, particularly in Mexico. Despite this, Peruvian silver—mainly from Potosí—was still significant. TePaske claimed it represented 30% (501.01 million pesos of 272 maravedies) of total shipments, Cross cited 32.5%, and Morineau 40%.⁴⁸ Official silver records themselves likewise increased; TePaske and Brown underlined the role of the Bourbon administration⁴⁹ in that process, while Rossana Barragán R. explains this resurgence through her analysis of the silver bank established in Potosí.

However, smuggling continued. The Colonia do Sacramento, a Portuguese enclave on Spanish soil, called the Jamaica of South America, was one of the

46 Barragán R., “Potosí’s Silver and the Global World of Trade,” 75, based on Fernando Jumar’s “Le commerce Atlantique au Río de la Plata, 1680–1778” (PhD diss., Ecole des Hautes Etudes en Sciences Sociales, 2000), 248.

47 Antonio García-Baquero, “American Gold and Silver in the Eighteenth Century: From Fascination to Accounting,” in *Global Connections and Monetary History, 1470–1800*, ed. Dennis O. Flynn, A. Giraldez, and R. von Glahn (Farnham: Ashgate, 2003), 120.

48 TePaske, *A New World*, 112; Cross, “South American Bullion,” 403; Morineau, *Incroyables gazettes*, 417, Table 61.

49 TePaske, *A New World*, 309–11.

privileged centers for silver from Potosí to Lisbon and key to British interests.⁵⁰ Fernando Jumar reconstructed the legal return cargo (with metals and other “fruits” or merchandise) from Río de la Plata to Spain. His estimate, based on 256 ships between 1715 and 1778, is higher than García-Baquero’s: a total of 58,050,395 pesos in contrast to 45,882,020 for Río de la Plata.⁵¹

The rise in silver and gold production in the eighteenth century intensified flows to Asia. An average of 150 ships departed annually from Amsterdam, Rotterdam, and Midelburg for the Levant and Cadiz. Gaastra and Israel underlined the role of silver in the VOC’s purchases of goods.⁵² Silver and gold circulated from Batavia, one of the centers of the VOC, to Ceylon, Bengal, and Coromandel. Vries stated that 35% of silver flowed through the Cape route, consisting of an exchange of silver exports for commodity imports with around 150 tons of silver every year. In direct trade between Asia and the Dutch Republic, silver represented between 50% and 63% of imports between 1713 and 1790.⁵³

In this period, Amsterdam, Paris, and London became the main financial cores, while Cadiz was the commercial geostrategic center that connected the Mediterranean Sea—Atlantic Ocean—North Sea—Baltic Sea maritime route through the Strait of Gibraltar.⁵⁴ In the mid-eighteenth century, Spanish merchants trading with the Spanish-American colonies represented 59% of all merchants, but they earned only 17.5% of the income. Foreign merchants

50 Jumar, “Le commerce Atlantique,” 54, 240.

51 See Jumar, “Le commerce Atlantique,” 248 and 670. The totals obtained by Jumar are different from the totals obtained for the same period by García-Baquero, Morineau, and other authors. Jumar presented a careful analysis of the reasons for this divergence: The application of different monetary units and the evaluation of non-minted metals. See Barragán R., “Potosí’s Silver and the Global World of Trade,” 74.

52 Femme Gaastra, “The Exports of Precious Metals from Europe to Asia by the Dutch East India Company, 1602–1795,” in *Precious Metals in the Later Medieval and Early Modern Worlds*, ed. J. Richards (Durham: North Carolina University Press, 1983); Jonathan Israel, *Dutch Primacy in World Trade 1585–1740* (Oxford: Oxford Clarendon Press, 1989). For the Dutch–Asiatic Trade: Kristoff Glamann, *Dutch-Asiatic Trade 1620–1740* (The Hague: Martinus Nijhoff S-Gravenhage, 1981). See also Herman Van Der Wee, “World Production and Trade in Gold, Silver, and Copper in the Low Countries, 1450–1700,” in *Precious Metals in the Age of Expansion*, ed. Hermann Kellenbenz (Stuttgart: Klett-Cotta, 1981), 79–86.

53 Peer Vries, “Connecting Europe and Asia: A Quantitative Analysis of the Cape Route Trade, 1497–1795,” in *Global Connections and Monetary History, 1470–1800*, ed. Dennis Flynn, Arturo Giráldez and Richard Von Glahn (London: Ashgate, 2003), 80–81.

54 Pilar Nogues Marco, “The Microeconomics of Bullionism: Arbitrage, Smuggling and Silver Outflows in Spain in the Early 18th Century: Working Papers in Economic History,” Universidad Carlos III, 2011, http://www.uc3m.es/uc3m/dpto/HISEC/working_papers/working_papers_general.html, 6 and 19.

(French, Italian, German, Damascene, Swedish, Prussian, Irish, English, and Flemish) represented 41% and earned 82.5% of the total income. The French were the most important in Cadiz, representing just one quarter but earning half of all merchants' total annual net income.⁵⁵ One of the main merchants was the Roux House, which had vast geographical activities in 360 cities in Europe, Levant, the Barbary Coast in North Africa, and the Antilles, with nearly 2,000 correspondents and eleven merchant houses.⁵⁶

Between 1765 and 1789, navigation and trade finally opened between different points of the Spanish Empire and peninsular ports. According to John Fisher, trade between 1782 and 1796 grew by more than 300% for exports in relation to 1778 and by more than 1,000% for imports. García-Baquero has questioned these figures, but this period was the most important for the transatlantic connections between Spain and America.⁵⁷ The share of Spanish and foreign products shows the importance of the latter, which amounted to more than 50% (Table 0.4). Cadiz accounted for 94.5% of this trade in 1795.⁵⁸ Although estimates of silver smuggling from Cadiz to Europe are difficult to establish, it may have been from 14% to 50% in the sixteenth century, up to 85% in the seventeenth century, and 50% in the eighteenth century.⁵⁹

1.4 *The Slave Trade*

Finally, it is important to mention the trade of enslaved people between Europe, America, and West Africa, one of the most "complex economic enterprises known to the pre-industrial world and the largest transoceanic migration."⁶⁰

55 Nogues-Marco, "The Microeconomics of Bullionism," 8; Ana Crespo Solana, *Comunidades Transnacionales. Colonias de mercaderes extranjeros en el Mundo Atlántico (1500–1830)* (Madrid: Ed. Doce Calles, 2010), 87; Irigoien, "The New World and the Global Silver Economy," 278. For the relations between Amsterdam and Cádiz, see Ana Crespo Solana, *El comercio marítimo entre Amsterdam y Cadiz (1713–1778)* (España: Banco de España, 2000) and "La Ruta del Levante: Cádiz en el tráfico neerlandés con sus mercados mediterráneo y orientales en los siglos xv y xviii," in *Ponencia presentada en Encuentro de Historia y Arqueología* 13 (Cádiz: CSIC, 1997); Albert Girard, *El comercio francés en Sevilla y Cádiz en tiempo de los Habsburgo. Contribución al estudio del comercio extranjero en la España de los siglos xvi al xviii* [1932] (Cádiz: Editorial Renacimiento, 2006).

56 Nogues-Marco, "The Microeconomics of Bullionism," 8 and 11.

57 Arnaud Bartolomei, *Les Marchands français de Cadix et la crise de la Carrera de Indias (1778–1828)* (Madrid: Casa de Velázquez, 2017) 16, 18–19.

58 Bartolomei, *Les Marchands français*, 20–21.

59 Nogues-Marco, "The Microeconomics of Bullionism," 5–8.

60 Herbert Klein, *The Atlantic Slave Trade* (Cambridge: Cambridge University Press, 2010), 75. See also Johannes Menne Postma, *The Dutch in the Atlantic Slave Trade* (Cambridge: Cambridge University Press, 1990).

TABLE 0.4 Commodities shipped to America in pesos, 1784–1796

Year	Spanish prod.	%	Foreign prod.	Total	Totals differing but shown in source
1784	9,794,268	45.05	11,946,161	21,740,429	
1785	16,863,330	43.96	21,499,109	38,362,439	
1786	11,478,223	52.74	10,285,920	21,764,143	
1787	18,211,400	43.96	23,220,000	41,431,400	
1788	10,300,000	50.88	9,944,800	20,244,800	20,644,800
1789	7,627,000	44.13	9,656,400	17,283,400	
1790	9,028,000	51.72	8,428,400	17,456,400	17,436,400
1791	9,909,100	49.37	10,161,200	20,070,300	
1792	11,457,600	50.39	11,282,000	22,739,600	
1793	8,947,800	54.45	7,485,400	16,433,200	16,432,200
1794	6,171,400	50.84	5,968,000	12,139,400	
1795	11,390,800	55.78	9,030,000	20,420,800	
1796	9,392,200	57.07	7,064,200	16,456,400	17,656,400

SOURCE: MORINEAU, *INCROYABLES GAZETTES*. THE LAST COLUMN PRESENTS DIFFERENT TOTALS THAT ARE IN THE SAME SOURCE

The ports in Europe were mainly those of Seville and Lisbon, while in Africa there were those of Santiago on Cape Verde Island, Sao Tome, and Sao Paulo de Loanda in Angola.⁶¹

Since 1518, the Portuguese, French, Dutch, and English were involved through the so-called *monopolio* and *asientos*: contracts to carry slaves to the American colonies in exchange for amounts of money and taxes. Portugal had the *asiento* over the slave trade granted by the Spanish Crown until 1640 in exchange for 100,000 to 150,000 ducats, with the obligation to introduce 4,000 enslaved people annually.⁶²

61 Enriqueta Vila Vilar, *Aspectos Sociales en América Colonial* (Bogotá: Universidad de Bogotá, 2001), 160 and also her work *Hispanoamérica y el comercio de esclavos* (Sevilla: Universidad de Sevilla, [1977] 2014).

62 Reyes Fernández Durán, *La Corona Española y el tráfico de negros: del Monopolio al libre comercio* (Madrid: PLUBIDISA, 2011) 25; see also Klein, *The Atlantic Slave Trade*, 78. These contracts could be in the hands of those who lent silver to the Crown (Domingo Grillo and Ambrosio Lomelin) and linked to the Genoese bankers who financed King Philip IV;

Some of the contracts were agreements between the monarchies. The *asiento* of 1701 was established between the “Catholic and Christian Majesties of Spain” and the Royal Guinea Company, established in the Kingdom of France, to deliver, over ten years, 48,000 enslaved people or “pieces of Indians” and loans to Philip V of 600,000 pounds of *tourneois* currency of France, equivalent to 200,000 pesos escudos.⁶³ A few years later, an *asiento* was established with the British South Sea Company focused on South America,⁶⁴ in exchange for 200,000 escudos pesos for which they received the authorization to take to the Indies, once a year, a ship of 500 tons with merchandise to be sold in the annual fairs in Portobelo and Veracruz.⁶⁵

New studies are reevaluating the scale and significance of the slave trade to the Spanish America, receiving 1.5 million between 1520 and 1867.⁶⁶

The traffic of African enslaved people grew exponentially in the eighteenth century due to the plantation economies in Brazil, the Caribbean, and the North American colonies, which produced cotton, tobacco, and sugar. Although slaves played a more prominent role in mining during the eighteenth century, specifically in gold production (mainly in New Granada and Brazil), in Potosí their number was small because the silver mining labor continued to be carried out almost entirely by Indigenous people.

1.5 Vale un Potosí [*To Be Worth a Potosí*]: *Labor in the Mountain*

We have examined the flows of silver throughout the world and the share of different imperial powers. We now focus on the mining historiography of

see Fernández Durán, *La Corona Española y el tráfico de negros*, 26. They agreed in 1662 to supply the Spanish colonies with 24,000 enslaved people during the next seven years. See Postma, *The Dutch in the Atlantic Slave Trade*, 33. The Dutch West India Company (in English, WIC) held an important role in the supply of slaves; cf. Fernández Durán, *La Corona Española y el tráfico de negros*, 28. See also Postma, *The Dutch in the Atlantic Slave Trade*, 26, 30. WIC shipped approximately 273,000 enslaved people from Africa from 1621 until 1803. The Dutch ranked fourth in the Atlantic slave trade while Great Britain, Portugal (in combination with Brazil), and France transported almost 90% of the total; see Postma, *The Dutch in the Atlantic Slave Trade*, 294–96, 306.

63 Fernández Durán, *La Corona Española y el tráfico de negros*, 16, 48, 57. This company was dominated by financiers Crozat, Thomé, Hubert Hubrecht (of Flemish origin).

64 It was established that the company could introduce around 4,800 “piezas de indias” (enslaved people) in total, being able to take 1,200 to Buenos Aires each year in four ships, of which 800 could remain in Buenos Aires and 400 could be taken to Chile and the northern provinces—what is now Bolivia.

65 Fernández Durán, *La Corona Española y el tráfico de negros*, 139–42.

66 Alex Borucki, David Eltis, David Wheat, eds., *From the Galleons to the Highlands: Slave Trade Routes in the Spanish Americas* (Albuquerque: University of New Mexico Press, 2020), 2–3. Michael Zeuske, *Esclavitud. Una historia de la humanidad* (Pamplona: Katakarak, 2018).

Potosí's impact on the world. Three topics in particular are explored in this volume: the world of workers and labor; engineering, technology and knowledge; and regional power relations.

It should be noted, first, that stories, legends, and graphic representations have long associated Potosí's wealth with the legend of "El Dorado."⁶⁷ The fame of Potosí's wealth reached Asia in writings, paintings, and engravings.⁶⁸ Around the same time, the most vivid depiction of Indigenous labor and exploitation inside the mines of Potosí was the engraving, based on a written description, issued by the successful De Bry family of publishers.⁶⁹

The consequences of the "world" in the Potosí mines have been at the heart of social and political reflections and research since the second half of the twentieth century. Potosí was, for example, central to Eduardo Galeano's narrative in his historical journalism book, *The Open Veins of Latin America: Five Centuries of Pillage in Latin America*, published in Spanish in 1971 and subsequently in multiple editions and translations in several languages. Galeano asserted, without historical evidence and somewhat reminiscent of the victims of the Holocaust, that in three centuries Potosí's Cerro Rico would have consumed 8 million indigenous lives.⁷⁰ In some way, De Bry and Galeano have each shaped the image and representation of Potosí to this day.

Potosí also played a key role in dependency theory: it constituted the paradigm of unequal exchange and how, simultaneously, capitalism produced development in some areas and underdevelopment in others.⁷¹ In the framework of Immanuel Wallerstein's world-systems theory, Potosí was presented

67 The most outstanding chronicles correspond to Pedro Cieza de León, Agustín Zárate, Luis Capoche, José de Acosta, Diego de Ocaña, Felipe Guaman Poma de Ayala, Martín de Murúa, Inca Garcilaso de la Vega, and Bartolomé Arzans de Ursúa y Vela.

68 The example of Iraqi traveler Elias al-Mawsili is particularly interesting: not only did he travel through much of Spanish America, but he also visited Potosí in the seventeenth century. See Roberto Marín Guzmán, *Un viaje poco conocido: la visita de Elías al-Mawsili: sacerdote caldeo iraquí, a la América Colonial (1669?–1680)* (Costa Rica: Editorial UCR, 2009).

69 See Rossana Barragán R., *Potosí Global: Traveling with its First Images (1550–1650)* (La Paz: Plural, 2019). Between 1590 and 1634, Theodor de Bry and his sons edited twenty-seven volumes dedicated to the East and West Indies, including superb engravings.

70 Eduardo Galeano, *The Open Veins of Latin America: Five Centuries of Pillage in Latin America* (New York: Monthly Review Press, 1997), 40. The idea of the Holocaust has been mentioned by Kris Lane, *Potosí: The Silver City that Changed the World* (California: University of California Press, 2019), 181–82.

71 On dependency theory, see Joseph Love, "The Origins of Dependency Analysis," *Journal of Latin American Studies* 22, no. 1 (1990), 45, 158–9, 165; Celso Furtado, *Economic Formation of Brazil* (México: Fondo de Cultura Económica, 1959); Celso Furtado, *Desenvolvimento e subdesenvolvimento* (Rio de Janeiro: Fundo de Cultura, 1961).

as a classic case of a peripheral supplier of raw materials to an industrialized center.⁷² Steve Stern criticized the determinism of the world-system approach: “historical explanation that reduces patterns of labor and economy in the periphery to a reaction of the capitalist world-system is one-dimensional and misleading, even for silver, the early world-system’s most valued American treasure.”⁷³

The historiography, whether linked to those general questions or not, focused on the enormous task of establishing silver production and reconstructed the labor system, technology, and consequences of production in the mines.

John TePaske, Herbert Klein, and Richard Garner have each demonstrated that Potosí was the largest silver producer in Peru during the sixteenth and seventeenth centuries, and although there were other important silver mining centers, they never reached Potosí’s production levels.⁷⁴

Abandoning perspectives that see mining sites as just enclave economies for the export of resources, Carlos S. Assadourian argued that Potosí articulated a broad region, proposing the concept of “Peruvian colonial space” (which included present-day Peru, Bolivia, Chile, Argentina, and Paraguay) with highly interconnected relationships between its different parts.⁷⁵ It was an internal market, with Potosí as the economic center of the production of silver and Lima as the political center and connection with the metropolis.

Labor in the mines has long received the most topical attention. Alberto Crespo Rodas gave one of the first detailed descriptions of *mita* work of pre-Hispanic origin in 1956,⁷⁶ a picture enriched and completed through the years. Established by Viceroy Toledo in 1573 (with reformulations in 1575 and 1578),

72 Immanuel Wallerstein, *The Modern World-System: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century* (New York: Academic Press, 1974).

73 Steve J. Stern, “Feudalism, Capitalism, and the World-System in the Perspective of Latin America and the Caribbean,” *American Historical Review* 93, no. 4 (1988): 829–72.

74 Oruro, Carangas, San Antonio del Nuevo Mundo, Hualgayoc, Cerro de Pasco, Chachapoyas, Cailloma, Huantajaya, among others. TePaske, *A New World*, 141–212; Herbert Klein and John TePaske, *Excel Alto Perú*, <https://realhacienda.colmex.mx>; Richard Garner, *Spanish-American Silver Registrations, SpAmSilverOutputex*, at <http://www.insidemysdesk.com/hdd.html>.

75 Carlos S. Assadourian, “La producción de la mercancía dinero en la formación del mercado interno colonial,” in *Ensayos Sobre el Desarrollo Económico de México y América Latina (1500–1975)*, ed. Enrique Florescano, 223–92 (México: Fondo de Cultura Económica, 1979); C. S. Assadourian, *El sistema de la economía colonial: mercado interno, regiones y espacio económico* (Lima: Instituto de Estudios Peruanos, 1982), 14 and 111.

76 Alberto Crespo Rodas, *La “mita” de Potosí* (Potosí: Universidad Tomás Frías, 1956). Gabriel René Moreno, *Últimos días coloniales en el Alto Perú* (Santiago de Chile: Imprenta Cervantes, 1896 and 1901).

the system involved the forced temporary migration of 14,000 men from eighteen to fifty years old from a total population of approximately 91,000 tributaries from sixteen provinces (*corregimientos*) in the region between the south of Cuzco and the south of present-day Bolivia for a period of one year. The routes of this forced migration reached—in some cases—more than 1,000 kilometers and up to twenty days on the road. Once in Potosí, the annual contingents of *mitayos* were divided into three groups. Each of these thirds was required to work for one week and to “rest” for the following two. The weekly shift of the *mita* theoretically ran from Monday to Saturday, with Sunday being a day off.⁷⁷

Peter Bakewell and Jeffrey A. Cole have contributed decisively to the study of labor in Potosí.⁷⁸ The former underlined that the labor system consisted of *mita* workers but also another important group of “free workers,” the *mingas*, who obtained triple the wages of the *mitayos*.⁷⁹ At the beginning of the seventeenth century, the *mitayos* constituted 30% of the mining labor force, while the *mingas* constituted 70%.⁸⁰ Cole focused on the seventeenth century and delineated the main changes of the *mita*—its “metamorphosis”—because from 1606–1608, at least 20% to 25% and perhaps up to 50% of the *mita* was paid in cash rather than in labor by the Indigenous groups. These were the “deliveries in silver” and the sums paid were considerable.⁸¹ In parallel and over a long period of time, there was significant defection of *mita* workers: they were reduced from 14,000 *mitayos*—as established by Toledo in 1573–1578—to no more than 4,000 at the end of the seventeenth century (a decline of more than 70%). At the same time, the fall in silver production implied a bigger

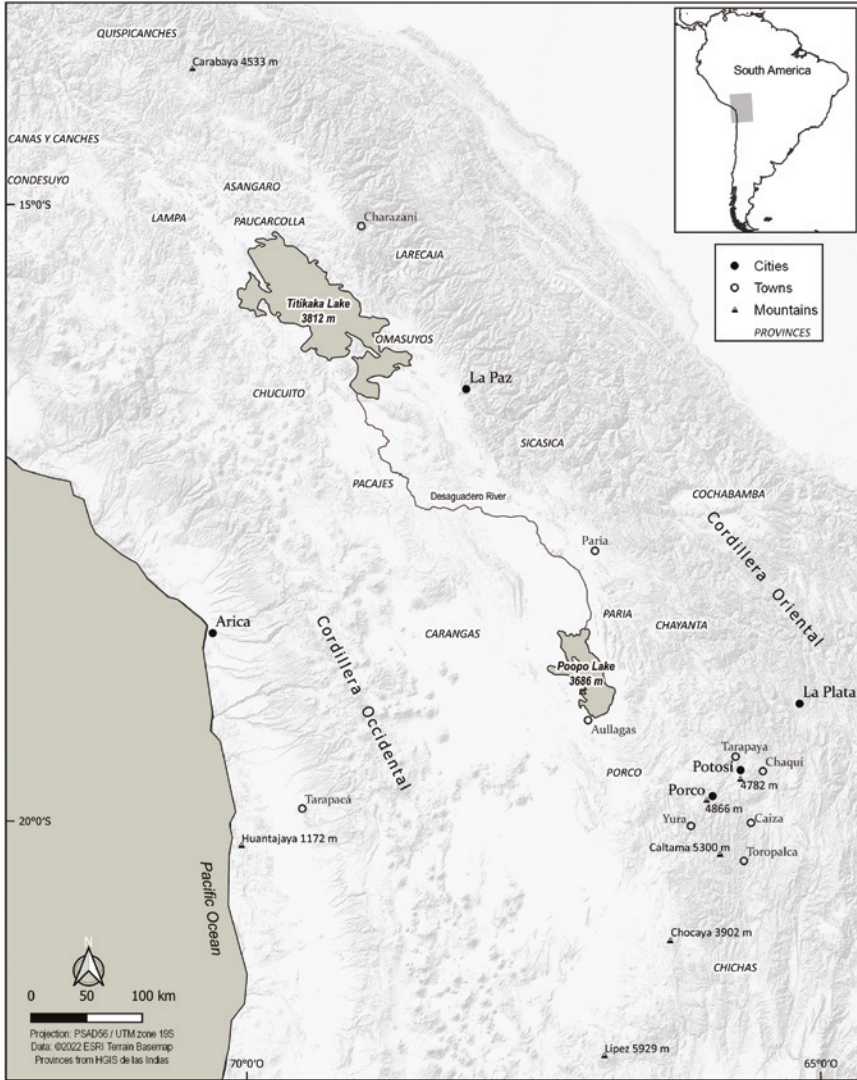
77 For descriptions of the *mita* system, see Peter J. Bakewell, *Mineros de la Montaña Roja: el trabajo de los indios en Potosí, 1545–1650* (Madrid: Alianza Editorial, [1984] 1989), 78–89; Paula C. Zagalsky, “La mita de Potosí: una imposición colonial invariable en un contexto de múltiples transformaciones (siglos XVI–XVII; Charcas, virreinato del Perú),” *Chungará* 46, no. 3 (2014): 375–95; Rossana Barragán, “Dynamics of Continuity and Change: Shifts in Labour Relations in the Potosí Mines (1680–1812),” *International Review of Social History* 61, S24 (2016): 93–114; “Working Silver for the World: Mining Labor and Popular Economy in Colonial Potosí,” *Hispanic American Historical Review* 97, no. 2 (2017): 193–222.

78 Jeffrey A. Cole, *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes* (Redwood City: Stanford University Press, 1985); Bakewell, *Mineros de la montaña roja*. Bakewell also published the only history of a colonial Potosí entrepreneur, P. J. Bakewell, in *Antonio López de Quiroga (industrial minero del Potosí colonial)* (Potosí: Universidad Boliviana Tomás Frías, 1973).

79 The “free” condition of salaried workers is placed in quotation marks to differentiate it from the contemporary characteristics of free labor. The biggest difference between the free (*minga*) and the forced (*mita*) laborers lay in the higher wages paid to the former and, in some cases, the type of work.

80 Assadourian, “La producción de la mercancía dinero,” 257.

81 Cole, *The Potosí Mita*, 37–38, 57.



MAP 0.2 Potosí and the south of the viceroyalty of Peru

demand on the remaining *mitayos*. For Cole, since the beginning of the seventeenth century, the *azogueros* also limited Indigenous participation in the profits they had previously made, imposing quotas of minerals to be delivered.

Ethnohistorians have introduced important aspects to consider. Thérèse Bouysse-Cassagne demonstrated that behind the organization of the colonial *mita* (and its “captaincies” of *mita*) lay the reformulated pre-Hispanic spatial

and symbolic organization.⁸² Thierry Saignes analyzed Indigenous strategies of accommodation and even success in confronting colonial policies and its participation in the market, while authors such as Wachtel have emphasized the destructurement of Andean societies and Assadourian and Sánchez Albornoz have stressed the magnitude of migration caused by the *mita*.⁸³

Assadourian, analyzing the production of monetary commodities, pointed out the “subsidy of [the] peasant economy” to the production of the great world silver supply center. The *mitayos* received a wage that has been estimated to be 90% destined to pay tribute.⁸⁴ This meant that the *mitayo* workers had to have other income to live on while working: the income from their *ayllus* (agrarian communities) “subsidized” colonial mining production through the reproduction of workers and their families. This analysis is at odds with recent assertions that workers in Potosí were the best paid in the world.⁸⁵ The insufficient wage for the reproduction of the labor force is a constant reference in different primary sources, but also in different historiographic publications. Enrique Tandeter even suggested that there was unlimited exploitation of the forced laborers—worse than in the case of slaves, given that their super-exploitation did not risk any employers’ investment.⁸⁶

Enrique Tandeter, who studied eighteenth-century Potosí, placed unfree/free workers at the center of his analysis. He argued that the *mita* or coerced labor allowed the profit of Potosí’s mining production during the last boom of the eighteenth century, despite the higher number of free mine workers or *mingas*.⁸⁷ He proposed the concept of *mita*-rent (*renta mitaya*) as essential for the mining entrepreneurs and owners to obtain profits and lower operating costs. The *mita*-rent meant a production relationship based on the assignment of

82 Thérèse Bouysse-Cassagne, “L’espace aymara: urco et uma.” *Annales, Histoire, Sciences Sociales* 33, no. 5–6 (1978).

83 Thierry Saignes, *Caciques, Tribute and Migration in the Southern Andes. Indian Society and the 17th Century Colonial Order (Audiencia de Charcas)*. (London: University of London, Institute of Latin American Studies Occasional Papers, 1985).

84 Assadourian, “La producción de la mercancía dinero,” 257–68.

85 Leticia Arroyo Abad, Elwyn Davies B, and Jan Luiten van Zanden, “Between Conquest and Independence: Real Wages and Demographic Change in Spanish America, 1530–1820,” *Explorations in Economic History* 49, no. 2 (2012), 149–66.

86 Enrique Tandeter, *Trabajo forzado y trabajo libre en el Potosí colonial tardío* (Buenos Aires: Estudios CEDES, 1980).

87 Rose Marie Buechler, *Gobierno, minería y sociedad. Potosí y el “Renacimiento” borbónico, 1776–1810* (La Paz: Biblioteca Minera Boliviana, 1989); Tandeter, *Coacción y mercado: la minería de la plata en el Potosí colonial, 1692–1826* (Buenos Aires: Editorial Sudamericana, 1992); Enrique Tandeter, “Forced and Free Labor in Late Colonial Potosí,” *Past & Present* 93 (1981).

fixed quotas and demanded continuous work that did not respect any of the established norms.⁸⁸

More recent studies are reexamining the dual system of free and unfree workers. On the one hand, this rigid dichotomy is somehow being questioned, contextualizing the varying historical meanings of freedom, and pointing out that forced laborers were not quite slaves, nor were free laborers truly free. So-called “free” systems included elements of coercion to establish and reproduce themselves. On the other hand, the relation between *mitayo* unfree workers and free workers or *mingas* has been scrutinized. In the historiography, both are mainly conceived as distinct laboring groups, although some authors have noted cases of *mitayos* working as *mingas*.⁸⁹ Recently, Paula Zagalsky drew attention to this, analyzing the *mita* commutations proposing the polyvalence of *mitayos*’ situation and the need to consider the requirements of specialized labor.⁹⁰ In 2014, Barragan proposed a single system of work, the *mita–minga* system, instead of two separate and opposing categories of laborers. The same people could work as unfree workers or *mitayos* for one week and as free workers or *minga* for two weeks after that. The ensemble as a whole could thus be understood as a system that combined low-wage corvée or *mita* with the well-paid *minga* work.⁹¹

The close connection among different workers⁹² requires us to consider the type of labor and their daily wages: from the specialized pickmen (*barreteros*) who worked in mines to those who worked mixing ores with mercury (*repasiris*), the *mitayos* that transported the materials inside the mines (*apiris*), and from the mines to the silver refining plant (*chacaneadores* and *cumuris*).⁹³

88 Tandeter, *Trabajo forzado y trabajo libre*.

89 For example, see Bakewell, *Mineros de la montaña roja*.

90 P. C. Zagalsky, “Trabajadores indígenas mineros en el Cerro Rico de Potosí: tras los rastros de sus prácticas laborales (siglos XVI y XVII),” *Revista Mundos do Trabalho* 6, no. 12 (2014): 55–82; P. C. Zagalsky and Isabel M. Povea Moreno, “Un mundo diverso: una panorámica sobre los trabajadores mineros coloniales a partir del análisis de casos en los virreinos de Nueva España y del Perú,” in *Trabajo y Trabajadores en América Latina (siglos XVI–XXI)*, ed. Rossana Barragán R., 245–80 (La Paz: Vicepresidencia del Estado Plurinacional de Bolivia, 2019).

91 Rossana Barragán, “Kajchas, trapiches y plata en el cerro de Potosí,” *Anuario de Estudios Bolivianos, Archivísticos y Bibliográficos* 20 (2014): 273–320, 291–92; Rossana Barragán, “Dynamics of Continuity and Change,” 95, 98–9; and Rossana Barragán, “Working Silver for the World,” 194–95, 217.

92 Transmission of specialized knowledge between *mitayos* and *mingas* have been explored by Zagalsky, “Trabajadores indígenas mineros.”

93 Zagalsky, “La mita de Potosí,” 386–88.

The world of mining labor tended to be more varied during the eighteenth century, including mulattoes, mestizos, and even poor Spaniards. Beginning in the 1730s, the presence of *k'ajchas*, the self-employed workers who remained in the mines on weekends to extract ore for themselves, became more visible and important. Along with the works of Tandeter and Abercrombie, Barragán R. has taken up the subject again in recent years.⁹⁴ She has argued that *k'ajchas* and *trapiches* (rudimentary ore mills) should be considered together. She also highlighted the key role of women in refining and trading ores, which challenges standard gender assumptions about mining labor. The importance of the *k'ajchas* and *k'achjeo* suggests the existence of a mining wage plus, allowed since the last quarter of the sixteenth century (the *corpa*), that can be compared with the existence of the *partido* in some novo-Hispanic mining centers.⁹⁵ The phenomenon was not new, but, in the eighteenth century in Potosí, it acquired not only public notoriety but also relevance in political and social public life.

An important issue to be explored is the system of justice that regulated mining labor relations in Potosí—affecting both *mitayos* and *mingas*—and was established, according to Zagalsky, as an oral and express system by Viceroy Toledo to avoid lengthy lawsuits that could put a brake on production.⁹⁶

It is clear from this brief overview that the Indigenous labor force in the mines was crucial. This is why the contributions, in this volume, of Julio Aguilar and James Almeida are particularly important. Aguilar centers *mita* workers and their knowledge for building the impressive water infrastructure required for ore processing. Moreover, Almeida's analysis is key to understanding the role and importance of a small group of enslaved people who worked in the mint house of Potosí, along with a diversity of other workers.⁹⁷

94 Enrique Tandeter, "La producción como actividad popular. Ladrones de minas en Potosí," *Nova Americana* 4 (1981): 43–65; Thomas Abercrombie, "Q'ajchas and La Plebe in Rebellion: Carnival vs. Lent in 18th Century Potosí," *Journal of Latin American Anthropology* 2, no. 1 (1996): 62–111; Rossana Barragán R., "¿Ladrones, pequeños empresarios o trabajadores independientes? K'ajchas, trapiches y plata en el cerro de Potosí en el siglo XVIII," *Nuevo Mundo Mundos Nuevos* (2015); Barragán, "Working Silver for the World."

95 Zagalsky and Povea Moreno, "Un mundo diverso." See also Rossana Barragán R. in this volume.

96 Paula C. Zagalsky, "Trabajo indígena, conflictos y justicia en la Villa Imperial de Potosí y su Cerro Rico, una aproximación: Virreinato del Perú, siglos XVI–XVII," *Historia y Justicia Journal* 9 (2017). Other works on the analysis of labor systems: María Concepción Gavira Márquez, *Población indígena*; Raquel Gil Montero, *Ciudades efímeras: El ciclo minero de la plata en López (Bolivia), siglos XVI–XIX* (Lima: IFEA y Plural Editores, 2015); and Paola A. Revilla Orías, *Entangled Coercion: African and Indigenous Labour in Charcas (16th–17th Century)*, (Berlin De Gruyter Oldenbourg, 2021).

97 Afro-descendants (enslaved people and free enslaved people) constituted a small fraction of the workforce in silver mining (unlike gold mining) and always worked on the surface,

Labor was also present in several discourses. Ignacio González Casanovas focused on the Crown's labor policy for Potosí, revealing extensive debates during the seventeenth century that included proposals to abolish the *mita*. The *mita* continued, although with a reduced number of workers during the eighteenth century.⁹⁸ More recently, Orlando Betancor examined the philosophical principles of the apologists for Hispanic rule and for the material exploitation of the Indigenous population in Potosí.⁹⁹ Allison Bigelow, at the intersection of philology and history, scrutinized the language that condensed the links between colonial mining, Indigenous knowledge, and racialized thought.¹⁰⁰

If the world of labor and its workers have been at the center of several studies, the world of the owners of mining concessions and mills is less well known. Silver mines were considered eminent property of the Crown, which granted them to the concessionaires in exchange for a tax consisting of one fifth of the production (20% until 1736 in Peru).¹⁰¹ Although a list of the concessionaries of veins in 1580–1585 is available, there is no information on their size, working

never underground. Among the tasks linked to mining was their work in the smelters or refineries, as artisans (carpenters, toolmakers), and, in a few cases, they served mine owners as stewards and managers. On the coins, see Carmen Salazar-Soler, "Minería y moneda en la época colonial temprana," in *Compendio de historia económica del Perú II: Economía del período colonial temprano*, ed. Carlos Contreras, 109–228 (Lima: BCRP-IEP, 2009).

98 Ignacio González Casanovas, *Las dudas de la Corona: la política de repartimientos para la minería de Potosí (1680–1732)* (Madrid: CSIC), 2000.

99 Orlando Bentancor, *The Matter of Empire: Metaphysics and Mining in Colonial Peru* (University of Pittsburgh Press, 2017).

100 Allison M. Bigelow, *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World* (University of North Carolina Press, 2020). In line with these studies, Heidi Scott's chapter analyzes the world of knowledge linked to mining and power relations.

101 In New Spain from 1548 and throughout the colonial period, the royal tax was 10%. Another direct tax on silver production in Peru was the assay duty or "Cobos" (initially 1%, later increased to 1.5%). With respect to mercury, the mines and transportation of this mineral were also granted in concession, but the sale was a royal monopoly. Within the historiography on Huancavelica, the main American mercury-producing center, the following works stand out: Guillermo Lohmann Villena, *Las minas de Huancavelica en los siglos XVI y XVII* [1949] (Lima: PUCP, 1999); Carlos Contreras, *La ciudad del mercurio, Huancavelica, 1570–1700* (Lima: IEP, 1982); Nicholas Robins, *Mercury, Mining, and Empire: The Human and Ecological Cost of Colonial Silver Mining in the Andes* (Bloomington and Indianapolis: Indiana University Press, 2011); Adrian J. Pearce, "Huancavelica 1563–1824: History and Historiography," *Colonial Latin American Review* 22, no. 3 (2013): 422–40; Isabel M. Povea Moreno, *Minería y reformismo borbónico en el Perú: Estado, empresa y trabajadores en Huancavelica, 1784–1814* (Lima: IEP / BCRP, 2014); Kendall W. Brown, *Minería e imperio en Hispanoamérica colonial: producción, mercados y trabajo* (Lima: BCRP-IEP, 2015).

conditions, and evolution in the long term. We still know little about the concessions' changes over time, whether they were concentrated in a few hands, and who the major beneficiaries were. We do not know about the dependency relationships, agreements, and integration between the mine concessionaires and mill owners. This is why the chapters on the world of producers in the late sixteenth century (Zagalsky) and in the second half of the eighteenth century (Barragán R.) are relevant.

The links between the mine producers and the merchants are important topics for future research. In exchange for the money advanced to producers, the merchants received uncoined and unminted refined silver at a price well below the market. These merchants became ransom collectors of silver bars and frequently paid for transport of the bars for minting, even paying the tax on the fifth.¹⁰² This credit system matured and an internal hierarchy was formed, with the "silver merchants" at the top, although we still know little about them despite Bakewell's study and some cases analyzed by Tandeter and Buechler. In this volume, Mariano Bonialian introduces the merchants *peruleiros* in Potosí, opening a new dimension of analysis on the world of merchants.

Engineering, technology, and knowledge together form a broad and important aspect of mining. The rich ores from the top of the mountain would have been extracted with Inca techniques alongside two innovations: the steel points on the tools and the excavation of horizontal galleries (*socavones*) to intercept the seams at deeper levels and facilitate extraction, drainage, and ventilation.¹⁰³ The traditional smelting furnaces (*huayrachinas*) in Indigenous hands have been analyzed by several authors,¹⁰⁴ although we do not know who in the first decades owned them or what arrangements existed between those who legitimately (or not) accessed the minerals from the mountain (mostly Spaniards) and those who smelted the silver (mainly Indigenous people). The construction of mills and the resources used in the so-called Rivera of Potosí since the 1570s merits further research. Minerals were pulverized in these mills to proceed with mercury amalgamation. Assadourian has argued that the establishment of the "quicksilver era" of the 1570s led to the almost

102 Bakewell, *Mineros de la montaña roja*; Frédérique Langue and Carmen Salazar-Soler, *Diccionario de términos mineros para la América española, siglos XVI–XIX* (Paris: Editions Recherche sur les Civilisations, 1993).

103 Carmen Salazar-Soler has established that these conditions were comparable to contemporary practices, for example, in the silver mines of Neuenberg (Sainte-Marie-Aux Mines, Upper Rhine), although the dimensions of the tunnels in Potosí were bigger. Salazar-Soler, "Minería y moneda," 115.

104 Pablo Cruz and Jean Vacher, *Mina y metalurgia en los Andes del Sur: Desde la época prehispánica hasta el siglo XVIII* (Sucre: IRD-IFEA, 2008).

total concentration of the social means of production into Spanish hands, the exceptional expansion of production, and an increased demand for labor.¹⁰⁵ But the Indigenous population was not totally marginalized during the entire colonial period.¹⁰⁶ The “alchemy” of amalgamation is known but one wonders about the continuous innovations that took place. Tristan Platt, in this volume, shows us the complexity of the mercury trade and the main changes introduced in the nineteenth century. Nicholas Robins’s work on the pollution in Potosí and Huancavelica has also opened an important field: the harmful effects of mining production within the framework of environmental history.¹⁰⁷

The structures of power within Potosí and its broader region are key to comprehension the dynamic of mining in this center and city. In this sense, analysis of the government and management of Potosí within the Audiencia de Charcas and the viceroyalty of Peru is essential.¹⁰⁸ Masaki Sato contributes, in this volume, to understanding the close relationships between Potosí and the highest authorities of the Audiencia de Charcas in the case of the mint fraud of the mid-seventeenth century. Kris Lane focuses on how the consequences of this fraud were felt all over the world.

The mines and the city at the foot of the mountain have attracted some edited volumes. An early book, in 2000, by Juan Marchena gathered several authors working at that moment on Potosí, and in 2008, Andrés Eichmann and Marcela Inch edited a collection about the city of Potosí and La Plata.¹⁰⁹ Other authors have studied its cultural production,¹¹⁰ legal culture, civic rituals

105 Other similar systems of forced recruitment of mining labor functioned in New Spain and Peru, each with their own specificities, but the *mita* system of Potosí was the largest and most extensive.

106 See Rossana Barragán “¿Ladrones, pequeños empresarios o trabajadores independientes?”

107 Nicholas A. Robins, *Mercury, Mining, and Empire*; Nicholas A. Robins, *Santa Barbara’s Legacy: An Environmental History of Huancavelica, Peru* (Leiden: Brill, 2017). See also Saúl Guerrero, *Silver by Fire, Silver by Mercury: A Chemical History of Silver Refining in New Spain and Mexico, 16th to 19th Centuries* (Leiden: Brill, 2017).

108 Eugenia Bridikhina, *Theatrum mundi: entramados del poder en Charcas colonial* (La Paz: Plural editores, 2007); M. C. Gavira Márquez, “Política minera y conflictos entre Potosí y Oruro a principios del siglo. XVII,” *Anuario de Estudios Bolivianos, Archivísticos y Bibliográficos* 16 (2010): 215–44.

109 Juan Marchena Fernández, and María José Villa Rodríguez, *Potosí, Plata para Europa* (Sevilla: Universidad de Sevilla, Fundación El Monte) 2000; Andrés Eichmann and Marcela Inch, *La construcción de lo urbano en Potosí y La Plata (siglos XVI–XVII)* (Sucre: Ministerio de Cultura de España, FCBCB, ABNB, 2008.)

110 The importance of the city of Potosí as a major center produced an important historiography on architecture and painting; Mario Chacón Torres, *Arte virreinal en Potosí: Fuentes para su historia* (Sevilla: Escuela de Estudios Hispano-Americanos de Sevilla, 1973);

of political life, and its public celebrations and fiestas, revealing not only the multidimensionality of Potosí but also the multiple themes for investigation.¹¹¹ Under the imprint of global history, Kris Lane has published a recent pivotal synthesis of the history of the city of Potosí.¹¹²

The studies in this volume reveal a complex of three simultaneous actors and processes: the Crown through its viceregal, regional and local authorities; the workers themselves; and the technological changes and knowledge. All of them are present in the four sections of this book: Geology, Sacred Spaces and Technical Knowledge (First Section), with Thérèse Bouysson-Cassagne, Heidi Scott, and Renée Raphael; Environmental History and Labor (Second Section), with Julio Aguilar and James Almeida; Flows, Heterogeneous Producers and Agency (Third Section), with Mariano Bonialian, Paula C. Zagalsky, and Rossana Barragán R.; and Local, Regional and Global Impacts (Fourth Section), with Kris Lane, Masaki Sato, and Tristan Platt.

2 The Chapters

The importance of Potosí as one of the centers of silver production for more than two and a half centuries, and one of the driving forces of globalization, has brought together eleven authors from different countries. Although they are all archival researchers, each of them has his or her own background and imprint, from ethnohistory and linguistics to the history of science, the construction of knowledge, political economy and political geology, historical

Teresa Gisbert, *Iconografía y Mitos Indígenas en el Arte* (La Paz: Editorial Gisbert, 1980); T. Gisbert, *Potosí Catálogo de su Patrimonio* (La Paz: INPAAV, IBC, OAS and UNESCO, 1990); Pedro Querejazu and Elizabeth Ferrer, eds., *Potosí: Colonial Treasures and the Bolivian City of Silver* (New York: Americas Society, 1997); T. Gisbert, *Historia del Arte en Bolivia* (La Paz: Editorial Gisbert, 2012). Other processes were also explored, like trade—see Jane Mangan, *Trading Roles: Gender, Ethnicity and the Urban Economy in Colonial Potosí* (Duke University Press, 2005); Paulina Numhauser, *Mujeres indias y señores de la coca: Potosí y Cuzco en el siglo XVI* (Madrid: Cátedra, 2005).

111 Clara López Beltrán, *La Ruta de la Plata: de Potosí al Pacífico: Caminos, comercio y caravanas en los siglos XVI y XIX* (La Paz: Plural editores, 2016); Renzo Honores, “Una sociedad legalista: Abogados, procuradores de causas y la creación de una cultura legal colonial en Lima y Potosí, 1540–1670” (PhD diss., Florida International University, 2007); Bridikhina, *Theatrum mundi*; Lisa Voigt, *Spectacular Wealth: The Festivals of Colonial South American Mining Towns* (Austin: University of Texas Press, 2016).

112 Kris Lane, *Potosí: The Silver City that Changed the World*. In his chapter in this volume, Lane presents a detailed analysis of an important aspect: the great fraud of the Potosí mint during the seventeenth century and its global repercussions.

anthropology, political history, social history, labor history, and global history. Each of them presents their most recent research in ways that provide readers with a body of work at the cutting edge of the fields they explore.

The chapters in this volume cover a long period of analysis, from the sixteenth to the nineteenth centuries. The opening contribution, by Thérèse Bouysse-Cassagne, stresses Potosí's geology and suggests that the site was already known in the pre-Hispanic period and has been exploited since 1000 AD, thus associating it with one of the first population layers in the region, that of the Collas with their Pukina language. The author argues that the name of Potosí is of Pukina origin, relating the mountain to the soul and force that engendered its wealth. She reminds us that the Andean mountains are places of memory tied with divinities and ancestors through time. Potosí was part of an extensive sacred space of gods and part of a vast landscape and topography, from the south of Cuzco to the area of Lake Titicaca, the Desaguadero River, the salt flats, and the territory of Potosí with its mountain and city, including the region towards the Pacific coast to the west and the inter-Andean valleys to the east. This chapter also tours through the religiosity and cults, showing us Potosí's insertion in this space.

Heidi Scott traces the "geological foundations" of the debates over mining between the sixteenth and eighteenth centuries. She asserts that these knowledges were shaped by economy, labor, and moral discussions, showing how these entanglements can enrich our understanding of labor and governance in Potosí. In other words, knowledge, representations, and politics greatly influenced how the Earth was perceived. This also means that geological knowledge should not be confined to the history of science alone.

Renée Raphael, on the other hand, reveals the technological experimentation for the reduction of mercury used in the silver process. It was the political authorities who were involved in technical refining improvements that lessened refining costs, as the author shows us. She analyzes the administrative protocols of the visits and interrogation of witnesses, through which these experiments became known. The author argues that rather than being transmitters of knowledge, they all aimed to shape viceregal policy by seeking its approval. In other words, the technical viewpoints cannot be "disentangled" from the political, the legal, or the administrative. Even so, the experiments of 1587 contain critical and detailed information on the origin of the ores, the mercury that was put in each trial box, the salt, and the iron, among other data.

The section on environmental history and labor contains the contributions of Julio Aguilar and James Almeida. The first author addresses a topic less analyzed in the empires: the public works and complex hydraulic infrastructure developed to ensure the magnitude of Potosí's silver production. In "Water for

the Monarchy of the World,” Julio Aguilar opens a vital research topic, as the use of water linked to mining and to the largest cities of that time. This was one of the main changes in the Andean environment: a complex hydraulic and engineering infrastructure from reservoirs built in the mountains and whose waters were conducted through tunnels, aqueducts, and canals to establish the Ribera de Potosí, where the mills operated to process silver. It is likewise just as important, if not more so, to demonstrate that this work was carried out by the Indigenous *mitayos*, artisans (*maestros*), and authorities such as corregidor Pedro Osores de Ulloa, each with their own knowledge in this radical transformation.

From these workers, we move to James Almeida’s contribution and to the mint and its diverse workers: *yanaconas*, slaves, convicts who lived “together but not mixed.” While the *yanaconas* lived outside the mint, melting the bars with the correct mix of metals to produce thin silver rails for coining as well as loading and unloaded the furnaces, slave workers living in the mint hammered out rough coin shapes. The author analyzes one of the links in the commodity chain of silver and forced labor, inside the Potosí mint house, showing us the division of their labor while at the same time uniting them in this labor site, in which each and all negotiated the small freedoms that shaped their lives.

We then go to the third section, to a counterpoint between circulation and production, linking two spheres that are generally analyzed separately. Mariano Bonialian’s chapter introduces the “beat and pumping of one the hearts of early globalization,” recapitulating the silver exports to reevaluate its early flows. The author, who has contributed to thinking beyond the “Atlantic,” takes us to Mexico, to the Pacific world, and to the connection with China. The author considers the South American lands on three flanks: the direct export to New Spain and China through the Pacific, the connection to Seville through Portobelo, and the connection of Buenos Aires, on the Atlantic, through which silver also flowed to Brazil. He argues that the circuits from Potosí to the eastern lands and China in fact threatened Peru’s transatlantic flows and relations with Seville. Finally, he speaks of the *peruleros*, Peruvian merchants who specialized in these flows and who were key global agents of silver.

Paula C. Zagalsky, on the other hand, introduces us to the lords of the mines and mills in Potosí’s boom period (1580–1630). The author shows us the complexity of the “universe of the miners,” exploring the meanings of this term and others, which named people with different positions in silver’s productive structure. With her careful approach, she unravels who were miners, “soldiers,” and *azogueros*, with a diversity of socioeconomic situations. The “soldiers” (*soldados*), for example, were “loose” people who exploited silver as mine owners or lessees, but they did not have mills or *ingenios* and were of medium and

low social extraction. At the top of the social ladder were the lords of mines and mills, who were privileged to receive delegations of *mitayo* workers, 70% of whom were assigned to the mills. Finally, Zagalsky shows us that there were a few women and Indigenous mill owners involved in production.

By focusing on the creation of a bank to purchase silver in a global context in the period between 1740 and 1790, Rossana Barragán R. shows how the higher prices paid made visible a heterogeneous world of small producers and silver rescuers alongside the traditional *azogueros* producers. The case analyzed also reveals the success of the bank, in the context of the Bourbon Reforms, to better control silver production, favored also paradoxically, subaltern and marginal actors. At the same time, the author explains the rise of production in this late period, shedding light, too, on the amount of silver that was smuggled before the creation of the bank.

The debasement of the silver levels in the coins and the way in which this counterfeiting silver was confronted by local and regional authorities in the Audiencia de Charcas constitutes the subject of analysis of Masaki Sato, while Kris Lane takes us through the world between 1650 and 1675 with what he calls “the hangover”—that is, the consequences of the great silver coin fraud in this period. Their contributions are an example of the potent interrelationship sought in this volume between global dynamics and regional and local relations. Sato examines the mint fraud—that is, the increasing amount of copper in the silver bars that was allowed, showing us, in great detail, the role of the most important political authorities in the Audiencia de Charcas as well as the attempts to find the culprits for most of ten years. Through his analysis, he unveils the links between Audiencia officials and Potosí’s elites, along with the enormous fiscal support that some of them meant for the Crown. This situation helps to explain the long process of investigation on this fraud but also the radical and soft measures taken towards different people involved. Lane focuses, instead, on the hangover that produced this fraud all over the world, as well as the global tide of panic and distrust created. His research shows the consequences of the fraud, from Batavia’s market to the total recall in 1650 ordered by King Philip IV, the panic in Seville, Cordoba or Granada, Genova, Flanders, and the Baltic.

The book ends with the chapter by Tristan Platt and the analysis of mercury, one of the most important inputs for refining by amalgamation. The author analyzes a key moment for many transformations—the end of the colonial period and the first decades of the republican period in the nineteenth century—showing us the shifts but also the continuities that occurred. During this politically turbulent period, mercury came from Almaden (and not from the Huancavelica mines that supplied Potosí for more than 200 years). By

1831, there were neo-Bourbonic efforts to sell mercury at cost, but by then the supply depended on bankers and merchants in France and England. In 1835, the London Rothschilds contracted with Spain to market the production of Almaden. During the first decades of independence, a number of institutions carried over from the colonial period: the refiners' guild, the Royal Mining Bank of San Carlos and the Royal Mint, renamed the National Mining Bank and the National Mint in the new prefecture of Potosí.

Taken together, these chapters contribute to three fundamental aspects of Potosí: 1) the flows and linkages between the local and the global and how these spheres were co-constituted, including the direct agency and involvement of actors; 2) the ways of thinking about the mountain and knowledge in Potosí; and, finally, 3) how the different theoretical and methodological approaches enrich our analysis of the complexity of a global mining center.

Silver flows reveal the interconnections between different parts of the world, and the chapters by Bonialian and Lane are most demonstrative in this regard. Less visible, but equally important, are the confluence of diverse traditions in Potosí in many other aspects. Aguilar shows, for example, how the construction of a great hydraulic work united diverse actors and their knowledges: first, the expertise of the Indigenous communities that had a long history of water management in the highland ecology; second, the political authority of Potosí, who had been in the battle of Lepanto as a military builder and had worked on tunnels in Huancavelica and roads and dams in Potosí. Finally, there was the involvement of specialists (*maestros*) and technicians.

Different influences are also present in the eighteenth century in the refiners' company (*Compañía de Azogueros*) and in the bank to buy silver (*Banco de Rescates*) as seen in Barragán R.'s contribution. The fame and success of the companies of the Netherlands and Great Britain, but also the cocoa company established between Caracas and Spain, are glimpsed within the initiatives and policies that shaped mining throughout this century.

The interplay of diverse traditions from the Old and New World are also very clear in contemporary European understandings of mineralogy and theories about the Cerro Rico that are explored in the chapter by Heidi Scott, whose work contributes to a rich historiography that can be linked to Carmen Salazar-Soler's pioneering work.

The agency and initiative that different actors could take in the global system were evident in the *peruleros*, the traders who, with the silver from Potosí and Peru, became independent from the merchants of Seville and Spain. These global agents managed, according to Mariano Bonialian, to open their own silk road to Asian markets, showcasing not only the flow of silver but also the

consumption that existed in Peru of ordinary and fine silk, porcelain, ivory, and other products.

The multiple practices and negotiations over “freedoms” amid workers in the mint house are one of Almeida’s main contributions. These negotiations meant concrete exchanges of cash for labor, choice of lodging and affective life. Various actors’ significant agency can also be glimpsed in the reports of how they took advantage of the mining resources for themselves, particularly the group of so-called *k’ajchas* and *trapicheros* who were able to insert themselves as producers and buyers of silver and became a concern for the authorities and for many *azogueros* of Potosí.

Another important area explored in the book is the construction and role of knowledge and how this is intertwined with forces of power and politics. Such topics rose to prominence with the works of Michel Foucault and Peter Burke’s social history of knowledge, as well as cultural studies, particularly present in the United States, and reflections on and questioning the division between nature and society.

Raphael analyzes the ways in which archival documents and sources have communicated technical knowledge and scientific “inventions” and experimentation, claiming that these were permeated by prevailing administrative, legal, and political protocols. In dialogue with research on science, the author argues that knowledge does not exist separately from other societal spheres, so that historical records, rather than being sources of culture and knowledge, should instead be considered performances of scientific and technical culture.

Heidi Scott, on the other hand, resorting to the concept of “political geology,” analyzes geological knowledge shaped by the economy, labor, moral debates, logics, and hierarchies of government. Knowledge about the mountain should then be situated as geological arguments by different authors who proposed, promoted, and debated policies on the government of the mines and on labor policies. In other words, such knowledge and representations influenced the governance practices and debates that took place around the labor of the *mita*. She argues that knowledge of the physical earth and human politics are not only intertwined but also co-constituted.

Regarding the imprints of the particular training and theoretical-methodological approaches of their authors, we will focus on three examples. First, ethnohistorian Thérèse Bouysson-Cassagne argues for the need to account for different fields of analysis in understanding the pre-Hispanic period of Potosí. The author draws not only on multiple and diverse historical sources but also on linguistic analyses of various terms. This allows her to reestablish the religious cartography of the region as well as the geology in a long-term perspective. Heidi Scott, whose background is in historical geography and

anthropology, and Renée Raphael, with her background in the history of science, contribute to thinking about the close links between fields generally conceived as distinct spheres, such as the production of historical sources, mining experimentation, and knowledge of the land. Both authors lead us to reflect on the connections between knowledge, power, and politics from particular angles: first, from political geology and, second, from reflecting on the formats and protocols of historical sources that permeate the regime of knowledge production. Bouysson-Cassagne, Scott, and Raphael make us realize that a mining site is more than just the exploitation of minerals: it is also a center and landscape imbued with conceptions of the world and wealth. It is also a place where the political economy influences knowledge and debates, whether in matters of technical experimentation, labor policies, or reports on the hill.

Several of the chapters, through their meticulous approaches, allow perspectives on Potosí that go beyond stereotypical visions, raising issues of the environmental history of mining and social and labor history, as in the case of Julio Aguilar, Paula C. Zagalsky, James Almeida, and Rossana Barragán R. These contributions invite us to break the dichotomy of workers versus owners as monolithic and uniform entities, as well as to consider the networks of relationships between activities and groups. Zagalsky shows us that socioeconomic differences existed between “the owners of the means of production”—the group that held the concessions and ownership of mines and mills. Members of the privileged elite were very different, for example, from the so-called soldiers. Barragán, moreover, reveals how people who did not have mines in the hills managed to appropriate, process, and sell minerals, opening up important labor spaces for different groups. Women as owners of mines (see Zagalsky), rudimentary mills, or silver sellers (see Barragán R.) de-masculinize mining spaces. James Almeida shows, on the other hand, how workers of different statuses coexisted in the Casa de la Moneda, but above all how each group was in charge of specific and particular tasks, distributed according to their differences, while roles of oversight and watchmen were frequently fulfilled by enslaved men who were then placed above non-slave workers. Finally, as Aguilar points out, the formation of the Potosí mining landscape should be understood not as a result of silver world demands but as part of the convergence between the Spanish Empire, regional and local societies, and the interconnections between groups within the constraints of colonial domination.

Annex

TABLE 0.1 Estimates of bullion shipments from the Indies to Europe 1501–1805 (by decade in millions of pesos of 272 maravedís)

Decade	Hamilton (1503–1660)	Chaunu (1584–1653)	Morineau (1581–1805)	TePaske (1581–1810)	Dominguez Ortíz (1621–1670)	García Fuentes (1651–1700)	García-Baquero (1717–1778)
1501–1510							
1511–1520							
1521–1530							
1531–1540							
1541–1550							
1551–1560							
1561–1570	42						
1571–1580							
1581–1590				110			
1591–1600							
1601–1610	92		92	135			
1611–1620		92		135			
1621–1630	86		101				
1631–1640							
1641–1650	42			110			
1651–1660		1		99			
1661–1670							

Decade	Hamilton (1503-1660)	Chaunu (1584-1653)	Morineau (1581-1805)	TePaske (1581-1810)	Dominguez Ortíz (1621-1670)	García Fuentes (1651-1700)	García-Baquero (1717-1778)
1671-1680							
1681-1690							
1691-1700			101				
1701-1710							
1711-1720							
1721-1730				187			
1731-1740				230			
1741-1750				257			
1751-1760			145	265			
1761-1770				262			189
1771-1780				321			
1781-1790			249	344			
1791-1800			170	393			
1801-1805			148	362			
Total	741	246	2,891	4,256	247		740

SOURCE: TEPASKE, *A NEW WORLD*, 314-15. INFORMATION ABOUT DOMINGUEZ ORTÍZ EXTRACTED FROM GARCÍA-BAQUERO, *ANDALUCÍA Y LA CARRERA DE INDIAS*, TABLE 0.1

Bibliography

- Abercrombie, Thomas. "Q'aqchas and La Plebe in Rebellion: Carnival vs. Lent in 18th Century Potosí." *Journal of Latin American Anthropology* 2, no. 1 (1996): 62–111.
- Alfonso, Marina, and Carlos Martínez Shaw. "La era de la plata española en Extremo Oriente." *Revista Española del Pacífico* 17 (2004): 17–35.
- Andrews, Kenneth R. *The Spanish Caribbean: Trade and Plunder 1530–1630*. New Haven: Yale University Press, 1978.
- Andrews, Kenneth R. *English Privateering Voyages to the West Indies 1588–1595*. New York: Kraus reprint, 1986.
- Arroyo Abad, Leticia, Elwyn Davies B., and Jan Luiten van Zanden. "Between Conquest and Independence: Real Wages and Demographic Change in Spanish America, 1530–1820." *Explorations in Economic History* 49, no. 2 (2012): 149–66.
- Assadourian, Carlos S. "La producción de la mercancía dinero en la formación del mercado interno colonial." In *Ensayos Sobre el Desarrollo Económico de México y América Latina (1500–1975)*, edited by Enrique Florescano, 223–92. México: Fondo de Cultura Económica, 1979.
- Assadourian, Carlos S. *El sistema de la economía colonial: mercado interno, regiones y espacio económico*. Lima: Instituto de Estudios Peruanos, 1982.
- Attman, Artur. "American Bullion in the European World Trade. 1600–1800." *Acta Regiae Societatis Scientiarum Et Litterarum Gothoburgensis–Humaniora* 26. Göteborg: Kungl, 1986.
- Atwell, William S. "International Bullion Flows and the Chinese Economy circa 1530–1650." *Past & Present* 95 (1982): 68–90.
- Bakewell, Peter J. *Antonio López de Quiroga (industrial minero del Potosí colonial)*. Potosí: Universidad Boliviana Tomás Frías, 1973.
- Bakewell, Peter J. *Mineros de la Montaña Roja: el trabajo de los indios en Potosí, 1545–1650*. Madrid: Alianza Editorial, [1984] 1989.
- Barragán R., Rossana. "Kajchas, trapiches y plata en el cerro de Potosí." *Anuario de Estudios Bolivianos, Archivísticos y Bibliográficos* 20 (2014): 273–320.
- Barragán R., Rossana. "¿Ladrones, pequeños empresarios o trabajadores independientes? Kajchas, trapiches y plata en el cerro de Potosí en el siglo XVIII," *Nuevo Mundo Mundos Nuevos*, 2015.
- Barragán R., Rossana. "Dynamics of Continuity and Change: Shifts in Labour Relations in the Potosí Mines (1680–1812)." *International Review of Social History* 61, S24 (2016): 93–114.
- Barragán R., Rossana. "Working Silver for the World: Mining Labor and Popular Economy in Colonial Potosí." *Hispanic American Historical Review* 97, no. 2 (2017): 193–222.
- Barragán R., Rossana. "Potosí's Silver and the Global World of Trade (Sixteenth to Eighteenth Centuries)." In *On the Road to Global Labour History*, edited by Karl Heinz Roth, 61–92. Leiden-Boston: Brill, 2017.

- Barragán R., Rossana. *Potosí Global: Traveling with its First Images (1550–1650)*. La Paz: Plural, 2019.
- Barrett, Ward. "World Bullion Flows, 1450–1800." In *The Rise of Merchant Empires: Long Distance Trade in the Early Modern World, 1350–1750*, edited by James D. Tracy, 224–54. Cambridge: Cambridge University Press, 1990.
- Bartolomei, Arnaud. *Les Marchands français de Cádiz et la Crise de la Carrera de Indias (1778–1828)*. Madrid: Casa de Velázquez, 2017.
- Bentancor, Orlando. *The Matter of Empire: Metaphysics and Mining in Colonial Peru*. Pittsburgh: University of Pittsburgh Press, 2017.
- Bernabéu, Albert Salvador, and Carlos Martínez Shaw, eds. *Un océano de seda y plata: el universo económico del Galeón de Manila*. Sevilla: Consejo Superior de Investigaciones Científicas, 2013.
- Bernal, Antonio Miguel. "La carrera del Pacífico: Filipinas en el sistema colonial de la Carrera de Indias." In *España y el Pacífico, Legaspi*, edited by Leoncio Cabrero, 485–525. Madrid: Sociedad Estatal de Conmemoraciones Culturales, 2004.
- Bigelow, Allison M. *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World*. Chapel Hill: University of North Carolina Press, 2020.
- Bonialian, Mariano. *El Pacífico Hispanoamericano: política y comercio asiático en el imperio español, 1680–1784, la centralidad de lo marginal*. México: El Colegio de México, 2012.
- Bonialian, Mariano. "Comercio y atlantización del Pacífico mexicano y sudamericano: La crisis del lago indiano y del galeón de Manila." *América Latina en la Historia Económica*, 24 (2017): 7–36.
- Bonialian, Mariano. *La América española. Entre el Pacífico y el Atlántico. Globalización mercantil y economía política, 1580–1840*. México: El Colegio de México, 2019.
- Bonialian, Mariano. "Peruleros en Filipinas y en el Oriente, 1580–1610." *Illes i Imperis* 23 (2021): 185–211.
- Bonialian, Mariano, and Bernd Hausberger. "Consideraciones sobre el comercio y el papel de la plata hispanoamericana en la temprana globalización, Siglos XVI–XIX." *Historia Mexicana* 68, no. 1 (2018): 197–244.
- Borah, Woodrow W. *Silk Raising in Colonial Mexico*. Berkeley: University of California Press, 1943.
- Borah, Woodrow W. *Early Colonial Trade and Navigation Between Mexico and Peru*. Berkeley: University of California Press, 1954.
- Borucki, Alex, David Eltis, David Wheat, eds. *From the Galleons to the Highlands: Slave Trade Routes in the Spanish Americas*. Albuquerque: University of New Mexico Press, 2020.
- Bouysse-Cassagne, Thérèse. "L'espace aymara: urco et uma." *Annales, Histoire, Sciences Sociales* 33 (1978), 5–6.

- Bridikhina, Eugenia. *Theatrum mundi: entramados del poder en Charcas colonial*. La Paz: Plural Editores, 2007.
- Brown, Kendall W. *Minería e imperio en Hispanoamérica colonial: producción, mercados y trabajo*. Lima: BCRP-IEP, 2015.
- Buechler, Rose Marie. *Gobierno, minería y sociedad: Potosí y el "Renacimiento" borbónico, 1776–1810*. La Paz: Biblioteca Minera Boliviana, 1989.
- Bustos Rodríguez, Manuel. *Burguesía de negocios y capitalismo en Cádiz: Los Colarte. 1650–1750*. Cádiz: Diputación Provincial de Cádiz, 1991.
- Chacón Torres, Mario. *Arte virreinal en Potosí: Fuentes para su historia*. Sevilla: Escuela de Estudios Hispano-Americanos de Sevilla, 1973.
- Chaudhuri, Kirti N. *The Trading World of Asia and the English East India Company: 1660–1760*. Cambridge: Cambridge University Press, 1978.
- Cole, Jeffrey A. *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press, 1985.
- Contreras, Carlos. *La ciudad del mercurio, Huancavelica, 1570–1700*. Lima: IEP, 1982.
- Crespo Rodas, Alberto. *La "mita" de Potosí*. Potosí: Universidad Tomás Frías, 1956.
- Crespo Solana, Ana. *El comercio marítimo entre Amsterdam y Cadiz (1713–1778)*. España: Banco de España, 2000.
- Crespo Solana, Ana. "La Ruta del Levante: Cádiz en el tráfico Neerlandés con sus mercados mediterráneo y orientales en los siglos XV y XVIII." *Ponencia presentada en Encuentro de Historia y Arqueología* 13. Cádiz: CSIC, 1997.
- Crespo Solana, Ana. *Comunidades Transnacionales: Colonias de mercaderes extranjeros en el Mundo Atlántico (1500–1830)*. Madrid: Edición Doce Calles, 2010.
- Cross, Harry E. "South American Bullion Production and Export, 1550–1750." In *Precious Metals in the Later Medieval and Early Modern Worlds*, edited by J. F. Richards, 425–39. Durham: North Carolina University Press, 1983.
- Cruz, Pablo, and Jean Vacher. *Mina y metalurgia en los Andes del Sur desde la época prehispanica hasta el siglo XVIII*. Sucre: IRD-IFEA, 2008.
- Eichmann, Andrés, and Marcela Inch, eds. *La construcción de lo urbano en Potosí y La Plata (siglos XVI–XVII)*. Sucre: Ministerio de Cultura de España, FCBCB, ABNB, 2008.
- Fernández Durán, Reyes. *La Corona Española y el tráfico de negros. Del Monopolio al libre comercio*. Madrid: PLUBIDISA, 2011.
- Flynn, Dennis O., and Arturo Giráldez. "Born with a 'Silver Spoon': The Origin of World Trade in 1571." *Journal of World History* 6, no. 2 (1995): 201–21.
- Flynn, Dennis O., and Arturo Giráldez. *World Silver and Monetary History in the 16th and 17th Centuries*. Aldershot: Variorum, 1996.
- Flynn, Dennis O., and Arturo Giráldez. *Metals and Monies in an Emerging Global Economy: Expanding World*. Brookfield: Variorum, 1997.

- Flynn, Dennis O., and Arturo Giráldez. "China and the Manila Galleons." In *Japanese Industrialization and the Asian Economy*, edited by A. J. H. Latham and Heita Kawakatsu, 71–90. New York: Routledge, 1999.
- Flynn, Dennis O., and Arturo Giráldez. "Cycles of Silver: Global Economic Unity through the Mid-Eighteenth Century." *Journal of World History* 13, no. 2 (2002): 391–427.
- Furtado, Celso. *Economic Formation of Brazil*. México: Fondo de Cultura Económica, 1959.
- Furtado, Celso. *Desenvolvimento e subdesenvolvimento*. Rio de Janeiro: Fundo de Cultura, 1961.
- Gaastra, Femme. S. "The Exports of Precious Metals from Europe to Asia by the Dutch East India Company, 1602–1795." In *Precious Metals in the Later Medieval and Early Modern Worlds*, edited by J. Richards. Durham: North Carolina University Press, 1983.
- Galeano, Eduardo. *The Open Veins of Latin America: Five Centuries of Pillage in Latin America*. New York: Monthly Review Press, 1997.
- García-Baquero, Antonio. *Andalucía y la Carrera de Indias: Estudio Preliminar de Carlos Martínez Shaw*. Granada: Universidad de Granada, 2002.
- García-Baquero, Antonio. "American Gold and Silver in the Eighteenth Century: from Fascination to Accounting." In *Global Connections and Monetary History, 1470–1800*, edited by Dennis O. Flynn, A. Giráldez, and R. von Glahn, 107–21. Farnham: Ashgate, 2003.
- García Guerra, Elena María. "Itinerarios mundiales de una moneda supra nacional: el real de a ocho o peso durante la edad moderna." *Studia Historica: Historia Moderna* 28 (2006): 241–57.
- Garner, Richard L. "Long-term Silver Mining Trends in Spanish America: A Comparative Analysis of Peru and Mexico." *American Historical Review* 93, no. 4 (1988): 898–935.
- Garner, Richard. "Spanish-American Silver Registrations. SpAmSilverOutputex." Accessed April 14, 2022. <http://www.insidemydesk.com/hdd.html>.
- Garner, Richard. "Where Did All the Silver Go? Bullion Outflows 1570–1650: A Review of the Numbers and the Absence of Numbers." Accessed February 19, 2022. <https://insidemydesk.com/pnp/silvergo.pdf>.
- Gavira Márquez, María Concepción. *Población indígena, sublevación y minería en Carangas*. Lima: Instituto Francés de Estudios Andinos, 2008.
- Gavira Márquez, María Concepción. "Política minera y conflictos entre Potosí y Oruro a principios del siglo. XVII." *Anuario de Estudios Bolivianos, Archivísticos y Bibliográficos* 16 (2010): 215–44.
- Gil Montero, Raquel. *Ciudades efímeras: El ciclo minero de la plata en Lípez (Bolivia), siglos XVI–XIX*. Lima: IFEA y Plural Editores, 2015.
- Giráldez, Arturo. "Born with a 'Silver Spoon': China, American Silver and Global Markets during the Early Modern Period." PhD diss., Faculty of Humanities, University of Amsterdam, 1999.

- Girard, Albert. *El comercio francés en Sevilla y Cádiz en tiempo de los Habsburgo. Contribución al estudio del comercio extranjero en la España de los siglos XVI al XVIII* [1932]. Cádiz: Editorial Renacimiento, 2006.
- Gisbert, Teresa. *Iconografía y Mitos Indígenas en el Arte*. La Paz: Editorial Gisbert, 1980.
- Gisbert, Teresa. *Potosí: Catálogo de su Patrimonio*. La Paz: INPAAV, IBC, OAS and UNESCO, 1990.
- Gisbert, Teresa. *Historia del arte en Bolivia*. La Paz: Editorial Gisbert, 2012.
- Glamann, Kristoff. *Dutch-Asiatic Trade 1620–1740*. The Hague: Martinus Nijhoff S-Gravenhage, 1981.
- González Casanovas, Ignacio. *Las dudas de la Corona: la política de repartimientos para la minería de Potosí (1680–1732)*. Madrid: CSIC, 2000.
- Guerrero, Saul. *Silver by Fire, Silver by Mercury. A chemical History of Silver Refining in New Spain and Mexico, 16th to 19th Centuries*. Leiden, Boston: Brill, 2017.
- Gunder Frank, André. *ReOrient: Global Economy in the Asian Age*. Berkeley: University of California Press, 1998.
- Haberlen, Mark. *The Fuggers of Augsburg: Pursuing Wealth and Honor in Renaissance Germany*. Virginia: University of Virginia Press, 2006.
- Hang-Sheng, Chuan. "Trade between China, the Philippines and the Americas during the Sixteenth and Seventeenth Centuries." In *Metals and Monies in an Emerging Global Economy*, edited by Dennis O. Flynn and Arturo Giráldez, 845–53. Aldershot: Variorum, 1997.
- Hausberger, Bernd. *Historia mínima de la globalización temprana*. México: El Colegio de México, 2018.
- Honores, Renzo. "Una sociedad legalista: Abogados, procuradores de causas y la creación de una cultura legal colonial en Lima y Potosí, 1540–1670." PhD diss., Florida International University, 2007.
- Irigoin, Alejandra. "Global Silver: Bullion or Specie? Supply and Demand in the Making of the Early Modern Global Economy." *LSE Economic History Working Paper Series* 285, 2018.
- Irigoin, Alejandra. "The Rise and Demise of the Global Silver Standard." In *Handbook of the History of Money and Currency*, edited by S. Battilossi, Y. Cassis, and K. Yago, 383–410. Singapore: Springer, 2018.
- Irigoin, Alejandra. "The New World and the Global Silver Economy." In *Global Economic History*, edited by Tirthankar Roy and Giorgio Riello, 271–86. London: Bloomsbury, 2019.
- Israel, Jonathan. *Dutch Primacy in World Trade 1585–1740*. Oxford: Oxford Clarendon Press, 1989.
- Jumar, Fernando. "Le commerce Atlantique au Río de la Plata, 1680–1778." PhD diss., Ecole des Hautes Etudes en Sciences Sociales, 2000.
- Klein, Herbert. *The Atlantic Slave Trade*. Cambridge: Cambridge University Press, 2010.

- Klein, Herbert, and John TePaske. "Excel Alto Perú" Accessed April 14, 2022. <https://realhacienda.colmex.mx>.
- Lane, Kris E. *Pillaging the Empire: Global Piracy on the High Seas, 1500–1750*. New York: Routledge, [1998] 2016.
- Lane, Kris. *Potosí: The Silver City that Changed the World*. Berkeley: University of California Press, 2019.
- Langué, Frédérique, and Carmen Salazar-Soler. *Diccionario de términos mineros para la América española, siglos XVI–XIX*. Paris: Editions Recherche sur les Civilisations, 1993.
- Lohmann Villena, Guillermo. *Las minas de Huancavelica en los siglos XVI y XVII* [1949]. Lima: PUCP, 1999.
- López Beltrán, Clara. *La Ruta de la Plata: de Potosí al Pacífico. Caminos, comercio y caravana en los siglos XVI y XIX*. La Paz: Plural Editores, 2016.
- Love, Joseph. "The Origins of Dependency Analysis." *Journal of Latin American Studies* 22, no. 1–2 (1990): 143–68.
- Lucena Salmoral, Manuel. *Piratas, bucaneros, filibusteros y corsarios en América*. Madrid: MAPFRE, 1992.
- Malamud, Carlos. *Cádiz y Saint Malo en el comercio colonial peruano (1698–1725)*. Cádiz: Diputación provincial de Cádiz, 1986.
- Mangan, Jane. *Trading Roles: Gender, Ethnicity and the Urban Economy in Colonial Potosí*. Durham: Duke University Press, 2005.
- Marchena Fernández, Juan, and María José Villa Rodríguez, eds. *Potosí, Plata para Europa*. Sevilla: Universidad de Sevilla, Fundación El Monte, 2000.
- Marichal, Carlos. "El peso o real de a ocho: Moneda universal de España y América, siglos XVI–XVIII." In *El camino hacia al euro: El real, el escudo y la peseta*. Madrid: Banco España, 2001.
- Marichal, Carlos. "The Spanish-American Silver Peso: Export Commodity and Global Money of the Ancien Regime, 1550–1800." In *From Silver to Cocaine: Latin American Commodity Chains and the Building of the World Economy, 1500–2000*, edited by Carlos Marichal, Steven Topik, and Zephyr L. Frank. Durham: Duke University Press, 2006.
- Marichal, Carlos, Steven Topik, and Zephyr L. Frank. *De la plata a la cocaína: cinco siglos de historia económica de América Latina, 1500–2000*. México: El Colegio de México, 2017.
- Marín Guzmán, Roberto. *Un viaje poco conocido: la visita de Elias al-Mawsili: sacerdote caldeo iraquí, a la América Colonial (1669?–1680)*. Costa Rica: Editorial UCR, 2009.
- Martínez Shaw, Carlos. "Estudio Preliminar." In *Andalucía y La Carrera de Indias*, edited by Antonio García-Baquero Gonzales. Granada: Universidad de Granada, 2002.
- Mazzeo, Cristina Ana. *El comercio libre en el Perú. Las estrategias de un comerciante criollo, José Antonio de Lavalle y Cortés, 1777–1815*. Lima: Pontificia Universidad Católica del Perú, 1994.

- Moreno, Gabriel René. *Últimos días coloniales en el Alto Perú*. Santiago de Chile: Imprenta Cervantes, 1896.
- Morineau, Michel. *Incroyables Gazettes et Fabuleux Métaux. Les Retours des Trésors Américains d'après les Gazettes Hollandaises (XVI–XVIII)*. Paris: Maison Sciences de l'Homme, 1985.
- Moutoukias, Zacarías. "Burocracia, contrabando y autotransformación de las élites: Buenos Aires en el siglo XVII." *Anuario IEHS* 3 (1988): 213–48.
- Nakashima, Roxana. "Contra los corsarios, al servicio de su Majestad. Expediciones inglesas por el Mar del Sur (1576–1594) en las informaciones de méritos y servicios de los vasallos del rey." In *Felipe II y Almazarrón: La construcción local de un Imperio global*, edited by María Martínez Alcalde and José Javier Ruíz Ibáñez, 31–29. Murcia: Universidad de Murcia, 2014.
- Nakashima, Roxana. "La presencia inglesa en las costas de la Mar del Sur durante las últimas décadas del siglo XVI: ¿una amenaza espiritual en América?" In *Conocer el Pacífico: exploraciones, imágenes y formación de sociedades oceánicas*, edited by Salvador Bernabéu Albert, María del Carmen Mena García and Emilio José Luque Azcona, 121–48. Sevilla: Editorial Universidad de Sevilla, 2015.
- Nogal, Carlos Álvarez. *Los Banqueros de Felipe IV y los metales preciosos*. España: Banco de España, 1997.
- Nogues-Marco, Pilar. "The Microeconomics of Bullionism: Arbitrage, Smuggling and Silver Outflows in Spain in the Early 18th Century. Working Papers in Economic History." Universidad Carlos III, 2011. http://www.uc3m.es/uc3m/dpto/HISEC/working_papers/working_papers_general.html.
- Numhauser, Paulina, 2005. *Mujeres indias y señores de la coca: Potosí y Cuzco en el siglo XVI*. Madrid: Cátedra.
- Pearce, Adrian J. "Huancavelica 1563–1824: History and Historiography." *Colonial Latin American Review* 22, no. 3 (2013): 422–440.
- Postma, Johannes Menne. *The Dutch in the Atlantic Slave Trade*. Cambridge: Cambridge University Press, 1990.
- Povea Moreno, Isabel M. *Minería y reformismo borbónico en el Perú: Estado, empresa y trabajadores en Huancavelica, 1784–1814*. Lima: IEP/BCRP, 2014.
- Querejazu, Pedro, and Elizabeth Ferrer, eds. *Potosí: Colonial Treasures and the Bolivian City of Silver*. New York: Americas Society, 1997.
- Revilla Orías, Paola A. *Entangled Coercion: African and Indigenous Labour in Charcas (16th–17th Century)*. Berlin: De Gruyter Oldenbourg, 2021.
- Robins, Nicholas A. *Mercury, Mining, and Empire: The Human and Ecological Cost of Colonial Silver Mining in the Andes*. Bloomington: Indiana University Press, 2011.
- Robins, Nicholas A. *Santa Barbara's Legacy: An Environmental History of Huancavelica, Peru*. Leiden: Brill, 2017.

- Rodríguez Lorenzo, Sergio. *La Carrera de Indias (La ruta, los hombres, las mercancías)*. Madrid: Esles de Cayón, 2015.
- Saignes, Thierry. *Caciques, Tribute and Migration in the Southern Andes. Indian Society and the 17th Century Colonial Order (Audiencia de Charcas)*. London: University of London, Institute of Latin American Studies Occasional Papers, 1985.
- Salazar-Soler, Carmen. "Minería y moneda en la época colonial temprana." In *Compendio de historia económica del Perú 11: Economía del período colonial temprano*, edited by Carlos Contreras, 109–228. Lima: BCRP-IEP, 2009.
- Schurz, William Lytle. *The Manila Galleon*. University of California, 1915.
- Sluiter, Engel. *The Gold and Silver of Spanish America*. Berkeley: Bancroft Library, University of California Press, 1998.
- Stern, Steve J. "Feudalism, Capitalism, and the World-System in the Perspective of Latin America and the Caribbean." *American Historical Review* 93, no. 4 (1988): 829–72.
- Suárez, Margarita. *Comercio y fraude en el Perú colonial: las estrategias mercantiles de un banquero*. Lima: IEP Ediciones, 1995.
- Suárez, Margarita. "El Perú en el mundo atlántico (1520–1739)." In *Compendio de historia económica del Perú 11: Economía del período colonial temprano*, edited by Carlos Contreras, 229–311. Lima: BCRP IEP, 2009.
- Suárez, Margarita. "Lima and the Introduction of Peru into the Global Trade of the 16th Century." In *A Companion to Early Modern Lima*, edited by Emily A. Engel, 171–95. Leiden: Brill, 2019.
- Suárez, Margarita. *Desafíos transatlánticos. Mercaderes, banqueros y el Estado en el Perú virreinal, 1600–1700*. Lima: Fondo de Cultura Económica-Instituto Francés de Estudios Andinos-Instituto Riva-Agüero, 2001.
- Tandeter, Enrique. *Trabajo forzado y trabajo libre en el Potosí colonial tardío*. Buenos Aires: Estudios CEDES, 1980.
- Tandeter, Enrique. "La producción como actividad popular: Ladrones de minas en Potosí." *Nova Americana* 4 (1981): 43–65.
- Tandeter, Enrique. "Forced and Free Labor in Late Colonial Potosí." *Past & Present* 93 (1981): 98–136.
- Tandeter, Enrique. *Coacción y mercado: la minería de la plata en el Potosí colonial, 1692–1826*. Buenos Aires: Editorial Sudamericana, 1992.
- TePaske, John J. "New World Silver, Castile and the Philippines, 1590–1800." In *Precious Metals in the Later Medieval and Early Modern Worlds*, edited by J. F. Richards, 425–45. Durham: North Carolina University Press, 1983.
- TePaske, John J. *A New World of Gold and Silver*. Leiden: Brill, 2010.
- Van Der Wee, Herman. "World Production and Trade in Gold, Silver, and Copper in the low Countries, 1450–1700." In *Precious Metals in the Age of Expansion*, edited by Hermann Kellenbenz, 79–86. Stuttgart: Klett-Cotta, 1981.

- Van Der Wee, Herman. *The Growth of the Antwerp Market and the European Economy (Fourteenth–Sixteenth Century)*. T. 3. The Hague: Martinus Nijhoff, 1963.
- Vila Vilar, Enriqueta. *Aspectos sociales en América Colonial*. Bogotá: Univ. de Bogotá, 2001.
- Vila Vilar, Enriqueta. *Hispanoamérica y el comercio de esclavos, 2da. Edición*. Sevilla: Univ. de Sevilla, [1977] 2014.
- Vila Vilar, Enriqueta. *Sevilla y los hombres del comercio (1700–1800)*. Sevilla: Editoriales Andaluzas Unidas, 1989.
- Voigt, Lisa. *Spectacular Wealth: The Festivals of Colonial South American Mining Towns*. Austin: University of Texas Press, 2016.
- Von Glahn, Richard. *Fountain of Fortune: Money and Monetary Policy in China, 1000–1700*. Berkeley: University of California Press, 1996.
- Vries, Peer. “Connecting Europe and Asia: A Quantitative Analysis of the Cape Route Trade, 1497–1795.” In *Global Connections and Monetary History, 1470–1800*, edited by Dennis Flynn, Arturo Giráldez, and Richard Von Glahn, 35–106. Farnham: Ashgate, 2003.
- Wallerstein, Immanuel. *The Modern World-System: Capitalist Agriculture and the Origins of the European World-Economy in the Sixteenth Century*. New York: Academic Press, 1974.
- Yuste, Carmen. *El comercio de la Nueva España con Filipinas, 1590–1785*. México: Instituto Nacional de Antropología e Historia, 1984.
- Yuste, Carmen. *Emporios transpacíficos. Comerciantes mexicanos en Manila, 1710–1815*. México, Universidad Nacional Autónoma de México, 2007.
- Zagalsky, Paula C. “Trabajadores indígenas mineros en el Cerro Rico de Potosí: tras los rastros de sus prácticas laborales (siglos XVI y XVII).” *Revista Mundos do Trabalho* 6, no. 12 (2014): 55–82.
- Zagalsky, Paula C. “La mita de Potosí: una imposición colonial invariable en un contexto de múltiples transformaciones (siglos XVI–XVII; Charcas, Virreinato del Perú).” *Chungará* 46, no. 3 (2014): 375–95.
- Zagalsky, Paula C. “Trabajo indígena, conflictos y justicia en la Villa Imperial de Potosí y su Cerro Rico, una aproximación. Virreinato del Perú, siglos XVI–XVII.” *Revista Historia y Justicia* 9 (2017).
- Zagalsky, Paula C., and Isabel M. Povea Moreno. “Un mundo diverso: una panorámica sobre los trabajadores mineros coloniales a partir del análisis de casos en los virreinos de Nueva España y del Perú.” In *Trabajo y Trabajadores en América Latina (siglos XVI–XXI)*, edited by Rossana Barragán R., 245–80. La Paz: Vicepresidencia del Estado Plurinacional de Bolivia, 2019.
- Zeuske, Michael. *Esclavitud. Una historia de la humanidad* Pamplona: Katakarak, 2018.

PART 1

*Geology, Sacred Spaces, Political
and Technical Knowledge*



Potosí Revisited

Toward a Pre-Hispanic Potosí

Thérèse Bouysse-Cassagne

1 Introduction

With its complex and outstanding features, the Cerro of Potosí (also named Cerro Rico) is the biggest silver ore deposit that has ever existed in the world. This is well known and has been stated by geologists.¹ Furthermore, since 2003, the works of limnologists Abbott, Wolfe, Cooke, and Hobbs have suggested that its exploitation began after the Tiwanaku Empire's brutal collapse (in 1000 AD) and that it was developed, with some variations, throughout the pre-Hispanic period until it was handed over to the Spaniard conquerors in 1545.² For this reason, Potosí has recently become one of the historically most significant “places of memory” in long-term Andean history. This geological history necessitates a completely new look at the cultures that benefitted from its minerals and the discovery of the cerro by the Spanish.

The colonial perspective in our studies—considering 1545 to be the date of discovery of Cerro Rico—had prevailed for a long time. Knowledge of the history of Potosí prior to the colonial period has not given rise to many studies,³

-
- 1 Charles G. Cunningham, Michael L. Zienteck, Walter J. Bawiec, and Greta J. Orrs, “Geology and Non-Fuel Mineral Deposits of Latin America and Canada.” *US Geological Survey Open File Report, 2005—1294B*: 374–5.
 - 2 B. Abbott Mark and Alexander P. Wolfe, “Intensive Pre-Incan Metallurgy Recorded by Lake Sediments from the Bolivian Andes,” *Science* 301 (2003): 1893–95; Colin A. Cooke, Prentiss H. Balcom, Charles Kerfoot, Mark B. Abbott, and Alexander P. Wolfe, “Pre-Colombian Mercury Pollution Associated with the Smelting of Argentiferous Ores in the Bolivian Andes,” *Ambio* 41, no. 1 (2011): 18–25; Colin A. Cooke, Alexander P. Wolfe, and William O. Hobbs. “Lake-Sediment Geochemistry Reveals 1400 Years of Involving Extractive Metallurgy at Cerro de Pasco, Peruvian Andes,” *Geological Society of America* 37, no. 11 (2009): 1019–22.
 - 3 Thérèse Bouysse-Cassagne, “Las minas del centro-sur andino, los cultos prehispánicos y los cultos cristianos,” *Bulletin de l'Institut Français d'Etudes Andines* 34, no. 3 (2005): 443–62; Thérèse Bouysse-Cassagne, “El Sol de adentro: wakas y santos en las minas de Charcas y en el lago Titicaca (siglos XV a XVII),” *Boletín de Arqueología PUCP* 8 (2005): 59–97; Thérèse Bouysse-Cassagne, “Minas del sol, del Inka y de la gente, Potosí en el contexto de la minería prehispánica,” in *Mina y metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVIII*, ed. Pablo Cruz and Jean Vacher (La Paz: IRD/IFEA, 2008); Thérèse

given the main difficulty of approaching precolonial cultures from colonial sources. In my opinion, this approach requires the establishment of a complex documentary corpus, covering several fields both inside and outside the historical discipline. Therefore, although history is the main point of entry to the past, in this chapter, starting from a trans-conquest reading of the documentation, I shall draw upon geological and historical linguistic archives that allow us to clarify the chronology of pre-Hispanic mining and the history of the settlement of the region.

Obviously, as we look further into the past, our reading requires greater caution and more prudence in handling the data than imagination regarding their interpretation. However, despite these limitations, I continue to defend the importance of the long-term view in this study because I strongly believe that, beyond the many changes that took place under the Spanish, we should not overlook the models provided by early colonial history, especially those that highlight religious practices linked to mineralogical knowledge. In this context, I consider that the documents on the eradication of mining idolatries offer us insight into religious and linguistic persistence, which I will return to later on. The late dates involved tend to demonstrate that the preservation of autochthonous rites was one of the tacit conditions of the successful development of the mines by the Spanish. They also make it easier to understand the role of Cerro Rico in the pre-Hispanic religious and ethnic sphere. These documents, moreover, allow us to compare the situation of Potosí with that of other mines, demonstrating the existence of shared ancient cults that express a complex political history often prior to and reformulated by the Incas.

Andean studies have not been marked by their enthusiasm for an interdisciplinary approach. Notwithstanding this, two disciplines—archaeology and history—offer insight into the pre-Hispanic past with independent, but sometimes complementary, data.⁴ It is worth noting that in studies on the Collasuyu, the southern quarter of the Inca Empire, cooperation across disciplinary boundaries tends to be promoted, as demonstrated by the work of archaeologists such as Browman,⁵

bouyasse-Cassagne, "Apuntes para la historia de los pukina-hablantes," *Boletín de Arqueología PUCP* 14 (2010): 283–307; Thérèse Bouyasse-Cassagne, "Las minas de oro de los incas, el Sol y las culturas del Collasuyu," *Bulletin de l'Institut Français d'Etudes Andines* 46, no. 1 (2017): 9–36; Pablo Cruz and Pascale Absi, "Cerros ardientes y huacas calladas," in *Mina y metalurgia en los Andes del Sur*, 303–34.

4 Pablo Cruz and Patrice Gérard, "Los adoratorios de altura incaicos: Una mirada desde el cerro Cuzco, departamento de Potosí," *Memoria Americana* (January–June 2013): 93–120.

5 David L. Browman, "Titicaca Basin Archaeolinguistics: Uru Pukina and Aymara AD 750–1450," *World Archaeology* 26, no. 2 (1994): 235–51.

Stanish,⁶ and, more recently, Pärssinen,⁷ when the latter interprets the Tiwanaku iconography of the island of Pariti in terms of structural models based on historical documentation. As linguists,⁸ archaeologists have been predicting for some time that linguistic and archaeological patterns must be agreed upon in the right place, at the right time, and for the right reason.

On a methodological level, my aim is therefore to find access routes to lead us to an understanding of pre-Hispanic Potosí, of the peoples who developed its mines, and of how they worshipped them, whenever possible relating them to each other.

2 The Great Silver Mountain

We know that the Cerro Rico has existed for millions of years. The history of this silver supergiant and that of the men who developed it are intertwined, and the mine gave rise to technical knowledges and beliefs that far predate Spanish colonial development. Before Spanish conquest, the early silver miners of Potosí, due to their limited technology in digging (stone tools) and refining techniques, were restricted to the surficial ore deposits of the weathered oxidation zone—mainly the upper part of the cerro. They recovered the richest silver ore: first the native silver worked directly with hammers, then the silver halides that were very easy to refine, and eventually the argentiferous galena and acanthite (Ag_2S), sulfide ores that were easier to process than the deeper Ag sulfides exploited after the conquest. In order to understand how this “metallogenic monster” was formed and to consider which of its minerals were mined prior to 1545, I will offer a short summary of the many works of geology and limnology. The main centers of pre-Hispanic metallurgy are well known in the Andes, but not the modalities of their ore exploitation by different civilizations. A record of trace metals emitted during ore smelting operations makes lakes sediments the best natural archive depositories, and these can be used to document the timing and magnitude of atmospheric lead

6 Charles S. Stanish, “Formación estatal temprana en la cuenca del lago Titicaca, Andes surcentrales,” *Boletín de Arqueología PUCP* 5 (2002): 189–215.

7 Martti Pärssinen, “Snake, Fish and Toad/Frog Iconography in the Ceramic Caches of Pariti, Bolivia,” in *Images in Action, The Southern Andean Iconographic*, ed. William H. Isbell, Mauricio I. Uribe, Anne Tiballi, and Edward P. Zegarra (California: UCLA, 2018), 661–82.

8 Adrian J. Pearce and Paul Heggarty, “History, Linguistics and the Andean Past: A Much-Needed Conversation,” in *History and Languages in the Andes*, ed. P. Heggarty and A. J. Pearce (London: Palgrave Macmillan, 2011), 1–18.

(Pb) pollution—and its volatilization with other metals—insofar as there is evidence of the use of argentiferous galena (*soroche*) during the smelting of silver-rich ores. Smelting with the aid of lead was deemed to have been applied to silver sulfurs—although obviously the lake sediments don't record the earliest evidence of mining activities that didn't leave traces of lead.

The Cerro Rico originated from the general Central Andes magmatism in the late Cenozoic era, triggered by the subduction (sliding) of the oceanic crust of the Nazca plate (one the Pacific oceanic plates) under the thicker continental crust of South America. These geodynamics produced silica-rich magmas. To the east of the volcanic front of the Western Cordillera, the emission of the Cordillera de los Frailes, an ignimbrite field, began 25 million years (Ma)⁹ ago. These deposits consist of thick, hot, gas-rich, welded tuffs that were emitted by several large calderas favored by the extensive tectonics. One of them, the Kari-Kari, located not far from Potosí, was formed ca. 21 Ma ago.¹⁰ The edges of this caldera are structured by a system of circular faults.

At 13.77 Ma, the dome of the Cerro Rico, made of rhyodacitic (silica-rich) lavas intruding on the substrate of Paleozoic shales (485–444 Ma), was emplaced during a protracted period of magma-related hydrothermal activity over at least 200,000 years.¹¹ The dome and the ore fluids were derived from a deeper and larger magmatic/hydrothermal source. During this hydrothermal circulation, water present at the base of the dome, heated by the proximity of the magma chamber, substantially altered the rocks, absorbing certain chemical elements, mainly metallic ones. Rising in the fissures of the dome, the hydrothermal fluids deposited several elements, whose composition was controlled by temperature and pressure conditions. *Primary* (hypogene) ore minerals precipitated in the form of veins, taking advantage of the reductive environment. They were zoned according to the temperature of the mineralizing fluids¹² with:

- 1) in the core: cassiterite (tin oxide), wolframite, bismuthinite, and arsenopyrite

9 Located at the northeast of the present-day Department of Potosí.

10 Peter W. Francis, M. C. W. Backer, and C. Halls, "The Kari Kari Caldera, Bolivia, and the Cerro Rico stock," *Journal of Volcanology and Geothermal Research* 10 (1981): 113–14.

11 C. M. Rice, B. Steele, D. N. Barfod, A. J. Boyce, and M. S. Pringle. "Duration of Magmatic, Hydrothermal, and Supergene Activity at Cerro Rico de Potosí, Bolivia," *Epiportalconomic Geology* 100, no. 8 (2005): 1647–56.

12 C. G. Cunningham et al. "The Age and Thermal History of the Cerro Rico de Potosí, Bolivia," *Mineralium Deposita* 31, no. 5 (1996): 374–85.

- 2) in a peripheral, lower-temperature mineral zone: sulfides of zinc (sphalerite), of lead (galena, often argentiferous), of iron (pyrite), of copper, of silver (including silver antimony sulfides), some native silver, and other minerals with traces of silver

These primary ore minerals fill the cracks of the region's rocks, constituting veins with a thickness of ten to fifty centimeters, sometimes more than one meter. In cerro mining history, these veins have been mined from the summit to 1,500 meters below the surface.

Soon after the dome emplacement and deposition of the primary hydrothermal minerals, an alteration event occurred around 13.5 Ma and progressed semi-continuously over at least 7.5 Ma:¹³ the *supergene* oxidation event, in action near the surface of the cerro and mainly affecting its upper part. Sillitoe's paper is pivotal for understanding the genesis of the oxidized silver ore in Potosí.¹⁴ In the supergene process, the meteoric water (derived from rain and rich in oxygen and CO₂) with concomitant oxidation and chemical weathering, circulated downward and easily dissolved most of the primary sulfides located above the water table, thus leading to transformation into *secondary* (supergene) minerals—oxides, carbonates, dominant silver halides (AgCl, chlorargyrite, and AgI, iodargyrite)—and the precipitation of native silver. All of these supergene non-sulfide Ag minerals would be easy to refine for the first pre-Hispanic miners of Potosí by feeding directly into elementary furnaces. Acanthite (Ag₂S), whether of hypogene or supergene origin, has a high degree of resistance to oxidation.¹⁵ It is the reason why it is reported in the oxidized zone of the cerro. The timing that acanthite and/or argentiferous galena was first used in the metallurgic process by the pre-Hispanic silver miners can be identified by the appearance of fine lead particles in the sediment of Lake Lobato, located five kilometers downwind of Cerro Rico, as we will report, because Ag sulfide minerals need the addition of lead during the refining process.

At the Cerro Rico of Potosí, the reasonably well-developed oxidized zone attains maximum subsurface depths of 300 to 500 meters, with some 95% of the mined and remaining ore being oxidized.¹⁶ A layer of iron was formed by oxidation of the sulfurous minerals on the surface cover of the upper part

13 C. M. Rice et al., "Duration of magmatic."

14 Richard H. Sillitoe, "Supergene Silver Enrichment Reassessed," in *Supergene Environment Processes and Products*, ed. S. R. Tiley (Littleton: Society of Economic Geologists, 2009), 15–32 (give special attention to Table 1 and Figures 1, 5, 7, and 8).

15 Sillitoe, "Supergene Silver Enrichment Reassessed," 23.

16 Sillitoe, "Supergene Silver Enrichment Reassessed," 24 and Figure 5.

of the cerro. This gave the mountain its characteristic reddish color, and erosional debris mixed with gravel are found on the lower parts of the cerro. These deposits, the *pallacos*,¹⁷ which contained silver ore clasts coming from the peak region, were not used by early miners due to unsuitable technology at the time.

In recent work on Lake Titicaca, Guedron et al. proved that the first evidence for metallurgy is found in the Altiplano during the apogee of the Tiwanaku State (AD 800–1150).¹⁸ During the Tiwanaku period, copper and tin-bronze metallurgy flourished and there was a significant rise in the use of copper and silver in this area. During the late intermediate period (1150–1450) a small increase in the use of copper and silver was found, but the next major increase was during the Inca Empire.¹⁹

In their 2003 article, Abbott and Wolfe, who first studied the sediments of the Laguna Lobato, proposed that metallurgy, with the emission of fine lead particles in the air, appeared in the Cerro Potosí at around 1000 AD, at the end of Tiwanaku.²⁰

In their 2008 paper, Cooke, Abbott, and Wolfe completed the previously published Pb records from Laguna Lobato and Laguna Pirhuacocha, situated in the mining region of Junin (Peru Wari State)—an area previously studied by Cooke—with a new geochemical record from Laguna Taypi Chaca, located in the Lake Titicaca hydrological catchment basin (approximately twenty-five kilometers east of Tiwanaku) and they amended their earlier, 2003 conclusions.²¹ As Guedron et al. did, they demonstrated that the earliest development of smelting in the Altiplano began around AD 400, with the rise of the pre-Inca Tiwanaku and Wari empires during the Andean Middle Horizon (400–1000 AD). They proved that, coeval with the collapse of these empires (1000 AD), there was a dramatic decrease in Pb pollution, suggesting that metallurgical activity was connected with the Tiwanaku and Wari states.

Therefore, while Abbott and Wolfe suggested in 2003 that metallurgy was brought from Titicaca to the Cerro Rico during the final expansion of Tiwanaku, they considered in their study of 2008 that there is little evidence

17 Paul J. Bartos, “The Pallacos of Cerro Rico of Potosí, Bolivia: A New Deposit Type,” *Economic Geology* 95 (2000): 645.

18 S. Guedron, J. Tolu, C. Delaere, P. Sabatier, J. Barre, C. Herredia, E. Brisset, S. Campillo, B. Bindler, S. C. Fritz, P. A. Baker, D. Amourous, “Reconstructing Two Millennia of Copper and Silver Metallurgy in the Lake Titicaca Region (Bolivia, Peru) Using Trace Metals and Lead Isotopic Composition,” *Anthropocene* 34 (2021): 100288.

19 Guedron et al., “Reconstructing Two Millennia.”

20 Abbott and Wolfe, “Intensive Pre-Incan.”

21 Colin A. Cooke, Mark B. Abbott, and Alexander P. Wolfe, “Late Holocene Atmospheric Lead Deposition in the Peruvian and Bolivian Andes,” *The Holocene* 18, no. 2 (2008): 353–59.

for such an exodus. On the contrary, many Tiwanaku and Wari colonies were abandoned at that time, implying, according to them, that neither Tiwanaku nor Wari were responsible for the late intermediary expansion of metallurgy. Consequently, they proposed that the expansion of peoples with metallurgical knowledge happened sometime after AD 1000, bringing their technology to new groups and previously undeveloped mineral deposits. This expansion may have been triggered by the very breakup of the Tiwanaku and Wari empires as the result of the diaspora generated by the collapse of Tiwanaku and Wari during the late intermediate period—which separates the Tiwanaku and Wari empires from the Inca—and was a time of decentralized and belligerent chiefdoms. Therefore, the metallurgy at Potosí and in the Junín region would have happened, if their analysis is correct, in the absence of a large imperial state and during the late intermediate period, as shown by increases in Pb concentrations (ca.AD 1300) at Laguna Taypi Chaca and Lobato.

This is an important point of analysis, which could have later consequences for the composition of the population of the whole of the Collasuyu and especially for Potosí, as I explore in the last part of this chapter, trying to eventually find who were the people with metallurgical knowledge who went to Potosí after the collapse of Tiwanaku and brought their technology to the mine.

Signs of the collapse of Tiwanaku began before 1000 AD, and an important factor in this collapse was a climatic change. The driest climate conditions occurred in the Altiplano between 915 and 1250, when Lake Titicaca water levels dropped by several meters.²² The drought engendered a period of crisis, destabilizing agricultural production for the densely populated lake basin.²³ The raised field system, where the majority of the Pukina- and Uruquilla-speaking groups lived, was replaced by other economic strategies such as pastoralism, and for about a century the Tiwanaku capital sites were abandoned and settlement was reorganized.²⁴ Those climate catastrophes provoked a drop in the population and a migration. Pärssinen and Arnold qualify those migrations as a “diaspora,” starting from Titicaca and spreading all over the

22 According to Abbott and Wolfe, this reduction linked to the collapse of the state is observed in the records of the Quelcaya glacier, which demonstrates a persistent interval of dryness between 1250 and 1300 in the Altiplano, during which Lake Titicaca's water level decreased by some six meters. Abbott and Wolfe, “Intensive Pre-Incan Metallurgy.”

23 Alan Kolata, *The Tiwanaku: Portrait of an Andean Civilization* (Cambridge: Blackwell, 1993), 250–56.

24 T. Elliot Arnold et al., “Drought and the Collapse of the Tiwanaku Civilization: New Evidence from Lake Orurillo, Peru,” *Quaternary Science Reviews* 251 (2021): 8.

Altiplano and the Pacific coast, between 1050 and 1150.²⁵ For his part, Owen²⁶ considered the existence of a two-stage diaspora: the first in the context of the functioning Tiwanaku polity, the second after Tiwanaku's collapse. A reorientation of ideology²⁷ may have promoted an ascendant elite, as Kolata wrote,²⁸ around 1150 AD.

Was this ideological change the result of the warlike supremacy of an Aymara migration²⁹ coming from the coast and Sierra region of central Peru upon the Pukina speaking group of Tiwanaku, as linguists proposed? Or were the Aymara people part of the multiethnic society of Tiwanaku, as Albarracín-Jordán and other archaeologists have suggested?³⁰ In the scope of the present study, we will take into account all of these upheavals and the fact that, in our documents, under the Inca, part of the Pukina-speaking group was frequently subordinated to the Aymara as a workforce and compelled to learn their language.³¹ However, as Jesuit friar Barzana wrote in 1594, about forty or fifty villages still spoke Pukina—a language of the Arawak linguistic group of Amazonia—in the Altiplano and on the Pacific coast.³²

Finally, the most important consequence of this diaspora and of Aymara supremacy was the division into new political units (chiefdoms) during the intermediate period and the complex ethnic and idiomatic mapping of the Collasuyu.³³

25 Martti pärssinen, “Desde la expansión de Tiwanaku hasta la diáspora de postiwanku: reflexiones finales,” in *El Horizonte Medio: nuevos aportes para el sur del Perú, Norte de Chile y Bolivia*, ed. Antti Korpisaari and Juan Chacama (Lima: IFEA, 2015), 297–330.

26 Bruce D. Owen and Paul Goldstein, “Tiahuanaco en Moquegua: interacciones regionales y colapso,” *Boletín de Arqueología. PUCP* 5, (2002): 169–88.

27 Bruce D. Owen, “Distant Colonies and Explosive Collapse: The Two Stages of the Tiwanaku Diaspora in the Osmore Drainage,” *Latin American Antiquity* 16, no.1 (2005): 71.

28 Kolata, *The Tiwanaku*, 150–200.

29 Rodolfo Cerron Palomino, “El puquina como lengua de Tiwanaku,” in *Interpretando Huellas* (Cochabamba: Grupo Editorial Kipus, Instituto de Investigaciones Antropológicas y Museo Arqueológico INIAM-UMSS, 2018), 418; Alfredo Torero, *Idiomas de los Andes: lingüística e historia* (Lima: Instituto Francés de Estudios Andinos, 2002), 131; Willem Adelaar and Simon Van de Kerke, “La lengua puquina,” in *Las lenguas de Bolivia*, T.1, *Ambito andino*, ed. M. Crevelsy and P. C. Muysken (La Paz: Ediciones. Plural, 2009), 135.

30 Albarracín-Jordán has suggested that the Aymara were part of Tiwanaku. Cf. Juan Albarracín-Jordán, *Arqueología de Tiwanaku: Historia de una antigua civilización andina* (La Paz: Sigla Ed., 1999).

31 Thérèse Bouysse-cassagne, *La identidad aymara. Aproximación histórica (siglo xv–siglo xvi)* (La Paz: Hisbol, 1978), 146–47.

32 Bouysse-cassagne, “Apuntes para la historia,” 289.

33 Bouysse-cassagne, “Apuntes para la historia,” 283–307.

On comparing the situation of Potosí with the Cerro de Pasco, the other big pre-Hispanic silver mountains of the Andes, Cooke, Wolfe, and Hobbs observed that the development of silver in the latter began in around 600 AD,³⁴ a date that corresponds to the expansion of the Wari Empire outside the Ayacucho Valley. This development gradually grew over 400 years until the culture's collapse around 1000–1100 AD, although it continued after the fall of the Wari. This point is interesting for our purpose because we know that Potosí and the Cerro de Pasco were of interest to two cultures that demonstrated “common concepts, rules, and models (such as the use of psychotropics drugs) and part of the iconography,”³⁵ in particular the representation of felines as divine figures, which we will study subsequently. In this respect, Korpisari and Pärssinen related the ceramics found on island of Pariti on Lake Titicaca with the Wari, and Nash indicated that, in the region of the Cerro Baúl-Omo, the discovery of Tiwanaku objects in a Wari palace evokes the possibility that the two states shared, in this case, the same territory, rituals, and even marriage links.³⁶ We will bear these data in mind when we endeavor to understand the gods of the Collasuyu mines and the mining rites of the Cerro Rico. Further, the possibility should not be ruled out that, when the religious or economic connections between the Wari and Tiwanaku states ceased to exist, the prestige of certain sanctuaries or *wakas*³⁷ remained or even grew with the kingdoms of the late intermediate period and when the Inca Empire arose.

In Potosí, lead and the other elements that marked smelting activity did indeed tend to diminish notably after the peak of 1300 AD. To give us an idea of the importance of mining in Potosí, we observe that this peak concentration of lead, which exceeds 100 µg/g of dry sediment, is comparable to the concentrations studied in the lakes close to the European mines developed during the Middle Ages.³⁸ This is not insignificant, bearing in mind the techniques in use at the time.³⁹ Notwithstanding this, Platt and Quisbert, who didn't use

34 Cooke, Wolfe, and Hobbs, “Lake-sediment geochemistry.”

35 Antti Korpisaari and Martti Pärssinen, *Pariti. The Ceremonial Tiwanaku Pottery of an Island in Lake Titicaca*, (Helsinki: Finnish Academy of Science and Letters, 2011), 1–208.

36 Paul S. Goldstein and Matthew J. Siteck, “Plazas and Processional Paths in Tiwanaku Temples: Divergence, Convergence and Encounter at Omo M10, Moquegua, Peru,” *Latin American Antiquity* 29, no. 3 (2018): 462; Donna Nash, “Evidencia de uniones matrimoniales entre las élites Wari y Tiwanaku de Cerro Baúl, Moquegua, Perú,” in *El Horizonte Medio: nuevos aportes para el sur del Perú, norte de Chile y Bolivia*, ed. Antti Korpisaari and Juan Chacama (Lima: IFEA, 2015), 180.

37 “Huaca,” “huaka,” “guaca,” and “waka” refer to a sacred entity (sacred stones, shrine).

38 Abbott and Wolfe, “Intensive Pre-Incan Metallurgy,” 1893–95.

39 Bouysson-Cassagne, “Las minas de oro,” 10.

limnological studies, considered that the cerro “was not developed on a large scale during the pre-Hispanic period.”⁴⁰

Around 1400–1450 AD, under the Incas, the growth of the lead rate suggests an intensive use of *wayras* (wind furnaces). In Potosí, Cruz found *wayras* on the Cerro Guaynacabra, near the Cerro Rico, while Van Buren and Mills discovered remains of those artifacts in Cerro Porco in areas associated with Inca material and in the ancient shrine at the peak of this cerro.⁴¹

3 The Spanish “Discovery” of 1545

The dreadful mining policy in Porco in early colonial times meant that, by 1541, the mines were already very deep, full of debris and water. The “discovery” of the fabulous Potosí⁴² took place in 1545 in this context. The first sources to describe its discovery by the Spaniards are subsequent to Viceroy Toledo’s visit.⁴³ These sources link the 1545 “discovery” to four Spanish soldiers from Porco who were seeking mines and *soroche*, a lead sulfide ore that frequently contains small quantities of silver (also known as galena).⁴⁴ These Spaniards were the initiators of the first ascent by “the two *yanakuna*⁴⁵ discoverers,” Guallpa and Chalco.⁴⁶ From Porco, they all went to the Gonzalo Pizarro settlement, where the two *yanakunas* were sent to the sanctuary at the peak of the Cerro of Potosí, to seek “the offerings of silver and gold treasures made to the *waka*,” and they remained in this settlement when Chalco returned from his ascent to hand them over.

40 Tristan Platt and Pablo Quisbert, “Tras las huellas del silencio: Potosí, los Incas y el Virrey Toledo,” *Runa* 31, no. 2 (2010): 139.

41 Cruz and Absi, “Cerros ardientes,” 303–34; Mary Van Burren and B. Mills, “Huayrachinnas and Tocoymimbo: Traditional Smelting Technology of the Southern Andes,” *Latin American Antiquity* 16, no. 1 (2005): 3.

42 Bartolomé Miranda Diaz, “Las minas y asiento de Porco: nuevos datos sobre la hacienda rica de Hernando Pizarro en India,” *Temas Americanistas* 33 (2014): 156.

43 Rodrigo de la Fuente Sanct Ángel, “Relación del Cerro de Potosí y de su descubrimiento” [1573], *Relaciones Geográficas de Indias*, T.1 (Madrid: Atlas, 1965), 358.

44 A. Alonso Barba, writes, “they commonly call *soroche* the metals in which the lead is formed” (1640, Ch. I, 58). The Spaniards in question are Marcos Xaramonte, Alvaro de Olmedo, Gaspar Montesinos, and Juan Camargo. See Alvaro Alonso Barba, *El arte de los Metales en que se enseña el verdadero beneficio de los de oro y plata por azogue. El modo de fundirlos todos y como se han de refinar y aparear unos de otros*. Madrid, En la Imprenta del Reyno, 1640, facsimile (Librerías Paris-Valencia, 1993).

45 At the time of colonization, *yanakuna* designated different categories of servant.

46 de la Fuente Sanct Ángel, “Relación del Cerro de Potosí,” 358.

That poor mining settlement, located at the foot of the Cerro Rico on the western side, had been developed by Gonzalo Pizarro before he left for the Tierra de la Canela at the end of 1540, but it was abandoned from then on.⁴⁷ We do not know the fate of Potosí between Gonzalo's departure and 1545.

The people who remained in the settlement logically knew about the existence of the *waka* and it should not be ruled out that the four Spaniards may have questioned them to know whether there was a sanctuary at the sacred peak of the cerro, like in the Cerro of Porco. We only know, though, what the informants said. De la Fuente Sanct Ángel does, indeed, write that they told them, "see that mountain and at the highest point of which you will find much mined silver and gold offered to the *guaca* [*waka*] which is in it."⁴⁸ The attractive references to the *waka* of such an imposing mountain constituted appealing indications.

What was said at that time could, however, have been decisive in the effort made by Guallpa to find and test the cerro's minerals as he progressed in his search.

I will now relate this discovery to the gitological context of the cerro.

The ancient ceremonial platform was located at the peak region, as in Porco. It was described as a "table of one hundred feet,⁴⁹ more or less, and with an equal contour all around." There, they found a shrine of the neighboring Indians and some items of little value offered to the *waka* who was there, which Guallpa climbed.⁵⁰ In his confession, heard by De la Fuente Sanct Ángel, Guallpa added two important details to this description, namely that "next to the summit of that mountain there were at that time ten or twelve big quinoa trees,⁵¹ among which were beds of lions from this land" and that he had taken possession of "a big piece of metal," probably a sacred stone called *mama*—which he sent to the King of Spain. At the sanctuary, Guallpa found objects of little value offered to the *waka*; these were handed over to the four Spaniards by Chalco. The scarcity of offerings was interpreted by Platt, Quisbert, and Cruz⁵² as an absence of paraphernalia following a cessation of rites in the sanctuary. Comparing the situation that they studied in the Cerro Cuzco, where they

47 Tristan Platt, Thérèse Bouysson-Cassagne, and Olivia Harris. *Qaraqara-Charka, Mallku, Inca, Rey en la provincia de Charcas (siglos XV–XVII): Historia antropológica de una confederación aymara* (Lima-La Paz: Institut Français d'Études Andines, Plural Editores, 2006).

48 de la Fuente Sanct Ángel, "Relación del Cerro de Potosí," 358–59;

49 Around 30 meters.

50 de la Fuente Sanct Ángel, "Relación del Cerro de Potosí," 359.

51 The *Polylepis tarapacana* is the species recorded to form the highest woodland in the world, reaching 5,200 meters in Sajama National Park.

52 Platt and Quisbert, "Tras las huellas," 266; Cruz and Gérard, "Los adoratorios," 106.

found a walled shrine on the mountain, Cruz and others concluded that the shrine of the Cerro Rico had been sealed “before the disclosure of the fabulous silver veins to the Spaniards.” Continuing with their analogical reasoning, they considered that it was in 1538, when the *waka* of Porco had been hidden in Caltama, that Potosí’s was concealed. I do, however, note that in 1583, Potosí still had “a shrine” and “Indians which served it.”⁵³ Furthermore, Capoche’s list of miners still notably contains the discrete presence of one of them, a certain “Diego Illa, Indian, a presbyter.”⁵⁴ Considering that his first name and surname refers to the god of thunder, creator of the minerals and of the initiation of the “sorcerers,” we suspect that this figure must have been an Indigenous “priest” of the Cerro Rico.

In 1599, Arriaga undertook the first eradication in the cerro to prevent the mine workers from climbing up to the shrine. He had “a wall built to make it difficult to climb the main mountain and having worked for a day and a half on it ... it collapsed.”⁵⁵ This is proof that the sanctuary was still active and that the miners climbed up to the sanctuary before and after 1599.

Before demonstrating anything else, it is worth observing that, “having seen another metal like this in Porco,”⁵⁶ Guallpa picked up from the ground a piece of mineral of approximately ten marks. High-grade silver minerals were first ground and then smelted with a mixture of *soroche*. On melting it in Porco, with a little galena, he obtained the same quantity of silver as of “metal.”⁵⁷ It was obvious that the sample was of native silver, which justifies his second ascent. On climbing the Cerro Rico again, Guallpa confirmed its wealth, the facility to ground it and the quality of the silver that the first sample disclosed. Indeed, the mineral was “on top of the ground like bait gifted by the sun”⁵⁸ and he did not have any difficulty in pulling it out of the ground in order to fill his *guayaca* (pouch). Our miner melted this second finding with *soroche* from

53 Diego Rodríguez de Figueroa, “Carta a Martin Enriquez” [1583], *Relaciones Geográficas del Perú* (Madrid: Atlas, 1965), 67.

54 Luis Capoche, *Relación general de la Villa Imperial de Potosí y de las cosas mas importantes a su gobierno, dirigida al Excmo. Sr. Don Hernando de Torres y Porugal, conde de Villar y virrey del Perú*[1585] (Madrid: Atlas, 1959), 98.

55 Pablo de Arriaga, “Carta Annua al P.C. Aquaviva, 29 de abril 1599,” in *Monumenta peruana* T.6, ed. A. de Egaña (Historica Societatis Jesu, Roma, 1974), 688–89.

56 de la Fuente Sanct Ángel, “Relación del Cerro de Potosí,” 359.

57 From antiquity to modern times, the “ore,” particularly if very rich, was frequently referred to as “metal.” See Nicolás del Benino, “Relación muy particular del Cerro y Minas de Potosí y de su calidad y labores, dirigida a don Francisco de Toledo” [1573], in *Relaciones Geográficas de Indias*, T.1 (Madrid: Atlas, 1965), 363.

58 de la Fuente Sanct Ángel, “Relación del Cerro de Potosí,” 358.

Porco and obtained “very fine silver.”⁵⁹ The fabulous wealth of Potosí had been demonstrated. According to del Benino, in the Centeno vein, the metal was found on “the surface of the earth,”⁶⁰ which demonstrated how easy it was to mine it, and this was also the case in the Rich vein, the closest to the extremely rich cerro peak, which Guallpa reached and where the metal on the surface “was found very shallow because they say that all those who were present in many parts found it at the knee and in great quantity and very rich, and in some parts they pulled the straw out by the roots from which hung potatoes as big as a walnut and more of an extremely rich metal which is called *tacana* [...] and it appeared that the metal wanted to spurt out”⁶¹. Those thick concretions of rich silver, situated in the supergene area, according to García de Llanos, could have the size of an orange in Potosí.⁶² These “potatoes,” as they often called them, formed part of metal ores of “breeding grounds on the face of the earth.”⁶³ The *tacana* and *machacado* could very easily be hammered; then came the *pacos* and *colorados*, the silver ores closest to the surface that contain silver chloride and some native silver. And wherever possible, the ores with native silver were smelted with lead.⁶⁴

Guallpa, who knew the minerals of Porco, quickly observed the abundance and the quality found on the Cerro Rico. He was faced with a much greater and consequently more sacred source of wealth than usual, as demonstrated by the experiments that he performed. The Potosí and Porco sites shared the same geological characteristics: large quantities of native mineral and of *tacana* were concentrated in “potatoes or bags.”⁶⁵ However, those of Potosí were greater in quantity than those of Porco.⁶⁶ The *tacana* was frequent in

59 de la Fuente Sanct Ángel, “Relación del Cerro Potosí,” 360.

60 Discovered by Chalco (del Benino, “Relación muy particular,” 364).

61 del Benino, “Relación muy particular,” 364.

62 “Some have been discovered like oranges and very rich, mainly in the tin area, and it is not known if there have been in another settlement” García de Llanos, *Diccionario y maneras de hablar que se usan en las minas y sus labores en los Ingenios y Beneficios de los Metales* [1609] (La Paz: MUSEF, 1983), 84.

63 “The very rich *machacado* dont needed to be melted with mercury, and the *tacana* was a little less rich” (de Llanos, *Diccionario y maneras*, 80).

64 Saúl Guerrero, “Chemistry as a Tool for Historical Research: Identifying Paths of Historical Mercury Pollution in the Hispanic New World,” *Bulletin of the History of Chemistry* 37, no. 2 (2012): 62.

65 In Porco, Capoché indicates that, in 1585, the mine having been developed for a long time, just one bag could bring between 8,000 and 10,000 pesos of silver. Bouysson-Cassagne, “Le palanquin d’argent de l’Inca,” *Techniques et culture* 29 (1997): 97.

66 According to Capoché, after its discovery the mountain was still so rich that the metal came to half of silver from smelting (Capoché, *Relación general*, 125).

Porco and the *mama* of that mine consisted of three stones of *tacana*, which weighed one arroba⁶⁷ and was considered the germinative prototype of that mine.⁶⁸ These sacred *mamas* “were the most beautiful stones of the metals and they have saved and save them and they worship them, calling them mothers of such mines. And first they are going to mine them on the day that they have to work they worship and drink to this stone and calling it *mama* of what they work.”⁶⁹ The miners—who identified the silver based on its color and the shape of the ore⁷⁰.—venerated, as *mama*, those of a larger size, of a unique shape, or of a special color. Part of the *tacana* of Porco was white, of such a precious color due to the light of the lightning that it was thought to contain, and it was used to make one of the litters of the Inca⁷¹ and it was inserted among the wall’s stones of the Coricancha⁷² of Cuzco. In Potosí, the native silver minerals found by Guallpa were abundant and of exceptional quality. Given his experience in Porco, he may have thought that the Cerro Rico belonged to the richest of the sacred entities. It is not unreasonable to think that during his ascents to the summit he would have observed “that it was devoted to the Sun,” as Ocaña stated in the account of the journey that he made in Peru.⁷³ Indeed, the ancient mining culture was based on the recognition of a huge number of mineral deposits; when, in 1609, García de Llanos recorded 258 terms and definitions in his dictionary of Potosí mining, over 160 corresponded to all the phases of the mining process in Quechua, Aymara, and Pukina. This is because behind each term there is “a knowledge or an element of pre-Hispanic technology,” as Gunnar Mendoza rightly remarked.⁷⁴ Both Chalco and Guallpa shared this knowledge with other miners. García de Llanos wrote that when the miners of Potosí saw “a metal stone which can be from different places they make the distinction from its appearance, saying that it will be from such a part of

67 One arroba = 11.3 kg.

68 Platt, Bouysse-Cassagne, and Harris, *Qaraqara-Charka*, 135–81.

69 Cristobal de Albornoz, *Fabulas y mitos de los Incas* (Madrid: Historia 16, 1989), 165.

70 Cobo summarizes with suggestive words what the talent and the knowledge of the pre-Hispanic silver workers consisted of on writing: “And in the colour and shape that they have the silver workers of this kingdom of Peru know where each sort of gold is and the grade that it has”. Bernabé Cobo, *Historia del Nuevo Mundo* [1553] (Madrid: Biblioteca de Autores Españoles, 1964), 140.

71 We do not know whether they were the litters of Pachacuti or of Huayna Capac.

72 Bouysse-Cassagne, “Le palanquin d’argent de l’Inca,” 105. The Coricancha was the temple of the Sun.

73 Diego de Ocaña. *Un viaje fascinante por la América hispana del siglo XVI* (Madrid: Studium ed., 1969).

74 de Llanos, *Diccionario y maneras*, Introduction xxv.

the cerro, of such a grade.”⁷⁵ In this case, García de Llanos was referring to colonial mining, but it should be considered that all of the empirical knowledge that he sets out did not arise overnight and that the vast majority came from before the colonial period and, in many cases, prior to the Incas.

To match Cerro Rico's geology with the descriptions of the sources, I accompanied Guallpa in his ascents to Cerro Rico, experiencing the wealth of the mineral deposits, while Platt and Quisbert chose to interrogate what they considered to be “the silences of the documentation.” Considering that Guallpa knew the secret of the wealth of the cerro on having been the guardian of the feathers of Huáscar Inca, Platt and Quisbert maintained that there was a sophisticated strategy designed by Manco Inca from Vilcabamba that brought together a group of Inca and “Incaized” *yanakunas* with the aim of serving the camp of the King of Spain and handing the cerro over to him. With that perspective, they proposed that *yanacona* Baltazar Challco, who discovered the cerro with Guallpa, likewise belonged to the lineage of Inca priests and governors of Copacabana, and for this reason he was involved in this gift to the Spaniards. Mercedes del Río, who studied the genealogies of the Incas of the ceremonial and administrative center of Copacabana, situated in front of the Island of the Sun on Lake Titicaca, is more circumspect. Without denying the importance of Baltazar Challco mentioned by Platt and Quisbert, and his probable knowledge of religion and mining, she considered that the family of the governor Challco Yupanqui appeared, disappeared, and reappeared in the governance of Copacabana and there is a lack of information concerning his progeny.⁷⁶

4 Mines of the Sun and Taboos

The first Spanish troops to cross the Collasuyu, the southern quarter of the Inca Empire (Tawantinsuyu), were those of Diego de Almagro, who made their way to Chile in 1535, where they hoped to find gold and silver. Their advance was accompanied by the high priest of the Tawantinsuyu, the *Willaq Umu*, who, before reaching the land of Chile, returned to Cuzco to join Manco's rebellious forces. Pawllu, the son of Huayna Capac, half-brother of Manco, formed part of the delegation. Pawllu, who had strengthened his ties with the

⁷⁵ de Llanos, *Diccionario y maneras*, 76.

⁷⁶ Mercedes del Río, “De sacerdotes del Tawantinsuyu a cofrades coloniales: Nuevas evidencias sobre los Acustupa y Viracocha Inga de Copacabana,” *Revista Andina* 49, no. 2 (2009): 1–49.

ceremonial center of the Incas through marrying an *aclla*, a sacred virgin of the Sun from Copacabana, knew that Porco had belonged to his father since the Inca conquest of the Aymara chiefdoms of Qaraqara and Charca, where Potosí was located, and he must have known that Potosí belonged to the Sun. This journey, planned by the high priest,⁷⁷ the custodian of the golden statue of the Sun (*Punchao*), had a markedly religious and prohibitive character: its participants had orders not to show the Spaniard the mines.⁷⁸ The *Willaq Umu*, organizer of the journey, “was so highly esteemed that he competed with the Ynga and had power over all the oracles and temples and dismissed and appointed priests.”⁷⁹ These powers included the mines, the mountains, and the sacred *mama* stones. For these reasons, “the Indians who went to the silver mines used to worship the mountains or mines, asking them for metal.”⁸⁰ Potosí was obviously the most important among these sanctuaries.

I will note that during the crossing of the Collasuyu, the entourage was joined by the governor and priest of the temple of the Sun of Copacabana, who controlled the shrines over the whole of the Collasuyu: Apu Challku Yupanqui, brother of Inca Huayna Capac, who was murdered in 1538 in the coca fields of Pocona by Tisoc, an uncle of Manco Inca, due to his proximity with Almagro and because he let the Spaniard go by Charcas territory.⁸¹ It was probably feared that he would disclose the mines to the conqueror, particularly the Cerro Rico, devoted to the Sun. All of the plans devised by the *Willaq Umu* were fulfilled—with the exception of the killing of Almagro—and neither Potosí nor Porco were handed over to the Spaniards during this journey.⁸² Several pockets of Indigenous resistance then arose in Desaguadero, Cochabamba, and Oruro.⁸³

In this context, after the battle of Cochabamba and after November 1538, Moroco, the Aymara leader of the Qaraqara federation, and Qaraqara chief Coisara handed over the Porco mine, property of the Inca Huayna Capac, to

77 Juan de Betanzos, *Suma y narración de los Incas* [1551] (Madrid: Atlas, 1987), 291.

78 Gold statue of *Punchao* was a representation of the Sun.

79 Pedro Cieza de León, *Crónica del Perú, El Señorío de los Incas* (Lima: Pontificia Universidad Católica del Perú, 1987) segunda parte, cap. xxx, 94.

80 Antonio de la Calancha Antonio, *Crónica moralizada del orden de San Agustín* [1638] (Lima: Universidad Nacional Mayor de San Marcos, 1976), 842.

81 Nelson Castro Flores, “Estrategias familiares, práctica jurídica y comunidad de memoria: Los descendientes de Tito Alonso Atauchi y Viracocha Inca en Charcas, siglos XVI–XVIII,” *Estudios Atacamenos* 61 (2019): 192.

82 Ella Dunbar Temple, “La descendencia de Huayna Capac (II),” *Revista Histórica* 12 (1939): 207; Platt, Bouyasse-Cassagne, and Harris, *Qaraqara-Charka*, 105; del Río, “De sacerdotes,” 192.

83 Platt, Bouyasse-Cassagne, and Harris, *Qaraqara-Charka*, 112–16.

Pizarro. However, as Zagalsky and Platt and colleagues have noted, the *Cedula de encomienda* of Hernando Pizarro (April 1539) does not include Porco or Potosí, nor the *Cedula* of his brother, Gonzalo (March 1540).⁸⁴ Zagalsky has also remarked that the *Cedula* of Gonzalo, as the *Cedula* of Pedro de Hinojosa, his successor (1548), rather surprisingly didn't mention the Visisas, in whose territory Porco and Potosí's mines were located, as Barnadas noted.⁸⁵ We know little about the Visisas except that under Toledo (1575), the geographical breakdown of the population changed and they were reduced to the villages of Toropalca, Yura, and Caiza.⁸⁶

Once Challku Yupanqui (1538),⁸⁷ the *Willac Umu* (1539), and Manco (1545) had been murdered, pressure increased on the Andeans and their chiefs,⁸⁸ who destroyed paths, bridges, and covered mine entrances where many *mama* stones were hidden.⁸⁹

After the murder of the *Willac Umu*, there were sixteen years of silence regarding who succeeded him as high priest of the Sun. We know that in 1556, Sayri Tupac held this position, and after the baptism of Titu Cusi in August 1569, this office was held by Thupa Amaru and then captain Wallpa Yupanqui. The Spanish captain, Francisco Camargo y Aguilar, seized from the latter the statue of the *Punchao* that had been in his custody, in his withdrawal to the land of the *Pilcosones*, an Amazonian group who lived near the Vilcabamba Sierra.⁹⁰

Between 1538 and 1552, the main religious authorities and many chiefs of important lineages changed, and there is consequently a considerable

84 Platt, Bouysson-Cassagne, and Harris, *Qaraqara-Charka*, 264; Paula C. Zagalsky, "Nuevas preguntas sobre una antigua federación aymara. Algunos aportes en torno a la Federación Qharaqhara Charcas, siglo XVI," *Surandino Monográfico* 1 (2012): 1–36.

85 Josep Barnadas, *Charcas orígenes históricos de una sociedad colonial 1535–1565* (La Paz: IPCA, 1973), 591.

86 Platt, Bouysson-Cassagne, and Harris, *Qaraqara-Charka*, 201.

87 "To this Apuchalco Yupanqui he sent Manco Inca son of Guaynacapac ... to secretly kill because he had given favours to the Spanish, who were with Diego de Almagro". Alonso Ramos Gavilán, *Historia del célebre Santuario de Nuestra Señora de Copacabana* [1621] (La Paz: Academia Boliviana de la Historia, 1976), 44.

88 It is not known who succeeded the *Willac Umu* after his murder. Indeed, sixteen years is sufficient time for it to be clear that it is impossible for them to have participated in the handover of the great mine of the Sun in Potosí or of the other mines of which the Spanish took possession.

89 Bartolomé Álvarez, *De las costumbres y conversión de los indios del Perú. Memorial a Felipe II* [1588] (Madrid: Polifemo, 1998), 74.

90 Edmundo Guillén-Guillén, "Wila Oma: el último gran Intip Apun del Tawantinsuyu," in *El culto estatal del Imperio Inca*, ed. Mariuz Ziolkowski (Amsterdam: CESLA, 1988), 79.

documentary vacuum around 1545. We should thus note that the authorities changed in Copacabana, the important religious center of the Titicaca. After the 1552 murder of Challku Yupanqui, the Guanche chief, possibly from the Chinchaysuyu nation, held the position of principal chief of Copacabana. Moreover, at that time, two of his main chiefs were extracting silver, with miners proceeding from the Titicaca region for their Spanish encomendero, Licenciado León, in Potosí.⁹¹

After the murder of Atawallpa on August 29, 1533, new myths were created, such as that of the *Inkarrí*, to express the messianic aspirations of Andeans, and until the eighteenth century there was a commonly held idea “that they superstitiously believed that their Inca must rise again,” as said the *Inkarrí* myth, and that for him “they kept all of the rich mines of which they were aware without there being one which by means of requests, threats or punishments they wished to show to the Spaniard, thus imitating bad geniuses.”⁹² Potosí belonged to the Sun and was the richest.

The death of the Inca, the profanation of the tombs, and the destruction of the *wakas* by the eradicators of idolatries had catastrophic consequences.⁹³ Disease, drought, and death were the signs of a world whose seriously damaged balance evoked the imminence of a *pachacuti* (a moment when the Earth turns upside down). It is worth situating these events in the sphere of the Taqui Oncoy, when numerous Indigenous priests and ordinary people committed suicide to escape the colonial order.⁹⁴ Indeed, the insistence⁹⁵ of the Spaniards was such that there were individuals in Chaquí, a village near Potosí, who preferred to commit suicide rather than to hand over their mine.⁹⁶ Capoche, reporting a legend from the time of the Inca, disclosed that the threat against those from Chaquí had been issued: “the Indians from Chaquí, which is a village five leagues from this town [from Potosí] wanting to work it, at that time

91 del Río, “De sacerdotes,” 1–25.

92 Juan de Solórzano y Pereira, *Política Indiana* [1736–1739] (Madrid: Lope de Vega, 1972), T.1, Book II, Ch. 17.

93 Thus, in 1613, in the midst of the eradication campaign in Yauyos (Peru), one witness equated the Andean and Christian terms: “For me has now arrived the *cutipacha* which is the judgement, because these clerics and fathers who are coming destroy my *huacas* and shrines, woe betide you for ill is going to befall you and you have to suffer hunger, pestilence and death” (ARSI Peru: 14, on eradication of Yauyos).

94 Peter Gose, *Invaders as Ancestors* (Toronto: University of Toronto Press, 2008), 116.

95 “[S]ince this province at that time had the reputation of having rich silver mines thanks to those of Porco, Gonzalo Pizarro, who procured them with great insistence both through the Indians and through the Spaniards and their servants who sought them ...” (Nicolás del Benino, 1573, B.N.M. ms. J.58).

96 Barba, *El Arte de los Metales*, 53.

there was a very great mortality which, being attributed to this, they left it, and that it being known that the Inca was fearful of these abuses, he ordered that it should not be worked and that the Indians heard voices in the air that for other better people it was kept."⁹⁷

Regarding Potosí, I do, however, suspect that the taboo concerning the mining of the cerro existed long before the colony. Árzans de Orsúa y Vela evoked a similar tradition as in Chaquí, repeated a thousand times, without the taboo being fully interpreted. According to this tradition, when Huayna Capac ordered the miners to open the veins of the Cerro Rico, "a dreadful rumbling was heard which shook the whole cerro, and after this a voice was heard which said: do not take silver from this mountain because it is for other owners ... Astonished, the Indians ... told the Inca what had occurred, and on reaching the word of the rumbling they said Potocsi." The "rumbling" was so strong that it shook the ground as if it were a tremor or an eruption, as if the Earth wanted to turn upside down.⁹⁸

The role that Incas, and before them, Tiwanakotas, played in their empires was similar to the Sun's role on the cosmic plane. The Sun, the ancestors, and the stars were liable to communicate their strength (*camay* in Quechua) to humans, plants, animals, and mountains, revealing their true essence.⁹⁹ As the great mine of the Sun, Potosí concentrated more energy or solar strength than all the others, which made it more sacred and richer. In this respect, I shall cite another illustrative example. When encomendero Lucas Martínez Vegaso encouraged the miners of Tarapacá to give him their mine, there was an eclipse of the Sun, thus demonstrating a loss of energy as if "it wanted to die,"¹⁰⁰ the ground began to shake, and they thought that they would all perish.¹⁰¹ Indeed, those miners guarded a mine that had a vein of "pure white silver and where there were so many seams ... as there are veins on a cabbage leaf and there is news of a vein that the Indians have covered, which they say was of the Sun with a width of two feet, all of white silver." When they were about to show it to their encomendero, their ministers told them that they would all die and their own land would dry if they revealed it, then the land tremored. When the

97 Capoche, *Relación general*, 77.

98 Bouysson-Cassagne, "El Sol de adentro," 67.

99 Gérald Taylor, *Camac, camay camasca y otros ensayos sobre Huarochiri y Yauyos* (Lima: IFEA, 2000), 235.

100 The eclipse demonstrated a loss of force of the Sun; it was said that it died or fainted. See César Itier, *Viracocha o el Océano, naturaleza y funciones de una divinidad inca* (Lima: IEP-IFEA, 2013), 77.

101 Bouysson-Cassagne, "El Sol de adentro," 67.

Indigenous people saw the eclipse of the Sun and the shake of the land, they said that even if they were killed, they would not reveal the mine—and this is what they did, never wanting to show it.¹⁰² One more example appears in the *Carta annua* of the Jesuits in 1599. In it can be seen, in Chuquisaca, the manifestation of a *supay* (soul of the ancestor) in the form of a storm—thunder and air that became an earth tremor.¹⁰³ The mestizo who witnessed the scene, following the advice of his sorcerer, had visions of collapsed buildings, and the Earth shook until the voice of “a tiger” was heard. While our man evoked Santiago-Illapa, the syncretic god of lightning in the sixteenth century, “the tiger replied that he was called *Tunari*, the name of a Chuquisaca Mountain range.”¹⁰⁴

In these cases, the celestial forces and those of the underground world gathered together to prevent access to the subsoil and, under these conditions, it was understood that there were few candidates to hand over Potosí—except, perhaps, if it was thought that some reward would be obtained from the king of Spain; this may be why Gualpa seized a magnificent stone, which he succeeded in sending to the Spanish ruler.

Times had changed by 1545, but the rich Potosí, the great mine of the Sun, was still an unmatched reservoir of solar energy and wealth. In what follows, I shall focus on the disquieting character of the feline, so frequent in the iconography of the Tiwanaku and Wari. Its character was connected to the telluric forces of the underworld and to the Sun itself, and it prevented access to the mines with roaring and proclaims the names of the mountains, like an oracle, which clearly evokes the “lions” of the sanctuary of Cerro Rico.

4.1 *Wari Viracocha*

The mountains were places of memory linked to remote ancestors, prior to the Incas. These beings were generically named the Wari (or Huaris), providers of wealth and well-being, and “the Indians who go to the silver, gold or quicksilver mines knew how to worship the mountains or mines, asking them for rich metal ... they worshipped high mountains, raised hills and the houses of the Huaris, who are the first settlers, the natives of each land, who were giants.... The Indians believed that many became mountains, and they therefore worshipped them in stones.”¹⁰⁵ These cults to the lithomorphose of the ancestors,

102 Pedro Pizarro, *Relación del descubrimiento y conquista de los reinos del Perú* (Madrid: Atlas, 1965), 221.

103 Bouysse-Cassagne, “El Sol de adentro,” 78.

104 Bouysse-Cassagne, “El Sol de adentro,” 67.

105 de la Calancha, *Crónica Moralizadora*, 842.

creators of lineages, were also followed in the cultivated lands,¹⁰⁶ where they took the form of *huanca*s, raised stones that transmitted their animating force (*camay*) when the soul of the ancestor (*supay*) visited them. For these reasons, the miners of Chuquiabo worshipped *choquehuanca*, a golden *huanca*, which they considered “the lord of the gold who does not diminish.”¹⁰⁷ I will note that the word *choque*, which designates gold and which we will again find later on, was exclusively reserved for religious contexts.

Marie Helmer wrote in 1978 that in several mines, miners continued to venerate some ancestor in the form of a stone that they called *mallku*, *wallchi*, or *supay* and which represented “the soul” of the ancestor;¹⁰⁸ June Nash observed in 1979 that under the figure of the current *tío* in Oruro, they worshipped the old god and ancestor *Wari*.¹⁰⁹ The eradicator of idolatries, Arriaga, wrote that “they invoke Huari, who they say is the God of strength, when they have to work on their fields or houses so that he will provided it¹¹⁰ and the men of Huarochirí, before any tough task, asked *WariViracocha* for his help throwing coca on the ground,¹¹¹ as *Wari Viracocha* was a man who lived inside the Earth. A Jesuit *Carta annua* of 1613, reported by Itier, portrays him as “a famous man of great strength and skilled at tilling and digging and who one day entered a cave, and they invoke him with great voices and as in the cave there is an echo, they feign that he answered, they hope that in the labours in their fields they have to worship it.”¹¹² The Andean experts in mining knew how to address the *wakas*, who replied to them during their shamanic sessions, when they took hallucinogens and were drinking. Arriaga provided an incomparable description of one of these assemblies, confirming the connection of felines with the inside world and that of the ancestors—*Wari*—with *otorongos* when he wrote: “in these meetings (of native priests) the demon appears to them, sometimes as the figure of a lion, others as the figure of a tiger, and sitting and

106 Pierre Duviols, “Un symbolisme de l’occupation, de l’aménagement et de l’exploitation de l’espace, le monolithe ‘huanca’ et sa fonction dans les Andes préhispaniques,” *l’Homme* 2 (avril–juin 1979): 7–31.

107 Bouysse-Cassagne, “El Sol de adentro,” 75.

108 Bouysse-Cassagne, “El Sol de adentro,” 73.

109 Bouysse-Cassagne, “El Sol de adentro,” 134.

110 Pablo Arriaga, *La extirpacion de la idolatria en el Peru* (Madrid: Crónicas Peruanas de Interés Indígena—Biblioteca de Autores Españoles, Atlas, 1968), 102.

111 Gerald Taylor, *Ritos y tradiciones de Huarochiri* (Lima: IFEA-Banco Central de Reserva del Perú-Universidad Particular Ricardo Palma, 1999), 10–11, cited by Itier, *Viracocha o el Océano*.

112 Itier, *Viracocha o el Océano*, 42.

standing on its arms very furiously, they worship it.”¹¹³ Further important documentation in 1571 lets us understand the place occupied by *Viracocha*, in Incan times, when a mine was opened: “When the Indians discovered a gold or silver mine, they offered it to their god and then to their idols and *waka*, assigning them parts which would belong to them and in second place they gave it to the Incas and no one could have a mine privately. They offered the first mineral to Viracocha and to their *wakas*.”¹¹⁴

The association of the *otorongo* with hallucinogens has been widely studied. For the Andean center-south, Pérez Gollán stressed the importance of consuming psychotropic substances during the first millennium AD.¹¹⁵ In Tiwanaku, monoliths Bennett and Ponce represent characters with snuff tablets and ceremonial bowls (*keros*) in their hands. The inhaling tubes and snuff tablets from the Tiwanaku era in the Kallawayá regions of Nino Korin and of Amayagua (oriental Andes, half-way between Lake Titicaca and Amazonia) have also been studied.¹¹⁶ In relation to funerary items found in the village of Pallca (Larecaja province), Loza noted that a jaguar skin was used as a big leather container and another as a case for the small spoon used for psychotropic powders. Capriles, in turn, observed that the presence of a jaguar skin in the funeral items of Pallca was significant in relation to the exchanges that this region had with the lower Amazonian land whose god was precisely the *Otorongo* (see Figure 1.1, the *Otorongo*, god of the Antisuyu in Guaman Poma de Ayala).

Similarly, during the eradication that he carried out on the Oruro mines in 1632, Franciscan friar Bernardino de Cárdenas disclosed that the rites were addressed to the *Otorongo*, from which “they requested its strength.” Throughout this ritual, in addition to coca, the miners made use of a psychoactive plant. Furthermore, it is worth underlining that we witness, for the first time, a rite to the *Wari-Otorongo* ancestor in a mine related to the use of substances with narcotic effects.¹¹⁷

113 Arriaga, *La extirpación de la idolatría*, 208. *Otorongos* are jaguars (*Panthera onca*). The Spanish did not know the jaguar before the conquest, so they gave them the names of the animals they knew (lions, tigers).

114 Bouysse-Cassagne, “Las minas del centro-sur,” 447.

115 José Antonio Pérez-Gollán and Inés Gordillo, “Alucinógenos y sociedades indígenas del noroeste argentino,” *Anales de Antropología* 30, no. 1 (1993): 299–350.

116 José María Capriles, “Intercambio y uso ritual de fauna por Tiwanaku. Análisis de pelos y fibras de los conjuntos arqueológicos de Amaguaya, Bolivia,” *Estudios Atacameños* 23 (2002): 33–50; Carmen B. Loza, “El atado de remedios de un religioso/médico del período Tiwanaku: miradas cruzadas y conexiones actuales,” *Bulletin de l’Institut français d’Etudes Andines* 36, no. 3 (2007): 317.

117 Bouysse-Cassagne, “Las minas del centro-sur,” 453–54.

IDOLOS IVACAS DE LOS AIDISVIOS

268



261

FIGURE 1.1 The Otorongo, God of the Antisuyu in Guaman Poma de Ayala

As we remember, on the Potosí summit stood “the beds of lions from this land”; further on, we will understand the persistence of idolatrous rituals in the Cerro Rico linked to felines.

In 1632, Friar Cárdenas wrote about the Oruro mines:

[T]hey almost all die in a pitiful state of idolatry because in the mine they commit bad idolatries, calling it “lady and queen” and telling it to soften and offering it in sacrifice a wretched herb which they call coca ... the Indians buy it to give them strength and it is just a terrible deceit of the demon, to which the Indians make idolatry, calling it *Otorongo*, which means strong tiger and they offer it roots which they call *curu* which I would also banish if God and your Majesty gave me a hand. I ascertained these two kinds of idolatry in the Oruro mines where I was last year, when in pursuit of my visit and mission I found that it included all the Indians who worked in the mines and no one until I arrived had taught them anything against or reprimanded them for such a great sin or preached against it, such is the neglect that exists here of the teaching and salvation of these poor Indians.¹¹⁸

This document reports on one of the longest-lasting mining rites in favor of the *Otorongo* in Oruro and probably also in Potosí and in other mines, a process that remained unnoticed until the Cárdenas visit. The likelihood that these rites were earlier disseminated seems feasible when the existence of similar cultural practices is considered in the copper mine of Las Turquesas in Salta (Argentina), where a jaguar shinbone was found together with seeds of *villca* (*Anadenanthera colubrina*, an arboreal plant whose seeds contain alkaloids). In the “old Inca cave” related to these copper mines, human occupation was recorded subsequent to 1000 AD, and its ritual character was demonstrated in cave art from the middle period (500–1000 AD). One of the most striking motifs in the cave is a jaguar with mottled skin, an *otorongo*.¹¹⁹ Recently, Horta also related the snuff trays of Atacama with Tiwanaku influence—given their

118 Fray Bernardino de Cárdenas, *Memorial y relacion de cosas muy graves muy importantes al remedio y aumento de el reino del Peru y al consuelo de la conciencia del Rey nuestro señor y descargo de ella y a la multiplicacion de su hacienda real y prosperidad de su corona* (Biblioteca del Palacio Real Madrid, Miscelanea de Ayala, 2845), 28–29.

119 Gabriel Lopez and Federico Coloca, “The cueva Inca Viejo site, Salar de Ratones, Puna de Salta: Archaeological Evidence and Process of Macro-Regional Interaction,” *Relaciones de la Sociedad Argentina de Antropología* 40, no. 1 (2015): 45–71.

iconography of felines—and to the copper mining of that region.¹²⁰ This confirms the presence of a ritual in favor of the *Otorongo* during the Tiwanaku period associated with psychotropic substances in an extremely broad region and in different kinds of mines.

Cárdenas wrote that in Oruro, the shafts were consecrated to the *Coya* (“the queen” in Quechua), and Álvarez (1588) described how the miners used previously chewed coca (*acullico*) to soften the hardest parts of the rock when they were mining. Later, the Church superimposed the figure of the Virgin Mary on that of “the lady and queen,” as is shown in the famous picture of the “Virgen-cerro of Potosí.”¹²¹ In fact, all stages of the mining process were ritualized: entering the mine, the mining, the smelting; “at that time they confess to the *ichuri* (Indigenous confessors and probably experts of smelting) and offer coca to the *wayra*.”¹²² When they left Potosí to bring *soroche*, they worshipped the *soroche* mine and offered coca leaves, and they did the same when they carried coal from the mine.¹²³ During the Incas, the coca leaves were reserved for the cult of the *wakas* and shared between them.¹²⁴

The *curu* (Quechua) (*Nicotiana spp.*), *petén* (field tobacco), or *curupau* (Guaraní)—which included more than forty-five species and was cultivated in the eastern valleys of Bolivia and Peru and in Amazonia—was inhaled, smoked in pipes, drunk mixed with corn beer (*chicha*), or mixed in preparations based on cebil (*villca* in Aymara), and was included in the composition of enemas.¹²⁵ Both tobacco leaf and root were taken.¹²⁶ *Nicotiana glauca* and *nicotiana glutinosa* grew among the Kallawayá of the foothills in the Umasuyo part of Lake Titicaca, and their “doctors” nowadays recognize that *nicotinia glauca* has narcotic effects when the dry powder of its flowers is mixed with *chicha* and that

120 Helena Horta, “El estilo circumpuneño en el arte de la parafernalia alucinógena prehispánica,” *Estudios Atacameños* 43 (2012): 5–34. Helena Horta, “Lo propio y lo ajeno: Definición del estilo San Pedro en la parafernalia alucinógena de los oasis del Salar de Atacama,” *Chungara* 46, no. 4 (2014): 559–83.

121 Bouysson-Cassagne. “El Sol de adentro,” 64.

122 The *ichuri* are the confessors.

123 Álvarez, *De las costumbres y conversión*, 354–61.

124 Álvarez, *De las costumbres y conversión*, 366.

125 Pérez-Gollán and Gordillo, “Alucinógenos y sociedades,” 303.

126 Two classes of tobacco are distinguished in the *Relaciones geográficas de Indias*: “The Indians also have tobacco, which they call *sayre*, which the black people use a lot, and the Indians purged themselves with the root which they call *coro* and they take it in powder” Marcos Jiménez de la Espada, *Relaciones geográficas de Indias* [1586] (Madrid: Atlas, 1965), 349.

the leaves and dry flowers of *nicotinia glutinosa* have hallucinatory effects.¹²⁷ We will examine the situation of the Kallawaya later on.

In the seventeenth century in La Plata province, a great deal of tobacco (*sayre*) was used, "brought from those below and from the people of *Chiriguanaés*, in blocks which is stronger." Recent ethnobotanical studies by Scarpa and Rosso demonstrate that, in part of the current region, *coro* continues to be used for symptoms of body weakening and to regain strength, and we therefore understand the reason for its use when the miners prayed to the *wari*.¹²⁸

Bearing in mind the importance of "the lions of the earth" worshipped on the peak of Cerro Rico, the rites of the miners, although partially reformulated in the sixteenth century, did not end in "the mouth of Hell." "Every day of the week, the *curacas* [chiefs] are drinking and with them there is always someone to drink from those who move and complete the task.... In the festivals, they are usually singing and drinking from midday throughout the night and another day afterwards. And the priests cannot stop them."¹²⁹ In the beginning of colonization, many of the colonial *keros* used during those drink-offerings in the mines were made of wood and decorated with superb feline figures.¹³⁰

5 The Miners of the Collasuyu and Their Divinities

The documentation distinguishes several political units prior to the Incas whose identity and territoriality were reflected in their *wakas*. The expansion of the Tawantinsuyu promoted the incorporation into the Inca state pantheon of several socially and politically important *wakas*, particularly in the Collasuyu, which the Incas conquered for its mines and for the worship center on the Island of the Sun on Lake Titicaca.

In order to conquer this south quarter, the Incas first formed an alliance with the Colla chiefdom, and later they fought and conquered them with the help of the Lupaca,¹³¹ who lived on the opposite shore and had an Aymara-speaking majority. Having rebelled three times and resisted the Incas, the Pukina-speaking Colla were defeated, massacred, and the region was divided by the armies of Tupac Yupanqui.¹³²

127 Louis Girault, *Kallawaya, guérisseurs itinérants des Andes* (Paris: IRD, 1984), 395–96.

128 G. Scarpa and C. Rosso, "Etnobotánica del *coro* (*Nicotinia paa*, *Solnacea*): Un tabaco silvestre poco conocido del extremo sur de Sudamérica," *Bonplandia* 20, no. 2 (2011): 391–404.

129 Álvarez, *De las costumbres y conversión*, 355.

130 Álvarez, *De las costumbres y conversión*, 81.

131 Cobo, *Historia del Nuevo Mundo*, 19.

132 Bouyasse-cassagne, "Apuntes para la historia de los pukina hablantes," 292–93.

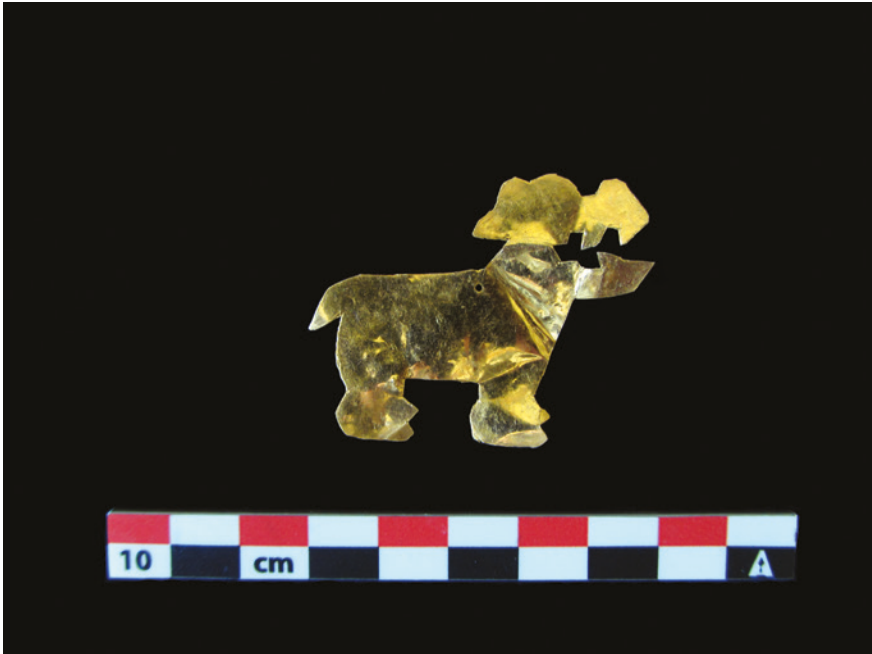


FIGURE 1.2 Gold plaque from Lake Titicaca. Christophe Delaere, *Le Patrimoine Subacquatique Du Lac Titicaca, Bolivie. Utilisation et Perception de l'espace Lacustre Durant La Période Tiwanaku (500–1150 PCN)* (Oxford: BAR Publishing, 2020)

5.1 *The Island of the Sun*

The sanctuary of Titicaca was among the most sacred temples of the Inca Empire, being the place where the Sun was born for the Incas, but its fame began long before. Archaeologists Bauer and Stanish, who discovered twenty-eight Tiwanaku sites on the Island of the Sun and two on the Island of the Moon,¹³³ proposed that, around 650 AD, these islands had become an essential part of the Tiwanaku state, and we know that during the apogee of this culture (800–950 AD), important metallurgical activity developed, as Guedron and Delaere noticed, in this region. Insofar as religion, exploitation, and metallurgy were inextricably linked, it is therefore crucial to establish the identities of the divinities to whom people prayed in the lacustrine area.

Delaere recently found several Tiwanakota objects at the bottom of the lake, on the Khoa reef (north of the Island of the Sun), including several gold plaques representing a small feline (see Figure 1.2).

¹³³ Bouysse-Cassagne, “Las minas de oro,” 9–36.

He notes that this representation also appears on a medallion located on the chest of the “staff god” of the Tiwanaku. And Delaere’s most recent subaquatic discoveries moreover attest to rituals linked to the main divinities of this culture, such as the god of the radiant face, that he identified with *Wiracocha*. This god, also appears on another medallion, along with various jaguar teeth and several censers in the shape of felines.¹³⁴

For linguist Torero, *Huira* (from Huiracocha) is a metathesis of *Huari* (*Wari*, the Sun) and, consequently, *Wiracocha* (or *Viracocha*) should be translated as lake (*cocha*) of the Sun.¹³⁵ *Viracocha* and *Huari* (*Wari*) would be the same solar divinity and we legitimately suspect that the whole lake was divine and that most of the numerous aquatic sacrifices and ritual gifts of the Titicaca were made to this underwater feline god.

According to linguist Itier, the Incas conceived the relationship between *Wiracocha Pachayachachi*¹³⁶ and the Sun (*Inti*), as that of the Inca with his personal golden double (*guaucue*), in such a way that the Sun was the receptacle in which *Wiracocha* projected itself.¹³⁷ Furthermore, and quite rightly, Itier proposed that the nature of *Wiracocha* was first of all aquatic, and that it was a question of the “groundwater which supplied all of the local hydrographic networks.”¹³⁸ *Wiracocha*, who Garcilaso de la Vega compared with a “great nocturnal swimmer,” travels the underworld by night as a nocturnal Sun opposed to the solar light of the day.¹³⁹

On appropriating the traditions, myths, gods, and fame of the Tiwanaku, the Incas made the Island of the Sun their place of origin. Considering that the Sun had emerged from the depths of the lake where it was born,¹⁴⁰ “it was said that when the Ingas [Incas] were in the high lands, they worshipped the Sun, in their sanctuary of Titicaca, saying this is the one who animated us the Incas.”¹⁴¹ The Incas asserted that *Wiracocha* had emerged from the depths of the lake in the form of a man¹⁴² and some versions of this myth state that this god traveled to the islands of the lake, from which the Cuzco elite came.

134 Christophe Delaere, José Antonio Capriles, and Charles Stanish, “Underwater ritual offerings in the Island of the Sun and the formation of the Tiwanaku state,” *Proceedings of the National Academy of Sciences* 116, no. 17 (2019): 8233–38.

135 Alfredo Torero, *Idiomas de los Andes*, 137.

136 *Pachayachachi* means “the one who takes the surface of the earth to the point of development required.”

137 Itier, *Viracocha o el Océano*, 78–79.

138 Itier, *Viracocha o el Océano*, 46.

139 Itier, *Viracocha o el Océano*, 111.

140 Cobo, *Historia del Nuevo Mundo*, 62–63.

141 Taylor, *Ritos y tradiciones de Huarochiri*, 280–81.

142 Betanzos, *Suma y narración de los Incas*, 11.

But the cult of the underwater *Wiracocha* didn't stop with the Tiwanaku. When Inca Huayna Capac entered the lake during a period of high water, surprised to not find the submerged Apinguela Island, he decided to make sacrifices. He made some stone containers with offerings and he submerged them to the bottom of the lake with ropes. In this process, so many infants and animals were killed that the water of the Titicaca became reddish. From that moment, this part of the lake was called *Vilacota*: "lake of blood" in Aymara.¹⁴³ Delaere found about twenty-eight Inca-period stone containers in the Khoa ridge near the Island of the Sun and another one in the *K'akaya*, the oriental sector of the Titicaca, near Escoma Bay, this last one containing a gold offering and a small carved llama of mullu.¹⁴⁴ In my opinion, those offerings to the *Wiracocha* Sun were probably individual votive gifts of pilgrims who went to the sacred island.

Under the Incas, the cult of the sacred lake took on such political importance that it led to the creation of a great center that governed the Collasuyu and was a cosmopolitan place of worship and sacrifice, with displaced people (*mitimaes*) from more than forty different chiefdoms and noble families of Cuzco established on the peninsula of Copacabana. For these reasons, at the time of Tupac Yupanqui, during the Inca great feast of the Sun (*Capac Raimi*), hundreds of young infants were sacrificed near the sacred rock of the island, and Huayna Capac, before his journey to Ecuador, consulted the Titicaca oracle, made many "luxurious" sacrifices in Lake Titicaca, and left in the island some local priests to pray *Wiracocha*. All these offerings were aquatic *capacochas*, supreme Inca sacrifices to the Titicaca's Sun.¹⁴⁵

In addition, in the context of the mines and because the first gold mineral of a mine was offered to *Wiracocha* during the Inca Empire, it seems necessary to consider a speech that the *Qolla* addressed to the Inca in the book of Pachacuti Yamqui Salcamaygua. We can observe that, when this speech was pronounced, there existed between *Wiracocha* and the Sun not only a dual sacredness, but also mineral and political symbolism. The *Qolla* and the Sun were related to a silver stool and the Inca to *Wiracocha* and a gold one:

143 Thérèse Bouysse Cassagne, "Le lac Titicaca, histoire perdue d'une mer intérieure," *Bulletin de l'Institut Français d'Etudes Andines* 21, no. 1 (1992): 128.

144 The mullu (*spondylus*) is a seashell. Delaere, "El contexto y significado de una ofrenda subacuática intacta del Lago Titicaca," *Chachapuma, Revista de Arqueología Boliviana* 10 (2021): 21–22.

145 Pedro Sarmiento de Gamboa, *Historia de los Incas* [1572] (Buenos Aires: Emecé Editores, 1942), 142–43.

I, king of Qolla,
 we will take, we will eat, we will talk. Let no one talk.
 I sit on the silver,
 you sit on the gold,
 you worship Viracocha the creator of the world
 I worship the Sun.¹⁴⁶

Before the Inca conquest of the Collasuyu, the Pukina-Colla and Uro-Colla chiefs of Capachica and Coata, who had composed the one exclusively monolingual Pukina-speaking encomienda of the Collasuyu in the sixteenth century and had been part of the Colla chiefdom during the late intermediary period, considered themselves to have been the owners of “the Island of the Sun and of other islands, such as Taquile, Amantani and of an important *waka* in Guarina called *inteca* which is like of the Sun.”¹⁴⁷ This may be the reason Murúa portrayed the Pukina-Colla and Uro-Colla worshipping the Titicaca idol on the top of a mountain or on a rock, with a big Sun on the background (Figure 1.3). In clarifying our arguments, it is necessary to remark that the most important religious islands of the Titicaca had belonged to the Pukina and Uro-Colla before the Incas and that our sources didn’t mention, in this case, an Aymara presence.

Once the Pukuina-Colla and Uro-Colla had been conquered, Tupac Yupanqui expelled them from the Island of the Sun and transferred them to Yunguyu, in the Lupaca land of their opponents,¹⁴⁸ built new temples on the island¹⁴⁹ banned the Colla groups from some of the important state festivals, appointed Sucusu (father of Chalco Yupanqui), bastard son of *Wiracocha Inca*, as governor and priest of the Sun of the Collasuyu, and implemented an active policy of discovering mines.¹⁵⁰ In Yunguyu, those Pukina and Uru formed a group of *ichuri* who confessed the pilgrims who went to the sanctuary of Copacabana under the Incas.

146 Juan de Santa Cruz Pachacuti Yamqui Salcamaygua, *Relación de antigüedades deste reyno del Piru* (Lima: IFEA, 1993), 146–47.

147 Bouysse-Cassagne, “Apuntes para la historia,” 294, citing Fray Martín de Murúa, *Los orígenes de los incas: crónica sobre el antiguo Perú* (Lima: Ediciones Miranda, 1946).

148 Bouysse-Cassagne, “Le palanquin d’argent,” 65.

149 Brian S. Bauer and Charles Stanish. *Ritual and Pilgrimage in the Ancient Andes: the Islands of the Sun and the Moon* (Austin: University of Texas Press, 2001), 125–32.

150 See Roberto Santos Escobar, “La contribución de Apu Chalco Yupanqui, gobernador del Kollasuyu en la expedición de Diego de Almagro a Copiapo, principio de Chile,” *Colección de Folletos Bolivianos de Hoy* 3, no. 24 (1987); Roberto Santos Escobar, “Probanza de los Incas Aucaylli de Copacabana,” *Colección de Folletos Bolivianos de Hoy* 2, no. 8 (1984): 1–33.



FIGURE 1.3 The Puquina and Uro Colla Worshipping the Titicaca with the Sun in the background by Murúa

The religious Sucusu Inca family of Cuzco, whose familiar divinity was *Wiracocha*, settled in Copacabana, as mentioned, for religious, strategic, and

economic reasons together with several families from the nobility of the Inca capital, from the royal lineages (*panacas*) of Capac Yupanqui, Topa Inca Yupanqui, Huascar, and Lloque Yupanqui.¹⁵¹

We note that by the seventeenth century, all the places cited by Murúa that had belonged to the Pukina and Uro-Colla of Capachica and Coata were part of the properties of don Lope José Mayta Capac Atauchi, heir of the famous Tito Atauche, brother of Huascar Inca, who also lived in Copacabana during the Inca Empire, as del Río remarks.¹⁵²

Some *mitimaes* from the Canas, Canchis, and Colla, who probably formed part of the Tiwanaku *mitimaes* (displaced persons) of the Island of the Sun, stayed in Copacabana. All those groups, as del Río noted, were devoted to *Wiracocha* and had very famous sanctuaries dedicated to this god in their own lands; this is likely reason they stayed to pray to this god of the underworld on the island.¹⁵³

5.2 *The Collas and the Mines*

In creating the first linguistic map of the Collasuyu, I demonstrated that, in the sixteenth century, the Pukina language, particularly linked to the Collas, continued to be spoken at the beginning of colonization in a broad area mainly on the eastern bank of the Titicaca, in the Omasuyu area, among the chiefdoms of the Canas, Pacajes, Collas, and Kallawayas, where the workforce was recruited to mine the gold deposits of Larecaja and Carabaya.¹⁵⁴

A long unnoticed part of a very well-known document allows me to assert that, before the Incas, the Pukina-speaking Collas were not only the owners of the sacred Titicaca island, as said, but also of the Potosí silver and the Carabaya gold mines. Indeed, in two chapters of his *Letter to the King*, Poma de Ayala, referring to the past, considers that the wealth and power of the Colla lord, and of the Colla queen, *Capac Comege*, was linked to them being owners of both mines. Poma de Ayala wrote: “*Capacomemallku warmi tallama*, this woman was very beautiful so fat she was ... rich people called *colla capac* rich with silver from potosí and with gold from carabaya the finest gold in the entire

151 del Río, “De sacerdotes,” 64.

152 del Río, “De sacerdotes,” 65. Those sanctuaries were Vilcanota, Aconcagua and Cacha.

153 del Río, “De sacerdotes,” 24.

154 Thérèse Bouysse-Cassagne, “Perteneencia étnica, status económico y lenguas en Charcas a fines del siglo XVI,” in *Tasa de la Visita General de Francisco de Toledo*, ed. D. N. Cook, (Lima: Universidad Mayor de San Marcos, 1975), 314; Bouysse-Cassagne, “Apuntes para la historia,” 288.

kingdom.... And they are big, weak, clumsy beasts and therefore they are called *poquiscolla, mapa colla*.”¹⁵⁵

The words *capac* and *ome*, which designed the Colla queen, are recorded as Pukina by de la Grasserie (1894), in his compilation of the lost dictionary of Oré: *Capac* means “rich” and *ome* means “mother.” Consequently, *Capac Comege* was the “Rich Mother” and Pukina-speaking Colla queen.¹⁵⁶

Another important aspect should also be taken into account. Several sources relate the *Capac Colla*, the Pukina-speaking lord, heir of Tiwanaku, with the cult of the Sun and of course with the Island of the Sun. His noble title was *Capac Capaapoyndichuri*, which, according to Betanzos, means “king and only lord son of the sun.”¹⁵⁷ For his part, Sarmiento proposed that “this *Chuchi Capac* (or *Colla Capac* as he also called him) gained so much in authority and wealth in the nations of the Collasuyu that all of the Collas respected him as ‘*Inca Capac*.’”¹⁵⁸ This sovereign controlled the people over “twenty leagues from Cusco to the Chichas and all the districts of Arequipa and the seacoast toward Atacama and the mountains on the Mojos.”¹⁵⁹ This vast territory, which corresponded approximately to the formerly Tiwanaku region of influence, was gradually divided into different chiefdoms when the empire collapsed, without all its prestigious *wakas* and traditions having been completely destroyed, as I will show.¹⁶⁰ Under these conditions, and although the old Colla territory was divided up in the sixteenth-century documentation, it is worth observing that we continue to find remains of the Pukina language linked to cults of Tiwanaku background, in the environment of the Carabaya and Larecaja gold mines and in Potosí at that time. Consequently, we might wonder how much of our historic documentation relative to the mines is the result of the diaspora generated by the collapse of Tiwanaku, as some of the limnologist studies supposed, or the remaining Tiwanaku Empire, or both.

But first we have to take into account the numerous changes generated by the Incas in the mines of Carabaya and then of Potosí.

After the conquest of the Collas and the massacre of their lord, Inca Pachacuti Yupanqui reorganized the gold mining region bordering the lands of

155 Felipe Guaman Poma de Ayala, *Coronica de Buen Gobierno* [1615–1616] (México: Siglo XXI Editores, 1980), cap. 77 and 178.

156 Raoul de la Grasserie, *Textes puquina contenus dans le “Ritualet seu manuale peruanum” de Gerónimo de Oré publié à Naples en 1607* (Paris: Jean Maisonneuve, 1894), 18.

157 Bouysse-Cassagne, “Las minas de oro de los incas,” paragraph 65.

158 “Inca” is a title, not an ethnic name. Sarmiento de Gamboa, *Historia de los Incas*, 103–5.

159 Sarmiento de Gamboa, *Historia de los Incas*, 105.

160 Bouysse-Cassagne, “Apuntes para la historia,” 295.

177 TER ZERA SEMORA
CAPACOMETALLAMA



173

FIGURE 1.4 The Colla Queen, *Capac Comege*. Guaman Poma de Ayala, *Coronica de Buen Gobierno* [1615–1616] (México: Siglo XXI editores, 1980), 156

the Antisuyu,¹⁶¹ appointing new chiefs. At that time, it was the Pukina-speaking chief of Charazani, Ari Capac Iqui, and his son, Hayaba, who opened the path

161 The lowland Amazonian quarter of the Inca Empire.

to the nearby Antisuyu lands to the Incas, through the Apolo valleys,¹⁶² where they found more gold mines. In repayment, the Inca appointed Ari Capac Iqui as governor of a new Inca-Kallawayaya province.¹⁶³

Subsequently, a fraction of the lands of Larecaja formed part of the heritage of the lineage of Tupac Yupanqui. In 1550, Sayri Tupac, his descendant, was recorded as owning the property of his great-grandfather in this region.¹⁶⁴ According to Saignes,¹⁶⁵ a member of the Sucusu's family established in Copacabana, Orco Guaranga Acustupa Inca, was, in turn, appointed as governor of the Chunchos, Yungas, and Larecaja, when the lands of Titicache and Guacatti of the Ayata valley in Larecaja region were assigned to the Titicaca *waka*, demonstrating the relationship that the Incas maintained with this gold mining region and worship center.¹⁶⁶ This is how the Sucusu, and several members of the *panaca* of Tupac Yupanqui, exercised control over the gold region that had belonged to the *Qolla*, appointing new authorities.

On the connection between the Kallawayaya language related to the Pukina and the practice of herbal medicine, Saignes wrote in his introduction to the Kallawayaya vocabulary of Girault that it was around the twelfth to fifteenth centuries—during the late intermediate, between the collapse of Tiwanaku and the Inca conquest—that the Kallawayas originating from the Colla chiefdom settled in the Yungas.¹⁶⁷ Were those Kallawayaya curanderos the heirs of the doctors and priests of Tiwanaku, whose knowledge was transmitted by the regional Colla kingdom?

One very important piece of historical data authorizes us to connect the mine workers of Carabaya to the religious traditions of the lowlands of the Andesuyu and to those of Lake Titicaca during Tiwanaku. During the reign of Tupac Yupanqui, a feast in honor of the birth of his son, Tupac Amaru, was celebrated. On this opportunity, “the miners of Carabaya and the *mitimaes*

162 Thierry Saignes, “Introduction,” in *Kallawayaya*, ed. L. Girault (Paris: Éditions de l'ORSTOM, 1984), 35–47; Thierry Saignes, “De la filiation à la résidence. Les ethnies dans les vallées de Larecaja,” *Annales* 33 (1978): 5–6; Carmen B. Loza, *Kallawayaya: reconocimiento mundial a una ciencia de los Andes* (La Paz: UNESCO, Viceministerio de Cultura, Fundación Cultural del Banco Central de Bolivia, 2004), 44.

163 Bouysse-Cassagne, “Las minas de oro de los Incas,” paragraph 46.

164 María Rostworowski de Diez Canseco, “Nuevos datos sobre tenencia de tierras reales en el incario,” *Revista del Museo Nacional* 31 (1962): 130.

165 Thierry Saignes, *Los Andes orientales: historia de un olvido* (Lima: IFEA/CERES Cochabamba, 1985), 255.

166 del Río, “De sacerdotes,” 22.

167 Saignes, “Introduction,” 36–37.

carried to Cuzco their divinity which animated the *otorongos* as ‘apu’.¹⁶⁸ It was the god *choquechinchay*, a gold ocelot,¹⁶⁹ who also represented a constellation of twenty-seven stars.¹⁷⁰ This god of the Carabaya gold mine was characterized in the sources by his polysemy: he was related to the celestial sphere, atmospheric phenomena, and the world of the mine, as I have demonstrated in a previous paper.¹⁷¹ Indeed, in the well-known cosmographic representation of Pachacuti Yamqui Salcamaygua,¹⁷² this small feline, which spits hail (*chichi* in Quechua), was also the provider of gold nuggets (*chichi cori*).¹⁷³ It has two names on this drawing: *choquechinchay*¹⁷⁴ and *coa*. According to Lira’s modern Quechua dictionary, the *choquechinchay* (or *felis pardalis equatorialis*) is a feline with mottled skin, halfway between the jaguarundi and the wildcat.¹⁷⁵

In Oré’s Pukina text, *coa upalleno* means “sorcerer” and in the form of *regah coa upalleno* means “worshippers of the *regah coa*.”¹⁷⁶ According to Adelaar, *coa* is a synonym for *waka*¹⁷⁷ and Girault translates *reka* (or *regah*) as “cat.”¹⁷⁸ In short, the Pukina Collas of Carabaya—who spoke the same Arawak language as those of Capachica and Coata, the old owners of the Island of the Sun—were sorcerers and miners who worshipped a mottled feline (the *chinchay* or *coa*)¹⁷⁹ that supplied gold (*choque*). This wildcat, who “animated” the Amazonian *otorongos*,¹⁸⁰ not so surprisingly looked very much like the small Tiwanaku golden god representation founded by Delaere in the bottom of Lake Titicaca near the Island of the Sun (Figure 1.2).

A small number of evangelizers learned the difficult Pukina language. While most Pukina speakers were bilingual during the sixteenth century, the Spanish

168 In the sky, numerous stars protecting and stimulating the land animals were considered *apu*.

169 According to Lira, the *tigrillo* or *Felis pardalis aequatorialis* from the *felidae* family is the Chinchay or ocelot. Cf. Jorge Lira, *Diccionario Kkechuwa-Español* (Tucumán: Universidad Nacional de Tucumán, Instituto de Historia Lingüística y Folklore, 1944), 290. According to Polo de Ondegardo, “He was a tiger who protects tigers, bears, and lions.” Spaniards gave the jaguar the name of the only felines they knew at that time.

170 Bouysse-Cassagne, “Las minas de oro,” paragraph 53.

171 Bouysse-Cassagne, “Las minas de oro,” paragraph 53–57.

172 Pachacuti Yamqui Salcamaygua, *Relación de antigüedades*, f. 21v.

173 Bouysse-Cassagne, “Las minas de oro,” paragraph 53–57.

174 *Coa* was added by Francisco de Ávila, who possessed the Salcamaygua manuscript.

175 Lira, *Diccionario Kkechuwa-Español*, 476.

176 de la Grasserie, *Textes puquinás*, 13, 37, 53.

177 Although in another part of Oré’s treaty, he writes *coac upalleno*, “serpent worshippers.”

178 Girault, *Kallawaya, guérisseurs*, 58.

179 Both, Oré and Calancha consider that the *coac* idols could also be a serpent.

180 Bouysse-Cassagne, “Las minas de oro,” paragraphs 53–57.

often evangelized in Aymara or Quechua. This was one of the reasons the Pukina tongue remained secretly attached to idolatrous cultural traditions like prestigious Colla rituality, inherited from Tiwanaku.¹⁸¹ However, the presence of Kallawayas specialists in curative art is scarce in the documentation. One (late) document, the Second Sinode of la Plata of 1619, states that “many of the Collas who walked through the Collasuyu pretended to be doctors and that they know how to cure, and they raised doubt among the Indians and a lot of sorceries.”¹⁸² And it is no small matter that the word *colla* means medication in Aymara. Two documents were mentioned by Torero: the first, in 1766 of a Catholic priest of the village of Charazani, described them as herbalists wandering on the pathways of the viceroyalty “carrying aromatic resin, incense, *quina-quina* (*coutarea hexaandra*), medicinal plants, they restore health thanks to the application of a mixture of herbs with specific properties”;¹⁸³ the other document (1800), a memorial of six Kallawayas from the village of Curva, relates the facts that led them to sell their medicines in Buenos Aires in order to pay their tribute.¹⁸⁴ The Kallawayas, priests and doctors of the Omasuyo valleys, prayed to the *choquechinchay* and knew the *Otorongo*, god of the nearby Antisuyu, where they collected plants for their pharmacopeia. We can easily conceive that those prestigious itinerant specialists, custodians of the religious and historic memory of Tiwanaku, were effectively a link between the diaspora’s people, and we can suspect their presence in the mines as providers of ritual psychotropic drugs for the miners and religious specialists in the mines. It seems likely that those Kallawayas disseminated their mining knowledge, but we have no direct information concerning that transfer.

6 Potosí, God of the Cerro, the Incas, and the Tiwanaku Background

Regarding the region of Potosí, I would like to stress that the “Copia de Curatos” that I discovered mentions that in 1596, Pukina, Quechua, and Aymara were spoken in the parishes of Potosí, and Pukina in the reductions (villages) of San Francisco de Puna, Quilaquila, and Yotala in the Yampara lands and in La Plata (Sucre).¹⁸⁵ Furthermore, chronicler Pedro Pizarro realized that the language spoken by the Charcas, allies of the Qaraqara, was “somewhat different” and

181 Bouysse-Cassagne, “Apuntes para la historia,” 287.

182 Bouysse Cassagne, “Le lac Titicaca,” 151. *Colla* means “doctor” in Aymara.

183 Saignes, “Introduction,” 16.

184 Torero, *Idiomas de los Andes*, 457.

185 Bouysse-Cassagne, “Pertenenencia étnica,” 312–28.

that “the *Amparaes* likewise differ in language” from the rest of this Aymara-speaking region.¹⁸⁶

Potosí was the destination of a massive migration during its economic heyday around 1610. In the mines, special linguistic codes were developed, with specialized lexicon containing words from different languages, as Van de Kerkes’s study of Garcia de Llanos’s dictionary demonstrates. However, in the present analysis, I would like to stress that this “code-mixing language” was probably born before colonization and was the consequence of various successive political, technological, and religious supremacies.

We know that Capacomege, the Colla- and Pukina-speaking queen, was the owner of Cerro Rico. And the name of the god of the cerro is a Pukina word, which is probably the most valuable testimony of the influence over the cerro that the Colla once formerly exerted and of vestiges of long-lasting cultural habits, as we will examine. And we cannot ignore that under the Spanish, 500 miners from Copacabana, probably heirs of the Lacustrine tradition of mining revealed by the liminological studies of Guedron, were working in Potosí for their encomendero, Garcia de Leon.¹⁸⁷

The Franciscan from La Paz, Bernardino de Cárdenas, inspector and eradicator for the Council of La Plata (1632), spoke Aymara, Quechua, and the Leco’s language, through which he evangelized.¹⁸⁸ He was responsible for recording vocabularies in Latin, Aymara, Quechua, Pukina, and Takana¹⁸⁹ and was the author of a manual of rites in these languages.¹⁹⁰ As a linguist and religious expert, Cárdenas, who introduced us previously to the cult of the mines of Oruro, allows us to appreciate the remote origins of the cult of the Cerro Rico:

I saw in the houses of the place and settlement that they had a place for when the demon came, who they saw sometimes in different figures, others did not see him but heard him speak, and among the things that I observed once he told them that he was the rich lord and therefore those Indians in their language called him Capac iqui, which means Rich Lord or that the mountain of Potosí was his son and thus the Indians

186 Pizarro, *Relación del descubrimiento*, 199.

187 Waldemar Espinoza Soriano, “Copacabana del Collao: Un documento de 1548 para la etnohistoria andina,” in *Temas de etnohistoria boliviana*, ed. W. Espinoza Soriano (La Paz: Producciones CIMA, 2003), 3–37.

188 The Lecos lived in the tropical region of Larecaja and South Apolo.

189 A linguistic family of the Bolivian Amazon.

190 Julián Heras, “Los franciscanos del Perú, Defensores del nativo,” *Revista peruana de historia eclesiástica* 3 (1994): 157.

worshipped it and that he gave them the silver and that the god of the Spanish did not have it, that therefore they came from Castilla to take from them what he gave them and that the silver was more valuable than the souls; and that the Priests and Corregidores and Visitadores were not seeking the soul but rather silver, and that it was a greater sin not to give pleasure to the Corregidor and to the Priest than the sorcery and the drunkenness, since they did not punish them, and for the former they were so mistreated that together they could have him for their god first and then that of the Spanish, and many Indians do this. And there was a time when he told them that the image of the crucifix which was in the church was his and that they had to worship him in it.¹⁹¹

Capac ique means rich (*capac*) father (*ique*) in Pukina; it is the male equivalent of the *capacome*, the Colla queen. However, Álvarez offers its deepest meaning, comparing *ique* with the concept of “soul,” explaining that the sense of *ique* was close to the powerful animating force contained in the body of the deceased ancestor.¹⁹² Likewise, in Oruro, where *mallku*, *wallchi* or *supay* represented “the soul” of the ancestor, as cited, we notice that *Capac ique* designated in Pukina the ancestral force engendering the wealth of the cerro, in the same way as “the Lord of the gold which does not diminish” engendered the gold of Chuquiabo. The sacred status of a lord is found in a variety of sources, and Molina wrote that “all the lords of the land no matter where they were, made people worship them in life and in death, and in the first half of the 16th century and the middle of 17th many continued to play a leading role in clandestine religious observance.”¹⁹³ Some of these ancestors had spontaneously lithified in the form of mountain, and the natives worshipped them and it seems to have been the case of the Cerro Rico.¹⁹⁴ The Sun was the god of the Collas and we remember that the rich Colla lord was the “son of the Sun” (*apuindichuri*) and Potosí, too.¹⁹⁵ Therefore, when the miners worshipped

191 “Memorial y relación de cosas muy graves,” Biblioteca del Palacio Real de Madrid, Miscelanea de Ayala 2845, and *Biblioteca Nacional de España*, ms. 3198.

192 Bouysson-Cassagne, “Las minas del centro-sur andino,” 452–53.

193 Cited by Susan Ramírez, *To Feed and Be Feed* (Stanford: Stanford University Press, 2005), 144.

194 In other regions like Chancay, beside the bones of the ancestors they sacrificed to and worshipped the Sun, Moon, thunder, stars, and an idol that had been the Sun’s priest, long since lithified. In Huamantanga in 1656, they invoked the Sun as the “father and lord of all the guacas.”

195 According to Torero (*Idiomas*, 394–95), *iquile* “currently means father in the Kallawayá language.” Nathan Wachtel, *Le retour des Ancêtres* (Paris: Galimard, 1989), 541–45; Mario Polia Meconi, *La cosmovision religiosa andina* (Lima: PUCP 1999), 249; Ximena

the god of the cerro, under the name of “son of the *capac ique*” they also worshipped the Colla Lord.

With this perspective, it is important to note that Franciscan friar Bocanegra used the Pukina word *ique* (the father) to design God the Father of the Christians, as we can read on the pillars of his Andahuaylillas chapel near Cuzco.¹⁹⁶ And in fact, the Sun was the father of all the *wakas*. On incarnating the son of the father Sun, Potosí had to be replaced during colonization by the son of the Christian God—that is, the image of the Holy Cross, as Cárdenas explained. Therefore, according to the “eradicator,” in the seventeenth century, the miners indiscriminately worshipped the Cerro Rico “son of the Father,” or Jesus Christ on the cross, or both at the same time. And as Arriaga wrote, some Andean priests spread a religious relativism and prayed simultaneously to the Christian God and to their *wakas*.

But at the end of the sixteenth century, the eradication of idolatry in Cerro Caltama (south of Porco), and that of Toropalca and Caiza, open our eyes to important regional worship centers that should disclose traces of Colla ritual in an Aymara-speaking environment and give us a new lead on some of the important religious reasons that the news of Porco, Potosí, and the Visisas was kept quiet to the Pizarro brothers and didn't appear in their encomienda's titles.

Indeed, in 1591, an eradicator priest, Hernán González de la Casa, heard that the Cerro Caltama housed several mine idols, including the big *mama* stones of *tacana* of the Porco mine—which was the god of war for the Aymara Qaraqara-Charca confederation of the south Collasuyu—and four mine stones from four mountains of silver and lead mines (called Cuzcoma, Chapote, Suricaba, and Aricaba),¹⁹⁷ but nothing was said about Potosí, the old Colla property of

Medinacelli, in “Bertonio y el mito de Tunupa,” *Ciencia y Cultura* 28 (2012): 133–51, referred to a *carta annua* of a Jesuit, Cabredo (1602), in which he wrote that the Andeans knew about a creator god called Pusicaka—thunder or lightning—and that his son, Tunupa, born of a virgin called Iqui, was worshipped “instead of Christ,” and considered that the Cerro Rico was none other than Tunupa. The three authors did not notice that the Jesuitic source was an Andeanized transposition of “the Catholic myth” of the Virgin Mary and that, on this occasion, Cabredo did not hesitate to promote a fantasized etymology of Iqui, in the tradition that manipulated local etymologies to adapt them to the needs of evangelization. In this case, Cabredo translates the word “virgin” as *iki*, while the word, which, according to Oré, designated a virgin girl in Pukina, was *inki*. The father was *iki* and the mother was *ome*. According to Cabredo, Jesus Christ would be none other than the son of this Andeanized virgin and the Jesuit concluded that “thus the elderly called Jesus Christ Tunupa” (*Carta Annua* of 1603).

196 Bruce Manheim, “Un traité sur la confession pour la region andine,” *Chasqui* 22 (2014).

197 Platt, Bouyasse-Cassagne, and Harris, *Qaraqara-Charka*, 184.

the Sun. To save their worship, Indigenous communities eventually moved the *mama* of Porco and the other *wakas* to Caltama to be hidden, sometime between the 1538 murder of Chalco Yupanqui and the time when the Aymara chiefs, Cuisara and Moroco, gave Porco—whose owner had been at that time Huayna Capac—to Pizarro, –but there are no known documents to prove this movement for the moment.¹⁹⁸

Caltama's extirpation informs us of an important place of worship and sacrifice and, overall, of the presence of a famous Andean priest, Diego Iquisi, whose name means (more or less) "of the father" (*ique-si*) in Pukina and seems to connect him, in 1591, not only to the Porco's *waka* but to the Sun of Potosí itself.¹⁹⁹

Indeed, Iquisi, who was a "very recognized wizard" was the *punku camayoc* (guardian of the entrance) of the *waka* of Caltama. This key custodial role seems similar to that of the Colla priests of the Island of the Sun, moved by the Incas to Yunguyu, where they confessed the pilgrims (as the *ichuri* they were) when they advanced to the sanctuary.²⁰⁰ Indeed, in 1591, Caltama was a place of pilgrimage where worshippers deposited their offerings (small pieces of silver, axes, flutes, bracelets, *kerus*, textiles, ropes, blankets, herb tortillas to dye clothing, different kind of llamas). The shrine, which brought together several *wakas*, seems to have played a prominent supra-regional role, since the Aymara confederation of the "Charcas, Caracaras, Yamparaes, Chichas, Yuras, Visisas, Asanaques, Carangas and Chuis as well as pilgrims from Cochabamba"²⁰¹ still visited it at the time of its eradication. And "all the Indians of these provinces sacrificed their children, llamas and other animals and had many superstitions, for the illness and for the storms invoking the god of rain and thunder"²⁰² who was the god of this great confederation of Aymara miners.

Iquisi heard the confessions of the Indians, carried out the sacrifices, preached, foresaw, cured diseases with plants, gave oracles, and also knew how to say the Catholic mass, which was carried out with corn *chicha*, and we can assume that was one of the moments when the miners worshipped Jesus Christ together with the Cerro Rico. We can suspect for all these reasons, and above all for his Pukina name, that Iquisi was an esteemed Colla (or maybe Kallawayá)

198 Platt, Bouysse-Cassagne, and Harris, *Qaraqara-Charka*, 863.

199 Rodolfo Cerrón Palomino, "El puquina como lengua de Tiwanaku," 195–96. I am grateful to Rodolfo Cerrón for the discussions about this particular point.

200 Bouysse-Cassagne, *Lluvias y Cenizas* (La Paz: Hisbol, 1988), 65.

201 Platt, Bouysse-Cassagne, and Harris, *Qaraqara-Charka*, 187.

202 Platt, Bouysse-Cassagne, and Harris, *Qaraqara-Charka*, 187.

priest, heir of the priests of Tiwanaku.²⁰³ For this purpose, it is important to report that at the time of the extirpation (1591), Iquisi had made the devotees worship the Caltama shrine like “God and the sun and the moon and the god of the rain and the thunder.”²⁰⁴ Indeed, some of the human sacrifices that took place on the mountains such as Caltama were dedicated not to the *wakas* of the mines themselves but to prominent gods such as the Sun or *Wiracocha*.²⁰⁵ On the other hand, “a rite glorifying a peak did not have to be observed on the peak itself, but could take place on a nearby hill or crag” and this was probably the case for the sacrifices offered in Caltama.²⁰⁶ In this respect we cannot rule out that it was about a *capacocha*, the most important ritual to the Sun of the Incas. *Capacocha* occurred not only in exceptional circumstances, as during disease outbreaks in the Inca or the great feasts of the calendar; such offerings could also relate to the exploitation of an important resource such as mines. And obviously, the miners needed to make sacrifices as a sign of reciprocity to the god who gave them such a wealth of silver.

All of these data lead us toward presupposing a *capacocha* ritual that founded a system of political alliances, which has significant implications for the mechanisms of political integration of the regional Aymara chiefdom of this part of the Collasuyu, in the Inca Empire, and that was part of the social, economic, and religious reciprocity of the Incan state. This ritual was part of the political cosmogony,²⁰⁷ and the great confederation of Qaraqara Charka of the south Collasuyu could therefore be strengthened by means of a *capacocha*, in which the Aymara chiefs of the confederation sacrificed, to the Sun god of the Incas (and before them, of the Collas),²⁰⁸ infants, llamas, clothing, and costumes of the *wakas*, as appeared in other *capacocha* rituals studied in other regions.

In a similar *capacocha* context, in the village of Recuay, eradicator Hernández Príncipe remarked that the people, having hidden their idols and mummies from his predecessors more than three decades, secretly continued their worship in 1567: “the son that knew, feared his father and grand-father, and the

203 We know that Ari Capac Iqui, the Kallawayá heir of the Tiwanaku priests, was elevated to lord of the Kallawayá chiefdom by the Incas.

204 Platt, Bouyasse-Cassagne, and Harris, *Qaraqara-Charka*, 189.

205 Cobo, *Historia del Nuevo Mundo*, 57.

206 Thomas Bessom, *Of Summits and Sacrifice: An Ethnohistoric Study of Inka Religious Practices* (Austin: University of Texas Press, 2009), 88.

207 P. Duviols, “La *capacocha* mecanismo y función del sacrificio humano, su proyección geométrica, su papel en la política integracionista y en la economía redistributiva del Tawantinsuyu,” *Alpanchis* 9 (1976): 11.

208 Platt, Bouyasse-Cassagne, and Harris, *Qaraqara-Charka*, 186n5.

latter feared the principal lords and head of the town, who, out of fear that someone might discovered their idolatry, concealed the beliefs of the community, so that as a consequence nothing was ever revealed not even in the penitential act.”²⁰⁹ We can easily imagine that Caltama was a place where the god of Porco and other mines was worshipped quietly until 1591, and for the same reasons in Recuay until 1590.²¹⁰ And I remark that in addition to the sanctuary of Caltama, González de la Casa destroyed “the most important *waka* of the region,” in the villages of Toropalca and Caiza, where the Visisas were reduced in 1572 but unfortunately, as expected, the content of this *waka*, as in Requay, was never disclosed.²¹¹

7 Felines

As we pointed out, the Pukina-speaking Colla, heirs of Tiwanaku, were the owners of the Island of the Sun, of Carabaya, and of Potosí, and in these three places, the people worshipped a sacred mottled feline. We also observe the presence of a jaguar in Salta’s copper mine at the end of the Tiwanaku around 1000 AD.

In two previous studies, I maintained that there is a relationship between the small gold feline of Carabaya and the *titi*, a wildcat of the Island of the Sun. Both felines were linked to mining, both were characterized by a diversity of meanings, and they had some similar functions. Both were worshipped by the Pukinas. But while the *choquechinchay* was related to gold, Ramos Gavilán wrote about the Island of the Sun that the word *titi* in Aymara means not only *oscollo* (ocelot) but also “lead, copper and tin.”²¹² This relates it to the silver and copper mining smelted during the time of the Tiwanaku in that region, as Guedron et al. remarked.

Our lake and island are called Titicaca, after a rock called like this, which means the rock where the cat walked, and it gave great brightness. For intelligence it should be warned that Titi in the Aymara language is the

209 Hernández Príncipe [1621] in Pierre Duviols, *Procesos y Visitas de Idolatrías, Cajatambo Siglo XVII* (Lima: IFEA /Fondo Editorial de la PUCP, 2003), 26, 29–30.

210 Villagomez, *Exhortaciones e Instrucción acerca de las idolatrias de los indios del Arzobispado de Lima*. Lima: Horacio Urteaga, 1919, 146.

211 Platt, Bouysse-Cassagne and Harris, *Qaraqara-Charka*, 201, 205.

212 In Quechua, *titi* means lead, *yurak titi* is tin (González Holguín [1608] 1989, 344). See also Bouysse-Cassagne, *Lluvias y Cenizas*, 114.

same as wildcat, which the Indians from the general Quichua language commonly called *Oscollo*, and *Kaca* means rock, and together the two words form *Titicaca*, which means what we have said.²¹³

Once the etymology of *Titicaca* had been clarified, Ramos Gavilán explicitly related the *titi* with the Sun and wrote, “These Indians think that in past times a cat was seen on the rock with great brightness, and that it often wandered around on it; for this reason they say that it was the rock where the Sun had its palaces, and this was the greatest and most solemn shrine that the kingdom had dedicated to this Planet.”

Before the Incas, the island and Potosí belonged to the Colla. Therefore, it is not surprising to find “the lions of the land” (the *titi*) standing near the sanctuary of the summit of the silver mine of the Cerro Rico (*kaca* means “Cerro” in Aymara) as on *Titicaca*’s island. And we understand better why Murúa drew the *Titicaca* idol on the peak of a rocky mountain with one Pukina-Colla and one Uro-Colla, worshipping it, and a big Sun in the background (Figure 1.3).

The relationship between Potosí and the Island of the Sun is moreover clarified when, summarizing a myth, Ramos Gavilán attributed the power to conceal (or to give?) stones to the mottled skin of the *titi*: “this animal has such an instinct that with a curtain or a fluffy cover that nature gave it, wrapped up the stone when it felt that they are pursuing and within reach of it.”²¹⁴ I have commented in previous work that the Island of the Sun and the peninsula of Copacabana were places of worship to various stones: not only to the *Titicaca* rock of the island, but also to the green-blue stone of Copacabana. This stone, compared by Ramos Gavilán to the Philistine god Dagon, represents a fish and has an important ritualistic role since it was the god of the Uru fishermen of the lake.²¹⁵ The Inca undoubtedly owned some precious sacred stones, particularly a large one they called *Intiptoca*, probably a *mama*, which, in this case, “is the same as an object spat out by the Sun.”²¹⁶ Both the *chinchay* and the *titi* spat magical stones that contained flashes of sunlight. Further, Santa Cruz Pachacuti asserts that Tupac Yupanqui “brought stones which lit up at night, removing them from an *oscollo* (ocelotl) from Aporima.”²¹⁷

The *choquechinchay* and the *titi*, small felines—which, like the *otorongos*, had spotted skin, although not their size or all of their characteristics—did not

213 In his dictionary, Bertonio likewise explains this (Bouyasse-Cassagne, *Lluvias y Cenizas*, 119).

214 Ramos Gavilán, *Historia del célebre Santuario*, 46.

215 Bouyasse-Cassagne, *Lluvias y Cenizas*, 102–7, 108.

216 Ramos Gavilán, *Historia del célebre Santuario*, 46.

217 Pachacuti Yamqui salcamaygua, *Relación de antigüedades*, fol. 24.

just produce magical stones for the Inca. To a great extent, the relationship that the *titi* maintained with the miners, explained by Bertonio, clarifies how silver mining was conceived. Bertonio's Aymara dictionary (1612) mentions that the word *titicamana* designated both "the official who removes the lead"—that is, the person who practiced the silver metallurgy—and "the person whose trade was to catch wildcats (the *titi*) and to prepare their skins."²¹⁸ "*Titi* was the name given to the daughters of these officials in times of the Inca and they called the sons *copa* and then they inherited the trade of catching cats."²¹⁹ Vázquez de Espinosa states that in the Andes, the skins of felines were tanned with *villca*, the psychotropic plant well known of the Kallawayá doctors (whose name was also associated with the Sun in ancient Aymara), and this task was the responsibility of the individuals who had hunted them.²²⁰ Several skins of felines, closely related to the stimulating forces of the feline gods and transmutation processes in shamanic cults, were found alongside the inhaling equipment of Tiwanaku medicine men in Carabaya territory. Horta also demonstrated that the iconography of various snuff tablets from Atacama, used in shamanic cults, represented an individual with their head embedded in that of a feline, and several caps with ears that she studied were used for this same effect.²²¹ For these reasons, I do not rule out the possibility that the miners who asked the *Otorongo* for strength, the metalurgists, and those who wore the skins of felines were engaged in an ancient ritual in which, according to Holguín, in Quechua, "a robust strong man"—such as the *Wari* god—was an "*Otorongo hina cinchi*" [a valorous warrior like an *otorongo*] "*otorongo hina runa*" [a man who looks like an *otorongo*], and a light runner like a tiger "*otorongo hina pahuaycacicha*."²²² The paragon of this figure was undoubtedly the brother of Inca Yupanqui, conqueror of the Andesuyu, who, after having killed the *Otorongo*, god of this

218 Ludovico Bertonio, *Vocabulario de la lengua Aymara* [1612] (Cochabamba: MUSEF, CERES, IFEA, 1984), 353.

219 Bouysse-Cassagne, *Lluvias y cenizas*, 119.

220 Apurima or Apurimac, in the Abancay region. Antonio Vázquez de Espinosa, *Compendio y descripción de las Indias Occidentales* (Madrid: Atlas, 1969), 609–10.

221 Horta, "Lo propio y lo ajeno," 578. In Cuzco, the Incas participated in the ritual of presenting the insignia to the *orejones* with similar attire. Betanzos (*Suma y narración*, 68), moreover, points out that "for the occasion all of the lords of Cuzco wore long and coloured shirts which ... went down to their feet, and they have tanned lion hides on their backs and the heads of these lions have gold ears on top of theirs." Finally, in 1954, in the town of Tiwanaku, Vellard and Merino ("Bailes de quena quena," *Travaux de l'Institut français d'études andines* [1954]: 96–99) studied a hunting dance, the *quena quena*, in which all the dancers were covered with skins of jaguars or ocelots.

222 Diego Gonzalez Holguín, *Vocabulario de la lengua general de todo el Perú llamada lengua Qichua o del Inka* [1608] (Lima: Universidad Nacional Mayor de San Marcos, 1989), 265.

region, and having swallowed its flesh, was transformed in this god, possessed his animating force (*camac*) and then had the title of Apu *camac* Inca and of *Otorongo Achachi* (the ancestor *Otorongo*).²²³ It is indeed highly likely that before the Incas, during the Tiwanaku, strong metaphorical relations had been established between felines and mining, along with the Sun as bestower of wealth, through the ancient cult of the *Wari*. The richer the mine, the more important those relations were, and there is no doubt that Potosí, whose god was the Sun, was the richest of all.

8 By Way of Conclusion

Our aim was to understand the pre-Hispanic past of Potosí, starting from scarce, elusive, and fragmentary sources. To avoid writing a history of mere indications, we first situated the different stages of its development in pre-Hispanic times using the studies of geologists and limnologists. This led us from the collapse of Tiwanaku to 1545, the culminating moment of its famous “discovery” by the Spaniards. It was necessary to understand the contexts in which the cerro was formed and mineral deposits were established, before accompanying Gualpa to the peak of the mountain where the sanctuary was located. The tests that he carried out during his ascent allow us to assume that he was in a position to observe the wealth and the sacred nature of this great silver ore-bearing mountain. Our *yanakuna* did, indeed, share with other miners a complex system of beliefs that converted the mine—and particularly Potosí, the richest of them all—into a unique sacred space. The entire mining production systems of Potosí, Porco, Oruro, and Carabaya were ritualized and revolved around old shamanic practices. The Incas, on settling in the Collasuyu, manipulated the beliefs inherited from the Tiwanaku and imposed new administrative divisions in the mines and elsewhere. They reformulated the political and religious organization using traditional Colla medicine men’s capacity for performance, increasing the importance of the mining *wakas* as demonstrated in the *capacocha* ritual at Caltama.

Regarding Potosí, since there is very scarce regional documentation concerning the mark left by the Incas on the cerro, our analysis went beyond the regional space and covers the period prior to the arrival of the Incas. This space does not correspond to the territorial divisions that the latter imposed or even

223 Therese Bouysse-Cassagne, “La piel que habito. De algunos mecanismos de aparejamientos ontológicos entre humanos y animales en los Andes del Sur,” in *Interpretando Huellas*, 308, 313.

to all the divisions of the late intermediate. It is based on the Pukina linguistic traces that the Tiwanaku culture left in the Collasuyu. Insofar as the Pukina-speaking Collas sought to be the heirs of the Tiwanaku and worshippers of the Sun, in the sources they claim to be the owners of the two most prestigious Collasuyu mines: Carabaya and Potosí. It is also highly likely that the Kallawayas, itinerant doctors, were in many cases guardians of the Tiwanaku tradition. Some mining myths that we have mentioned moreover demonstrate that several small felines shared their powerful identity with the *Otorongo*; this allows us to consider that if, in Potosí, as Gualpa said, there were “several beds of these lions of the land,” the *titi*, this is because it was a great center of worship devoted to the Sun and related to that of Titicaca Island and to Carabaya. Several linguistic indications and the visit by Cárdenas lead us to think that the cult of the Sun continued in the great mine to at least 1632, and it must be recognized that the miners and the *guayradores* (Indigenous smelters) did not cease their rituals after 1545.

In an emic perspective, we don't separated the religious data from the economic and politic ones. The increase in silver production at the beginning of the Colony probably generated an intensification of the rites “to the god which gave them the silver”, and the miners were well aware “that the god of the Spaniards did not have it and that therefore they came from Spain to take it away from them”. In exchange for their work the Spaniards, who stigmatized “ritual songs, dances (*taqui*) and drunkenness” in words but not in acts, did not succeed in eradicating their gods nor their cults.

Acknowledgments

This paper is an homage to the work and dedication of my two dear colleagues and friends, Olivia Harris and Thierry Saignes. I am grateful to Philippe Bouysse, former general secretary of the Commission for the Geological Map of the World, who offered me his availability and knowledge. My special thanks go to professor Tomas Cummins (Harvard University), who supplied the Murúa drawing of the Island of the Sun (Mss. Galvin) and authorized its publication, and to Christophe Delaere (Université Libre de Bruxelles), who authorized the publication of one of the underwater felines. My thanks are also due to professor Rodolfo Cerrón Palomino (Pontificia Universidad Católica del Perú, Lima) for the brief discussion we had about the name *iquisi*; to Dr. Martti Pärssinen (University of Helsinki) and to Heli Pärssinen for offering me hospitality when I was working in the Madrid archives, and to Laura Gutierrez Arbulu, director of the Archivo del Arzobispado de Lima, who helped in the transcription of the

Ms. *Biblioteca del Palacio Real de Madrid*, Miss. de Ayala 2845 during my stay of 2002–2004 in the IFEA.

Primary Sources

Archivo Histórico Madrid. Diversos de Indias 210. “Visita de Alvaro Ruiz de Navamuel a los indios del Perú sobre las costumbres suyas y las de sus antepasados.” Valle de Yucay, 1571.

Biblioteca del Palacio Real de Madrid, Miscellanea de Ayala 2845, and Biblioteca Nacional de España, manuscript 3198. *Memorial y relacion de cosas muy graves muy importantes al remedio y aumento de el reino del Peru y al consuelo de la conciencia del Rey nuestro señor y descargo de ella y a la multiplicacion de su hacienda real y prosperidad de su corona. Hecha por el padre fray Bernardino de Cárdenas del orden de mi padre San Francisco, letor de Teologia y difinidor de ella, predicador general de indios y españoles, comisario de la Santa Cruzada y legado del Santo Concilio Argentino para la predicacion y conbercion de los indios y extirpacion de sus idolatrias y vicios, en el arçobispado de los Charcas y en todos los obispados sufraganeos, 1632–1634.*

Bibliography

- Abbott Mark, B., and Alexander P. Wolfe. “Intensive Pre-Incan Metallurgy Recorded by Lake Sediments from the Bolivian Andes.” *Science* 301 (2003): 1893–95.
- Adelar, Willem, and Simon Van de Kerke. “La lengua puquina.” In *Las lenguas de Bolivia*, edited by M. Crevels and P. C. Muysken, 125–46. La Paz: Plural, 2009.
- Albarracín-Jordán, Juan. *Arqueología de Tiwanaku: Historia de una antigua civilización andina*. La Paz: Sigla Ed., 1999.
- Álvarez, Bartolomé. *De las costumbres y conversión de los indios del Perú: Memorial a Felipe II*. Madrid: Ediciones Polifemo, [1588] 1998.
- Arnold, T. Elliott, et al. “Drought and the collapse of the Tiwanaku Civilization: New evidence from Lake Orurillo, Peru.” *Quaternary Science Reviews* 251 (2021): 1–10.
- Arriaga, Pablo. *La extirpación de la idolatría en el Perú*. Madrid: Atlas, 1968.
- Arriaga, Pablo. “Carta Annuā al P.C. Aquaviva, 29 de abril 1599.” In *Monumenta peruana* VI, edited by Egaña, 688. Roma: Monumenta Historica Societatis Jesu, 1974.
- Barba, Alvaro Alonso. *El arte de los Metales en que se enseña el verdadero beneficio de los de oro y plata por azogue. El modo de fundirlos todos y como se han de refinar y aparear unos de otros*. Madrid, En la Imprenta del Reyno. 1640, facsimile. Librerías Paris-Valencia, 1993.

- Barnadas, Josep, 1973. *Charcas orígenes históricos de una sociedad colonial (1535-1565)*. La Paz: CIPCA.
- Bartos, Paul. "The Pallacos of Cerro Rico of Potosí, Bolivia: A New Deposit Type." *Economic Geology* 95, no. 3 (2000): 645-54.
- Bauer, Brian S., and Charles Stanish. *Ritual and Pilgrimage in the Ancient Andes: The Islands of the Sun and the Moon*. Austin: University of Texas Press, 2001.
- Bertonio, Ludovico. *Vocabulario de la lengua aymara* [1612]. Cochabamba, Bolivia: Museo Nacional de Etnografía y Folklore, Centro de Estudios de la Realidad Económica y Social, Instituto Francés de Estudios Andinos, 1984.
- Bessom, Tomas. *Of Summits and Sacrifice: An Ethnohistoric Study of Inka Religious Practices*. Austin: University of Texas Press, 2009.
- Betanzos, Juan de. *Suma y narración de los Incas*. Madrid: Atlas, 1987.
- Bouysse-Cassagne, Thérèse. "Pertenenencia étnica, status económico y lenguas en Charcas a fines del siglo XVI." In *Tasa de la Visita General de Francisco de Toledo*, edited by David Noble Cook, 312-28. Lima: Universidad Mayor de San Marcos, 1975.
- Bouysse-Cassagne, Thérèse. *La identidad Aymara: Aproximación histórica (siglo XV-siglo XVI)*. La Paz: Hisbol., 1978.
- Bouysse-Cassagne, Thérèse. *Lluvias y cenizas, dos Pachacuti en la historia*. La Paz: Hisbol, 1988.
- Bouysse Cassagne, Thérèse. "Le lac Titicaca, histoire perdue d'une mer intérieure." *Bulletin de l'Institut Français d'Etudes Andines* 21, no. 1 (1992): 89-159.
- Bouysse-Cassagne, Thérèse. "Le palanquin d'argent de l'Inca. Petite enquête d'ethno-histoire à propos d'un objet absent." *Techniques et Culture* 29 (1998): 1-43.
- Bouysse-Cassagne, Thérèse. "El Sol de adentro: wakas y santos en las minas de Charcas y en el lago Titicaca (siglos XV-XVII)." *Boletín de Arqueología PUCP* 8 (2004): 59-97.
- Bouysse-Cassagne, Thérèse. "Las minas del centro-sur andino, los cultos prehispánicos y los cultos cristianos." *Bulletin de l'Institut Français d'Etudes Andines* 34, no. 3 (2005): 443-62.
- Bouysse-Cassagne, Thérèse. "Minas del sol, del Inka y de la gente, Potosí en el contexto de la minería prehispánica." In *Mina y metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVIII*, edited by Pablo Cruz and Jean Vacher, 303-34. La Paz: IRD-IFEPA, 2008.
- Bouysse-Cassagne, Thérèse. 2010. "Apuntes para la historia de los pukina-hablantes." *Boletín de Arqueología PUCP* 14 (2010): 283-307.
- Bouysse-Cassagne, Thérèse. "Las minas de oro de los incas, el Sol y las culturas del Collasuyu." *Bulletin de l'Institut Français d'Etudes Andines* 46, no. 1 (2017): 9-36.
- Bouysse-Cassagne, Thérèse. "La piel que habito: De algunos mecanismos de aparejamiento ontológicos entre humanos y animales en los Andes del Sur." In *Interpretando Huellas: Arqueología, Etnohistoria y Etnografía de los Andes y sus Tierras Bajas*, edited by María de los Angeles Muñoz, 694-719. Cochabamba: Grupo

- Editorial Kipus, Instituto de Investigaciones Antropológicas y Museo Arqueológico (INIAM-UMSS), 2018.
- Browman, David L. "Titicaca Basin Archaeolinguistics: Uru Pukina and Aymara AD 750–1450." *World Archaeology* 26, no. 2 (1994): 235–51.
- Capoche, Luis. *Relacion general del asiento y Villa Imperial de Potosí y de las cosas mas importantes a su gobierno, dirigida al Excmo. Sr. Don Hernando de Torres y Portugal, conde de Villar y virrey del Perú*. Madrid: Atlas, 1959.
- Capriles, José María. "Intercambio y uso ritual de fauna por Tiwanaku. Análisis de pelos y fibras de los conjuntos arqueológicos de Amaguaya, Bolivia." *Estudios Atacameños* 23 (2002): 33–50.
- Castro Flores, Nelson. "Estrategias familiares, practica juridica y comunidad de memoria: Los descendientes de Tito Alonso Atauchi y Viracocha Inca en Charcas, siglos XVI–XVIII." *Estudios Atacamenos* 61 (2019): 177–98.
- Cerrón Palomino, Rodolfo. "El puquina como lengua de Tiwanaku." In *Interpretando Huellas: Arqueología, Etnohistoria y Etnografía de los Andes y sus Tierras Bajas*, edited by María de los Angeles Muñoz, 415–27. Cochabamba: Grupo Editorial Kipus, Instituto de Investigaciones Antropológicas y Museo Arqueológico (INIAM-UMSS), 2018.
- Cieza de León. *Crónica del Perú. Segunda parte*. Lima: PUCP, 1987.
- Cobo, Bernabé. *Historia del Nuevo Mundo* [1550]. Madrid: Atlas, 1964.
- Cooke, Colin A. Mark B. Abbott, and Alexander P. Wolfe. "Late Holocene Atmospheric Lead Deposition in the Peruvian and Bolivian Andes." *The Holocene* 18, no. 2 (2008): 353–59.
- Cooke, Colin A., Prentiss H. Balcom, Charles Kerfoot, Mark B. Abbott, and Alexander P. Wolfe. "Pre-Colombian Mercury Pollution Associated with the Smelting of Argentiferous Ores in the Bolivian Andes." *Ambio* 41, no. 1 (2011): 18–25.
- Cooke, Colin A., Alexander P. Wolfe, and William O. Hobbs. "Lake-Sediment Geochemistry Reveals 1400 years of Evolving Extractive Metallurgy at Cerro de Pasco, Peruvian Andes." *Geological Society of America* 37, no. 11 (2009): 1019–22.
- Cruz, Pablo, and Pascale Absi. "Cerros ardientes y huacas calladas." In *Mina y metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVIII*, edited by Pablo Cruz and Jean Vacher, 91–120. La Paz: IRD-IFEA, 2008.
- Cruz, Pablo, and P. Gérard. "Los adoratorios de altura incaicos. Una mirada desde el cerro Cuzco, Departamento de Potosí." *Memoria Americana* (2013): 93–120.
- Cunningham, Charles J., Robert Zartmann, Erwin H. McKee, Robert O. Rye, Charles Naeser, W. Sanjines O.V., George Eriksen, and Frantz V. Tavera. "The Age and Thermal History of Cerro Rico de Potosí, Bolivia." *Mineralium Deposita* 31, no. 5 (1996): 374–85.

- Cunningham, Charles, Michael L. Zientek, Walter J. Bawiec, Greta J. Orris. "Geology and Non-Fuel Mineral Deposits of Latin America and Canada." *Geological Survey, Open File Report* 2005-1294 B, 2005.
- de Albornoz, Cristobal. *Fabulas y mitos de los Incas*. Madrid: Historia 16, 1989.
- de la calancha, Antonio. *Crónica moralizada del orden de San Agustín* [1638], VI tomos; Lima: Universidad Nacional Mayor de San Marcos Ignacio Prado Pastor, 1974-1982.
- Delaere, Christophe. *Le Patrimoine Subacquatique Du Lac Titicaca, Bolivie. Utilisation et Perception de l'espace Lacustre Durant La Période Tiwanaku (500-1150 PCN)*. Oxford: BAR Publishing, 2020.
- Delaere, Christophe. "El contexto y significado de una ofrenda subacuática intacta del Lago Titicaca." *Chachapuma, Revista de Arqueología Boliviana* 10 (2021): 20-26.
- Delaere, Christophe, José M. Capriles, and Charles Stanish. "Underwater Ritual Offerings in the Island of the Sun and the Formation of the Tiwanaku State." *Proceedings of the National Academy of Sciences* 116, no. 17 (2019): 8233-38.
- de la Fuente Sant Ángel, Rodrigo. "Relación del Cerro de Potosí y de su descubrimiento." In *Relaciones Geográficas de Indias*, edited by Marcos Jiménez de la Espada, 357-61. Madrid: Atlas, 1965.
- de la Grasserie, Raoul. *Textes puquina contenus dans le "Ritualet seu manuale peruanum" de Geronimo de Oré publié à Naples en 1607*. Paris: Jean Maisonneuve, 1894.
- del Benino, Nicolas. "Relacion muy particular del cerro y minas de Potosí y de su calidad y labores, por nicolas del benino, dirigida a don francisco de Toledo in 1573." In *Relaciones Geográficas de Indias*, edited by Marcos Jiménez de la Espada, 262-371. Madrid: Atlas, 1965.
- de Llanos, Garcia. *Diccionario y maneras de hablar que se usan en las minas y sus labores en los Ingenios y Beneficios de los Metales*. La Paz: Museo de Etnografía y Folklore, 1983.
- del Rio, Mercedes. "De sacerdotes del Tawantinsuyu a cofrades coloniales: Nuevas evidencias sobre los Acustupa y Viracocha Inga de Copacabana." *Revista Andina* 49, no. 2 (2009): 9-48.
- de Ocaña, Diego. *Un viaje fascinante por la América hispana del siglo XVI*. Madrid: Studium, 1969.
- dunbar temple, Ella. "La descendencia de Huayna Capac (I)." *Revista Historica* 11 (1937): 93-165.
- dunbar temple, Ella. "La descendencia de Huayna Capac (II)." *Revista Historica* 12 (1939): 204-45.
- Duviols, Pierre. "La capacocha mecanismo y función del sacrificio humano su proyección geométrica, su papel en la política integracionista y en la economía redistributiva del Tawantinsuyu." *Alpanchis* 1X (1976): 11-57.

- Duviols, Pierre. "Un symbolisme de l'occupation, de l'aménagement et de l'exploitation de l'espace, le monolithe 'huanca' et sa fonction dans les Andes préhispaniques." *L'Homme* XIX, no. 2 (1979): 7–31.
- Duviols, Pierre. *Procesos y Visitas de Idolatrías, Cajatambo Siglo XVII*. Lima: IFEA/Fondo Editorial de la PUCP, 2003.
- Espinoza Soriano Waldemar. "Copacabana del Collao. Un documento de 1548 para la etnohistoria andina." In *Temas de etnohistoria boliviana*, edited by Waldemar Espinoza Soriano, 3–37. La Paz: Producciones Cima, 2003.
- Francis, Peter W., M. C. W. Backer, and C. Halls. "The Kari Kari Caldera, Bolivia, and the Cerro Rico Stock." *Journal of Volcanology and Geothermal Research* 10 (1981): 113–24.
- Girault, Louis. *Kallawaya, guérisseurs itinérants des Andes*. Paris: Editions de l'ORSTOM, 1984.
- Goldstein, Paul S., and Mathiew J. Siteck. "Plazas and Processional Paths in Tiwanaku Temples: Divergence, Convergence and Encounter at Omo M10, Moquegua, Peru." *Latin American Antiquity* 29, no. 3 (2018): 455–74.
- Gose, Peter. *Invaders as Ancestors*. Toronto: University of Toronto Press, 2008.
- Guaman Poma de Ayala, Felipe. *Coronica de Buen Gobierno* [1615–1616]. México: Siglo XXI Editores, 1980.
- Guedron S., J. Tolu, C. Delaere, P. Sabatier, J. Barre, C. Herredia, E. Brisset, S. Campillo, B. Bindler, S. C. Fritz, P. A. Baker, D. Amourous. "Reconstructing Two Millennia of Copper and Silver Metallurgy in the Lake Titicaca Region (Bolivia, Peru) Using Trace Metals and Lead Isotopic Composition." *Anthropocene* 34 (2021): 100288.
- Guerrero, Saúl. "Chemistry as a Tool for Historical Research: Identifying Paths of Historical Mercury Pollution in the Hispanic New World." *Bulletin of the History of Chemistry* 37, no. 2 (2012): 61–71.
- Guillén-Guillén, Edmundo. "Wila Oma: el último gran Intip Apun del Tawantinsuyu." In *El culto estatal del Imperio Inca*, edited by Mariuz Ziolkowski. Amsterdam: CESLA, 1988.
- Heras, Julian O. F. M. "Los franciscanos del Perú defensores del nativo." *Revista peruana de historia eclesiástica* 3 (1994): 156–60.
- Holguin, Gonzalez. *Vocabulario de la general de todo el Perú llamada lengua quichua o del Inca*. Lima: Universidad Nacional Mayor de San Marcos, 1989.
- Horta, Helena. "El estilo circumpuneño en el arte de la parafernalia alucinógena prehispanica." *Estudios Atacameños* 43 (2012): 5–34.
- Horta, Helena. "Lo propio y lo ajeno: Definición del estilo San Pedro en la parafernalia alucinógena de los oasis del Salar de Atacama." *Chungara* 46, no. 4 (2014): 559–83.
- Itier, César. *Viracocha o el Océano, naturaleza y funciones de una divinidad inca*. Lima: IEP-IFEA, 2013.
- Jiménez de la Espada, Marcos. *Relaciones Geográficas de Indias* [1586]. Madrid: Atlas, 1965.

- Kolata, Alan. *The Tiwanaku: Portrait of an Andean Civilization*. Cambridge: Blackwell, 1993.
- Korpisaari, Antti, and Martti Pärssinen. *Pariti: The Ceremonial Tiwanaku Pottery of an Island in Lake Titicaca*. Helsinki: Finnish Academy of Science and Letters, 2011.
- Lira, Jorge. *Diccionario Kkechuwa-Español*. Tucumán, Argentina: Universidad Nacional de Tucumán, 1944.
- Lopez, Gabriel, and Federico Coloca. "Prácticas rituales incas en el Noroeste Argentino: hallazgo de un monolito en una estructura ceremonial en cueva inca viejo, Puna de Salta." *Relaciones de la Sociedad Argentina de Antropología* 43, no. 1 (2019): 179–86.
- Loza, Carmen B. *Kallawayá: reconocimiento mundial a una ciencia de los Andes*. La Paz: UNESCO, Viceministerio de Cultura, Fundación Cultural del Banco Central de Bolivia, 2004.
- Loza, Carmen B. "El atado de remedios de un religioso/médico del periodo Tiwanaku: miradas cruzadas y conexiones actuales." *Bulletin de l'Institut français d'Etudes Andines* 36, 3 (2007): 317–42.
- Manheim, Bruce. "Un traité sur la confession pour la region andine." *Chasqui* 22 (2014): 1–2.
- Medinacelli, Ximena. "Bertonio y el mito de Tunupa." *Ciencia y Cultura* 28 (2012): 133–51.
- Miranda Díaz, Bartolomé. "Las minas y asiento de Porco: nuevos datos sobre la hacienda rica de Hernando Pizarro en India." *Temas Americanistas* 33 (2014): 149–70.
- Murúa, Fray Martín de. *Los orígenes de los incas: crónica sobre el antiguo Perú*. Lima: Ediciones Miranda, 1946.
- Nash, Donna J. "Evidencia de uniones matrimoniales entre las élites Wari y Tiwanaku de Cerro Baúl, Moquegua, Perú." In *Nuevos aportes para el sur del Perú, norte de Chile y Bolivia*, edited by Antti Korpisaari and Juan Chacama, 177–200. Lima: IFEA, 2015.
- Owen, Bruce. "Distant Colonies and Explosive Collapse: The Two Stages of the Tiwanaku Diaspora in the Osmore Drainage." *Latin American Antiquity* 16, no. 1 (2005): 45–80.
- Owen, Bruce D., and Paul Goldstein. "Tiahuanaco en Moquegua: interacciones regionales y collapse." *Boletín de Arqueología PUCP* 5 (2002): 169–88.
- Pachacuti Yamqui Salcamaygua, Juan de Santa Cruz. *Relación de antigüedades deste reyno del Piru*. Lima: IFEA, 1993.
- pärssinen, Martti. "Desde la expansión de Tiwanaku hasta la diáspora de pos Tiwanaku: reflexiones finales." In *El Horizonte Medio: nuevos aportes para el sur del Perú, Norte de Chile y Bolivia*, edited by Antti Korpisaari and Juan Chacama, 297–330. Lima: IFEA, 2015.
- pärssinen, Martti. "Snake, Fish and Toad/Frog Iconography in the Ceramic Caches of Pariti, Bolivia." In *Images in Action, The Southern Andean Iconographic*, edited by William H. Isbell, Mauricio I. Uribe, Anne Tiballi, and Edward P. Zegarra, 661–82. California: UCLA, 2018.

- Pearce, Adrian J., and Paul Heggarty. "History, Linguistics and the Andean Past: A Much-Needed Conversation." In *History and Languages in the Andes*, edited by P. Heggarty and A. J. Pearce, 1–18. Basingstoke: Palgrave Macmillan, 2011.
- Pérez Gollán, José Antonio, and Inés Gordillo. "Alucinógenos y sociedades indígenas en el Noroeste argentino." *Annales de Antropología* 30, no. 1 (1993): 299–350.
- Pizarro, Pedro. *Relación del descubrimiento y conquista de los reinos del Perú*. Madrid: Atlas, 1965.
- Platt, Tristan, Thérèse Bouyasse-Cassagne, and Olivia Harris, 2006. *Qaraqara-Charka, Mallku, Inca, Rey en la provincia de Charcas (siglos XV–XVII): Historia antropológica una confederación aymara*. La Paz: Instituto Francés de Estudios Andinos, Plural Editores, University of St. Andrews, University of London, Inter-American Foundation, Fundación Cultural del Banco Central de Bolivia.
- Platt, Tristan, and Pablo Quisbert. "Tras las huellas del silencio. Potosí, los Incas y el Virrey Toledo." In *Mina y metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVIII*, edited by Pablo Cruz and Jean Vacher, 231–77. La Paz: IRD-IFEA, 2010.
- Polia Meconi, Mario. *La cosmovision religiosa andina en los documentos del Archivo Romano de la Compañía de Jesús 1581–1752*. Lima: PUCP, 1999.
- Ramirez, Susan. *To Feed and Be Feed*. Stanford: Stanford University Press., 2005.
- Ramos Gavilán, Alonso. *Historia del célebre Santuario de Nuestra Señora de Copacabana [1621]*. La Paz: Academia Boliviana de la Historia, 1976.
- Rice, C. M., B. Steele, D. N. Barfod, A. J. Boyce, and M. S. Pringle. "Duration of Magmatic, Hydrothermal, and Supergene Activity at Cerro Rico de Potosí, Bolivia," *Epivitalconomic Geology* 100, no. 8 (2005): 1647–56.
- Rodríguez de Figueroa, Alonso. "Carta a Martín Enriquez [1583]." In *Relaciones Geográficas de Indias*, edited by Marcos Jiménez de la Espada, 372–85. Madrid: Atlas, 1965.
- Rostworowski de Diez Canseco, María. "Nuevos datos sobre tenencia de tierras reales en el incario." *Revista del Museo Nacional* 31 (1962): 130–59.
- Saignes, Thierry. Introduction of Girault, Louis. *Kallawayaya, guérisseurs itinérants des Andes*. Paris: Editions de l'ORSTOM, 1984.
- Saignes, Thierry. "De la filiation à la résidence. Les ethnies dans las vallées de Larecaja." *Annales* 33 (1978): 5–6.
- Santos Escobar, Roberto. "La contribución de Apu Chalco Yupanqui, gobernador del Kollasuyu en la expedición de Diego de Almagro a Copiapo, principio de Chile." *Colección de Folletos Bolivianos de Hoy* 3, no. 24 (1987).
- Santos Escobar, Roberto. "Probanza de los Incas Aucaylli de Copacabana." *Colección de Folletos Bolivianos de Hoy* 2, no. 8 (1984): 1–33.
- Sarmiento de Gamboa, Pedro. *Historia de los Incas [1572]*. Buenos Aires: Emecé editores, 1942.

- Scarpa, G., and C. Rosso. "Etnobotánica del coro (*Nicotinia paa*, *Solnacea*). Un tabaco silvestre poco conocido del extremo sur de Sudamérica." *Bonplandia* 20, no. 2 (2011): 391–404.
- Sillitoe, Richard. "Supergene Silver Enrichment Reassessed." In *Supergene Environment Processes and Products*, edited by S. R. Tittley, 15–32. Society of Economic Geologists, 2009.
- Solórzano y Pereira, Juan de. *Política Indiana*, T.1. Madrid: Lope de Vega, 1972.
- Stanish, Charles S. "Formación estatal temprana en la cuenca del lago Titicaca, Andes surcentrales." *Boletín de Arqueología PUCP* 5 (2002): 189–215.
- Taylor, Gerald. *Ritos y tradiciones de Huarochirí*. Lima: IFEA, Banco Central de Reserva del Perú, Universidad Particular Ricardo Palma, 1999.
- Taylor, Gerald. *Camac, camay camasca y otros ensayos sobre Huarochirí y Yauyos*. Lima and Cuzco: Instituto Francés de Estudios Andinos, Centro de Estudios Regionales Andinos "Bartolomé de Las Casas," 2000.
- Torero, Alfredo. *Idiomas de los Andes: lingüística e historia*. Lima: Instituto Francés de Estudios Andinos, 2002.
- Van Burren, Mary, and B. Mills. "Huayrachinnas and Tocoymimbo: Traditional Smelting Technology of Southern Andes." *Latin American Antiquity* 16, no. 1 (2005): 3–25.
- Vazquez de Espinosa, Antonio. *Compendio y descripción de las Indias occidentales* [1629]. Madrid: Atlas, 1969.
- Vellard, Jean. "Bailes de quena quena." *Travaux de l'Institut français d'études andines*. IFEA, 1954.
- Villagomez, Pedro. *Exhortaciones e Instrucción acerca de las idolatrias de los indios del Arzobispado de Lima*. Lima: Horacio Urteaga, 1919.
- Wachtel, Nathan. *Le retour des Ancêtres*. Paris: Galimard, 1989.
- Zagalsky, Paula C. "Nuevas preguntas sobre una antigua federación aymara. Algunos aportes en torno a la Federación Qharaqhara Charcas, siglo XVI." *Surandino Monográfico* 1 (2012): 1–36.

The Potosí Mita and the Geological Foundations of a Colonial Debate

Heidi V. Scott

1 Introduction

Enclosed within a bundle of documents that resides in Spain's Archive of the Indies is a manuscript entitled "On the reproduction of metals in the mountain of Potosí."¹ Although it bears no date or signature, textual comparison reveals it to be a chapter of the *Guía histórica, física, política, civil y legal del Gobierno e Intendencia de la Provincia de Potosí* (*Historical, Physical, Political, Civil, and Legal Guide to the Government and Intendancy of the Province of Potosí*). Encompassing historical narrative, geographical description, and detailed accounts of Potosí's institutions, this expansive work was written in the 1780s by Pedro Vicente Cañete y Domínguez, who for many years occupied the post of *asesor* (advisor) of the government and intendancy of Potosí.² Due to bitter enmities that emerged between Cañete and the miners' guild of Potosí, the *Guía* was not published until 1952, although various copies of the manuscript circulated in Charcas in the late eighteenth century.

It appears that Cañete's chapter accompanied a terse communication that Victorián de Villava, *fiscal* and protector of Indigenous people of the Audiencia de Charcas,³ sent to Spain's minister of the treasury in 1799 as part of his long-standing campaign against the perpetuation of the Potosí *mita*, the forced labor system that Viceroy Francisco de Toledo had established over 200 years earlier. Towards the end of the report, which is preserved in the same archival bundle as the transcribed chapter, Villava invited the minister to consider: "Is it just that the Indian is obliged to extract from a deep mine the same number of *arrobas*⁴ of tailings as from a shallow mine, and that, if he fails to do so,

1 "De la reproduccion de los Metales del Cerro de Potosí," s/f. Archivo General de Indias (henceforth AGI), Charcas 700.

2 Pedro Vicente Cañete y Domínguez, *Guía histórica, física, política, civil y legal del Gobierno e Intendencia de la Provincia de Potosí* (Potosí: Editorial Potosí, 1952).

3 A judicial and administrative court, as well as the territory under that court's jurisdiction. The highlands of what today is Bolivia formed the core of the Audiencia de Charcas.

4 A now-obsolete unit of weight that was equivalent to approximately eleven kilograms.

he is compelled to complete [the quota] during his rest days?" He went on to observe that those interested in learning "all the facts" should consult Cañete's history of Potosí, which was, at that time, "in Madrid in order to be published by license of the Council of the Indies."⁵

If Villava dispatched Cañete's chapter to Madrid alongside his own report, he almost certainly did so because it contained a damning description of work conditions in the depths of Potosí's mountain and advanced the view that its reserves of rich silver were exhausted. The Cerro Rico's interior, Cañete explained, was so riddled with interweaving mine workings that it resembled a sponge. As a result of these perilous conditions, which resulted in frequent cave-ins and deaths among laborers, the mines should be recognized as "a true abyss for humanity."⁶ Elsewhere in his chapter, Cañete admitted that this "abyss" did not even promise great wealth. Although he was persuaded that the entire cerro was "composed of metals," albeit in very low concentrations, he rejected the widespread belief that metals continuously regenerated below ground as well as the notion that "great wellsprings of silver" still awaited discovery in the deepest recesses of the cerro.⁷

Cañete's commentaries on the geology of the Cerro Rico were duly noted by Villava. In his letter to the minister of finance, Villava asked, "If the need for the extraction of metals can justify this violence [of the *mita*], is it just to send them [the *mitayos*] to mines that are exhausted?"⁸ Villava was not interested in the geological constitution of Potosí's silver mountain for its own sake. Rather, geological knowledge provided him with one of numerous foundations on which to base his campaign against the *mita*. In stark contrast to Villava, Cañete was committed to maintaining and even expanding the labor draft, despite his pessimism about the state of Potosí's mines. A number of years after completing his *Guía*, and in the context of his conflicts with Villava and the miners' guild, he would substantially revise his geological understandings of the Cerro Rico.

These fragments offer a preliminary glimpse of how knowledge of the Cerro Rico's geology was interwoven with late colonial politics that revolved around the *mita* and the question of the mountain's longevity as a privileged site of silver production. Although debates over the Potosí *mita* have been deeply studied in historical scholarship alongside other dimensions of late colonial

5 Victorián de Villava al Ex.mo Señor Ministro de Hacienda. La Plata, 02 Feb 1799. AGI, Charcas 700.

6 "De la reproduccion," AGI, Charcas 700. See also Cañete y Domínguez, *Guía*, 57–58.

7 "De la reproduccion." AGI, Charcas 700. See also Cañete y Domínguez, *Guía*, 57–58.

8 Villava al Ministro de Hacienda. La Plata, 02 Feb 1799. AGI, Charcas 700.

mining reform, the geological dimension of these debates is largely overlooked, despite its notable presence in archival documentation.⁹ In bringing this dimension to the fore, building on and expanding beyond explorations of this theme that I have published elsewhere,¹⁰ I seek to demonstrate that closer attention to the entanglement of geology and politics can enrich historical studies of labor and governance in and in relation to Potosí.

Extant historical records of discussions among colonial administrators over mining reform at Potosí reveal an array of perspectives on the formation and geographical distribution of metals as well as on the physical characteristics of the Cerro Rico above and below ground, its origins, and the formation of silver ore within the context of that particular place. Just as colonial commentators throughout the colonial period regarded the Cerro Rico as exceptional in its physical constitution and mineral wealth, so too it was understood by many to be at the center of a vast subterranean network of silver veins that connected Potosí with locations throughout the southern Andes.¹¹ The theories that were advanced in the late eighteenth century by Cañete and Villava, among many others, drew simultaneously on contemporary European understandings of mineralogy and on theories about the Cerro Rico's geological constitution and its mineral reserves that had circulated among mining practitioners at Potosí since early colonial times.

The systematic tracing of genealogies of knowledge about Potosí's Cerro Rico throughout the colonial period is still to be carried out, and it is a project that far exceeds the scope of this chapter. Instead, my purpose in this essay is to illustrate how colonial knowledge of the Cerro Rico's geology was inescapably political—in other words, how it shaped and was shaped by questions

9 See Rose Marie Buechler, *Gobierno, minería, y Sociedad: Potosí y el "renacimiento" borbónico 1776–1810*, 2 vols. (La Paz: Biblioteca Minera Boliviana, 1989); Enrique Tandeter, *Coacción y mercado: La minería de la plata en el Potosí colonial, 1692–1826* (Madrid: Siglo Veintiuno de España Editores, 1992).

10 See Heidi V. Scott, "Mining, Geological Imaginations, and the Politics of Subterranean Knowledge in the Colonial Andes," *Geoforum* (in press), <https://doi.org/10.1016/j.geoforum.2020.08.017>; Heidi V. Scott, "Between Potosí and Nuevo Potosí: Mineral Riches and Observations of Nature in the Colonial Andes, ca. 1590–1800," in *Geopolitics, Culture, and the Scientific Imaginary in Latin America*, ed. Joanna Page and María del Pilar Blanco (Gainesville: University of Florida Press, 2020), 117–32.

11 This exceptionalist thinking was not unjustified given that the Cerro Rico, an ancient volcanic dome, is "easily the world's richest silver deposit." See Kris Lane, *Potosí: The Silver City that Changed the World* (Oakland: University of California Press, 2019), 25. Lane notes that estimates of the quantity of silver extracted from the mountain so far range between 30,000 to 60,000 tons and, moreover, that geologists estimate that "an equivalent amount dispersed in low-grade, refractory ores" still remains.

of economy and labor, the struggles of individuals and groups to control and exploit the subsurface at Potosí and elsewhere in the southern Andes, moral debates over mining, and the wider logics and hierarchies of imperial rule.

The analysis that follows considers illustrative examples from the sixteenth and seventeenth centuries and then turns to Cañete's and Villava's arguments about the geology of the Cerro Rico, examining the controversies over mining reform at Potosí in the late 1700s. By tracing the deep roots of eighteenth-century debates over geology at Potosí, I show that early and mid-colonial sources are equally deserving of scholarly attention for critical inquiries into the entanglements of geological knowledge and politics and, moreover, that such knowledge can often be found in unexpected places. First, however, I offer a brief overview of existing historical scholarship that provides an indispensable point of departure for these explorations. Second, I bring historical scholarship into conversation with political geology, a concept that makes visible the ways in which knowledge of the physical earth is shaped by and also molds social and political thought and the practices of governance that characterize human societies.¹² In doing so, I consider its potential for furthering lines of inquiry into the political dimensions of the competing ways in which, in colonial times, the Cerro Rico and its physical constitution were understood.

2 Andean Histories and Political Geology

Although an overarching genealogy of knowledge in colonial times about the geology of the Cerro Rico remains to be written, a rich body of scholarship that examines the production of knowledge about the subsurface and its properties at Potosí and elsewhere in the Andes already exists. Alongside generating a substantial literature on mining and metallurgical technologies, Andeanist scholars have studied the characteristics and circulation of mineralogical knowledge in Upper Peru and other areas of the Andes in early and mid-colonial times and also prior to the Spanish invasion.¹³ In some cases, this

12 See, in particular, Adam Bobbette and Amy Donovan, eds., *Political Geology: Active Stratigraphies and the Making of Life* (Cham: Palgrave Macmillan, 2019).

13 In this volume, see Thérèse Bouysson-Cassagne, "Potosí Revisited: Toward a Pre-Hispanic Potosí." See also the essays on the pre-Hispanic period in Pablo Cruz and Jean-Joinville Vacher, eds., *Mina y metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVII* (Lima: Instituto Francés de Estudios Andinos, 2008), and in Alan K. Craig and Robert C. West, eds., *In Quest of Mineral Wealth: Aboriginal and Colonial Mining and Metallurgy in Spanish America* (Baton Rouge: Geoscience Publications, Louisiana State University, 1974). See also Modesto Bargalló, *La amalgamación de los minerales de plata*

scholarship attends to the political contexts within which colonial knowledge making about the Earth emerges.

Among these studies, Carmen Salazar-Soler's work is especially notable for her careful tracing of networks of sixteenth- and seventeenth-century knowledge production about the physical earth and the formation of minerals in the Andes.¹⁴ Just as she demonstrates that Potosí and its Cerro Rico was a site of lively innovation in mining and refining techniques, so too she presents colonial theories about the formation of minerals at Potosí and elsewhere in the Andes as an integral part of broader intellectual endeavors to understand geological phenomena such as volcanoes and their eruption.¹⁵ In tracing the mineralogical and earth knowledge that mining experts such as Nicolás de Benino and Luis Capoché generated at Potosí, Salazar-Soler considers questions of power and the influence that many members of mining communities, especially at Potosí, wielded in colonial society. The knowledge of such experts, she writes, "and the interpretation that they carry out of natural phenomena and of colonial society is subject to political and at times religious objectives."¹⁶ In some instances, this knowledge was deployed for political purposes by powerful individuals such as the Viceroy Toledo, while on other occasions the writings of Potosí-based mining experts such as García de Llanos, who authored a mining dictionary and an account of Oruro and its mines in

en Hispanoamérica colonial (México: Fundidora de Fierro y Acero de Monterrey, 1969). Allison Bigelow foregrounds how colonial ore-refining techniques and mineralogical understandings were shaped by Andean knowledge, even as the Andean origins of that knowledge is obscured in the historical record. See Chapter 9 in Allison Margaret Bigelow, *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World* (Chapel Hill: University of North Carolina Press, 2020); Allison Bigelow, "Incorporating Indigenous Knowledge into Extractive Economies: The Science of Colonial Silver," *The Extractive Industries and Society* 3, no. 1 (2016): 117–23.

14 See Carmen Salazar-Soler, "Los 'expertos' de la corona: Poder colonial y saber local en el Alto Perú de los siglos XVI y XVII," *De Re Metallica* 13 (2009): 83–94; Carmen Salazar-Soler, "En búsqueda del tesoro perdido: los jesuitas y las técnicas mineras en el Perú de los siglos XVI y XVII," in *Los jesuitas y la modernidad en Iberoamérica, 1549–1773*, ed. Manuel Marzal and Luis Bacigalupo, 226–58 (Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú, 2007); Carmen Salazar-Soler, "Obras más que de gigantes: Los jesuitas y las ciencias de la tierra en el Virreinato del Perú (siglos XVI y XVII)," in *El saber de los jesuitas: historias naturales y el Nuevo Mundo*, ed. Luis Millones Figueroa y Domingo Ledezma (Frankfurt-Madrid: Vervuert-Iberoamericana, 2005), 147–72.

15 See, in particular, Salazar-Soler, "Obras."

16 Carmen Salazar-Soler, "Los 'expertos,'" 13.

the early seventeenth century, played a role in the unfolding of regional power struggles over territorial control in Upper Peru.¹⁷

Also concerned with questions of power and politics in relation to the underground, Tristan Platt, Pablo Quisbert, and Thérèse Bouysse-Cassagne explore the sacred and political geographies to which Potosí's Cerro Rico and other important pre-conquest mining sites belonged, as well as examining the Andean politics of concealing and divulging knowledge of silver ore deposits in the wake of the Spanish invasion of the southern Andes.¹⁸ In addition to showing that sites rich in gold or silver ore, including the Cerro Rico, were subject to complex and shifting geographies of ownership by numerous Inca rulers and lineages and local Andean communities, these authors bring to light how, in the colonial period, Spanish knowledge of rich ore deposits and mining sites was strongly shaped by these preexisting Andean geographies and the politics that shaped them. Within these regional landscapes and their politico-religious geographies, the Cerro Rico, which in all likelihood was dedicated to the Sun by the Incas on account of its exceptional mineral wealth, occupied both the center and the apex in terms of the sacred significance with which it was associated.¹⁹ Conveyed by this literature is the insight that Andean politics over these sites of mineral wealth were strongly relational, for they were accorded meaning not simply as discrete places but rather as integral parts of a vast topography and subterranean geography of sacrality and power. Even as the European invaders rejected Andean sacred geographies, casting them as idolatry, colonial ways of knowing the geological attributes of the Cerro Rico as well as of other mining sites would continue to be shaped by relational thinking.²⁰

As this brief sketch suggests, existing scholarship about Potosí that traces the entanglements of geological knowledge and colonial politics is strongly focused on the sixteenth and seventeenth centuries. Yet, as Salazar-Soler notes, the late eighteenth century was a time of renewed "intellectual effervescence"

17 Carmen Salazar-Soler, "Los 'expertos,'" 13. See also Scott, "Mining," 4, for a brief discussion of Toledo's efforts to generate knowledge of the Cerro Rico's interior as well as of wider Andean mineral geographies more generally.

18 Thérèse Bouysse-Cassagne, "Minas del sol, del Inka, y de la gente. Potosí en el contexto de la minería prehispánica," in *Mina y Metalurgia*, ed. Cruz and Vacher. See also Tristan Platt and Pablo Quisbert, "Tras las huellas del silencio: Potosí, los Inkas y el Virrey Toledo," in *Mina y Metalurgia*, ed. Cruz and Vacher.

19 See Bouysse-Cassagne, "Minas del sol"; Platt and Quisbert, "Tras las huellas del silencio," and Pablo Cruz and Pascale Absi, "Cerros ardientes y *huayras* calladas: Potosí antes y durante el contacto," in *Mina y Metalurgia*, ed. Cruz and Vacher, 105.

20 See Scott, "Between Potosí and Nuevo Potosí."

that was reminiscent of “Potosí in the times of Alonso Barba.”²¹ Although Salazar-Soler appears to link this effervescence specifically to the 1790s and the years that followed the arrival of the Nordenflicht expedition, recent scholarship more broadly calls into question the notion that, despite reform efforts and modest recoveries in silver production, eighteenth-century Potosí and its mines were primarily defined by continued decline and crisis. In this volume, for example, Rossana Barragán Romano demonstrates that the eighteenth-century recovery of Potosí’s mining industry was not only substantial but also that it experienced dynamic change through the growing participation of small- and medium-scale artisanal operations that were largely carried out by Indigenous miners and refiners.²² Within this landscape of change, renewal, and conflict between different interest groups over varied aspects of governance and reform policy, discussion and heated debate also flourished about the physical constitution of the Cerro Rico and the processes that brought about its formation.²³

The shifting and conflicting ideas that circulated about the Cerro Rico’s physical interior during the colonial period may be understood through the conceptual lens of political geology. This term, which has generated growing interest in the humanities and social sciences, captures the ways in which human politics and knowledge of the physical earth are not only intertwined but are also co-constituted.

For Adam Bobbette and Amy Donovan, editors of a key volume of essays on political geology, “Social and political space is fundamentally geological.”²⁴ On the one hand, this statement is intended to convey that human politics are founded upon and shaped by struggles over an array of geological resources, including fossil fuels and minerals. On the other hand, it also evokes the ways in which “geology too emerges in and through political processes, as it is demarcated, framed, and becomes an object of knowledge.”²⁵ Far from being neatly

21 Salazar-Soler, “En búsqueda,” 236.

22 Rossana Barragán, “Un banco de plata: el heterogéneo mundo de productores/as, rescatis-tas y el renacimiento de Potosí en el siglo XVIII,” this volume.

23 In the context of mining reforms at Potosí and broader efforts to systematize the exploitation of the underground in the Andes, the eighteenth century witnessed a proliferation of mineralogical descriptions, mining maps, and reports on the state of the mining that were produced by mining officials and administrators as well as by private individuals who sought to promote extractive activities. For discussion of the mapping of the Cerro Rico within the context of reform see Scott, “Mining,” 5–8.

24 Adam Bobbette and Amy Donovan, “Political Geology: An Introduction,” in *Political Geology*, ed. Bobbette and Donovan, 2.

25 Bobbette and Donovan, “Political Geology,” 2–3.

detached from social and political realms, geological sciences are unavoidably imbricated in politics, in the sense that the knowledge and representations that these sciences generate exert influence on how the Earth is perceived and, therefore, on practices of governance, because “knowing the earth is simultaneously a means of governing people in relation to it.”²⁶ As an object of knowledge, however, geology is by no means the exclusive preserve of the Western discipline that coalesced in the nineteenth century.²⁷ In addition to highlighting the political dimensions of the modern geological sciences, Bobbette and Donovan call for what they term an “amodern” understanding of geology that “pluralizes the world of geological practices and traditions” and “tells stories of the multiple traditions of geological thinking and of encounters between traditions of geological thought.”²⁸

To be sure, the time period that is covered in this chapter predates the emergence of disciplinary geology, and it is vital to acknowledge epistemological change across time as well as changing historical circumstances—not least, a recognition of the dramatic expansion and intensification in extractivism and in other forms of human interactions with the subsurface that characterize the present and recent past in Bolivia, Peru, and elsewhere in Latin America.²⁹ Yet Bobbette and Donovan’s emphasis on a pluralized understanding of “geological traditions” that goes beyond the epistemological and temporal confines of modern geological science make it possible to think about the intertwining of politics and varied ways of knowing the physical earth in the colonial Andes as expressions of political geology.

First, the concept of political geology allows the inseparability of politics and earth knowledge at Potosí in the period of Spanish rule to be brought to the fore as a focus of critical inquiry. Second, it permits the inclusion of diverse

26 Bobbette and Donovan, “Political Geology,” 26.

27 For a detailed overview of the history of this discipline, see Rachel Laudan, *From Mineralogy to Geology: The Foundations of a Science, 1650–1830* (Chicago: University of Chicago Press, 1987).

28 Bobbette and Donovan, “Political Geology,” 17–18. To cite a specific example, Bobbette’s own contribution to the volume examines the different ways in which scientists and shamans in Java seek to “know and predict the same volcano.” See Adam Bobbette, “Cosmological Reason on a Volcano,” in *Political Geology*, ed. Bobbette and Donovan, 170.

29 On the modern politics of extraction and control over the subsurface in the Andes and elsewhere in Latin America see, for example, Anthony Bebbington and Jeffrey Bury, eds., *Subterranean Struggles: New Dynamics of Mining, Oil, and Gas in Latin America* (Austin: University of Texas Press, 2013); Fabiani Li, *Unearthing Conflict: Corporate Mining, Activism, and Expertise in Peru* (Austin: Duke University Press, 2015); Andrea Marston, “Strata of the State: Resource Nationalism and Vertical Territory in Bolivia,” *Political Geography* 74 (2019): <https://doi.org/10.1016/j.polgeo.2019.102040>.

ways of knowing the physical earth that, over the course of the colonial period, emerged from different Andean and European traditions of thought and that variously intersected, shaped one another, and came into conflict. Used on its own, a term such as “mineralogy” effectively describes specific forms of earth knowledge that flourished in colonial Potosí and other mining sites, and it necessarily excludes, for example, the nascent earth historical thought that is evident in some late eighteenth-century writings about the geology of the Cerro Rico, as well as the Andean sacred geographies that placed the silver mountain at the center of a network of venerated sites. In addition to allowing for a plurality of ways of knowing the Earth, a political geological approach to studying Potosí’s colonial past also invites the study of their tensions and interconnections, within the context of wide-ranging concerns and conflicts in society that included mining but also extended far beyond it. After presenting some illustrative examples from the sixteenth and seventeenth centuries, I pick up the thread of the story that opens this chapter in order to trace the political geologies that were embedded within late colonial debates over the Potosí *mita*.

3 Potosí and the Politics of Geological Knowledge in Early Colonial Writings

The late sixteenth century and early seventeenth centuries, a period of unparalleled mining activity and silver production at Potosí, witnessed the creation of an array of accounts of the Cerro Rico and its geological attributes. None was more widely disseminated than José de Acosta’s description of Potosí’s silver mountain, along with his account of mining in the wider Andes and his theories of mineral formation. Contained within his widely disseminated opus *Historia natural y moral de las Indias* that was first published in Seville in 1590, the Jesuit scholar’s writings on Potosí were remarkably influential in shaping geological understandings of the silver mountain throughout the colonial period, even in the late eighteenth century, as the next section of this chapter briefly illustrates. Nevertheless, many more accounts of the Cerro Rico, often contained within practical reports and petitions, were written in the early years of the silver boom by mining practitioners, mine owners, and mining officials—that is, by men such as Nicolás de Benino, Luis Capoche, García de Llanos, and Álvaro Alonso Barba—who were all deeply immersed in Potosí’s extractive economy. As Salazar-Soler demonstrates, these individuals, and others like them who were resident in Potosí and were viewed as experts on the city’s affairs and especially its mining industry, enjoyed very

considerable influence and recognition in a colonial society that was founded upon the extraction and circulation of precious metals.³⁰ Viceroy and other individuals in positions of power drew on and invoked their local expertise in order to advance their own personal and political projects; indeed, the influence and knowledge of these Potosí mining experts also operated through Acosta, whose writings draw directly on Capoche's 1585 *Relación General de la Villa Imperial de Potosí*, and who benefitted from his personal interactions with mining men during his stay in the city.³¹

In demonstrating how the local knowledge of such men was "put to work for the political and social objectives of the crown," Salazar-Soler emphasizes the varied nature of their expertise rather than the role that geological understandings of the Cerro Rico played in these networks of influence and power.³² Beginning with a brief discussion of Nicolás de Benino's *Relación muy particular del cerro y minas de Potosí* (*Very Particular Account of the Mountain and Mines of Potosí*), I build on Salazar-Soler's work by tracing the political geologies that run through and connect a selection of sixteenth- and seventeenth-century writings. In doing so, I emphasize their internal tensions and consider how these might be understood in the context of debates over the future of Potosí and other mining centers. Far from being a comprehensive chronology, this discussion emphasizes sources that have received relatively little scholarly attention and those that have been overlooked as repositories of geological knowledge.

Benino's prominent position and his influence in Potosí and beyond makes his *Relación* a good point of departure for examining the political geologies that centered on the Cerro Rico in the early colonial period. After establishing himself as a mine owner in 1550, just five years after the Cerro Rico began to be worked by the Spanish, he and a number of associates responded to the first signs of declining silver yields by commencing excavation of the first *socavón* (adit or horizontal gallery) into the mountain in 1556 in search of rich ore, a highly ambitious project that would be emulated widely at Potosí.³³ Benino also had the ear of Viceroy Toledo. The viceroy, who endeavored to rehabilitate Potosí's mining economy following the exhaustion of rich surface ores in the 1560s, instructed Benino in 1573 to write an account of the Cerro Rico that was intended for the eyes of Philip II. Around the time of writing the

30 Salazar-Soler, "Los 'expertos'".

31 Salazar-Soler, "Los 'expertos,'" 87.

32 Salazar-Soler, "Los 'expertos,'" 83.

33 Salazar-Soler, "Los 'expertos,'" 84–85.

Relación, Benino held the post of city attorney for Potosí³⁴ and as such was an official advocate for the wider community of mine owners as well as for his own interests.

Benino was concerned as much with describing the physical properties of the Cerro Rico and contemporary theories of the distribution and formation of silver ore inside the mountain as he was with detailing its “discovery” in 1545 and its subsequent exploitation. Perhaps not surprisingly, given the length of his experience of over twenty years at Potosí, his descriptions of the mountain’s principal veins and of the distribution of ore are strikingly nuanced, for he carefully noted the wide variations in the richness and quantity of silver deposits even in its upper reaches, where the sheer volume of high-grade ore fueled the initial boom of 1545. In describing the Centeno vein, for example, he observed that “there have been so many variations [in the richness of the ore] that when people who are knowledgeable about such matters think about this, they lose their wits and their ability to understand these things.”³⁵

Overall, however, on the basis of empirical observations, Benino identified a pattern whereby the ore became substantially less abundant and less rich about one third of the way down—a pattern that would later be described in many other accounts of the Cerro Rico, among them in José de Acosta’s widely read *Historia natural y moral de las Indias*.³⁶ In contrast to Acosta, Benino expressed support for the theory—one that enjoyed widespread acceptance among miners at Potosí—that considerable silver wealth would continue to be discovered in the lowest third of the mountain. Indeed, he suggested, the ongoing discovery of new deposits located at great depth inside his own mine, which was the deepest of all the mines in the Cerro Rico, pointed towards this being the case.³⁷

Undoubtedly influenced by Andean understandings of ore formation as well as by European traditions of thought, Benino understood that the formation of silver ore in the cerro resulted from two sets of parallel forces, one from above

34 See editorial note (a) in Nicolás de Benino, *Relación muy particular del cerro y minas de Potosí y de su calidad y labores* [1573], in *Relaciones Geográficas de Indias: Perú*, Vol. 2 (Madrid: Tipografía de Manuel G. Hernández, 1885), 98.

35 Benino, *Relación*, 106.

36 José de Acosta, *Historia natural y moral de las Indias* (Seville, 1590), 215. The tripartite division of the Cerro Rico, described by Benino and other Spanish commentators, reflected Andean classifications of ore into pacos, mulatos, and negrillos. These categories, Bigelow observes, were spatial, determined by “underground location, using observable physical properties to understand the inner essences of mixed metals.” See Bigelow, *Mining Language*, 278.

37 Benino, *Relación*, 108.

and the other—more powerful—from below. On the one hand, the silver ore that was to be found close to the cerro's surface had taken shape thanks to the combined effects of rainwater and hail on the cerro's surface with the actions of the sun and “the virtue of the planets.”³⁸ On the other hand, he explained, the mountain's silver “has another more important source, which proceeds from below and towards the center and upward, and in that place it is said there is a *cepa* (rootstock).” Growing upwards in tree-like fashion, the veins of silver “or branches are produced by the force of the rootstock.”³⁹ In the depths of his mine, he continued, the *Veta Rica* (Rich Vein) was “enclosed within the rock so firmly and beautifully, that it must be understood that God our Lord formed it in order to hold greater secrets.”⁴⁰ The cerro's greatest riches, in other words, might yet await discovery.

It would be misguided to suggest that Benino embraced this optimistic interpretation of the Cerro Rico's geology purely as a calculated political maneuver intended to secure new royal privileges or rewards for himself and the wider Potosí mining community. Nevertheless, his commentaries should certainly be considered in light of his position as a prominent mine owner, engineer, and advocate for Potosí's mining industry. In 1573, Benino's adit project—which relied upon *mitayo* labor—was still several years from completion, and it must be assumed that he wished to assure his mining associates, as well as the monarch and viceroy, that this ambitious engineering work would yield rich rewards.

Toledo, who was himself aggressively committed to fostering mining at Potosí, and who initiated the establishment of the *mita* in the year in which he instructed Benino to write his *Relación*, was receptive to the promising predictions, relayed by Benino and other miners, about the existence of great riches in the Cerro Rico's depths.⁴¹ Indeed, in his mining ordinances for Potosí, issued in 1574, the viceroy advanced this very interpretation of the mountain's geology. Drawing on “the opinion of the majority of miners,” he upheld the theory that the principal silver veins converged deep within the mountain's base, forming an exceptionally rich lode. Consequently, from a depth of about 200 *estados*

38 Benino, *Relación*, 111.

39 Benino, *Relación*, 111.

40 Benino, *Relación*, 112. Similar ideas were also expressed in the 1620s by the licentiate Juan de Torres, who proposed opening yet another adit about two thirds of the way down the Cerro Rico in order to access its “*çepa*” of silver ore. He produced a written account that was accompanied by a sketch map. See Scott, “Mining,” 1–3.

41 For a detailed discussion of Toledo's implementation of the *mita*, see Cole, *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes* (Stanford: Stanford University Press, 1985).

onwards, “the wealth will be like that which was found from the surface down to about sixty or fifty [*estados*], and less in some [mines], and in that case it will be the most important and consequential thing that has ever occurred.”⁴²

Toledo undoubtedly recognized the ever-present uncertainties of mining. Nevertheless, this theory provided a geological basis, endorsed by the majority of Potosí’s mining practitioners, for conceiving of the Cerro Rico as a mining site that would endure—as well as for justifying, in the years of Toledo’s government as well as beyond, the establishment and preservation of a large-scale system of forced labor. Even though the lode never materialized, Toledo’s predictions were arguably vindicated by the uninterrupted extraction of metals from the Cerro Rico that would take place for centuries to come—and this continues in the present day. As early as the 1590s, however, the possibility that the cerro would soon be exhausted and abandoned became a common theme—one that would, at times, be strategically invoked by prospectors and mine owners who were engaged in mining ventures beyond Potosí.

Even as the first signs of decline in production began to be felt at the Cerro Rico, the mountain and its mines continued to provide a vital point of reference and a yardstick against which all other mining sites in the Andes were measured. Juan Fernández de Hinestrosa’s petition to the monarch for a quota of between 800 and 1,000 *mitayos*, along with other royal concessions, is a good case in point.⁴³ Hinestrosa, who played a central role in establishing the silver mines of Nuevo Potosí in the central Peruvian province of Huarochirí, trod a fine line between likening this site to the “original” Potosí and conveying the message that, unlike the Cerro Rico’s mines, these would endure for a long time to come. He expressed his ideas in geological terms: the mines of Nuevo Potosí, just like those of their namesake, were “*minas fijas*”—literally, “fixed” mines or mines of substance in which silver matured deep underground and grew upward towards the surface. At the same time, he called into question the notion that a rich lode still remained to be discovered at Potosí: the renewed discovery of great wealth inside the Cerro Rico would be, he insisted, “contrary to the order of nature” given the depth of the mines.⁴⁴

42 Francisco de Toledo, *Ordenanzas de las minas de plata de Potosí y Porco* (1573), in *Disposiciones gubernativas para el virreinato del Perú, 1569–1574*, ed. Guillermo Lohmann Villena (Seville: Escuela de Estudios Hispano-Americanos, 1986), 325.

43 See Juan Fernández de Hinestrosa, “Relaçion breue y sumaria del descubrimiento q. hizo Fran.co Gomez del çerro nuevo potossi y los demas que estan en su contorno ... por Juan F.dez de Hinestrosa minero que es el verdadero descubridor de la plata destas minas y el que a dado luz de su fijeza y fundamento.” Nuevo Potosí, 19 March 1596. AGI, Charcas 134.

44 Hinestrosa, “Relaçion breue.” AGI, Charcas 134. For a more detailed discussion of this case, see Scott, “Between Potosí and Nuevo Potosí.”

Hinestrosa's understanding of a close correspondence between these two locations was undoubtedly shaped by Andean geological knowledge and sacred geographies that, since Inca times, had symbolically linked the Cerro Rico with Nuevo Potosí and other surrounding sites. Hinestrosa and his associates, Platt and Quisbert observe, very much owed their "discovery" to the knowledge of Indigenous miners, and this knowledge is manifest in Hinestrosa's descriptions.⁴⁵ Nevertheless, Hinestrosa identified not only parallels between the Cerro Rico and Nuevo Potosí, but also differences that, in tension with these parallels, played a key role in his project of persuasion. By locating each site at different stages on a linear trajectory of underground exploitation that was constrained by natural limits, he sought to convince the Crown that his own mines were truly the "new" Potosí.

As the seventeenth century progressed, the continued downturn in Potosí's silver production fueled fears among mine owners over the imminent exhaustion and possible abandonment of the Cerro Rico's ever-deepening mines, and they felt threatened not only by falling silver yields in their own mines but also by the prospect of a transfer of labor, capital, and royal favor to more recently established sites such as Nuevo Potosí. In the face of such threats, some prominent *potosinos* who sought to defend the privileges of Potosí's mine owners not only promoted favorable understandings of the Cerro Rico's geology but also deployed geological arguments that cast doubt on the value of mining sites that were being established elsewhere.

A particularly prominent advocate for Potosí's mining industry was Sebastián Sandoval y Guzmán. In addition to being a scholar of the University of Lima, Sandoval held the post of city attorney for Potosí. Published in Madrid in 1634, his lengthy and self-consciously erudite *Pretensiones de la Villa Imperial de Potosí* (*Pretensions of the Imperial City of Potosí*) brought to the royal court the pleas of Potosí's mining community for new royal privileges and assistance, along with elaborate supporting arguments. In representing the mine owners' interests to the Council of the Indies by means of his *Pretensiones*, Sandoval petitioned, among other things, for the royal fifth (*quinto*) that was paid to the royal treasury on silver extracted from Potosí's mines to be reduced to a tenth, and that a new "general reduction" be carried out that would forcibly return Indigenous migrants to their communities of origin in provinces that were subject to the *mita* in order to make them available for the labor draft.⁴⁶

45 See Platt and Quisbert, "Tras las huellas del silencio," 270.

46 Sebastián Sandoval y Guzmán, *Pretensiones de la Villa Imperial de Potosí, propuestas en el Real Consejo de Indias* (Madrid, 1634), fol. 1. Very little scholarship exists on this text and on Sandoval's efforts on behalf of Potosí's mining community. See, however, Renzo

The attorney acknowledged, on the one hand, that the great depth of the mines had made extraction increasingly difficult and that the quality of the ore was decreasing. On the other hand, he identified the lack of subsidized labor (that is, draft labor), the scarcity and cost of mercury, and the fiscal burden—which was, in his view, excessive—of the royal fifth as the principal problems that Potosí's miners faced. As we will see, he mobilized geological arguments to underpin his claim that the miners and mill owners of Potosí deserved to be recipients of special royal privileges and that, despite the decline in production, the establishment of mines in other areas should be restricted.

In light of the scarcity of cheap labor, Sandoval declared, it was preferable to have “few mines well supplied with Indians than many mines that are poorly supplied” and that it was logical for draft laborers to be assigned to the most productive mines—a policy that, he noted, Viceroy Toledo had also followed.⁴⁷ According to the attorney, all the mining sites in adjacent regions, among them the mines of Oruro and those of Lipes and Chichas, in addition to impeding the fulfillment of the Potosí *mita*, could not be expected to last for any length of time, despite having produced large profits in the short term.⁴⁸ In contrast,

until this time, no other mountain has been discovered in Peru as rich as [that of] Potosí, for in it there is not a single stone that does not contain silver, and [in] the other mines that have been discovered only the veins that are worked contain silver, and the gangue does not. And although very rich mines are sometimes found at these new mining sites, they do not endure, and only serve to upset the Indians, and remove them from their villages, without being of any utility whatsoever to His Majesty.⁴⁹

If mineral prospectors went to great lengths to seek out veins of silver in “other mountains and remote areas” it was—according to Sandoval—because they were permitted to pay the Crown no more than one tenth of the value of the metal they extracted, in contrast to the mine owners of Potosí, who were obliged to pay the royal fifth.⁵⁰

Honores, “Arbitrismo, derechos mineros y discursos legales en las Pretensiones de la Villa Imperial de Potosí de 1634.” X Congreso de la Asociación de Estudios Bolivianos. Sucre, Bolivia, 22–26 de julio del 2019.

47 Sandoval y Guzmán, *Pretensiones*, fol. 103v.

48 Sandoval y Guzmán, *Pretensiones*, fol. 104.

49 Sandoval y Guzmán, *Pretensiones*, fol. 104v.

50 Sandoval y Guzmán, *Pretensiones*, fol. 104v-105.

For all his carefully crafted arguments, Sandoval failed to secure for Potosí's mining élite the royal privileges on which he had set his sights. Ever ambivalent and uncertain about matters relating to Potosí, the Crown continued to cling to the Cerro Rico, economically and symbolically, but declined to accede to Sandoval's requests.⁵¹ Far from being forgotten, however, Sandoval's *Pretensiones*, which Cole describes as the "most famous, and complete, of the *azogueros*' petitions,"⁵² was repeatedly invoked in later endeavors to advocate for Potosí's mining community. Perhaps most notably, the *Pretensiones* substantially shaped a late seventeenth-century pro-*mita* treatise, written in 1673 by lawyer and Lima resident Nicolás Matías del Campo de la Rynaga, that would prove critical in the preservation of the *mita* into the eighteenth century.

Campo's *Memorial apologético, histórico, jurídico, y político* was written in direct response to the 1670 proposal, presented by the Conde de Lemos, viceroy of Peru, to abolish the Potosí *mita* on the grounds that its abuses were so deeply engrained that true reform would be an impossible task.⁵³ Over the course of the seventeenth century, the depopulation of communities that were subject to the *mita*, outward migration of people from those communities, and the ongoing decline in silver production all played a role in transforming Toledo's labor system. By the 1660s, the numbers of *mitayos* who could be assigned to the mines and mills of Potosí every year had fallen to roughly half of the quotas originally assigned by Toledo, and cash payments, delivered by kurakas to the mine owners, replaced up to half of that reduced pool of *mitayos*.⁵⁴ This

51 In part, this hesitancy stemmed from the profoundly "divergent" reports about Potosí that were received in Madrid from viceroys on the one hand and mine owners on the other, as well as from the viceroys' reluctance to reward miners for their violations of laws governing the *mita*, particularly their practice of accepting payments in lieu of *mitayos*. See Jeffrey A. Cole, "An Abolitionism Born of Frustration: The Conde de Lemos and the Potosí Mita, 1667–73," *Hispanic American Historical Review* 63, no. 2 (1983): 313–14.

52 Cole, "An Abolitionism," 313.

53 Cole observes that although Lemos presented moral arguments, his reasons for calling for abolition were principally "logistical"—that is, founded primarily on the impossibility of reform—rather than on a fundamental moral objection to the *mita* as established by Francisco de Toledo. See Cole, "An Abolitionism," 326. For a book-length study of the early history of Potosí's *mita*, see Jeffrey A. Cole, *The Potosí Mita*. For an in-depth analysis of the *mita* in the late colonial period, see Tandeter, *Coacción y mercado* and Vol. 1 of Rose Marie Buechler, *Gobierno, minería, y Sociedad: Potosí y el "renacimiento" borbónico, 1776–1810*, 2 vols. (La Paz: Biblioteca Minera Boliviana, 1989). For a key reevaluation of the relationship between the *mita* and other forms of labor in Potosí's mines and mining mills, with emphasis on the eighteenth century, see Rossana Barragán, "Working Silver for the World: Mining Labor and Popular Economy in Colonial Potosí," *Hispanic American Historical Review* 97, no. 2 (2017): 193–222.

54 Cole, "An Abolitionism," 309–311.

situation, as the Conde de Lemos and other contemporary critics of the *mita* observed, placed intolerable burdens on *mitayos* who labored in the mines as well as on their kurakas and home communities, in addition to defrauding the Crown of its silver revenue. Attempts by royal officials to lessen the demands on draft workers and stamp out fraudulent practices were met with tenacious resistance and even with deadly violence: In 1660, mine owners orchestrated the murder of Fray Francisco de la Cruz who, appointed by Viceroy Conde de Alba, had been granted sweeping powers to enact such reforms.⁵⁵

By the time the Council of the Indies began to deliberate over the Conde de Lemos's proposal, three years had passed; added to Lemos's death in 1671, the Council's uncertainties about the situation at Potosí, and its fears that abolition would cause silver production to fall still further, the publication of Campo's pro-*mita* arguments fatally delayed these deliberations.⁵⁶ Campo insisted that Peru's Indigenous communities, on whose labor the kingdom depended, were richly deserving of royal protection and that the Crown should "honor, favor, assist and compensate those Indians for the harm they suffer in the mines of Peru."⁵⁷ Although he dismissed as hyperbole the horrific terms in which the *mita* was frequently described, he conceded that a variety of abusive and illegal practices did occur in Potosí's mines and mills. As Cole observes, however, the lawyer's "most important message" was that the Potosí *mita* could be successfully reformed.⁵⁸ Campo also viewed the labor draft as critically important for ensuring ongoing extraction at Potosí, not despite but indeed because of the fact that the Cerro Rico's ores had become increasingly poor. Although it would be misleading to suggest that geological arguments were central to Campo's treatise, his arguments about the *mita* itself were framed by a political geology that rationalized the continued exploitation of Potosí's mines and their privileging over other mining sites.

55 Cole, "An Abolitionism," 317.

56 Cole, "An Abolitionism," 327–29. For a highly detailed study of how policies towards and debates over the *mita* unfolded in the last two decades of the seventeenth century and the early 1700s, see Ignacio González Casanovas, *Las dudas de la corona: La política de repartimientos para la minería de Potosí (1680–1732)* (Madrid: Consejo Superior de Investigaciones Científicas, 2000).

57 Nicolás Matías del Campo de la Rynaga, *Memorial apologético, histórico, jurídico, y político. En respuesta de otro, que publicó piadoso vn religioso, contra el repartimiento de indios, que introduxo en Potosí la comun necesidad, y causa publica, para el beneficio de sus minas* (Madrid, 1672), 7. I consulted the copy that is held in the Houghton Library, Harvard University.

58 Cole, "An Abolitionism," 329. This episode is also discussed in Cole, *The Potosí Mita*, 88–104.

Predictably, the lawyer went to great lengths to counter arguments that the labor draft was inherently unjust, a violation of Indigenous people's "natural liberty," and the principal cause of the depopulation of communities that were subject to the *mita*.⁵⁹ At the same time, he vigorously attacked the suggestion that the *mita* should be banned at Potosí and allocated to other mining sites, in the event that the monarch chose not to abolish the institution altogether.

Drawing directly on Sandoval's arguments and turns of phrase, he insisted that Potosí's decline had been greatly exacerbated by the establishment of new mining sites that had lured workers with prospects of "greater wealth and superior wages."⁶⁰ How many mining sites, he asked rhetorically, had been worked and had benefitted from the labor of Andeans who had been assigned to the Potosí *mita*? "Oruro, Tazi, Cochino, Zipuro, Porco, los Lipes, los Chichas, Caylloma, Carangas, San Antonio, and others," he went on, "have these not consumed and stolen the Indians of Potosí?"⁶¹ Neither Toledo nor his successors had chosen to grant *mita* quotas to other mining sites, for they well knew—and again he paraphrased Sandoval—"that it is better to have few mines well supplied with Indians than many that are poorly supplied."

In light of the very real decline in silver production that Potosí had witnessed in the decades since Sandoval presented his *Pretensiones* to the Council of the Indies, it is perhaps unsurprising that Campo, in contrast to Sandoval, freely admitted that the richness of Potosí's silver ores had become "greatly deteriorated and diminished"⁶² and that many of the newer mining sites yielded ores of far higher grade. Far from being a reason to abolish Potosí's *mita*—an argument that Victorián de Villava would make over a century later—the very poverty of Potosí's ores, Campo maintained, justified the *mita*'s preservation, for free wage laborers would never choose to work in mines in which they could not enjoy "the compensation of rich metals."⁶³ For many years, Potosí's miners had lived "deluded by their hope, promising themselves that their success in [exploiting] the veins would be infallible" and imagining the rocks inside their mines to be "pure silver"—a collective belief that generally resulted in them dying as paupers.⁶⁴ Without *mitayos*, these miners would become disillusioned and, once and for all, would abandon Potosí.⁶⁵ Furthermore, Campo

59 Campo, *Memorial*, 4.

60 Campo, *Memorial*, 26.

61 Campo, *Memorial*, 27.

62 Campo, *Memorial*, 39.

63 Campo, *Memorial*, 37–38.

64 Campo, *Memorial*, 39–40.

65 Campo, *Memorial*, 40.

reasoned, sending *mitayos* into these exhausted mines was more morally justifiable than assigning them to rich ones: to do the latter was to use forced labor “to needlessly violate the freedom of the Indians.”⁶⁶

Although Campo acknowledged the depleted state of the Cerro Rico, he—like Sandoval—dismissed the wealth of other mining sites as short-lived, repeatedly invoking Sandoval’s argument that these other, newer mines “lack the longevity and fixity in their veins [of ore] that has always been abundantly evident at Potosí.”⁶⁷ Notwithstanding the state of decrepitude of Potosí’s mines, he declared,

the extreme situation involving their workings being abandoned has not been reached, as it has in many others that have shut down because their veins lacked wealth altogether, or because they were inundated or suffered other kinds of misfortunes that those [mines] of Potosí have overcome because they are the most firm and constant ... and so superior in their excellence to all others, that even the stones and the gangue, that shelters the veins, hold silver: such that today this site delivers to the royal treasury more tribute ... than the most powerful and rich [mine] that is being worked.⁶⁸

On the one hand, Campo’s arguments in favor of the *mita*’s preservation at Potosí were underpinned by what might be termed a declensionist geological narrative. On the other hand, he attributed to the Cerro Rico a material constancy that had no parallel anywhere else in the Andes and that allowed him to justify the allocation of Indigenous mine workers, even as they shunned the mountain in favor of other sites.

Such narratives of the Cerro Rico’s enduring qualities and its primacy over other sites, rather than fading over time, themselves endured. As we will see, the earth knowledge of early colonial commentators loomed large in the late eighteenth century, as both defenders and detractors of the Potosí *mita* deployed geological arguments to bolster their cause. The struggles over the *mita* that Victorián de Villava and Vicente de Cañete conducted through their writings therefore continued a debate that spanned centuries. If, at times, this debate subsided, at other times—often in the context of economic or demographic crisis—it rose vigorously to the surface. Without doubt, questions about the inherent morality or otherwise of forcing men who were deemed

66 Campo, *Memorial*, 47–48.

67 Campo, *Memorial*, 27.

68 Campo, *Memorial*, 29.

legally free to risk their lives and health by laboring below ground and in ore processing mills were a constant, even though the vast majority of colonial critics were reluctant to call for the *mita*'s wholesale abolition, on the grounds that Peru and Spain's empire alike depended so heavily on Potosí's silver that they would crumble without it.⁶⁹

In the writings of Bourbon defenders of Potosí and the *mita*, these narratives took the shape, as we have seen, of ever more detailed geological arguments. If we are to believe his 1797 account of geological "conversion," Pedro Vicente de Cañete not only came to embrace the idea that deep-seated rich ores still remained to be discovered in the mountain, but he also felt able to declare that it constituted, in a literal sense, "the trunk from which all the [silver] veins in the Kingdom of Peru germinate."⁷⁰ Like Campo and Sandoval before him, however, he considered these offshoots to be considerably less vigorous than the rootstock from which they emerged.

69 For discussion of debates over the *mita* in the mid-colonial and late colonial period, see González Casanovas, *Las dudas de la corona*; Tandeter, *Coacción y mercado*; Volume 1 of Buechler, *Gobierno, minería, y sociedad*. Ricardo Levene's work was foundational in bringing Victorián de Villava's life and work into scholarly view, including his writings against the *mita*. See Ricardo Levene, *Vida y escritos de Victorián de Villava* (Buenos Aires: Peuser, s.a., 1946). José M. Portillo Valdés presents Villava not only as a fierce critic of the *mita* but also as a political figure who advocated for sweeping reforms to Spain's monarchical government, including its relationship with American viceroyalties. See José M. Portillo Valdés, *La Vida atlántica de Victorián de Villava* (Madrid: Fundación Mapfre, 2009). On the life of Cañete and his role in the debate over the *mita*, see Gunnar Mendoza L., *El doctor don Pedro Vicente Cañete y su Historia física y política de Potosí* (Sucre: Universidad de San Francisco Xavier, 1954). Rossana Barragán analyzes the debate in counterpoint to actions taken by Indigenous communities and workers at Potosí to evade and undermine the *mita*. See Rossana Barragán, "El 'bien público' del trabajo compulsivo en entredicho: contrapuntos de voces y acciones en Potosí (siglos XVII–XVIII)," in *Trabajos y trabajadores en América Latina (siglos XVI–XXI)*, ed. Rossana Barragán, (La Paz: Vicepresidencia del Estado Plurinacional de Bolivia, 2019), 369–99; see also Rossana Barragán, "Indios esclavos': en torno a la mita minera y la igualdad, 1790–1812," in *L'Atlantique révolutionnaire: une perspective ibero-américaine*, ed. Clément Thibaud, Gabriel Entin, Alejandro Gómez, and Federica Morelli (Béchérel, France: Éditions Les Péseides, 2013), 151–78. For discussion of the debate as a lens through which to explore the complexities of Enlightenment thought in late colonial Spanish America, see Ana María Lorandi, "Heterogeneidad de los discursos ilustrados: funcionarios reales y eclesiásticos en el ocaso del imperio," *Estudios Bolivianos* 17 (2012): 75–105.

70 "Cañete a los Señores Diputados." AGI, Charcas 700.

4 Geological Discourse and the Eighteenth-Century Debate over Potosí's *Mita*

Declining silver production and the disintegration of the *mita* unfolded in tandem over the course of the seventeenth century and into the early 1700s. Nevertheless, the contraction of the draft did not spell the end for Potosí, despite stark predictions by those owners of mines and refineries who effectively relied on *mita* labor as a form of subsidy.⁷¹ Free labor had existed alongside the labor draft throughout the colonial period and represented an ever-growing proportion of Indigenous workers at the Cerro Rico and the nearby processing mills. Indeed, from about 1730 onwards, even as the *mita* languished, Potosí's mining industry witnessed a significant recovery in production that would last until the end of the century. At least in part, and especially from 1750 onwards, this upturn was stimulated by the emergence of what Barragán terms a "popular economy" that was driven by the *k'ajchas*, highly skilled self-employed Indigenous miners who extracted ore from the mountain's mines for their own benefit, by the growth in small-scale ore-processing operations (*trapiches*), many of which were in the hands of Indigenous owners—some of whom were also *k'ajchas*—and by the Indigenous networks of trade and commerce that were centered on Potosí.⁷²

Barragán's important interventions bring to light a crucial feature of this complex landscape of labor; namely that in many cases, *mitayos* also worked as *mingas* (free wage laborers) or *k'ajchas*, moving between these various roles.⁷³ The means of production, then, were gradually shifting back into the hands of Andeans, a situation that was experienced by the Spanish and Spanish American mine and mill owners—who denounced the *k'ajchas* as violent thieves—as a progressive loss of control over the underground and its resources and, in ways that were intimately connected, over Potosí's Indigenous workers and the nature of their interactions and relations with the Cerro Rico.

71 For a detailed analysis of the distribution of *mitayos* to Potosí's mines and mills in the early colonial period and the identity of recipients, see Paula Zagalsky, "Señores de minas e ingenios durante el primer gran auge de la plata de Potosí (1570–1610)," this volume. Although access to *mitayos* was increasingly dominated by large-scale mine and mill owners (known as *azogueros*), medium- and small-scale owners who were not members of the social elite were also recipients. Zagalsky also provides an in-depth discussion of the terms *azoguero* and *minero* and how these were used in colonial times.

72 The records of an official inspection of *trapiches* carried out in 1761–62 show that 73% of *trapiches* were owned by Indigenous people. See Barragán, "Working Silver," 206–8, and Barragán, "El 'bien público.'"

73 Barragán, "Working Silver;" Barragán, "El 'bien público.'"

The intensification of debates over the *mita* in the late eighteenth century, and the revival of proposals to expand it, therefore took place within the context of growing threats to the mining elite's monopoly on silver production—threats that partially originated in *mita* workers' own expanding economic agency.

Renewed moves by Potosí's governing classes to revive the *mita* in the late eighteenth century were partly a response to the failure of repeated endeavors, from 1750 onwards, to usher in a mining renaissance through technical interventions. These involved efforts to open new low-level *socavones* in the Cerro Rico to access ore and, in 1789, a disastrous attempt to introduce, with the help of northern European mining experts led by the Baron von Nordenflicht, a method of mercury amalgamation that had promised dramatic improvements in efficiency and profit.⁷⁴ The architecture of the *mita nueva* (new *mita*), as it came to be known, was set out in the *Código Carolino*, a highly detailed legal code for the mines of Potosí and the wider viceroyalty of Río de la Plata that was drafted by Cañete y Domínguez in 1794 in collaboration with Francisco de Paula Sanz, who assumed governorship of Potosí in 1789.⁷⁵ Although the ordinances that were to govern the new regime were highly detailed, at the heart of these new provisions was a projected increase in the numbers of *mitayos* who were assigned to the annual draft and the allocation of laborers to a larger number of mines and ore processing mills.⁷⁶ These proposals, as Lane notes,

74 For a detailed discussion of these attempted reforms, see Buechler, *Gobierno*, Vol. 1. On eighteenth-century debates over the *socavones*, see Scott, "Mining."

75 *Código Carolino de ordenanzas reales de las minas de Potosí, y demás provincias del Río de la Plata* (Potosí, 1794). I consulted a copy held in the John Carter Brown Library, Providence, RI, United States. The *Código* was never implemented and remains unpublished. For discussion of the political opposition that stymied its implementation, see Buechler, *Gobierno*, Vol. 1, 206–30.

76 Cañete did not stipulate specific numbers, although he did hope to restore the functioning of the *mita* system to the principles that Viceroy Toledo had established in the 1570s. The *Código Carolino*, folios 168v–169, specified that there should be no innovation in the *mita*, but rather that it would observe the "distribution, good economy, methods, and rules that ... the viceroy don Francisco de Toledo prescribed." Buechler, *Gobierno*, Vol. 1, 179 and 187, suggests that an implementation of Cañete's code would have involved increasing the annual quota of *mitayos*, which stood at 3,326 in 1780, to "over 5000." The new allocation favored those mine owners and operators who were actively seeking to invest in their extractive and refining operations. Indeed, Luis de Orueta and his associate, Juan Bautista Jauregui, who had made a particular effort to adopt Nordenflicht's barrel method of refining, were rewarded in 1794 with a quota of 184 *mitayos* from Chayanta province. For this reason, the *mita nueva* may be understood not merely as a renewed expansion of the overall *mita* quota but as a means of rewarding mining entrepreneurs who embraced new technology and a spirit of improvement. I am grateful to Rossana Barragán and Paula Zagalsky for clarifying this point in their editorial comments.

drew the immediate ire of Victorián de Villava, whose efforts to contest the expanded *mita* also opened the door to organized opposition in the affected provinces.⁷⁷

The debate that ensued, as we have already glimpsed, was in no way divorced from understandings of the physical earth. In his letter to Spain's minister of finance, Villava implied that Cañete's proposals to expand the *mita* were contradicted by the pessimistic predictions he had made about the possibility of rich ore being discovered in the depths of the Cerro Rico. Although Cañete recognized in his *Guía* that "many learned men have persuaded themselves that metals are capable of regeneration"—among them Aristotle, French scholar Monsieur Sage, and Spanish Jesuit Antonio de la Calancha—he firmly rejected this theory, observing that

[t]he objects of the Mineral Kingdom (according to the explanation by M. Baume the celebrated chemist) are all those bodies that nature produces and encloses within the earth, and that, lacking any sign of life or growth, are absolutely deprived of any reproductive capacity, and for the most part only show evidence of a certain kind of symmetrical coordination or crystallization.⁷⁸

Just as it was a fallacy—he went on—to imagine that silver could regenerate, it had also been frequently observed that, the deeper one ventured into the mines of the Cerro Rico, the less silver they tended to yield. Indeed, Cañete suggested, this reality had already been predicted two hundred years ago, by Jesuit and natural historian José de Acosta, author of the *Historia natural y moral de las Indias*.⁷⁹

Ten years later, in 1797, Cañete would narrate a striking transformation in his own geological interpretations of the Cerro Rico. His narration, to which this discussion will shortly turn, formed part of a detailed communication with

77 Lane, *Potosí*, 174–75. The populations in these provinces had already lived through and participated in the Indigenous uprisings that reverberated through the southern Andes between 1780–1781. Although the grievances that propelled these uprisings were numerous, the Potosí *mita* was a central grievance among communities that were affected by the draft. As Portillo Valdés (*La vida atlántica*, 27) notes, Villava's denunciation of the *mita* and his efforts to oppose it "can only be understood when they are considered in the post-revolutionary Andean context of the 1790s" (author's translation).

78 "De la reproduccion." AGI, Charcas 700; Cañete, *Guía*, 56.

79 "De la reproduccion." AGI, Charcas 700; Cañete, *Guía*, 54; 57. As Cañete's citation suggests, Acosta's *Historia*, first published in Seville in 1591, was profoundly influential, not only at the time of its publication but for centuries to come.

the mining guild of Potosí. Recently, the members of the guild had denounced him as a perfidious enemy of the *mita*, due to the criticisms in his *Guía* of the labor draft and the methods by which Potosí's mines were worked. Anxious to disprove that the *Guía* consisted of a "criminal accusation" against that body, Cañete also sought to persuade guild members that they should honor their offer to contribute 3,000 pesos to subsidize the publication of his work.⁸⁰ As Buechler explains, the guild, which had not yet reviewed Cañete's *Guía* at the time it promised financial support,⁸¹ received from Villava certain excerpts of the opus that he had transcribed, in Cañete's words, "in opposition to the *mita*."⁸²

In all likelihood, the excerpts that Villava shared with the mining guild included a transcription of the chapter on the formation of metals in the Cerro Rico, in light of the damning descriptions contained within it of workers' daily experiences inside the mines.⁸³ Under pressure to demonstrate that he was in fact a staunch ally of the mining guild and "the greatest advocate and defender of the *Mita*," Cañete explained that he had made these assessments prior to Francisco de Paula Sanz's enlightened reform, at a time when Potosí's mines were truly dangerous, due to the state of abandonment that afflicted "almost all of the mineworks."⁸⁴ When composing the *Guía*, he had also regarded as "very rational" the theory that no more rich ore was to be found in the Cerro Rico.⁸⁵ His views had been informed by the venerable writings of the "learned naturalist" José de Acosta, who had described the mountain and its silver veins in the late sixteenth century, as well as by the writings of Dutch scholar Joannes de Laet and the reports of miners who had observed that the cerro's richest veins narrowed from a width of about sixteen *varas* on the surface to a mere knife-edge deep below ground. However, the surveys carried out by Nordenflicht and his "scientific miners" had persuaded both him and Paula Sanz that significant deposits of rich silver ore did in fact remain at depth and that these could be

80 "Doctor Pedro Vicente de Cañete a los Señores Diputados del Ilustre Gremio de Azogueros de Potosí." La Paz, February 8, 1797. AGI, Charcas 700. More than one manuscript copy of the *Guía* exists. Buechler, *Gobierno*, Vol. 2, 393, cites a copy that is held in the Archivo y Biblioteca Nacionales de Bolivia.

81 Buechler, *Gobierno*, Vol. 2, 392.

82 "Cañete a los Señores Diputados." AGI, Charcas 700. According to Cañete, the manuscript had been stolen from his house due to "the inattentiveness of those who were tasked with safeguarding the keys to my study." It is not clear, Buechler observes, exactly how Villava succeeded in obtaining a copy. Buechler, *Gobierno*, Vol. 2, 392.

83 "De la reproduccion." AGI, Charcas 700; Cañete, *Guía*, 58.

84 "Cañete a los Señores Diputados." AGI, Charcas 700.

85 "Cañete a los Señores Diputados." AGI, Charcas 700.

worked profitably, even though it would involve cutting through many sections of rock.⁸⁶

In addition to narrating his own geological “enlightenment,” thanks to the purported expertise of the northern Europeans, Cañete was interested in clarifying “the reflections that the Señor Fiscal [Villava] made about the characteristics of the [silver] veins of Potosí, in order to persuade [others] that in the present day these mines have little influence on the wealth of the State.”⁸⁷ More specifically, he was anxious to demonstrate how Villava continued to cling to what he, Cañete, now considered to be discredited ideas about the Cerro Rico’s geology and how those ideas underpinned his opposition to the *mita*.

In his 1795 treatise entitled “Discourse on the *mita*,” Villava had made little direct reference to the geology of the Cerro Rico, other than to point out that its ore reserves were overwhelmingly spent. Written in response to the efforts of Cañete and Paula Sanz to expand the labor draft for Potosí’s mines and mills, this text vigorously attacked the *mita* and the assertion that mining served the interests of society. In addition to questioning the economic beliefs that privileged mining in Charcas, he rejected the colonial logics that justified forcing Indigenous workers below ground against their will, and—refuting the notion that the physical environment of the Andean highlands lent itself only to mining—advocated for a turn to agriculture.⁸⁸

Early in 1797, however, Paula Sanz’s angry reaction to a royal decree that ordered an immediate halt to expansion of the labor draft prompted Villava to expound his understandings of the Cerro Rico’s geology. Dismissing critics of the *mita* and its injustices as “blind to reality,” the governor also rejected as false “the rumor that the standstill of the mills and the decline of this place of silver production results from the lack of metals in the Cerro as they are almost exhausted.”⁸⁹ In response, Villava defended the view that Potosí’s silver

86 “Cañete a los Señores Diputados.” AGI, Charcas 700.

87 “Cañete a los Señores Diputados.” AGI, Charcas 700.

88 Victorián de Villava, *Discurso sobre la mita de Potosí*, 1795. In: Quaderno No. 1. Sobre la Mita de Potosí: Contiene la representación del Gremio de Azogueros de aquella Villa con varios documentos. Año de 1795. Archivo General de la Nación, Argentina (henceforth AGN), Sala IX, Gobierno 14-08-08. For a fuller discussion of Villava’s call for agriculture to be prioritized over mining, and the mobilization of environmental arguments by Cañete and Paula Sanz to counter Villava’s proposals, see Scott, “Mining,” 8–10.

89 “Recurso del doctor don Victorián de Villava ... sobre que en cumplimiento de la Real Orden de 1796.08.03 cese el aumento de la mita decretado a instancias de don Francisco de Paula Sanz.” Paula Sanz’s response to the royal decree, directed to the Audiencia of Charcas, is dated December 22, 1796 (Potosí). Villava’s consequent address to the Audiencia members is dated January 6, 1797 (La Plata). Archivo y Biblioteca Nacionales de Bolivia (henceforth ABNB), ALP Min 129/15, folios 1–23.

reserves were spent by offering his interpretation of the characteristics of the Cerro Rico's silver veins and those that were found in the wider Andes:

Whether due to Peru's greater elevation as compared to that of New Spain ... or because God created it [Peru] using numbers, weights, and measures according to the laws of equilibrium, the mines of Potosí are richest at the surface, and those of New Spain at medium depth; such that, in the opinion of the *Fiscal* [Villava], the veins of ore diverge in both Kingdoms, although in inverse fashion: that is, they form a cone, the base of which in Peru is located at the surface, and in New Spain in the center; thus, in Peru, the vein gets narrower with depth, and in New Spain it widens out.⁹⁰

This, Villava insisted, was not a "new system" of his own invention, but rather "a fact" that long ago had been established by José de Acosta, and it had been reiterated in recent times by the "precise Robertson" who, in his *History of America*, published in 1777, described the great abundance of silver that had once existed near the Cerro Rico's surface and the ease with which it had been extracted.⁹¹ Quoting Robertson directly, Villava conveyed to his readers the Scottish historian's amazement that work had continued in the Cerro Rico even as the mines became deeper and the richness of the ore continually declined. "Had this Englishman [*sic*] known," Villava added, "not only about the scarcity of Potosí's silver veins but also about the abundant vein of the *Mita*, he would not have found it strange that the Spaniards exploit it."⁹²

Cañete concurred with Villava's broad understanding of the structure of silver-bearing veins at Potosí and attributed this structure, along with the formation of the whole Andean cordillera, to the effects of the receding waters of the biblical flood. Nevertheless, he asserted, even though these veins narrowed as they descended, the silver ore contained within them was far richer than the more abundant ore found near the surface, due to the interactions of heat and humidity deep below ground. Consequently, the exploitation of the Cerro's

90 "Recurso del doctor don Victorián de Villava." ABNB, ALP Min 129/15, fol. 17.

91 "Recurso del doctor don Victorián de Villava." ABNB, ALP Min 129/15, fol. 17.

92 "Recurso del doctor don Victorián de Villava." ABNB, ALP Min 129/15, fol. 17v. Robertson's original observation reads: "Those mines having been wrought without interruption for two centuries, the veins are now sunk so deep, that the expence of extracting the ore is greatly increased. Besides this, the richness of the ore, contrary to what happens in most mines, has become less as the vein continued to dip, and has diminished to such a degree, that one is amazed that the Spaniards should persist in working it." See William Robertson, *History of America*, Vol. II (Dublin, 1777), 507–8.

deepest veins was both logical and necessary.⁹³ It was impossible, he claimed, to find “free laborers who hire themselves out voluntarily” because Indigenous residents of Potosí, who were dedicated to “vice-filled distractions,” refused to work. Both the physical characteristics of the land and the “moral constitution of Potosí” made the *mita* indispensable—to abolish it would be to abandon “guaranteed deposits of effective wealth, rather like burying a sick man who is still alive.”⁹⁴

For Cañete, then, questions of morality and geology were inseparable in his defense of the *mita*, for particular theories about the physical earth could be deployed to uphold or undermine the logic of this labor system. Defending the *mita* and his own reputation as its “greatest advocate” required Cañete not only to adopt a new interpretation of the Cerro Rico’s geology but also to challenge and discredit his rival’s geological understandings. In doing so, he seized the opportunity to tap into political tensions between Spain and its European rivals, suggesting that Villava had been dangerously influenced in his thinking by foreigners such as William Robertson. Like Villava, Robertson had questioned the belief that mining in general was good for society and, in contrast to many Enlightenment commentators in Europe and the Andes alike, he rejected the notion that the qualities of Andean nature did not permit significant economic activities beyond the extraction of precious metals.⁹⁵ It was no surprise, exclaimed Cañete, that the Scottish historian had “cast his vote for the abandonment of Potosí’s mines, being one of the historians who has most offended the Spanish nation.”⁹⁶ If, Cañete implied, Villava’s understandings of

93 Scott, “Mining,” 9.

94 “Cañete a los Señores Diputados.” AGI, Charcas 700.

95 For Robertson, the Spanish obsession—as he saw it—with mining gold and silver was deeply “adverse to such improvement in agriculture and commerce, as render a nation really opulent.” The mining industries in Peru and Mexico, he maintained, had severely stymied the development of “useful manufactures” or “those lucrative branches of cultivation, which furnish the colonies of other nations with their staple commodities.” See Robertson, *History*, Vol. 2, 391–92.

96 “Cañete a los Señores Diputados.” AGI, Charcas 700. Robertson’s *History*, along with the writings of other northern Europeans on Spain and its empire, became a focus of considerable controversy in Spain. In 1777, Spain’s Academy of History sponsored a translation, with the support of powerful statesman Pedro Rodríguez de Campomanes. In 1778, however, the monarch suspended publication on the recommendation of José de Gálvez, a no less influential political figure who was at the time a member of the Council of the Indies. A review of Robertson’s book solicited by Gálvez had “denounced it as anti-Spanish propaganda.” See Jorge Cañizares-Esguerra, *How to Write the History of the New World: Histories, Epistemologies, and Identities in the Eighteenth-Century Atlantic World* (Stanford: Stanford University Press, 2001), 174–78; quote at 178.

the Cerro Rico's constitution and his arguments about the *mita* were informed by an enemy of Spain, it was clear that neither could be given credence.

In addition to debating the Cerro Rico's geology, Cañete sought to describe how, over the centuries, order and justice had been progressively instituted at mining sites in Spain's American territories. Moreover, he made an elaborate case for the indispensability of mining and metallurgy, even though it came at great cost to those who were required to labor in the mines. In other words, he sought to persuade the guild that his descriptions of the suffering borne by workers below ground should not be misunderstood as an attack on the *mita*: this suffering, he insisted, was a necessary and even natural price to pay in order to uphold civilization.⁹⁷

Understood within the conceptual frameworks of political geology, Cañete's arguments justified the forcible exposure of human bodies, and more specifically of Indigenous bodies, to what Bobbette and Donovan term "geological violence."⁹⁸ Although this justification did not, for Cañete, ultimately hinge upon proving that substantial mineral reserves still remained in the Cerro Rico—after all, he maintained that rulers should send their subjects below ground even when the mines produce no profit⁹⁹—both he and Paula Sanz actively deployed arguments in support of this notion to strengthen the case for preserving the *mita*. In similar fashion, Villava was able to condemn the labor draft on moral grounds that were not contingent upon proving or disproving particular geological understandings: for the *fiscal*, the *mita* was indefensible, regardless of how much silver remained inside the Cerro Rico. Nevertheless, in responding to his adversaries, he similarly mobilized geological knowledge in order to lend greater weight to his moral and political economic arguments.

97 "Cañete a los Señores Diputados." AGI, Charcas 700.

98 Bobbette and Donovan, "Political Geology," 6.

99 "Cañete a los Señores Diputados." AGI, Charcas 700. Cañete drew this argument from the entry on "Mines" in the *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers*, Vol. 21 (1778–1779), 867–907; 877–78. The passage to which Cañete refers is the following: "Schroeder a regardé le travail des mines comme une chose si avantageuse pour un état, qu'il ne balance point à dire qu'un prince doit les faire exploiter dans son pays, même sans profit; parce que par-là il occupe un grand nombre de bras qui demeureroient oisifs; il occasione une circulation de l'argent parmi ses sujets; il se fait une consommation des denrées, & il s'établit des manufactures & du commerce." The *Encyclopédie*—and perhaps the entry on mines in particular—appears to have circulated widely among the governing elite in late Bourbon Potosí. In the 1780s, Potosí governor Pino Manrique drew on this entry to support his claim that silver continuously regenerated in the Cerro Rico. See Juan del Pino Manrique to the Inspector General Jorge Escobedo, Potosí, July 15, 1783, AGN, Sala IX, Gobierno 06-03-05. See also Scott, "Mining," 7.

This late Bourbon episode of conflict over the *mita*, over the logics of perpetuating a mining-based economy that privileged Potosí, and over Cañete's personal role in this conflict, did not result in transformative changes, although Villava's actions succeeded in permanently stalling the implementation of the *Código Carolino* and, consequently, of the *mita nueva*.¹⁰⁰ The *fiscal's* arguments against the *mita* continued to reverberate in the early nineteenth century, profoundly shaping a dissertation written by Mariano Moreno, a prominent figure in Argentina's first national government, who argued that forced labor was incompatible with the legally recognized freedom of Indigenous men and women.¹⁰¹ Rather than connecting the two men's geological arguments to particular outcomes, however, my concern has been to highlight how these arguments were integral to a debate that, in existing historiography, has barely been linked to the ways in which knowledge of the physical earth was shaped and contested.

5 Conclusions

In presenting a series of episodes that span and connect the sixteenth, seventeenth, and eighteenth centuries, I have sought to explore how geological thinking and theorizing shaped and was in turn shaped by the politics that revolved around the exploitation of the Cerro Rico, its labor draft, and the shifting constellation of other mining sites that coexisted with, and in tension with, the mines of Potosí. Although late colonial sources provide windows onto debates over geology that are especially detailed—and that reveal their political entanglements with particular immediacy—early and mid-colonial texts similarly, albeit more subtly, reveal such politics. Indeed, it is difficult to fully comprehend the Bourbon-era political geologies that coalesced around Potosí without tracing them back to earlier times, even as the eighteenth century brought new currents of thought about the physical earth.

Far from being a comprehensive analysis, this chapter brings a series of fragments into conversation to bring to light their interconnectedness and offers points of departure for further study. I have attempted to show that theorizing about the physical earth underpins or grounds particular arguments about the

100 Although Cañete achieved a brief truce with the mining guild, it did not take long until his relations with this body deteriorated again, and consequently his *Guía* remained unpublished. For a detailed account of this episode, and the efforts of the mining guild to block publication of the *Guía*, see Buechler, *Gobierno*, Vol. 2, 392–400.

101 Portillo Valdés, *La vida atlántica*, 36. See also Barragán, “El ‘bien público,’” 391–92.

Potosí *mita*, both for and against its continuation, even when such thinking does not appear dominant or even immediately obvious—for example, in the lawyerly writings of Sandoval and Campo. Political geology, in other words, may be traced in a wide array of historical sources that go far beyond those in which its presence might be anticipated, such as the descriptions of natural historians or of mining experts.

At the same time, the study of colonial geological knowledge should not be confined to the history of science alone. Given that geology provided the material conditions of possibility for a colonial society and a wider imperial system that were organized around the exploitation of the underground, it is not surprising that geological thinking was enmeshed within realms of moral debate as well as in the more down-to-earth political maneuvering of individuals such as mine owner Juan de Hínestrosa, whose geological arguments simultaneously reaffirmed and undermined the primacy of Potosí's Cerro Rico. Indeed, the realm of everyday experience and struggle—a realm that is most effectively glimpsed through unpublished archival sources—may offer some of the most exciting possibilities for further examining the political geologies that centered on Potosí and connected it with a far-flung constellation of other mining sites.

In what ways, for example, might geological theories and arguments be traced in disputes over mine ownership or over the allocation or denial of *mitayos* to particular mine owners? What forms did geological thinking take in conflicts that pitted the owners of mines and ore refineries against cultivators and pastoralists? How, in everyday contexts, might members of Indigenous communities who variously resisted the *mita*, contested its abuses, or participated in the mining economy as autonomous agents have mobilized or generated particular geological understandings about the Cerro Rico and surrounding mining sites? How and to what extent did the Cerro Rico and its geology continue to be a point of reference in the myriad proposals and petitions to develop new sites of extraction in the context of eighteenth-century mining reforms? And in what ways may Bourbon-era Potosí be understood as a site at which new strands currents of geological thought were drawn in from outside, critically examined, and deployed (or ignored) for a variety of political ends? Such questions may open the way to new and richly textured understandings of how Potosí's existence both depended on and was continually disrupted by the underground.

Acknowledgements

The research on which this chapter is founded was made possible by funding and support provided by the University of Massachusetts Amherst. I am deeply grateful to Rossana Barragán R. and Paula Zagalsky for their detailed and incisive critical readings of chapter drafts as well as for their unfailing encouragement and patience. I also thank external reviewers for their helpful comments. Any errors that remain are my own.

Primary Sources

Archivo y Biblioteca Nacionales de Bolivia (ABNB), ALP Min 129/15.

Archivo General de Indias (AGI), Charcas 700.

Archivo General de la Nación, Argentina (AGN), Sala IX, Gobierno 14-08-08; Gobierno 06-03-05.

John Carter Brown Library, Rhode Island, *Código Carolino de ordenanzas reales de las minas de Potosí, y demás provincias del Río de la Plata* (Potosí, 1794).

Bibliography

Acosta, José de. *Historia natural y moral de las Indias*. Seville, 1590.

Bargalló, Modesto. *La amalgamación de los minerales de plata en Hispanoamérica colonial*. México: Fundidora de Fierro y Acero de Monterrey, 1969.

Barragán, Rossana. "Indios esclavos: en torno a la mita minera y la igualdad, 1790–1812." In *L'Atlantique révolutionnaire: une perspective ibero-américaine*, edited by Clément Thibaud, Gabriel Entin, Alejandro Gómez, and Federica Morelli, 151–78. Béchérel, France: Éditions Les Péseides, 2013.

Barragán, Rossana. "Working Silver for the World: Mining Labor and Popular Economy in Colonial Potosí." *Hispanic American Historical Review* 97, no. 2 (2017): 193–222.

Barragán, Rossana. "El 'bien público' del trabajo compulsivo en entredicho: contrapuntos de voces y acciones en Potosí (siglos XVII–XVIII)." In *Trabajos y trabajadores en América Latina (siglos XVI–XXI)*, edited by Rossana Barragán, 369–99. La Paz: Vicepresidencia del Estado Plurinacional de Bolivia, 2019.

Bebbington, Anthony, and Jeffrey Bury, eds. *Subterranean Struggles: New Dynamics of Mining, Oil, and Gas in Latin America*. Austin: University of Texas Press, 2013.

Benino, Nicolás de. *Relación muy particular del cerro y minas de Potosí y de su calidad y labores* [1573]. In *Relaciones Geográficas de Indias: Perú*, Vol. 11, 97–136. Madrid: Tipografía de Manuel G. Hernández, 1885.

- Bigelow, Allison. "Incorporating Indigenous Knowledge into Extractive Economies: The Science of Colonial Silver." *The Extractive Industries and Society* 3, no. 1 (2016): 117–23.
- Bigelow, Allison Margaret. *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World*. Chapel Hill: University of North Carolina Press, 2020.
- Bobbette, Adam. "Cosmological Reason on a Volcano." In *Political Geology: Active Stratigraphies and the Making of Life*, edited by Adam Bobbette and Amy Donovan, 169–99. Cham: Palgrave Macmillan, 2019.
- Bobbette, Adam, and Amy Donovan. "Political Geology: An Introduction." In *Political Geology: Active Stratigraphies and the Making of Life*, edited by Adam Bobbette and Amy Donovan, 1–34. Cham: Palgrave Macmillan, 2019.
- Bobbette, Adam, and Amy Donovan, eds. *Political Geology: Active Stratigraphies and the Making of Life*. Cham: Palgrave Macmillan, 2019.
- Bouysse-Cassagne, Thérèse. "Minas del sol, del Inka, y de la gente. Potosí en el contexto de la minería prehispánica." In *Mina y Metalurgia metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVII*, edited by Pablo Cruz and Jean-Joinville Vacher, 303–48. Lima: Instituto Francés de Estudios Andinos, 2008.
- Buechler, Rose Marie. *Gobierno, minería, y Sociedad: Potosí y el "renacimiento" borbonico 1776–1810*, 2 vols. La Paz: Biblioteca Minera Boliviana, 1989.
- Campo de la Rynaga, Nicolás Matías del. *Memorial apologético, histórico, jurídico, y político. En respuesta de otro, que publicó piadoso vn religioso, contra el repartimiento de indios, que introduxo en Potosí la comun necesidad, y causa publica, para el beneficio de sus minas*. Madrid, 1672.
- Cañete y Domínguez, Pedro Vicente. *Guía histórica, física, política, civil y legal del Gobierno e Intendencia de la Provincia de Potosí*. Potosí: Editorial Potosí, 1952.
- Cañizares-Esguerra, Jorge. *How to Write the History of the New World: Histories, Epistemologies, and Identities in the Eighteenth-Century Atlantic World*. Stanford: Stanford University Press, 2001.
- Cole, Jeffrey A. "An Abolitionism Born of Frustration: The Conde de Lemos and the Potosí Mita, 1667–73." *Hispanic American Historical Review* 63, no. 2 (1983): 307–33.
- Cole, Jeffrey A. *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press, 1985.
- Craig, Alan K, and Robert C. West, eds. *In Quest of Mineral Wealth: Aboriginal and Colonial Mining and Metallurgy in Spanish America*. Baton Rouge: Geoscience Publications, Louisiana State University, 1974.
- Cruz, Pablo, and Pascale Absi. "Cerros ardientes y huayras calladas: Potosí antes y durante el contacto." In *Mina y Metalurgia metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVII*, edited by Pablo Cruz and Jean-Joinville Vacher, 91–120. Lima: Instituto Francés de Estudios Andinos, 2008.

- Cruz, Pablo, and Jean-Joinville Vacher, eds. *Mina y metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVII*. Lima: Instituto Francés de Estudios Andinos, 2008.
- Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers*, Vol. 21. 1778–1779.
- González Casanovas, Ignacio. *Las dudas de la corona: La política de repartimientos para la minería de Potosí (1680–1732)*. Madrid: Consejo Superior de Investigaciones Científicas, 2000.
- Honores, Renzo. “Arbitrismo, derechos mineros y discursos legales en las Pretensiones de la Villa Imperial de Potosí de 1634.” X Congreso de la Asociación de Estudios Bolivianos. Sucre, Bolivia, 22–26 de julio, 2019.
- Lane, Kris. *Potosí: The Silver City that Changed the World*. Oakland: University of California Press, 2019.
- Laudan, Rachel. *From Mineralogy to Geology: The Foundations of a Science, 1650–1830*. Chicago: The University of Chicago Press, 1987.
- Levene, Ricardo. *Vida y escritos de Victorián de Villava*. Buenos Aires: Peuser, S.A., 1946.
- Li, Fabiana. *Unearthing Conflict: Corporate Mining, Activism, and Expertise in Peru*. Austin: Duke University Press, 2015.
- Lorandi, Ana María. “Heterogeneidad de los discursos ilustrados: funcionarios reales y eclesiásticos en el ocaso del imperio,” *Estudios Bolivianos* 17 (2012): 75–105.
- Marston, Andrea. “Strata of the State: Resource Nationalism and Vertical Territory in Bolivia.” *Political Geography* 74 (2019), <https://doi.org/10.1016/j.polgeo.2019.102040>.
- Mendoza L., Gunnar. *El doctor don Pedro Vicente Cañete y su Historia física y política de Potosí*. Sucre, Bolivia: Universidad de San Francisco Xavier, 1954.
- Platt, Tristan, and Pablo Quisbert. “Tras las huellas del silencio: Potosí, los Inkas y el Virrey Toledo.” In *Mina y Metalurgia metalurgia en los Andes del Sur desde la época prehispánica hasta el siglo XVII*, edited by Pablo Cruz and Jean-Joinville Vacher, 231–77. Lima: Instituto Francés de Estudios Andinos, 2008.
- Portillo Valdés, José M. *La Vida atlántica de Victorián de Villava*. Madrid: Fundación Mapfre, 2009.
- Robertson, William. *History of America*, Vol. II. Dublin, 1777.
- Salazar-Soler, Carmen. “Obras más que de gigantes. Los jesuitas y las ciencias de la tierra en el Virreinato del Perú (siglos XVI y XVII).” In *El saber de los jesuitas, historias naturales y el Nuevo Mundo*, edited by Luis Millones Figueroa y Domingo Ledezma, 147–72. Frankfurt-Madrid: Vervuert-Iberoamericana, 2005.
- Salazar-Soler, Carmen. “En búsqueda del tesoro perdido: los jesuitas y las técnicas mineras en el Perú de los siglos XVI y XVII.” In *Los jesuitas y la modernidad en Iberoamérica, 1549–1773*, edited by Manuel Marzal and Luis Bacigalupo, 227–58. Lima: Fondo Editorial de la Pontificia Universidad Católica del Perú, 2007.

- Salazar-Soler, Carmen. "Los 'expertos' de la corona. Poder colonial y saber local en el Alto Perú de los siglos XVI y XVII." *De Re Metallica* 13 (2009): 83–94.
- Sandoval y Guzmán, Sebastián. *Pretensiones de la Villa Imperial de Potosí, propuestas en el Real Consejo de Indias*. Madrid, 1634.
- Scott, Heidi V. "Between Potosí and Nuevo Potosí: Mineral Riches and Observations of Nature in the Colonial Andes, ca. 1590–1800." In *Geopolitics, Culture, and the Scientific Imaginary in Latin America*, edited by Joanna Page and María del Pilar Blanco, 117–32. Gainesville: University of Florida Press, 2020.
- Scott, Heidi V. "Mining, Geological Imaginations, and the Politics of Subterranean Knowledge in the Colonial Andes." *Geoforum* 127 (2021): 373–84.
- Tandeter, Enrique. *Coacción y mercado: La minería de la plata en el Potosí colonial, 1692–1826*. Madrid: Siglo Veintiuno de España Editores, 1992.
- Toledo, Francisco de. *Ordenanzas de las minas de plata de Potosí y Porco* (1573). In *Disposiciones gubernativas para el virreinato del Perú, 1569–1574*, edited by Guillermo Lohmann Villena, 301–60. Seville: Escuela de Estudios Hispano-Americanos, 1986.

Reading along the Administrative Grain

Knowledge Production and the Investigation of Refining Improvements in Late Sixteenth-Century Potosí

Renée Raphael

1 Introduction

In November of 1587 and then again the following January, the viceroy of Peru, Fernando de Torres y Portugal, Conde del Villar, ordered captain Juan Ortiz de Zárate, then serving as *justicia mayor* in Charcas and *visitador* in Potosí, to carry out investigations (*averiguaciones*) related to the town's mining and refining operations.¹ The first inquiry was directed towards a new method of refining developed by a well-connected *minero* named Carlos Corzo.² The second, ostensibly motivated by reports that individuals were testing new silver refining techniques without viceregal authorization, specified a more

1 The Juan Ortiz de Zárate who served as *visitador* in 1587 and 1588 was likely related to the Juan Ortiz de Zárate who gained initial success and compensation as an encomendero as a reward for his service as a soldier in the conflict between Diego de Almagro and Francisco Pizarro in the 1530s. Involved in multiple economic interests, including mining in Potosí, Ortiz de Zárate was entrusted by Philip II in 1570 with leading a mission to reestablish the city of Buenos Aires. The attempt failed, and Ortiz de Zárate passed away in 1576. Although he never married, his relationship with Leonor Yupanqui, an Indigenous woman from Cuzco, led to the birth of a daughter, Juana de Zárate, who was granted legitimacy by Philip II. See Ana María Presta, *Encomienda, familia y negocios en Charcas colonial (Bolivia): los encomenderos de La Plata, 1550–1600* (Lima: IEP, 2000), 139–94. The 1587 investigation identifies Juan Ortiz de Zárate as “el capitán Jhoan Ortiz de Zárate visitador e Justicia mayor en esta provincia”; see BNE Ms 3040, 274r. He was later named *corregidor* of Potosí from 1592 to 1594; see Jane E. Mangan, *Trading Roles: Gender, Ethnicity, and the Urban Economy in Colonial Potosí* (Durham: Duke University Press, 2005), 209–10.

2 These notarial records are found in BNE Ms 3040, 274r–308v. They are also partially transcribed in Modesto Bargalló, *La Amalgamación de los Minerales de Plata en Hispanoamerica Colonial* (México: Compañía Fundidora de Fierro y Acero de Monterrey, 1969), 244–56; Jiménez de la Espada, ed., *Relaciones geográficas de Indias, Perú* (Madrid: Tipografía de Manuel G. Hernández, 1885), II, CXXVIII–CXXXI. Complete transcriptions are found in successive contributions by José Ramón de Luanco, “Metalurgistas Españoles en el Nuevo Mundo,” *Crónica Científica: Revista Internacional de Ciencias* VIII, IX (1885, 1886). Subsequent citations refer to Ramón de Luanco's transcriptions.

general investigation. With “particular care and diligence,” in 1588, Ortiz de Zárate was to

know and find out what new invention or inventions have been presented ... for the refining of the said metals and who began them first, in what way, and who has followed them and wants to follow them and what experiences have been made on small and large scales and which ones have resulted certain and uncertain.³

The viceroy also requested information about the inventions’ potential effects on the Crown’s treasury and on the demand for Indigenous laborers.⁴

The inquiries ordered by the viceroy in 1587 and 1588 were likely intended as additional investigations secondary to Ortiz de Zárate’s role as the head of a *visita general*. In Spain’s American territories, *visitas generales* usually comprised inspections ordered by a colonial authority in order to investigate and resolve problems of interest to the Crown: the responsibilities of Indigenous governance, the taxation of tributes, material and human resources, jurisdictional conflicts, or demographic catastrophes.⁵ Period sources refer to Ortiz de Zárate’s activities as a *visitador* in Potosí in November of 1586, where he pronounced on the supply and prices of goods in the town. The following year, Ortiz de Zárate is known to have appointed don Fernando Ayawiri Kuysara as the first *alcalde mayor de los mitayos* and of the province of Charcas. This appointment followed a 1581 order by then-viceroy Martín Enríquez that Pedro de Castro, *visitador* of *tambos*, routes, and bridges, find and name *alcaldes*

3 Bargalló, *La amalgamación*, 262. The 1588 investigation is documented in BNE MS 3040, 323r–372r. Partial transcriptions of the documents are found in Bargalló, 242–77; Espada, *Relaciones geográficas*, II, CXXIII–CXXVIII. In this and subsequent entries, where printed transcriptions exist, references will be to the printed version with transcriptions omitted.

4 Bargalló, *La amalgamación*, 262.

5 For this definition, see Paula Zagalsky, “Huellas en las revisitas: tensión social e imposiciones culturales,” *Memoria Americana* 17 (2009): 244–45. For an overview of the types of *visitas* and relevant literature, see David Block, “Four Decades of ‘Visitas de Indios,’ an Annotated Bibliography,” in *Los Andes: cincuenta años después (1953–2003): Homenaje a John Murra*, ed. Ana María Lorandi, Carmen Salazar-Soler, and Nathan Wachtel (Lima: Pontificia Universidad Católica del Perú, 2003), 16–19. John Murra pioneered the *visita* as a tool for historical and anthropological investigation; cf. John Murra, “Una apreciación etnológica de la visita,” in *Visita hecha a la Provincia de Chucuito por Garci Diez de San Miguel en el año 1567*, ed. Waldemar Espinoza Soriano (Lima: Ediciones de la Casa de la Cultura del Perú, 1964), 421–42. On the information sought in a *visita* directed at mines or mills, albeit in the eighteenth century, see the examples discussed in Rossana Barragán R.’s contribution to this volume.

mayores from among the caciques and governors of each province.⁶ These details suggest that the two investigations ordered in 1587 and 1588 were intended as additional inquiries to be appended to a *visita general* in the area of Potosí.

The inventions that came to the attention of Ortiz de Zárate in 1587 and 1588 were intended to modify established methods of refining silver in ways that augmented yields while reducing mercury consumption. Mercury had been used to refine Potosí's silver ores since 1572. Initially the process involved combining mercury and silver ores in large wooden crates or troughs without heat.⁷ It was quickly found that yields were improved through the application of heat and the use of a rectangular press (*buitrón*) subdivided into individual sections (*cajones*) to store the mercury–silver ore mixture.⁸ However, as the mountain's deeper veins were mined, the silver ores extracted were often a mix of silver sulphide, sulfosalts, and antimony, for which the established procedure was less effective. The methods, which Ortiz de Zárate was tasked with investigating, had been developed to facilitate the purification of these deeper ores through the incorporation of additives, including blue vitriol and iron slag, known collectively as “magistrals.”⁹ Corzo's method, in particular, involved the addition of iron filings to the silver-mercury amalgam.

As the viceroy's 1588 order suggests, these new methods potentially affected multiple aspects of economic and social life in Potosí. Refiners were interested in the methods because the purported reduction of mercury consumption would lessen their own refining costs, while the promised augmentation of silver yields would increase their profits. Those involved in the transport and sale of mercury in Potosí, however, were concerned and voiced their opposition during the course of the investigations because a reduction in mercury consumption could disrupt their livelihoods.¹⁰

6 Such *alcaldes mayores* would occupy the former position of *tukuy rikuq*, the highest authority in the Inca provinces; see Tristan Platt, Thérèse Bouysse-Cassagne, and Olivia Harris, eds. *Qaraqara-Charka Mallku, Inka y Rey en la provincia de Charcas (siglos xv–xvii): Historia antropológica de una confederación aymara* (La Paz: Plural editores, 2006), 673–75.

7 Bargalló, *La amalgamación*, 170.

8 Bargalló, *La amalgamación*, 192.

9 Bargalló, *La amalgamación*, 227–28. On the composition of silver ores, see Thérèse Bouysse-Cassagne's contribution in this volume; Saúl Guerrero, *Silver by Fire, Silver by Mercury: A Chemical History of Silver Refining in New Spain and Mexico, 16th to 19th Centuries* (Leiden: Brill, 2017), 26–32; Kris Lane, *Potosí: The Silver City That Changed the World* (Oakland: University of California Press, 2019), 22–26.

10 In March of 1588, two petitions were made to the *corregidor* of Potosí, Torres de Ulloa, on behalf of the factors of quicksilver opposing new innovations in the methods of silver refining, AGI Lima 129, “Autos que se hicieron por el teniente cerca de otra nueva

The Crown's interests were multiple. Improved silver yields impacted treasury revenues, since refiners were obligated to turn over a percentage of the silver they refined to the king. Because the Crown had a monopoly on the production and sale of mercury, however, any augmentation in silver yields could be offset by a decline in mercury consumption. Significant changes to refiners' demand for mercury, moreover, threatened to disrupt the delicate balance between mercury supply, demand, and transport, which had been established through royal decrees and contracts that involved private individuals and royal officials in Potosí and the town's main source of mercury, Huancavelica.¹¹ Mining and refining operations at Potosí and Huancavelica, moreover, were predicated on the ready availability at low cost of Indigenous workers, who were assigned by the viceroy through the labor tribute system of the *mita*.¹²

Documents generated as part of the quotidian functioning of the Iberian administration, such as those associated with Ortiz de Zárate's 1587 and 1588 investigations, have tended to be read by historians of science and technology on two levels. Some scholars have culled from them specific details to describe the state of natural or technical knowledge in the period. Others have relied on such documents as windows into the scientific culture of the early modern Iberian world. Both of these approaches are oriented towards the recuperation or reconstitution of technical and scientific practices and values, as evidenced in the role each assigns to the state. In the former approach, documents are read for the technical details and processes they describe, with scant attention paid to the administrative protocols that generated them.¹³ The latter draws explicit attention to the legal, administrative, and political forces that shaped knowledge production, but its explicit focus on describing the nature

ynvencion, 1588." A manuscript transcription is found in Ms. 3040, 365r–369r and partially reproduced in Bargalló, *La amalgamación*, 266–68.

- 11 On these agreements, see Guillermo Lohmann Villena, *Minas de Huancavelica en los siglos XVI y XVII* (Sevilla: Escuela de Estudios Hispano-Americanos, 1949), 60–111.
- 12 The literature on the *mita* is vast. For two canonical works, see Peter J. Bakewell, *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650* (Albuquerque: University of New Mexico Press, 1984); Jeffrey A. Cole, *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes* (Stanford: Stanford University Press, 1985).
- 13 Modesto Bargalló, *La Minería y la metalurgia en la América española durante la época colonial* (Buenos Aires: Fondo de Cultura Económica, 1955); Julio Sánchez Gómez, *De minería, metalúrgica y comercio de metales: La minería no férrica en el Reino de Castilla, 1450–1610* (Salamanca: Universidad de Salamanca, 1989). Scholarship focusing on Indigenous contributions to mining technology shares some of the features of this approach. Cf. Allison Bigelow, *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World* (Chapel Hill: University of North Carolina Press, 2020).

of scientific and technical practice often results in the assignation of the state's motivations to the science itself. Thus, scholars have argued that science in the Iberian world was characterized by a utilitarian nature, an early reliance on eye-witness reports and often experimentation, a tendency towards manuscript publication, an overwhelmingly visual character, and a focus on practical, not speculative, questions that served the state's interests.¹⁴

This chapter, in contrast, asks us to pause on the administrative text and to reflect on how its process of generation was a performative act directed by legal, administrative, and political values and practices. With an argument that complements Heidi Scott's discussion of the political nature of early modern geology, it highlights the difficulties of recovering technical practice and culture from documentation generated for administrative, legal, and political purposes.¹⁵ In making this claim, it takes inspiration from recent scholarship in the history of archives, which has argued for the productive uses of moving beyond an exploration of the contents of archival documents to examine the material, agential, and circumstantial nature of their production.¹⁶ It also draws

14 Antonio Barrera-Osorio, *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution* (Austin: University of Texas Press, 2006); Daniela Bleichmar, *Visible Empire: Botanical Expeditions and Visual Culture in the Hispanic Enlightenment* (Chicago: University of Chicago Press, 2012); Jorge Cañizares-Esguerra, *Nature, Empire, and Nation: Explorations of the History of Science in the Iberian World* (Stanford: Stanford University Press, 2006); María Portuondo, *Secret Science: Spanish Cosmography and the New World* (Chicago: University of Chicago Press, 2009). With respect to Potosí, cf. Rose Marie Buechler, *The Mining Society of Potosí, 1776–1810* (Syracuse: Department of Geography, Syracuse University, 1981); Rose Marie Buechler, "Technical Aid to Upper Peru: The Nordenflicht Expedition." *Journal of Latin American Studies* 5, no. 1 (1973): 37–77; Enrique Tandeter, *Coercion and Market: Silver Mining in Colonial Potosí, 1692–1826*. (Albuquerque: University of New Mexico Press, 1993), 167–219.

15 See Heidi Scott's contribution to this volume.

16 A key contribution in terms of methodology has been Ann Laura Stoler, *Along the Archival Grain: Epistemic Anxieties and Colonial Common Sense* (Princeton: Princeton University Press, 2009). Recent overviews to scholarship on the history of archives in the early modern world include Ann Blair and Jennifer Milligan, "Toward a Cultural History of Archives." *Archival Science* 7, no. 4 (2007); Filippo de Vivo, Andrea Guidi, and Alessandro Silvestri, eds., "Archival Transformations in Early Modern European History," *European History Quarterly* 46, no. 3 (2016); Kate Peters, Alexandra Walsham, and Liesbeth Corens, eds., *Archives and Information in the Early Modern World* (Oxford: Oxford University Press, 2018); Alexandra Walsham, ed., "The Social History of the Archive: Record-Keeping in Early Modern Europe," *Past and Present* 230, no. 11 (2016); Elizabeth Yale, "The History of Archives: The State of the Discipline," *Book History* xviii (2015): 332–59. The caution I am advocating was addressed with respect to Spanish archives and the history of science in María Portuondo, "Finding 'Science' in the Archives of the Spanish Monarchy," *Isis* 107, no. 1 (2016): 95–105.

on insights developed by Armando Guevara-Gil and Frank Salomon regarding the impossibility of separating the “ethnohistorical” from the “administrative” parts of *visitas generales*.¹⁷

This chapter makes this argument through a case study of Ortiz de Zárate’s 1587 and 1588 investigations. It shows how administrative, legal, and political concerns cannot be separated from the scientific and technical elements that Ortiz de Zárate was charged with investigating. This entanglement is illustrated on two levels. First, in terms of identity, it demonstrates that there was no clear distinction between “administrators” charged with doing the investigating and “technical experts” whose knowledge was regarded as the subject of the investigations. Second, the chapter considers the entanglement of the technical, administrative, and legal at the level of practice. In particular, it reveals the extent to which notaries and standards of eyewitnessing drawn from legal practice shaped how the investigations were conducted and documented. The resulting textual record, it argues, should be read not as a window into the scientific and technical culture of Potosí but as a performance of that culture made legible according to accepted legal and administrative practices intended for political ends.

In making these claims, the contribution highlights the role of community in Potosí in documenting details of technical practice. Jorge Cañizares-Esguerra has emphasized how narratives of the Scientific Revolution assume a “liberal” regime grounded in print culture, the public sphere, and the Republic of Letters. Because of its distinctive knowledge regime—one based on rewards and legislation in which “most activities were transacted through one-on-one epistolary correspondence”—the Iberian world often has been excluded from such narratives.¹⁸ The central role played by the Potosian community in the production and dissemination of new methods of silver refining indicates that the knowledge-producing regime in Potosí might have been more open and public than Cañizares-Esguerra’s depiction suggests. While not a public sphere based on the circulation and discussion of printed texts, the administrative activities of calling witnesses and documenting technical processes generated a public space in which technical knowledge was discussed. To use the terminology of Guevara-Gil and Salomon, the investigations ordered by the viceroy

17 Armando Guevara-Gil, and Frank Salomon, “A ‘Personal Visit’: Colonial Political Ritual and the Making of Indians in the Andes,” *Colonial Latin American Review* 3, no. 1–2 (1994): 3–36.

18 Jorge Cañizares-Esguerra, “On Ignored Global ‘Scientific Revolutions,’” *Journal of Early Modern History* 21 (2017): 421.

triggered the performance of an administrative ritual that centered on the community's experience with silver refining.

2 Officials and *Mineros* in the Context of Ortiz de Zárate's Inspections

This section and the next focus on the individuals whose technical processes and experiences were the subject of Ortiz de Zárate's investigations. We pose the question: did these individuals demonstrate a "technical" viewpoint or sense of identity that can be separated from the political, legal, and administrative identities and aims of Ortiz de Zárate and other officials involved in the investigations? Both sections respond in the negative. This first section considers the relationship the individuals investigated had to both Potosí's refining operations and to the administrators charged with carrying out the investigations. It emphasizes the distance between these individuals and actual on-the-ground refining practices and shows that there was a not insignificant overlap between those with mining interests and administrative responsibilities.

The investigations Ortiz de Zárate was tasked to perform in 1587 and 1588 resulted in distinct textual outputs. Ortiz de Zárate carried out the first investigation into Carlos Corzo's new method by ordering two notaries to Corzo's *ingenio* (refining mill) in the valley of Tarapaya to document a series of trials comparing Corzo's method of refining with the established one. Those who had used the new method were also asked to provide sworn testimony stating the quantity of metals they had refined by the new method, the results of the refining process compared to the old method, and the origin of the ores refined in this way. The 1588 investigation, in contrast, was conducted in a manner more similar to that of a *visita general*, which typically focused on securing the responses to a questionnaire from the area's inhabitants.¹⁹ In the case of the 1588 investigation, ten witnesses responded to the set of questions described in the viceroy's order, which inquired about all refining methods recently proposed in Potosí, not just that of Corzo. Following the record of these testimonies, Ortiz de Zárate included his own report (*informe*), declaring his favorable assessment of the new inventions based on the assembled testimony and the experiments on Corzo's method carried out in 1587.

While the witnesses who testified in the two investigations had close ties to Potosí's silver industry, they were not the individuals who actually carried

¹⁹ Block, "Four Decades," 16–19.

out the mining and refining operations. They were individuals of European descent who described themselves according to their place of habitation and their relationship to Potosí's mining and refining operations (Table 3.1).

Of the nineteen witnesses called over the course of the two investigations, two described themselves as owning or sharing ownership in either water- or horse-powered *ingenios*, as well as being owners or part-owners of veins in Potosí's *Cerro Rico*. Seven witnesses testified that they owned *ingenios* but not mines; four did not specify their relationship to the mining and refining industry, but period sources indicate their involvement as owners of mines and mills. Six others described themselves as being involved in mining and refining work or holding a business "refining metals" but not owning mines or *ingenios* specifically.

Though Corzo was described in the 1587 proceedings as merely the person whose refining method was under investigation, he would have been well-known to officials as a result of his personal and family connections. Historians have linked Corzo to a merchant house in Seville, headed by Juan Antonio Corso, which had close associations with the Crown. Himself a merchant in Los Reyes, Corzo held both his *ingenio* in Tarapaya and a mine in Potosí in 1587. Through his personal and family connections, Corzo's reach in the mining industry extended more broadly. In 1580, he and two associates received a much-coveted contract to manage the transport of mercury between Huancavelica and Potosí; their agreement remained in effect through 1586.²⁰ In the period following these investigations by Ortiz de Zárate, Corzo would continue to operate his *ingenio* in the valley of Tarapaya and be named *alcalde mayor de minas*.²¹

The individuals investigated and questioned by Ortiz de Zárate belonged to the class of *mineros*, individuals with political power who were intimately involved in the mining and refining industries as owners, renters, or administrators of mines and *ingenios* of different sizes. As Paula Zagalsky notes in her contribution, these individuals in general were not the laborers or operators who worked in a hands-on capacity with Potosí's ores. Though they had extensive experience with the business of mining and refining, these individuals did not possess the type of artisanal knowledge that historians of science have often ascribed to the technical "experts" whose knowledge was sought by the

20 Ana María Presta, "La Compañía del Trajín de Azogues de Potosí: Un capítulo inédito de la financiación de los repartimientos indígenas surandinos al desarrollo de la minería colonial," *Boletín del Instituto de Historia Argentina y Americana "Doctor Emilio Ravignani,"* (2015): 31–58; Lohmann Villena, *Minas de Huancavelica*, 108–23.

21 See Paula Zagalsky's contribution to this volume.

TABLE 3.1 Witnesses in the 1587 and 1588 investigations and their connections to Potosí's mining and refining industries

Witness	Relationship to mining and refining industry	Source
Cristóbal de Espinosa	Owner of a mine in the <i>Veta Rica</i> and in the <i>veta de los Flamencos</i> and part-owner of a mill of two <i>cabezas</i> with two <i>mazos</i> and a <i>lavadero</i>	Capoche's 1585 <i>Relación</i> ^a
Martin Fernandez de Herrera	He "has refined ... a great sum of metals of silver, <i>lamas</i> and <i>relaves</i> "	1587 testimony ^b
Jerónimo de Fuentes	Owner of a horse-powered <i>ingenio</i>	1587 testimony ^c
Domingo Gallego	Owner of a water-powered <i>ingenio</i> in Tarapaya	1587 testimony ^d
Nicolás de Guevara (notary)	Involved in mining and refining work for about four years	1588 testimony ^e
Juan de Hermosa	Owner of a mine in the <i>Veta Rica</i> , in possession of mines in the vein of Cristóbal López, and part-owner of a mill of one <i>cabeza</i> of 10 <i>mazos</i>	Capoche's 1585 <i>Relación</i> ^f
Francisco de Loizaga	Owner of a horse-powered <i>ingenio</i>	1587 testimony ^g
Gonzalo López de las Higueras	Owner of two water-powered <i>ingenios</i> , one each in Potosí and Tarapaya Had a business "refining metals" for nearly four years	1587 testimony ^h 1588 testimony ⁱ
Diego Lopez Suarez	Has refined in Potosí and Tarapaya "a great quantity of quintals of metal"	1587 testimony ^j
Cristóbal Maldonado	He "engaged in the refining of metals and held and holds mines and <i>ingenios</i> " for the past three years	1588 testimony ^k
Antonio Benitez Melgarejo	Owner of a water-powered <i>ingenio</i>	1587 testimony ^l

TABLE 3.1 Witnesses in the 1587 and 1588 investigations (*cont.*)

Witness	Relationship to mining and refining industry	Source
Juan Núñez de Maldonado	Part-owner of a mine in the <i>veta de estaño</i> and owner of a mill with two <i>cabezas</i> , a <i>lavadero de agua</i> , and twelve <i>mazos</i>	Capoche's 1585 <i>Relación</i> ^m
Cristóbal de Ortega Ximénez	Held a business "refining metals" for the past three years	1588 testimony ⁿ
Juan Pérez Donoso	"A gentleman of the mills and mines in the valley of Tarapaya," "occupied in the refining of metals," during his more than fifteen-year residency in Potosí	1588 testimony ^o
Sebastián Sánchez de Merlo	Owner of an <i>ingenio</i> of two <i>cabezas</i> in Tarapaya Owner of a mine in the <i>Veta Rica</i> , part-owner of a mill of two <i>cabezas</i> with twelve <i>mazos</i> and a <i>lavadero</i> , and owner of another mill with eight <i>mazos</i>	1587 testimony ^p Capoche's 1585 <i>Relación</i> ^q
Gonzalo Santos	Owner of a water-powered <i>ingenio</i> , four other <i>ingenios</i> , and a <i>lavadero</i>	1587 testimony ^r
Juan de Torres Machuca	He "has refined a great sum of metals" during the twenty-six years he lived in Potosí	1587 testimony ^s
Juan de Urquiza	He "has refined ... a great sum of quintals of metals" in Potosí and Tarapaya	1587 testimony ^t
Luis Ygunza	No connection uncovered	Testified in 1588 ^u

a Luis Capoche, *Relación general de la villa imperial de Potosí*. Madrid: Ediciones Atlas, 1959, 81–82, 120. A *cabeza* refers to the milling assembly with mallets (*mazos*); *lavadero* to the washer.

b Ramón de Luanco, "Metalurgistas Españoles," 1886, 56. *Lamas* referred to slimy residues from the amalgamation process, *relaves* to re-washings of the silver-amalgam mixture.

c Ramón de Luanco, "Metalurgistas Españoles," 122.

d Ramón de Luanco, "Metalurgistas Españoles," 121.

e BNE MS 3040, 335v.

f Capoche, *Relación general*, 81, 97, 118.

g Ramón de Luanco, "Metalurgistas Españoles," 122.

h Ramón de Luanco, "Metalurgistas Españoles," 1886, 80.

i BNE MS 3040, 339v.

j Ramón de Luanco, "Metalurgistas Españoles," 161.

TABLE 3.1 Witnesses in the 1587 and 1588 investigations (*cont.*)

k	BNE MS 3040, 330v.
l	Ramón de Luanco, "Metalurgistas Españoles," 1886, 79.
m	Capoche, <i>Relación general</i> , 83, 118.
n	BNE MS 3040, 353v.
o	BNE MS 3040, 362r–v.
p	Ramón de Luanco, "Metalurgistas Españoles," 79.
q	Capoche, <i>Relación general</i> , 82, 120–21.
r	Ramón de Luanco, "Metalurgistas Españoles," 1886, 29.
s	Ramón de Luanco, "Metalurgistas Españoles," 56.
t	Ramón de Luanco, "Metalurgistas Españoles," 123.
u	BNE MS 3040, 358r–359v.

Crown. Antonio Barrera-Osorio, for example, has described how royal officials sought (and recorded) information about efficient and profitable knowledge for the Spanish imperial mission from technical experts, who were eager to receive compensation and protection for their innovations from the Crown.²² While he does not provide a definition of "expert," Barrera-Osorio refers interchangeably to "experts" and "artisans," implying that the expertise sought by the state was grounded in hands-on, practical knowledge.²³

The knowledge held by these witnesses as *mineros* corresponds instead to a notion of expertise developed by Carmen Salazar-Soler that encompassed both knowledge obtained "in the field" and "life experiences." By describing how experience in the field facilitated communications with privileged contacts, including local informants, Indigenous experts, and other Europeans, Salazar-Soler emphasizes the role of connections more than practical experience in the development of expert knowledge. Since their expertise was also understood to derive from their life experiences, these experts were also encouraged to pronounce on social and economic problems that affected mining.²⁴ This identification of the witnesses as *mineros* with expertise grounded in life experiences and personal connections thus implies an outlook closer to that of royal administrators than the artisans or laborers whose knowledge encompassed practical skills.

The gap between the witnesses and the officials charged with carrying out the investigations shrinks even more when one considers the relationship between the state and society in sixteenth-century Potosí. As noted, Corzo's personal

22 Barrera-Osorio, *Experiencing Nature*, 57–74.

23 Barrera-Osorio, *Experiencing Nature*, 56–80.

24 Carmen Salazar-Soler, "Los 'Expertos' de la Corona. Poder Colonial y Saber Local en el Alto Perú de los Siglos XVI y XVII," *De Re Metallica* 13 (2009): 83–94.

and family connections with Iberian officials had helped him to secure a contract for the transport of mercury between Huancavelica and Potosí between 1580 and 1586. Many of the witnesses' activities in Potosí extended to municipal administration. When he testified in 1587, Gonzalo Santos was serving as *alcalde* to Santa Hermandad de Potosí.²⁵ Juan Nuñez Maldonado, who testified in 1588, was then *alcalde ordinario* of Potosí, while Juan de Hermosa was serving as regidor.²⁶ Nicolás de Guevara was a notary involved in the transcription of both the 1587 and 1588 investigations even while he was questioned as a witness in 1588.²⁷ In an act that demonstrated both his technical proficiency and administrative savvy, Domingo Gallego would present his own method of silver refining to Potosí's municipal officials in 1596.²⁸ These examples affirm the conclusions of Tamar Herzog who, in her study of colonial Quito, argued that it is impossible to separate the administration from the population.²⁹

While the instructions for the 1587 and 1588 investigations convey the impression of an administrative inquiry into technical practice, this closer examination of the individuals involved raises questions about the modern historians' ability to locate "technical practice" in them at all. The individuals being questioned were not those with hands-on experience. The overlap between witnesses' technical, administrative, and political identities also suggests the infeasibility of separating out a "scientific" or "technical" viewpoint apart from the political and administrative context in which the texts documenting these investigations were generated.

3 Speaking "Like a State" or as a Technical Expert?

This section builds on the first by considering the *mineros'* testimonies before Ortiz de Zárate in 1587 and 1588. In other geographical areas and knowledge-making traditions, historians have used witness testimonies as a means of gauging the development of professional identity. Bradford Bouley, for example, has shown how in canonization proceedings for Counter-Reformation saints, medical opinions regarding bodily incorruption were often negotiated

25 Ramón de Luanco, "Metalurgistas Españoles," 1886, 29.

26 BNE MS 3040, 324v–330v, 359v.

27 Guevara appears throughout the 1587 and 1588 records as a notary. His witness testimony and self-description as a notary are found in BNE MS 3040, 335v–339v.

28 ABNB CPLA 7, 235v–237r.

29 Tamar Herzog, *Upholding Justice: Society, State, and the Penal System in Quito (1650–1750)* (Ann Arbor: University of Michigan Press, 2004), see especially 8.

truths that took into account not only established medical knowledge but also popular opinion and the wishes of ecclesiastical and secular authorities. The fact that physicians over the course of the seventeenth century were increasingly willing to oppose powerful officials and public opinion by issuing verdicts in keeping with accepted medical opinion is, according to Bouley, an indication of their growing sense of professional identity.³⁰ In the case of Potosí, one might imagine that even though *mineros* occupied administrative roles, they self-identified as members of a group of technical experts united by shared knowledge traditions and standards. When called to pronounce on technical questions, they thus would offer opinions grounded in their shared experience, seeking to inform administrators ostensibly eager for their expertise. The testimonies given in 1587 and 1588, however, suggest the contrary. Witnesses' enthusiastic endorsements of the new refining methods aimed to secure vice-regal approval of the new methods, not to share their knowledge of Potosí's ores with the Crown.

In 1588, the witnesses called before Ortiz de Zárate offered a similar assessment of the new methods. Like Luis Ygunza, they agreed that some refining inventions had proven effective and others less so:

Some people in the last three years ... have tried to search for and have searched for some new methods ... and those that were devised by Gaspar Ortiz and by Juan Fernandez Montaña and others up until Carlos Corzo and Juan Andrea tried their hand weren't effective, except that which the *bachiller* Garçi Sanchez and Domingo Gallegos revealed of the new method by slag of iron.³¹

As Ygunza indicates, while some methods, like that of Sánchez, had proven somewhat effective, Corzo's method was judged especially promising.

Despite these witnesses' unanimous endorsement of Corzo's method, records produced six months later tell a different story. In October of 1588, mining and refining operations in Potosí had come to a standstill because mine and mill owners were waiting eagerly for the secrets of a different method: that

30 Bradford Bouley, "Negotiated Sanctity: Incorruption, Community, and Medical Expertise," *Catholic Historical Review* 102, no. 1 (2016): 15–25.

31 "algunas personas de tres años poco mas o menos a esta parte an tratado de buscar y an buscado algunos nuevos beneficijos ... y los que se hizieron por gaspar ortiz e por Joan Fernandez montaña y otros hasta que carlos corzo y joan andrea tomaron la mano no ffueron de efecto eçcepto el que el bachiller garçi sanchez e domingo gallegos manifestaron el nuevo beneficio por escoria de hierro," BNE Ms. 3040, 358r–v.

of Garçi Sánchez. The method refiners sought in October of 1588 was likely a different method than that attributed to Sánchez in Ortiz de Zárate's investigation of early 1588. In the intervening period, Sánchez had been entrusted with a new refining method that involved the addition of sulphur, not iron slag, developed by Juan Muñoz de Cordova and Hernando de la Concha of Los Reyes.³² The crisis of October 1588 surrounding this method held by Sánchez suggests that Corzo's method had not met witnesses' expectations.

The nature of empirical testing and Potosí's ore chemistry can account for the apparent abandoning of one method for another. One way of reading the 1588 inspection in relation to the clamor over Sánchez is as enthusiasm for a new method that ultimately did not meet the standard of communal verifiability. The claims in the inspection regarding the experimental tests of Corzo's method might suggest, according to this interpretation, that it worked reasonably well for some ores but not others. When the procedure was employed more widely, it did not turn out as well as expected. Modern knowledge both of the geological formation of Potosí's cerro and of the chemistry of silver refining explains why various refining methods had variable results; Potosí's silver ores existed in various chemical combinations, and different additives were necessary to reduce them into elemental silver.³³

Familiarity with the variability of Potosí's ores and the difficulties of developing a refining method that was widely applicable is precisely the sort of experiential knowledge Potosí's *mineros* surely held. Yet the witness statements provided in 1588, especially when read alongside the community's response to Sánchez six months later, suggest that this experiential knowledge was also not what *mineros* shared with Ortiz de Zárate during his official inspection. Administrative officials instead articulated the type of assessment we might have expected the *mineros* to have fulfilled as witnesses—namely, voicing more ambivalent assessments of new refining technologies that acknowledged the known realities of Potosí's variable ore chemistry. At the end of February 1588, before Ortiz de Zárate began his second inspection, *fiscale* Ruano Telles composed two letters to the viceroy on behalf of the Audiencia

32 Rodríguez de la Serna described Muñoz de Cordova and Hernando de la Concha of Los Reyes: "lo comunicaron e dieron rrazon dello al bachiller garci sanchez persona de los mas ynteligentes y expertas ... despues de tener ... satisfacion del dicho beneficio de algunos ensayes que avia hecho de por menor con licencia expressa por escrito que parallo tenia de dio don pedro tores de Ulloa corregidor e justicia mayor desta provincia e teniente de general de la guerra en ella començo a hazer en su casa algunas adgerentes neçesarios para hazer en ellos la expiriencia del dicho beneficio de por mayor," BNE Ms. 3040, 100r. For Sánchez's declaration of the method, see Bargalló, *La amalgamación*, 237.

33 Thérèse Bouysse-Cassagne's contribution to this volume; Guerrero, *Silver by Fire*, 102–52.

de Los Charcas. He argued that the refiners should be left to their own devices, because the new inventions would not harm the royal revenues from quicksilver.³⁴ Explaining further, Telles noted that “what one day is good and certain becomes within a few days not so good, and it is seen many times that the same metal and the same method of refining has turned out well one day and not well on another.”³⁵ Telles emphasized that the information he shared derived from those with experience in refining. In support of his argument that refining methods should not be regulated, he explained that he had “dealt at different times with people expert in the refining of metals.” As deeper ores were excavated, he narrated, “those who are charged with their refining use and seek out the best way to make the most of them and improve them, and they obtain various experiences in order to choose the most useful.”³⁶

Telles’ acknowledgement of the expertise of those involved in the mining and refining industries points to a difference between the knowledge the *mineros* held and the information they presented to Ortiz de Zárate as witnesses. Telles relied on such individuals to learn about the nature of the mines and their metals, including information about the depth of the mines and how the refiners work to determine the best refining methods. The witness testimonies of 1588, in contrast, suggest that when called upon to speak in proceedings that would influence policy, *mineros* spoke not to communicate this knowledge but to advance their communal interests. It is of consequence that Telles had access to a more realistic assessment of Potosí’s ore chemistry and also endorsed an opinion regarding the innovations with which *mineros* would have been sympathetic.

Those who testified in 1588 thus were not making claims about technical effectiveness, which they believed were subject to evaluation by others involved in silver mining and refining. Rather, their claims were intended to achieve an action—viceregal approval of the new innovations—that would benefit the larger community of *mineros* who were interested in increased silver yields at lower cost. These witnesses acted in similar ways as Bradford Bouley has described for early modern Catholic physicians participating in canonization proceedings. While Italian medical professionals over the course of the early modern period felt increasingly obligated to offer expert testimony regarding

34 “dejar a cada uno beneficiar como quisiese que el tiempo informaria de lo que mas conueniese se hiciese mejor que nadie,” AGI Charcas 35, 771r. A transcription of the part of the letter cited, which does not include the previous quotation, is found in Bargalló, *La amalgamación*, 269.

35 Bargalló, *La amalgamación*, 269.

36 Bargalló, *La amalgamación*, 269.

the question of the incorruption of bodies with which their fellow doctors would agree, they had traditionally felt bound more by ideas of civic virtue and respect toward their community. These obligations often encouraged them to offer testimony that contradicted established medical opinions.³⁷ The situation seems similar in Potosí, where witnesses attempted to paint the new innovations favorably to shape viceregal policy instead of offering more measured assessments that reflected their experience with Potosí's ores.

These considerations suggest that rather than measured assessments reflecting the *mineros'* experience with Potosí's ores, the witness statements in 1588 reflected their notions of what served as plausible and persuasive stories for higher-up officials. These witnesses had learned to "speak" like the state, creating narratives that fulfilled the horizon of expectations shared by them and royal officials.³⁸ This aspect of their testimonies indicates, again, the difficulty of extracting from the investigations a technical viewpoint separate from its larger political and administrative implications.

The context in which witnesses were questioned mattered. During the 1587 investigation, *mineros* were similarly asked to testify before the viceroy. This earlier investigation, however, focused on refiners' experiences with Corzo's method. It was not intended, as the 1588 investigation was, as a means of determining viceregal policy with respect to the new refining procedures. Witnesses who had used the said new method were asked to declare "the quantity of metals that they had refined and from what veins and mines of the *Cerro Rico* they derived, and what they lost of quicksilver and what they yielded in terms of silver."³⁹ In general they answered with specifics. Sebastián Sanchez de Merlo,

37 Bouley, "Negotiated Sanctity," 15–25.

38 Following James Scott's notion that the state's pursuit of information in the interest of governance leads to its particular ways of restricted "seeing" and thus constructing reality, Szonyi has argued that the military households of Ming China developed specific ways of "speaking" to the state to secure their own interests. See Michael Szonyi, *The Art of Being Governed: Everyday Politics in Ming China* (Princeton: Princeton University Press, 2017), 220–22; James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (New Haven: Yale University Press, 1998). "Horizon of expectations" comes from Hans Robert Jauss, who uses the term to describe the intellectual tradition and set of assumptions shared by a text's creators and readers; see Hans Robert Jauss, "Literary History as a Challenge to Literary Theory," In *Toward an Aesthetic of Reception*, translated by Timothy Bahti (Minneapolis: University of Minnesota Press, 1982), 3–45. A similar use of archival documents as a means of probing narratives that peasants, artisans, and nobles believed credible is found in Natalie Zemon Davis, *Fiction in the Archives: Pardon Tales and Their Tellers in Sixteenth-Century France* (Stanford: Stanford University Press, 1987).

39 Ramón de Luanco, "Metalurgistas Españoles," 1886, 28–29.

for example, stated that for the past month and a half, he had refined in his mill “by the new method declared by the said Juan Andrea and Carlos Corzo a quantity of 4,000 quintals of ore of different veins,” to which he had added, to each fifty quintals, “10 pounds of ground iron and to others eight, seven, six, four and three pounds, without any heat, and with only four *repasos*.” After describing the addition of quicksilver and the additional steps taken, he closed his description of the process with quantitative results comparing silver yields and quicksilver lost by the old and new methods for the ore and the *lamas*, offering numbers that indicated both what he found in his refining trials and also extrapolating to give expected numbers when refining a quintal or a hundred quintals of ore.⁴⁰

Despite this focus on quantitative comparisons, witnesses in 1587 recognized the political implications of their testimonies. They often closed their statements with a short appeal that shared much in substance with the longer declarations they would make in 1588. Sanchez de Merlo, for example, was reported as stating that “the said new method is of great utility and benefit, for those who refine the said metals ... for all of Christendom and for the augment and increase of the royal fifths of the king, our lord.” Furthermore, he declared, if the old method continued to be used, refiners would fall into ruin as a result of “the great loss of quicksilver and the poverty of the metals and the great cost in their refining.” To the contrary, “all people who have holdings and refine metals for the said new method will benefit.”⁴¹

That these witnesses could have reasonably conceived of themselves as speaking to officials’ expectations is suggested by their own familiarity with Iberian legal and administrative protocols. Discovering, owning, and managing mines and *ingenios* were activities that required collaboration with notaries and interactions with administrative officials in order to create records of claims to mines and mills, to establish business agreements, and to engage in lawsuits.⁴² Those who developed new refining or mining techniques appeared before Potosí’s municipal council or communicated with officials at higher

40 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 79.

41 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 79.

42 Many of the mining ordinances issued by Toledo in 1574 focus on the requirement that miners register mines in order to be legally recognized as their discoverer. Each province, moreover, was to have an *escribano de minas* who was to authorize local notaries and judges to register such finds in a consistent manner. See Roberto Levillier, ed., *Gobernantes del Perú, cartas y papeles, siglo XVI* (Madrid: Sucesores de Rivadeneyra, 1921), VIII, 143–240, esp. 155, 221. These interactions are an example of Castile’s legal culture, as described in Richard L. Kagan, *Lawsuits and Litigants in Castile, 1500–1700* (Chapel Hill: University of North Carolina Press, 1981), 128–62.

levels of administration in an attempt to secure compensation for their innovations. The methods described by witnesses in 1588, including those developed by Juan Fernandez Montaña and Garçi Sánchez, were inscribed in the municipal council's records. Comparison of these municipal records and the 1588 testimonies indicates that witnesses drew on details shared by the innovators in the context of their own interactions with local officials.⁴³

This regular interaction between *mineros*, local administrators, and notaries would have created a shared horizon of expectations regarding what information and arguments would be most persuasive to officials regarding these technical innovations. In the case of the 1587 and 1588 investigations, the narrative was successful in persuading Ortiz de Zárate of the benefit of the new refining methods. In his communication with the viceroy, Ortiz de Zárate offered a positive assessment of the new inventions, citing his own observations, the testimonies of the witnesses, and communications with Luis Garcia de Cervantes, a factor of quicksilver in the town, who had assured Ortiz de Zárate that the new method would not negatively impact the royal treasury.⁴⁴

The manipulation of witness testimony and the political aims of science in the Iberian world are, of course, well known. My point here is in keeping with the argument of the preceding section. The more one delves into the identities of the witnesses who were questioned and the nature of their testimony, the more difficult it is to identify a technical viewpoint that can be disentangled

43 To take one example, in the 1588 *visita*, Juan Nuñez de Maldonado described Fernandez Montaña's proposal in the following way: "putting in each *cajon* of fifty quintals of ground ore a little horse dung and some ounces of *paquira*, which is a blue stone that is found in certain mines from Los Lipos, the quality of the metal is increased and less quicksilver is lost than is customary" ("dehando en cada caxon de cinquenta quintales de harina de metal un poco de estiercol de caballos e ciertas onças de lo paquira que es una piedra azul que se sala de ciertas minas de los lipos se aumentava la ley de los metales e se perdia menos azogue del que solian"), BNE Ms. 3040, 325v. The record of Fernandez Montaña's declaration confirms these details but includes many more: "Not salt but brine must be sprinkled on the ground ore that must be incorporated [with quicksilver]" ("Que la harina de metal que se hubiere de yncorporar no se ha de hechar sal sino salmuera que sea bien fuerte"); transcribed in Bargalló, *La amalgamación*, 239. Manuscript declarations are found in BNE Ms. 3040, 411r; ABNB CPLA 5, 90v. These proposals have been analyzed for the insight they offer into collaboration between Indigenous and European-born miners in Allison Bigelow, "La técnica de la colaboración: redes científicas e intercambios culturales de la minería y metalurgia colonial altoperuana." *Anuario: Estudios Bolivianos, Archivísticos y Bibliográficos* 18 (2012): 53–77. A narrative history based on these proposals and on details found in the 1587 and 1588 inspections is provided in Bargalló, *La Minería*, 154–57; Sánchez Gómez, *De Minería, metalúrgica y comercio*, I, 164, 320.

44 Bargalló, *La amalgamación*, 266. Note that Luis Garcia de Cervantes' support likely did not reflect the opinions of the majority of the factors of quicksilver in Potosí. See footnote 10.

from political, legal, and administrative motives and identities. A project of recovering scientific/technical practice and culture through documents produced at the instigation of an administrative process by individuals who themselves embodied this entanglement becomes even more fraught.

4 Inscribing an Experimental Trial

The final two sections turn from the individuals investigated by Ortiz de Zárate to the process by which he conducted the inquiries. The privileging of empirical or experimental methods over text-based scholarship is a key feature associated with European science in the early modern period. Scholarly attention to this transition has focused less on cataloguing experimental discoveries and more on elucidating how and why these new methods of inquiry took root. Of particular interest has been the rise of a culture of experimentation and its associated conventions of carrying out, documenting, and verifying purported experimental findings.⁴⁵ Iberian actors and the Iberian state are often described as early forerunners who promoted such experimental practices.⁴⁶

The experimental trials of Corzo's method carried out at Ortiz de Zárate's instigation in 1587 initially appear to offer a window into just such an experimental or empirical culture of refining in sixteenth-century Potosí. Closer attention to the individuals who documented the trials, however, suggests instead that the resulting records reveal more about notarial practices and standards of proof than they do experimental ones. Because these notaries constructed a written account designed to conform to administrative and legal expectations, it is difficult to use their records to develop a sense of the experimental culture of sixteenth-century Potosí independent from legal, political, and administrative concerns.

The 1587 experimental trials and the written record documenting them were orchestrated by Ortiz de Zárate. Two royal notaries, Mateo de Almonacir and

45 Peter Dear, *Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500–1700* (Princeton: Princeton University Press, 2001), 127–44; Peter Dear, “The Meanings of Experience,” in *The Cambridge History of Science. Volume 3: Early Modern Science*, ed. Katharine Park and Lorraine Daston, 106–31 (Cambridge: Cambridge University Press, 2006); Steven Shapin, *The Scientific Revolution* (Chicago: University of Chicago Press, 1998).

46 Barrera-Osorio, “Empiricism in the Spanish Atlantic World,” in *Science and Empire in the Atlantic World*, ed. James Delbourgo and Nicholas Dew (New York: Routledge, 2008), 177–202; Barrera-Osorio, *Experiencing Nature*, especially 7; Cañizares-Esguerra, *Nature, Empire, and Nation*, 12–45.

Nicolas de Guevara, were tasked by the *visitador* with traveling to Corzo's mill in the valley of Tarapaya. Once there, they were to "be present at the assaying and incorporation of the metals, *lamas*, and *relaves*."⁴⁷ Ortiz de Zárate offered specific instructions as to how the experimental tests were to be carried out: ores were to be refined by "both the method that previously was employed and is currently in use in this town and the said new method." He also directed the production of the written record, instructing the notaries to note down "what was placed in each *cajon*" and after washing, "what was removed from each one by the said new method and by the older one." They also had to keep track of how much quicksilver was used. As administrative officials deserving of compensation, the notaries were required to keep a record of the time they dedicated to these observations so that they could be paid.⁴⁸

Almonacir and Guevara followed Ortiz de Zárate's instructions and produced a detailed record of the experimental trials. After noting the origins of the ore brought to the *ingenio*, they described the preparatory steps for refining and the refining process. It involved keeping ore samples from different veins separate by thoroughly cleaning the mortar, sieves, and workspace after each sample was ground.⁴⁹ Refining by the old method involved adding salt and quicksilver to the ore, applying heat, and stirring the mixture periodically over the course of ten days. The addition of ground iron and no application of heat characterized the new method. After the silver ore had been incorporated into the quicksilver, the ore was washed, and yields were assessed. Results were recorded as quantitative comparisons. For the ore provided by Diego de Meneses, for example, it was found that "each quintal of the new method surpassed the old one by one peso, one *tomin*, and eight *granos* of the said silver."⁵⁰ The ore provided by Alonso Brassa yielded similarly positive results for the new method: "the *cajon* of the new method surpassed the old by four *tomines* and ten *granos* of silver in each quintal."⁵¹

While these records are a boon for historians of science and technology eager to reconstruct past refining methods, they are less useful as a window into the empirical culture of Potosí's refining industry. This is because their written form, and possibly even the experimental process itself, was shaped

47 Ramón de Luanco, "Metalurgistas Españoles," 1885, 193.

48 Ramón de Luanco, "Metalurgistas Españoles," 1885, 193.

49 Ramón de Luanco, "Metalurgistas Españoles," 1885, 240–41.

50 Ramón de Luanco, "Metalurgistas Españoles," 1885, 376–77.

51 Ramón de Luanco, "Metalurgistas Españoles," 1885, 406. For similar calculations in the eighteenth and nineteenth centuries of the *correspondido* ("ratio"), or the silver yield per pound of quicksilver, see Tristan Platt's contribution in this volume.

both by Ortiz de Zárate's instructions and by administrative and notarial practices. The notaries described in detail the procedure by which the two refining methods were carried out and their results assessed. Ores were refined in a series of *cajones*, which were numbered one to twelve, in order to keep track of the origin of the ore samples and the refining method applied to each.⁵² As they narrated the application and results of the old and new processes, the notaries continued to refer to these numbers. The decision to refine ore samples simultaneously using both methods was dictated by Ortiz de Zárate, who had been tasked by the viceroy with evaluating the efficacy of Corzo's method. It is unclear whether individual refiners, who were eager to maximize their own profits, carried out such comparative tests. The numbering of the *cajones* also might have been a convention introduced by the notaries to facilitate their production of a written account documenting the trials and their results.

The influence of administrative and notarial practices is also evident in the procedures employed to safeguard the refining materials and experimental process. Each time the refining process was left undisturbed, the notaries testified that the door of the *buitrón* was shut "with keys so that neither an *indio* nor anyone else was inside" and the said keys remained in custody of the notaries, with each notary keeping one.⁵³ This description of locking the site and dividing up the keys parallels municipal archival practice in the Iberian world. According to a 1530 *cédula*, municipal officials in the Americas were to compile duplicate inventories of papers and documents in their archives. One copy was to remain outside the strongbox for prior consultation. The rest were to remain inside the strongbox, which was to be locked with three keys, distributed, in turn, to the ordinary mayor, one of the regidores, and the notary of the town council.⁵⁴ A similar method was employed to protect cash and documents pertaining to Indigenous *repartimientos*; these valuables were stored in *cajas de comunidad* and locked with three keys, which were to be held by the *kuraka*, a second member of the Indigenous community, and the vicereally appointed *corregidor de indios*.⁵⁵

Notarial standards are also evident in the way agency was assigned in the experimental record. In general, the notaries wrote in the passive voice, describing what they observed without assigning agency to any individual.

52 Ramón de Luanco, "Metalurgistas Españoles," 1885, 242.

53 Ramón de Luanco, "Metalurgistas Españoles," 1885, 272.

54 Antonio Castillo Gómez, "The New Culture of Archives in Early Modern Spain," *European History Quarterly* 46, no. 3 (2016): 554.

55 Steve J. Stern, *Peru's Indian Peoples and the Challenge of Spanish Conquest: Huamanga to 1640* (Madison: University of Wisconsin Press, 1993), 97.

Once the ores had been brought to the *ingenio*, for example, the notaries wrote that “the mortar where the ore is ground was cleaned,” and around eight in the morning, “the said metal began to be ground in our [the notaries’] presence.”⁵⁶

Agency was attributed to specific individuals in key moments in the narrative that correspond to processes or materials of legal, administrative, and political concern. One such instance is the act of sworn testimony. On Friday, November 13, 1587, the notaries recorded that “Alonso Brassa, citizen and *juez de bienes de difuntos*” appeared in the *ingenio*. He “signaled” to the present notary another pile of ore on the *ingenio*’s patio and “he said that in the said pile of ore there were 150 quintales.”⁵⁷ The notaries similarly recorded the delivery by Francisco Guiral of 143 quintales and three *arrobos* of ore, which “he brought by the order of Melchor de Segovia Velasco.”⁵⁸ Here the attribution of agency, the actions of Guiral, is linked to his stated, sworn, and signed declaration, as well as to the fact that he acted on behalf of Segovia Velasco. This relationship between agency, justice, and testimony extended to Corzo and the others involved in carrying out the trials. The notaries described how Carlos Corzo, Juan Andrea, “and other people who were in the said *ingenio* and that had responsibility for it” affirmed the narrative of the refining preparations, making sworn testimony to God and “making the sign of the cross with two fingers of their hands.”⁵⁹

Agency was also assigned to two groups of individuals—unnamed Indigenous workers and the notaries themselves—when they handled quicksilver. Just as in the case of sworn testimony, this notarial attention to quicksilver was the product of administrative and political concerns. The state determined the price, supply, and distribution of quicksilver, and those who exercised control over the metal wielded considerable political power.⁶⁰ On

56 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 240.

57 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 239–40.

58 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 240.

59 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 242.

60 Bakewell, *Miners*, 159; Kendall W. Brown, *A History of Mining in Latin America: From the Colonial Era to the Present* (Albuquerque: University of New Mexico Press, 2012), 20–25; Lane, *Potosí*, 83–84; Nicholas A. Robins, *Mercury, Mining, and Empire: The Human and Ecological Cost of Colonial Silver Mining in the Andes* (Bloomington: Indiana University Press, 2011), 29–30. Control over mercury production, its distribution, and the resources to employ it in the refining of silver also had a political element, as the conflict among Spaniards of different regional peninsular backgrounds known as the “war between the *vicuñas* and the *vascongados*” in the 1620s made clear; see Alberto Crespo, *La guerra entre vicuñas y vascongados, Potosí, 1622–1625* (Sucre, Bolivia: Universidad Andina Simón Bolívar, 1997); David Dressing, “Social Tensions in Early Seventeenth-Century Potosí,” PhD diss., Tulane University, 2007, esp. 270–73; Bernd Hausberger, “Paisanos, soldados y bandidos: la guerra entre los *vicuñas* y los *vascongados* en Potosí (1622–1625),” in *Los buenos*,

Monday, November 23, the notaries explained that metallic flour “and the said iron were stirred by two *indios* with the said flour being made into *barro*.” In a subsequent step, “two *indios* with two pickaxes mixed and incorporated the metallic flour of the said *cajon* with the *barro*,” while in a *cajon* dedicated to the established method of refining, quicksilver was added and was mixed (*repasado*) by two *indios*.⁶¹ Indigenous laborers were also specifically identified later in the refining process as the individuals who washed the *lavadero*, the container where the amalgamated ore was washed.⁶² The notaries, in contrast, were described at certain points as active agents who weighed the quicksilver. On Tuesday, November 24, the record notes that to the mixture of metallic flour, water, and iron was added five quintals of a “quicksilver broth, clean of *pella* and anything else,” which “was weighed by us, the said notaries.”⁶³ Similarly, on November 25, the door of the *buitrón* was opened again, and four quintals of quicksilver broth “was weighed ... by us, the said notaries.”⁶⁴

The features of the 1587 notarial record highlighted in this section are the types of details often employed by historians of science to elucidate past cultures of experimentation. The carrying out of simultaneous trials of two different refining methods with careful attention to the separation of ores and meticulous record-keeping, as evidenced in the numbering of the *cajones*, might suggest a community that embraced new technologies when their superiority could be demonstrated through quantitative empirical trials. The attributions of agency to those who delivered ores, to those charged with preparing the materials for refining, and to those who handled quicksilver might suggest that either these individuals or these steps in the process were judged the most important.

Such an interpretation, however, is a misattribution. It assigns to scientific practice features that have at least part of their origins in notarial practice, administrative instructions, and political implications. Even at the level of practice—the carrying out of the investigation and the production of the written record documenting it—it is difficult to disentangle the political, legal, and

los malos y los feos. Poder y Resistencia en América Latina, ed. Nikolaus Böttcher, Isabel Galaor, and Bernd Hausberger, 283–308 (Madrid-Berlin: Publicaciones del Instituto Ibero-Americano e Iberoamericana Vervuert, 2005); Paula C. Zagalsky, and Lia Guillermina Oliveto, “¡Se vienen los chiriguano! Los rumores sobre ataques a la Villa Imperial de Potosí,” *Andes. Antropología e Historia* 26, no. 1 (2016): 1–24.

61 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 287–88.

62 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 375.

63 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 298.

64 Ramón de Luanco, “Metalurgistas Españoles,” 1885, 351.

administrative elements of these investigations in a way that allows the modern scholar access to the technical culture of sixteenth-century Potosí.

5 Producing Eyewitness Testimony

Just as notarial and administrative practice provided the frame through which the 1587 experimental trials were recorded, so, too, is there evidence that legal standards of proof shaped how Ortiz de Zárate carried out his investigations and formulated his conclusions. This section investigates these legal standards of proof through an examination of the role of eyewitnessing in the documentation produced during the two inquiries.

Historians have emphasized how the developing experimental culture of the early modern period privileged the role of eyewitnessing. Concomitant with the rise of experimental methods was a move away from arguments based on universal experiences shared by all to those based on particular experiences observed by a few and often reported as eyewitness testimony. The status awarded to eyewitness testimony in scientific contexts is known to have derived from its role in the legal realm.⁶⁵ The argument here, in keeping with that advanced in the fourth section, is that, at the level of practice—the carrying out of the investigations and the generation of the texts documenting them—it is extremely difficult to disentangle the role eyewitnessing may have played for those involved in developing new refining techniques from its role in legal procedure.

According to his own report to the viceroy, Ortiz de Zárate assessed the new innovations positively after seeing many things:

Having seen (*viendo visto*) this information and what was contained in it and other experiences had by the new method of quicksilver, invented by

65 On the transition from experience to experiment, see G. Baroncini, *Forme di Esperienza e Rivoluzione Scientifica* (Firenze: Leo S. Olschki, 1992); Peter Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution* (Chicago: University of Chicago Press, 1985); Charles B. Schmitt, “Experience and Experiment: A Comparison of Zabarella’s View With Galileo’s in *De Motu*,” *Studies in the Renaissance* 16 (1969): 80–138. The now canonical exploration of the role of witnessing in these academies is Steven Shapin, and Simon Schaffe, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton: Princeton University Press, 1985). On the legal origins of this transition, Barbara J. A. Shapiro, *Culture of Fact: England, 1550–1720* (Ithaca: Cornell University Press, 2003). On the role of Spanish legal culture in the institutionalization of the pursuit of natural knowledge in the realm of cosmography, see Portuondo, *Secret Science*, 136–40.

Carlos Corzo and Juan Andrea, made diverse times and in different parts, and having seen (*aviendo visto*) the poverty in which presently the metals of the hill of this said town are and the great costs that are had and make in removing and refining the metals, and thus having seen by the sight of eyes (*se ha visto de ojos*) that this said new method of water of iron has solved a great part of them.⁶⁶

Ortiz de Zárate's emphasis on witnessing or seeing is expected given his role as *visitador*, or visiting judge, tasked with writing a report that conveyed a legal argument. The preference for testimony was well established in legal proof doctrine, which judged testimony to prevail over physical evidence and written documents in the Middle Ages and early modern period.⁶⁷

A closer reading of the documents reveals that Ortiz de Zárate's eyewitness testimony conformed to established legal and notarial practices, where "seeing" did not necessarily imply one's physical presence. Ortiz de Zárate wrote that he saw "other experiences had by the new method of quicksilver ... made diverse times and in different parts." The documents, however, indicate that Ortiz de Zárate did not witness these trials himself but instead, as was common for practicing judges, saw these trials through the reports of his notaries. Four of the witnesses described what had taken place in the earlier 1587 investigation. Gonzalo López de las Higueras, for example, recounted how Ortiz de Zárate

sent Nicolas de Guevara and Matheo de Almonacir, notaries, to the valley of Tarapaya to Carlos Corzo's mill where they tested metals from the principal veins of the *cerro rico* of this town by the old method and by the new.⁶⁸

As did the other three witnesses who described the trials, López de las Higueras declared the superiority of the new method. As evidence, he cited the testimony of the notaries and his own experiences: he knew it to be true "because he saw it a few times in the said mill."⁶⁹ Guevara, one of the two notaries sent

66 Bargalló, *La amalgamación*, 266.

67 Fernando Vidal, "Miracles, Science, and Testimony in Post-Tridentine Saint-Making," *Science in Context* 20, no. 3 (2007): 486.

68 "enbio a nicolas de guevara e matheo de almonacir escrivanos al balle de tarapaya al yngenio de carlo corço adonde ensayaron los metales de las betas principales del çerro rico desta dicha villa por el benefiçio biejo e por el nuevo," BNE Ms. 3040, 341r.

69 "lo save por que lo bio algunas bezes en el dicho yngenio," BNE Ms. 3040, 341r-v.

by Ortiz de Zárate, confirmed López de las Higueras's testimony in his account. He corroborated how, having been sent to the mill of Carlos Corzo, "many trials of all the metals of the principal veins of the *cerro rico* of this town" were carried out "with the said ground iron." A "notable benefit" was seen.⁷⁰ The final two witnesses, refiner Cristóbal de Ortega Ximenez and regidor Juan de Hermosa, also testified to the carrying out of these tests in the presence of the notaries.⁷¹ None of the witnesses indicated that Ortiz de Zárate had been present during the experimental trials.

While not officially sanctioned, it was common in practice for notaries to stand in for judges and document what transpired in their absence. In her study of notarial practice in Cuzco, Kathryn Burns argues that notaries frequently were the ones who were physically present in situations where the documents they produced imply the presence of judges. Although judges were by law required to be present when testimonies for lawsuits were taken from witnesses, often the witnesses were sworn in by the judge at his residence before departing for the notary's workplace, where their testimony was recorded.⁷²

Although her research does not directly address the role of notaries in the carrying out of technical trials, Burns suggests a similar role for notaries in the testing of witnesses. In cases of serious crime, Roman and canon law allowed for examination of the suspect under torture when a sufficiently high standard of proof was met but there was not sufficient proof to convict the suspect.⁷³ Notarial manuals stressed the important role played by notaries in such cases. As the Castilian notary Gabriel de Monterroso y Alvarado explained in his 1563 *Practica civil y criminal e instruction de escrivanos*, notaries should "register the precise location of the tourniquets on the defendants' thighs, calves, biceps, and forearms, and the exact number of turns given to them, the precise amount of water poured through a thin cloth and down the defendant's throat, and so

70 "hizieron muchos ensayes de todos los metales de las betas principales del çerro rico desta villa con el dicho yerro deshecho por las quales notoriamente se bio el notable beneficcio," BNE Ms. 3040, 336v–337r.

71 "el dicho capitan Joan Ortiz de çarate compelio a nicolas de Guevara e matheo de almonacir escrivano al valle de tarapaya al yngenio de carlo corço adonde ensayaron los metales de las betas principales del çerro rico desta dicha villa por el beneficcio viejo e por el nuevo," "enbio al valle de tarapaya dos escrivanos de su magestad que fueron nicolas de guevara e matheo de almonacir escrivanos de toda fidelidad ... los quales se hizieron ensayes de diferentes metales de las vetas mas prinçipales del çerro," BNE Ms. 3040, 355r, 360v.

72 Kathryn J. Burns, *Into the Archive: Writing and Power in Colonial Peru* (Duke University Press, 2010), 32, 88–89.

73 John H. Langbein, *Torture and the Law of Proof: Europe in the Ancien Régime* (Chicago: University of Chicago Press, 2006), 4–5.

on.” Doing so would ensure that justice was upheld. The judge calibrated the type and degree of torture in accordance with the crime and quality of the accused. Notaries were charged with writing everything down precisely so that any deviations from procedure, which could cause inadvertent death or false utterances, could come to light.⁷⁴

A parallel role for the notary in documenting trials—in this case, of experimental procedures—on behalf of the judge seems to have transpired in Potosí. To respond to the viceroy’s requests, Ortiz de Zárate needed to offer testimony regarding refining trials. Busy with his other tasks, he dispatched two notaries to witness the trials—not of witnesses but of refining procedures—and record their results.

An analogous relationship between Ortiz de Zárate and his notaries is implied in the documents generated as part of the 1588 investigation. Each testimony begins by stating the date, Ortiz de Zárate’s swearing in of the witness, and the witness’s ties to Potosí.⁷⁵ While such declarations imply Ortiz de Zárate’s presence, his own declaration to the viceroy suggests that he was not actually present when these testimonies were given. In his report, Ortiz de Zárate declares that he “saw” “this information and what was contained in it,” not that he observed or heard the witnesses themselves.⁷⁶

The notion that *visto* could mean “I saw” in this legal context of seeing and affirming a report made by others is reflected in period dictionaries. Nebrija’s 1516 dictionary gives the Latin *videre* and also the Latin *cernere* as definitions of *ver*. *Videre* could mean “to see,” but it also had the connotation of “looking at” or “considering.” *Cernere* is even more removed from the notion of seeing with one’s eyes, for though it could mean “to see,” it also encompassed a range of meanings, including “to sift,” “to distinguish,” “to discern,” “to examine,” and “to decide.” Casas’ 1570 Spanish-Italian dictionary assigned to *ver* the Italian *vedere* (“to give to understand,” “to make appear,” “to make understand”) and listed the Latin *persuadere* as an equivalent. It also defined *ver* with the Italian *scorgere* (“to make known,” with the Latin synonym *se ostendere*).⁷⁷ These various connotations of *ver* are present in contemporary use. While the first three definitions assigned to the verb “to see” in the Oxford English Dictionary pertain to

74 Cited in Burns, *Into the Archive*, 36.

75 For example, “el capitan Joan Ortiz de çarate visitador desta provincia por su magestad ... recibio juramento por dios nuestro señor y por una senal de cruz en fforma de derecho de jjoan nuñez maldonado,” BNE Ms. 3040, 324v–325r.

76 “aviendo visto esta ynformacion y lo contenido en ella,” BNE Ms. 3040, 364r.

77 Italian translations from the 1612 *Vocabolari degli Accademici della Crusca*. The Italian *veduta* was translated as “seen” (Latin: *visus*).

the act of seeing or visual evidence, “to see” is also defined as “to become aware of (information, a fact, etc.) as a result of reading something.” Similarly the *Diccionario de la lengua española* of the Real Academia Española defines *ver* first as “percibir con los ojos algo mediante la acción de la luz.” The following twenty-one definitions involve other acts of perception or examination: “percibir con la inteligencia algo,” “examinar algo,” “considerar,” and so forth.⁷⁸

Ortiz de Zárate’s word choice, as formulated by the notary who inscribed his report, distinguishes between these definitions of seeing. Ortiz de Zárate emphasized or differentiated the final thing that he saw, the effectiveness of the method in solving the problems of the town, by including the descriptor *de ojos* along with the action “has seen.” His other uses of *visto* thus signify more the notion of becoming aware of rather than acting as an eyewitness. Ortiz de Zárate’s appeal to eyewitnessing reflected his production of a legal document, not the epistemological criteria of period technical practice.

6 Conclusions

This contribution builds on recent scholarship that has recognized the central role played by the state in shaping the generation and dissemination of scientific and technical knowledge in the early modern Iberian world. Yet it cautions historians against passing too quickly over the act of generating the administrative document itself. Drawing on the terminology of Guevara-Gil and Salomon, it suggests that the interaction between administrative procedure and technical practice generated performances of scientific and technical culture rather than documented this culture as it existed apart from the administrative gaze. These performances, I suggest, provided a means through which the Iberian state shaped the production of natural and technical knowledge in its realm. They also provided a public space for the creation and dissemination of scientific and technological knowledge.

Two points made by Guevara-Gil and Salomon in their analysis of the nature of the *visita general* deserve particular mention here. First, recognizing the performative nature of such administrative procedures does not make them less interesting as observational documents; it just changes the nature of what a historian can ask and expect from them. In keeping with this point, Guevara-Gil and Salmon emphasize how such performances had to be believable to all

78 *Ver* (“to see”) is thus defined as “to perceive with the eyes something via the action of light,” “to perceive something with intelligence,” “to examine something,” “to consider.”

participants and witnesses. The performances generated for Ortiz de Zárate's benefit at Carlos Corzo's *ingenio* and by the *mineros* called to testify had to meet minimum standards of technical believability and administrative, legal, and political expectations. The records of Ortiz de Zárate's inspections document this process, whose ultimate product was the textual record that survives today.

Works cited

Unpublished Primary Sources

- Archivo y Biblioteca Nacionales de Bolivia (ABNB), Cabildo Secular de Potosí (CPLA) 5, 7.
 Archivo General de Indias (AGI)
 Charcas 35.
 Lima 129.
 Biblioteca Nacional de España (BNE), Ms. 3040. "Descubrimiento del Potosí y papeles de minas."

Published Sources

- Bakewell, P. J. *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650*. Albuquerque: University of New Mexico Press, 1984.
 Bargalló, Modesto. *La Minería y la metalurgia en la América española durante la época colonial*. Buenos Aires: Fondo de Cultura Económica, 1955.
 Bargalló, Modesto. *La Amalgamación de los Minerales de Plata en Hispanoamérica Colonial*. Mexico: Compañía Fundidora de Fierro y Acero de Monterrey, 1969.
 Baroncini, G. *Forme di Esperienza e Rivoluzione Scientifica*. Firenze: Leo S. Olschki, 1992.
 Barrera-Osorio, Antonio. *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution*. Austin: University of Texas Press, 2006.
 Barrera-Osorio, Antonio. "Empiricism in the Spanish Atlantic World." In *Science and Empire in the Atlantic World*, edited by James Delbourgo and Nicholas Dew, 177–202. New York: Routledge, 2008.
 Bigelow, Allison. "La técnica de la colaboración: redes científicas e intercambios culturales de la minería y metalurgia colonial altooperuana." *Anuario: Estudios Bolivianos, Archivísticos y Bibliográficos* 18 (2012): 53–77.

- Bigelow, Allison. *Mining Language: Racial Thinking, Indigenous Knowledge, and Colonial Metallurgy in the Early Modern Iberian World*. Chapel Hill: University of North Carolina Press, 2020.
- Blair, Ann, and Jennifer Milligan. "Toward a Cultural History of Archives." *Archival Science* 7, no. 4 (2007): 289–96.
- Bleichmar, Daniela. *Visible Empire: Botanical Expeditions and Visual Culture in the Hispanic Enlightenment*. Chicago: University of Chicago Press, 2012.
- Block, David. "Four Decades of 'Visitas de Indios,' an Annotated Bibliography." In *Los Andes: Cincuenta Años Despues (1953–2003): Homenaje a John Murra*, edited by Ana María Lorandi, Carmen Salazar-Soler, and Nathan Wachtel, 15–51. Lima: Pontificia Universidad Católica del Perú, 2003.
- Bouley, Bradford. "Negotiated Sanctity: Incorruption, Community, and Medical Expertise." *Catholic Historical Review* 102, no. 1 (2016): 1–25.
- Brown, Kendall W. *A History of Mining in Latin America: From the Colonial Era to the Present*. Albuquerque: University of New Mexico Press, 2012.
- Buechler, Rose Marie. "Technical Aid to Upper Peru: The Nordenflucht Expedition." *Journal of Latin American Studies* 5, no. 1 (1973): 37–77.
- Buechler, Rose Marie. *The Mining Society of Potosí, 1776–1810*. Syracuse: Department of Geography, Syracuse University, 1981.
- Burns, Kathryn J. *Into the Archive: Writing and Power in Colonial Peru*. Duke University Press, 2010.
- Cañizares-Esguerra, Jorge. *Nature, Empire, and Nation: Explorations of the History of Science in the Iberian World*. Stanford: Stanford University Press, 2006.
- Cañizares-Esguerra, Jorge. "On Ignored Global 'Scientific Revolutions.'" *Journal of Early Modern History* 2 (2017): 420–32.
- Capoche, Luis. *Relación general de la villa imperial de Potosí*. Edited by Lewis Hanke, Juan Pérez de Tudela y Bueso, and José J. Real Díaz. Biblioteca de autores españoles 122. Madrid: Ediciones Atlas, 1959.
- Castillo Gómez, Antonio. "The New Culture of Archives in Early Modern Spain." *European History Quarterly* 46, no. 3 (2016): 545–67.
- Cole, Jeffrey A. *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press, 1985.
- Crespo, Alberto. *La guerra entre vicuñas y vascongados, Potosí, 1622–1625*. Sucre, Bolivia: Universidad Andina Simón Bolívar, 1997.
- Davis, Natalie Zemon. *Fiction in the Archives: Pardon Tales and Their Tellers in Sixteenth-Century France*. Stanford: Stanford University Press, 1987.
- Dear, Peter. *Discipline and Experience: The Mathematical Way in the Scientific Revolution*. Chicago: University of Chicago Press, 1985.
- Dear, Peter. *Revolutionizing the Sciences: European Knowledge and Its Ambitions, 1500–1700*. Princeton: Princeton University Press, 2001.

- Dear, Peter. "The Meanings of Experience." In *The Cambridge History of Science. Volume 3: Early Modern Science*, edited by Katharine Park and Lorraine Daston, 106–31. Cambridge: Cambridge University Press, 2006.
- Dressing, David. "Social Tensions in Early Seventeenth-Century Potosí." PhD diss., Tulane University, 2007.
- Espada, Jiménez de la, ed. *Relaciones geográficas de Indias. Perú*. 4 vols. Madrid: Tipografía de Manuel G. Hernández, 1885.
- Guerrero, Saul. *Silver by Fire, Silver by Mercury: A Chemical History of Silver Refining in New Spain and Mexico, 16th to 19th Centuries*. Leiden: Brill, 2017.
- Guevara-Gil, Armando, and Frank Salomon. "A 'Personal Visit': Colonial Political Ritual and the Making of Indians in the Andes." *Colonial Latin American Review* 3, no. 1–2 (1994): 3–36.
- Hausberger, Bernd. "Paisanos, soldados y bandidos: la guerra entre los vicuñas y los vascongados en Potosí (1622–1625)." In *Los buenos, los malos y los feos. Poder y Resistencia en América Latina*, edited by Nikolaus Böttcher, Isabel Galaor, and Bernd Hausberger, 283–308. Madrid-Berlin: Publicaciones del Instituto Ibero-Americano e Iberoamericana Vervuert, 2005.
- Herzog, Tamar. *Upholding Justice: Society, State, and the Penal System in Quito (1650–1750)*. Ann Arbor: University of Michigan Press, 2004.
- Jauss, Hans Robert. "Literary History as a Challenge to Literary Theory." In *Toward an Aesthetic of Reception*, translated by Timothy Bahti, 3–45. Minneapolis: University of Minnesota Press, 1982.
- Kagan, Richard L. *Lawsuits and Litigants in Castile, 1500–1700*. Chapel Hill: University of North Carolina Press, 1981.
- Lane, Kris. *Potosí: The Silver City That Changed the World*. Oakland: University of California Press, 2019.
- Langbein, John H. *Torture and the Law of Proof: Europe in the Ancien Régime*. Chicago: University of Chicago Press, 2006.
- Levillier, Roberto, ed. *Gobernantes del Perú, cartas y papeles, siglo XVI; documentos del Archivo de Indias*. 14 vols. Madrid: Sucesores de Rivadeneyra, 1921.
- Lohmann Villena, Guillermo. *Las minas de Huancavelica en los siglos XVI y XVII*. Sevilla: Escuela de Estudios Hispano-Americanos, 1949.
- Mangan, Jane E. *Trading Roles: Gender, Ethnicity, and the Urban Economy in Colonial Potosí*. Durham: Duke University Press, 2005.
- Murra, John. "Una apreciación etnológica de la visita." In *Visita hecha a la Provincia de Chucuito por Garci Diez de San Miguel en el año 1567*, edited by Waldemar Espinoza Soriano, 421–42. Lima: Ediciones de la Casa de la Cultura del Perú, 1964.
- Peters, Kate, Alexandra Walsham, and Liesbeth Corens, eds. *Archives and Information in the Early Modern World*. Oxford: Oxford University Press, 2018.

- Platt, Tristan, Thérèse Bouysson-Cassagne, and Olivia Harris, eds. *Qaraqara-Charka Mallku, Inka y Rey en la provincia de Charcas (siglos XV–XVII): Historia antropológica de una confederación aymara*. La Paz: Plural editores, 2006.
- Portuondo, María. *Secret Science: Spanish Cosmography and the New World*. Chicago: University of Chicago Press, 2009.
- Portuondo, María. "Finding 'Science' in the Archives of the Spanish Monarchy." *Isis* 107, no. 1 (2016): 95–105.
- Presta, Ana María. *Encomienda, familia y negocios en Charcas colonial (Bolivia): los encomenderos de La Plata, 1550–1600*. Lima: IEP, Instituto de Estudios Peruanos, 2000.
- Presta, Ana. "La Compañía del Trajín de Azogues de Potosí: Un capítulo inédito de la financiación de los repartimientos indígenas surandinos al desarrollo de la minería colonial." *Boletín del Instituto de Historia Argentina y Americana "Doctor Emilio Ravignani"* 43 (2015): 31–58.
- Ramón de Luanco, José. "Metalurgistas Españoles en el Nuevo Mundo." In *Crónica Científica: Revista Internacional de Ciencias* VIII, edited by Rafael Roig y Torres, 1885.
- Ramón de Luanco, José. "Metalurgistas Españoles en el Nuevo Mundo." In *Crónica Científica: Revista Internacional de Ciencias* IX, edited by Rafael Roig y Torres, 1886.
- Robins, Nicholas A. *Mercury, Mining, and Empire: The Human and Ecological Cost of Colonial Silver Mining in the Andes*. Bloomington: Indiana University Press, 2011.
- Salazar-Soler, Carmen. "Los 'Expertos' de la Corona. Poder Colonial y Saber Local en el Alto Perú de los Siglos XVI y XVII." *De Re Metallica* 13 (2009): 83–94.
- Sánchez Gómez, Julio. *De minería, metalúrgica y comercio de metales: La minería no férrea en el Reino de Castilla, 1450–1610*. 2 vols. Salamanca: Universidad de Salamanca, 1989.
- Schmitt, Charles B. "Experience and Experiment: A Comparison of Zabarella's View With Galileo's in De Motu." *Studies in the Renaissance* 16 (1969): 80–138.
- Scott, James C. *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven: Yale University Press, 1998.
- Shapin, Steven. *The Scientific Revolution*. Chicago: University of Chicago Press, 1998.
- Shapin, Steven, and Simon Schaffer. *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life*. Princeton: Princeton University Press, 1985.
- Shapiro, Barbara J. *A Culture of Fact: England, 1550–1720*. Ithaca: Cornell University Press, 2003.
- Stern, Steve J. *Peru's Indian Peoples and the Challenge of Spanish Conquest: Huamanga to 1640*. Madison: University of Wisconsin Press, 1993.
- Stoler, Ann Laura. *Along the Archival Grain: Epistemic Anxieties and Colonial Common Sense*. Princeton: Princeton University Press, 2009.
- Szonyi, Michael. *The Art of Being Governed: Everyday Politics in Ming China*. Princeton: Princeton University Press, 2017.

- Tandeter, Enrique. *Coercion and Market: Silver Mining in Colonial Potosí, 1692–1826*. Albuquerque: University of New Mexico Press, 1993.
- Vidal, Fernando. “Miracles, Science, and Testimony in Post-Tridentine Saint-Making.” *Science in Context* 20, no. 3 (2007): 481–508.
- Vivo, Filippo de, Andrea Guidi, and Alessandro Silvestri. “Archival Transformations in Early Modern European History.” *European History Quarterly*, Special Issue, 46, no. 3 (2016): 421–34.
- Walsham, Alexandra. “The Social History of the Archive: Record-Keeping in Early Modern Europe.” *Past and Present*, Special Issue, 230, suppl. 11 (2016): 9–48.
- Yale, Elizabeth. “The History of Archives: The State of the Discipline.” *Book History* XVIII (2015): 332–59.
- Zagalsky, Paula C. “Huellas en las revisitas: tensión social e imposiciones culturales.” *Memoria Americana* 17 (2009): 241–79.
- Zagalsky, Paula C., and Lia Guillermina Oliveto. “¡Se vienen los chiriguano! Los rumores sobre ataques a la Villa Imperial de Potosí.” *Andes. Antropología e Historia* 26, no. 1 (2016): 1–24.

PART 2

Environmental History and Labor



Water for the Monarchy of the World

Mitayos and Maestros of Colonial Potosí Hydraulic Works

Julio Aguilar

1 Introduction

Potosí was the location of one of the most complex hydraulic infrastructure projects in colonial America. These works allowed for the operation of a city and large-scale mining in an environment lacking permanent water sources. The basis of this engineering marvel was reservoirs located in the Kari-Kari mountain chain near Potosí, where water from thaws, but mainly from summer rains, was collected.¹ Local authorities directed this water to the city through canals and tunnels, creating a stream, *la ribera*, where the silver processing mills operated. Along this stream, each of these refining plants received water through elaborate aqueducts, and it mobilized the silver refining mills. In the city, the vital liquid flowed through a water distribution system (*cajas de aguas*), pipes, and fountains located in squares, churches, convents, private residences, and public buildings. The miners, the town council, and the *corregidores* (royal magistrates) contributed to maintaining up to thirty-four reservoirs that set the city, the market, and mining activities in motion.²

1 Potosinos used the Spanish term “laguna” (lagoon) to denote the basic hydraulic structure of their city. For translation purposes, I use the term “reservoir” to denote the anthropogenic nature of these bodies of water. Likewise, I use the term “Kari-Kari” to refer to the mountain range neighboring Potosí, in accordance with the denomination used in the 1892 *Monografía del Departamento de Potosí*. See Centro de Estudios Potosí, *Monografía del Departamento de Potosí* (Potosí: Imprenta El Tiempo, 1892), 100. For purposes of distinction, I have opted for the term “Caricari” to refer specifically to that reservoir.

2 National Library of Spain (hereafter BNE), *Relacion que Hizo de su Gobierno, el Excmo Señor Dn José de Armendariz, primer Marqués de Castelfuerte, 1736, f.141*. According to Arzáns, noted colonial historian of Potosí, the *azogueros* played an essential role in financing the first waterworks. Bartolomé Arzáns de Orsúa y Vela, *Historia de la Villa Imperial de Potosí* (Providence: Brown University, 1965), Vol.1, 157. The agreements of the town council of Potosí preserved in the National Archive and Library of Bolivia in Sucre indicate that the owners of mines and mills contributed to eventual expenses related to the reservoirs, which were called “derramas.” Likewise, the authorities used the *sisá*, a tax charged on foodstuffs such as wine and meat, to support waterworks.

Therefore, the hydraulic works became the backbone of the urban space and the silver machine of Potosí, favoring the development of the overall economy and the empire's prosperity.³ As a viceroy of Peru concluded in 1627, the kingdom, the Crown, and all Christendom depended on the reservoir of Potosí.⁴ This study offers a social history of this environmental transformation, emphasizing the encounter between workers and technicians of different origins who built the reservoir of Potosí and especially the contribution of Indigenous artisans who came from societies with a long historical experience of hydraulic management in the Andean highlands.

Building and maintaining this infrastructure over time required mobilizing a significant labor force. Workers began construction of the first reservoirs and canals in the Kari-Kari mountain range around the 1570s.⁵ Several sources suggest that in 1576, workers completed the construction of the dams of Caricari—also called the San Ildefonso and the king's reservoir—and the San Pablo, both located in the San Ildefonso ravine (see Map 4.1).⁶ Different viceroys and *corregidores* ordered workers to expand the hydraulic infrastructure towards the end of the sixteenth century and the beginning of the seventeenth century. During the 1590s, *corregidor* Pedro Osores de Ulloa built three more reservoirs and a few years later, the viceroy, Luis de Velasco, ordered the construction of more dams. Through this process, the city had six reservoirs by the year 1600. Other *corregidores*, such as Pedro de Lodeña, Pedro Córdova y Mesía, and Rafael Ortiz de Sotomayor built about ten additional reservoirs between

3 Several authors have contributed to the history of the hydraulics of Potosí. Without being exhaustive, it is worth mentioning William Rudolph, "The Lake of Potosí," *Geographical Review* 26, no. 4 (1936): 529–54. Laura Escobari, "Las Lagunas de Potosí," *Arte y Arqueología* 8, no. 9 (1989): 177–84. Carlos Serrano and Julio Peláez, "Potosí y su Sistema Hidráulico," *Boletín Sociedad Geográfica y de Historia "Potosí"* 14 (1991): 44–52. Carlos Serrano and Julio Peláez, "Potosí y Su Sistema Hidráulico (Continuación)," *Boletín Sociedad Geográfica y de Historia "Potosí"* 15 (1991): 75–93. Teresa Gisbert and José de Mesa, "Potosí y su Sistema Hidráulico Minero," in *Obras Hidráulicas en América Colonial*, ed. Centro de Estudios Históricos de Obras Públicas y Urbanismo (Madrid: Ministerio de Obras Públicas, Transportes y Medio Ambiente, 1993), 151–64. Catherine Julien, "Las Lagunas de Potosí en Tiempos de don Pedro de Lodeña: Documentos del Archivo de Indias," *Historia y Cultura* 24 (1997): 13–53. Alain Gioda, Carlos Serrano, and Markus Frey, "L'eau et l'argent à Potosí (ancien Haut-Pérou puis Bolivie)," *La Houille Blanche*, 7 (1998): 65–75.

4 Historic Archive of the National Mint "Mario Chacon Torres" (Potosí) (thereafter, AHP), Caja Real, 214, f.1r. The words correspond to the viceroy of Peru, Don Diego Fernández de Córdoba Márquez de Guadacázar.

5 University of Oviedo Library (hereafter BUO), Fondo Antiguo, M-215, Diego de Ocaña, Relación del viaje de Fray Diego de Ocaña por el Nuevo Mundo (1599–1605), f.179v.

6 José Baquijano Carillo, "Historia del Descubrimiento del Cerro de Potosí, Fundación de su Imperial villa, sus Progresos y Actual Estado," *Mercurio Peruano* VII, no. 213 (1793): fol. 36.

1600 and 1610 to address water shortages that affected the town during those years. The Spanish government also required a hydraulic fix for specific reconstruction tasks, such as the one that occurred after the flooding of the Caricari dam in 1626.⁷ Between the 1740s and 1770s, miners and Bourbon officials also demanded workers to build and rebuild reservoirs in order to reactivate mining in Potosí.⁸ Despite their importance, relatively little is known about these hydraulic workers, their technologies, and their knowledge of Andean nature. Without them, there would not have been the indispensable hydraulic support of the Andean mining metropolis that, according to Guamán Poma de Ayala, converted the King of Spain into the Monarch of the World.⁹

This text explores how Indigenous workers—*mitayos* (draft laborers) as well as *mingas* (free workers)—and a variety of construction specialists known as *maestros* built the hydraulic infrastructure that sustained Potosí's urban and industrial ecosystem. In doing so, the chapter seeks to expand our understanding of the environmental changes driven by Spanish colonization in the Andes. Throughout the Peruvian viceroyalty, Spanish officials promoted the construction of multiple waterworks to supply cities and villages, irrigate haciendas, and power textile mills and other industries.¹⁰ The reservoirs of Potosí formed part of this broader colonial policy that used water to sustain mining and, with it, Spanish social and cultural ways of life. This infrastructure, implemented by the Spanish Empire, significantly altered the physical environment. Nevertheless, the vision of this chapter is that the formation of the Potosí mining landscape should be understood not merely as a result of the decisions of the viceregal power groups, but as part of the convergence between the Spanish Empire, the local society, and the environment.¹¹ Andean

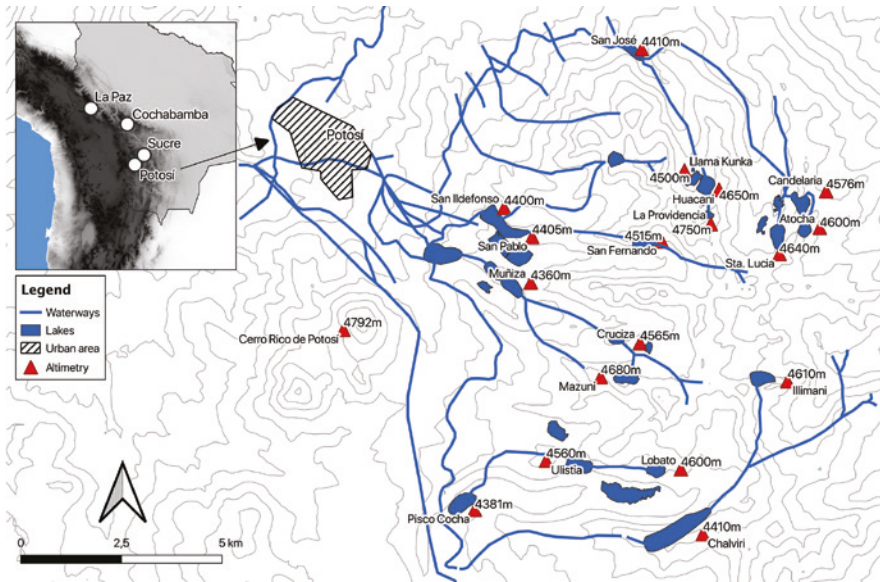
7 Antonio Vázquez de Espinosa, *Compendio y Descripción de las Indias Occidentales* (Washington: Smithsonian Institution, 1942), 588–92. Alan Gioda, Carlos Serrano and Ana Foreza, “Les Ruptures de Barrages Dans le Monde: un Nouveau Bilan de Potosí (1626, Bolivie),” *La Houille Blanche* 88, no. 4–5 (2002): 165–70.

8 I examine these different historical moments in my doctoral dissertation, “A Thirsty Colonization: Water and Environmental Transformation in the Silver City of Potosí, 1545–1760” UC Davis, 2022.

9 Royal Library of Denmark. Guamán Poma de Ayala, *Nueva Corónica y Buen Gobierno* 1615: 1065–68.

10 Centro de Estudios Históricos de Obras Públicas y Urbanismo, *Obras Hidráulicas en América Colonial* (Madrid: Ministerio de Obras Públicas, Transportes y Medio Ambiente, 1993), 357.

11 Ling Zhang suggests understanding environmental change beyond the nature-society dichotomy by emphasizing the encounter of multiple actors, which she calls a “tri-lectic complexity”: between state, society, and environment. Ling Zhang, *The River, the Plain, and the State: An Environmental Drama in Northern Song China, 1048–1128* (New York: Cambridge University Press, 2016), 7.



MAP 4.1 Reservoirs of Potosí

MAP AUTHOR: MANOEL RENDEIRO NETO, IN AGUILAR "THIRSTY COLONIZATION".

nature, Indigenous workers, and *maestros* played an active role in the unfolding of this imperial hydraulic policy.¹²

The first section addresses Viceroy Francisco de Toledo's policies, which led to the creation of the reservoir of Potosí. Authorities, miner owners, and *azogueros* saw in obtaining the waters of the Andean highland an indispensable resource to ensure the imperial economy and the civilization of Indigenous societies. The second section deals with the problem of the hydraulic workers of Potosí, focusing on the Indigenous *mitayos*. My interest is to shift the focus from the work of the *mitayos* in mining mills and mines to other activities such as the construction of public works. This section traces the origin of the *mita* destined for hydraulic works and the labor conditions in the construction and conservation of the reservoir in the Kari-Kari mountain range. I propose that the *mitayos'* labor in the reservoirs was influenced by the previous experiences of Indigenous societies forged in the interaction and remodeling of Andean

12 Environmental historians propose that the physical environment is more than just the setting for human events. On the problem of the agency of nature, see Linda Nash, "The Agency of Nature or the Nature of Agency?" *Environmental History* 10, no. 1 (2005): 67–69.

ecosystems through hydraulic technologies and techniques. The final section explores the case technicians of the waterworks—engineers, architects, and *maestros*. Droughts, the city's growth, and the demands of silver at the beginning of the seventeenth century favored the consolidation of a local group of specialists in dams and hydraulics. The manual and arduous work of the *maestros*, *mitayos*, and other Indigenous workers in the Kari-Kari mountains highlights the intimate intertwining of the environment and colonial culture.¹³

2 The Toledan Hydraulic Policies: Energy and Environmental Changes in Potosí

The Spanish government, through Viceroy Toledo, undertook a profound reorganization of Peruvian viceroyalty and mining production in Potosí in order to secure imperial power and wealth. Viceroy Toledo's reforms in the 1570s prompted a radical transformation in the interactions between human societies and nature in the Andes.¹⁴ Potosí retained a special place in the viceroy's plan for the redesign of government and the functioning of colonial society and economy. His reforms radically transformed the Imperial City, its people, and surroundings with a view to increasing silver production. Obtaining large quantities of water became a fundamental piece in the political-ecological reengineering of Potosí and an absolute necessity for the prosperity of the empire and its mining elites.

Technological innovations in mining production and the massive use of human energy were the two central themes of Viceroy Toledo's reforms in

13 Regarding the intertwining of human labor and nature, see Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill and Wang, 1995), 130.

14 Historians have termed this type of process ecological revolutions for other colonial and modern contexts. See Carolyn Merchant, *Ecological Revolutions: Nature, Gender, and Science in New England* (Chapel Hill: University of North Carolina Press, 2010) 424; Chris Boyer and Martha Micheline Cariño Olvera, "Mexico's Ecological Revolutions," in *A Living Past. Environmental Histories of Modern Latin America*, ed. John Soluri, Claudia Leal and José Augusto Pádua (New York: Berghahn, 2018), 23–44. Among the viceroy's measures with ecological repercussions was, for example, the massive reduction of Andean societies to villages in accordance with Iberian urban and political style and the regulation of collective access to water, land, and pasture. See Jeremy Mumford, *Vertical Empire: The General Resettlement of Indians in the Colonial Andes* (Durham: Duke University Press, 2012), 293.

Potosí.¹⁵ The Spanish government introduced a new method for refining silver using *azogue* (mercury). This method was successfully employed in New Spain and Potosí, allowing the exploitation of lower-quality ores. Mining entrepreneurs began to rapidly build silver processing plants. These mills required the use of hydraulic energy—although there were also mills powered by animals and humans. Silver mill owners also required water for multiple procedures, such as cleaning the ores.¹⁶ Eighteenth-century sources indicate that it was precisely Viceroy Toledo who ordered the construction of eighteen reservoirs in the Kari-Kari mountains to supply the Potosí mills, a measure that received broad consensus among mining entrepreneurs and local elites.¹⁷ Toledo obtained the necessary political support within the viceroyalty to expand and institutionalize the colonial *mita*, a forced migration work regime for thousands of Indigenous people destined for annual work in the mines and mills.¹⁸ These measures favored the rebound of mining production and rapid population growth, which in turn imposed greater urgency in obtaining water both for the operation of the city and for the so-called Potosí machine.

Francisco de Toledo considered water an essential element to consolidate colonization and undertook various initiatives to guarantee access to this element in Potosí and other cities of the viceroyalty. In Lima and La Plata, the viceroy favored the exploration and channeling of rivers and springs to supply water to the population and ordered town councils to formulate regulations for the distribution and use of this vital liquid.¹⁹ Each city and local society had its own agendas and political interests behind the massive management of

15 Peter Bakewell, "Technological Change in Potosí: The Silver Boom of the 1570s," *Jahrbuch Jahrbuch für Geschichte Lateinamerikas—Anuario de Historia de America Latina* 14 (1977): 5–77.

16 Arzáns, *Historia de la Villa Imperial de Potosí*, 157.

17 Pedro Vicente Cañete, in the eighteenth century, mentions a royal decree with this vice-regal order. See Pedro Vicente Cañete y Domínguez, *Guía histórica, geográfica, física, política y legal del gobierno e intendencia de la Provincia de Potosí* (La Paz: Ministerio de Educación, Bellas Artes y Asuntos Indígenas, 1952), 49. Franciscan chronicler Diego de Mendoza states that in Potosí, there were eighteen reservoirs in the mid-seventeenth century. See Fray Diego de Mendoza, *Chronica de la Provincia de San Antonio de los Charcas* (Madrid, 1664), 31. These dams, composed of lime and stone, reflect the reconstruction of the hydraulics after the flood of 1626. In his memoir, Viceroy Castefuerte states that Potosí originally had eighteen reservoirs. BNE, *Relacion que Hizo*, 1736, f. 141.

18 On Toledo's efforts at the viceroyalty level to institutionalize the *mita*, see Peter Bakewell, *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650* (Albuquerque: University of New Mexico Press, 1984), 64. On the early *mita*, see also Jeffrey Cole, *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes* (Stanford: Stanford University Press, 1985), 6.

19 Martha G. Bell "Historical Political Ecology of Water: Access to Municipal Drinking Water in Colonial Lima, Peru (1578–1700)," *Professional Geographer* 67, no. 4 (2015): 504–26.

water.²⁰ In Mexico City, the drainage of the lakes landscape was related to the needs of the elites to impose a regime of individual private property and commercial activities.²¹ In Potosí, mine owners and *azoguero* interests converged with the government fiscal concern in the royal fifth. Indeed, the viceroy gave specific instructions to also provide water to Indigenous workers, understanding the importance of their physical well-being for mining production.²² Similarly, the construction of the waterworks may also have responded to the intention of cementing a spatial vision of the ethno-racial order of colonial society insofar as water was used to divide the Spanish neighborhood and the Indigenous *rancherías*.²³

For some officials, the availability of water played an essential role in the so-called reciprocity pact between Spanish rule and Indigenous societies.²⁴ The *rancherías*, where Indigenous people and other subaltern sectors resided, lacked access to water fountains such as those in city's squares and convents. From that point of view, the construction of the reservoir had limited impacts on the residential conditions of *mitayos* and other workers. Yet government officials noticed that the increased availability of water generated by the dams provided an opportunity for Andean workers and their communities. According to them, the increased volume of water allowed the mining mills to operate longer, generating more work and producing more wealth in the form of silver. In this way, obtaining water not only benefitted the income of the royal treasury and the owners of mines and mills, but also Indigenous people, who would be better able to pay their taxes through their work. Therefore, the hydraulic works of the Imperial City of Potosí were critical for the support of the colonial order.²⁵

The Spanish Empire and Potosí mining entrepreneurs' hydraulic policy gave way to an intimate intertwining of local society and the physical environment.

20 Centro de Estudios Históricos de Obras Públicas y Urbanismo, *Obras Hidráulicas en América Colonial*, 357.

21 Vera Candiani, *Dreaming of Dry Land: Environmental Transformation in Colonial Mexico City* (Stanford: Stanford University Press, 2014), 376.

22 Potosinos noted the social differences in water consumption and water quality depending on the type of liquid: spring water, well water, and *azogadas*. BNE, Descubrimiento del Potosí y papeles de minas. Representación al Virrey del Lizdo Cepeda sobre el remedio de los escándalos y excesos de Potosí, s/f, folio 70r.

23 Arzáns, *Historia de la Villa Imperial de Potosí*, 168.

24 Tristan Platt, *Estado Boliviano y Ayllu Andino: Tierra y Tributo en el Norte de Potosí* (Lima: Instituto de Estudios Peruanos, 1982) 20.

25 General Archive of the Indies (hereafter AGI), Lima 152, f.51v. Información de oficio de la real audiencia de La Plata sobre la obra de las lagunillas que don Pedro de Lodeña hizo en la villa de Potosí y otros servicios. Transcription in Julien, "Las Lagunas de Potosí," 35.

Following environmental history and technology studies, it is possible to point out that Potosí became an “environmental entity”—that is, a landscape marked by the convergence between the empire, the local multiethnic society, and non-human nature such as animals and water.²⁶ As a *corregidor* of Potosí observed in 1620, the sustainability of silver production depended on the mobilization of Indigenous people and pack animals, the availability of mercury, and the presence of large quantities of water.²⁷ Other elements were also essential, such as salt. If the Spanish Empire required silver, it had to have and mobilize llamas, *azogue* (mercury), Indigenous people, salt, and water. Responding to this pressing demand for organic and hydraulic energy involved significant transformations in the environs of Potosí. The following pages explore the identities of the Indigenous workers and *maestros* who concretized this colonial hydraulic policy and forged on the heights of the Kari-Kari the reservoirs that set the environmental entity of Potosí in motion.

3 Indigenous Workers and the *Mita* for Hydraulic Labor

This hydraulic policy faced multiple challenges in Potosí. Capturing the summer rains that ran down streams and depressions of glacial origin above 4,000 meters above sea level was a challenging task at the technological level. It required mobilizing a workforce to the Kari-Kari mountains in tasks that could last for several months. Authorities and miners demanded specialists who could determine the feasibility of each of the reservoirs, considering factors such as site selection and the connection of each reservoir to the rest of the system. They also required workers to plan and build the containment structures and reservoir gates to confine and control the water, as well as spillways to evacuate the excess liquid. Likewise, the operation of the mining town required workers to build canals, flatten land, and dig tunnels to channel and distribute water from the mountains to the town and the *ribera*. The authorities also needed producers and transporters of construction materials such as lime and other supplies to the work camps. Finally, the colonial government needed labor to maintain the infrastructure, which was vulnerable to deterioration caused by sedimentation and erosion due to water and snow, as well as

26 On environmental entities, see Ling Zhang, *The River*, 40.

27 AGI, Charcas, 54. Cartas y expedientes de personas seculares del distrito de dicha Audiencia vistos en el Consejo entre los años, Relaçion de los seruiçios personales que acuden a la labor de las minas del çerro de Potosí, 1620, f.25r.

events such as floods and extreme winds. Consequently, the Crown's hydraulic plans depended on permanent access to and control of a labor force.

Lewis Hanke and Gunnar Mendoza argued that the construction of the reservoir was above all a collective and multiethnic work in which Spaniards, Indians, mestizos, Black slaves, and foreigners participated.²⁸ However, sources likewise suggest Indigenous people as the main workforce of the hydraulic infrastructure of Potosí. Potosí authorities and miners specifically used the Potosí mining *mita* to employ Indigenous workers in the construction and maintenance of the reservoir. The Potosí mining *mita*, standardized during Toledo's rule in the 1570s, consisted primarily of the assignment and migration of Indigenous workers from specific Andean communities to work in Potosí for a period of one year. Toledo's *mita* in Potosí had arisen fundamentally as part of a gradual process of transformations and labor innovations that colonial officials, encomenderos, miners, and others developed to ensure access to Indigenous labor from the late 1540s onward.²⁹

To understand the role of these Indigenous workers in Potosí hydraulic processes, it is necessary to examine the pre-Columbian past. In Andean Studies, greater collaboration between history and other disciplines such as archaeology would allow for the study of the Kari-Kari reservoirs and the colonial hydraulic infrastructure of Potosí. This becomes even more pressing if we consider the discussions and findings of recent research highlighting the long pre-Columbian history of mining production in Potosí by the Tiwanaku, Collas, and Incas.³⁰ Andean Indigenous societies inhabited the surroundings of Potosí in settlements such as Kantu Marka and developed mining such as through the Porco sites and even built ceremonial shrines on the Cerro Rico itself.³¹

28 Lewis Hanke and Gunnar Mendoza suggested that the dams had probably been a common work of the multiethnic society of Potosí. Lewis Hanke and Gunnar Mendoza, "Bartolomé Arzáns de Orsúa y Vela: su Vida y su Obra," in *Historia de la Villa Imperial de Potosí*, YCXXX.

29 Paula C. Zagalsky, "La Mita de Potosí: Una Imposición Colonial Invariable en un Contexto de Múltiples Transformaciones (siglos XVI–XVII; Charcas, Virreinato del Perú)," *Chungara* 46, no. 3 (2014): 376–77.

30 Bouysse-Cassagne's chapter in this book.

31 Pablo Cruz and Pascale Absi, "Cerros Ardientes y Huayras Calladas. Potosí Antes y Durante el Contacto," in *Minas y metalurgia en los Andes del Sur: Desde la época prehispanica hasta el siglo XVII*, ed. Pablo Cruz and Jean J. Vacher (Lima: Institut de Recherch pour le Developpement e Instituto Francés de Estudios Andinos, 2008), 93; Pablo Cruz, "Huacas Olvidadas y Cerros Santos: Apuntes Metodológicos sobre la Cartografía Sagrada en los Andes del Sur de Bolivia," *Estudio Atacameños* 38 (2009): 58–59; Tristan Platt and Pablo Quisbert, "Tras las huellas del silencio: Potosí, los Incas y el Virrey Toledo," in *Minas y metalurgia en los Andes del Sur*, 231–77; see Bouysse-Cassagne's chapter in this book.

With the available information, it is not yet possible to conclude to what extent pre-Hispanic interventions in the Potosí landscape impacted the development of colonial hydraulic works after the 1570s. Although the dams and the *ribera* were a colonial creation, the *mitayos* builders came from regions and communities that possessed a deep knowledge and practice of water management in the highland ecology.

The Indigenous workers of Potosí were indeed from societies that had achieved great mastery of high-altitude water management. For example, part of the working population recruited through the *mita* was originally from the Lake Titicaca basin. Archaeological research has shown that native Andean groups transformed this basin by means of hydraulic-agricultural technologies such as terraces, *camellones*, and *q'ochas*.³² The Incas extended these hydraulic practices throughout the Andes, engineering the collection of water from springs, the construction of reservoirs in the high mountains, the use of groundwater, the redirection of water courses from rivers and streams in ravines, the provision of structures for flood control of crops, and drainage in strategic buildings such as *tambos*. The Incas also developed sophisticated fountains and waterfalls carved with fine stonework in urban settlements. Andean and Inca societies consequently developed a fine hydrological knowledge, perceiving the link between the waters of the sea, lakes, rainfall, rivers, and underground water courses.³³ Central notions in Andean hydrology such as *cocha* (*q'ocha*, *kocha*, *cocha*, *qucha*) were used to name bodies of water in colonial Potosí.³⁴ One of the reservoirs that supplied the mining city received,

32 The *camellones* used the artificial elevation of the land to capture water for crops. For their part, *q'ochas*—also called *chacras hundidas*—used the depression or excavation of the land to flood crops and store water for times of drought. In addition to these technologies, farmers and shepherds modified springs, rivers, and streams by building stone walls and dikes, constructed canals between mountains, made artificial wetlands, and built reservoirs for human communities and livestock consumption. These interventions were widespread, radically transforming the ecology of the puna. See Clark Erickson, “The Lake Titicaca Basin: A Pre-Columbian Built Landscape,” in *Imperfect Balance: Landscape Transformations in the Pre-Columbian Americas*, ed. David L. Lentz (New York: Columbia University Press, 2000), 311–56.

33 Stella Nair and Jean-Pierre Protzen, “The Inka Built Environment,” in *The Inka Empire: A Multidisciplinary Approach*, ed. Izumu Shimada (Austin: University of Texas Press, 2015), 215–31; Kenneth Wright, Alfredo Valencia, Ruth Wright, Gordon McEwan, *Machu Picchu: a Civil Engineering Marvel* (Reston: American Society of Civil Engineers, 2000). The Incas even used hydraulic infrastructure as defense mechanisms by flooding a valley near Cuzco to defeat the Spanish conquerors. See Terence N. D’Altroy, *The Incas* (Sussex: Wiley Blackwell, 2015), 224.

34 Water played a vital role in Inca origin myths. Lake Titicaca was one of the *paqarinas* that had given rise to humans. The Incas considered oceans, lakes, and lagoons as *Mama*

for example, the name Piscococha.³⁵ In 1609, García de Llanos reported that the workers of the mining mills used the term *cocha* to describe lagoons, ponds, or pools that collected water. Andean people in Potosí used the term *cocha* to describe specifically the standing water that did not flow to the sea.³⁶ This usage reflects the accommodation of Andean hydrological language to the colonial industrial setting.³⁷ Be that as it may, it is clear that the Indigenous Potosí workers were part of societies that had long accumulated experience with landscape construction in the Andes by means of hydraulic engineering.

Pre-Columbian Andean hydraulics was associated with a collective work regime and likely the *mita*. The magnitude of pre-Hispanic hydraulic works such as those developed in the Titicaca basin demonstrate prolonged human intervention over time and, above all, the mobilization of a significant workforce.³⁸ Planning and implementing these works eventually required a significant amount of political coordination.³⁹ Archaeological and ethnohistorical research has suggested that Inca rulers used *mita* to support imperial infrastructure such as roads—like the Qhapaq Ñan—bridges and hydraulic works. *Mitayos*, for example, may have built the fountains and waterfalls of Inca royal settlements.⁴⁰ Early colonial records show that the Inca Empire

Qucha, the origin of the waters that flowed on Earth. See Carolyn Dean, “Inka Water Management and the Symbolic Dimensions of Display Fountains,” *Res: Anthropology and Aesthetics* 59–60 (2011): 22–38.

35 According to William Rudolph’s early twentieth-century record. Rudolph, “The Lakes of Potosí,” 540.

36 García de Llanos, *Diccionario y Maneras de Hablar que se Usan en las Minas y sus Labores en los Ingenios y Beneficios de los Metales* (La Paz: Museo Nacional de Etnografía y Folklore, [1609] 1983), 20.

37 Linguistic and historical research has suggested how the movement of population and particularly of Indigenous workers as a result of the colonial *mita* influenced the languages practiced in the mining regions of the Peruvian viceroyalty. See Adrian J. Pearce and Paul Heggarty, “Mining the Data’ on the Huancayo-Huancavelica Quechua Frontier” in *History and Language in the Andes*, ed. Adrian J. Pearce and Paul Heggarty (New York: Palgrave Macmillan, 2011), 100. In addition to Quechua, other languages such as Puquina, whose presence was significant in pre-Hispanic Potosí as suggested by Bouysse-Cassagne in this book, need to be further explored for the colonial period.

38 For example, the *q’ochas* or *chacras hundidas* cover around 530 square kilometers in the Titicaca. The *camellones* extend over about 120,000 hectares in the same basin. Erikson, “The Lake Titicaca Basin,” 336–37.

39 For a discussion of the relationship between political power and water management in the pre-Columbian Andes, see Charles Stanish, “The Hydraulic Hypothesis Revisited: Lake Titicaca Basin Raised Fields in Theoretical Perspective,” *Latin American Antiquity* 5, no. 4 (1994): 312–32.

40 Dean, “Inka Water Management,” 35.

demanded Indigenous people for the construction of public works. In the case of Huánuco, in the central Andes, 400 Indigenous moved to Cuzco to work in building public infrastructure.⁴¹ According to this information, the Incas would have designated certain tasks to certain ethnic groups depending on their specializations. In Garci Diez de San Miguel's inspection or *visita* of 1567, Spaniards noted that among the specialists of the Indigenous people of the province of Chucuito were many official stonemasons dedicated to making walls and carving stones, and that the *caciques* sent *mitayo* stonemasons to the Inca.⁴² Such evidence is striking, since many Indigenous people of this area participated in the Potosí labor force.⁴³ It seems clear that large-scale hydraulic engineering projects demanded the massive recruitment of workers, *mitayos*, and specialists in the pre-Hispanic Andes. If so, the colonial *mita* for services in the reservoir of Potosí should be understood not only as a work modality, but also as redeploying established knowledge and technologies in fields such as hydraulics and landscape transformation.

The Spanish Crown recruited Indigenous workers for hydraulic tasks through the *mita*. Although different Indigenous labor regimes coexisted in Potosí, such as the *yanaconas*, *indios varas*, *apiris*, *mingas*, and *k'ajchas*, the colonial authorities opted to use the *mita* system to build and maintain the city's dams, canals, and fountains.⁴⁴ Although the historiography on the *mita* is extensive, few studies have dealt with the work of the *mitayos* in non-mining activities. In fact, *mita* administrators assigned a significant amount of Indigenous workers to extracting and transporting minerals in the mines of the Cerro Rico and processing silver in the mills.⁴⁵ However, the *mitayos* also developed other tasks in and around Potosí. According to a 1585 account, the *mitayos* participated in the war against the Chiriguanos and in services in Spanish houses, monasteries,

41 Julien, "Las Lagunas de Potosí," 265.

42 Garci Diez de San Miguel, *Visita Hecha a la Provincia de Chucuito por Garci Diez de San Miguel en el año 1567* (Lima: Ediciones de la Casa de la Cultura del Perú, [1567] 1964), 38.

43 2,200 *mitayos* from the province of Chucuito—which included the districts on the west bank of Lake Titicaca, Chucuito, Acora, Ilave, Juli, Pomata, Yunguyo, and Zepita—had to migrate to Potosí every year in accordance with the first general *repartimiento*. See Noble David Cook, *Tasa de la Visita General del Virrey Francisco de Toledo* (Lima: Universidad Mayor San Marcos, 1975), 78–80. On the Viceroy Martín Enríquez's *repartimiento* of 1582, see Luis Capoche, *Relación General de la Villa Imperial de Potosí* (Madrid: Biblioteca de Autores Españoles, [1585] 1952), 136–38.

44 *Mingas* worked in the reconstruction of the reservoirs after the Potosí flood of 1626, but their presence seems less significant compared to the *mitayos*. AHP, Caja Real, 214, 1627, f.131v.

45 Bakewell, *Miners of the Red Mountain*; Cole, *The Potosí Mita*.

government buildings, the hospital, and in the transport of food.⁴⁶ Likewise, according to another account from 1603, the authorities employed *mitayos* to produce and/or transport materials such as salt, candles, charcoal, firewood, and llama dung.⁴⁷ Judging by these reports, it does not seem strange then that the *mitayos* were involved in the construction of reservoirs, canals, and fountains that supplied the city and the mining mills.

The construction and repair of the hydraulic infrastructure was then part of the public works labor of the Indigenous *mitayos*. According to Arzáns, the organization of this hydraulic workforce was jointly agreed among the viceroy, Francisco de Toledo, *azogueros*, and miners. However, we lack early sources to glimpse in detail the political negotiations that led to the decision making of these works as well as local support for the use of Indigenous labor. A letter to the king from *corregidor* Pedro de Lodeña written in 1603 offers what can be considered the first historical account of the organization of the hydraulic *mita* in Potosí.⁴⁸ According to this *corregidor's* account, Viceroy Toledo designated the activities of the *mita* population for the work of the mines and mills. As part of his ordinances, the viceroy instructed that 600 *mitayos* were to remain at the disposal of the *corregidor* of Potosí to be assigned to public tasks such as the construction and repair of the reservoirs or the transport of salt from Yocalla. Lodeña was intimately familiar with the work and importance of the dams. Around 1603, he ordered more than one hundred *mitayos* to repair the seven dams that existed at that time in Potosí. In the same way, this *corregidor* also instructed the construction of four additional reservoirs during his mandate. In his letter to the king, the *corregidor* regretted that his predecessors in the *corregimiento* had reassigned these 600 Indigenous workers, destined for essential tasks such as hydraulics, to work in mines and mill refineries.⁴⁹ This caused an additional workload for the *mitayos*, offering some indication of the poorly studied working conditions of the hydraulic *mitayos*.⁵⁰

46 Capoche, *Relación General*.

47 Anonymous, "Descripción de la Villa y Minas de Potosí. Año 1603," in *Relaciones Geográficas de Indias* (Madrid: Biblioteca de Autores Españoles [1603] 1965), T.1, 377.

48 AGI, Charcas 46. Carta de don Pedro de Lodeña al Rey, Potosí, 1 de abril de 1603. Transcription in Julien, "Las Lagunas de Potosí," 24.

49 Zagalsky (in this volume) indicates that in the *repartimientos* of *mitayos* of 1578 and 1610, the majority of the Indigenous workers were destined mainly to work in the mining mills. In 1578, 70% of the *mitayos* were employed in the mills.

50 According to him, these Indigenous workers had no rest and already had an excessive workload. Pedro de Lodeña's denunciation likely responded to the interest and political agenda of the *corregidores* to have a greater number of *mitayos* to distribute among the different tasks of Potosí, including the exploitation of new veins.

The former *corregidor* of Potosí, Rafael Ortiz de Sotomayor, in 1620 offered a similar account of the origin of the *mita* for hydraulic services. Like Pedro de Lodeña, this *corregidor* was a key player in Potosí's hydraulics and had direct knowledge of the problems of recruiting Indigenous labor. Ortiz de Sotomayor had been politically responsible for the design and execution of the canalization of water from Tabaconuño, one of the most ambitious phases of the construction of the hydraulic infrastructure of Potosí. According to his account, 13,500 *mitayos* served annually in Potosí, of which 4,500 worked in mining operations and the rest rested according to turns. But this general order of the *mita* had undergone local modifications, since 200 additional Indigenous laborers were distributed to reinforce the work in the mines and others for "the service of the water of lagoons, with which they grind the mills."⁵¹ The *corregidor* recalled that other local services of the *mitayos* included work in the salt mines, butcher shops, and monasteries. Therefore, the obligation to work for the construction and maintenance of reservoirs had its origin in local imposition and was administered by the *corregidor*.

The working conditions of the *mitayos* in the reservoir were not very different from those of the workers in the mines and mining mills. In practice, the Indigenous people destined to repair the dams came from the same social and labor universe as those who served in the mining *mita*. Both spheres of work—mining and hydraulics—were divided only by eventual shifts depending on the needs to build, expand, and conserve the reservoir system. Antecedent accounts confirm Pedro de Lodeña's apprehensions about the use of hydraulic works *mitayos* in silver production by mining entrepreneurs. In 1585, a judge of the Audiencia de Charcas prohibited the use of "the Indians of the lagoons" in the mills and mines.⁵² For this official, drought and the lack of Andeans working in the reservoirs as a result of their misuse by the *azogueros* were the main causes of the decline in silver production during those years.⁵³

The size of the Indigenous labor force in hydraulic works varied according to the magnitude of each project. At the beginning of the eighteenth century, Arzáns noted that King Philip II had assigned 20,000 Indigenous people to

51 AGI, Charcas, 54. Cartas y expedientes de personas seculares del distrito de dicha Audiencia vistos en el Consejo entre los años, Relación de los seruiçios personales que acuden a la labor de las minas del çerro de Potosí, 1620, f.25r. According to the figures of this *corregidor*, the *mitayos* of Potosí came from the 81,000 tributary Indigenous groups in the lists of the provinces above Cuzco, of which 13,500 a year were to serve in Potosí.

52 BNE, Descubrimiento de Potosí y papeles de minas. Representación al Virrey del Licenciado Cepeda sobre el remedio de los escándalos y exceso de Potosí, s/f.

53 BNE, Descubrimiento de Potosí y papeles de minas.

work perpetually in the hydraulic infrastructure.⁵⁴ This royal decree has not been found and the figure seems unlikely considering the distribution of the labor force in the city, mines, and mining mills.⁵⁵ It is known that in 1603 more than one hundred Indians were engaged in the maintenance of the first seven lagoons of the Potosí infrastructure alone. Apparently, the construction of reservoirs demanded more *mitayos* compared to the maintenance work. In 1604, a neighbor and mine owner of Potosí presented a project to channel the waters of the Tabaconuño Lagoon. To implement this project, this neighbor needed 450 Indigenous workers for a period of six months to channel the waters from Tabaconuño to the *ribera*.

The daily scenario of hydraulic work in the Kari-Kari mountains is difficult to investigate. *Corregidores* and officials of the Potosí town council generally provided information on these activities in their service reports. Such documentation tends to emphasize the personal merits of the authorities and the results of the works rather than detailing the situation of the Indigenous people and the construction process. However, a careful reading of these testimonies shows that the *mitayos* suffered pressure from the authorities. Perhaps the best precedent for this was the construction of the water canalization works from the Tabaconuño Lagoon to Potosí in 1610. Potosí experienced a significant water shortage between 1605 and 1610, which forced the authorities and miners to undertake works to expand the hydraulic infrastructure. Neighbors and miners had dreamed of using the waters of Tabaconuño at least since the end of the sixteenth century.⁵⁶ Tabaconuño represented the largest natural water reservoir in the Kari-Kari range, but it was located far from the city in rugged terrain. Around 1609, Ortiz de Sotomayor finally began work on the canalization of Tabaconuño, employing the *mitayos*, who were to build a large canal and tunnel to carry water between different ravines. The *corregidor* personally supervised the works in the Kari-Kari mountains in order to speed up the laborers, who had to complete the work in the shortest possible time.⁵⁷ This pressure on the *mitayos* was due to the need to obtain water for the mining activities whose production had been reduced by the water shortage during

54 Arzáns, *Historia de la Villa Imperial de Potosí*, 157.

55 By 1603, around 19,000 *mitayos* were working in Cerro Rico, most of them in the mines and hydraulic mills. Anonymous "Descripción de la Villa y minas de Potosí. Año 1603," in *Relaciones Geográficas de Indias* (Madrid: Biblioteca de Autores españoles, 1965), T.1, 372–85. Lewis Hanke and Gunnar Mendoza have called attention to Arzáns' inaccuracies about the history of the construction of the streams and reservoirs of Potosí. Arzáns, *Historia de la Villa Imperial de Potosí*, 157–58.

56 AGI, Charcas 87, N.2, f.39v.

57 AGI, Charcas 87, N.2, f.20v.

that year. But it also responded to the imperatives of construction work of this magnitude in a landscape like the high Andean mountains. Indeed, the *mitayos* had to work during the winter months, before the rains, frost, and snow made it difficult to build dams and canals. Consequently, the *mitayos* had to endure working days with the haste imposed by the authorities and miners and before the summer rains were felt in the mountains of Kari-Kari.⁵⁸

As in the mines and mills, authorities and miners committed abuses against the Indigenous workers in the reservoir. However, the *mitayos* of the reservoirs did not remain passive in the face of these abuses. In particular, the question of payments to the Indigenous people who built dams and canals aroused concerns among some of the religious practitioners of Potosí. After arriving in the Imperial City of Potosí around 1590, Valentín de Caravantes, rector of the School of the Society of Jesus witnessed the construction of several dams. In 1610, the Jesuit pointed out that throughout his years residing in the city, he had acquired knowledge of the grievances and complaints of the Indigenous people during the construction of the reservoirs.⁵⁹ According to him, the officials in charge of the working projects were accustomed to not paying the wages to the *mitayos* of the hydraulic works.⁶⁰ Knowing the complaints of the Indigenous people, the Jesuit rector of Potosí asked the *corregidor*, Ortiz de Sotomayor, if the Indigenous people who worked on the canalization of the waters of the Tabaconuño Lagoon had received the corresponding payment for their work. Both the *corregidor* and the technicians—called the artificers of the reservoirs—paid the Indigenous workers six reales a day, an amount

58 AHP, Caja Real, 214. In addition to these pressures, working conditions in the construction of the reservoirs probably demanded significant physical exertion. It is not difficult to think of the poor conditions of the workers in the Kari-Kari mountain considering the official provisions in place to protect Indigenous workers transporting rocks and other construction materials in the Villa from physical abuse. In 1572, the High Court of Charcas and the town had clashed over the prohibition of employing Andean workers to carry construction materials such as rocks and adobe. The discussion referred that the Indigenous people carried these materials on their backs and in blankets. ABNB, MNL 52/17. Some years later, in 1579, residents of Potosí accused the *corregidor* of using Indigenous people to carry heavy construction materials.

59 AGI, Charcas 87, N.2, f.34v.

60 For Father Valentín de Caravantes, the working conditions of the *mitayos* became one of the most sensitive issues in the Villa Imperial. In that same year of 1610, the Jesuits participated in a meeting organized by the viceroy and the High Court of Charcas to discuss possible reforms to the *mita* regime in Potosí. Led by the rector of the Jesuit College, the Jesuits criticized the excessive work, the loss of freedom and goods, and the uprooting of the *mitayos* who came to serve and reside in Potosí. See Pareceres de los Padres de la Compañía de Jesús, 1610, in Rubén Vargas Ugarte, "Pareceres Jurídicos en Asuntos de Indias (Conclusión)," *Derecho PUCP* 12 (1952): 32–48.

that the Jesuit priest finally estimated as fair considering the payments that Indigenous people received for this type of work in the Villa.

This was not the first time that the *mitayos* had asked authorities to intervene for their situation in the reservoir. In 1662, the governors and captains of *mita* of the provinces of Canas and Canchis presented a complaint to the Protector of Indians of Potosí to prevent the Indigenous people of their provinces from being employed in the reservoir.⁶¹ According to the provincial leaders, previous ordinances prohibited the use of *mitayos* from their groups as *Indios de meses* and *camachis* in the dams and in other mining activities in Cotamitos, the Real Socavón. The caciques did not offer any further explanation for their refusal to send *mitayos* to the dams, although they alluded that they came from lands far from Potosí. Some years later, other *mitayos* and caciques denounced that a major captain of a *mita* from Potosí, José Fernández de Valencia, was misusing the *camachicos* and *mitayos* in the reservoir. In fact, the *mitayos* initiated a long process of denunciation against this official in 1677. According to the accusation that the *mitayos* presented to the *corregidor* of Potosí, Fernández de Valencia weekly requested from all *mita* captains two or three Indigenous people to work in the dam of San Sebastián, located in the vicinity of this city. However, this officer, instead of sending the *mitayos* to repair the dam, employed them in the extraction of minerals in mines located in the Kari-Kari mountains. These antecedents allow us to conclude that the *mitayos* in the reservoir were not exempt from the abuses that Indigenous workers suffered in other tasks in Potosí. But, likewise, they were able to articulate political defenses against mistreatments through their caciques, lawyers, and local justice officials.⁶²

4 Maestros: Hydraulic Experts in Colonial Potosí

In addition to the *mitayos*, several other specialists such as stonemasons, carpenters, engineers, and architects participated in the construction of the Potosí hydraulic system. Colonial administrative and notarial records generally refer to these experts with the term *maestros*, even though behind this category lay a heterogeneous social universe and professional hierarchy. These technicians

61 ABNB, Sección Colonia/Audiencia de la Plata/MIN 125/5.

62 On the Indigenous workers in Potosí and the uses of colonial justice, see Paula C. Zagalsky, "Trabajo Indígena, Conflictos y Justicia en la Villa Imperial de Potosí y su Cerro Rico, una Aproximación. Virreinato del Perú, siglos XVI–XVII," *Revista Historia y Justicia* 9 (2017):11–45.

undertook different hydrometric, topographic, design, and construction tasks for the dams, canals, aqueducts, and public fountains of the Imperial City. They have received little attention in the historiography despite their importance for the creation of the urban and industrial landscape of Potosí. In the following section I will use a variety of sources to suggest who these hydraulic masters of colonial Potosí were and how they interacted with the *mitayos* and the Andean physical environment.

The hydraulic experts offer a different angle on the history of technology and technical processes in the Cerro Rico. Historical studies of colonial Potosí technology have focused primarily on metallurgical matters. From the first years of the discovery of the silver mines, several mining specialists experimented and generated knowledge about the geology of the *cerro*, the nature of its minerals, and the processes of obtaining silver. Figures such as Alonso Barba, Nicolás de Benino, Luis Capoche, and García de Llanos transformed Potosí into one of the most advanced centers of metallurgical knowledge in colonial America.⁶³ But metallurgy was not the only area of technological development in Potosí. Powering and sustaining one of the largest cities in colonial America in a landscape like the Andean highland required the introduction, development, and use of other knowledge and techniques, such as hydraulics. Hanke precisely considered the construction of the reservoir as one of the unknown aspects of the history of Potosí's technical developments.⁶⁴ However, it is difficult to trace hydraulic knowledge and practices in the Imperial City because the *maestros* did not write treatises with their technical decisions and their perceptions about Andean ecosystems. Undoubtedly, those *maestros* led hydraulic innovations that adapted to the circumstances of the local Andean context—which, although difficult to trace, became the foundation of the entire urban and mining ecosystem of Potosí.⁶⁵

The emergence of hydraulic technicians in Potosí responded to the technological changes in silver production and the scale of mining activities after 1570. Toledo's reforms, and in particular the introduction of the *azogue*

63 Carmen Salazar-Soler, "Los 'Expertos' de la Corona. Poder Colonial y Saber Local en el Alto Perú los siglos XVI y XVII," *De Re Metallica* 13 (2009): 83–94. In addition to them, it is possible to add the owners of hydraulic mills and mines, authorities, and Indigenous people who produced knowledge and experiments not recorded in dictionaries, treatises, or reports.

64 Lewis Hanke, *The Imperial City of Potosí: An Unwritten Chapter in the History of Spanish America* (The Hague: Martinus Nijhoff, 1956), 21.

65 This type of knowledge circulated fragmentarily in Potosí through documents such as private letters and merit and service reports. Jorge Cañizares-Esguerra, "On Ignored Global 'Scientific Revolutions,'" *Journal of Early Modern History* 21 (2017): 421.

amalgamation method, encouraged the diversification of technical work in Potosí.⁶⁶ In addition to the specializations of Indigenous labor, another variety of occupations emerged among non-Indigenous workers. Luis Capoché reported that with the introduction of the *azogue* amalgamation method of silver refining, the miners' need for blacksmiths, carpenters, and masons to build the mining mills increased.⁶⁷ Apparently, technical responsibilities followed an ethnic division in Potosí, with some trades, such as the mills' refiners, being reserved for Spaniards or mestizos.⁶⁸ The *maestros'* reservoir builders and other hydraulic works also came from Spanish groups and possibly mestizos and Creoles, although further research is still needed to appreciate the degree of rigidity of this ethnic segregation. What is certain is that the emergence of these specialists responded to the general demand for technicians following the introduction of the mercury amalgamation method. The city's rapid growth and the incessant water demands of the mining mills during periods of fluctuant rainfall in the late sixteenth and early seventeenth centuries made these dam builders both urgent and indispensable.

Historical sources allow for the tracing of some aspects of the origin and work organization of the hydraulic experts of Potosí. Everything seems to indicate that the specialists who worked in the reservoirs of Kari-Kari emerged from local mining work. So far there are no reports of Spanish government efforts to bring European engineers or architects to design and build the hydraulic engineering of Potosí, unlike the construction of the Mexico City drainage.⁶⁹ These technicians of Potosí corresponded to workers already residing in the Cerro Rico and in the Audiencia de Charcas who were dedicated to mining and architectural work. In addition, there was a diversification in the activities of hydraulic work that included masters, engineers, architects, and other specific trades such as stonemasons, carpenters, and lime workers. Documentation rarely defines this hierarchy and the technical preparation of this specialized workforce. According to Covarrubias's dictionary, engineers, *maestros*, and architects shared a similar sense of designing and manufacturing something

66 An example of this was the diversity of occupations carried out by Indigenous workers, such as *barreteros*, *apires*, *pallires*, *siquepiches*, *pirquires*, *pongos*, *apirepongos*, *morteros*, *repasires*, *lavadores* or *tinadores*, *servires*, *leñateros*, *carboneros*, *quemadores*, or *horneros*, among others. See Bakewell, *Miners of the Red Mountain*, 138–40.

67 Capoché, *Relación General*, 117.

68 Bakewell, *Miners of the Red Mountain*, 139. Although, as Zagalsky explains in this volume, in other sectors of mining activity, social heterogeneity prevailed, including in the ethnic, social, and gender composition among mine owners.

69 John López, "In the Art of My Profession: Adrian Boot and Dutch Water Management in Colonial Mexico City," *Journal of Latin American Geography* 11/S (2012): 36.

with skill and ingenuity.⁷⁰ It is no coincidence, then, that one of the first dam builders in Potosí was described on several occasions as a “very ingenious man.” Likewise, it is worth noting the words chosen by chronicler and *ingenio* owner Luis Capoche, who pointed out that the lack of water forced the “engineers” to build reservoir: “necessity is ingenious.”⁷¹ In the case of New Spain, the builders of Mexico City’s drainage system sought to differentiate between the architects—who designed the works based on geometric and arithmetical knowledge—and the mechanical arts officers such as stonemasons or carpenters who executed the projects.⁷² In the case of Potosí, I have not found documents that clearly delineate this separation between hydraulic technicians. However, names such as *maestros* and *arquitectos* retained great variability and may even have been interchangeable. The analysis of the trajectory and technical responsibility of some of these *maestros* allows for a glimpse into the organization and hierarchy of work according to each water management project.

Maestros led the planning and eventually the execution and inspection of large-scale public works in Potosí. The first reference to this type of expert corresponds to Pedro Sande, a mine and mining mill owner who received *mitayos* in the *repartimiento* in 1578.⁷³ In an account of 1610, two neighbors of Potosí attributed the creation of the first dams to Pedro Sande, although information is lacking that reveals the exact chronology and work of the first dam builders. One of the earliest references corresponds to Baltazar Ramírez, who, around 1597, reported on a reservoir called “Caricari,” composed of a dam and flood-gate, which supplied forty mining mills.⁷⁴ Eighteenth-century sources suggest that the reservoir of Caricari and San Pablo were built in 1576.⁷⁵ It is possible that both dams were built together because they are adjacent to each other and stand on the same ravine of San Ildefonso. If Pedro Sande was the builder of the first dams of Potosí, then surely he built both or at least one of these

70 Sebastián Covarrubias Orozco, *Parte Primera del Tesoro de la Lengua Castellana, O Española* (Valladolid: Junta de Castilla y León, 1674).

71 Capoche, *Relación General*, 178.

72 This distinction between design and execution originated from a Renaissance idea of the preponderance of the master architect over the mechanical trades. See Candiani, *Dreaming of Dry Land*, 95.

73 Pedro Sande was also a beneficiary of the *repartimiento* of Indigenous workers. AGI, Lima 207, 11 BIS, 1580, f.5r.

74 Balthasar Ramirez, “Description del Reyno del Pirú,” in *Quellen zur Kulturgeschichte des präkolumbischen Amerika*, ed. Hermann Trimborn (Stuttgart: Strecker und Schröder, [1597] 1946), 58.

75 Baquíjano Carillo, “Historia del Descubrimiento del Cerro de Potosí,” fol. 36.

two.⁷⁶ Be that as it may, there is little doubt as to the capabilities of this early *maestro*. Dominican cleric Fray Reginaldo de Lizárraga described Pedro Sande as a man of Potosí, a great expert smelter, and connoisseur of metals.⁷⁷ But the most relevant source on this *maestro* is found in a 1585 letter from official Joan Lozano de Machuca to the viceroy of Peru in which he identified Pedro Sande as the person who gave the order for the construction of the reservoir. The officer described Pedro Sande as an ingenious man and “general in many things,” meaning that he was educated in multiple spheres. Sande in fact designed, executed, and proposed projects of different kinds, including the drainage of mines in Porco and Lipez, as well as an ambitious road that would cross the Andes mountain range to connect the valley of Copiapó in the kingdom of Chile and the silver mines of today’s northwestern Argentina. Such a road would help supply cattle and pasture for mining activities. The letter shows how Pedro Sande became a key informant for the authorities regarding the riches of the southern Andean territory, including on Indigenous metallurgical practices and pre-Hispanic hydraulic infrastructure. It should be noted that the authorities’ idea was to expand and reuse an Inca hydraulic work to supply water to silver mines that Sande had seen with his own eyes in the Atacama Desert (Tarapacá), thus favoring the concentration of the scattered Indigenous population and their incorporation into the mining labor market and the Spanish civilizing orbit.⁷⁸ Some Potosí miners also studied and used hydraulic infrastructure to provide hydraulic energy for the mills.⁷⁹ In sum, Sande retained great empirical knowledge of the Andean landscape and an eagerness to reform this environment, whether by building reservoirs or opening roads, in accordance with the interests of the miners and the viceregal authorities.

Another early technical leader of the reservoir of Potosí was *corregidor* Pedro Osores de Ulloa. The life of this actor illustrates the transatlantic movement of people, ideas, and technologies resulting from the so-called Iberian globalization.⁸⁰ Before arriving at the Audiencia de Charcas, Osores de Ulloa

76 It is also possible that Sande participated in the construction of some of the reservoirs in the San Sebastián ravine, the other valley near Cerro Rico.

77 Reginaldo de Lizárraga, *Descripción Colonial (Libro Segundo)* (Buenos Aires: Librería La Facultad, [1605] 1916), 289.

78 On this and other initiatives to irrigate the Atacama Desert, see Jorge Hidalgo, “Proyectos Coloniales Inéditos de Riego del Desierto: Azapa (Cabildo de Arica 1619), Pampa Iluga (O’Brien, 1765) y Tarapacá (Mendizábal, 1807),” *Chungará* 14 (1985): 183–220.

79 Capoche, *Relación General*, 120–21. The perception of some Potosinos was that the Tarapaya lagoon and its embankment had been an Inca work. Árzans, *Historia de la Villa Imperial de Potosí*, Vol. I, 22–24.

80 Serge Gruzinski, *Las Cuatro Partes del Mundo. Historia de una Mundialización* (México: Fondo de Cultura Económica, 2010), 40–44.

lived in Italy and fought as a soldier in several battles during the Ottoman-Habsburg war. In 1571, he was on the galley *San Francisco de España* in the Battle of Lepanto and a year later, in 1572, in the naval battle of Navarino. After the Battle of Lepanto, Osores de Ulloa spent eight months in Tunis on fortification works and then as a prisoner in Algiers.⁸¹ The Crown appointed Osores de Ulloa as *corregidor* of Potosí in November 1585 and a year later he was in Cádiz and Seville, preparing his trip to America.⁸² Osores de Ulloa traveled to America with family members, gold and silver jewelry, weapons such as swords, daggers, and arquebuses, and three Black slaves for his service.⁸³ In the Peruvian viceroyalty, he was characterized by his underground mining projects, undertaking mine repairs in Potosí after a collapse and later promoting the construction of a tunnel and shaft in the mines of Huancavelica.⁸⁴ Indeed, in 1589 a major cave-in destroyed the mines of Muniza, Veta Rica, Pancorbo, and Santa Catalina in Cerro Rico, leaving hundreds of workers trapped in the bowels of the hill. The *corregidor* spent forty days assisting in the recovery and repair of the mines and according to his testimony, 417 Indigenous people were rescued.⁸⁵ In mining matters, the *corregidor* also stood out for preparing a report on Cerro Rico in 1598.⁸⁶

During his government of the *corregimiento* of Potosí (1587–1592), this *corregidor* also undertook other lesser-known works such as the construction of

81 José Toribio Medina, *Diccionario Colonial de Chile* (Santiago: Imprenta Elzeviriana, 1906), 627–29. Guillermo Lohmann Villena has provided vital information and analysis on the life and government of Osores de Ulloa in Huancavelica—see his *Las Minas de Huancavelica en los siglos XVI y XVII* (Sevilla: Escuela de Estudios Hispano-Americanos de Sevilla, 1949).

82 AGI, Contratación, 5792, L.2., f.129–f.130. The Crown provided him with an annual salary of 3,000 pesos ensayados to use the *vara* of justice and to designate lieutenants in Potosí. AGI, Charcas, 415, L.1, f.147v.–f.149r.

83 About his 1,000 ducats of gold and silver jewelry, see AGI, Charcas, 415, L.1, f.150r.(2). On their weapons, see AGI, Charcas, 415, L.1, f.149v.(3). In addition, the authorities authorized their servants to carry swords, daggers, and an arquebus. AGI, Charcas, 415, L.1, f.150r (1). On his slaves, see AGI, Charcas, 415, L.1, f.150r.(3).

84 In addition to the tunnel, Viceroy Prince Esquilache described the project for the ventilation of the interior of the Huancavelica mines formulated by Osores de Ulloa. The project consisted of the creation of two openings from the top of the mines to a depth of 200 meters. Lohmann Villena, *Las Minas de Huancavelica*, 232.

85 ABNB, Acuerdos de la Real Audiencia de La Plaza de los Charcas. Servicios y Méritos, 1582–1693. Volumen 10, f.194r., Don Pedro Çores de Ulloa. Other documents refer to the rescue of 10,000 Indigenous people, although the total number of deaths in this accident is unknown. ABNB, Audiencia 1598, f. 259–f.59v.

86 Salazar-Soler, “Los ‘Expertos’ de la Corona,” 85.

roads and dams,⁸⁷ ordering the construction of four bridges and the opening of a road in the sector called La Angostura to improve the transit of minerals from the Cerro Rico to the water mills in the Tarapaya valley. These works were vital to connect Potosí, Tarapaya, and the road that led to Cuzco, where the travelers and pack animals were at risk, especially during the rainy season when the river rose.⁸⁸ The work was financed by the owners of water-powered stamp mills in Tarapaya and the *corregidor* himself, who, with his wife, also owned mills and mines.⁸⁹ Osore de Ulloa, in addition to working on public infrastructure, paid for the barrettes and other tools so that the workers could open the road to La Angostura crossing lie “rocks” (*peñas vivas*).⁹⁰

The *corregidor* played an even more active role in the construction of more dams for the “great acreñentamiento [of] la machina [of Potosí].”⁹¹ For this purpose, he gave “traza y orden” for the construction of three additional reservoirs, likely built by Pedro Sande. The exact date of construction of these reservoirs is unknown, but they must have been completed towards the end of the *corregidor*’s mandate, between 1590–1592.⁹² The *corregidor* indicated that at the time he began to build the three large reservoirs, these were in addition to the four that Potosí already had and that, in his opinion, they had not been sufficient to ensure silver production throughout the year.⁹³ According to several witnesses, the dams built by Osore de Ulloa were located at the foot of the hill, half a league from the town (that is to say, at a short distance).⁹⁴ According to this information, these could be the reservoirs located in the San Sebastián or San Ildefonso ravines. During his visit to Potosí in 1600, Friar Diego de Ocaña counted six reservoirs—“three in one valley and three in another”—probably referring to the San Ildefonso and San Sebastián ravines, the closest to the

87 Gunnar Mendoza, “Lista Preliminar de Gobernadores de Potosí en los años 1545–1738,” in *Historia de la Villa Imperial de Potosí* T.III, ed. Lewis Hanke and Gunnar Mendoza (Providence: Brown University Press, 1965), 481.

88 AGI, Lima, 215, N.4, f.24r.

89 AGI, Lima, 215, N.4, f.8r.

90 AGI, Lima, 215, N.4, f.29v–f.30r.

91 ABNB, Acuerdos de la Real Audiencia de La Plaza de los Charcas. Servicios y Méritos, 1582–1693. Volumen 10, f.194v.

92 Around March 1590, the High Court of Charcas recognized several of the *corregidor*’s services, except for the construction of the dams. AGI, CHARCAS 17, R.1, N.6, f.1r.–f.1v. Yet in another letter dated February 1596, the High Court of Charcas records the construction of three reservoir in its governance. ABNB, Acuerdos de la Real Audiencia de La Plaza de los Charcas. Servicios y Méritos, 1582–1693. Volumen 10, f.194v.

93 AGI, Lima, 215, N.4, f.1v.

94 AGI, Lima, 215, N.4, f.23v and f.39v.

city.⁹⁵ It could be, then, that the first reservoirs were built by Pedro Sande and the other three were works ordered and/or designed by Pedro Osore de Ulloa. As was to be expected, this *corregidor*, miner, and builder emphasized the great work of his government's hydraulic works—"fue traça y serviço de muy gran inportançia"—so that silver production would be stable and perpetual.⁹⁶ In 1603, another witness insisted on the role of the *corregidor* as planner of the works, noting that the authority "was very busy giving the *traças* and orders that they should have to make the said reservoirs."⁹⁷

Pedro Osore de Ulloa continued in the viceroyalty, fighting corsairs and Indigenous people of the province of Mojos. He fulfilled several commissions of the colonial government and in the town of Potosí in the midst of cycles of droughts and confrontations with neighbors.⁹⁸ Around 1610, he received the maximum amount of *mitayos* in a *repartimiento* and there were even accusations against him for mistreatment of Indigenous workers.⁹⁹ Viceroy Príncipe de Esquilache and judge Juan Solórzano de Pereira maintained a favorable opinion of this *corregidor*-architect, considering him a person of experience, knowledgeable in mining matters, and intelligent in matters related to Peru.¹⁰⁰ More background information is needed to trace the technological culture and technical processes represented by the history of Pedro Osore de Ulloa. His history in the Mediterranean as a naval soldier and military builder surely gave him vital experience in matters of imperial engineering. But his practical knowledge of geology and mining apparently arose in the American world.¹⁰¹ Nor it is possible to discard his close relations with *mitayos* and especially with

95 BUO, Fondo Antiguo, M-215, Diego de Ocaña, Relación del viaje de Fray Diego de Ocaña por el Nuevo Mundo (1599–1605), f.179v.

96 ABNB, Acuerdos de la Real Audiencia de La Plaza de los Charcas. Servicios y Méritos, 1582–1693. Volumen 10, f.194v.

97 AGI, Lima, 215, N.4, f.62r.

98 About Pedro Osore de Ulloa and lack of rain in Potosí around 1595, see ABNB, CPLA 7: f.169v–f.170r. About other his functions in the viceroyalty, see María Carolina Jurado, "(...) Muy Mañoso Para Esto'. Comisiones para don Pedro Osore de Ulloa, segundo juez de composición de tierras de Charcas, 1594–1596," *Corpus* 4, no. 2 (2014): 1–3.

99 See Zagalsky, in this volume.

100 Lewis Hanke, ed., *Los Virreyes Españoles en América durante el Gobierno de la Casa de Austria* (Madrid: Biblioteca de Autores Españoles, 1978), T. II, 171.

101 Perhaps in Potosí he had contact with Nicolás Benino, the Italian miner and member of the Medici family, who proposed the construction of the *socavón* of Potosí. This would not be strange considering that Potosí was a particularly fertile setting for the development of geological ideas and theories, as Scott explains in the present volume.

other *maestros* during his government and who, under his leadership, participated in the construction of reservoirs and other public works.¹⁰²

The personal life and professional career of another early master, Francisco Ortiz de Aulestia, illuminates the social world and the interactions between different social and ethnic groups involved in the construction of the hydraulic works in Potosí. Ortiz de Aulestia was a stonemason specializing in public and hydraulic works in Potosí during the last decades of the sixteenth century. A source from 1610 suggests that Ortiz de Aulestia was one of the first *maestro* builders of reservoirs. He was already in Potosí during the time of Viceroy Toledo and therefore he may have worked and/or established contact with Pedro Sande. In addition to being a contemporary of this maestro, Ortiz de Aulestia also worked with *corregidor* Pedro Osores de Ulloa. It is not an exaggeration to think that this stonemason shared with them similar attitudes and visions about his trade, public works, and water management for mining activities and colonization. Unlike other cases, the sources clearly identify Ortiz de Aulestia's trade: master stonemason. In 1572, Ortiz de Aulestia built a bridge over the Pilcomayo River, a crucial work that contributed to connecting La Plata (now Sucre) and the Imperial City. In 1589, he built another bridge called La Angostura that connected Potosí and the Tarapaya valley. Therefore, Ortiz de Aulestia established direct relations with *corregidor* Pedro Osores de Ulloa. Apparently, Francisco Ortiz de Aulestia followed a workshop model of organization where he had hired people to work in exchange for sustenance. According to a 1592 notarial deed, Ortiz de Aulestia hired Martín Albiz, a resident of Potosí, for one year, "to help in the said stonemasonry trade."¹⁰³ The master stonemason agreed to provide his helper with a salary, food, house, washed clothes, and protection in case of any illness.¹⁰⁴

This stonemason had a long career in hydraulic works and stonemasonry in the city. In 1595, the town council of Potosí awarded work on the reservoirs to Ortiz de Aulestia and another official, Francisco de Oruña.¹⁰⁵ It is not known

102 Viceroy García Hurtado de Mendoza gave Pedro Osores de Ulloa the authority to coordinate the transfer of the *mitayos* from their provinces to Potosí; see ABNB, CPLA 5: 204v. In his report, he highlighted the diligences to bring Indigenous workers from different regions to the silver city of Potosí. See ABNB, Acuerdos de la Real Audiencia de La Plaza de los Charcas. Servicios y Méritos, 1582–1693. Volumen 10, f.194r.

103 AHP, Escrituras Notariales: EN-025, f.728v.–f. 729 Contrato. Potosí, 18 de febrero de 1592.

104 Aulestia and Albiz are Basque surnames. The stonemason also wrote to a friend in Bilbao. So, it is probable that Ortiz de Aulestia participated in the networks and social ties of Basques in Potosí.

105 ABNB, CPLA 7: f.206v.–f.207r. In 1589, Francisco Oruña worked on repairs of the reservoirs. See ABNB, CPLA 5: f.161v.–f.162r. See also ABNB, CPLA 5: f.162v. Luis Capoche mentions a

whether this work involved the creation or maintenance of existing fortifications and canals, but it did include more than one dam. When he died in 1597, he had been working on reservoirs and building fountains and canals in the city for about forty years.¹⁰⁶ There is no reference that specifies the exact reservoirs built by Francisco Ortiz de Aulestia, however, a map of Potosí waterworks from the mid-eighteenth century makes it clear that a part of the infrastructure was called Aulestia, along with one of the reservoirs located south of Potosí, in the Lobato ravine.¹⁰⁷ Francisco Ortiz de Aulestia probably led, together with Francisco Oruño, the creation of this reservoir and that of Lobato, located a short distance away, and the respective canal that linked the two. The stonemason maintained a close relationship with Indigenous people, both in his work and in his private life. For the construction of the fountains of the city, every week the *maestro* had about thirty Indigenous workers open ditches and transport materials for the masonry.¹⁰⁸ Private letters between Ortiz de Aulestia and a friend who had returned to Bilbao suggest that this master sent money to his family. The stonemason saw to it that his friend's Indigenous wife, Isabel Ynguilla, and her mother attended the doctrine and he administered some goods for their sustenance.¹⁰⁹

The need to expand Potosí's hydraulic system contributed to the consolidation of a group of hydraulic specialists during the first decades of the seventeenth century. Indeed, during the years 1600 and 1610, almost a dozen reservoirs were added to the infrastructure, including the Tabaconuño Lagoon, the largest of the entire system. Several factors converged to increase the Imperial City's infrastructure. On one hand, authorities and owners of mining mills perceived that constant drought or intense fluctuating rainfall affected

Francisco de Oruño, overseer of mines and owner of mines in Diego Centeno's vein and owner of a hydraulic mill in Tabaconuño. Luis Capoche, *Relación General*, 81–82, 119, 158.

106 ABNB, CPLA 8. Acuerdo sobre la imposición de precios a varios productos y otros, 29 de noviembre de 1597, f.89v–90r.

107 AGI, MP Buenos Aires, 301, Plan sin reglas de Geometría que a poco más o menos, por solo práctica, hago de la villa de Potosí, su rico cerro, lagunas, conductos e ingenios. Miguel Antonio de Escurrechea.

108 ABNB, CPLA 8: f.18v–19r.

109 María del Carmen Martínez, *Desde la Otra Orilla. Cartas de indias en el Archivo de la Real Chancillería de Valladolid (siglos XV–XVIII)* (Valladolid: Universidad de León, 2007), 258. This *maestro's* friend left his Indigenous wife, Isabel Ynguilla, in Potosí when he decided to return to Spain with his mestizo children. This was a common practice among sixteenth-century Spaniards who wished to return to Europe with their mestizo children in search of a Christian social environment to educate their offspring. See Jane Mangan, *Transatlantic Obligations: Creating the Bonds of Family in Conquest-Era Peru and Spain* (New York: Oxford University Press, 2016).

production capacity. The presence of capital and the willingness of the elites and the local government allowed investment and the recruitment of *mitayos* and specialists. In this process, some masters of water-powered stamp mills acquired experience in the construction of reservoirs, canals, and other devices to manage water. *Corregidores* and miners began to distinguish specialists within the universe of Potosí technicians as the *maestros* of reservoirs.

Master builder Pedro de Ávila represents the best case of these hydraulic experts of the early seventeenth century. During the government of *corregidor* Pedro Córdova Messia (1600–1602), Ávila oversaw the construction of three reservoirs and two large canals.¹¹⁰ A few years later, *corregidor* Pedro de Lodeña (1602–1607), anxious to increase the number of dams, called upon Ávila's technical assistance and experience. The *corregidor* commissioned Ávila to build five reservoirs and two other canals to respond to a long drought facing this mining metropolis.¹¹¹ A notarial deed from 1604 sheds some light on the organization of the work on the reservoirs led by Ávila. At that time, the cabildo and the *corregidor* had finished off the works to “bring the water from the new reservoirs” to Ávila. The document suggests that the role of this master was to “make the said reservoirs” and build the irrigation ditches that would bring the water from the high ravines of Kari-Kari to the riverbank. To this end, Ávila partnered with master mason Matías Franco and they hired “master mason and stonemason” Sebastián Pérez Durazno, who, over the course of ten months, would help them make the reservoir, ditches, and other elements necessary to complete the work.¹¹² This notarial deed demonstrates that such masters had the technical-political responsibility of carrying out the work awarded in interaction with the local government. However, these masters also had to deal with the day-to-day financial and technical aspects of these works, such as the subcontracting of personnel such as technical officers and, as we have seen, Indigenous workers. In 1610, *corregidor* Rafael Ortiz de Sotomayor again employed Pedro de Ávila and Matías Franco to channel the waters of the Tabaconuño Lagoon, which was some distance from Cerro Rico. When *corregidor* Ortiz de Sotomayor explained the reason he preferred to appoint these *maestros*, the authority did not hesitate to recognize that they were simply the “*maestros* of such works.”¹¹³ Ávila worked alongside the *mitayos*, who broke a hill and rocks using barrettes, fire, and vinegar to pour the waters between different streams of the Kari-Kari.

110 AGI, Charcas 84, N.2. Información Pedro de Ávila.

111 AGI, Charcas 84, N.2. Información Pedro de Ávila.

112 AHP, Escrituras Notariales, EN-037, f.2197v.

113 AGI, Charcas 84 N.2. Información Pedro de Ávila f.50r.

Maestros such as Pedro de Ávila demonstrate the role that water-powered stamp mill builders played in reshaping the physical environment of Potosí. Mining activities in the Audiencia de Charcas promoted the emergence of multiple technicians who offered help to the government and the owners of mills and mines in the face of water-related difficulties. Some of these technicians were also miners with personal interests in the situation of the mines and mining mills, such as Pedro Sande and Pedro Osoreo de Ulloa. The first *maestro* of the reservoir of Potosí, Sande had worked in Lípez and Porco draining mines. Hydraulic inventions to drain mines in the Andes and Mexico abound in the historical record.¹¹⁴ The mining mill builders were part of this group of technicians who sought to regulate the flow of water to favor mining production. Ávila was above all an expert in managing water to improve operation of the mining mills. *Maestros* of the mills had to know the terrain in detail and define the forces that the machinery would face according to the availability and gravity of the waters. It is thus not surprising that the mill builders gradually specialized in the construction of reservoirs and canals in the mountain range neighboring Potosí. Different witnesses affirmed that Ávila had perfected the aqueducts and water wheels in the Potosí mills that moved the mechanisms that crushed the minerals. As part of this work, his task apparently extended in scale, and he was charged with creating several reservoirs and canal network between 1600 and 1610. In 1607, around the same time that Ávila was building dams and irrigation ditches in Potosí, in the neighboring mining town of Oruro, local authorities were planning the creation of two to three reservoirs to collect water. At that time, a stream had been channeled to supply the mills.¹¹⁵ As in Potosí, mining mill builders had discussed and designed a system to draw water from the Laguna de Paria by means of a stream and convey it to Caracollo. Like all projects of this type, the authority considered the initiative difficult even though he affirmed that in the end “necessity is the mother of science.”¹¹⁶ In any case, the episode reveals the ingenuity of the *maestros* involved in projects to intervene in the Andean landscape and its waters. Specialists of

114 The soils in Potosí and other mines in the region facilitate water filtration, so a serious problem for mine owners was that the mines and tunnels became waterlogged. Viceroy Toledo understood that miners stopped working several mines in Porco and Berenguela between December and March because of the water brought by the “winter.” See Francisco de Toledo, “Ordenanzas de las Minas de Plata de Potosí y Porco, La Plata, 13 de febrero de 1574,” *Disposiciones Gubernativas para el Virreinato del Perú 1575–1580*, v.i, ed. Guillermo Lohmann Villena (Sevilla: Escuela de estudios Hispano-Americanos, Consejo Superior de Investigación Científicas, Monte de piedad y Caja de Ahorros de Sevilla. 1986), 336.

115 AGI, Charcas 32, Description de la Villa de Sanct Phillipe de Austria, f.14v.

116 AGI, Charcas 32, Description de la Villa de Sanct Phillipe de Austria, f.15v.

the reservoirs of Potosí, such as Pedro de Ávila, emerged essentially from this context in which hydraulics and the mining industry were part of the same field and where the interests of government, mining capital, and technological knowledge converged.

5 Final Comments

Potosí rightly retains a prominent place in the history of the early modern world. As the chapters by Bonialian and Lane have demonstrated in this volume, the silver riches extracted from the Cerro Rico contributed to global economic development and, indeed, to the maintenance of Spanish colonization in South America. The hydraulic policies of the Spanish Empire in Potosí reflect another point of convergence between world history and that of Cerro Rico. Like other colonial experiences, the Spanish government promoted a radical reorganization of the interactions between human societies and the rest of nature. Viceroy Toledo's mining and labor technological reforms of 1572–1578 set in motion profound environmental changes in Potosí and the rest of the viceroyalty. As part of this transformation, the city and the so-called “machine” of Potosí required the procurement of hydraulic and organic energy such as firewood, coal, animals, and human power. In particular, the need for water to supply one of the most populated cities in the world by the sixteenth century and to mobilize its mining mills became a technical and politically challenging task in location over 4,000 meters above sea level. The life of the people of Potosí and the imperial and world economy depended on obtaining water from the Kari-Kari mountain range.

In 1936, American engineer William E. Rudolph wondered if the marvel of Potosí's hydraulics had been a product of the Roman and Moorish legacy of Iberian engineering. Unlike Rudolph, this chapter instead highlighted the colonial encounter of different social sectors and individuals who shaped the reservoir of Potosí, emphasizing in particular the critical contribution of the unknown artisans, Indigenous workers, and hydraulic technicians. Indigenous *mitayos* and *maestros* became the mediators between the hydraulic policies of the Spanish Empire and the Andean ecosystems of Potosí. They were the ones who did the arduous and daily work of building dams, canals, and fountains in Potosí and its surroundings. The history of the *mita* for hydraulic works reveals another dimension of Potosí's labor history. These waterworks-based *mitayos* experienced and responded to constant labor abuses and pressures from authorities and miners. This text has suggested that the *mitayos* in hydraulic works should not be understood solely as a labor force, but as part of

a more complex process of the exchange of technologies and environmental knowledge. The history of the construction of the reservoir of Potosí illustrates how water control was associated with the dominance of Andean societies.¹¹⁷ By building dams, Indigenous workers contributed to obtaining the energy needed to run the mining activities that would in turn demand more *mitayos*. But it is also true that the hydraulic infrastructure had a direct impact on water access for the Andeans themselves and other, lower urban groups in colonial Potosí. Similarly, the silver production achieved by means of water could favor the peasant economies, the payment of tribute, and commercial and labor relations in the city.

The variety of master dam builders emerged from the intermediate and technical sectors of colonial mining in Potosí. The complexity and scale of the works demanded the participation of senior architects and engineers. The introduction of the mercury amalgamation method increased the demand for specialists such as masons, stonemasons, carpenters, and master builders of mills. Further research is needed on the technological cultures of these *maestros*, who were shaped by hydraulic and mining experiences in the Iberian Peninsula and Europe. Cases such as those of the first master, Pedro Sande, make it clear that they were constantly learning about the Andean physical environment and Indigenous hydraulic infrastructure. For their part, the Indigenous people were also assuming technical leadership and social recognition for their work in the world of hydraulic specialists. When the reconstruction of the reservoir and canals of San Ildefonso, San Pablo, San Sebastián, and Tabaconuño were completed in January 1628, an Indigenous master mason of the village of Yocalla, Diego Sagayó, was the one who inspected the quality of the work.¹¹⁸

Acknowledgments

I am grateful to the SSRC-IDRF fellowship for allowing the development of this research. I also acknowledge the invaluable help of the staff of the historical archives of Spain and Bolivia in my search for documentary sources on the

117 David Blackburn, *The Conquest of Nature: Water, Landscape, and the Making of Modern Germany* (New York: W. W. Norton, 2006), 266. See also Donald Worster, *River of Empire: Water, Aridity, and the Growth of the American West* (New York: Oxford University Press, 1985), 50.

118 AHP. Caja Real. 214 f.144v. On Diego Sagago, see Mario Chacón, *Arte Virreinal en Potosí* (Sevilla: CSIC, Escuela de Estudios Hispano Americanos de Sevilla, 1973), 18.

hydraulics of Potosí. I am also grateful for the comments of the two anonymous reviewers and the editors who helped to improve this chapter. Finally, I thank historians Joel Daniel Calixto and Manoel Rendeiro Neto for their collaboration with the translation of this chapter and the elaboration of the map of the Potosí reservoirs.

Primary Sources

- Biblioteca Nacional de España, Descubrimiento del Potosí y papeles de minas.
 Biblioteca Nacional de España, Relacion que Hizo de su Gobierno, el Excmo Señor Dn José de Armendariz, primer Marqués de Castelfuerte, 1736.
 Biblioteca de la Universidad de Oviedo, Fondo Antiguo, M-215, Diego de Ocaña, Relación del viaje de Fray Diego de Ocaña por el Nuevo Mundo (1599–1605).
 Royal Library of Denmark. Guaman Poma de Ayala, Nueva Corónica y Buen Gobierno, 1615.

Bibliography

- Aguilar, Julio. A Thirsty Colonization: Water and Environmental Transformation in the Silver City of Potosí, 1545–1760. PhD diss., University of California Davis, 2022.
 Anonymous. “Descripción de la Villa y Minas de Potosí. Año 1603.” In *Relaciones Geográficas de Indias-Perú* T.1, 372–85. Madrid: Biblioteca de Autores Españoles, 1965.
 Arzáns de Orsúa y Vela, Bartolomé. *Historia de la Villa Imperial de Potosí* [1700–1736]. Providence: Brown University Press, 1965.
 Bakewell, Peter. “Technological Change in Potosí: The Silver Boom of the 1570s,” *Jahrbuch Jahrbuch für Geschichte Lateinamerikas* 14 (1977): 5–77.
 Bakewell, Peter. *Miners of the Red Mountain. Indian Labor in Potosí 1545–1650*. Albuquerque: University of New Mexico Press, 1987.
 Baquijano Carillo, José. “Historia del Descubrimiento del Cerro de Potosí, Fundación de su Imperial villa, sus Progresos y Actual Estado.” *Mercurio Peruano* VII, no. 213 (1793).
 Bell, Martha G. “Historical Political Ecology of Water: Access to Municipal Drinking Water in Colonial Lima, Peru (1578–1700).” *Professional Geographer* 67, no. 4 (2015): 504–26.
 Blackburn, David. *The Conquest of Nature: Water, Landscape, and the Making of Modern Germany*. New York and London: W. W. Norton, 2016.

- Boyer, Chris, and Martha Micheline Cariño Olvera. "Mexico's Ecological Revolutions." In *A Living Past: Environmental Histories of Modern Latin America*, edited by John Soluri, Claudia Leal, and José Augusto Pádua, 23–44. New York: Berghahn, 2018.
- Candiani, Vera. *Dreaming of Dry Land: Environmental Transformation in Colonial Mexico City*. Stanford: Stanford University Press, 2014.
- Cañete y Domínguez, Pedro Vicente. *Guía histórica, geográfica, física, política y legal del gobierno e intendencia de la Provincia de Potosí*. La Paz: Ministerio de Educación, Bellas artes y Asuntos Indígenas, 1952.
- Cañizarez-Esguerra, Jorge. "On Ignored Global 'Scientific Revolutions.'" *Journal of Early Modern History* 21, no. 5 (2017): 420–32.
- Capoche, Luis. *Relación General de la Villa Imperial de Potosí* [1585]. Madrid: Biblioteca de Autores Españoles, 1959.
- Centro de Estudios Históricos de Obras Públicas y Urbanismo. *Obras Hidráulicas en América Colonial*. Madrid: Ministerio de Obras Públicas, Transportes y Medio Ambiente, 1993.
- Centro de Estudios Potosí. *Monografía del Departamento de Potosí*. Potosí: Imprenta El Tiempo, 1892.
- Chacón, Mario. *Arte Virreinal en Potosí*. Sevilla: CSIC, Escuela de Estudios Hispano Americanos de Sevilla, 1973.
- Cole, Jeffrey. *The Potosí Mita 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press, 1985.
- Cook, Noble David. *Tasa de la Visita General del Virrey Francisco de Toledo*. Lima: Universidad Mayor San Marcos, 1975.
- Covarrubias Orozco, Sebastián. *Parte Primera del Tesoro de la Lengua Castellana, O Española*. Valladolid: Junta de Castilla y León, 1674.
- Cruz, Pablo. "Huacas Olvidadas y Cerros Santos: Apuntes Metodológicos sobre la Cartografía Sagrada en los Andes del Sur de Bolivia." *Estudio Atacameños* 38 (2009): 55–74.
- Cruz, Pablo and Pascale Absi. "Cerros Ardientes y Huayras Calladas. Potosí Antes y Durante el Contacto." In *Minas y metalurgia en los Andes del Sur: Desde la época prehispánica hasta el siglo XVII*, edited by Pablo Cruz and Jean Joinville Vacher, 91–120. Lima: Institut de Recherche pour le Developpement and Instituto Francés de Estudios Andinos, 2008.
- D'Altroy, Terence. *The Incas*. Sussex: Wiley Blackwell, 2015.
- Dean, Carolyn. "Inka Water Management and the Symbolic Dimensions of Display Fountains." *Res: Anthropology and Aesthetics* 59–60 (2011): 22–38.
- Diez de San Miguel, Garci. *Visita Hecha a la Provincia de Chucuito por Garci Diez de San Miguel en el año 1567*. Lima: Ediciones de la Casa de la Cultura del Perú, 1964.

- Erickson, Clark. "The Lake Titicaca Basin: A Pre-Columbian Built Landscape." In *Imperfect Balance: Landscape Transformations in the Pre-Columbian Americas*, edited by David L. Lentz, 311–56. New York: Columbia University Press, 2000.
- Escobari, Laura. "Las Lagunas de Potosí." *Arte y Arqueología* 8, no. 9 (1989): 177–84.
- Gioda, Alain, Carlos Serrano, and Ana Forenza. "Les Ruptures de Barrages Dans le Monde: un Nouveau Bilan de Potosí (1626, Bolivie)." *La Houille Blanche* 88, 4–5 (2002): 165–70.
- Gioda, Alain, Carlos Serrano, and Markus Frey. "L'eau et L'argent à Potosí (Ancien Haut-Pérou Puis Bolivie)." *La Houille Blanche* 7 (1998): 65–75.
- Gisbert, Teresa and José de Mesa. "Potosí y su Sistema Hidráulico Minero." In *Obras Hidráulicas en América Colonial*, edited by Centro de Estudios Históricos de Obras Públicas y Urbanismo, 151–64. Madrid: Ministerio de Obras Públicas, Transportes y Medio Ambiente, 1993.
- Grunzinski, Serge. *Las Cuatro Partes del Mundo: Historia de una Mundialización*. México: Fondo de Cultura Económica, 2010.
- Hanke, Lewis. *The Imperial City of Potosí: An Unwritten Chapter in the History of Spanish America*. The Hague: Martinus Nijhoff, 1956.
- Hanke, Lewis, ed. *Los Virreyes Españoles en América durante el Gobierno de la Casa de Austria*, T II. Madrid: Biblioteca de Autores Españoles, 1978.
- Hanke, Lewis, and Gunnar Mendoza. "Bartolomé Arzáns Orsúa y Vela: su vida y su obra." In *Historia de la Villa Imperial de Potosí, Bartolomé Arzáns de Orsúa y Vela, xxvii–clxxxii*. Providence: Brown University Press, 1965.
- Hidalgo, Jorge. "Proyectos Coloniales Inéditos de Riego del Desierto: Azapa (Cabildo de Arica 1619), Pampa Iluga (O'Brien, 1765) y Tarapacá (Mendizábal, 1807)." *Chungará* 14 (1985): 183–220.
- Julien, Catherine. "How Inca Decimal Administration Worked." *Ethnohistory* 35, no. 3 (1988): 257–79.
- Julien, Catherine. "Las Lagunas de Potosí en Tiempos de don Pedro de Lodeña: documentos del Archivo de Indias." *Historia y Cultura* 24 (1997): 13–53.
- Jurado, María Carolina. "'(...) Muy Mañoso Para Esto'. Comisiones para don Pedro Osoreo de Ulloa, Segundo Juez de Composición de Tierras de Charcas, 1594–1596." *Corpus* 4, no. 2 (2014): 1–28.
- Lizárraga, Reginaldo de. *Descripción Colonial (Libro Segundo)* [1605]. Buenos Aires: Librería La Facultad, 1916.
- Llanos, García de. *Diccionario y Maneras de Hablar que se Usan en las Minas y sus Labores en los Ingenios y Beneficios de los Metales* [1609]. La Paz: Museo Nacional de Etnografía y Folklore, 1983.
- Lohmann Villena, Guillermo. *Las Minas de Huancavelica en los siglos XVI y XVII*. Sevilla: Escuela de Estudios Hispano-Americanos de Sevilla, 1949.

- Lohmann Villena, Guillermo. *Disposiciones Gubernativas para el Virreinato del Perú 1575–1580*. Sevilla: Escuela de estudios Hispano-Americanos, Consejo Superior de Investigación Científicas, Monte de Piedad y Caja de Ahorros de Sevilla, 1986.
- López, John. “In the Art of My Profession’: Adrian Boot and Dutch Water Management in Colonial Mexico City.” *Journal of Latin American Geography* 11 (2012): 35–60.
- Mangan, Jane. *Transatlantic Obligations: Creating the Bonds of Family in Conquest-Era Peru and Spain*. New York: Oxford University Press, 2016.
- Martínez, María del Carmen. *Desde la Otra Orilla. Cartas de indias en el Archivo de la Real Chancillería de Valladolid (siglos XV–XVIII)*. Valladolid: Universidad de León, 2007.
- Medina, José Toribio. *Diccionario Colonial de Chile*. Santiago: Imprenta Elzeviriana, 1906.
- Mendoza, Fray Diego de. *Chronica de la Provincia de San Antonio de los Charcas*. Madrid, 1664.
- Mendoza, Gunnar. “Lista Preliminar de Gobernadores de Potosí en los años 1545–1738.” In *Historia de la Villa Imperial de Potosí*, T.III, edited by Lewis Hanke and Gunnar Mendoza, 479–85. Providence: Brown University Press, 1965.
- Merchant, Carolyn. *Ecological Revolutions: Nature, Gender, and Science in New England*. Chapel Hill: University of North Carolina Press, 2010.
- Mumford, Jeremy. *Vertical Empire: The General Resettlement of Indians in the Colonial Andes*. Durham and London: Duke University Press, 2012.
- Nair, Stella and Jean-Pierre Protzen. “The Inka Built Environment.” In *The Inka Empire: A Multidisciplinary Approach*, edited by Izumu Shimada, 215–31. Austin: University of Texas Press, 2015.
- Nash, Linda. “The Agency of Nature or the Nature of Agency?” *Environmental History* 10, no. 1 (2005): 67–69.
- Pearce, Adrian J., and Paul Heggarty. “‘Mining the Data’ on the Huancayo-Huancavelica Quechua Frontier.” In *History and Language in the Andes*, edited by Adrian J. Pearce and Paul Heggarty, 87–109. New York: Palgrave Macmillan, 2011.
- Platt, Tristan. *Estado Boliviano y Ayllu Andino: Tierra y Tributo en el Norte de Potosí*. Lima: Instituto de Estudios Peruanos, 1982.
- Platt, Tristan, and Pablo Quisbert. “Tras las huellas del silencio. Potosí, los Incas y el Virrey Toledo.” In *Minas y metalurgia en los Andes del Sur: Desde la época prehistórica hasta el siglo XVII*, edited by Pablo Cruz and Jean Joinville Vacher, 231–77. Lima: Institut de Recherche pour le Developpement and Instituto Francés de Estudios Andinos, 2008.
- Ramírez, Balthasar. “Description del Reyno del Pirú” [1597]. In *Quellen zur Kulturgeschichte des präkolumbischen Amerika*, edited by Hermann Trimborn, 10–68. Stuttgart: Strecker und Schröder, 1946.
- Rudolph, William E. “The Lakes of Potosí.” *Geographical Review* 26, no. 4 (1936): 529–54.

- Salazar-Soler, Carmen. "Los 'Expertos' de la Corona. Poder Colonial y Saber Local en el Alto Perú los siglos XVI y XVII." *De Re Metallica* 13 (2009): 83–94.
- Serrano, Carlos and Julio Peláez. "Potosí y su Sistema Hidráulico." *Boletín Sociedad Geográfica y de Historia "Potosí"* 14 (1991): 44–52.
- Serrano, Carlos and Julio Peláez. "Potosí y su Sistema Hidráulico (continuación)." *Boletín Sociedad Geográfica y de Historia "Potosí"* 15 (1991): 75–93.
- Stanish, Charles. "The Hydraulic Hypothesis Revisited: Lake Titicaca Basin Raised Fields in Theoretical Perspective." *Latin American Antiquity* 5, no. 4 (1994): 312–32.
- Toledo, Francisco de. "Ordenanzas de las Minas de Plata de Potosí y Porco, La Plata, 13 de febrero de 1574." In *Disposiciones Gubernativas para el Virreinato del Perú 1575–1580, v.i.*, edited by Guillermo Lohmann Villena. Sevilla: Escuela de estudios Hispano-Americanos, Consejo Superior de Investigación Científicas, Monte de piedad y Caja de Ahorros de Sevilla, 1986.
- Vargas Ugarte, Rubén. "Pareceres Jurídicos en Asuntos de indias (conclusión)" [1610]. *Derecho PUCP* 12 (1952): 32–48.
- Vázquez de Espinosa, Antonio. *Compendio y descripción de las Indias Occidentales* [1636]. Washington, DC: Smithsonian Institution, 1948.
- White, Richard. *The Organic Machine: The Remaking of the Columbia River*. New York: Hill and Wang, 1995.
- Worster, Donald. *River of Empire: Water, Aridity, and the Growth of the American West*. New York: Oxford University Press, 1985.
- Wright, Kenneth, Alfredo Valencia, Ruth Wright, Gordon McEwan. *Machu Picchu: A Civil Engineering Marvel*. Reston: American Society of Civil Engineers, 2000.
- Zagalsky, Paula C. "La Mita de Potosí: Una Imposición Colonial Invariable en un Contexto de Múltiples Transformaciones (siglos XVI–XVII; Charcas, Virreinato del Perú)." *Chungara* 46, no. 3 (2014): 375–95.
- Zagalsky, Paula C. "Trabajo Indígena, Conflictos y Justicia en la Villa Imperial de Potosí y su Cerro Rico, una Aproximación. Virreinato del Perú, siglos XVI–XVII." *Revista Historia y Justicia* 9 (2017): 11–45.
- Zhang, Ling. *The River, the Plain, and the State: An Environmental Drama in Northern Song China, 1048–1128*. New York: Cambridge University Press, 2016.

The Market of Small Freedoms

Labor Negotiation in Seventeenth Century Potosí

James Almeida

1 Introduction

On an October day in 1651, Navarrese Francisco Ramiro de Urrea entered the Potosí silver mint and quickly found himself in trouble. At the fountain on the mint's main patio, Urrea encountered enslaved laborers from Agustín de Ortega's *hornaza* (cospel-cutting workshop), sifting ore out of the dirt swept from the *hornaza* floor.¹ Testimonies differ about what happened next, but Urrea was arrested on suspicion that he had illegally purchased silver ore from the laborers.² The mint's magistrate summoned three of the enslaved men to testify about what had transpired, and they all agreed that Antonio Congo (identified as a Black slave) had tricked Urrea by hiding a common stone under

1 In the *hornaza*, teams of laborers cut, hammered, and trimmed long, thin silver rails to produce unbleached blank coins (cospels).

2 Period documents generally describe people as *negro* (Black), *indio* (Indian), *mulato* (mulatto), *mestizo* (mixed Indigenous/European descent), *español* (Spaniard) or *esclavo* (slave—not always paired with a racial term but assumed to be Black). Where quoting or describing how someone was classified, I employ these literal translations. I call attention to the fictions behind such classifications by speaking generally of Afro-descendants/people of African descent and Andeans/people of Andean descent and by being more specific where the data permits. The term Andean, while overly general, is not intended to imply a homogenous culture for all Indigenous people of the Andes but to avoid the colonial and derogatory *indio* and remind the reader that those classified as *indios* in Potosí were largely heterogeneous migrants from across the region, not natives of Potosí. For more on the difficulties of generalizing these diverse peoples, see Thomas Abercrombie, “To Be Indian, To Be Bolivian: ‘Ethnic’ and ‘National’ Discourses of Identity,” in *Nation-States and Indians in Latin America*, ed. Joel Sherzer and Greg Urban (Austin: University of Texas Press, 1991), 95–130. I also heed activists’ call to use the terms enslaved and Afro-descendant rather than slave to avoid normalizing the commodification of people and essentializing complex identities. See Nell Irvin Painter, “How We Think about the Term ‘enslaved’ Matters,” *The Guardian*, August 14, 2019, 3; Maribel Arrelucea Barrantes, *Sobreviviendo a la esclavitud: negociación y honor en las prácticas cotidianas de los africanos y afrodescendientes*. Lima, 1750–1820 (Lima: Instituto de Estudios Peruanos, 2018), 29.

a cloth to pass it off as silver.³ When the naive Spaniard fell for the trick, witnesses agreed that Congo promptly spent his earnings “in drinking with the other Blacks of the said workshop, minus four *reales* that he gave in alms to the mother of God.”⁴ In a reversal of the disciplinary norms of the mint and Spanish colonial society, it was the foolish Spaniard who was punished in the end, receiving a year’s banishment from the mint and threat of fines if he failed to stay away.

This temporary upending of the racial and social hierarchy of colonial Potosí signals two important elements for understanding labor organization in the seventeenth-century mint. First, the enslaved witness, Juan de Montoya, identified Urra as a *viracocha*, using a Quechua term to connect Urra’s naiveté to his recent arrival from Spain.⁵ Enslaved Africans borrowing from Quechua and donating to the Catholic Church signal ways that the mint’s internal culture had alloyed together Andean, African, and European cultural elements.⁶ Laborers of Andean and African descent composed the majority of a large (over 150-person) workforce in the mint, interacting daily with each other and with European officials and visitors. Second, these enslaved workers enjoyed the proceeds of their deceit without punishment, suggesting that coercion and control did not always prevent the laborers of the Potosí mint from acquiring cash and using it to ameliorate their lives with small freedoms.

In the seventeenth century, enslaved Afro-descendants, Indigenous Andean servants, and penal workers of various racial categorizations who toiled in the

3 The *hornaza*, literally a jeweler’s furnace in English, refers both to the furnaces used to reheat the silver rails for cutting and hammering and the workshops in which they were located. See also Kris Lane, “Slavery and the Casa de La Moneda in Seventeenth-Century Potosí,” in *Territorios de Lo Cotidiano, Siglos XVII–XX: Del Antiguo Virreinato Del Perú a La Argentina Contemporánea*, ed. Mónica Ghirardi (Rosario: Prohistoria Ediciones, 2014), 101–14.

4 *Archivo Histórico de Potosí–Casa Nacional de la Moneda* (hereafter, AHP-CNM), *Casa Real de Moneda* (hereafter, CRM)-1186 (1651), f. 4v.

5 I have encountered two other examples of Afro-descendants using the term *viracocha*, both confirming this refers to a naive, newly arrived peninsular Spaniard. AHP-CNM, CRM-1297 (1661), 1v; Archivo Arzobispal de Sucre, Esclavos, Caja 1, Legajo 2, Documento 1 (1762).

6 I employ the term *alloy* only to ground this in a metallurgic setting and call attention to how these separate elements were present in combination, not to critique the extensive literature and debates over *mestizaje* and hybridity in colonial culture that exceed the scope of this article. See, for example Brooke Larson, Olivia Harris, and Enrique Tandeter, eds., *Ethnicity, Markets, and Migration in the Andes: At the Crossroads of History and Anthropology* (Durham: Duke University Press, 1995); Carolyn Dean and Dana Leibsohn, “Hybridity and Its Discontents: Considering Visual Culture in Colonial Spanish America,” *Colonial Latin American Review* 12, no. 1 (2003): 5–35; Laura Gotkowitz, ed., *Histories of Race and Racism the Andes and Mesoamerica from Colonial Times to the Present* (Durham: Duke University Press, 2012).

Potosí mint negotiated, often successfully, in what I call the market of small freedoms. By forcibly recruiting a variety of workers of African and Andean descent from near and far, Spaniards brought the world into Potosí and did their best to confine and separate it within the four walls of the mint. But workers demanded opportunities for small freedoms that were important to them, which mint authorities were often willing to supply in exchange for peaceful compliance or additional labor. Over the seventeenth century, this market exhibited a rise and fall tied tightly to the more tangible market for the silver coin emanating from the mint. A major mid-century audit aimed at eliminating the rampant adulteration of Potosí coinage dramatically changed the economic context of minting (see Lane and Sato, this volume). For the mint's forced laborers, this meant changes in the composition of the workforce and a gradual decline in the supply of small freedoms. The contraction of the market highlighted the divisions among and between various subjected groups that frustrated coordination in negotiating for freedoms.

This study contributes to defining freedom in a pre-Enlightenment context as multiple small freedoms recognized by contemporaries. Many people who were enslaved or in other unfree labor situations never achieved or even aspired to manumission from these statuses or equality with Spaniards, but instead seized opportunities to claim small freedoms that shaped their lives in meaningful ways. These included elements of self-determination, free contract, and legal personhood with great power to ameliorate forced labor and legal slavery. Recent studies of slavery have begun redefining Freedom (capitalized to distinguish the post-Enlightenment concept from the small freedoms discussed here) as something contingent and contested, especially in light of gradual abolition processes in the nineteenth-century Atlantic world.⁷ Historians of

7 Carlos Aguirre, *Agentes de su propia libertad: los esclavos de Lima y la desintegración de la esclavitud, 1821–1854* (Lima, Perú: Pontificia Universidad Católica del Perú, Fondo Editorial, 1993); Christine Hünefeldt, *Paying the Price of Freedom: Family and Labor Among Lima's Slaves, 1800–1854* (Berkeley: University of California Press, 1994); Stephanie M. H. Camp, *Closer to Freedom: Enslaved Women and Everyday Resistance in the Plantation South*, Gender & American Culture (Chapel Hill: University of North Carolina Press, 2004); Diana Paton, *No Bond but the Law: Punishment, Race, and Gender in Jamaican State Formation, 1780–1870* (Durham: Duke University Press, 2004); Rebecca J. Scott, *Degrees of Freedom: Louisiana and Cuba After Slavery* (Cambridge: Belknap Press of Harvard University Press, 2005); Elizabeth McMahon, "Trafficking and Reenslavement: The Social Vulnerability of Women and Children in Nineteenth-Century East Africa," in *Trafficking in Slavery's Wake: Law and the Experience of Women and Children in Africa*, ed. Benjamin N. Lawrance and Richard L. Roberts (Athens: Ohio University Press, 2012), 29–44; Emmanuel Akyeampong, "Ties That Bound: Slave Concubines/Wives and the End of Slavery in the Gold Coast, c. 1874–1900," in *Essays in Honor of Ama Ata Aidoo at 70*, ed. Anne V. Adams (Oxfordshire: Ayebia

colonial Spanish America have demonstrated that this contestation and contingency began long before abolition, yet they still largely equate Freedom with manumission from slavery.⁸ Enslaved and other coerced laborers in the Potosí mint and beyond did not always seek manumission or see it as an end goal, but rather seized opportunities to acquire and exercise these small freedoms. Concepts like Scott's "degrees of freedom" and McKinley's "fractional freedoms" accept that manumission and equal citizenship or belonging were always the goals, inadvertently implying that a post-Enlightenment definition of Freedom can be generalized across both time and space.⁹ Jonathan Glassman's work on Africa's Swahili coast has provided a framework for unpacking freedom as a set of multiple ideas and practices during enslavement.¹⁰ I build on these tools here by foregrounding the practices of coerced laborers and the texts of manumission documents to understand how contemporaries defined and claimed their freedoms.

Understanding these negotiations as a market deepens our knowledge of the agency of coerced laborers in negotiating their freedoms while simultaneously emphasizing how these negotiations were cash-based and tied to the actual market for mint silver. Previous scholarship on the seventeenth-century mint has demonstrated that men of African and Andean descent did the hardest work in transforming silver from Potosí into the coin that circulated across the early modern world.¹¹ Historian Kris Lane even argued that

Clarke Publishing Ltd., 2012), 231–40; Camillia Cowling, *Conceiving Freedom: Women of Color, Gender, and the Abolition of Slavery in Havana and Rio de Janeiro* (Chapel Hill: University of North Carolina Press, 2013); Walter Fraga Filho, *Crossroads of Freedom: Slaves and Freed People in Bahia, Brazil, 1870–1910*, trans. Mary Ann Mahony (Duke University Press, 2016); Adriana Chira, *Patchwork Freedoms: Afro-descendant Cubans, Law and Racial Identity in Cuba, 1791–1868* (New York: Cambridge University Press, 2022).

- 8 Herman Lee Bennett, *Africans in Colonial Mexico: Absolutism, Christianity, and Afro-Creole Consciousness, 1570–1640* (Bloomington, Indiana University Press, 2005); Michelle A. McKinley, *Fractional Freedoms: Slavery, Intimacy, and Legal Mobilization in Colonial Lima, 1600–1700* (New York: Cambridge University Press, 2016); Tamara J. Walker, *Exquisite Slaves: Race, Clothing, and Status in Colonial Lima* (New York: Cambridge University Press, 2017); Paola A. Revilla O'rias, *Entangled Coercion: African and Indigenous Labour in Charcas (16th–17th Century)* (Boston: De Gruyter Oldenbourg, 2020).
- 9 See also the work of Maribel Arrelucea Barrantes (*Sobreviviendo a la esclavitud*), who acknowledges that manumission was not the goal for many enslaved people and uses interchangeably *pequeños beneficios* (small benefits), *privilegios* (privileges), *pequeños favores* (small favors), and even *semilibertad* (semi-freedom) to refer to what I call small freedoms.
- 10 Jonathon Glassman, "The Bondsman's New Clothes: The Contradictory Consciousness of Slave Resistance on the Swahili Coast," *Journal of African History* 32, no. 2 (1991): 277–312.
- 11 Alberto R. Crespo, *Esclavos negros en Bolivia* (La Paz: Academia Nacional de Ciencias de Bolivia, 1977); Inge Wolff, "Esclavitud y tráfico de negros en el Alto Perú, 1545–1640," trans. Maren Urioste, *Historia y cultura* 4 (1981): 37–63; Carlos Lazo García, *La hornaza: taller*

a moral economy existed among the enslaved laborers and mint authorities that permitted the enslaved to spend small amounts of scrap silver without punishment.¹² But to limit this discussion to one group of workers and rights to scrap metal stops short of seeing the full array of negotiation tactics laborers deployed and obscures how authorities saw the market of small freedoms as essential to managing the diverse array of forced laborers in the seventeenth-century mint. The market is both reality and metaphor: it refers to concrete exchanges of cash, labor, and small freedoms between laborers and authorities and also the more indirect exchanges of influence, threats, and violence that underwrote the system. Laborers used daily interactions like the one between Urra and the enslaved workers, petitions, and formal inspections of the mint as opportunities for negotiation and exchange. Authorities were willing to grant these small freedoms and even proactively offer them while the market conditions for coining were good and fraudulent coining was rampant in the first half of the century. The supply of freedoms dwindled significantly in the second half of the century as mint authorities paid penalties for fraud and saw their potential coining profits restricted by reforms.

I employ here a body of evidence drawn primarily from the Archivo Histórico de Potosí—Casa Nacional de la Moneda. The sources include many investigations by the mint's internal magistrates, policies established by its officials, and financial transactions such as purchases of enslaved laborers or offices within the mint. Supplementary records on the mint come from other relevant archives in Bolivia, Peru, and Spain. But documenting the social practices and aspirations of the Andean and Afro-descendant working classes was not a goal of secular officials, and many of these records are based on conflict and punishment of laborers. This makes it the historian's task to read these documents against the grain, between the lines, and with imagination to investigate these aspects.

colonial de acuñación de macuquinas (Lima: Banco Central de Reserva del Perú, Sección Numismática, 1991); Carlos Lazo García, *Economía colonial y régimen monetario: Perú, siglos XVI–XIX* (Lima: Banco Central de Reserva del Perú, Fondo Editorial, 1992); Arnaldo J. Cunietti-Ferrando, *Historia de la Real Casa de Moneda de Potosí durante la dominación hispánica, 1573–1825*, Vol. 1 (Buenos Aires: Pellegrini, 1995); Eugenia Bridikhina, "Desafiando los límites del espacio colonial: la población negra en Potosí," *Estudios Bolivianos* 13 (2007): 169–216; José Antonio Fuertes López, "La trata de esclavos en La Casa de Moneda de Potosí—Bolivia," *Monografias.Com*, accessed September 27, 2016, <http://www.monografias.com/trabajos70/trata-esclavos-casa-moneda-potosi/trata-esclavos-casa-moneda-potosi.shtml>.

12 Lane, "Slavery and the Casa de La Moneda."

2 Labor Organization in the Early Mint

The Potosí mint was an important middle link in the commodity chain of silver and forced labor. Andean miners—many of them coerced *mitayos* (rotational laborers)—extracted silver from Potosí's mines. A mix of coerced and free Andeans and Afro-descendants refined the silver with mercury in the city's many *ingenios* (refineries) to form silver bars.¹³ In the mint, the forced laborers considered here transformed the bars into coins of the appropriate size, weight, and purity for circulation. Then much of the coin and some bars were hauled down from the Andes on muleback to a Pacific port, usually Arica (in today's Chile) and shipped via the Spanish fleet, generally to Spain (via Central America and the Caribbean).¹⁴ Penal and enslaved laborers toiled on the Spanish ships, adding additional elements of coercion to the commodity chain.¹⁵

Coercion and racial division characterized the mint from its first moments and built on both Spanish and Andean traditions. Sixteenth-century labor forms in Spain included serfdom (gradually disappearing by this period), penal labor (largely in military service), and slavery (disappearing elsewhere in Europe but flourishing in southern Spain).¹⁶ While serfdom had tied peasants to the land and required some personal service, it had allowed for relatively free family and personal life. Penal labor, on the other hand, separated convicts from their families for the duration of sentences (which ranged between two and ten years) if they survived the brutal conditions. Slavery combined features of both systems. It was permanent (unless the master offered manumission), but duties ranged from light household tasks to hard labor in galley service. The enslaved were generally integrated into urban households in Spain, with some access to religious services (though only for Catholics), mobility, and family life.¹⁷

13 Peter J. Bakewell, *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650* (Albuquerque: University of New Mexico Press, 1984); Jeffrey A. Cole, *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes* (Stanford: Stanford University Press, 1985).

14 See Oropeza and Bonialian, this volume, and Clara López Beltrán, *La ruta de la plata: de Potosí al Pacífico: caminos, comercio y caravanas en los siglos XVI y XIX* (La Paz: Plural Editores, 2016). Much silver was also shipped to China via Mexico and Manila or leaked out as contraband via Buenos Aires.

15 Ruth Pike, *Penal Servitude in Early Modern Spain* (Madison: University of Wisconsin Press, 1983).

16 Pike, *Penal Servitude*, x11; Teofilo F. Ruiz, *Spanish Society, 1400–1600* (New York: Longman, 2001), 112–14.

17 Ruth Pike, *Aristocrats and Traders: Sevillian Society in the Sixteenth Century* (Ithaca: Cornell University Press, 1972), 170–92; Ruiz, *Spanish Society, 1400–1600*, 112–14; Debra Blumenthal,

Coerced labor was also common in the Andes. Early colonial histories of the Inca Empire—as well as their subsequent interpretations by scholars—differ on how exactly these arrangements worked and labor forms were probably not homogenous even within areas of Inca control. Theoretically, Inca society (and that of its predecessors and subject groups) was based on a reciprocal and redistributive system in which people exchanged labor time horizontally among themselves and vertically for resources or services from leaders.¹⁸ Most adult, male citizens of the empire were expected to serve in annual rotations of labor for the state or religion in a system called the *mit'a* (Hispanicized as the *mita* after the conquest). The post-conquest *mita* was informally practiced until it was established and dramatically expanded as a rotating labor obligation for service in Potosí's mines and refineries (in 1572, just as plans began for the mint) and in other areas.¹⁹ Others served as *yanaqkuna* (Hispanicized as *yanaconas*), retainers of the Inca state, religion, and individuals or families. Some have interpreted these to be hereditary, lifetime roles in which the individuals were denied access to the traditional *ayllu* (clan) structure of Andean life and even a sort of penal arrangement stemming from a rebellion against the Inca ruler. But others have argued that the status was only in some cases for life and that the *yanaqkuna* retained their ethnic affiliations.²⁰ In the intervening forty years between the conquest of Peru and the construction of the mint, *yanaconas* had been organized into royal, religious, and private service as lifetime, hereditary retainers. A similar debate exists over *mitmaqkuna*, who were sent to other parts of the empire as colonists, a practice that was not regularly employed in the colonial period.²¹

Having visited Potosí in 1572, Viceroy Toledo ordered the establishment of a mint the next year and laid out the ordinances that would govern minting, including the division of labor. He initially endowed the Potosí institution with

Enemies and Familiars: Slavery and Mastery in Fifteenth-Century Valencia (Ithaca: Cornell University Press, 2009).

18 For a general model, see John V. Murra, *The Economic Organization of the Inka State* (Greenwich: JAI Press, 1980).

19 Bakewell, *Miners of the Red Mountain*, 55–60; Cole, *The Potosí Mita*. Other *mita* duties included construction and maintenance of public buildings in urban areas and *tambos* (rest stops) along the roads.

20 Pedro Sarmiento de Gamboa, *Historia de los incas*, ed. Angel Rosenblat (Buenos Aires: Emecé, 1572), 51; Murra, *The Economic Organization of the Inka State*. For the debate over terms of service and ethnic affiliations, see Ann Zulawski, *They Eat from Their Labor: Work and Social Change in Colonial Bolivia* (Pittsburgh: University of Pittsburgh Press, 1995), 20.

21 Murra, *The Economic Organization of the Inka State*, 89–119.

twelve *yanaconas* assigned to operate the coin metal foundry, twelve *mitayos* to carry heavy loads and clean the building, and twelve enslaved men of African descent for work in the *hornazas*.²² These were the most labor-intensive positions within what was a complex, multi-step coining process. In the foundry, the *ensayador/fundidor mayor* (head of assay and the foundry) oversaw the *yanaconas*, testing the bars for purity and then melting them down and alloying them with the correct mix of metals to produce long, thin silver rails for coining. This was an overnight project for each batch of silver and the *yanaconas* specialized in tasks that included loading and unloading the furnaces, pouring the liquid metal over molds, and fanning the flames to maintain heat. This was seen as highly skilled work, and Toledo leveraged a tradition of skilled mining and refining among the *yanaconas* that had concentrated in Potosí in its first few decades.²³ While the individual identities of the mint's first *yanaconas* are unknown, they were probably experienced silver refiners from the highlands. Cruz and Téreygeol have demonstrated that the most prominent groups of *yanaconas* among the early *huayradores* (refiners using Indigenous technology) in Potosí came from the Pacajes, Lupaqaq, Hatuncolla, and Canas and Canchis provinces in the Collao region south of Lake Titicaca.

Next, the silver moved in rail form to the *hornazas*, where it might spend a week or more. These were privately owned workshops run by the owner or hired administrators. In this stage, enslaved Afro-descendants (occasionally accompanied by wage or penal laborers) reheated the rails for manipulation, cut them into appropriate sizes, hammered out rough coin shapes, and then adjusted and trimmed each cospel (blank coin). These were always men, purchased from traffickers or locals. West central Africans described as Angolas and Congos (roughly from the modern territory of these countries) were the largest group, with significant numbers of *criollos* (American born) as well.²⁴ The offices took their name from the *hornazas* (furnaces) used for reheating, but the term generally refers to the whole office with furnaces, furniture, and tools for hammering and cutting, charcoal supply rooms, and sleeping quarters. Between four and six *hornazas* operated at once in the Potosí mint, distributed around a central patio and staffed by between four and twenty-eight

22 Archivo General de Indias (hereafter, AGI), Charcas 134, Document 3 (1598); Cunietti-Ferrando, *Historia de la Real Casa de Moneda de Potosí durante la dominación hispánica, 1573–1825*, 1: 65–83.

23 Bakewell, *Miners of the Red Mountain*, 34–45; Pablo Cruz and Florian Téreygeol, “Yanaconas del rayo. Reflexiones en torno a la producción de metales en el espacio surandino (Bolivia, siglos xv–xvi),” *Estudios Atacameños* 49 (2014): 19–44.

24 Wolff, “Esclavitud y tráfico de negros,” 54; Lane, “Slavery and the Casa de La Moneda,” 111.

laborers each.²⁵ Enslaved *mandadores* (overseers) and *miradores* (watchmen) supervised the other laborers, who specialized in reheating the metal, hammering, cutting, sizing, and quality control. Other steps in the coining process required manual labor in much smaller numbers. Following the cutting and sizing in the *hornaza*, the blank coins were bleached in a corrosive solution to clean them. This office was usually staffed by two enslaved men and, later in the century, by hired Andean laborers. Finally, the coiners, usually Spaniards and always free, stamped the coin using the appropriated dies to finish the process. Royal officials weighed, inspected, and guarded the silver throughout the process, sometimes assisted by other dependent laborers.

Toledo's organization had created a racial/ethnic delineation of labor roles in which distinct groups (European, Andean *yanacunas*, Andean *mitayos*, and Afro-descendants) served separate purposes and were arranged in a hierarchy.²⁶ While the European managers and Andean *yanacunas* were perceived to be "skilled," the *mitayos* and enslaved *hornaza* workers were perceived as unskilled manual laborers. This was built not only on the tradition of metallurgy in the Andes, but also the perceived physical distinctions among races. Africans and their descendants were seen as well-built for the heavy manual tasks like hammering and cutting, but poorly adapted to the climate and thus not worthwhile laborers inside of the mines.²⁷ *Mitayos*, seen as adapted to the climate but mostly unskilled in mining and metallurgy, were often assigned the most menial duties in the mines, refineries, and mint.²⁸ One document suggests that the *mitayos* assigned to the mint were Carangas (Aymara speakers from Colquemarca, near Lake Poopó, northwest of Potosí) and primarily supplied the institution with charcoal.²⁹

25 Plans for the original mint building, in use from 1574 through the 1770s, have not survived. Toledo had assigned four enslaved laborers to each *hornaza*, but they had between twenty-four and twenty-eight each by the middle of the seventeenth century. AGI, Charcas 113 (1648), ff. 883–910v.

26 This was also supposed to correspond to a spatially segregated construction of the city. See Aguilar, this volume.

27 Cole, *The Potosí Mita*, 4; Nicholas A. Robins, "La leyenda negra: esclavos negros en las minas de Potosí," in *Mitos expuestos: leyendas falsas de Bolivia*, ed. Nicholas A. Robins and Rosario Barahona Michel, Vol. 1 (Cochabamba: Bolivia: Grupo Editorial Kipus, 2014), 11–38.

28 Bakewell, *Miners of the Red Mountain*, Chapter 5; Enrique Tandeter, "Forced and Free Labour in Late Colonial Potosí," *Past & Present*, 93 (1981): 98–136; Enrique Tandeter, *Coercion and Market: Silver Mining in Colonial Potosí, 1692–1826* (Albuquerque: University of New Mexico Press, 1993), Chapters 2–3.

29 This is an undated document in the AGI (Charcas 43, s.f.) that appears to be from the 1590s and mentions twenty-four Carangas from Colquemarca assigned to supply the head of the foundry (*fundidor mayor*).



FIGURE 5.1 Chimney of one of the Potosí mint's cospel-cutting workshops (*hornaza*)

SOURCE: PHOTO TAKEN BY JAMES ALMEIDA,
OCTOBER 2018

As coin production increased in the seventeenth century, forced labor expanded. Mint authorities perceived the increased numbers of Andeans and Afro-descendants side by side in the mint to be a threat to the social order. While the foundry labor force remained mostly consistent, the number of enslaved laborers in the *hornazas* grew remarkably from twelve in 1575 to 150 by 1648.³⁰ *Mitayos* disappeared from the mint in the first half of the century and never numbered more than twelve, but Andeans remained in the foundry

30 AGI, Charcas 113 (1649), ff. 883r–910v. Fourteen *yanaconas* worked in the foundry in 1647 versus twelve in 1575. AGI, Escribanía de Cámara de Justicia (hereafter, Escribanía) 871C (1651), ff. 673V–689.

and periodically served other mint offices.³¹ Some came also as personal servants to individual officials, complicating the theoretically ethnically divided system. Particularly in times of crisis, local authorities expressed fears that mixing between the populations of African and Andean descent would lead to joint rebellion.³² Together, they easily outnumbered the Spaniards within the mint, and authorities were even more fearful they might ally with the city's Andean population, a majority because of the many *mitayos* and their families.

The mint had originally been intended to be a small-scale facility with different groups of labor organized by the perceived skill sets of distinct ethnic groups. Within the four walls it was difficult to keep subject groups totally separate, and the institution grew in the early seventeenth century into a complex, multiracial space that sometimes upset or reversed the power dynamics. Anxieties about the potential for rebellion prompted authorities to negotiate with laborers in the market of small freedoms to maintain peace and productivity.

3 The Market of Small Freedoms and Its Rise

Over the first half of the seventeenth century, coerced laborers employed a variety of tactics to negotiate for their small freedoms. Being enslaved, *yanacona*, a penal laborer, "Black," "Indian," or Spaniard all mattered in these negotiations but not always in determinant or predictable ways. In an environment where manumission was unobtainable and full independence and autonomy was unimaginable, workers negotiated for multiple moments or elements of self-determination, free contract, and legal personhood that relieved some pressures of the grueling labor regime.³³ Like a market, these negotiations

31 It's not completely clear from surviving documentation how long *mitayos* were assigned to the mint and they don't appear to be listed in the general labor divisions for the *mita* (*repartimientos generales*). A record from the treasury indicates that twelve *mitayos* were conceded to the treasurer in perpetuity until the audit of Nestares Marin in the 1650s. This perhaps explains when and why the grant ended, as the acting treasurer was found guilty of several violations in the audit and ultimately executed. "Testimonios del titulo de recepción de tesorero de la Real Casa de Moneda presentado por el conde Tesorero de ella ante el señor Visitador don Ventura de Santelices y Venero, del Consejo de Su Majestad" (1753), Biblioteca Nacional del Perú, Colección General, ms. C2371, f. 63.

32 Archivo y Biblioteca Nacionales de Bolivia (hereafter, ABNB), Vicuña-Vascongado (hereafter, VV) 11 (September 8, 1623); ABNB, VV 53 (November 29, 1623); ABNB, VV 50 (November 9, 1623), 53; Kris Lane, "The Ghost of Seventeenth-Century Potosí: An Autopsy," *The Americas* 76, no. 2 (2019): 345–50.

33 Scholars of slavery have clearly demonstrated that manumission did not convey autonomy, rather the manumitted often remained under dependency relations with the

featured both supply and demand and were often monetized. Laborers of African and Andean descent actively negotiated not just their small freedoms but also complicated understandings of identity, sometimes supporting the evolving racial ideologies that kept them in coerced positions.

To understand the market of small freedoms, it is first necessary to point out that manumission (legal Freedom) was a virtual impossibility for those enslaved in seventeenth-century Potosí. Purchase prices for enslaved laborers were so high in Potosí that it appears most enslavers were reluctant to grant manumission. Scanning thousands of pages of notarial records for key years has revealed only a handful of *cartas de libertad* (letters of freedom) and one successful self-purchase by an enslaved woman.³⁴ Those enslaved in Potosí also appear to have had few opportunities to rent out their labor daily as *jornaleros* (day laborers) and retain some of their earnings, a key strategy for achieving manumission in other cities in colonial Latin America.³⁵ No evidence confirms any of the mint laborers were manumitted or released from *yanacona* or *mitayo* positions, work conditions were brutal and violent, and there are very few sales of enslaved people out of the mint, suggesting that enslavement or *yanacona* work in the mint usually lasted until death.³⁶

enslaver and subjugated to regulation that curtailed autonomy based on race and gender. See McKinley, *Fractional Freedoms*; Revilla Orias, *Entangled Coercion*.

- 34 For example, Cristina Conga (described as a Black woman) obtained a loan to purchase her Freedom in 1620. AHP-CNM, Escrituras Notariales (hereafter, EN) 53 (1620), ff. 3563–3564v. A notary logbook for 1654 contains two testamentary manumissions. See AHP-CNM, EN-116 (April 16, 1654), ff. 372–379; AHP-CNM, EN-116 (May 21, 1654), ff. 553–556v.
- 35 This was especially the case in Lima and has been well-studied there. Hünefeldt, *Paying the Price of Freedom*; Carlos Aguirre, *Breve historia de la esclavitud en el Perú: una herida que no deja de sangrar* (Lima: Fondo Editorial del Congreso del Perú, 2005), 81–90; Francisco Quiroz, “Aprendiendo juntos: indios, negros libres y esclavos en talleres de la Lima colonial,” in *Trabajos y trabajadores en América Latina (siglos XVI–XXI)*, ed. Rossana Barragán R. (La Paz: Vicepresidencia del Estado Plurinacional de Bolivia, 2019), 285. I encountered few such records in Potosí’s notarial archives, though Jane Mangan did find some enslaved women working as vendors in the marketplace. See Mangan, *Trading Roles: Gender, Ethnicity, and the Urban Economy in Colonial Potosí* (Durham: Duke University Press, 2005).
- 36 In a 1620 case, a fugitive tried to purchase his manumission with money borrowed from a relative, but he was accused of stealing the funds and remained enslaved at the end of the prosecution; see AHP-CNM, CRM-1040 (1620). The 1658 testimony of enslaved mulatto Cristobal de Montoya was typical when he said of a Black woman that he didn’t know “whose Black (*negra*) she is,” reinforcing the idea that subjection and enslavement were the norm for Afro-descendants. AHP-CNM, CRM-1261 (1658), f. 3v. I found only three recorded sales in which enslaved laborers left the mint, all in the first decade of the century. See AHP-CNM, EN-033, ff. 302–304v (1602); EN-036, ff. 2985v–2988v (1603); EN-041, ff. 391–391v (1608). Violent deaths via homicide, execution, and suicide were also common

While the historiography of slavery has been dominated by a post-Enlightenment notion of Freedom as autonomy and independence conveyed by manumission or emancipation from slavery, I follow historian Tamara Walker in defining freedoms according to contemporary documents.³⁷ Two mid-century (apparently unfulfilled) promises of manumission made within the mint provide a textual basis. The first comes from 1638, when Andrés Moran Butrón registered such a promise to the enslaved overseer Mateo de los Reyes, said to be from the land of Congo. If de los Reyes served three more years in Moran's *hornaza* without losing more than two *marcos* of silver in the coining process (a nearly impossible feat), Moran promised that

[w]hen they [the three years] are completed according to the conditions, I no longer hold or lay claim to the holding, possession, property and lordship that I had and I held of the said Mateo de los Reyes, loosed; I renounce and transfer to the said party as a free person not subject to slavery nor any subjection, he can treat and contract, state and plead, appear in judgements, present official documents and some securities, grant powers and enter into obligations and authorize testaments to dispose of his goods without any impediment ... I give him the power that he may remain free of subjection completing this [obligation] and not before.³⁸

These formulaic statements describe how seventeenth-century enslavers and enslaved people understood freedoms. Holding “possession, property, and lordship” over oneself certainly encompassed many different elements of self-determination. This might entail choice of lodging and the ability to form a family or affective relationships. Perhaps no less important were the economic and legal freedoms promised. Free contract was understood to include voluntary labor for an agreed-upon wage and some control over the terms (such as schedule and duties) of this labor. Closely related were the stated elements of legal personhood: the ability to authorize documents (verbally and in writing), testify under one's own authority, and to freely incur debts and dispose

for the enslaved mint laborers. A few examples are found in AHP-CNM, CRM-1050 (1631); CRM-1238 (1656); and CRM-1303 (1662).

37 Walker, *Exquisite Slaves*, 70.

38 AHP-CNM, CRM-1055 (1638) 41. The second freedom promise was made in 1644 as part of an administrative agreement of an *hornaza* and was much simpler, but almost identical in its aims. The subject was to complete thirty-eight batches of silver with minimal loss to obtain his freedom. See AHP-CNM, CRM-1121 (1644), 2.

of goods. In other words, the manumitted person would be able to acquire, possess, and distribute money and goods and to defend these freedoms legally.

One important small freedom was to determine where one lived. The “holding” and “possession” of a master was noticeably less pronounced when one was not required to live under his/her roof. Enslaved and penal laborers lived within their *hornazas*. The end of the workday did not mean the end of the master’s surveillance or confinement. The *yanaconas* who operated the foundry enjoyed the small freedom of living outside of the mint in the Andean neighborhoods of Potosí. These workers came to the mint only for their shifts, and it was more difficult to compel them to work than the laborers who lived inside. Officials complained more than once about their erratic attendance and in a 1658 incident, some of the *yanaconas* reported to work intoxicated after drinking in one of their homes.³⁹

Another element of self-determination is the ability to form affective relationships. All forced workers had some degree of ability to form connections with others outside of the mint that could offer relief from their bleak daily lives. Affective relationships included family, romantic relationships, and friendships and might be endogamous or interracial/interethnic. The Catholic Church provided protections for voluntary marriage that enslaved people took advantage of elsewhere, though regional authorities reiterated instructions that owners of enslaved and *yanacona* labor should oversee their marriages.⁴⁰ In Potosí, enslaved laborers negotiated for the rights to communication with the outside world, Sunday visits and the exchange of food with female relatives, and the occasional conjugal visit. Two cases refer to couples selectively being permitted to sleep in the *hornazas*’ charcoal rooms.⁴¹ While these conditions were not particularly private or desirable, laborers clearly valued this freedom. They fled the mint after being denied permission to sleep in the charcoal room in both instances. As part of their freedom to live outside of the mint, *yanaconas* could form family units with daily access to shared time and resources. Crucially, however, *yanaconaje* and slavery were inherited statuses. Children born into these arrangements would grow up in the same conditions,

39 AGI, LIMA 33, ff. 107–107v (1598); AHP-CNM, CRM-1128 (1644); AHP-CNM, CRM-1259 (1658).

40 For regional regulation of marriage, see Revilla Oñas, *Entangled Coercion*, 257–69. For enslaved couples defending their rights, see Bennett, *Africans in Colonial Mexico*, 79–125; Yobani Gonzales Jáuregui, “Los esclavos de Lima y su defensa del matrimonio en el siglo XVII,” *Artifcios. Revista colombiana de estudiantes de Historia*, no. 2 (2015): 27–52.

41 In 1676, two Andean men fought over the woman they wanted to bring back to the charcoal room to sleep with; see AHP-CNM, CRM-1454 (1676). Another case indicates multiple couples slept in this space at once, AHP-CNM, CRM-1370 (1690).

meaning the small freedom to form romantic relationships carried the long-term risk that one's children would never obtain manumission. Penal laborers were sometimes sent to the mint from outside of Potosí, severing their connections with family for the duration of their sentences and denying them the freedom to find paid work to support their families, though some support may have been provided by mint authorities. Family ties could provide crucial resources—both material and social—that shaped the lives of forced laborers, but it was also difficult for them to fully penetrate the mint's walls. The freedom of family formation was fragile, negotiated individually and situationally, not guaranteed to any class of laborer.

As suggested in the freedom to “treat and contract” in the manumission promise, control over the terms of one's labor was an important small freedom. All types of coerced workers in the mint struggled to control their labor. The enslaved, as elsewhere in the early modern world, were subjected to their enslavers' will regarding when and where they worked. Yet a testimony from the major audit at mid-century indicates that even those enslaved in the mint could expect some guarantees about their work schedules. They were permitted to rest at night and on Sundays or could expect compensation for giving up that time. Juan Ventura, who described himself as a mulatto slave of *hornaza* owner Fabian Sanchez Romero, revealed that when coining (fraudulently) at night, Romero gave the enslaved workers ten to twelve pesos each time, which they divided amongst themselves.⁴² Penal labor conditions were theoretically determined by the sentence, and these men seem in practice to have been treated like the enslaved while in the mint.⁴³ Two of them petitioned in 1689 to be transferred to different *hornazas* because of mistreatment by the administrators, but both petitions were denied.⁴⁴ The erratic attendance of the *yanaconas* suggests that they faced few consequences for failing to report to work, or that their work varied more in terms of the demands it placed on them. But in other ways they lacked control over their labor. Miguel Nina Quispe complained in 1658 that the *Capitan de Yanaconas* (Captain of *Yanacunas*) had

42 AGI, Escribanía 871C (1651), ff. 137–41.

43 No sentencing documents survive from the seventeenth century, but penal laborers often described the circumstances under which they arrived in the mint when testifying in internal judicial proceedings. Most were sentenced to mint work by Potosí's *alcaldes ordinarios* (ordinary magistrates) or *corregidores* (governors), though many were originally from outside of the city. The *Audiencia* (high court) in La Plata sent one penal laborer, as did unspecified authorities in La Paz. AHP-CNM, CRM-1366 (1689); AHP-CNM, CRM-1374 (1694).

44 AHP-CNM, CRM-1366 (1689); AHP-CNM, CRM-1367 (1689).

transferred him from a confectionary to work in the mint against his will.⁴⁵ If absconding was possible, choosing one's own industry was apparently not.

For the enslaved and *yanaconas* alike, some degree of small freedoms came from advantageous positioning in the labor hierarchy. The overseer and watchmen positions in the *hornazas* were exclusively filled by enslaved men of African descent, even when Andean and other laborers were available. The two manumission promises mentioned above were made to overseers and these were usually long-standing mint laborers, suggesting that laborers earned these positions based on skill, tenure, and trustworthiness. While enslaved laborers were permanent in the mint, penal and wage workers moved in and out more frequently and so were less likely to gain the experience and trust necessary for such a position. Overseers and watchmen consistently fared better than other enslaved laborers in the market of small freedoms. They often were able to leave the mint when others could not and had greater access to silver. Multiple cases include examples of these officials coming and going from the mint socially, gambling with silver, and lending it amongst themselves.⁴⁶ The hierarchy placed enslaved Afro-descendants in positions of authority over others, sometimes inverting the racial hierarchy of the outside world and generating tensions. One of the petitioners mentioned above, penal worker Juan Mendoza de los Rios (race unspecified, suggesting he passed as a Spaniard or mestizo), complained about the special authority enslaved laborers possessed in the *hornaza*.⁴⁷

The mint's *yanaconas* also had internal hierarchies of privilege and specialization. A magistrate (*alcalde*) named from among them, and an inherited or appointed chief (*cacique* or *kuraka*) enjoyed greater authority and probably flexibility in the market of small freedoms. The magistrate's duties to ensure the *yanaconas* reported to work and to maintain discipline in the foundry seem to have overlapped with those of the chief, who was also responsible for punctual attendance as well as communal duties such as incentivizing work and protecting, defending, and facilitating indoctrination of the *yanaconas*.⁴⁸ Those who specialized in the foundry could also negotiate greater freedoms. In the same case in which Nina Quispe testified, the "journeyman brazier-maker" (*oficial de hacer callanas*) Francisco Topoxo explained that he came to the mint

45 AHP-CNM, CRM-1259 (1658), ff. 18–20.

46 AHP-CNM, CRM-1040 (1620); AHP-CNM, CRM-1205 (1653); AHP-CNM, CRM-1261 (1658).

47 AHP-CNM, CRM-1366 (1689), f. IV.

48 AHP-CNM, CRM-1289 (1660), f. 3; AHP-CNM, CRM-1259 (1658), f. 15. AHP-CNM, CRM-1086 (1641), ff. 54–54v.

by himself or with assistants to construct or fill the braziers but did not have to work overnight like other *yanaconas*.⁴⁹

The labor hierarchies that Spaniards used to compel forced laborers had the side effect of differentiating freedoms not just by race but also by experience, skill, or favor. This seems to have resulted in envy, prompting at least enslaved men to work hard with hopes of earning one of these positions and the accompanying freedoms. Pedro Congo, described as a Black slave, testified in 1649 that he had served his master in the mint for around six years. In that time, he had learned two specialized roles and was training in a third. Congo was also learning the responsibilities of the underperforming overseer with hopes of replacing him.⁵⁰ The small freedoms associated with the position prompted Congo to work harder.

Another small freedom linked to free contract and control of one's labor was leisure time. The rhythms and dictates of the Catholic church partly guaranteed this freedom. The *hornazas* were ordered to be locked during prayer hour to allow the laborers time for religious observance and the laborers were free to relax after hearing Mass on Sundays and holidays.⁵¹ *Hornaza* laborers were apparently free to leave the mint after Mass until a 1649 riot. Authorities reacted by prohibiting them from leaving the mint at all.⁵² Throughout the century, the building's main patio was a space for relaxation after Mass. Enslaved and penal laborers could invite guests, particularly family members. Women also came frequently to sell food and drink. Patio revelry occurred in a multi-racial space. Laborers gambled there and the Spanish coiners of the mint were admonished for doing the same in 1645, precisely because officials believed gambling in this multiracial space posed security threats.⁵³ Although there is little evidence that *yanaconas* participated, the presence of other Andeans is clear. The 1658 investigation of smuggling silver out of the foundry revealed that the *yanaconas* enjoyed their own leisure time drinking alcohol at their magistrate's house before beginning their shift.⁵⁴

The ability to acquire and use cash and property was an important element of free contract. This small freedom was key to taking advantage of leisure time and solidifying affective relationships. Not only is Lane correct that

49 AHP-CNM, CRM-1259 (1658), ff. 3-4.

50 AGI, Escribanía 871C (1651), f. 134v.

51 AHP-CNM, CRM-1176 (1650). Priests came to give a Mass in the mint as early as the 1620s. AHP-CNM, CRM-1043 (1627).

52 AHP-CNM, CRM-1160 (1649).

53 AHP-CNM, CRM-1136 (1645), AHP-CNM, CRM-1205 (1653).

54 AHP-CNM, CRM-1259 (1658).

the enslaved sometimes enjoyed the freedom to take small amounts of scrap metal, but other opportunities presented themselves also.⁵⁵ Enslaved workers in the mint were not paid a salary, but they did receive one *real* on Fridays and Saturdays in addition to daily bread rations.⁵⁶ Authorities sometimes failed to notice or even deliberately ignored illicit ways of acquiring silver. In the case of Antonio Congo's false sale to Francisco Ramiro de Urra, Congo earned four pesos and spent them on drinks for himself and his fellow "Blacks."⁵⁷ In other cases, the authorities were the ones paying for additional labor outside of normal work hours.⁵⁸

Yanaconas, on the other hand, did earn a daily wage. Even as they complained these wages were insufficient and presumably had to pay rent and feed themselves, they had regular access to cash. Miguel Nina Quispe complained that while working as a confectioner, he had earned twelve reales daily, compared to just three working in the mint in the 1650s.⁵⁹ By living outside the mint and being able to establish families, some would have had other opportunities to earn an income. For penal laborers, the seventeenth-century documentation is vague, but they appear to have drawn no wages. Juan Mendoza de los Rios described himself as poor and laden with the obligation to support his wife and children when he requested to be transferred to a different *hornaza* in 1689.⁶⁰ Juan de la Cruz, described as an Indian and Potosí native in the 1620s, was apparently never sentenced to mint labor but struck a deal with a silver merchant to front his court costs in a criminal matter. De la Cruz handed over his wages to the merchant in exchange.⁶¹ Eighteenth-century records have additional detail, but never do convict laborers appear to have been paid a cash wage.⁶²

A final set of freedoms composing legal personhood appear in the manumission promise as the abilities to state and plead and to appear in judgments. Technically, enslaved actors were not able to testify against Spaniards. In practice, legal tradition and the mediation of community leaders could provide

55 Lane, "Slavery and the Casa de La Moneda," 113–14.

56 AHP-CNM, CRM-1060 (1631).

57 AHP-CNM, CRM-1186 (1651).

58 AGI, Escribanía 871C (1651), ff. 137–41.

59 AHP-CNM, CRM-1259 (1658), ff. 18–20.

60 AHP-CNM, CRM-1366 (1689).

61 AHP-CNM, CRM-1261 (1658), ff. 22v–23.

62 Some eighteenth-century sentences indicate that the "wages" penal laborers earned were not paid in cash but diverted to court costs, restitution for crimes, and the maintenance of their families. See AHP-CNM, CRM-1447 (1754). Others simply specify the worker would receive rations and no salary. See AHP-CNM, CRM-1828 (1780–1781).

such freedoms. Mint laborers classified as Indians (*yanaconas* and others alike) enjoyed access to interpreters and a legal protector (*protector de naturales*) in their litigation. Even in a 1694 case of assault between two men classified as Indians, each had a protector named to represent them.⁶³ The enslaved often lacked such representation, but at times they were appointed a general representative at no cost and defendants under age twenty-five were granted a *curador ad litem*, regardless of race or enslavement. Authority figures in both the Afro-descendant and Andean communities exercised influence as character witnesses, organizers of communal support, or perhaps mediators in less formal forms of dispute resolution that have evaded the archive. For the former group, despite a prohibition on the role in 1610, Potosí had an *alcalde de negros* (magistrate of the Blacks) through at least mid-century.⁶⁴ This figure served as an intermediary in penal labor arrangements and as a character witness in criminal investigations of Afro-descendants. For the *yanaconas* of the mint, their chief seems to have handled these functions. He probably drew his authority from hereditary descent or another traditional Andean structure and examples suggest the chief could serve as a character witness and muster community support.⁶⁵ The magistrate, on the other hand, served mostly as a disciplinary figure and was likely elevated to this position from among the other *yanaconas* of the mint by Spanish appointment.⁶⁶ Penal laborers lacked any formal authority figures to turn to in times of further legal jeopardy, although those who were Andean may have had some access to chiefs or *mita* captains from their home regions who were stationed in Potosí.

63 AHP-CNM, CRM-1374 (1694).

64 For the prohibition, see ABNB, Cabildo Secular de Potosí (hereafter, CPLA), 12 (September 1, 1610), ff. 323v–326. The order is a brief one by the town council in response to an order by a legal representative at the viceregal level (which is not included in the text). Lima's Afro-descendant population was growing significantly in this period, and militias, guilds, and confraternities were the institutions that the viceregal administration preferred to use as intermediaries in governing this population. The prohibition on Black magistrates may have been an effort to enforce the intermediary role of these institutions throughout the viceroyalty. The magistrate appears at least twice after the prohibition in the mint records. AHP-CNM, CRM-1043 (1627), f. 123; AGI, Escribanía 865C (1652), ff. 149–175. Two previous studies also mention this role: Bridikhina, “Desafiando los límites del espacio colonial: la población negra en Potosí,” 191; Kris Lane, “The Ghost of Seventeenth-Century Potosí: An Autopsy,” *The Americas* 76, no. 2 (April 2019): 327–50.

65 The mint officials interfered to name a replacement for an absent chief in 1641, but the wording suggests this was a one-time deviation from the normal process. AHP-CNM, CRM-1086 (1641), ff. 54–55.

66 AGI, Escribanía 871C (1651), ff. 674v–6675.

There is no record Mateo de los Reyes ever realized the manumission he was promised. But the terms offered him were not a dead letter. Over the first half of the seventeenth century, forced laborers of all types negotiated, often successfully, the small freedoms of self-determination in living conditions and affective relationships, free contract, and legal personhood. They did so as individuals and groups, actively and passively in response to incentives offered by their bosses. Collectively, these negotiations resembled a market in their structure.

4 Market Structures

In addition to commodities (here, freedoms), a market requires buyers, sellers, and mechanisms for negotiation. Each of these elements was present in the exchanges of small freedoms. Laborers and slaveholder-officials acted as the parties on either end of the negotiating table, although who was the “buyer” and who was the “seller” varied with the situation. Most often, the laborers demanded their freedoms, sometimes acting collectively and other times individually. In many of the examples provided above, laborers assumed or specifically asked for their small freedoms. But in other examples, masters and mint officials offered freedoms in exchange for additional work, complicity in fraud, or simply to keep a fragile peace. The rules of negotiation can be difficult to decipher, but both sides participated actively in the market of small freedoms.

Surviving archival documentation is primarily conflictive, which sometimes obscures these negotiation structures. But they often hide in plain sight or lurk in the background of other stories. Sometimes, as in the case of Francisco Ramiro de Urra’s trick, a simple conversation and access to common supplies in the mint could facilitate a negotiation. On other occasions, mint laborers filed formal petitions. Workers sometimes petitioned during ongoing prosecutions, consulted independently with the mint’s notary, or even slipped away to enlist the help of municipal authorities. At least one of the penal laborer petitioners left the mint to declare before a public notary.⁶⁷

Visitas (audits or inspections) provided a formal and somewhat regular structure for negotiation (see Raphael and Sato, this volume).⁶⁸ Internal and external authorities conducted these to review officials’ conduct. They asked laborers and other witnesses a standard list of questions that often contained

67 AHP-CNM, CRM-1366 (1689).

68 See also Zagalsky’s contribution in this volume for official inspections (in her case, redistributions of *mita* laborers) as opportunities for negotiation.

information about the small freedoms laborers could expect. The most detailed surviving records come from two internal and two external examples in the middle decades of the century. These describe living conditions for the mint's workers and evidence for negotiation of their small freedoms. Laborers' complaints probably triggered the earliest such inspection, dated 1631. The magistrate was acting on the accusation that some of the *hornaza* owners failed to provide the enslaved workers with adequate food and clothing.⁶⁹ He proceeded to review each *hornaza*, commenting on the state of the laborers' clothing, asking about their rations, and fining the administrators whose provisions failed to meet expectations. Notably, the enslaved witnesses from one *hornaza* complained successfully that their administrator did not give them a cash stipend for Friday and Saturday rations as the other administrators did. Information clearly circulated among the workers of different *hornazas* and speaking up or even initiating an audit could prove an effective negotiation tactic.

A decade later, the mint magistrate summoned all the top officials of the mint to audit each of its offices and ensure compliance with royal standards in coining.⁷⁰ This involved asking the workers of the *hornazas* and the foundry if they had the necessary tools for their work. While the enslaved *hornaza* laborers were also questioned about food and clothing, the *yanaconas* were only asked about their wages, suggesting they were expected to purchase their own necessities out of their pay. Another audit conducted by the governor in 1648 went even further in examining living conditions and small freedoms. For example, the governor asked what were described as "the ordinary questions" in the *hornaza* of Juan Garcia "of if they are given bad and unjust treatments, if they hear Mass on holy days, if they are prevented from visiting with their women, if they are given sufficient rations and sustenance and if they know anything demanding correction in this *hornaza* or of the officials and Personnel of this Mint."⁷¹ A personal audience with the governor, or with all of the officials of the mint together, provided a powerful forum for negotiating freedoms. Mistreated laborers had a chance to understand their rights (as in the phrasing of this last question), compare with the living standards of others in different offices (as in the rations comment), and shame their administrators or even subject them to penalties for noncompliance. Exchanging small freedoms with the laborers was necessary not just to prevent rebellion or wide-scale noncompliance, but for authorities to save face (and money) in these audits.

69 AHP-CNM, CRM-1060 (1631), f. 1.

70 AHP-CNM, CRM-1098 (1642).

71 AGI, Charcas 113 (1648), ff. 883-910v.

The most important audit of the century was a series of inspections by four different outside auditors, of which the 1648 instance mentioned above was a part (see Soto and Lane, this volume). The final auditor, don Francisco Nestares Marin, was a Galician inquisitor, sent by the Crown, who operated from 1648 to 1658.⁷² Nestares Marin's work had major repercussions for the market of small freedoms, the mint, and the whole city. The inquisitor interviewed many mint laborers more than once about the conduct of mint officials. He asked open-ended questions that allowed these workers to express themselves relatively freely, resulting in testimonies like Pedro Congo's mentioned above. Congo discussed broadly his experience, training, and specialization in the mint before answering questions about the official in question. Laborers' testimony was another point of negotiating small freedoms. For example, the *yanacona* testimonies about the treasurer's conduct are almost identical and uniformly praise the treasurer as a good Christian and almsgiver. Enslaved witnesses who testified on the same day were even more specific, commending the treasurer's generous provision of food and alms to the Black laborers.⁷³ These alms likely included bribes to the workers or their officials to produce such positive testimonies.

Audits, petitions, and daily discussions with the mint's slaveholders and officials gave coerced laborers opportunities and information with which to negotiate their small freedoms. Their power was limited, but officials both offered and acceded to freedoms to head off rebellion, facilitate their own fraudulent coining, and to generally keep the peace in a brutal environment. This market was tied closely to the market conditions for minting itself and would see a major curtailing in the second half of the century.

5 The Market in Decline

The market of small freedoms went into a clear decline in the second half of the seventeenth century for reasons closely connected to the major fraud scandal uncovered by the inspector Nestares Marin. The inspector had discovered widespread fraudulent coining in the mint, resulting in coins that were under weight and under value. His reforms reshaped global markets and the entire Potosí economy (see Lane, this volume).⁷⁴ The silver merchants who received

72 See also Kris Lane, *Potosí: The Silver City That Changed the World* (Oakland: University of California Press, 2019), 134–35.

73 AGI, Escribanía 871D (1648), legajo 3, ff. 642–689.

74 See also Daniel Oropeza Alba, *Siglo XVII: La falsificación de la Moneda en la villa imperial de Potosí*. (Potosí: Casa Nacional de Moneda, 2013); Kris Lane, "From Corrupt to

heavy fines had served as the creditors behind mint employees and miners.⁷⁵ Reducing credit and simultaneously fining the *hornaza* owners for their roles in the fraud made it financially more difficult to run an *hornaza* with enslaved labor. Slaves had long been expensive in Potosí and losing Portugal from the Spanish Empire in 1640 increased prices and reduced the volume of the slave trade to Potosí.⁷⁶ Slavery did not disappear from the mint, but it declined in both absolute numbers and as a percentage of the labor force. Mining production and thus the amount of silver arriving to the mint also declined in this period, making it unnecessary to maintain the same number of workers as the *hornazas* had employed at their 1647 height.⁷⁷ Late in the century, the use of penal laborers increased while the overall workforce shrank. This meant a reduction in both demand (fewer laborers) and supply (lower incomes for mint officials and less incentive to obtain additional work) in the market of small freedoms. Unsurprisingly, the remaining laborers still tried to negotiate freedoms and often resorted to running away when the market failed.

The end, or at least curtailing, of good times for the mint officials (the head of the foundry, boss of the *yanaconas*, was also implicated in the fraud) and *hornaza* owners fostered a curtailing of the market of small freedoms. Like the changes in labor composition, this was neither instant nor complete, but it is evident that forced laborers in the second half of the seventeenth century faced tighter conditions. While *yanacona* status was clearly hereditary by the seventeenth century, mint assignments were not. In the first half of the century, most *yanaconas* had been described as Potosí natives and some had substantial training and tenure in the foundry. Those working in the second half of the century were increasingly described as immigrants and people of mixed ancestry, probably forced into the mint upon arrival in Potosí.⁷⁸ Their

Criminal: Reflections on the Great Potosí Mint Fraud of 1649," in *Corruption in the Iberian Empires: Greed, Custom, and Colonial Networks*, ed. Christoph Rosenmüller (Albuquerque: University of New Mexico Press, 2015), 33–62.

75 Peter Bakewell, *Silver and Entrepreneurship in Seventeenth-Century Potosí: The Life and Times of Antonio López De Quiroga* (Albuquerque: University of New Mexico Press, 1988), 46.

76 Lane, *Potosí*, 104. The average slave sale price in the mint between 1600 and 1640 was 548.5 pesos and from 1641 to 1700 it rose to 620.13 pesos. The last three sales I have data for in 1661, 1662, and 1681 reached an average of 910 pesos per slave.

77 John Jay TePaske, *A New World of Gold and Silver*, Vol. 21, Atlantic World (Boston: Brill, 2010).

78 Some individuals clearly passed in and out of *yanacona* status via migration and marriage to tributary Andeans, Spaniards, and Afro-descendants. During Nestares Marin's audit in 1647, all the *yanaconas* assigned to the foundry testified that they were Potosí natives. These testimonies may have been given under bribe or duress, but many of the witnesses also testified to having worked many years in the mint. See AGI, Escribanía 871C

pay seems to have remained the same, at a rate lower than what they could earn in other industries.⁷⁹ Enslaved and penal laborers saw the few freedoms they had previously acquired noticeably curtailed.

Lack of control over where they lived meant the enslaved were forced to enter or leave the mint without any choice in the matter. Slaveholders could be obligated to both maintain or expel the enslaved from the mint, both increasing their vulnerability and curtailing their freedoms. The 1658 text of the oath Antonio Garcia Cantero swore to become an *hornaza* owner prohibited him from selling off any of his newly acquired enslaved workers until he paid off the mortgage he had used to buy them.⁸⁰ In other cases, slaveholding mint officials were compelled to sell offending enslaved men out of the mint.⁸¹ Both of the 1689 petitions by penal laborers to change *hornazas* were denied as they, too, lacked control over where they served their time.⁸² For those laborers who remained, living conditions in the *hornazas* apparently deteriorated. No audits from this period survive, but escapees in 1673 cited terrible living conditions as their primary reason for fleeing. Multiple witnesses (of African and Andean descent and both enslaved and penal laborers) complained of being abused, underfed, and kept naked in the *hornaza*.⁸³ They were locked inside for long periods, denied even the limited mobility of freely moving about the mint. The use of the *hornazas* as a jail in other instances indicates that conditions were punitive. During the 1651 investigation of Spaniard Francisco Ramiro de Urra, both Urra and an enslaved suspect were jailed in separate *hornazas*.⁸⁴ *Hornaza* sales from the period generally came with an inventory of the enslaved workers, tools, and multiple types of torture devices housed there. Denied a choice, enslaved and penal workers lived under increasingly harsh conditions.

(147), ff. 673v–689. By a 1672 census, seven of the sixteen mint *yanaconas* were natives of other places (Cochabamba, Oruro, Cuzco, Laricaja, Tarija, and Pocona). One identified his father as mestizo, another said he was the son of a free *zambo*, and a third called his father a *pardo* (brown, referring to someone of African descent). See Archivo General de la Nación Argentina Sala 13, Legajo 1279, Documento 3 “Padron de Los Yndios Yanaconas de Su Magestad ...” (1672). The author thanks Raquel Gil Montero for sharing a copy of this document.

79 See Miguel Nina Quispe’s complaint, also discussed above. AHP-CNM, CRM-1259 (1658), ff. 18–20.

80 ABNB, CPLA 26 (1658), ff. 26v–28v.

81 AHP-CNM, CRM-1261 (1658); ABNB, Audiencia de La Plata-Recursos Documentales sobre la Minería (hereafter ALP-Min), 135, doc. 2 (1666–1668).

82 AHP-CNM, CRM-1366 (1689); AHP-CNM, CRM-1367 (1689).

83 AHP-CNM, CRM-1335 (1673).

84 AHP-CNM, CRM-1186 (1651), f. 1.

The hungry, naked, and abused *hornaza* workers who fled in 1673 also complained about the loss of small freedoms in their affective relationships. When asked what he and his peers had planned to do after escaping, Salvador de Salinas (described alternately as a Black slave, convict, or wage laborer) said they were looking for a way to remove their chains and then go see their wives, whom the *hornaza* owner prevented from visiting or bringing food. Another penal laborer, Manuel de Campos, confirmed this testimony. Campos was called an Indian and declared himself to be a native of Potosí and a *yanacona* who was also prevented from seeing his wife.⁸⁵ While Campos did not work in the foundry, his case suggests that even the mint's *yanaconas* were not immune from repressive measures. They were certainly investigated, and some were jailed for smuggling silver in 1658, although the case ended without any punishment.⁸⁶ This case also highlights disparities in treatment. The *yanacona* defendant Diego Guaman was jailed in an *hornaza* during investigation. That a *yanacona* could be punished and confined by living in the conditions that were routine for the enslaved and penal laborers served as a reminder of a freedom the *yanaconas* normally possessed.

While these examples demonstrate attempts to constrain affective relationships, this was the hardest of the small freedoms to control. Partly, this is a function of the natural intertwining of the affective with the economic. Family members and friends were sometimes also vendors, selling food and alcohol within the mint. Men of both African and Andean descent had wives who came to sell chicha on Sundays and sometimes they brought food for their husbands.⁸⁷ In a 1663 case, one enslaved witness described an information network among the city's enslaved population that was centered on two brothers, one enslaved in the mint and the other outside of it.⁸⁸ Sometimes such relationships also facilitated counterfeiting or theft.⁸⁹ Affective connections with those who had an excuse to be in the mint selling food or drink or running errands allowed continued visitation even in periods when the mint's laborers were confined and controlled. Social relationships were the most resilient freedom to which laborers could cling when the market declined.

Mint authorities also curtailed workers' control over their own labor in this period. For enslaved men purchased by mint officials and for the increasing number of workers entering the mint in a penal capacity, this meant a forced

85 AHP-CNM, CRM-1335 (1673), ff. 19v–28v.

86 AHP-CNM, CRM-1259 (1658).

87 AHP-CNM, CRM-1261 (1658), f. 15v.; AHP-CNM, CRM-1306 (1663), ff. 6–7.

88 AHP-CNM, CRM-1306 (1663), f. 4v.

89 AHP-CNM, CRM-1093 (1642); AHP-CNM, CRM-1180 (1651); AHP-CNM, CRM-1225 (1655).

change in industries. In a 1673 robbery-escape, Salvador de Salinas (described as Black) testified that he had been a journeyman shoemaker (*oficial zapatero*) but now “was working in the *hornaza* that belonged to Diego Moreno de Villegas, whose slave he is.”⁹⁰ Salinas testified that he had fled with the intention of going to the house of Captain Don Miguel de Oquendo, who he hoped would purchase him out of the mint and employ him in another profession. Enslaved laborers were seized as collateral in a 1667 case against three *hornaza* owners, but they were quickly released and put back to work on their enslaver’s petition. The enslaver wanted to keep the *hornazas* producing to pay off the debts that had caused the legal complications in the first place.⁹¹ Even being confiscated as moveable property did not provide enslaved men with a rest.

The post-audit tightening also impacted the freedoms associated with the hierarchies of the various mint offices. Complaining of excessive losses in production, *hornaza* owner Agustín de Ortega dismissed his watchmen at the end of 1650 and named replacements for 1651, removing the former laborers’ access to small freedoms and perhaps enhancing the situation for those named as replacements.⁹² These positions were always precarious, and they came at the expense of others lower in the hierarchy. Antonio de Escobar, an enslaved man in don Pedro Ponce’s *hornaza*, testified in 1665 that he had and the other three laborers who had chosen not to flee had been threatened by the fugitive overseer and watchmen not to say anything. As a new arrival, Escobar was at a disadvantage in the labor hierarchy, yet his superiors were vulnerable to his potentially damning testimony.⁹³ The hierarchy often conditioned robberies and escapes, as the overseers and watchmen’s greater mobility enabled them to make social connections to people outside of the mint and later flee to their homes and taverns. Yet these superiors were generally targeted with the harshest punishments when caught.⁹⁴ The most egregious example reminds us of the brutality of the forced labor regime in Potosí’s mint. The mint magistrate summoned three enslaved witnesses in 1661 to confirm that overseer Francisco Cabezas’s death had been a suicide. They confirmed that he had stabbed himself because the absentee *hornaza* owner had stormed into the *hornaza* in a fury over missing silver and ordered the other enslaved laborers to seize Cabezas and prepare him for a whipping. Panicked at the sudden threat or

90 AHP-CNM, CRM-1335 (1673), f. 20.

91 Archivo General de la Nación del Perú (hereafter, AGNP), Colección Familiar Moreyra y Matute, D1. 83 Real Casa de la Moneda, 1934 (1667).

92 AHP-CNM, CRM-1230 (1651), f. IV.

93 AHP-CNM, CRM-1315 (1665).

94 AHP-CNM, CRM-1188 (1651); AHP-CNM, CRM-1457 (1657).

simply exhausted by the constant brutality of the *hornaza* regime, Cabezas chose to end his life rather than submit to another brutal punishment.⁹⁵ Small freedoms were not always enough to control the laborers of the mint.

While no records survive of harsh punishments for the *yanacona* magistrates and chiefs, their roles were similarly tenuous and fraught. Twice in the 1640s, mint officials dispossessed the chief of the *yanaconas* of his office. Each time the authorities cited the incumbent's absence from the mint and offered a lengthy justification of the deviation from the norm: the chief was named by the king, or more likely his ancestor had been so named and passed down a hereditary position. But officials intervened, complaining that both chiefs were absent from their roles and thus an insufficient number of *yanaconas* reported to work.⁹⁶ Officials were not afraid to remove an Andean authority from office if he took his freedoms too liberally.

The decline of the market of small freedoms also affected leisure time and related activities. While the *yanaconas* retained their ability to come and go at the beginning and end of the workday, conditions worsened for the *hornaza* workers. As mentioned, the treasurer prohibited Blacks from leaving the mint on Sundays and holidays in 1649, just as Nestares Marin's audit was gaining steam.⁹⁷ The evidence available for the rest of the century suggests this was enforced and applied to all workers of the *hornaza*, regardless of race. Only overseers and watchmen appear leaving the mint in subsequent cases, an apparent concession to the still important *hornaza* hierarchy.⁹⁸ Perhaps struggling to recover the profits of the first half of the century, at least one *hornaza* administrator tried to compel labor on Sunday. The treasurer fined Antonio de Zuaza in 1671 for locking his workers inside the *hornaza* and failing to let them out to hear Mass.⁹⁹

Sunday as a day of rest and revelry came under still greater threat in the 1690s. The *hornaza* organization was used to limit the number of people on the patio in an attempt to prevent violence. The treasurer grouped the four *hornazas* operating in 1691 into pairs thought to have peaceful relations amongst themselves and created a schedule for leisure time. Instead of all the workers enjoying the patio each Sunday as had been the case previously, they were allowed out only on alternating Sundays in the paired groupings. Four years later the system was still in operation, though it did not have the desired effect

95 AHP-CNM, CRM-1303 (1661), ff. 35–37v.

96 AHP-CNM, CRM-1086 (1641), ff. 54–55; AHP-CNM, CRM-1128 (1644).

97 AHP-CNM, CRM-1160 (1649).

98 AHP-CNM, CRM-1261 (1658), ff. 16v–19; AHP-CNM, CRM-1343 (1678).

99 AGNP, Colección Familiar Moreyra y Matute, D1. 86. Real Casa de Moneda 2023 (1671).

of keeping peace.¹⁰⁰ The system was apparently abandoned later in the decade as it does not appear in eighteenth-century records.

Even at its height, the small freedom of completing extra work for pay had been quite risky. Auditor Nestares Marin wrote a letter to the Crown in 1651 denouncing the refiners, miners, silver merchants, and even clergy complicit in defrauding the king's currency, pointing out that the merchants and officials worked through the hands of their "Blacks," who then failed to denounce their employers.¹⁰¹ Their reticence to testify is unsurprising, given that their pay was probably predicated on them keeping quiet. There are no examples in the latter part of the century of enslaved laborers working for wages at night or gambling as before, indicating this freedom had declined along with the market. An enslaved watchman confessed in 1658 to having adulterated silver with copper but specified that he and his peers had saved their meager food rations to buy the copper, suggesting they were no longer able to earn wages for night work.¹⁰²

Support from authorities (magistrates, chiefs, and masters) remained possible but often had to be renegotiated. In 1661, three enslaved men denounced the *hornaza* administrator (who owned their labor) to the mint magistrate for stealing scrap silver. The case took some curious turns, as other enslaved witnesses sided with the administrator, and ultimately it ended badly for both accusers and accused. If the enslaved witnesses had been trying to change enslavers, they were successful, but only after receiving 100 lashes each for false testimony and being force-sold out of the mint. The administrator was officially absolved of theft charges but dismissed from his position and ordered to pay the court costs.¹⁰³ Perhaps the unstated assumption of the magistrate was that a slaveowner who failed to control his own slaves could not be trusted. In either case, denouncing abuses had consequences for the enslaved. Mint officials also used the authority structure to sow tension between the *yanaconas* and the enslaved *hornaza* workers, probably to prevent collusion in theft and adulteration of silver. In 1660, the magistrate of the *yanaconas* was called on to whip enslaved offenders as a punishment for a robbery-escape and an unnamed group of four "Indians" of the foundry (probably including the magistrate and the chief) was asked to do so in 1679.¹⁰⁴ Such instances not only

100 AHP-CNM, CRM-1372 (1691); AHP-CNM, CRM-1371 (1695).

101 AGI, Charcas 113 (1651), ff. 319–324v.

102 AHP-CNM, CRM-1261 (1658), ff. 2v–4.

103 AHP-CNM, CRM-1297 (1661).

104 AHP-CNM, CRM-1289 (1660), f. 3; AHP-CNM, CRM-1346 (1679), ff. 3v–4.

restricted free access to traditional authorities, but also they reinscribed race as an important differentiator.

The mint archive's fragmentary nature makes it impossible to quantify resistance in one period versus another. However, it is clear qualitatively that resistance to the reduction of the market of small freedoms was widespread. There were at least fourteen robbery-escapes from the mint between 1655 and 1700, plus cases of enslaved resistance, violence, and the two petitions mentioned above in which penal workers requested to be transferred to other *hornazas*. In other words, the forced laborers continued to claim their small freedoms in non-market ways.

6 Conclusions

To see how the Potosí mint's coerced laborers themselves imagined and lived freedoms, one must read laborer testimonies in the background of judicial proceedings and responses to formulaic questions posed to them during inspections. Comparing these descriptions to the text of a manumission promise moves the definition of Freedom beyond a post-Enlightenment sense of individual autonomy into multiple practices of self-determination, free contract, and legal personhood claimed and contested by coerced laborers in the seventeenth century.

These laborers managed to create the market of small freedoms in the first half of the century by negotiating with authorities who were anxious to secure extra labor and prevent rebellions. After Nestares Marin's audit put an end to the widespread fraud in the mint, neither side could fully impose its will against the decline of the tangible market in Potosí silver.

The market had served as a useful way of subduing and distinguishing an increasingly diverse workforce. While in the opening decades, *yanaconas* had been confined to the foundry, enslaved workers to the *hornazas*, and *mitayos* to carrying and cleaning tasks, by the end of the century, the picture had changed dramatically. New penal labor arrangements might apply to men of all backgrounds, and individual Andeans and Afro-descendants had negotiated freedoms based on hierarchy or skill.¹⁰⁵ Individual positions in the mint were never defined by a dichotomy of slave and free, and the market had served as an important tool for differentiating workers as well as an outlet for the tension

105 See also Barragán's contribution to this volume. Individual workers might occupy multiple labor statuses in their trajectory in the mint, as in the city's mines and refineries.

inherent in coercive labor arrangements. With small freedoms in shorter supply and fewer distinctions among workers in the latter half of the century, judicial records confirm that laborers often resorted to flight or violence to seize their small freedoms.

Primary Sources

- Archivo Arzobispal de Sucre (AAS), Esclavos, Caja 1, Legajo 2, Documento 1
 Archivo y Biblioteca Nacionales de Bolivia (ABNB), Cabildo Secular de Potosí (CPLA) 12, 26.
 Archivo General de Indias (AGI)
 Lima 33.
 Escribanía 871C, 871D
 Archivo General de la Nación Perú (AGNP), Colección Familiar Moreyra y Matute, D1. 86.
 Archivo Histórico de Potosí-Casa Nacional de la Moneda (AHP-CNM), Casa Real de Moneda (CRM) 1040, 1043, 1050, 1055, 1093, 1098, 1128, 1160, 1176, 1186, 1238, 1259, 1261, 1289, 1297, 1303, 1335, 1366, 1367, 1370, 1374, 1454, 2023.
 AHP-CNM, Escrituras Notariales (EN) 33, 36, 41, 53, 116

Bibliography

- Abercrombie, Thomas. "To Be Indian, To Be Bolivian: 'Ethnic' and 'National' Discourses of Identity." In *Nation-States and Indians in Latin America*, edited by Joel Sherzer and Greg Urban, 95–130. Austin: University of Texas Press, 1991.
- Aguirre, Carlos. *Agentes de su propia libertad: los esclavos de Lima y la desintegración de la esclavitud, 1821–1854*. Lima: Pontificia Universidad Católica del Perú, Fondo Editorial, 1993.
- Aguirre, Carlos. *Breve historia de la esclavitud en el Perú: una herida que no deja de sanar*. Lima: Fondo Editorial del Congreso del Perú, 2005.
- Akyeampong, Emmanuel. "Ties That Bound: Slave Concubines/Wives and the End of Slavery in the Gold Coast, c. 1874–1900." In *Essays in Honor of Ama Ata Aidoo at 70*, edited by Anne V. Adams, 231–40. Oxfordshire: Ayebia Clarke Publishing Ltd, 2012.
- Arrelucea Barrantes, Maribel. *Sobreviviendo a la esclavitud: negociación y honor en las prácticas cotidianas de los africanos y afrodescendientes*. Lima, 1750–1820. Lima: Instituto de Estudios Peruanos, 2018.
- Bakewell, Peter J. *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650*. Albuquerque: University of New Mexico Press, 1984.

- Bakewell, Peter J. *Silver and Entrepreneurship in Seventeenth Century Potosí: The Life and Times of Antonio López De Quiroga*. Albuquerque: University of New Mexico Press, 1988.
- Bennett, Herman L. *Africans in Colonial Mexico: Absolutism, Christianity, and Afro-Creole Consciousness, 1570–1640*. Bloomington: Indiana University Press, 2005.
- Blumenthal, Debra. *Enemies and Familiars: Slavery and Mastery in Fifteenth Century Valencia*. Conjunctions of Religion and Power in the Medieval Past. Ithaca: Cornell University Press, 2009.
- Bridikhina, Eugenia. “Desafiando los límites del espacio colonial: la población negra en Potosí.” *Estudios Bolivianos* 13 (2007): 169–216.
- Camp, Stephanie M. H. *Closer to Freedom: Enslaved Women and Everyday Resistance in the Plantation South*. Chapel Hill: University of North Carolina Press, 2004.
- Chira, Adriana. *Patchwork Freedoms: Afro-descendant Cubans, Law and Racial Identity in Cuba, 1791–1868*. New York: Cambridge University Press, 2022.
- Cole, Jeffrey A. 1985. *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press.
- Cowling, Camillia. *Conceiving Freedom: Women of Color, Gender, and the Abolition of Slavery in Havana and Rio De Janeiro*. Chapel Hill: University of North Carolina Press, 2013.
- Crespo, Alberto R. *Esclavos negros en Bolivia*. La Paz: Academia Nacional de Ciencias de Bolivia, 1977.
- Cruz, Pablo, and Florian Téreygeol. “Yanaconas del rayo. Reflexiones en torno a la producción de metales en el espacio surandino (Bolivia, siglos xv–xvi).” *Estudios Atacameños* 49 (2014): 19–44.
- Cunietti-Ferrando, Arnaldo J. *Historia de la Real Casa de Moneda de Potosí durante la dominación hispánica, 1573–1825*. Vol. 1. Buenos Aires: Pellegrini, 1995.
- Dean, Carolyn, and Dana Leibsohn. “Hybridity and Its Discontents: Considering Visual Culture in Colonial Spanish America.” *Colonial Latin American Review* 12, no. 1 (2003): 5–35.
- Fraga Filho, Walter. *Crossroads of Freedom: Slaves and Freed People in Bahia, Brazil, 1870–1910*. Translated by Mary Ann Mahony. Durham: Duke University Press, 2016.
- Fuertes López, José Antonio. “La trata de esclavos en la casa de moneda de Potosí—Bolivia.” *Monografias.Com*. Accessed September 27, 2016. <http://www.monografias.com/trabajos70/trata-esclavos-casa-moneda-potosi/trata-esclavos-casa-moneda-potosi.shtml>.
- Glassman, Jonathon. “The Bondsman’s New Clothes: The Contradictory Consciousness of Slave Resistance on the Swahili Coast.” *Journal of African History* 32, no. 2 (1991): 277–312.
- Gonzales Jáuregui, Yobani. “Los esclavos de Lima y su defensa del matrimonio en el siglo xvii.” *Artifícios. Revista colombiana de estudiantes de Historia* 2 (2015): 27–52.

- Gotkowitz, Laura, ed. *Histories of Race and Racism the Andes and Mesoamerica from Colonial Times to the Present*. Durham: Duke University Press, 2012.
- Hünefeldt, Christine. *Paying the Price of Freedom: Family and Labor Among Lima's Slaves, 1800–1854*. Berkeley: University of California Press, 1994.
- Lane, Kris. "Slavery and the Casa de La Moneda in Seventeenth-Century Potosí." In *Territorios de lo cotidiano, Siglos XVII–XX: Del antiguo Virreinato Del Perú a La Argentina Contemporánea*, edited by Mónica Ghirardi, 101–14. Rosario: Prohistoria Ediciones, 2014.
- Lane, Kris. "From Corrupt to Criminal: Reflections on the Great Potosí Mint Fraud of 1649." In *Corruption in the Iberian Empires: Greed, Custom, and Colonial Networks*, edited by Christoph Rosenmüller, 33–62. Albuquerque: University of New Mexico Press, 2015.
- Lane, Kris. "The Ghost of Seventeenth-Century Potosí: An Autopsy." *The Americas* 76, no. 2 (2019): 327–50.
- Lane, Kris. *Potosí: The Silver City That Changed the World*. Oakland: University of California Press, 2019.
- Larson, Brooke, Olivia Harris, and Enrique Tandeter, eds. *Ethnicity, Markets, and Migration in the Andes: At the Crossroads of History and Anthropology*. Durham: Duke University Press, 1995.
- Lazo García, Carlos. *La hornaza: taller colonial de acuñación de macuquinas*. Lima: Banco Central de Reserva del Perú, Sección Numismática, 1991.
- Lazo García, Carlos. *Economía colonial y régimen monetario: Perú, siglos XVI–XIX*. Lima: Banco Central de Reserva del Perú, Fondo Editorial, 1992.
- López Beltrán, Clara. *La ruta de la plata: de Potosí al Pacífico: caminos, comercio y caravanas en los siglos XVI y XIX*. La Paz, Bolivia: Plural Editores, 2016.
- Mangan, Jane E. *Trading Roles: Gender, Ethnicity, and the Urban Economy in Colonial Potosí*. Durham: Duke University Press, 2005.
- McKinley, Michelle A. *Fractional Freedoms: Slavery, Intimacy, and Legal Mobilization in Colonial Lima, 1600–1700*. New York: Cambridge University Press, 2016.
- McMahon, Elizabeth. "Trafficking and Reenslavement: The Social Vulnerability of Women and Children in Nineteenth-Century East Africa." In *Trafficking in Slavery's Wake: Law and the Experience of Women and Children in Africa*, edited by Benjamin N. Lawrance and Richard L. Roberts, 29–44. Athens: Ohio University Press, 2012.
- Murra, John V. *The Economic Organization of the Inka State*. Greenwich: JAI Press, 1980.
- Oropeza Alba, Daniel. *Siglo XVII: La falsificación de la moneda en la villa imperial de Potosí*. Potosí: Casa Nacional de Moneda, 2013.
- Painter, Nell Irvin. "How We Think about the Term 'Enslaved' Matters," *The Guardian*, August 14, 3 (2019).
- Paton, Diana. *No Bond but the Law: Punishment, Race, and Gender in Jamaican State Formation, 1780–1870*. Durham: Duke University Press, 2004.

- Pike, Ruth. *Aristocrats and Traders; Sevillian Society in the Sixteenth Century*. Ithaca: Cornell University Press, 1972.
- Pike, Ruth. *Penal Servitude in Early Modern Spain*. Madison: University of Wisconsin Press, 1983.
- Quiroz, Francisco. "Aprendiendo juntos: indios, negros libres y esclavos en talleres de la Lima colonial." In *Trabajos y trabajadores en América Latina (siglos XVI–XXI)*, edited by Rossana Barragán R., 281–312. La Paz: Vicepresidencia del Estado Plurinacional de Bolivia, 2019.
- Revilla Orías, Paola A. *Entangled Coercion: African and Indigenous Labour in Charcas (16th–17th Century)*. Boston: De Gruyter Oldenbourg, 2020.
- Robins, Nicholas A. "La leyenda negra: esclavos negros en las minas de Potosí." In *Mitos expuestos: leyendas falsas de Bolivia*, edited by Nicholas A. Robins and Rosario Barahona Michel, 1: 11–38. Cochabamba, Bolivia: Grupo Editorial Kipus, 2014.
- Ruiz, Teofilo F. *Spanish Society, 1400–1600*. New York: Longman, 2001.
- Sarmiento de Gamboa, Pedro. *Historia de los incas [1572]*, 3rd ed. Edited by Angel Rosenblat. Buenos Aires: Emecé, 1947.
- Scott, Rebecca J. *Degrees of Freedom: Louisiana and Cuba After Slavery*. Cambridge: Belknap Press of Harvard University Press, 2005.
- Tandeter, Enrique. "Forced and Free Labour in Late Colonial Potosí." *Past & Present* 93 (1981): 98–136.
- Tandeter, Enrique. *Coercion and Market: Silver Mining in Colonial Potosí, 1692–1826*. Albuquerque: University of New Mexico Press, 1993.
- TePaske, John Jay. *A New World of Gold and Silver*. Vol. 21. Boston: Brill, 2010.
- Walker, Tamara J. *Exquisite Slaves: Race, Clothing, and Status in Colonial Lima*. New York: Cambridge University Press, 2017.
- Wolff, Inge. "Esclavitud y tráfico de negros en el Alto Perú, 1545–1640." Translated by Maren Urioste. *Historia y cultura* 4 (1981): 37–63.
- Zulawski, Ann. *They Eat from Their Labor: Work and Social Change in Colonial Bolivia*. Pittsburgh: University of Pittsburgh Press, 1995.

PART 3

Flows, Heterogenous Producers and Agency



The Silver of Potosí, 1580–1630

The Beating and Pumping of One of the Hearts of Early Globalization

Mariano A. Bonialian

1 Potosí, the Pacific and Early Globalization

When did globalization start? How can we define it? These questions have been discussed at large in global history studies for at least four decades. In principle, its historicity is among its main features: it is a process, rather than a sudden, impactful fact. The current global village seems to be characterized by speed and the technological revolution but even in a somewhat slow and fragile manner, it could be argued that the phenomenon existed long before. Kevin O'Rourke and Jeffrey Williamson have dated its onset in the first half of the nineteenth century. Based on mainly North Atlantic data, they suggest it started when the first international price convergence occurred, which accounted for the birth of a unified market across the globe.¹ This definition is obviously economistic. I would like to define globalization in a wider sense, by means of a historical approach strongly affected by the spatial dimension and the construction of social-economic relations: It could be defined as the construction of a network of economic, cultural, migratory, and social relations that connects macro regions. Corridors and long-distance paths—mainly maritime—enabled the connection of great spatial blocks. Long-distance commerce, transcontinental cash flows and the circulation of agents played a relevant role in world dynamics.

According to this definition, we could date the beginning of globalization centuries before. Dennis Flynn and Arturo Giráldez criticized Kevin O'Rourke's and Jeffrey Williamson's Eurocentric approach of only considering the transatlantic economy of the nineteenth century and the convergence of global prices. Considering China as a global pole and the transcontinental relations that it sustained with the West Indies through the Pacific, Flynn and Giráldez have dated the beginning of globalization to the end of the sixteenth century.

¹ Kevin O'Rourke and Jeffrey Williamson, *Globalization and History: The Evolution of a Nineteenth Century Atlantic Economy* (Cambridge: MIT Press, 1999).

Indeed, since 1570, the China-America link was the transcontinental relationship that was still due for the creation of a truly global network of relations—the Europe-Asia and transatlantic ones already existed. This way, the Chinese boats (called *junks*) that made the Macao-Cavite route, and the Manila galleon that linked the Acapulco port with the Philippines, were founding connectors of early globalization.²

The Flynn and Giráldez hypothesis is tributary of an important school of thought that emphasizes, among other characteristics, the double role that the imperial economy of the Ming dynasty played from the fifteenth century (1368 and 1644): silverization and goods-export capacity.³ In fact, China became the main warehouse for the silver that circulated all over the world—a “suction pump,” as it was described in the classic and often quoted study by Magalhaes Godinho.⁴ Between 1570 and 1640, three silver production spaces prevailed. Two of them were located in the West Indies: Potosí, in Peru, and Zacatecas, in Mexico. The third one was Japan. Precious metals from the West Indies reached China by two routes. First, there was a circuit that crossed the Atlantic towards Europe and then re-exported the Peruvian and Mexican precious metals to India and China through the Euro-Asiatic Baltic route, the Levant, and Cape of Good Hope routes. From the end of the sixteenth century to the end of the eighteenth century, 30% to 50% of the Hispanic-American silver imported by Europe was re-exported to the Chinese internal market.⁵ The second outlet

2 Dennis Flynn and Arturo Giráldez, “Born with a ‘Silver Spoon’: The Origin of World Trade in 1571,” *Journal of World History* 6, no. 2 (1995): 201–21. Both historians have produced numerous works about the subject, such as: “China and the Manila Galleons,” in *Japanese Industrialization and the Asian Economy*, ed. Heitha Kawakatsu and John Latham (London: Routledge, 1999), 71–90; “The Philippines as Imperial Profit Center in the 16th and 17th Centuries,” in *Monetary History in Global Perspective 1500–1800*, ed. Dennis Flynn, Michel Morineau, Richard Von Glahn (Madrid: Fundación Fomento de la Historia Económica, 1998), 17–25.

3 Here’s a brief list of studies on the role of China in global history: Victorino Magalhaes Godinho, *Os Descobrimentos e a Economia Mundial* (Lisboa: Arcádia, 1, 1963); André Gunder Frank, *ReOrient: Global Economy in the Asian Age* (London: University of California Press, 1998); John Lee, “Trade and Economy in Preindustrial East Asia, 1500–1800: East Asia in the Age of Global Integration,” *Journal of Asian Studies* 58, no. 1 (1999): 2–26; Kenneth Pomeranz, *The Great Divergence: Europe, China, and the Making of the Modern World Economy* (Princeton: Princeton University Press, 2000); Manuel Pérez García, *Global History with Chinese Characteristics: Autocratic States along the Silk Road in the Decline of the Spanish and Qing Empires 1680–1796* (Singapore: Palgrave-Macmillan, 2020).

4 The Mexican and Peruvian silver coin offset the European balance of trade deficit with China. Europe had little to offer China for the valued oriental goods.

5 Harry Cross, “South American Bullion Production and Export 1550–1750,” in *Precious Metals in the Later Medieval and Early Modern World*, ed. John F. Richards (Durham: North Carolina University Press, 1983), 397–423; William Atwell, “International Bullion Flows and the Chinese Economy circa 1530–1650,” *Past and Present* 95 (1982): 68–90; Alejandra Irigoin,

was across the Pacific, either by means of the Manila galleon or, in the case of Peruvian metal, the direct route between the Callao port, the Philippines, and Macao. China's silverization process reflected its high level of development. The globalization literature also highlighted China's remarkable capacity to export manufactured goods and products to consumer markets in Asia, Africa, Europe, and America: porcelain, spices, silk, ivory, furniture, fans, jade, pearls, muslin, carpets, calico, iron, copper, rice, and tea, among other products. By 1590, the Yangtze River economic belt showed higher manufacturing development levels than England, France, and Holland.⁶ Hence, the bipolar nature of globalization that referenced the West and China—and India to a lesser extent—as global development poles would remain true until the beginning of the nineteenth century, when this world phenomenon became unipolar, Western, with the consequent general Chinese crisis.

In the last few years, two studies with a global approach to Potosí were published. One was Kris Lane's work and the other is Angela Schottenhammer's essay. Lane's book is a long-term overview about Potosí's influence in the world and the world's influence on Potosí. Its capacity as a silver provider for global markets, as well as its great demand for international goods are analyzed there, among other issues. Schottenhammer, on the other hand, uncovers the presence of Potosí in the cartography designed by the Jesuits that arrived in China in the last years of the fourteenth century. With these maps, the Celestial Empire authorities were informed about the precious metal richness found in Peru. The news about the production peak of Potosí mining at the end of the sixteenth century reached not only the West but also the Ottoman Empire, Portuguese India, and the Ming dynasty's China.⁷ Around 1640, Potosí experienced a sharp decline in production, which led to currency devaluations and counterfeiting, in both domestic and external markets, as illustrated in Kris Lane's and Masaki Sato's chapters in this book.

In these pages, I present some ideas and evidence that hint at the active participation of the Potosí silver and the Peruvian agents mentioned in the sources as *peruleros*. These agents were responsible for the money movements

"The New World and the Global Silver Economy, 1500–1800," in *Global Economic History*, ed. G. Riello and T. Roy (London: Bloomsbury, 2018), 271–86.

6 Saito Osamu, "Japan," in *A History of the Global Economy*, ed. Joerg Baten (Cambridge: Cambridge University Press, 2016), 167–87.

7 Kris Lane, *Potosí: The Silver City That Changed the World* (Oakland: University of California Press, 2019); Angela Schottenhammer, "East Asia's Other New World, China and the Viceroyalty of Peru: A Neglected Aspect of Early Modern Maritime History," *Medieval History Journal* 23, no. 2 (2020): 181–239. See also Rossana Barragán, *Potosí Global: Viajando con sus primeras imágenes (1550–1650)* (La Paz: Editorial Plural, 2019).

of the Lima elite towards the global markets during the first decades of early globalization. First, we will analyze the Potosí silver production levels and circulation towards the external markets in the period 1580–1630. These were the decades of the peak production levels of Cerro Rico that were unmatched during the whole colonial period.⁸ This finding is revealed when compared with the production levels of the viceroyalties of Peru and Mexico and with Hispanic America. Regarding its exports circuits, there are three routes: 1. across the Atlantic from Portobelo to Seville; 2. from the River Plate to the Iberian Peninsula and Africa; and 3. the clandestine flow from the Callao port to New Spain and China across the Pacific. Finally, we will study the circulation of the *peruleros* towards Mexico and the Philippines and their participation in the trade fair held in the archipelago, known as the *pancada*. It is worth mentioning Iwasaki Cauti's study about the early expeditions to the East by the *peruleros* between 1580 and 1590. Additionally, essays by Ramiro Flores and Margarita Suárez followed the tracks of the *peruleros*' investments to the port of Acapulco. The former covers the period between the last decade of the sixteenth century and the first years of the seventeenth century and the latter covers the rest of the seventeenth century.⁹ Consequently, this chapter's contribution is to introduce the role of Potosí as a provider of precious metals to the trade flow and as one of the main centers of consumption of Chinese goods in the West Indies.

The chapter describes the circulation of Potosí silver towards Mexico and China during the decades of a boom in mining production, when Potosí's urban center was thriving with high levels of development in its services and consumption. Certainly, the circulation of Peruvian silver along the Central American Portobelo transatlantic route was greater than the one across the Pacific. Nevertheless, this Atlantic primacy should not minimize the remarkable role of the silver clandestine circuit and the *peruleros* in China's silverization process. The initial problem for a comparative exercise is that there are neither customs records nor serial economic data about Potosí silver exports

8 About the Potosí silver production at different times during the colonial period, see the works by Paula Zagalsky and Rossana Barragán that are included in this compilation.

9 Ramiro Flores, "El secreto encanto de Oriente: Comerciantes peruanos en la ruta transpacífica (1590–1610)," in *Passeurs, mediadores culturales y agentes de la primera globalización en el mundo ibérico, siglos XVI–XIX*, ed. Scarlett O'Phelan Godoy and Carmen Salazar-Soler (Lima: Pontificia Universidad Católica del Perú, 1995), 377–409; Margarita Suárez, "The Alternative Circuits of Silver: Lima and the Inter-Colonial Trade in the Pacific During the 17th Century," in *A Global Trading Network: The Spanish Empire in the World Economy (1580–1820)*, ed. Ignacio Martínez (Seville: Editorial Universidad de Sevilla, 2018), 239–60; Fernando Iwasaki Cauti, *Extremo Oriente y Perú* (Madrid: MAPFRE, 1992).

to Mexico and China. This lack of documentation is due to the fact that silver exports were prohibited after 1580 in order to guarantee Potosí shipments through the official transatlantic circuit. This study thus resorts to a thorough review of qualitative documents such as official reports, complaints, confiscations, and individual proven cases to establish a trend in the flow of Potosí silver through the Pacific. In spite of the restrictions, from the moment Potosí experienced its production boom, the viceroys of Peru and Mexico acted permissively and flexibly so that the *peruleros* and Potosí silver could circulate towards Mexico, the Philippines, and China. The constant granting of *asientos* to Peruvian individuals so that they could send their ships to Mexico, or even to the Philippines and back, resulted in a trade “privatization” scenario through the Pacific that could bypass any customs control.¹⁰ Thus, the complaints and reports seem veracious.

Most of the studies about the Manila galleon point out that China received Mexican silver exclusively.¹¹ There is little or no mention of the role of Potosí silver. There are exceptions, though. In his classic book *The Manila Galleon*, published in 1939, William Schurz noted the relevance of the Peruvian metal surplus during the decades of Cerro Rico’s peak production.¹² Woodrow Borah took the baton from Schurz and acknowledged the importance of Potosí silver in the transpacific journeys to the port of Cavite in his research about commerce between Mexico and Peru towards the end of the sixteenth century.¹³ The quoted works by Flynn and Giráldez emphasized the overall relevance of Potosí silver flow in China through the transpacific circuit, but they did not go into great detail.

10 See “Copia de un capítulo de carta de 16 de diciembre de 1585 del virrey de Nueva España”; “Copia del mandamiento de 31 de julio de 1585 del arzobispo de México para que los mercaderes que vienen de Filipinas para ir a Perú no paguen derechos de la salida del puerto de Acapulco”; “Copia del mandamiento de 9 de diciembre de 1585 para que se cobren en el puerto de Acapulco los derechos de las cosas de Filipinas conforme al almojarifazgo nuevo y viejo de Sevilla,” AGI, Filipinas, volumen 6, R. 4, expediente 44, fs. 31, 35 y 16; “Carta del virrey Gaspar de Zuñiga y Acevedo, conde de Monterrey,” 8-6-1599, Mexico, AGI, Mexico, volumen 24, número 18, fs. 1–2.

11 Classic works out of an abundant literature are as follows: Carmen Yuste, *El comercio de la Nueva España con Filipinas, 1570–1785* (México: INAH, 1984); Antonio Miguel Bernal, “La carrera del Pacífico: Filipinas en el sistema colonial de la carrera de Indias,” in *España y el Pacífico, Legaspi*, ed. Leoncio Cabrero (Madrid: Sociedad Estatal de Conmemoraciones Culturales, 2004), 485–525; Vera Valdés Lakowsky, *De las minas al mar: Historia de la plata mexicana en Asia, 1565–1834* (Mexico: Fondo de Cultura Económica, 1987).

12 William Schurz, *The Manila Galleon* (New York: E. P. Dutton, 1939).

13 Woodrow Borah, *Early Colonial Trade and Navigation Between Mexico and Perú* (Berkeley: University of California, 1954).

My previous research has described the participation of the viceroyalty of Peru in Asian commerce during the long period spanning from the end of the sixteenth century to the beginning of the nineteenth century.¹⁴ There, the analysis focused on the long duration and macro-history of an economic model of circulation between China and the West Indies in the framework of the Spanish monarchy. While the research also included the transcendent role that Potosí played in the early colonial period by guaranteeing operations in transpacific relations, the present chapter is a first approach to this specific case.

2 The Beat: Potosí's Production, a "Substance that Supports the Whole of Peru"

This phrase was written by Luis de Velasco y Castilla, viceroy of Peru, between 1596 and 1604, in the first lines of his *relación* (report) to his successor, Gaspar de Zúñiga y Acevedo: that "among the great things that this province contains, the greatest and main one is Potosí because from it flows the substance that supports the whole of Peru."¹⁵ The viceroy's words remind us of Carlos Sempat Assadourian's depiction of Potosí as the main viceroyalty economic pole that enabled the creation of a colonial domestic market. The "Peruvian space" commodified via the articulation of viceroyalty regional economies with the productive pole of Potosí and Lima, which offered them investments, raw materials, and products. It was the first "realization" of silver into commodity-money (D-M), an object that could be traded. Assadourian's contribution focused on the study of the creation and consolidation of a colonial domestic market in Peru. Even though external circulation was not within its scope, it is worth mentioning that in the first pages of his report, he pointed to a second "realization" of silver into commodity-money in the international markets of Europe, Mexico, and China through the outlets of this metal: Portobelo, the

14 Mariano Bonialian, *China en la América colonial: Bienes, mercados, comercio y cultura del consumo desde México hasta Buenos Aires* (México: Instituto Mora-Biblos, 2014); Mariano Bonialian, *El Pacífico hispanoamericano: Política y comercio asiático en el Imperio español (1680–1784). La centralidad de lo marginal* (México: El Colegio de México, 2012); Mariano Bonialian, *La América española: entre el Pacífico y el Atlántico: Globalización mercantil y economía política, 1540–1840* (México: El Colegio de México, 2019).

15 "Relación del virrey Luis de Velazco al conde de Monterrey sobre el estado del Perú," in Ricardo Beltrán and Róspide, *Colección de las Memorias o Relaciones que escribieron los virreyes del Perú acerca del estado en que dejaban las cosas generales del Reino* (Madrid: Impresión del Asilo de Huérfanos del S. C. de Jesús, 1921), 108–9.

River Plate and the Callao through the Pacific.¹⁶ To a certain extent, this chapter delve into issues that Assadourian already pinpointed.

Table 6.1 shows the remarkable role that Potosí played in the production and circulation of silver within and outside of the viceroyalty. Between 1580 and 1630, the production and records of silver in Potosí accounted for 86% of the total production of the viceroyalty. Oruro mines produced 10% and only 4% came from mines in the rest of the viceroyalty.¹⁷ Given this general figure, it may be concluded that Potosinean production accounted for 60% of the precious metal elaborated in Hispanic America. The rest came from the mines of New Spain, particularly Zacatecas, and a minimal amount from the rest of the mines of Hispanic America. Between 1591 and 1600, Potosí silver represented 40% of the metal that circulated around the world.¹⁸

These figures are impressive, but they look even more significant when we display them per decade or five-year period, as shown in Table 6.1 and Figure 6.1. Between 1571 and 1580, the royal coffers of Potosí accounted for 90.4% of viceroyalty production. In the next decades, the percentage was even higher: 97.93% for the period 1581–1590, and 98.63% for 1591–1600. In the sixteenth century, this trend started to decline, but still maintained very high levels: 1601–1610: 92.59%; 1611–1620: 73.94%, and 1621–1630: 68.67%. A preliminary conclusion that may be drawn but that has not been emphasized enough is that virtually *all* the Peruvian silver was produced and registered by Potosí, so the numerous documentary references mentioning “outgoing Peruvian silver” or “Peruvian silver,” either by official channels or smuggled, pointed to the production, registration, and circulation of silver from Cerro Rico. Its export through various Peruvian ports—the official anchorage of the Callao port or

16 See the chart on page 152, where his innovative global approach shows its singularity given the historiographic trends of the Hispanic American academia at that time: Carlos Assadourian, *El sistema de la economía colonial: Mercado interno, regiones y espacio económico* (Lima: Instituto de Estudios Peruanos, 1982), 152; see also Carlos Assadourian, “La producción de la mercancía dinero en la formación del mercado interno colonial,” in *Ensayos sobre el desarrollo económico de México y América Latina (1500–1975)*, ed. Enrique Florescano (México: Fondo de Cultura Económica, 1979), 223–92.

17 TePaske and Brown include the production of smaller mines located very near Cerro Rico within the production of Potosí. It should be noted that, during the period under study, the production of many Charcas mines was included in the royal coffer records as coming from Potosí—so not all of the production registered as coming from Potosí came from Cerro Rico. For further information on this topic, see Paula Zagalsky, “Trabajo indígena, conflictos y justicia en la Villa Imperial de Potosí y su Cerro Rico, una aproximación. Virreinato del Perú, siglos XVI–XVI,” *Historia y Justicia* 9 (2017): 20127.

18 Cross, “South American Bullion Production and Export 1550–1750.”

TABLE 6.1 Production and circulation of Potosinean silver, 1570–1630 (in millions of pesos)

Period	Production				Circulation	
	Mexico	Peru	Potosí	%	Peru-Mexico	Panama-Seville
1571–1575	19.61	15.74	14.23	90.4		
1576–1580	19.61	15.74	14.23	90.4		
1581–1585	17.05	32.4	31.73	97.93	10	16.31
1586–1590	17.05	32.4	31.73	97.93	10	18.04 ^a
1591–1595	20.85	35.1	34.62	98.63	10	22.64
1596–1600	20.85	35.1	34.62	98.63	10	18.01
1601–1605	24.06	36.07	33.4	92.59	10	16.24
1606–1610	24.06	36.07	33.4	92.59	10	17.71
1611–1615	25.19	36.31	26.85	73.94		29.40
1616–1620	25.19	36.31	26.85	73.94		27.37
1621–1625	23.95	37.26	25.59	68.67	10	23.83 ^a
1626–1630	23.95	37.26	25.59	68.67	10	21.76

a 1586–90: for Hamilton it was 26.341.130; 1621–1625: Hamilton's figure. According to Morineau, 9.07 is a questionable number.

SOURCE: JOHN TEPASKE, *A NEW WORLD OF GOLD AND SILVER, ATLANTIC WORLD. EUROPE, AFRICA AND THE AMERICAS* (LEIDEN: BRILL, 2010), 56–122; IN PANAMÁ-SEVILLE: EARL HAMILTON, *EL TESORO AMERICANO Y LA REVOLUCIÓN DE LOS PRECIOS EN ESPAÑA, 1501–1650* (BARCELONA: ARIEL, 1975), 47–55; MICHEL MORINEAU, *INCROYABLES GAZETTES ET FABULEUX MÉTAUX* (LONDON: CAMBRIDGE UNIVERSITY PRESS, 1985), 71–77; ABOUT THE PERU-MEXICO CIRCULATION, SEE FOOTNOTES AND THE CHAPTER'S BIBLIOGRAPHY

other informal coastal locations, such as Paita, Guayaquil, or even Buenos Aires—allowed for the monetization of the economies of Europe and Asia.

3 The “Pumping”: Potosinean Silver Circulation towards Global Markets

The last two columns of Table 6.1 refer to the two most important outlets of Peruvian silver. The first one is the official route of Callao–Panama–Seville, based on the numbers of the famous Morineau data series. The second one refers to the strong illegal circuit that linked Peru with New Spain, which is

documented in a wide range of qualitative sources and bibliographic references. There was a third silver journey: the one that connected Potosí to the port of Buenos Aires, in the Atlantic mouth of the Paraguay Governorate and Buenos Aires. In spite of its significance, I decided not to include it in the table due to the lack of serial data. First, we will focus on the transatlantic cases of Portobelo and Buenos Aires, and then on the exports through the Pacific towards China. In these flows, eight-reales assayed pesos predominated, but it is worth highlighting that, in the case of the Pacific flow, there was a considerable metallic mass in the form of bars of different sizes, bullions or silver paste. Since it was an illegal circuit, the metal exports were neither registered nor coined.

3.1 *Peru-Panama-Seville*

Undoubtedly, during the Cerro Rico production boom, the highest percentage of Potosinean silver circulated towards the *feria de* Portobelo to be transported in the Spanish galleon to Seville. In Table 6.1, we have gathered the classic figures by Morineau in quinquennial averages, which are the most accepted statistics in historiography.¹⁹ Nevertheless, it must be acknowledged that the figures before 1620 by Morineau come mainly from qualitative and partial sources of the Castilian administration and do not differ much from the general statistics that Hamilton had detailed a decade before.²⁰ Another limitation of the Morineau series is that he does not frequently offer specific data about silver shipments on the Portobelo galleon. For the most part, the figures account for the total exports from New Spain and Peru. We have considered Hamilton's study bearing in mind that, as mentioned, 60% of the total production of Hispanic American precious metals came from Peru, and in Peru, almost entirely from Potosí. Another limitation of the Morineau figures lies in the fact that the precious metal shipments from South America consider the output of silver from Buenos Aires or other Atlantic Hispanic American ports on *navíos de registro* (a vessel licensed to sail independently of the treasure fleet). There are hardly any details about this latter issue.

The truth is the first destination port of the Potosinean silver was Seville, where a great part of this metal flowed towards other European and Asian markets. The first remarkable finding of Table 6.1 is that, in spite of the importance of the transatlantic circuit, the amount of Peruvian-Potosinean silver exported through Portobelo represented 50%–60% of the production of Cerro Rico.

19 Morineau, *Incroyables gazettes*, 50–84.

20 Morineau, *Incroyables gazettes*, 71–77; Hamilton, *El tesoro americano*, 64–67.

More precisely, between 1581 and 1585, 51.4% of its production was exported; 1586–1590: 56.84%; 1591–1595: 65%; 1596–1600: 52%; 1601–1605: 48% (45% if we consider Peru's entire production); 1606–1610: 53% (49%). These percentages are relatively lower than the ones traditionally mentioned. The high percentage of precious metals retention within the viceroyalty clearly supports Assadourian's premise about the highly commodified regional economies of the viceroyalty domestic markets during those decades before its export. During those three decades, over 40% of the Potosinean silver may have found illegal channels for export: whether through the isthmus of Panama with foreign traders (English, Dutch, or Portuguese), through the port of Buenos Aires, or through the Pacific to Mexico and China, a route that we will cover later on.

The illegal exports could be explained to a large extent by the long interval between the galleon arrivals in Portobelo. According to Morineau's data, there is a gap of two or three years between the arrivals of the galleon—far from the annual timeliness required by the regulations. The scenario after 1610 was different. In the period 1611–1615, the Peruvian silver exported from Portobelo accounted for 80% of the viceroyalty production; in the period 1616–1620, it was 75%; in the period 1621–1625, 63%, according to Hamilton's data, and 24% according to Morineau's data; and in the period 1626–1630, it amounted to 58%.

Considering the numbers, in the period between 1610 and 1630, the silver inflow to Seville was “more successful” and guaranteed the arrival of this metal to the peninsula. In the previous period (1580–1610), the scenario was different because the leakage of Potosinean silver towards Mexico/China through the Pacific seems to have affected the official transatlantic circuit. Figure 6.1 indicates that the 10 million quinquennial pesos that may have flowed to Mexico accounted for more than half of the silver exported by Portobelo. Between 1596 and 1600, trade through the Pacific accounted for 55.5% of the total amount of silver concentrated in Portobelo; in the period 1601–1605, 61.6%, and 56.4% in the following quinquennium. These averages are significantly high, and they explain the consistent complaints about scarcity of Potosinean silver and the failure of the Panama exchanges due to the leakage to Mexico and China.²¹ The tension about circulation flows was anticipated by the Viceroy Marqués de Cañete in 1593 when he stated, “the tradings and commerce of this kingdom

21 In 1596, the *oidor* (judge) of the Royal Audience of Panama, Attorney Salazar, pointed out that there was little silver for the operation of the Portobelo fleet because the Peruvian market was receiving merchandise from Castile through Mexico in exchange for the great amount of silver from Potosí. See “Carta del oidor licenciado Salazar, 1596-5-25,” Panamá, AGI, Panamá, 14, R. 12, N. 74, fs. 3–4.

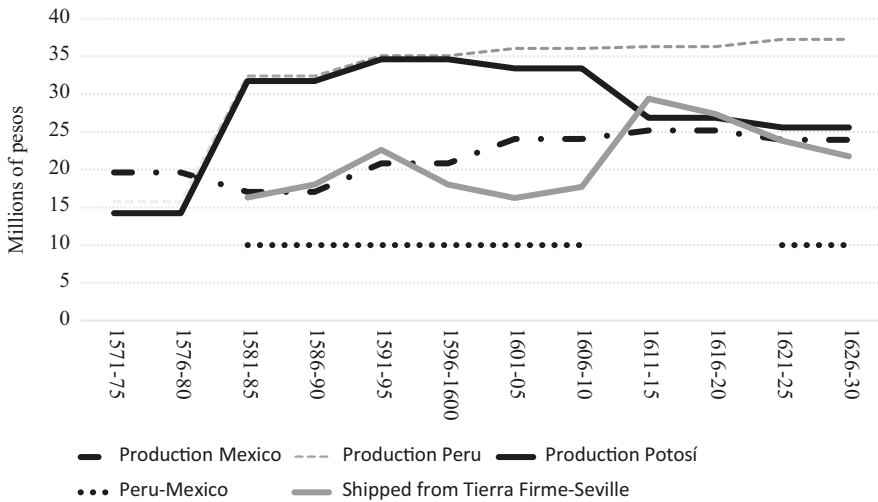


FIGURE 6.1 Production and circulation of registered silver: Potosí, Peru, and Mexico, 1570–1630 (in millions of pesos)

SOURCE: SEE TABLE 6.1

[Peru] with that [Spain] are being so much reduced that the money is taken to New Spain for use.”²² Juan Manuel de Anaya, royal treasurer of Lima, reported in 1599 that “so much silver goes to Mexico from this kingdom every year that it is almost the same quantity that goes to Castile from individuals.”²³ The treasurer might have exaggerated, but it is undeniable that both circulation paths competed for Potosinean silver, a fact that clearly illustrates an early globalization process with two gravitational centers: China and Europe. When Potosí experienced its production boom, the circulation of the mining surplus exposed the global bipolarity, with Europe and China acting as poles that attracted the silver flowing from the West Indies. In this global framework, the Potosinean silver exports circuits towards the East through the Pacific compromised the development of the transatlantic relationship between Seville and Peru.

22 “Carta a Su Majestad del virrey Marqués de Cañete,” *Los Reyes*, 20 de noviembre de 1593, in Roberto Levillier, *Gobernantes del Perú. Cartas y papeles. Documentos del Archivo General de Indias, siglo XVI, XIII* (Madrid: Colección de Publicaciones Históricas de la Biblioteca del Congreso Argentino, 1921), 115.

23 Quoted in Demetrio Ramos, *Minería y comercio interprovincial en Hispanoamérica, siglos XVI, XVII, y XVIII* (Valladolid: Universidad de Valladolid, 1970), 232–33.

3.2 *Buenos Aires-Brazil-Europe and Africa*

Table 6.2 shows the official records of the value of merchandise imported and exported through the River Plate. The most conspicuous finding is the deficit in the balance of trade, with higher import than export values. There is a minimal difference between the balance of trade in the period 1586–1595, during which Buenos Aires had certain licenses for slave and silver trading, and the balance of trade after 1594, when a royal decree suspended the trading licenses and the Río de La Plata viceroyalty had to depend on Lima as a supply center. The incoming and outgoing merchandise and agricultural products that landed in Seville, Brazil, and Buenos Aires cannot account for the whole exchange dynamics of the Buenos Aires port. These numbers include neither the incoming slave trade nor the significant amount of Potosinean silver outflow.

TABLE 6.2 Trade values at Buenos Aires port (in pieces of eight)

Period	Imports	Exports
1586–1595	1,810,314	84,758
1596–1605	1,411,282	753,436
1606–1615	7,534,123	1,151,678
1616–1625	7,957,579	360,904
1626–1635	1,792,427	255,974

SOURCE: JUAN AGUSTÍN GARCÍA, *LA CIUDAD INDIANA. BUENOS AIRES DESDE 1600 HASTA MEDIADOS DEL SIGLO XVIII* (BUENOS AIRES: TALLERES GRÁFICOS ARGENTINOS L. J. ROSSO, 1937), 227

In his overview about the viceroyalty of Peru, Luis de Velasco described Buenos Aires as the “port of Potosí.” The River Plate port was recognized as one of the exit paths for silver to the transatlantic world. Fernand Braudel and, later, Enrique Tandeter defined Potosí-Buenos Aires as the geographical-historical axis for the drainage of Potosí surplus.²⁴ The classic research by Boxer about *Salvador de Sá* should not be overlooked. In Chapter 3, he analyses “the

24 Fernand Braudel, “Du Potosí à Buenos Aires: une route clandestine de l’argent: fin du xvie, debut xviiie siecle,” *Annales* 3–4 (1948): 546–50; Enrique Tandeter, “El eje Potosí-Buenos Aires en el imperio español,” in *Gobernare il mondo: L’impero spagnolo dal xv al xix secolo*, edited by Massimo Ganci y Ruggiero Romano (Palermo: Facoltà di Lettere, Università di Palermo, 1991), 185–202.

road to Potosí” from the perspective of Portuguese Brazil.²⁵ This axis combines parts of the journey that were accomplished by land joining Salta, Córdoba, and Buenos Aires and “from there, a great part of the coins made in Potosí is shipped to Brazil, Guinea and other parts, and up north its scarcity is already felt and here down south, even more.”²⁶

There are plenty of complaints about the scarcity of Potosinean silver in Lima and throughout Peru, due to its leakage to Buenos Aires. In 1594, the Crown imposed laws to prevent its leakage and reinforce the Portobelo route. Evidently, the enforcement of these laws was quite limited. Potosinean silver was exchanged for slaves brought to the Buenos Aires port by the Portuguese slave traders coming from Angola after a stop in Brazil. Two smuggled goods circulation levels can be traced along the great southern axis. On one level, local products from the River Plate area, such as animal fat, flours, salted cured meat, and other products, were sent to Brazil. However, on a higher and more intense level, the silver from Potosí was used to buy slaves and Castilian and European objects. Braudel suggests that no less than 80% of the basket of European goods and slaves that entered through the port was paid with silver.²⁷

In 1602, Friar Martín Ignacio de Loyola urged the Crown to allow the circulation of regional products between Brazil and Buenos Aires. A border control would limit the significant amount of silver that was smuggled to pay for African slaves bound for Potosí or Lima. If Buenos Aires continued to be banned from trading, “the dealings from Brazil to Potosí and from Potosí to Brazil” would increase.²⁸ This quote raises a doubt. Was the friar referring to the direct corridor from the ports of Brazil and Buenos Aires to the mining center through the “camino real,” that is, the royal road? Or was he referring to the alternative pathway linking the Atlantic port with Potosí through the Franciscan missions located on the Iguazú, in the southeast of Paraguay and the southwest of Brazil?

In Figure 6.1, estimates for silver exports through the River Plate port are omitted. The lack of evidence with reliable data about outgoing silver and incoming slaves forces us to navigate hypothetical scenarios. One exercise that could be done is calculating the price and number of slaves that entered

25 Charles Boxer, *Salvador de Sá and the Struggle for Brazil and Angola 1602–1686* (University of London: Athlone Press, 1952).

26 *Relación* Luis de Velasco, in *Colección de las Memorias*, 129.

27 Braudel, “Du Potosí à Buenos Aires,” 146–48.

28 “Carta de Martín Ignacio de Loyola, obispo del Río de la Plata, al presidente del Consejo de Indias, adjuntándole memorial sobre Filipinas en Documentos sobre el comercio de Filipinas,” [1602] AGI, Filipinas, 35, no. 47, fol. 823–25.

through the port and estimating their price in terms of exported silver value. According to Moutoukias, between 1580 and 1630, the port of Buenos Aires received—both legally and illegally—about 16,875 slaves from Angola, which would account for 338 imported slaves per year. This number is deduced from the fact that 25,000–30,000 slaves arrived between 1586 and 1665. Vila Vilar suggests an even higher number: 44,000 slaves between 1595 and 1640, about 450 per year. If we agree with the Vila Vilar hypothesis that a slave price at that time was 80 to 120 pesos, the outgoing Potosinean silver might have exceeded 5 million pesos worth, according to his estimates. In contrast, Moutoukias's calculations reach only 2 million. These are remarkably low figures for silver outbound shipments.²⁹ If we add the amount of silver exported through Portobelo to Seville and estimates of the outflow from the ports of Peru to New Spain and China—which are detailed below—we get the following result: in the period 1580–1610, 84.5% of the Potosí silver output flowed through those two locations.³⁰ A great part of the rest of the silver (15.5%) was probably sent to the port of Buenos Aires. Considering the calculations in Figure 6.1 and the unreliable official balance of trade in Table 6.2, we estimate an outgoing flow of Potosinean silver amounting to 500,000 to 1 million annual pesos through the port of Buenos Aires.

3.3 *Peru-Mexico-China*

In 1580, China instituted a new tax law, known as the “Single Whip Law,” which forced Chinese farmers, artisans, and merchants to pay taxes by means of silver instead of the traditional paper money. A great part of the then 100 million inhabitants of China needed to have silver in order to pay their taxes to the state, ruled by the Ming dynasty. This tax reform resulted in a strong monetization of the Asian internal economy.³¹ Japan's silver mines supplied the Chinese

29 For further details on specific cases: Alice Canabrava, *O Comércio português no Rio da Prata 1580–1640* (Sao Paulo: Universidad de São Paulo, 1984); Raúl Molina, *Las primeras experiencias comerciales del Plata: el comercio marítimo 1580–1700* (Buenos Aires: Taller Gráfico Dorrego, 1966), 76–79; Zacarías Moutoukias, *Contrabando y control colonial en el siglo XVII: Buenos Aires, el Atlántico y el espacio peruano* (Buenos Aires: Centro Editor de América Latina, 1988), 65–68; Enriqueta Vila Vilar, *Hispanoamérica y el comercio de esclavos* (Seville: Escuela de Estudios Hispanoamericanos de Sevilla, 1977), 208–9.

30 In five-year periods, the results are as follows: 1581–1585, a total of 26.31 (millions of pesos), which account for 82% of Potosí's production during those years; 1586–1590: 28.04, 88%; 1591–1595: 32.64, 94%; 1596–1600: 28.01, 80%; 1601–1605: 26.74, 79.9%; and 1606–1610: 27.71, 83%.

31 Fang-chung Liang, *The Single-whip Method of Taxation in China* (Cambridge: Harvard University Press, 1956); Ray Huang, *Taxation and Governmental Finance in Sixteenth-Century Ming China* (London: Cambridge University Press, 1974).

economy through the Portuguese traders. Potosí, Mexico, and Japan became a financial source for this Asian empire. The “Single Whip Law” and the Potosí golden age were two fundamental pieces in the dynamics of early globalization. The remarkable increase in China’s demand for silver produced a rise in its price in the domestic market.³² Since China needed silver but did not produce it, the silver-gold arbitrage rendered more profits than in any other world market. Silver was more expensive in China than in Europe, so more goods could be bought and at higher profitability margins. During the sixteenth century and early seventeenth century, the gold-silver ratio was 1:5 to 1:7 in Canton (Guangzhou), 1:8 in India, and 1:12 to 1:14 in Spain.³³

The Peruvian agents, known as *peruleros*, who are studied below, mobilized the Potosinean silver to the Philippines through the Pacific. A significant portion of the Potosinean coins carried by the *peruleros* ended in Mexico, where the Peruvian economy was offered not only silk, porcelain, and other Chinese articles but also international products, such as Castilian and European textiles that were brought aboard the Veracruz fleet and were left out by the New Spain market. Thus, the Peruvian agents who arrived in Mexico with silver had access to a wide range of low-priced products exempt from the customs duties that they had to pay in Portobelo.³⁴

Even though in the 1580 decade, the Spanish Crown banned silver shipments from Peru to China, evidence points to an eastbound flow of “many millions,” “great loads of metal,” and even mentions of “the whole of Peru silver has been swept off.”³⁵ Viceroy Cañete calculated the annual outflows between 1580 and 1593 were worth 2 to 3 million pesos, approximately.³⁶ Between 1597 and 1601, 12 million pesos in Hispanic American silver coins were apparently exported from Acapulco to the Philippines, out of which 8 to 10 million were Potosinean silver coins and the rest, New Spain coins.³⁷ Royal officers from Lima reported that, after Viceroy Luis de Velasco’s (1596–1604) rule, over a million Potosinean pesos were leaked per year without paying the *avería* tax “and most of it is sent from Acapulco to China.”³⁸ In 1609, Francisco Valverde de Mercado, governor

32 Flynn and Giráldez, “Born with a ‘Silver Spoon,’” 201–21.

33 Flynn and Giráldez, “Born with a ‘Silver Spoon,’” 205–16.

34 Bonialian, *China en la América*, 71–116.

35 Carta del oidor licenciado Salazar, 1596-5-25 Panamá, AGI, Panamá, 14, R. 12, N. 74, fs. 3. “Carta del virrey Marqués de Cañete a Su Majestad,” Callao, 12 de abril de 1594, in Levillier, *Gobernantes del Perú*, Tomo 13, 136.

36 Margarita Suárez, *Comercio y fraude en el Perú colonial. Las estrategias mercantiles de un banquero* (Lima: Instituto de Estudios Peruanos, 1995), 34.

37 Borah, *Early Colonial Trade*, 227–36.

38 Ramos, *Minería y comercio*, 233.

of Panama, reported that two ships from Peru carried 2 million pesos. This provoked “such a paralysis in the Lima market” that it was impossible to dispatch the Southern Fleet with silver to trade in Panama.³⁹ The series of testimonials and complaints leads us to assume an average silver exportation of 2 million pesos per year, adding to about 10 million pesos in five-year periods, as detailed in Figure 6.1.

In view of the Peruvian reluctance to stop the silver outflow to the East, in 1593, there was a new royal decree to export to China only New Spanish silver for 500,000 pesos on the Manila galleon. However, according to testimonies, the Manila galleon continued to carry an annual average of 3 million pesos of Mexican and Peruvian silver. By the end of the sixteenth century and the beginning of the seventeenth century, the *cabildo* (council) of the city of Mexico reported exports of 2 to 3 million pesos per year; a plausible estimate since in 1601, the *Santo Tomás* galleon exported 2,500,000. Let us add two figures contributed by Louisa Hoberman: during the decade 1601–1610, trade with the Philippines amounted to 3,500,000 pesos and, between 1611 and 1620, the silver outflow was about 5 million pesos.⁴⁰

It is difficult to discern what percentage of the 2 or 3 million pesos transported every year by the *nao de China* was in fact silver produced and registered in Potosí. Its journey is even more obscured because part of it admittedly got into Mexico City. While Potosinean coins were in the format accepted by the Chinese, silver in bars or bullions was brought into Mexico to be engraved and coined by the Mexican mint.⁴¹ The eight-reales coins from Potosí were used as money and a medium of exchange in China and India. Later, during the seventeenth century, Zacatecas silver coined in Mexico would overtake the role that Cerro Rico’s Peruvian metal played in Asia decades before.⁴² This observation would explain why there are not many mentions of Potosí coins in circulation in New Spain. More than half the Potosinean silver that arrived in Mexico might have continued en route to China. Therefore, an average of 1 to 1.5 million Potosinean pesos per year might have reached the Philippine *pancada* in exchange for Chinese products. If that is the case, between 1580 and 1620, 30% to 50% of the silver that flowed to China was from Cerro Rico.

39 “Carta de Francisco Valverde de Mercado, 15 de agosto de 1609,” AGI, Panamá, 16, R. 9, N. 89, f. 14.

40 Louisa Hoberman, *Mexico’s Merchant Elite, 1590–1660: Silver, State and Society* (Durham: Duke University Press, 1991), 218–19.

41 “Carta del virrey Luis de Velasco, el joven,” AGI, México, 27, no. 66, fs. 5–6.

42 About the importance of the silver coins from the Zacatecas mines in China in the second half of the seventeenth and the eighteenth century, see Irigoin, “The New World,” 271–86.

A noteworthy fact is that the mobilization of Potosinean coins to the Philippines and Canton did have an alternative, direct route, bypassing the mediation of the Acapulco New Spanish port. Violating the royal orders decreed as from 1580, there were at least four substantial commercial expeditions from Peru to the Philippines and Canton between 1583 and 1591. The initiative was led by the commercial and political elite of Lima. First, in 1583, the ship *Nuestra Señora de la Cinta* left the Callao port with a large number of *peruleros* furnished with Potosinean silver in bars, coins, and bullions supplied by the most prominent merchants of Lima with the aim of purchasing oriental products. The exact amount of silver transported on that ship is unknown but a large amount can be safely assumed considering the myriad *peruleros* that arrived in the East among the passengers.⁴³ Second, in July 1589, the royal prosecutor of the Philippine islands, attorney Gaspar de Ayala, sent a letter to the Council of the Indies notifying the presence of a Peruvian ship entering the port of Macao “on the Canton river” that was ready to invest “a significant amount of silver” in Chinese merchandise and which had not been seen in the Philippine islands. According to the prosecutor, the ship compromised the *pancada* event in the Philippines because only “nine or ten *junks* had arrived that year.”⁴⁴ Third, in 1590, Viceroy Marqués de Cañete sent a ship to China clandestinely, without permission from the king. According to testimonies, the money from the viceroy, the *oidores*, and the most prominent merchants that made its way to the East on that ship amounted to 120,000 pesos approximately, in addition to “several thousand pesos” from other, less important merchants from Lima.⁴⁵ Finally, in 1591, the ship *Nuestra Señora del Rosario* sailed from the Callao port to the “provinces of China.”⁴⁶ The number of travelers in this expedition is unknown. The Royal Audience of Panama had reported this expedition in July as carrying more than 200,000 pesos in reales in pieces of eight and warned that another ship was ready to imitate the venture, sailing from Panama with a similar amount of Potosinean silver.⁴⁷ It is very likely that

43 “Relación del segundo viaje del jesuita Alonso Sánchez a China en 1584,” AGI, Filipinas, volumen 79, expediente 13, fs. 4–5; Iwasaki Cauti, *Extremo Oriente y Perú*, 96–134.

44 “Carta de Gaspar de Ayala a Felipe II, 15 de julio de 1589,” in Emma Helen Blair and James Alexander Robertson, *The Philippine Islands 1493–1898*, Vol. 3 (Cleveland: Arthur H. Clark Company, 1903–1908), 112.

45 “Visita de la Audiencia y Oficiales Reales de Lima,” AGI, Lima, 274, fs. 223. For further details, see Iwasaki Cauti, *Extremo Oriente y Perú*, 190.

46 AGNL, no. 1, frb1, 15, 142, fs. 2239 r y v., poder; AGNL, no. 1, frb1, 15, 725, fs. 2990–2992, PODER; AGNL, no. 1, raci, 22, 1007, fs. 1316–1317; AGNL, no. 1, dcm1, 23, 142, fs. 193. AGNL, no. 1, frb1, 15, 802, fs. 3099–3101.

47 “Carta de Miguel Ruiz de Elduayen, contador de real hacienda de Tierra Firme,” 28 de enero de 1592, AGI, Panamá, 33 no. 145, s/n fs.

other direct commercial ventures could have taken place between Peru and the East. Even with all the limitations of studying a clandestine flow, it is evident that the estimates of 2 or 3 million worth of Potosinean silver exported to China per year gain credibility if we consider the direct route.

3.4 *Peruleros: Transporting Agents of Potosinean Silver across the World*

To help understand the paramount role played by Potosinean silver in early globalization markets, there is no historical phenomenon more enlightening than the agency of the so-called *peruleros*. They have been defined as commission agents, factors, or representatives of the viceroyalty economic and political elite who traveled to different markets of the world to invest Potosinean silver in international products. They were truly global agents, with a mobility that went beyond viceregal and even imperial borders. This term can also be found in Lusitanian historiography: the *peruleiros*, Portuguese slavers who arrived at the Río de la Plata port to sell slaves in exchange for silver from Potosí.⁴⁸

Be that as it may, the *perulero* was a truly global agent, moving across the European and Southeast Asian markets. We can visualize this mobilization at a planetary scale during the seventeenth century, but it was most intense between 1580 and 1620, when Potosí registered the peak of its productivity. The availability of coins, bullion, and bars in various sizes produced in Cerro Rico enabled the *peruleros* to sail simultaneously across the Atlantic and the Pacific oceans to buy Castilian, European, and Asian products. As Potosí's silver production began to decrease, their participation declined until it became insignificant. Indeed, their presence can be found all over Europe, in the markets of Genoa, Milan, Lisbon, and Seville itself, and also in Portobelo, Buenos Aires, and Brazil, across Hispanic American Pacific ports like Guayaquil, Huatulco, or Acapulco and, especially, in the Philippines and Cantonese China.⁴⁹ Their presence on the transatlantic route up to the Sevillian epicenter has been recognized in historiography.⁵⁰ For example, García Fuentes found that in 1591, the value of the merchandise belonging to the *peruleros* inside the galleons headed for Panama was 56% of the total cargo; in 1605, 46%, and in 1615, 37%.⁵¹

48 Canabrava, *O Comércio português*; Charles Boxer, *Salvador de Sá*.

49 Bonialian, *La América española*, 128–48.

50 Pierre Chaunu, *Seville et Atlantique, 1500–1650*, Tomos IV, V, VIII, (Paris: Libraire Armand Colin, 1955–59); Eufemio Lorenzo Sanz, *Comercio de España con América en la época de Felipe II, Los mercaderes y el tráfico indiano*, (Valladolid: Instituto Cultural Simancas, 1979); Lutgardo García Fuentes, *Los peruleros y el comercio de Sevilla con las Indias, 1580–1630* (Seville: Universidad de Sevilla, 1997); Suárez, *Comercio y fraude*.

51 García Fuentes, *Los peruleros*, 58.

He could trace more than five hundred galleons in Seville (527), carrying over a million pesos in merchandise, headed for Portobelo between 1580 and 1620. The *perulero*, furnished with Potosinean silver, had a great deal of power: he could avoid the Spanish middleman, he had the authority to decide whether or not to call for a trade fair, and he could even determine whether to dispatch a fleet with the European merchandise acquired in the Panamanian isthmus.

Quantification is not a promising way to analyze the Potosinean silver shipments that sailed the transpacific routes. A more conclusive scenario is presented in Table 6.3, where specific cases of wealthy *peruleros* in the markets of Mexico, China, or the Philippines are listed. The *peruleros* advance on the Pacific routes took place towards the last decade of the sixteenth century and the first few years of the next century, when Potosinean metal records accounted for 99% and 93% of the total amount produced in the viceroyalty (Figure 6.1).

It is worth reexamining some specific facts. In 1599, the governor of the Philippines, Francisco Tello de Guzmán, informed the Crown that the 500,000 pesos tickets reserved in theory for Philippines inhabitants to buy Chinese merchandise imported in *junks* were in the hands of *peruleros*, and since they were “very wealthy people,⁵² they came loaded with money” and “having found lots of clothes in the hands of the Chinese, they spent their money regardless of their price.”⁵³ Two years later, the same governor reported a similar phenomenon; “the *peruleros* come with licenses by the Viceroys of New Spain and some others that pretend to pass as sailors, so that they can spend their money and go back to their markets.”⁵⁴ An official document, which probably dates back to 1602, warned the viceroy of New Spain not to grant the *peruleros* passage to the Philippines with coins from Potosí because “they come to spend them and then go back, making the merchandise prices rise over 50 percent.”⁵⁵ This last quote sheds light into the consequences of the presence of *peruleros* in eastern lands. The rise in the prices of merchandise offered in this Asian market was caused by the willingness of the *peruleros* carrying great amounts of silver to

52 The term “gruesa” used to describe the *peruleros* in the original Spanish quote can be translated as “big,” “abundant,” “important.” I translated it as “wealthy” in the English rendering.

53 “Carta de Tello sobre asuntos de gobierno,” 1599-7-12 Manila, AGI, Filipinas, 6, R. 9, N. 167, fs. 22–23.

54 “Capítulo de carta de Tello sobre licencias a peruleros,” AGI, Filipinas, 6, R.9, N. 178, fs. 1–4. June 6, 1601.

55 Informe impreso de Alonso Fernández de Castro [relator del Consejo]: “Puntos de lo que tienen suplicado las Islas Filipinas sobre la contratación de ellas” (probably 1602), AGI, Filipinas 35, no. 47, fs. 832–33.

TABLE 6.3 *Peruleros* in the Philippines and China, 1580–1601

	Name	Mobility range	Notes
1583	Cristóbal González de Rosas (passenger in Pedro Rodríguez's ship)	From Lima to the Philippines	Power of attorney to buy merchandise in the Philippines for 2,000 pesos
1583	Pedro Rodríguez	From Lima to the Philippines	<i>Recibo de obligación</i> (purchase mandate document): purchase of 1,000 silver reales' worth of Chinese clothes. Granted by Blas Hernández (notary public working in the <i>cabildo</i>)
1583	Cristóbal Fernández de Rosas	From Lima to the Philippines	Power of attorney to buy Chinese merchandise for 2,000 pesos granted by Blas Hernández
1583	Juan de Mendoza	Philippines, Guangzhou, Lanquin	Arrived in the Philippines in a ship named <i>Nuestra Señora de la Cinta</i> .
1583–91	Melchor de Roelas	Philippines	With thousands of pesos to buy Chinese goods at the <i>pancada</i>
1588	Juan de Solís	Nagasaki, Philippines	Captain of the second ship to ever sail directly from Peru to Asia "with lots of silver to expend in merchandise"
1591	Rodrigo de Córdoba Guzmán	Philippines	Captain of the third ship to ever sail from Peru to China. Viceroy Marquis of Cañete's nephew
1591	Pedro López Pinto	Acapulco-Mexico	Carrying loads of mercury
1591	Diego López de Toledo	Mexico-Philippines	Mercury import ordered by Marquis of Cañete

TABLE 6.3 *Peruleros* in the Philippines and China, 1580–1601 (*cont.*)

	Name	Mobility range	Notes
1596	Miguel González Morón (a <i>maestre de la nao</i> in the ship <i>La Visitación</i>)	Mexico-Philippines	Power of attorney to buy merchandise from the Philippines
1593–97	Leandro Felipe (Jesuit from Peru)	China-Malacca-Yemen-Japan	Front man for Viceroy Marquis of Cañete's silver
1593–97	Gonzalo de Belmonte (Jesuit from Peru)	China-Malacca-Yemen-Japan	Lender of Peruvian silver
1598	Jorge Corzo	From Lima to China	Power of attorney granted by Juan Arias (silk merchant) to do business and attend to legal matters in Mexico and the provinces of China
1598	Martín de Ribero Sánchez	From Lima to China	Receipt of silver to buy merchandise in the provinces of China from Gerónimo Girón (notary public of the Royal Audience of Lima).
1599	Juan Núñez de Anaya	Callao-Philippines	He sent nine containers of Chinese merchandise from the Philippines to Juan de Segura Sotelo.
1599	Sebastián Aguilar	Philippines	Receipt and proof of purchase for Chinese merchandise sent to Diego Núñez de Campoverde (merchant from Lima)
1600	Diego Hernández "de Manila"	Philippines	Power of attorney granted by Antonio Ponce Terán and Francisco de Mansilla from Lima to collect the sale proceeds for merchandise sent from Manila

TABLE 6.3 *Peruleros* in the Philippines and China, 1580–1601 (*cont.*)

	Name	Mobility range	Notes
1600	Alonso de Hita	To Philippines and China	Receipt in pesos from Pedro de Ortega Sotomayor to buy merchandise and ship it to Callao
1601	Juan López de Mugaren	Manila resident	Power of attorney granted by Francisco de Mansilla Marroquí, governor and general depositary of Lima, to “collect and do business”
1601	Bernardo Venegas de Vergara	Route to China	Letter and powers of attorney granted by Francisco Muñoz Zenteno, Simón Rodríguez, and Juan Rodríguez de Cepeda to ship merchandise from China

SOURCE: IWASAKI CAUTI, *EXTREMO ORIENTE*, 24–202; BONIALIAN, *LA AMÉRICA ESPAÑOLA*, 141–43

accept the prices of Asian merchandise offered by the Chinese. Not only did they generate increased prices but also an increased incoming volume of this merchandise from the southeast coast of China.

According to the data offered by historian Li Qing, Figure 6.2 presents the total annual values of Chinese merchandise brought by *junks* to the Philippines from the port of Canton. The first observation that comes to mind are the two big cycles with opposing trends: 1. 1598–1613: growth and peak; 2. 1614–1632: drop. The peak is closely related to the arrival of *peruleros* at the Philippine *pancada*. The sudden drop of 1604 seems to be related to the royal decree extended to all the governments of the West Indies completely banning the entrance of Chinese merchandise to Panama and the Peruvian viceroyalty. Why did the 1598 leap occur? Perhaps we can find clues in Governor Tello’s complaint about the great amounts illegally shipped to the Philippines by the *peruleros* in order to buy silk, fabrics, and other Chinese products. The circulation and consumption of these products in the Peruvian viceroyalty point to the *peruleros*’ strategy. Potosí’s silver enabled the arrival of Chinese products in

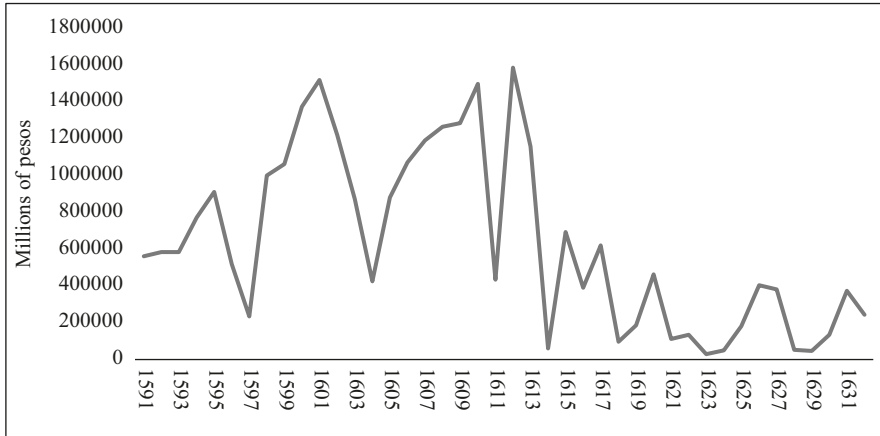


FIGURE 6.2 Annual value of Chinese merchandise Imports in the Philippines made by *junks* (in millions of pesos)

SOURCE: LI QING, “TRADE AND ITS HISTORICAL TREND BETWEEN CHINA AND THE PHILIPPINES IN THE LATE MING DYNASTY: AN ANALYSIS ON THE ALMOJARIFAZGO DATA,” *RESEARCH IN CHINESE ECONOMIC HISTORY* 3 (2018), 21

the Philippines to be shipped in Manila galleons and, upon arrival in Acapulco, be reshipped to Lima so that, eventually, a large cargo would be dispatched to the city of Potosí.

4 Potosí as a Consumption Node: The Case of Chinese Goods

During the decades under study, Potosí was the most populated city in the viceroyalty. The number of inhabitants is still up for debate. The highest figures can be found in a classic study by Lewis Hanke where 120,000 inhabitants are estimated for 1580, with a growing trend that reaches 160,000 people towards 1650.⁵⁶ An anonymous document titled “Descripción de la Villa y Minas de Potosí” dating back to 1603 mentions 120,000 inhabitants.⁵⁷ A 1610 “census” that Arzáns de Orsúa y Vela mentions in his *Historia de la Villa imperial* suggests 160,000 people (76,000 Indigenous people [*indios*], 6,000 enslaved people [*negros*], and 75,000 *criollos*, Spaniards, and foreigners).⁵⁸ Setting these

56 Bartolomé Arzáns de Orsúa y Vela, *Historia de la villa imperial de Potosí*, ed. Lewis Hanke and Gunnar Mendoza (Providence: Brown University Press, 1965), 18.

57 “Descripción de la Villa y Minas de Potosí” [1603], in *Relaciones Geográficas de Indias*, Tomo 2, ed. Jiménez de la Espada (España: Ministerio de Fomento, 1881), 119.

58 Arzáns de Orsúa y Vela, *Historia de la villa imperial*, 286.

differences aside, the numbers show that, in the peak of its mining activity, Potosí was not only one of the most important cities in Hispanic America, but also comparable, in terms of population, to the main cities of the Western world such as Amsterdam, London, Seville, or Venice. It surpassed Mexico, which in 1600, held a bit more than 100,000 inhabitants, and towards 1630, had dropped to 60,000. Potosí was much more populated than the two other most populated cities in Peru: Lima and Huancavelica. The city of Lima had a little more than 14,000 inhabitants at the beginning of the seventeenth century, and 26,000 in 1610.⁵⁹ Around that time, Huancavelica, the city of mercury, had 10,000 inhabitants. Both cities account for 7%, 10%, or 15% of Potosí's population.

In order to perceive its remarkable consumption, it is worth considering the details included in the anonymous 1603 *Descripción*.⁶⁰ According to this text, Potosí had a main square where short-, middle-, and long-distance trade flows of local, regional, and international goods converged. It also makes mention of a local market named *el Carbón* and another market where imported goods from Asia, Mexico, and Europe were offered. There were eighty *pulperías* (grocery stores), over thirty stores for Spanish and Lima hats, and 24 stores selling clothes from Castile, Quito, Huánuco and Mexico. The Spanish church was located in the main square, closely surrounded by thirteen Indigenous churches. Six schools "for boys" are mentioned as well and also, at least since 1616, a coliseum where there was an intense religious and cultural sociability. Indeed, the description paints Potosí as a truly cosmopolitan city, with a combination of elite and "popular" consuming universes produced by short- and long-distance trade flows.

This description shows a highly developed urban center and an appetite for international goods from Europe, India, and China. Next, I will present evidence about an important topic in this chapter: the connection between China and Potosí. During this period, Potosí, known as the Villa Imperial de Potosí by then, was an important consumption center of two main eastern products: silk and porcelain. The *peruleros*, factors, and agents of the merchants from Lima would buy goods in the Philippine *pancada* with silver from Potosí and then send the cargo to the port of Acapulco on the Manila galleon. From

59 Carmen Salazar-Soler, "Minería y Moneda en la época colonial temprana," in *Economía del período colonial temprano: Compendio de la Historia económica del Perú*, Tomo 2, ed. Carlos Contreras (Lima: Banco Central de la Reserva del Perú/Instituto de Estudios Peruanos, 2009), 109–228; Carlos Contreras, *La ciudad del mercurio. Huancavelica 1570–1700* (Perú: Instituto de Estudios Peruanos, 1982), 42.

60 "Descripción de la Villa y Minas de Potosí," 113–36.

there, Peruvian ships transported the cargo to the port of Callao, where Lima's investors checked all the cargo upon arrival to make sure a portion of Castilian and Asian goods was delivered to Potosí. There are two cases found in the General Archive of Lima that are worth noting. Around 1599, Juan Núñez de Anaya, a rich merchant from Potosí, traveled to the Philippine islands carrying silver belonging to Juan de Segura, an important merchant from Lima. From the islands, Anaya sent ten boxes of merchandise to Acapulco bound for the Callao port. Juan de Segura delivered nine of them to the Arica port on the ship *Sebastián* in the hands of *maestre* Francisco Majuelo. The cargo was supposed to be delivered to the bailiff of the Holy Office of Potosí, Hernando Jaramillo de Andrada and to Arequipa's *corregidor*, Pedro de Valencia, to be sold later at retail price. Among the goods inside those "nine Chinese merchandise boxes," there were more than fifty pounds of different varieties of silk—raw silk, floss silk, white, black, and colored silk—and almost one hundred dozen plates and bowls from China to be sold to the families of the Villa Imperial de Potosí. A year later, in 1600, Anaya, the merchant from Potosí who had sent the cargo from the Philippines returned to the city of Lima.⁶¹

The second case has to do with another known merchant from Lima, Diego Núñez de Campoverde, who was interested in Asian contracts at least since 1595 and formed a partnership with his colleague, Francisco Cano de Nebrisa. A Chinese merchandise shipment was sent to them to the port of Callao, dispatched from the Philippines via Mexico by their factors, Sebastián de Aguilar and Martín Rivero Sánchez. Campoverde was aware of the high demand that Chinese products had in Potosí and for that reason, in two opportunities, he hired Francisco Ramírez Olivos, who lived in Potosí but traveled frequently to Lima to sell items in Potosí brought to him from the Philippines. The first contract was valid for two years, from 1595 to 1597, enough time for Olivos to sell Chinese and Castilian merchandise for 98,293 pesos. The value of the merchandise is not specified in the settlement contract.⁶² Ramírez Olivos's deals in Potosí were so successful that Campoverde, Francisco Cano, and other merchants in Lima did not hesitate to hire him for a second two-and-a-half-year period in Potosí: from October 1597 to May 1600. According to the contract notary, Olivos

took a lot of Diego Núñez de Campoverde's, Francisco Cano de Nebrisa's and other people's property which *amount to more than two hundred*

61 AGNL, no. 1, jbe1, 12, 469, fs. 774–776; AGNL, no. 1, jbe1, 12, 472, fs. 779 r–v., AGNL, no. 1, jbe1, 12, 473, fs. 780r–v.

62 AGNL, no. 1, frb1, 14, 549, fs. 1742–1751.

thousand assayed pesos and, in order to collect the proceeds of the deals, Olivos had to visit Potosí in person to provide for Catalina and her children.⁶³

Olivos traveled from Callao to the Arica port on Juan de la Luna's ship, along with captain Pedro del Solar Obregón, carrying a few handbags because, for the most part, the shipment was transported "by mules and boats," "by land and sea." Of a total of 200,000 pesos in merchandise, there were more than seventy-two pieces of Chinese silk that were worth 61,164 pesos and belonged to Campoverde.⁶⁴ Francisco Nebrisa's investment amounted to 20,000 pesos, and the rest was from "other people."⁶⁵

In 1592, the viceroy of Peru, Marquis de Cañete, justified before the king the permissions given to take silver from Potosí to Mexico to purchase Chinese silk:

They bring these loads of clothes from China and they would not have paid greater fees or *almojarifazgos* had they brought them from New Spain.⁶⁶

The shipments included the finest Chinese silks and ordinary silk in comparable quantities. The first was destined to the privileged class and the second, to poor Spaniards, Indian chiefs, Indigenous people, and even slaves throughout Peru. In 1592, Cañete himself said that "since Chinese silks are so cheap, they are widely sold, especially to the chiefs and Indians because they find their price more convenient than that of their former traditional clothing."⁶⁷ In relation to the Spanish intent of consuming silk from Castile and Granada, banning the Chinese silk, the viceroy responded:

Chinese merchandise is so cheap for everyone and the merchandise from Spain is so expensive that it is impossible for me not to allow merchandise from China to be sold in this kingdom, since a man can dress a

63 AGNL, no. 1, frb1, 14, 759, fs. 1022 r-v. Italics are mine.

64 AGNL, no. 1, frb1, 16, 155, fs. 243-53. Date: 22-05-1600.

65 AGNL, no. 1, frb1, 14, 688, fs. 1944-46, 25-06-1597.

66 "Carta del marqués de Cañete al secretario Juan de Ibarra dando explicaciones sobre ciertos actos de su gobierno," Los Reyes, 28 de abril de 1592, Levillier, *Gobernantes*, Tomo 12, 242-43.

67 "Carta a Su Majestad del virrey Marqués de Cañete," Los Reyes, 20 de noviembre de 1593, Levillier, *Gobernantes*, Tomo 13, 115.

woman with such silks for 200 reales, but he cannot do that with those from Castile for two hundred pesos.⁶⁸

Thus, the flow of Chinese silk to Peru enabled the creation of a Chinese silk road that started in the port of Canton and stretched as far as Buenos Aires, Mexico City, Panama, Guayaquil, Lima, Salta, and Córdoba. All of these cities were stopover and transit points where Chinese silk was also consumed.⁶⁹

Among the few products that Peru needed to import were iron and steel, essential supplies to work the mines in Potosí. Its importation from Seville through Panama is known in historiography. However, various inconsistent sources claim that since 1590, iron and steel from China could have entered Potosí through Lima. In 1592, for example, Viceroy Marquis de Cañete informed that, in spite of the prohibition he had allowed,

[i]tems coming from China because they are very much necessary to this kingdom ... especially copper and iron, materials which, had they not come in quantities, the work at the mines would cease.⁷⁰

It seems clear that he was referring to the mines of Potosí. Finally, let us draw some provisional conclusions. First, when we include an analysis of the transpacific economy, the role played by Potosí as a silver production center and a market that consumed international goods gains more relevance than ever before in the framework of early globalization's economy. Second, even without data series and records of silver exports to China, these pages offer important evidence on the participation of Cerro Rico and the exports of its silver through the transpacific route in China's silverization process. Third, it is necessary to include the *peruleros* as the main economic agents who managed to liaise and connect the great markets of early globalization, not only because of their notorious participation in the transatlantic front but also their participation in the transpacific world. In conclusion, they account for a true Hispanic American agency in the global economy of their time.

68 "Carta del virrey Marqués de Cañete a Su Majestad," Callao, 12 de abril de 1594, Levillier, *Gobernantes*, Tomo 13, 136.

69 Bonialian, *China en la América*, 87–106.

70 "Carta del marqués de Cañete al secretario Juan de Ibarra dando explicaciones sobre ciertos actos de su gobierno," Los Reyes, 28 de abril de 1592, Levillier, *Gobernantes*, Tomo 12, 242.

Primary Sources

AGI. Archivo General de Indias [General Archive of the Indies], Seville, Spain.

AGNL. Archivo General de la Nación de Lima [National Archive of Peru].

Bibliography

- Arzáns de Orsúa y Vela, Bartolomé. *Historia de la villa imperial de Potosí*, edited by Lewis Hanke and Mendoza Gunnar. Providence: Brown University Press, 1965.
- Assadourian, Carlos. "La producción de la mercancía dinero en la formación del mercado interno colonial." In *Ensayos sobre el desarrollo económico de México y América Latina (1500–1975)*, edited by Enrique Florescano, 223–92. México: Fondo de Cultura Económica, 1979.
- Assadourian, Carlos. *El Sistema de la economía colonial. Mercado interno, regiones y espacio económico*. Lima: Instituto de Estudios Peruanos, 1982.
- Atwell, William. "International Bullion Flows and the Chinese Economy circa 1530–1650." *Past and Present* 95 (1982): 68–90.
- Barragán, Rossana. *Potosí Global. Viajando con sus primeras imágenes (1550–1650)*. La Paz: Editorial Plural, 2019.
- Beltrán y Róspide, Ricardo. *Colección de las Memorias o Relaciones que escribieron los virreyes del Perú acerca del estado en que dejaban las cosas generales del Reino*. Madrid: Impresión del Asilo de Huérfanos del S. C. de Jesús, 1921.
- Bernal, Antonio Miguel. "La carrera del Pacífico: Filipinas en el sistema colonial de la carrera de Indias." In *España y el Pacífico, Legaspi*, edited by Leoncio Cabrero, 485–525. Madrid: Sociedad Estatal de Conmemoraciones Culturales, 2004.
- Blair, Emma Helen and James Alexander Robertson. *The Philippine Islands 1493–1898*, Vols. 7 and 12. Cleveland: Arthur H. Clark Company, 1903–1908.
- Bonialian, Mariano. *El Pacífico hispanoamericano. Política y comercio asiático en el Imperio español (1680–1784). La centralidad de lo marginal*. México: El Colegio de México, 2012.
- Bonialian, Mariano. *China en la América colonial. Bienes, mercados, comercio y cultura del consumo desde México hasta Buenos Aires*. México: Instituto Mora-Biblos, 2014.
- Bonialian, Mariano. *La América española: entre el Pacífico y el Atlántico. Globalización mercantil y economía política, 1540–1840*. México: El Colegio de México, 2019.
- Borah, Woodrow. *Early Colonial Trade and Navigation between Mexico and Perú*. Berkeley: University of California Press, 1954.
- Boxer, Charles. *Salvador de Sá and the Struggle for Brazil and Angola 1602–1686*. University of London: Athlone Press, 1952.

- Braudel, Fernand. "Du Potosí à Buenos Aires: une route clandestine de l'argent: fin du xv^e, début xvii^e siècle," *Annales* 3–4 (1948): 546–50.
- Canabrava, Alice. *O Comércio português no Rio da Prata 1580–1640*. Sao Paulo: Universidad de São Paulo, 1984.
- Contreras, Carlos. *La ciudad del mercurio: Huancavelica 1570–1700*. Perú: Instituto de Estudios Peruanos, 1982.
- Cross, Harry. "South American Bullion Production and Export 1550–1750." In *Precious Metals in the Later Medieval and Early Modern World*, edited by John Richards, 397–423. Durham: Carolina Academic Press, 1983.
- Chaunu, Pierre. *Seville et Atlantique, 1500–1650*, Tomos IV, V, VIII. París: Librairie Armand Colin, 1955–59.
- "Descripción de la Villa y Minas de Potosí" [1603]. In *Relaciones Geográficas de Indias*, Tomo 2, edited by Jiménez de la Espada, 113–36. España: Ministerio de Fomento, 1881.
- Flores, Ramiro. "El secreto encanto de Oriente. Comerciantes peruanos en la ruta transpacífica (1590–1610)." In *Passeurs, mediadores culturales y agentes de la primera globalización en el mundo ibérico, siglos XVI–XIX*, edited by Scarlett O'Phelan Godoy and Carmen Salazar-Soler, 377–409. Lima: Pontificia Universidad Católica del Perú, 1995.
- Flynn, Dennis and Arturo Giráldez. "Born with a 'Silver Spoon': The Origin of World Trade in 1571," *Journal of World History* 6, no. 2 (1995): 201–21.
- Flynn, Dennis and Arturo Giráldez. "The Philippines as Imperial Profit Center in the 16th and 17th Centuries." In *Monetary History in Global Perspective 1500–1800*, edited by Dennis Flynn, Michel Morineau, Richard Von Glahn, 17–25. Madrid: Fundación Fomento de la Historia Económica, 1998.
- Flynn, Dennis and Arturo Giráldez. "China and the Manila Galleons." In *Japanese Industrialization and the Asian Economy*, edited by John Latham and Heita Kawakatsu, 71–90. London: Routledge, 1999.
- García, Juan Agustín. *La Ciudad Indiana (Buenos Aires desde 1600 hasta mediados del siglo XVIII)*. Buenos Aires: Talleres gráficos argentinos L. J. Rosso, 1937.
- García Fuentes, Lutgardo. *Los peruleros y el comercio de Sevilla con las Indias, 1580–1630*. Seville: Universidad de Sevilla, 1997.
- Gunder Frank, André. *ReOrient: Global Economy in the Asian Age*. Berkeley: University of California Press, 1998.
- Hamilton, Earl. *El tesoro americano y la revolución de los precios en España, 1501–1650*. Barcelona: Ariel, 1975.
- Huang, Ray. *Taxation and Governmental Finance in Sixteenth-Century Ming China*. Cambridge: Cambridge University Press, 1974.
- Hoberman, Louisa. *Mexico's Merchant Elite, 1590–1660: Silver, State and Society*. Durham: Duke University Press, 1991.

- Irigoin, Alejandra. "The New World and the Global Silver Economy, 1500–1800." In *Global Economic History*, edited by G. Riello and T. Roy, 271–86. London: Bloomsbury, 2018.
- Iwasaki Cauti, Fernando. *Extremo Oriente y Perú en el siglo XVI*. Madrid: MAPFRE, 1992.
- Lane, Kris. *Potosí: The Silver City That Changed the World*. Berkeley: University of California Press, 2019.
- Lee, John. "Trade and Economy in Preindustrial East Asia, 1500–1800: East Asia in the Age of Global Integration." *Journal of Asian Studies* 58, no. 1 (1999): 2–26.
- Levillier, Roberto. *Gobernantes del Perú. Cartas y papeles. Documentos del Archivo General de Indias, siglo XVI*. Madrid: Colección de Publicaciones Históricas de la Biblioteca del Congreso Argentino, 1921.
- Liang, Fang-chung. *The Single-whip Method of Taxation in China*. Cambridge: Cambridge University Press, 1956.
- Li Qing. "Trade and its Historical Trend between China and the Philippines in the Late Ming Dynasty: An Analysis on the Almojarifazgo Data." *Research in Chinese Economic History* 3 (2018): 171–81.
- Lorenzo Sanz, Eufemio. *Comercio de España con América en la época de Felipe II, Los mercaderes y el tráfico indiano*. Valladolid: Instituto Cultural Simancas, 1979.
- Magalhaes Godinho, Vitorino. *Os Descobrimentos e a Economia Mundial*. Lisboa: Arcádia, 1963.
- Molina, Raúl. *Las primeras experiencias comerciales del Plata: el comercio marítimo 1580–1700*. Buenos Aires: Taller Gráfico Dorrego, 1966.
- Morineau, Michel. *Incroyables gazettes et fabuleux métaux*. London: Cambridge University Press, 1985.
- Moutoukias, Zacarías. *Contrabando y control colonial en el siglo XVII: Buenos Aires, el Atlántico y el espacio peruano*. Buenos Aires: Centro Editor de América Latina, 1988.
- O'Rourke, Kevin H., and Jeffrey Williamson. *Globalization and History: The Evolution of a Nineteenth Century Atlantic Economy*. Cambridge: MIT Press, 1999.
- Osamu, Saito. "Japan." In *A History of the Global Economy*, edited by Joerg Baten, 167–87. Cambridge: Cambridge University Press, 2016.
- Pérez García, Manuel. *Global History with Chinese Characteristics: Autocratic States along the Silk Road in the Decline of the Spanish and Qing Empires, 1680–1796*. Singapore: Palgrave-Macmillan, 2020.
- Pomeranz, Kenneth. *The Great Divergence: Europe, China, and the Making of the Modern World Economy*. Princeton: Princeton University Press, 2000.
- Ramos, Demetrio. *Minería y comercio interprovincial en Hispanoamérica, siglos XVI, XVII, and XVIII*. Valladolid: Universidad de Valladolid, 1970.
- Salazar-Soler, Carmen. "Minería y Moneda en la época colonial temprana." In *Economía del período colonial temprano. Compendio de la Historia económica del Perú*, Tomo 2. Edited by Carlos Contreras, 109–228. Lima: Banco Central de la Reserva del Perú/ Instituto de Estudios Peruanos, 2009.

- Schottenhammer, Angela. "East Asia's Other New World, China and the Viceroyalty of Peru: A Neglected Aspect of Early Modern Maritime History." *Medieval History Journal* 23, no. 2 (2020): 181–239.
- Schurz, William. *The Manila Galleon*. New York: E. P. Dutton, 1939.
- Suárez, Margarita. *Comercio y fraude en el Perú colonial. Las estrategias mercantiles de un banquero*. Lima: Instituto de Estudios Peruanos, 1995.
- Suárez, Margarita. "The Alternative Circuits of Silver: Lima and the Inter-Colonial Trade in the Pacific during the 17th Century." In *A Global Trading Network: The Spanish Empire in the World Economy (1580–1820)*, edited by Ignacio Martínez: 239–60. Seville: Editorial Universidad de Sevilla, 2018.
- Tandeter, Enrique. "El eje Potosí-Buenos Aires en el imperio español." In *Gobernare il mondo. L'imperio spagnolo dal xv al xix secolo*, edited by Massimo Ganci and Ruggiero Romano, 185–202. Palermo: Facoltà di Lettere, Università di Palermo, 1991.
- TePaske, John, and Kendall Brown. *A New World of Gold and Silver, Atlantic world. Europe, Africa and the Americas*, Vol. 21. Leiden: Brill, 2010.
- Valdés Lakowsky, Vera. *De las minas al mar. Historia de la plata mexicana en Asia, 1565–1834*. México: Fondo de Cultura Económica, 1987.
- Velasco y Castilla, Luis. "Relación del virrey Luis de Velazco al conde de Monterrey sobre el estado del Perú." In *Colección de las Memorias o Relaciones que escribieron los virreyes del Perú acerca del estado en que dejaban las cosas generales del Reino*, edited by Ricardo Beltrán and Róspide, 108–9. Madrid: Impresión del Asilo de Huérfanos del S. C. de Jesús, 1921.
- Vila Vilar, Enriqueta. *Hispanoamérica y el comercio de esclavos*. Sevilla: Escuela de Estudios Hispanoamericanos de Sevilla, 1977.
- Yuste, Carmen. *El comercio de la Nueva España con Filipinas, 1570–1785*. México: INAH, 1984.
- Zagalsky, Paula. "Trabajo indígena, conflictos y justicia en la Villa Imperial de Potosí y su Cerro Rico, una aproximación. Virreinato del Perú, siglos XVI–XVI." *Historia y Justicia* 9 (2017): 20.

Lords of Mines and Mills during the First Great Silver Boom of Potosí (1569–1610)

Paula C. Zagalsky

1 Introduction

Since the 1950s, researchers have explored the central aspects of the colonial social, political, cultural, and economic life of Potosí. Included in these are studies of the organization and systems of mining labor, the reconstruction of the stages of colonial silver production through the books of the royal treasury, commerce, and markets in the town, as well as analyses of the regional products coming from varying and distant places “drawn” by the Potosí “hub” or “pole” of attraction, the institutional and political history with its peaks of conflict, and, finally, the history of Potosí’s colonial architecture and art.¹ In this historiographic framework, which includes decades of accumulated work and knowledge, this chapter analyzes the universe of the so-called “miners” (*mineros*) of Potosí during the first silver production peak (1580–1610). The analysis begins with the government of Viceroy Francisco de Toledo (1569–1581), during which a set of reforms gave impetus to the years of greatest silver production throughout the history of Potosí (1580–1610), according to the official records of the Royal Hacienda (see Figure 2, “Silver production in Potosí, 1545–1810,” in the Introduction to this volume as well as Figure 7.1).

1 Included here is a very short but essential list of works: Carlos S. Assadourian, “La producción de la mercancía dinero en la formación del mercado interno colonial,” in *Ensayos sobre el desarrollo económico de México y América Latina (1500–1975)*, ed. Enrique Florescano, 223–92 (México: Economic Culture Fund, 1979); Peter J. Bakewell, *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650* (Albuquerque: University of New Mexico Press, 1984); Jeffrey A. Cole, *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes* (Stanford: Stanford University Press, 1985); Enrique Tandeter, *Coacción y mercado: la minería de la plata en el Potosí colonial, 1692–1826* (Buenos Aires: Sudamericana, 1992); John J. TePaske, *A New World of Gold and Silver* (Leiden: Brill, 2010); Teresa Gisbert, *Iconografía y mitos indígenas en el arte* (La Paz: Gisbert, 1980); Andrés Eichmann and Marcela Inch, eds., *La construcción de lo urbano en Potosí y La Plata (siglos XVI–XVII)* (Sucre: Spanish Ministry of Culture, FCBCB and ABNB, [2008] 2011). This chapter was translated by Jenna Elizabeth Hall.

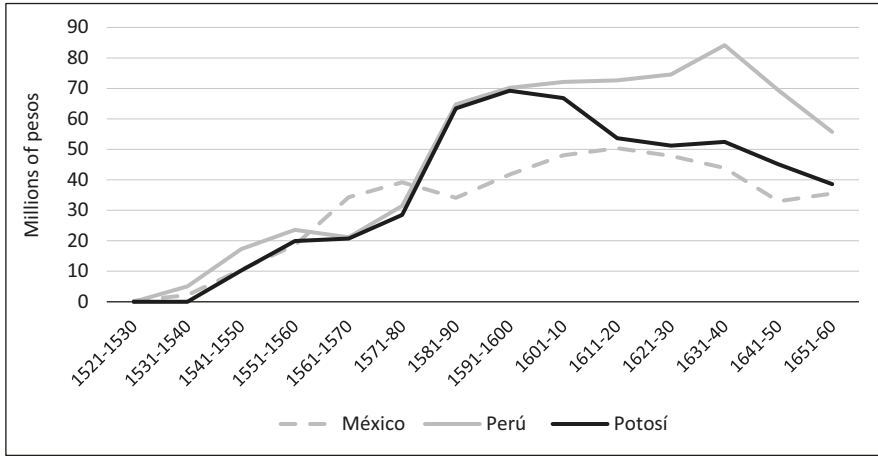


FIGURE 7.1 Silver production in Spanish America, 1521–1660 (in millions of pesos of 272 maravedis)

SOURCE: PREPARED FROM: J. J. TEPASKE, *A NEW WORLD OF GOLD AND SILVER* (LEIDEN: BRILL, 2010)

With prominent exceptions, studies of these crucial actors in the world of Potosí mining labor and their companies remain scarce, especially for the selected period. Some research on larger, multi-sector miners stands out, especially of those who entered the universe of colonial trade;² those involved in the trade that connected Potosí with merchants from Lima and La Paz;³ and those who appeared in investigations on the armed conflict unleashed in the Villa Imperial between 1622 and 1625 (the so-called war between *vicuñas* and *vascongados* -Basques). The latter was an episode during which individuals closely linked to mining, but also to political, economic, local, and regional power structures and governance, played a relevant role.⁴ Hence, the first part

2 Peter J. Bakewell, *Antonio López de Quiroga: industrial minero del Potosí colonial* (Potosí: Bolivian University “Tomás Frías,” 1973).

3 Margarita Suárez, *Comercio y fraude en el Perú colonial: las estrategias mercantiles de un banquero* (Lima: IEP, 1995); Clara López-Beltrán, *Alianzas familiares, élite, género y negocios en La Paz, siglo XVII* (Lima: IEP, 1998); Margarita Suárez, *Desafíos trasatlánticos. Mercaderes, banqueros y el estado en el Perú virreinal, 1600–1700* (Lima: IFEA, PUCP, Riva Agüero Institute, FCE, 2001); Clara López-Beltrán, *La Ruta de la Plata: de Potosí al Pacífico, caminos, comercio y caravanas en los siglos XVI y XIX* (La Paz, Plural, 2016).

4 Alberto Crespo, *La guerra entre vicuñas y vascongados, Potosí, 1622–1625* (Sucre: Universidad Andina Simón Bolívar, 1997); David Dressing, “Social Tensions in Early Seventeenth-Century Potosí” (PhD diss., Tulane University, 2007); Paulina Numhauser, “Un asunto banal: las luchas de Vicuñas y Vascongados en Potosí (siglo XVII),” *Illes i Imperis* 14 (2012): 113–38; Bernd

of this chapter highlights the colonial meanings associated with the word “miner,” especially in Potosí during the period of study, and investigates a series of words linked to this universe.

The second part of this chapter systematizes unpublished information from the records of the large beneficiaries of the mining *mita* in 1578 and 1610, as well as additional fragmented data from 1582. This documented evidence offers valid indicators to identify those who made up the segment of most prominent miners or *azogueros* (mill owners and the main consumers of mercury) in Potosí during said period, as well as on who may have made up the universe of medium and small mine and mill (*ingenio*) owners and tenants. In terms of diversity within the world of the “miners,” the minimal but unquestionable presence of Indigenous people and women stands out. It is a first foray into a hierarchical and diverse world during a central period for Potosí mining. The chapter aims to contribute to the identification of the actors who were historically situated within the complex networks that prevailed in the Potosí mining world during a key period of its history.

2 “Miners” in Potosí: Defining an Intricate Subject

The term “miners” refers to a very heterogeneous group of owners and tenants of both mines and mills who were part of the world of colonial mining. Before diving into the historically situated meanings of the word, we explore some historiographic contributions.

Historiographically, the notion of “entrepreneur” or “businessman” has been associated with miners. Of course, not all miners—whether owners or tenants—met this condition. According to Peter Bakewell’s classic text, certain miners can be conceived as “entrepreneurs”—those individuals who deployed large capital investments in the construction of mills and mining pits (*socavones*), which required a specific division of labor and capital and, in most cases, the establishment of a “vertical” type of enterprise.⁵

Mexican historiography offers enlightening parameters and guidelines to enrich studies on Peruvian colonial mining and its actors. For the viceroyalty

Hausberger, “Paisanos, soldados y bandidos: la guerra entre los vicuñas y los vascongados en Potosí (1622–1625),” in *Los buenos, los malos y los feos. Poder y resistencia en América Latina*, ed. Nikolaus Böttcher, Isabel Galaor and Bernd Hausberger, 283–308 (Madrid/Frankfurt a.M.: Iberoamericana/Vervuert, 2005); Bernd Hausberger, “Paisanos. La etnicidad de los vascos en Potosí, c. 1600–1625,” *Caravelle* 101 (2013): 173–92.

5 Bakewell, *Antonio López de Quiroga*, 35.

of New Spain, it is customary to talk about “big, medium and small” mining. As David Navarrete rightly points out, the category of medium and small mining refers to three semantic fields: 1. the producers (mine owners and mining investors) who did not belong to the Novo-Hispanic elite; 2. the productive units (mines, companies); and 3. silver-producing areas (districts, regions, and mining hubs/centers named *reales mineros*) with lower levels of investment, infrastructure, and mineral production than the larger mining centers.⁶ In the case of New Spain, decades of study have revealed the existence of large mining areas (Zacatecas and Guanajuato, for example) that exhibited enormous production compared to that of medium and smaller mining centers. Studies on the great miners of New Spain have tended to outline their ties with other social actors and sectors of the colonial economy, depicting their role in the political history of the Hispanic monarchy and its global connections. These are the successful cases, but they were certainly the exception.⁷ Recent studies show that the majority were small and medium mining centers and that these were fundamental in New Spain. From these, the study of small and medium mining’s characteristics, its conditions of labor, and particularly its business strategies allow us to appreciate the real conditions of the majority of mining

6 David Navarrete G., “La mediana minería en la Nueva España: Apuntes para una agenda de investigación,” *ISTOR* 73 (2018): 95–109.

7 Some research focusing on large mining centers and their major figures is as follows: Walter Howe, *The Mining Guild of New Spain and its Tribunal General (1790–1821)* (Cambridge: Harvard University Press, 1949); Richard Garner, “Zacatecas, 1750–1821: The Study of a Late Colonial Mexican City” (PhD diss., University of Michigan, 1970); David A. Brading, *Mineros y comerciantes en el México borbónico (1763–1810)* (México: FCE, 1975); Peter J. Bakewell, *Minería y sociedad en el México colonial, Zacatecas (1546–1700)* (México: FCE, 1984); Eduardo Flores Clair and Cuahtémoc J. Velasco Ávila, “Minería y poder político en México 1770–1856,” *Historias* 5 (1984): 33–55; Frédérique Langue, “Mineros y poder en Nueva España. El caso de Zacatecas en vísperas de la Independencia,” *Revista de Indias* 51, no. 192 (1991): 327–41; Inés Herrera, ed., *La minería mexicana. De la colonia al siglo XX* (Mexico: Mora/Colmex Institute, 1998); Frédérique Langue, *Los señores de Zacatecas. Una aristocracia minera del siglo XVIII novohispano* (México: FCE, 1999); Brígida von Mentz, “La organización y el abasto de insumos de una empresa minera en Zacatecas a fines del periodo colonial e inicios del independiente,” in *Dinero y negocios en la historia de América Latina: veinte ensayos dedicados a Reinhardt Liehr*, ed. Nikolaus Botcher and Bernd Hausberger, 199–230 (Frankfurt: Vervuert Iberoamericana, 2000); Edith Couturier, *The Silver King: The Remarkable Life of the Count of Regla in Colonial Mexico* (Albuquerque: New Mexico University Press, 2003); Laura Pérez R., *Familia, poder, riqueza y subversión: Los Fagoaga novohispanos, 1730–1830* (México, Universidad Iberoamericana, 2003); Jaime García, “La administración de las minas de plata y haciendas de beneficio de la familia Sandoval en Taxco, 1562–1564,” in *La plata en Iberoamérica, siglos XVI–XIX*, ed. Jesús Paniagua and Nuria Salazar, 39–59 (León: University of León, 2008); Ana M. Arroyo, *Minería en el real de Temascaltepec en el último cuarto del siglo XVIII* (México: INAH, 2011).

entrepreneurs in New Spain.⁸ Navarrete formulated a series of parameters that would allow for building a border-transcending research agenda and comparative guidelines for medium and small mining in Latin America. To this end, he identified some basic variables while studying the productive units of the New Spain medium sector mining industry: quantity of mineral produced, amount of capital invested, size of the productive units (infrastructure), machinery and technology used, labor base (quantity of workers, recruitment and hiring systems) as well as the integration of extraction processes, assets, and circulation of silver.⁹ Although for the place and period of study selected in this chapter it is difficult to obtain this type of information from the available documentary sources, the proposed program of study enriches and renews the need to sharpen the views, questions, and interpretations of the documentation available. This chapter builds on the foundations of Navarrete's research agenda.

The section will hereafter explore the main definitions of the term "miner" (*minero*) during the colonial period. Using the imposing dictionary developed by Langue and Salazar-Soler¹⁰ that include definitions from both primary and secondary sources, one can trace definitions that have varied and acquired nuances over the colonial centuries. Definitions that were in use during the analyzed period in Potosí are of particular interest here, although this path inevitably opens views on both temporal and spatial aspects. According to Gunnar Mendoza, during the Peruvian viceroyalty in the sixteenth to eighteenth centuries, "miner" meant both "an expert in charge of the work of the mine"—a sort of specialized administrator—and the "owner of the mine."¹¹ Similar to this last meaning, in New Spain, between the sixteenth and nineteenth centuries, the term "miner" never referred to the operator or worker

8 Bernd Hausberger, *La Nueva España y sus metales preciosos: La industria minera colonial a través de los libros de cargo y data de la Real Hacienda, 1761–1767* (Frankfurt: Vervuert, 1997); David Navarrete, *Propietarios y trabajadores en el distrito minero de Pachuca, 1750–1810* (México: Servicio Geológico Mexicano, 2002); David Carbajal, *La minería de Bolaños, 1748–1810: ciclos productivos y actores económicos* (Zamora: El Colegio de Michoacán, 2002); Inés Herrera and Eloy González, *Recursos del subsuelo, siglos XVI al XX* (México: UNAM-Océano, 2004); Brígida von Mentz, "Plata y sociedad regional. Reales de minas pequeños en la Nueva España, siglos XVI–XVIII: Entre lo rural y lo urbano," *Nuevo Mundo Mundos Nuevos* (2015); Margarita Villalba Bustamante, "El gran potencial de los pequeños y medianos mineros de Guanajuato en la segunda mitad del siglo XVIII," *Nuevo Mundo Mundos Nuevos* (2015); Navarrete, "La mediana minería en la Nueva España."

9 Navarrete G., "La mediana minería en la Nueva España," 108.

10 Frédérique Langue and Carmen Salazar-Soler, *Diccionario de términos mineros para la América española (siglos XVI–XIX)* (Paris: Éditions Recherche sur les civilisations, 1993).

11 Gunnar Mendoza, "Glosario de voces relativas al trabajo minero," in *Relación General de la Villa Imperial de Potosí*, ed. Luis Capoché (Madrid: BAE, 1959), 204.

but to the owner or possessor of a mine or mining estate. The latter were also called *hacenderos* in New Spain, a term comparable to the *azogueros*, used specifically in Potosí. This term referred to the possessors, owners, or lessees of mills (refineries or *ingenios*) that used mercury to process the mineral. In this respect, García de Llanos indicates that they “are called such those who have mills in Potosí because of the mercury of the process.”¹² Most of the mill owners in Potosí were, in turn, mine owners. Therefore, the term *azoguero* in Potosí was closely associated with that of miner but limited to a select group of them, identified with the wealthy and prestigious upper strata of the universe of “businessmen” and mine owners. Finally, to finish untangling this web of meanings, let us point out that in New Spain, *azoguero* had a different meaning from that of the Peruvian, as this meaning referred to the person in charge of the amalgamation process—that is, an operator, even if highly specialized in his task.¹³

García de Llanos, himself a miner and overseer of the mountain (*veedor del Cerro*) in Potosí at the beginning of the seventeenth century, defined the term “miner” in his dictionary as follows:

Miner: commonly it means a man who earns a salary with someone else’s work, whether he understands it or not, and thus, when in Potosí, something in relation to miners is proposed or dealt with, it is understood that what is referred to are the stewards (*mayordomos*) of the actual labor and who assist them in the mine, and of them can be said that they are not miners, meaning they are not intelligent. And when anyone else or themselves say that they are, it means that they have intelligence about these things.¹⁴

This definition linked the word “miner” (*minero*) to that of *mayordomo* (steward), a type of administrator for the owners and tenants of mines. In this regard, García de Llanos historically and socially associated the trade of “*mayordomo*” with the early figure of the *pongo* (*puncu*), in relation with the door (*puncu*) of the mine, a kind of doorman or custodian of the mines, a function that in the early days of Potosí’s colonial exploitation was carried out by Indigenous people who took care of the mines, the works, the tools, and the storage rooms

12 García de Llanos, *Diccionario y maneras de hablar que se usan en las minas y sus labores en los ingenios y beneficios de los metales (1609)* (Madrid: Consejo Superior de Colegios de Ingenieros de Minas, 2009), 8.

13 Langue and Salazar-Soler, *Diccionario de términos mineros*, 61.

14 Llanos, *Diccionario y maneras de hablar*, 95.

in which the metals were kept. At a certain point in the sixteenth century, the pongos were replaced by Spaniards, who, under the title of *mayordomo* and in exchange for a salary, carried out the same tasks, and the Indigenous *pongos* stepped down to occupy a lower hierarchy of

attendants to the miners or mayordomos in the mines, assisting at all hours in the works, hurrying, quarreling and punishing the other Indians, being in all ways as their captains in every task ... place this duty [*"pongo"*] on the most skilled and spirited in word so that they know how to command in the mine and do what is convenient, as much in the way of working, as in repairing, relying in all needs, with the Indians, as is their purpose. In all that they occupy themselves and do not extract metal like ordinary Indians, and the mayordomos neglect more than is reasonable with them.¹⁵

Returning to the term "miner," Buechler proposes the following meaning, which would be applicable for the entire colonial period:

a practical individual in mining in charge of directing the construction of tunnels, adits, shafts, wells, arches, galleries, fortifications, repairs, etc. He would watch over the repair of the interior and exterior passages of each mine and oversee the work of the Indians. The miner was not allowed to work or sell minerals on his own account.¹⁶

Some eighteenth-century writings reinforce this idea of the American "miners" as practical men. As is exemplified by Lazaga and Velázquez de León's text from the late eighteenth century in New Spain:

in our America mining is learned by imitation and it is preserved traditionally because, although there is no shortage of Spanish books that deal with subjects of metal, they are neither studied nor esteemed, rather, certain men dedicated to these matters despise them with vain arrogance known as: miners, *azogueros* and smelters. The miners are those who direct the interior and exterior work of the mines, the *azogueros* and smelters are in charge of the outputs of the metals. Both are usually men of low extraction and vile upbringing, and most of the time quite

15 Llanos, *Diccionario y maneras de hablar*, 110–11.

16 Rose Marie Buechler, *Gobierno, minería y sociedad: Potosí y el "Renacimiento" borbónico, 1776–1810*, Tomo 2 (La Paz: Biblioteca minera boliviana, 1989), 498.

depraved. However, they are the custodians of what is most delicate and most in need of trust in mining.¹⁷

This notion of the miner as a man of practical trade coexisted with another of the miner as owner, not necessarily actively involved with the production process but rather with the possession of mines, mills, and smelting plants. Each notion of “miner” became relevant, depending on the region and period. In the case of New Spain, the dominant meaning registered throughout the colonial period was that of “businessman,” “owner,” and “investor,” both during mining’s period of grandeur in the second half of the eighteenth century, with Guanajuato leading production, and in previous centuries and in other mining centers (Guanajuato, Zacatecas, San Luis Potosí, Pachuca, and Real del Monte). In the case of the viceroyalty of Peru, in Potosí during the period of peak silver production, the term was associated with the mines and all knowledge surrounding them, but not necessarily with the “owners” of mines and mills. In general, historical writings have suggested that the elite owners were associated almost directly with the word *azoguero*, which included those who were “owners” and “lords” of mills (that used mercury to process the mineral) and also those with combined ownership of mills and of mines. The *azogueros* headed the economic and social hierarchy of the mining community and were actively involved in town governance, especially through the cabildo. Their networks wove not only locally, but also at a regional level, vicereally (throughout the colony), and even crossed oceans.¹⁸ The existence of the Azogueros’ guild has also been widely mentioned in historical documents. Buechler associates the foundation of this guild with the granting of a viceregal permit for the creation, in 1611, of a brotherhood within the church of San Francisco, dedicated to dealing with the exploitation of the mountain and the profits of the mills.¹⁹ In the Books of Agreements (*Libros de Acuerdos*) of the secular cabildo of Potosí, the first explicit mention of the guild of Azogueros appears in 1635.²⁰ Before that

17 Juan Lucas de Lazaga and Joaquín Velázquez de León, “Representación,” in *La minería en la Nueva España a postrimerías del siglo XVIII*, ed. Luis Chávez Orozco (México, [1774] 1938).

18 Eugenia Bridikhina, “Los misterios de la urbe: enredos políticos y económicos en La Plata y Potosí,” in *La construcción de lo urbano en Potosí y La Plata: (siglos XVI–XVII)*, ed. Andrés Eichmann and Marcela Inch C., 195–97 (Sucre: Ministerio de Cultura de España, FCBCB and ABNB, 2011); Margarita Suárez, *Desafíos trasatlánticos*; Bonialian in this volume.

19 Buechler, *Gobierno, minería y sociedad*, Tomo 2, 301.

20 ABNB, CPLA 20: 334r–338v, 17/10/1635 “Acuerdo relativo a los siguientes asuntos: verificación que hace el Cabildo junto al gremio de los *azogueros*, del artificio por cuya invención Antonio Fernández Picón reclama respectivo premio, revolviéndose que le paguen 500 pesos corrientes, y otros asuntos.”

date, in the agreements of the cabildo, there is mention of the upper layer of the miners, named “lords of mines and mills” [1588]²¹ and *azogueros* [1594].²² Previously, in 1585, Luis Capoché wrote a report (*relación*) where he names the mining entrepreneurs in the following ways: “lords of mines,” “miners,” “mine owners,” and “lords of mills,” although the word *azoguero* is not explicit.

Lower down in the mining socioeconomic hierarchies, in 1585 mention is made differentiating those who “have leased mines” from the “owners,” not only with respect to property rights but also by the type of “agreements” or labor arrangements they had with Indigenous workers.²³ Also in these minor establishments in the mining sector we find, according to García de Llanos in 1609, references to “mine-owning soldiers” (*soldados*) and “biters” (*mordedores*), who managed the mines. Generally, the meaning of “soldier” in this period was not associated with a military position, but with a semantic field linked to men or “loose people” (*gente suelta*)—poor people who sought to make a living, without trade, who were usually armed, aimless vagabonds. Fray Diego de Ocaña describes the soldiers as “Spanish people” very numerous in Potosí towards the beginning of the seventeenth century; as testimony of his stay of over a year in the Imperial Villa, he affirmed that

they live off gambling and consorting with rich black and indian women, who in turn support them with food and dress ... and have interest in no other than to stroll around all day on the cobblestone of the plaza ... so numerous are the disputes, that hardly a day passes without the death of two or three men.²⁴

Such violent confrontations were the result of gambling disputes, quarrels over women, and debt collection. However, for the same period, other sources present divergent and nuanced semantic associations with “soldiers.” In this respect, the Audiencia de la Plata considered them “neighbors without income or *encomienda* of Indians,”²⁵ “honorable and honest persons, although

21 BO, ABNB, CPLA 5: 139v–140v, 17/10/1588, “Que se pregone que todos los señores de minas e ingenios ... se junten a cabildo abierto en la Iglesia Mayor para tratar sobre el nuevo beneficio que ofrece el bachiller Garci Sánchez.”

22 BO, ABNB, CPLA 7, 1/6/1594, “Acuerdo sobre el cabildo y otros.”

23 Capoché, *Relación General*, 109.

24 Fray Diego de Ocaña, *Un Viaje fascinante por la América Hispana del siglo XVI* (Madrid: Studium, 1969), 196.

25 BO ABNB, CACH 619, “Carta de la Audiencia de La Plata al Consejo de Indias,” La Plata 2.4.1608, cited in Bridikhina, “Los misterios de la urbe,” 158, 172.

indebted.”²⁶ Contributing to the nuances within the universe of the so-called “soldiers,” and being himself one of them, García de Llanos includes them in his dictionary as mine owners who, unlike the *azogueros*, integrated a lower segment of the mining hierarchy:

Mine-owning soldiers: are named such those who in Potosí try to till and profit of the mines and metals and don't own mills, and to those who, together with those who do own them are given the name of *azogueros*, owners or hacienda owner, and the same of those owning only the mills.²⁷

Finally, García de Llanos remembers the “biters.” It appears that they wouldn't have been owners of mines, and it is stated that they would have known little (“without being miners”) but, even so, by contracting the work of Indigenous people, they attempted mining, although ineffectively (“poor labor,” *mala labor*), resulting in being almost destructive due to their lack of care in repairing and cleaning the mines. In any case, he judged that this was preferable to them being idle. Llanos does not clarify the type of arrangement that involved the “biters”²⁸—if they were tenants of mines or otherwise.

These different terms and references allow us to string together historical indications about the internally differentiated universe of Potosí miners.

Regarding the legal status of the miners with the mines and mills, there was a wide variety of situations and arrangements, as would happen in frameworks of labor relations. The ownership and exploitation of the subsoil belonged to the Crown, who ceded it to individuals on the condition of registering the mines, maintaining a continuous exploitation (with a maximum time without work of four months) and the payment of a fifth—or the tithe in New Spain—of the profits, plus a 1% or 1.5% tax. In case of non-compliance with these conditions, it could give rise to requests for licenses and exemptions, complaints, dispossession, and even the sale and lease of the mines. So, one can distinguish private owners from tenants, and on some occasions, each of these categories included more than one individual. In this regard, many mines were undivided, leading to a confusing legal framework for the determination of rights:

26 BO ABNB, CACH 313, “Carta de la Audiencia de La Plata al Virrey,” La Plata 2.1.1601, cited in Bridikhina, “Los misterios de la urbe,” 172.

27 Llanos, *Diccionario y maneras de hablar*, 125.

28 Llanos, *Diccionario y maneras de hablar*, 97.

To mine *divided* (*labrar diviso*) is to work each his own mine or his *varas*²⁹ that have divided and marked measures. *Undivided* (*indiviso*), is to have among many, a mine to divide up and work each where he can, and the one who has a 'vara' is such a gentleman as to open much labor and seize everything without giving part to the others, as one who has much. This way of mining favors the viceroy don Francisco de Toledo's orders, without there being reason for its use, and it seems there could be no other understanding than that in this way more metals would be extracted. But time has shown the prejudice this could generate, and thus some disorder was remedied by a more modern ordinance, although there are no judges to enforce it and it is worthy of some remedy.³⁰

In his famous *Relación* (report), miner Luis Capoche included a detailed listing of the 575 mines and 110 mills registered during the visit made by Dr. Diego López de Zúñiga, court mayor (*alcalde de corte*) of the royal audience of Los Reyes (Lima), which had been ordered by Viceroy Enríquez and concluded on March 9, 1582.³¹ Systematizing this list, it appears that 42% (243) were considered "virgin mines" due to their poverty and "what little could be exploited."³² Some mines had more than one owner or possessor (some, two or more individuals, mostly undivided); other cases speak of "the minors" or "heirs" of a deceased owner without specifying their quantity or names, and other times religious institutions (a convent, monastery, church, or brotherhood) or an individual from the church (for example, "Father Cáceres, clergyman") are mentioned.³³ On the other hand, twenty-three mines were his majesty's—one attributed to the Catholic majesty and other to King Philip II.

Beyond these individual or group legalities, there were countless additional arrangements that converted the miners' realities into complex plots to unravel, and lawsuits were commonplace. An instance of such situational intricacies was recorded in 1610. Pedro de Mondragón was one of the main mining lords at the time—he owned mines, tunnels, and a mill with two "heads" on the banks of Tarapaya, and he had received eighty-three *mitayos* to work in them:

29 *Vara*: old Spanish measurement roughly equivalent to a yard.

30 Llanos, *Diccionario y maneras de hablar*, 63.

31 The nominal and descriptive lists present in Capoche have been systematized in a database in order to work with them. The information on these lists comes from: Capoche, *Relación general*, 79–102 (mines registered in 1582) and 118–24 (includes all the water mills and "dry" mills located in the *ribera* and in Potosí, Tabaconuño, Tarapaya, Pilcomayo Valley, Mataka Valley, and Chaquí River).

32 Capoche, *Relación General*, 75.

33 Capoche, *Relación General*, 80.

He made a donation to Diego de Brizuela, his son-in-law, with the charge to secure profits. So securing it and ordering it be appointed by judges. And now Mondragón repented and not restraining referred to lawyers and reviewed the donation sent to Brizuela. Mondragón now says he has leased it and that this all appears to be a trap. Mondragón works himself in his own mines (*los Flamencos*).³⁴

This case demonstrates the indolent way in which a mining lord and *azoguero* could make and undo donations, agreements, contracts, and leases.

Another example of the complexity of property arrangements involves the case of Gregorio de Lazarraga in 1610, beneficiary of sixty-one *mitayos* for his mines and mills. Confusion arises around his role as both debtor and creditor:

He [Gregorio de Lazarraga] sold to Francisco Ramírez for 36 thousand pesos and must put in the treasury 29 thousand that he owes. The sale was for the Indians as he has no mines worth anything. He works in the mines of Cosme López as allowance because Cosme owes him [Gregorio] 5,000 pesos.³⁵

The case of Pedro de Venegas, with his eight-mallet mill in the Tarapaya valley, shows an “in trust” sale, perhaps a way to refer to figureheads who appeared as owners of other individuals—in this case, Carlos Corzo de Leza—that for legal reasons could not appear to be buying and selling mines and mills:

A certain Pedro Mosquera, bought this mill [and was listed as Pedro de Venegas]. They say that he is “in trust” [*es en confianza*], he works in black metals in “Centeno” and in El Estañó. And it is the trust for Carlos Corzo de Leza having taken out this mill and not having been able to possess it being mayor [*alcalde mayor*] of mines.³⁶

In short, the term “miner” took definitions that, although precise, were sometimes polysemic and changed geographically and historically. When I refer to miners in Potosí during the selected period (1569–1610), it is to denote a key social, economic, and political group in the local milieu and in the Peruvian and global economy that, without a doubt, was heterogeneous, made up of

34 BNF, MS Espagnol 175, f. 336v, “Repartimiento del Excelentísimo Marqués de Montesclaros virrey de estos reinos,” año 1610.

35 BNF, MS Espagnol 175, f. 325v.

36 BNF, MS Espagnol 175, f. 3336v.

owners of large, medium and small mines and mills and tenants of some mines and mills. The owners of large mines and mills are called “lords” here, which is comparable to the historiographic widespread idea of the *azogueros*. Additionally, it is necessary to note that in Potosí during the period in question, the word “miner” was used to refer to the administrators of mines and mills and had no relation to their property or possession. Finally, in neither of the two great viceregal spaces during the colonial period was the word “miner” ever linked to the mine workers, a meaning that only gained strength in the twentieth century and is still in use today.

3 Recovering the Names of the Potosí Miners, 1578 and 1610

As mentioned, with notorious exceptions, studies on these fundamental actors in the world of mining in Potosí are scarce. The remarkable study by Peter Bakewell on Antonio López de Quiroga stands out, a work associated with his major study *Miners of the Red Mountain*, which focused on Indigenous workers in Potosí.³⁷ Undoubtedly, part of the historiography alluded to royal officials who occupied important positions in Potosí, Charcas, and Lima, as well as to the universe of merchants and other actors who managed a key sector of the Peruvian economy, controlling the trade and circulation of Peruvian silver on a global scale, especially in the early seventeenth century.³⁸

Finally, it is important to mention studies on political conflicts, particularly on the war of the vicuñas and vascongados, in which many miners played “starring” roles.³⁹ In Hausberger’s valuable interpretation of the conflict, he relativizes its ethnic element, showing that the opposing sides were not defined strictly or solely by their peasantry but rather by the social networks in which individuals operated. The influence of the Basques exceeded their numerical weight (as miners, as merchants, as ordinary mayors), but this was not enough

37 Bakewell, *Antonio López de Quiroga*; Bakewell, *Miners of the Red Mountain*.

38 Amongst various works, see: Pierre Chaunu, *Seville et Atlantique, 1500–1650* (Paris, Librairie Armand Colin, 1955–59); Lawrence A. Clayton, “Trade and Navigation in the Seventeenth-Century Viceroyalty of Peru,” *Journal of Latin American Studies* 7, 1 (1975): 1–21; Fred Bronner, “Elite Formation in Seventeenth-Century Peru,” *Boletín de Estudios Latinoamericanos y del Caribe* 24 (1978): 3–26; Suárez, *Desafíos trasatlánticos*; Mariano A. Bonialian, *La América española: entre el Pacífico y el Atlántico. Globalización mercantil y economía política, 1540–1840* (México: El Colegio de México, 2019); Bonialian, in this volume.

39 Crespo, *La guerra entre vicuñas y vascongados*; Dressing, *Social Tensions*; Numhauser, “Un asunto banal”; Hausberger, “Paisanos, soldados y bandidos”; Hausberger, “Paisanos. La etnicidad de los vascos.”

to control the Imperial Villa. More than by their ethnicity, the Basques in Potosí could be defined as a network that united powerful individuals of Basque origin and their allies, who themselves were both a part of and outside of the ethnic group. Hausberger demonstrates the laxity of ethnic exclusivity in the Basque brotherhood—for example, Pedro Mondragón, one of the most prominent *azogueros* of the period and biggest beneficiaries of the *mita* in the 1610 distribution, was a mestizo born in Cuzco to a Basque father and *Palla* (Inca) Indigenous mother. In addition, Hausberger pointed out that the group had strong alliances with the *corregidores* of Potosí—Rafael Ortiz de Sotomayor, Francisco Sarmiento de Sotomayor, and Felipe Manrique, who were Castilian, Galician, and Andalusian, respectively. Third, the fabric of marriage alliances within the social network appealed to relations between Basques and non-Basques. In short, it was a successful social network in which ethnicity played a role, together with clientelism and matrimonial strategies. It is thus possible to define the so-called “war” of the 1620s as a social struggle that placed a hegemonic power group in front of members from a disadvantaged social strata, especially that of the soldiers (who in turn had links with some sectors of the elite). Hausberger points out that in the 1610s, vicuñas included Juan de Iturri, a “failed miner,” and Pedro de Zumárraga, a “Potosí creole without profession,” whose last names were possibly of Basque origin. In other words, socioeconomic differences outweighed ethnic ties, but the tendency remained among contemporaries to interpret the conflict as an ethnic one, as social tensions are sometimes also conceived in recent contemporary history. These interpretation keys are applicable to the nominal listings presented below.

Within the miners’ universe, only some individuals managed to stand out by integrating the different stages of mining and inserting themselves into other branches of activity, especially commerce. This chapter aims to give an account of this diverse and hierarchical universe of miners, who, for the most part, did not follow successful business paths but nonetheless constituted an essential element of the machinery of Potosí silver mining during a key period. It seeks to identify the subjects who constituted these social, economic, political, and labor networks that animated Potosí. To this end, this section presents systematized nominal information on large, medium and small owners—as well as tenants—of mines and mills.

To do this, two *mita repartimientos* (distributions) have been selected: that of 1578, the last of the four distributions issued by Viceroy Francisco de Toledo, and that of 1610, carried out by Viceroy Montesclaros. Both begin with the list of the groups (*repartimientos de indios* or Indigenous jurisdictions) obligated to the *mita*, their numbers, and, in the case of the 1610 listing, fascinating additional information. These *mita repartimientos* have been analyzed in previous

works,⁴⁰ but here we focus on the lists of the beneficiaries of *mita* work. The lists show differences, since the 1610 list presents a single list of beneficiaries arranged alphabetically by name, while the 1578 list divides the beneficiaries according to work spaces—mines, mills, and tailings (*lamas y relaves*)—reiterating some of the individuals' names. The information presented below is based on a database I created to analyze the information and correlate the two lists. Additionally, data is included from Viceroy Martín Enríquez's distribution in 1582 and from the visit that preceded it. Unlike the other distributions, this information is in the *Relación* written by Luis Capoche in 1585, where he included the list of people who owned mines and another of those who owned mills.

The distribution of the Toledo *mita* in 1578 included a total of 4,401 *mitayos* (4,389, according to personal calculations). Of these, 25% (1,100) were assigned to mines, 5% (228) to tailings, and the main portion (70%, 3,061) was assigned to the mills. These percentages must of course be qualified because between what the viceroy established and what was carried out, there was a margin in which to maneuver; however, they give us insight as to where the majority of the salaried forced laborers were required or placed: mineral processing in the mills.

Capoche's *Relación* of 1585 states that the visit prior to Viceroy Enriquez's *mita repartimiento* estimated the *mita* workforce truly needed by each establishment, while Enriquez's distribution assigned a smaller amount. Moreover, Capoche's text confirms a central aspect of the process: the majority of the *mitayo* contingent went to the mills. The general distribution of the *mita* issued by Viceroy Enríquez in 1582 included a total of 4,476 ordinary (weekly) *mitayos*. Capoche's record, there were 1,348 weekly *mitayos* (30%) assigned to those who had mines, mostly located in the main veins: Centeno, Rica, Los Flamencos, El Estano, Mendieta, and Los Ciegos. Of the remaining 70% of the *mitayos*, eighty-four of them (1.8%) were assigned to the construction and maintenance of tunnels or adits and the repair of lagoons, but the others—the main portion, composed of 3,014 *mitayos* (68.2%)—were placed in the ore processing mills.⁴¹ Capoche explained that *mita* assignment to the mills depended—in theory—on the number of mallets, heads, and horses of each

40 Paula C. Zagalsky, "La mita de Potosí: una imposición colonial invariable en un contexto de múltiples transformaciones (siglos XVI–XVII; Charcas, virreinato del Perú)," *Chungará* 46, 3 (2014): 375–95; Zagalsky, "Trabajadores indígenas mineros en el Cerro Rico de Potosí: tras los rastros de sus prácticas laborales (siglos XVI y XVII)," *Revista Mundos do Trabalho* 6, 12 (2014): 55–82.

41 Capoche, *Relación General*, 75–111.

mill. Diego de Zúñiga's visit deemed necessary greater *mita* endowments, but eventually the viceroy, "not having enough Indians," distributed twenty-four *mitayos* to the *Ribera* and *Tabaconuño* mills which each had one head, and to those with two heads, twenty-eight Indigenous workers, mostly destined for the dry milling stage. To the two-headed mills of *Tarapaya* were assigned thirty-six *mitayos* and the one-headed mills received twenty-eight (it was estimated that these of *Tarapaya* had less chance of getting *minga* Indians for processing work and for forming the silver into cones or *piñas*. To the few mills outside these locations, *mitayo* allotments were made in specific quantities).⁴²

Returning to the distribution of 1578, out of a total of 351 assignments, fifty-two had two or more owners (thirty-five mills, sixteen mines, and one tailing) and the rest were individual beneficiaries. As indicated, the 1578 listing divided the beneficiaries of the *mitayos* into three categories, according to the type of productive unit or work space: mines, mills, and slats and tailings. From that, out of a total of 351 *mitayo* beneficiaries (149 mines, 173 mills and 29 tailings), the names of sixty-two individual proprietors, owners, or lessees of mills and mines, and of mines and tailings, are repeated. Putting aside these nominal repetitions, we can conclude that the total number of beneficiaries of 1578 were 288 individuals, of which only sixteen received the title of "don." Another noteworthy element: in 1578, most of the beneficiaries received *mitayos* from a single jurisdiction (*repartimiento de indios*). Of the 351 allocations, only fifty-three received *mitayos* from different districts (890 *mitayos* out of the total of 4,389, that is, 20%).

The information contained in the 1578 distribution of *mita* allows us to see the close relationship between the mills and the *mita* labor. On the one hand, 70% of ordinary *mitayos* were assigned to the mills (3,061). On the other hand, among the *mita* beneficiaries, those who received the largest amounts of *mitayos* were mill owners (some of which also had mines): fifty-two *azogueros* or lords (representing 18% of the beneficiaries) received the largest individual *mita* allocations (in some cases shared), ranging between twenty-two and sixty *mitayos* (accounting 1,644 *mitayos*, 38% of the total). The *mita* allocations destined to mines of some of these fifty-two *azogueros* have also been taken into account. Table 7.1 lists the major beneficiaries of the *mita* in 1578; it offers a useful way to identify the large miners/*azogueros*/*lords* of the time. Future works, of course, should compare this list with other sources (notarial documents, official records of the *cabildo* and the *Real Hacienda*, for example), even though these are scattered and dispersed.

42 Capoche, *Relación General*, 118–22.

Although they were a minority, it is worth noting the presence of five women beneficiaries of *mitayos* in the Toledo distribution of 1578: three of them were mine owners, one of a mill in joint ownership with a man (Catalina González with Garci Michel in Table 7.1), and one owner of both a mine and a mill, doña Guiomar de Lizárraga. The names of these women can be useful in future explorations of how to interpret their roles and the management choices made about their mines and mills (Table 7.2).

We can also identify some beneficiaries whose trades, in addition to the mines and mills, are detailed in the *mita* distribution of 1578: apothecaries (Andrés Velázquez; Pedro de Herrera); carpenters (Francisco Ramírez, Juan Díaz, Juan Martín); blacksmiths (Antón Yañez); squire (Pedro Fernández), and astrologist (Villanueva). Later sources do not include such interesting references to trades that were not necessarily linked to mining. Famous chronicler Luis Capoche, appears on the list, receiving an assignment of twenty *mitayos*, to work in his mine (nineteen originating from Cabana and one *mitayo Chicha* (from Polo Ondegardo's former *encomienda*). There aren't any Indigenous beneficiaries listed, but we can deduce, by their names, that Pedro Sacaca (with a mine and four *mitayos* from Paria) and Diego Condor (with a mine and two *mitayos* from Sacaca) probably were.

Seven years later, Capoche presented "the list of people who own mines," based on data from the distribution ordered by Viceroy Enríquez in 1582 and the preceding visit of the mines and mills. Raking through this list meticulously, two issues are evident. First, the presence of women mine owners or proprietors increased exponentially in a few years: there are thirty-four references to women who, either alone or, in most cases, accompanied by men, appear on the list. Table 7.3 includes their names, the number of *mitayos* that the visit officially allocated, and the total number of *mitayos* that they effectively received in 1582 (it is important to note that not all miner women were able to count on these allocations).

It is evident, on the one hand, that some women owned more than one mine. Such is the case of Juana de Alcoba, Elena de Solís, Elena de Santiago, Isabel Clavijo, María Castellanos (who had a mining vein named after her), María Ortiz and Mariana de Flores. Of the thirty-four women mentioned by Capoche, only seven, along with a convent of nuns received *mitayos* in the distribution of 1582: Juana de Alcoba received fourteen, Ana Gutiérrez, twelve, María Ortiz, eight, the nuns of the Encarnacion of the City of Kings, eight, Mariana de Flores, five, María Castellanos, four, and María Vélez (neighbor of La Plata), four. Among the mining women, two cases are of peculiar interest: the possession of a mine by Juana de Alcoba and Domingo Quenta (Indigenous, neither *cacique* nor having title of "don"); and, on the other hand, the presence of a

TABLE 7.1 Major beneficiaries of the 1578 Potosí *mita* (receivers of consignments of between 60 and 22 *mitayos*)

Name	Type of establishment	Mitayos			Origin
		Mill	Mine	Total	
His Majesty and Francisco Ruiz	mill and mine	40	20	60	Quillacas, Asanaques, Caquingora
Juan de Pendones (and with Sancho de Quintana mill)	mill and mine	36	16	52	Caracollo, Azángaro, Chayanta
Luis de la Serna and company (and with Garci Michel mines)	mill and mine	30	20	50	Pomata
Gonzalo Santos	mill and mine	30	16	46	Sipesipe, Paucarcolla
Juan de Figueroa and Benito Sánchez	mill	46		46	Chayanta and Juli
Francisco de Nava (with Gonzalo de Soria; with Tomás de Ibarra)	mill	44		44	Copacabana, Chancocabana, Pomacanche
Garci Michel (with Catalina González mill; with Luis de la Serna mines)	mill and mine	24	20	44	Lampa del Esquivel, Calamarca, Pomata
Rodrigo de Ibarra	mill and mine	35	8	43	Yanaoca, Caminaca, Urinoca
Luis de San Román	mill and mine	18	24	42	Colquemarca
Diego de Gamarra	mill and mine	30	10	40	Arapa, Santiago del Paso de Polo
His Majesty and Marcos Muñoz de la Regata	mill	40		40	Quillacas, Asanaques
Juan de Solís and company	mill	30	8	38	Macha

TABLE 7.1 Major beneficiaries of the 1578 Potosí *mita* (cont.)

Name	Type of establishment	Mitayos			Origin
		Mill	Mine	Total	
Nuño de Balboa	mill and mine	30	8	38	Juli, Coata from Encinas
Hernán Cabrera de Córdova	mill and mine	24	12	36	Chayanta
Domingo Gallego	mill and mine	24	10	34	Capachica
Don Juan de Ávila	mill and mine	24	10	34	Machaca la grande
Gerónimo de Vargas	mill and mine	30	4	34	Caquingora
Don Diego Vaca	mill and mine	24	8	32	Azángaro de Quiñones
Gonzalo Alonso	mill and mine	20	12	32	Macha
Hernán Sánchez Carballo	mill and mine	24	8	32	Cepita, Carabuco, Caracollo
Martín Sánchez Blancaflor	mill	24	8	32	Pomata
Mejía de Avendaño	mill and mine	24	8	32	Juli
Don Luis de Ávalos	mill and mine	16	15	31	Paria
Juanea de Gamboa	mill and mine	24	7	31	Machaca la grande. Machaca la chica
Juan Román	mill and mine	24	6	30	Pomacanche de Paria, Caquiavire
Pedro Sande	mill and mine	20	10	30	Totora, Macha
Sebastián Gutiérrez	mill	24	5	29	Laja, Cacha, Sicuani
Diego Bravo	mill and mine	16	12	28	Santiago del Paso
Juan de Carvajal	mill and mine	20	8	28	Callapa, Tiguanaco
Luis de Argüello de la Torre and company	mill and mine	20	8	28	Callapa, Guarina

TABLE 7.1 Major beneficiaries of the 1578 Potosí *mita* (cont.)

Name	Type of establishment	Mitayos			Origin
		Mill	Mine	Total	
Cristóbal de Perena	mine	24	4	28	Caquingora Hilavi and Caquiavire
Antonio Hernández de Velasco	mill	26		26	Macha
Juan Pérez de Arriaga	mill and mine	20	6	26	Yauri, Uros from Coata
Marcos Muñoz and company	mill	26		26	Nuñoa, Puno
Sebastián de Otaola and Gonzalo López	mill	26		26	20 Condes from Mancio Sierra, 6 from Achanquillo
Alonso Pérez Barriales	mill	25		25	Tapacari
Álvaro de Ribas Taguada and Murcia	mill	25		25	Chicacopi, Guancasco
Antonio Bautista de Salazar	mill	25		25	Tapacari
Alonso de Torrejón	mill	24		24	Aullagas
Alonso Hernández Borregas and Bernabé de Salazar	mill	24		24	Sacaca
Guevara, licenciado	mill	24		24	Colquemarca
Luis Osorio de Quiñones	mill	24		24	Caquingora
Pedro de Arroyo and Santos de Arroyo	mill	24		24	Quillacas, Asanaques
Roque de Larumbide and company, de Álvaro González and Gonzalo Hernández	mill	24		24	Totora

TABLE 7.1 Major beneficiaries of the 1578 Potosí *mita* (cont.)

Name	Type of establishment	Mitayos			Origin
		Mill	Mine	Total	
Guillermo de Desty	mill and mine	15	8	23	Pichigua, Hatun Cana, Hurin Canca
Alonso de Vera and del Peso	mill and mine	18	4	22	Chuquicota, Sabaya
Alonso Ruiz Francés	mill and mine	14	8	22	Acora
Álvaro López de Padilla	mill and mine	14	8	22	Ayavire
Bartolomé Remón	mill	22		22	Guarina
Capitán Diego Moreno	mill and mine	14	8	22	Manaso
Francisco Manoso	mill and mine	18	4	22	Guaqui
Martín de Tineo	mill and mine	15	7	22	Lurucache, Acopia

TABLE 7.2 Women miner beneficiaries of the 1578 *mita*

Name	Mitayos	Type of establishment
Beatriz Gallo	4	mine
María de Godoy	10	mine
Doña Juana de Zárate	12	mine
Catalina González (with Garci Michel)	24	mill
Doña Guiomar de Lizárraga	5 and 15	mine / mill

TABLE 7.3 Women miners, 1582

Name	Indians identified during visit	Indians received
Mariana de Flores	15	5
Nuns of Encarnación of the City of Kings	60	8
María Velez, neighbor of La Plata	13	4
Juan Guerra and Francisco de Salazar and Luis de Sayas and the widow of Guillermo Diste, Juana de Alcoba and the younger daughter of Moreno	50	10
Juana de Alcoba	10	4
Elena de Solís and Rodrigo de Quiroga	30	0
Lope Sellinos. In this mine, Luis Hernández has 10 <i>varas</i> ; Miguel de Rosas, 18; María Ortiz, 10; and Sellinos, 22 <i>varas</i>	30	8
Wife of Garci Michel and Juan Gutiérrez and Francisco Vázquez	25	0
Isabel de la Paz	16	0
Juana de Alcoba, 40 <i>varas</i> and Domingo Quenta Indian, 20	30	0
José de Escobar, Juan de Ordoñez, Baltasar de Villanueva, and Isabel Clavijo	20	0
Isabel Clavijo, wife Baltasar de Villanueva	20	0
Guillermo Diste and wife, Juana de Alcoba		
Juana de Alcoba and the heirs of her husband	20	0
Juan Chupacho, Indian; María Ortiz Picón; Juan Picón	35	0
Elena de Solís, 20 [<i>varas</i>] and Gaspar	25	0
Miranda, 20 and don Luis Dávalos, 20		
Francisco Oruño, and Jerónimo Pérez de Valdés and doña Mariana, daughter of Diego Rodríguez and the others, his daughters, had two mines	15	0
Gaspar de Miranda, and in them has Luis de Escobar 8 <i>varas</i> , and Diego de Palma 10 [<i>varas</i>] and Magdalena de Salas, 10, and Juan Franco (son of doctor Franco), 10 and Pascuala (daughter of Antonia, black), 10	20	0

TABLE 7.3 Women miners, 1582 (*cont.*)

Name	Indians identified during visit	Indians received
Gaspar Miranda, and Elena de Solís, and Diego Rodríguez and Diego de Palma and Inés de Olivera	15	0
María Castellanos	15	0
Gaspar Miranda, and Elena de Solís, and Gonzalo de Solís and Bernabé de Bruceña	0	0
Gonzalo Solís, Ana Gutiérrez, 15 [<i>varas</i>], Pedro de Jerez, 15, Juan Gutiérrez de Ulloa, 30	30	12
María Castellanos	3	0
Gaspar Ortiz, gave 50 <i>varas</i> to Catalina Ortiz, his daughter, 10 veins to the church of Señor San Pedro, and 10 <i>varas</i> to Nuestra Señora and 10 to Luis Hernández	30	0
Francisco Díaz in company of doña Margarita	20	0
Gonzalo de Tarragona in the company of Francisca Eufrasia, daughter of Gaspar Ortiz	20	0
María Castellanos	20	4
Álvaro González and García Hernández 30 <i>varas</i> and the other 30 Mariana de Flores	20	0
Juan de Arriaga and Elena de Santiago, two mines	15	0
Antonio de Hereda and doña Elvira de Godoy and Andrés Vela, and in this mine has 10 <i>varas</i> Anton de Poblete and 20 Gaspar de Meneses	16	0
Juan de Porras 22 and doña Ana de Valderrama 6, and another 6 Luisa Requelme and 10 veins Santiago de Samalvide and Martín Yáñez 8	25	0
Elena de Solís and Elena de Santiago have 15 <i>varas</i> . In the mine beside that of Cevicos on a new vein	10	0
Pedro de León in which doña Quitería de Berrío has 20, and Bernabé Bruceña 10 <i>varas</i>	15	0
Pedro de Niza, absent, the 30, and María Ortiz, 20, and Manuel Rodríguez 10	15	0

mulatta in the list “Pascuala (daughter of Antonia, black).” Capoche’s *Relación* is a remarkable document for the information it contains, which has not only been edited but widely studied. It had, however, not yet been explored through the subject of mining women in Potosí during the sixteenth and seventeenth centuries. Of course, these are the first steps in a line of research that deserves to be continued to piece together these women’s stories.

On the other end of the timeline for the selected period is the distribution of 1610. Unlike the Toledo distribution, this account lists, in one set, the beneficiaries of *mitayos*, together with the origins of the workers and other, very enriching information. Comparatively, the amount of *mitayos* distributed hardly changed (from 4,389 to 4,413, according to personal calculations) but several important elements did shift.

In 1610, the universe of beneficiaries of the *mita* was greatly transformed. First, from the 1578 distribution to the 1610, they were reduced almost by half: from 288 to 140 beneficiaries. Among the beneficiaries in 1610—as in

TABLE 7.4 Women miner beneficiaries of the 1610 *mita*

Name	Mitayos	Type of establishment	Details
Nicolás de Garnica	25	mill	“his wife <i>doña Mariana</i> ... is widow and manages the estate Simon de Peralta has leased the Indians, Lorenzo de Vera Hernando of the Holy Brotherhood. Treats them badly and pays them worse Simón de Peralta”
Antonio Vázquez	33	mill	“works with them Juan Ortiz Antonio Vázquez who is his nephew on behalf of <i>doña María Davalos</i> heiress of Antonio Vázquez her husband, together with his nephew”
Alonso Benítez	62	mines/mill	“his wife <i>doña Beatriz</i> and Francisco Arias, her nephew, heirs”

TABLE 7.5 Comparison between the 1578 and 1610 *mita* distributions

	1578		1610	
Total <i>Mitayos</i>	4,389	100%	4,413	100%
Total beneficiaries	288	100%	140	100%
Women	5	1.7%	3	2.1%
Don/doña (noble title)	16	5.6%	12	8.60%
Soldiers	No data	No data	45	32.1%
Distribution of <i>mitayos</i> of multiple origins	890	20%	4,310	98%

Toledo's time—was the king and this time also included was the Royal Smelt House, the mines of the Holy Office, and a contingent for general cleanup of sinkholes (*socavones*). The 1610 list only included three women *mita* beneficiaries, and they were not directly mentioned, as shown in Table 7.4.

The 1610 distribution, in addition to these three “doñas,” included nine men who received the title of “don.” Forty-five individuals registered as “soldiers,” a social category of beneficiaries that had not appeared in the 1570s or 1580s lists. This reflected, on one hand, their emergence and development over the course of the past thirty-two years and, on the other hand, a political decision at the viceregal level to assign *mitayos* to this “lower” strata of miners. The only Indigenous beneficiary was a *mallku*: Don Juan Colqui with 15 *mitayos* (two Uros from Paria and thirteen from Tapacarí) for an eight-headed mill that he possessed in the Potosí *Ribera*.

Another contrasting element with respect to the 1578 distribution surfaces when analyzing the origin of the assigned *mitayos*. In 1578, only 20% of the distributions included *mitayos* from different Indigenous groups, while by 1610, 98% of the assignments included Indigenous people of diverse origins (between two and nine *repartimientos de indios*, sometimes from very distant regions). This is a stark contrast to Toledo's “mono-ethnic” order. In his report on Potosí around 1610, García de Llanos advised the rearrangement of the groups of *mitayos* according to ethnicity; as an overseer (*veedor del Cerro*) and expert in the field, he argued that it would increase the productivity of the workers.⁴³ Table 7.5 presents a brief systematization of some of this data comparison between 1578 and 1610.

43 Zagalsky, “Trabajadores indígenas mineros.”

TABLE 7.6 Major beneficiaries of the 1610 Potosí *mita* (receivers of consignments of between 137 and 40 *mitayos*)

Name	Type of establishment	Mitayos	
		Total	Number of <i>Repartimientos de indios</i> assigned (jurisdictions from which the <i>mitayos</i> came from)
Pedro Osoreo de Ulloa	mines/mills	137	7
Diego da Luiz	mines/mill	112	9
Martín de Garnica	mines/Tarapaya mill	112	8
Sebastián Sánchez de Merlo	mines/mill	105	8
Martín Pérez de Gallate and Sancho de Madariaga	mines/Tarapaya mill	95	8
Diego de Olaeta	mines/Tarapaya mill	90	8
Pedro de Mondragón	mines/mills Tarapaya	83	7
Diego Ximenez	mines/mill	82	7
Francisco de Oyanume	mines/Tarapaya mill	81	7
Gerónimo Gómez	mines/mill	81	6
Domingo Beltrán	mines/mill	78	7
Juan de Ibarra	mines/mill	77	7
Hernando de Valdez	mines/mill	75	7
Cosme López del Castillo	mines/mill	69	9
Juan Ramírez de Salazar	mines/mill	66	8
Pedro Rodríguez de Varas	mines/mills	66	6
Alonso González de la Pava	mines/mill	63	9
Hernando de Cuellar	mines/mill	63	6
Diego Bravo and his men (Pedro de Verasategui and Diego de Verasategui)	mines/Tarapaya mill	63	6
Alonso Benítez	mines/mill	62	5
Pedro Mexia de León	mines/mills	62	6
Hernán Carrillo de Córdoba	mines/mill	62	5
Gregorio de Lazarraga	mines/mill	61	7
Hernando de la Concha	mines/mill	60	6
Rodrigo Martínez de León	mines/mill	57	6

TABLE 7.6 Major beneficiaries of the 1610 Potosí *mita* (cont.)

Name	Type of establishment	Mitayos	
		Total	Number of <i>Repartimientos de indios</i> assigned (jurisdictions from which the mitayos came from)
Juan Cano	benefit and labor mines	56	7
Martín de Vertendona	mines/mill	54	7
Manuel de Guevara and Tomás de Cisneros	mines/mill	54	6
Juan Gómez Fernández	benefit and labor mines	53	6
Juanes de Castro	benefit and labor mines	49	6
Baltasar González	mines/mill	44	6
Luis García de Melo	mines/mill	44	6
Bernardino Muñoz	mines/mill	43	5
Antonio Osoreo de Ulloa	mines/mill	42	4
Gerónimo de Fuentes	mines/Tarapaya mill	41	5
Cristóbal Carrión de la Serna	mine/Tarapaya mill	40	5

Note: Data for the elaboration of Table 7.6 and about miners on the following pages come from BNF, MS Espagnol 175, f. 319r–340r.

To identify the individuals who received the most *mitayos* in 1610, a maximum individual allocation range was taken, from 40 to 137 *mitayos*—more than doubling the 1578 range, which was from 60 to 22 *mitayos*. That analysis yielded a list of thirty-six individuals, who received the largest *mitayo* assignments, and whose names are detailed in Table 7.6.

This 1610 list of the major *mita* beneficiaries, like the one from Toledo (Table 7.1), can guide us to the names of the more prominent or “major” miners, the “mining lords.” In any case, these are indicative, but not conclusive, lists that need to be supplemented by other sources to verify and develop the

global picture of these major miners. It is known that by 1610, one of the most important miners was Pedro de Mondragón,⁴⁴ who, although he was among the select group of the largest beneficiaries of *mitayos* (83), received a significantly lower amount than the largest beneficiary, Pedro Osores de Ulloa (137 *mitayos*). Pedro Osores de Ulloa, in addition to having been *corregidor* and chief of justice (*justicia mayor*) of La Plata city and the Imperial Villa of Potosí as well as second judge for land composition in Charcas from 1594 to 1596,⁴⁵ is mentioned in the text of the 1610 *mita* distribution for his cruel treatment of the *mitayos* and Indigenous people laboring in his mines and mills.

The Toledo distribution of 1578 appears brief compared to the one issued by Viceroy Montesclaros in 1610, as this one contains comments that allow us to learn more about the miners: whether they were “good miners,” whether “they treated and paid their worker well, or not.” Some of the “lords” of the mines and mills included in Table 7.6 were distinguished as being “good miners.” About Diego Ximenez, who had eighty-two assigned *mitayos* from seven Indigenous districts (*repartimientos de indios*), it was said:

He works with them in his own mines. And he is one of the best and oldest miners on the mountain, one who has brought about great labor with leased Indians. He has good miners such as Francisco de León and Diego de Vargas as Manuel de Guevara has amended.⁴⁶

Note that the mentions of Francisco de León and Diego de Vargas as “good miners” referred to the fact that they were administrators of the mines, as explained in the dictionary by García de Llanos. In the same way, Rodrigo Martínez de León received fifty-seven *mitayos* and had “as a ‘miner’ [administrator], Pedro Lonso, who treats them well.” Likewise, the case of Martín Pérez de Gallate and Sancho de Madariaga, who received ninety-five *mitayos* from eight Indigenous districts for their mines and mills, appeared to have had their own mines in the upper vein of “Los Ciegos” and had an adit “of high regard in the lower ‘Los Ciegos’ that has cost them much silver. Their estates are the best in Peru. They work its passages and with the flow pay the Indians well.” We know that Sancho de Madariaga, mining lord, and his *azoguero* (mill administrator), Tomás de Vicuña, prepared technological reports that tied them to the

44 Numhauser, “Un asunto banal,” 130.

45 María Carolina Jurado, “‘(...) muy mañoso para esto.’ Comisiones para don Pedro Osores de Ulloa, segundo juez de composición de tierras de Charcas, 1594–1596,” *Corpus* 4, no. 2 (2014).

46 Jurado, “(...) muy mañoso para esto.”

men involved in advances in the mining sector.⁴⁷ Among the “good miners” that “treated and paid [their Indigenous workers] well,” there were large beneficiaries of the *mita*: Gerónimo Gómez, with eighty-one *mitayos*, “works in his own mines, in [the vein of] ‘El Estano’ and [the vein of] ‘El Ciego’, they are good estates and he a good miner”; Hernando de Valdez, with seventy-five *mitayos*, “works very well in his tunnel in San Juan de la Pedrera”; Pedro Rodríguez de Varas, with sixty-six *mitayos*, “works in ‘los flamencos’ in his own vein. Good miner”; Juan Gómez Fernández received fifty-three *mitayos* and had “a mill of two heads with 16 hammers and another of 7 hammers in company of Cristóbal Carrión de la Serna in Tarapaya, and for his mines,” and it is noted in the margin: “It was a head of 11 hammers. He brings some in a small vein of el ‘Estano’ and others in the upper ‘Ciegos’. He has as miner, his son, who treats them well.” Among the “good miners,” there were also those with more modest endowments of *mitayos*: Martín de Mardones, with twenty-six *mitayos*; Matheo Ruiz also received twenty-six *mitayos* (and had “a mill of 7 hammers in the Ribera de Potosí and mines”; some other details were also mentioned: Ruiz owed Alonso Muñoz 30,000 pesos; he sent Indigenous *mita* workers together with those of Alonso Bernal Lozano to work in the vein of upper El Ciego and in the vein of Cosme López; in his mines, he had Captain Villalobos Zapata as a miner (manager), who treated them very well); Pedro Corvacho was described as a soldier, had twenty-two assigned *mitayos*, and it was mentioned that “he has worked for 28 years without having Indians. He had a lot of mines and is a good miner.” As can be seen, those considered “good miners,” for treating and paying workers well, included large and small beneficiaries. Perhaps the condition of “good miner” was also linked to the practices and technical knowledge related to the exploitation of mines and mills.

Among those accused as abusers of the Indigenous people were Diego de Olaeta, with ninety *mitayos*, who “has a lawsuit against the *alcalde mayor* due to his debt to Indians, which is a large sum. Treats them badly and pays them worse”; the aforementioned Pedro Osore de Ulloa inflicted cruel treatment on his *mitayos*; Martín de Vertendona, with fifty-four *mitayos* assigned to his mines and mills:

He works in the upper *Los Ciegos* with the Indians from Hernán Carrillo that he has leased and with those of Alonso de Mesa. His miner is Alonso

47 Carlos Sempat Assadourian, “Los informes tecnológicos del minero Sancho de Madariaga y de su azoguerro Tomás de Vicuña. Potosí, 1610 (British Library, Manuscripts, Sloan 3055, folios 74–92),” *Surandino Monográfico* 1, no. 2 (2010), <http://revistascientificas.filo.uba.ar/index.php/surandino/article/view/5932/5275>.

Álvarez [beneficiary of only two *mitayos*], a very cruel man with the Indians and who gives enormous tasks. He is sentenced to Chile and in 200 *pesos ensayados*.⁴⁸

About Gómez Cabrera, it was said that with his twenty-five assigned *mitayos*, “working with them is his son-in-law; Gabriel Santo Domingo, whom he keeps present at the mill because he is disabled from old age and gout. Treating them badly, [Gabriel], and the *alcalde* [mayor] of mines has filed cases against him.” Diego Calderón de Salzedo had as administrator Simón de Peralta, who paid and treated the Indigenous workers badly.

Some of the beneficiaries were jailed for selling to their *mitayos*: for example, Don Juan de Mendoza, who was Juan de Fajardo’s brother, “sold them to Juan Ruíz and now to Manuel de Guevara. He is now imprisoned for it.” Juan de Ugarte had twenty-two *mitayos* removed “because of the many who are in the mill of others.” Of the other miners, especially the soldiers, it is mentioned in which veins they worked, and if they had done so by hiring workers. Of others, it was said that nothing was known of their work, or that “the mayor of mines [*alcalde de minas*] has not seen labor of theirs.” Most likely in these cases, the beneficiaries funneled their *mitayos* towards other tasks or rented them out. The following stand out in this regard: Antonio Osore de Ulloa (forty-two *mitayos*); Don Beltrán de Castro (leased out his twenty-three *mitayos*); and Gabriel Jurado (eight *mitayos*, “has an adit above Berrío and does not work there or have other mines. The Indians are sold in Guariguari and the mayor of mines does not know of his labor”).

Linked to this, the *mita* distribution of 1610 indicated that some of the beneficiaries “bagged” (*embolsaban*): “for candles” (*candelas*) (Francisco de Oyanume, beneficiary of eighty-one *mitayos* for his mines and mill in Tarapaya); “money” (Diego da Luiz); “silver” (Diego Bravo and his men, Pedro and Diego de Verasategui; Juan Álvarez de Solar); “Indians” (Domingo de Arauxo, Juan de Tovalina, Pedro Ximenez del Castillo; Benito Bohorquez). Consulting the authorities’ dictionary of 1732, Volume III, the meaning of the expression “to bag” (*embolsar*) is almost the same as understood today:

Place or store money or other in the bag; although the common use of this verb is understood by money; and thus, by antonomasia, in saying

48 BNF, MS Espagnol 175, 333v.

“to bag,” money is meant. Lastly, in the case of several mill owners, it is clarified that these are “trapiches that hurt from behind.”⁴⁹

That is to say, it was the money that these miners earned from the sale or rent of different merchandise or labor (candles, silver, Indigenous work). In that same sense, in 1610, soldier Pedro Julián (who counted on eight *mitayos* plus another eighteen that he had received together with a mill in Tarapaya as a dowry from his father-in-law, Hernando Ortiz de Villallave) was singled out for his harmful and unlawful practices (against the *ordenanzas de rescates*) on the mountain, in his home, and with the cattle that he moved to Tarapaya, where his mill was located. Regarding García de Llanos himself, beneficiary of the 1610 *mita* and recognized as a soldier in other documents, it is indicated: “He has no mines through purchase or by [cut] nor unpopulated. More than a few donations made to him by soldiers when he left.” Thus, the overseer of the Cerro Rico himself exploited mines that he had received as a donation from other soldiers.

4 Final Comments

This chapter aimed to analyze the universe of the so-called “miners” of Potosí, specifically during its peak silver production (1569–1610), to contribute to a better understanding of the different actors who played a role in Potosí and who benefitted from the Crown’s distribution of *mitayo* workers.

It has been argued that the meaning of the term “miner” during the 1569–1610 period was not the same as the current meaning, which designates the workers or operators of a mine or mill. On the contrary, the term “miner” referred to an economic, social, and political sector that was key to viceregal life and the economy and made up of a variety of owners and/or tenants of mines and mills, where only the largest and most important would be denoted as “lords.” The term “miner” was also used in a broader sense to refer to managers of mines and mills.

We attempted here to understand the universe of the main “mining lords” based on the viceroys’ official allotments of *mitayo* workers, especially those of 1578 and 1610. In analyzing the *mita* beneficiaries, we found the emergent presence of women miners and the probable presence of Indigenous miners.

49 Real Academia Española, *Diccionario de Autoridades*, accessed November 22, 2021, <https://apps2.rae.es/DA.html>.

Comparing data from 1578 and 1610, it appears that the number of miners who benefitted from *mitayo* work was reduced by half in those thirty years. I suggested that this clustering of access to cheap *mitayo* labor into fewer hands was linked to the risks and volatility of the mining sector. Likewise, I outlined reasons for the marked increase in the number of “soldiers” during the period.

One of the areas that historiography has yet to explore is the relationship between the chemical profile of Potosí minerals, production levels, and the technical role played by its miners in creating novel recipes for refining the silver sulfides. Without this new formula it would not have been possible to refine the black metals (*metals negrillos*) with mercury; the refiners would have had to re-smelt with lead, and the environmental impact would have been much greater. Some of these creative miners are mentioned in the report of Juan Ortiz de Zárate’s visit:⁵⁰ Domingo Gallego and Garci Sánchez, Joan Fernández Montaña, Joan Andrea Corzo, and Carlos Corzo. Only Domingo Gallego appears on the 1578 list, while none appear in the 1610 listing. For his part, Carlos Corzo must have acted through figureheads; it is therefore very likely that the Corzo brothers are indirectly represented in Tables 7.1 and 7.6. It was also mentioned that Sancho de Madariaga, mining lord, and his *azoguero*, Tomás de Vicuña, put together technological reports linked to these advances. In sum, most of the innovative miners of the period were not among the beneficiaries of the *mita*. It is possible to outline some reasons for this. On one hand, it could be associated with the high turnover among “medium and small” miners/refiners, with short cycles of participation in mining for most of them. Another possible explanation is that most of the creative miners were “small” miners and lower down on the hierarchical ladder, with fewer sociopolitical networks, and therefore did not receive significant amounts of *mitayos*. Additionally, it is possible that this less privileged position in the structure of the mining industry, including less access to cheap *mitayo* labor, spurred them to develop solutions through creativity and innovation.

The nominal lists of the largest beneficiaries of the *mita* in 1578 and 1610 (Tables 7.1 and 7.6), as well as the qualitative information presented here, are not only contributions in the construction of a historiography around the great mining lords of Potosí, but also aid in creating more visibility about other relevant subjects in Potosí life, such as the medium and smaller actors and those less often identified with the activity, such as women and Indigenous people. The lists presented are indicative, but not conclusive, since they focus on one variable, the labor base, and within it, they focus on one section: the *mitaya*

50 Raphael in this volume.

base. They should, therefore, be complemented with other sources of information. In this sense, to expand research by using the variables proposed by Navarrete to classify the areas and dimensions of mining ventures could be a useful objective, which this chapter has attempted to establish. Let us remember these variables: labor base (number of workers, labor systems), quantity of silver produced, capital invested, size of productive units, machinery and technology, and the vertical integration of processes. In the case of Potosí, we know that the measurement of the amount of *mitayos* and mercury purchased may not necessarily be indicative of the size of the company, since there were practices that altered the “ideal” destination, such as the rental of *mitayos* to third parties (or putting them to work in non-mining/personal productive units) and the speculative resale of mercury delivered by the Hacienda Real. Additionally, all information needs to be contextualized, even when analyzing a short period since, it is well known, the mining cycles and the lives of the companies associated with the sector often had short lifespans.

On the other hand, this chapter made it possible to detect the presence of female miners—although few—as beneficiaries of *mitayos*, either as owners or as heirs. The presence of women among mining entrepreneurs was verifiable throughout the boom period: In 1578, there were five women, Capoché’s list includes twenty-one women, and in 1610 it declined to only three. The presence of these women requires further interrogation as to the role played by certain women as entrepreneurs or possessors of assets linked to mining during the period and about the practices deployed for their administration.⁵¹

Finally, in comparing the distributions of 1578 and 1610, we can detect an important constant: most of the *mitayos* were sent to work in the mills, milling the ore. The comparison also shows a series of notorious changes unrelated to variances in the names on the lists, since over the period of thirty-two years, in

51 Valuable recent contributions have begun to emerge around women in mining, both women workers and women entrepreneurs, but there is still a long way to go: Alison Bigelow, “Women, Men, and the Legal Languages of Mining in the Colonial Andes,” *Ethnohistory* 63, no. 2 (2016): 351–80; Rossana Barragan R., “Women in the Silver Mines of Potosí: Rethinking the History of ‘Informality’ and ‘Precarity’ (Sixteenth to Eighteenth Centuries),” *International Review of Social History* 65, no. 2 (2020): 289–314; Isabel M. Povea Moreno, “Mujeres y minería en la América colonial: una introducción,” *Chronica Nova* 46 (2020): 11–20; Isabel M. Povea Moreno, “Mineras y parcioneras. La participación de las mujeres en la minería de San Luis Potosí, una aproximación a través de los pleitos, siglo XVIII,” *Chronica Nova* 46 (2020): 53–82; Margarita Villalba Bustamante, “Empresarias mineras de Guanajuato, 1714–1803,” *Chronica Nova* 46 (2020): 21–52; María Concepción Gavira Márquez, “Azogueras, trapicheras y dueñas de minas en los centros mineros de Charcas (Bolivia), siglo XVIII,” *Chronica Nova* 46 (2020): 83–110.

addition to a changing political and clientelist dynamic, individuals also died. The notable changes that stand out refer, above all, to variables that were radically modified during the period. First, despite contrary opinion, there was an increase in multiethnic *mita* allocations. Second, it is clear that in 1610 the beneficiaries of the *mita* had been reduced numerically by half (from 288 to 140), forming a smaller and probably more select group that shared close sociopolitical ties. In 1610, moreover, a few individuals had access to much larger quantities of *mitayos* (from a maximum of sixty Indigenous people given to one person in a 1578 allocation, an increase was seen to a maximum of 137 *mitayos* given to a single individual). In 1610, contrary to what might be assumed, the select group of thirty-six beneficiaries included both Basques and non-Basques. Therefore, we can verify certain tendencies towards a concentration of access to *mitayos* (forced, salaried, and cheap labor). However, there is also nuance to this trend: in 1610, 32% of the beneficiaries were “soldiers,” people of medium or low levels of society who managed to insert themselves within the beneficiary group of a precious and fundamental resource of the colonial mining economy.

In analyzing the trends and lists referring to people of flesh and blood, this chapter sought to contribute to the study of the key variables, unraveling the labor and sociopolitical networks that developed during a pivotal period in Potosí's history.

Acknowledgements

I wish to thank the valuable readings of anonymous reviewers, as well as the comments of Kris Lane, Rossana Barragán R., and Renée Raphael. The ideas that gave rise to this article arose, to a large extent, from exchanges with colleagues in Mexico during a visit that was made possible thanks to a 2016 postdoctoral scholarship from AMEXCID, at El Colegio de México. My thanks to Bernd Hausberger, Brígida von Mentz, David Navarrete, Valentina Garza Martínez, Felipe Castro Gutiérrez, and Isabel M. Povea Moreno. I am indebted to everyone, although responsibility for the final outcome of this study lies with me.

Primary Sources

Bibliothèque Nationale de France (BNF), Manuscrit (MS) Espagnol 175.
Bolivia (BO), Archivo y Biblioteca Nacionales de Bolivia (ABNB)

- Libros de Acuerdos del Cabildo Secular de Potosí (CPLA) 5, 7, 20.
- Correspondencia Audiencia de Charcas (CACH) 313, 619.

Bibliography

- Arroyo, Ana M. *Minería en el real de Temascaltepec en el último cuarto del siglo XVIII*. México: INAH, 2011.
- Assadourian, Carlos S. "La producción de la mercancía dinero en la formación del mercado interno colonial." In *Ensayos sobre el desarrollo económico de México y América Latina (1500–1975)*, edited by Enrique Florescano, 223–92. México: Fondo de Cultura Económica, 1979.
- Assadourian, Carlos Sempat. "Los informes tecnológicos del minero Sancho de Madariaga y de su azoguero Tomás de Vicuña. Potosí, 1610 (British Library, Manuscripts, Sloan 3055, folios 74–92)." *Surandino Monográfico* 1, no. 2 (2010).
- Bakewell, Peter J. *Antonio López de Quiroga: industrial minero del Potosí colonial*. Potosí: Universidad Boliviana "Tomás Frías," 1973.
- Bakewell, Peter J. *Minería y sociedad en el México colonial, Zacatecas (1546–1700)*. México: FCE, 1984.
- Bakewell, Peter J. *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650*. Albuquerque: University of New Mexico Press, 1984.
- Barragán R., Rossana. "Women in the Silver Mines of Potosí: Rethinking the History of 'Informality' and 'Precarity' (Sixteenth to Eighteenth Centuries)." *International Review of Social History* 65, no. 2 (2020): 289–314.
- Bigelow, Alison. "Women, Men, and the Legal Languages of Mining in the Colonial Andes." *Ethnohistory* 63, no. 2 (2016): 351–80.
- Bonialian, Mariano A. *La América española: entre el Pacífico y el Atlántico. Globalización mercantil y economía política, 1540–1840*. México: El Colegio de México, 2019.
- Brading, David A. *Mineros y comerciantes en el México borbónico (1763–1810)*. México: FCE, 1975.
- Bridikhina, Eugenia. "Los misterios de la urbe: enredos políticos y económicos en La Plata y Potosí." In *La construcción de lo urbano en Potosí y La Plata*, edited by Andrés Eichmann and Marcela Inch C., 149–267. Sucre: Ministerio de Cultura de España, FCBCB y ABNB, 2011.
- Bronner, Fred. "Elite Formation in Seventeenth-Century Peru." *Boletín de Estudios Latinoamericanos y del Caribe* 24 (1978): 3–26.
- Buechler, Rose Marie. *Gobierno, minería y sociedad: Potosí y el "Renacimiento" borbónico, 1776–1810*, Tomo 2. La Paz: Biblioteca minera boliviana, 1989.
- Carbajal, David. *La minería de Bolaños, 1748–1810: ciclos productivos y actores económicos*. Zamora: El Colegio de Michoacán, 2002.

- Chaunu, Pierre. *Seville et Atlantique, 1500–1650*. Paris: Libraire Armand Colin, 1955–59.
- Clayton, Lawrence A. “Trade and Navigation in the Seventeenth-Century Viceroyalty of Peru.” *Journal of Latin American Studies* 7, no. 1 (1975): 1–21.
- Cole, Jeffrey A. *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press, 1985.
- Couturier, Edith. *The Silver King: The Remarkable Life of the Count of Regla in Colonial Mexico*. Albuquerque: New Mexico University Press, 2003.
- Crespo, Alberto. *La guerra entre vicuñas y vascongados, Potosí, 1622–1625*. Sucre: Universidad Andina Simón Bolívar, 1997.
- Dressing, David. “Social Tensions in Early Seventeenth-Century Potosí.” PhD diss., Tulane University, 2007.
- Eichmann, Andrés, and Marcela Inch, eds. *La construcción de lo urbano en Potosí y La Plata (siglos XVI–XVII)*. Sucre: Ministerio de Cultura de España, FCBCB y ABNB, [2008] 2011.
- Flores Clair, Eduardo, and Cuauhtémoc J. Velasco Ávila. “Minería y poder político en México 1770–1856.” *Historias* 5 (1984): 33–55.
- García, Jaime. “La administración de las minas de plata y haciendas de beneficio de la familia Sandoval en Taxco, 1562–1564.” In *La plata en Iberoamérica, siglos XVI–XIX*, edited by Jesús Paniagua and Nuria Salazar, 39–59. León: Universidad de León, 2008.
- Garner, Richard. “Zacatecas, 1750–1821: The Study of a Late Colonial Mexican City.” PhD diss., University of Michigan, 1970.
- Gavira Márquez, María Concepción. “Azogueras, trapicheras y dueñas de minas en los centros mineros de Charcas (Bolivia), siglo XVIII.” *Chronica Nova* 46 (2020): 83–110.
- Gisbert, Teresa. *Iconografía y mitos indígenas en el arte*. La Paz: Gisbert, 1980.
- Hausberger, Bernd. *La Nueva España y sus metales preciosos: La industria minera colonial a través de los libros de cargo y data de la Real Hacienda, 1761–1767*. Frankfurt: Vervuert, 1997.
- Hausberger, Bernd. “Paisanos, soldados y bandidos: la guerra entre los vicuñas y los vascongados en Potosí (1622–1625).” In *Los buenos, los malos y los feos. Poder y resistencia en América Latina*, edited by Nikolaus Böttcher, Isabel Galaor, and Bernd Hausberger, 283–308. Madrid/Frankfurt a.M.: Iberoamericana/Vervuert, 2005.
- Hausberger, Bernd. “Paisanos. La etnicidad de los vascos en Potosí, c. 1600–1625.” *Caravelle* 101 (2013): 173–92.
- Herrera, Inés, ed. *La minería mexicana. De la colonia al siglo XX*. México: Instituto Mora/Colmex, 1998.
- Herrera, Inés and González, Eloy. *Recursos del subsuelo, siglos XVI al XX*. México: UNAM-Océano, 2004.
- Howe, Walter. *The Mining Guild of New Spain and its Tribunal General (1790–1821)*. Cambridge: Harvard University Press, 1949.

- Jurado, María Carolina. "(...) muy mañoso para esto.' Comisiones para don Pedro Osores de Ulloa, segundo juez de composición de tierras de Charcas, 1594–1596." *Corpus* 4, no. 2 (2014).
- Langué, Frédérique. "Mineros y poder en Nueva España. El caso de Zacatecas en vísperas de la Independencia." *Revista de Indias* 51, no. 192 (1991): 327–41.
- Langué, Frédérique. *Los señores de Zacatecas. Una aristocracia minera del siglo XVIII novohispano*. México: FCE, 1999.
- Langué, Frédérique and Salazar-Soler, Carmen. *Diccionario de términos mineros para la América española (siglos XVI–XIX)*. Paris: Éditions Recherche sur les civilisations, 1993.
- Lazaga, Juan Lucas de, and Joaquín Velázquez de León. "Representación." In *La minería en la Nueva España a postrimerías del siglo XVIII*, edited by Luis Chávez Orozco. México, [1774] 1938.
- Llanos, García de. 2009. *Diccionario y maneras de hablar que se usan en las minas y sus labores en los ingenios y beneficios de los metales (1609)*. Madrid: Consejo Superior de Colegios de Ingenieros de Minas, 2009.
- López-Beltrán, Clara. *Alianzas familiares, élite, género y negocios en La Paz, siglo XVII*. Lima: IEP, 1998.
- López Beltrán, Clara. *La Ruta de la Plata: de Potosí al Pacífico, caminos, comercio y caravanas en los siglos XVI y XIX*. La Paz: Plural, 2016.
- Mendoza, Gunnar. "Glosario de voces relativas al trabajo minero." In *Relación General de la Villa Imperial de Potosí*, edited by Luis Capoche, 198–208. Madrid: BAE, 1959.
- Navarrete, David. *Proprietarios y trabajadores en el distrito minero de Pachuca, 1750–1810*. México: Servicio Geológico Mexicano, 2002.
- Navarrete G., David. "La mediana minería en la Nueva España: Apuntes para una agenda de investigación." *ISTOR* 73 (2018): 95–109.
- Numhauser, Paulina. "Un asunto banal: las luchas de Vicuñas y Vascongados en Potosí (siglo XVII)." *Illes i Imperis* 14 (2012): 113–38.
- Ocaña, Fray Diego de. *Un Viaje fascinante por la América Hispana del siglo XVI*. Madrid: Studium, 1969.
- Pérez R., Laura. *Familia, poder, riqueza y subversión: Los Fagoaga novohispanos, 1730–1830*. México: Universidad Iberoamericana, 2003.
- Povea Moreno, Isabel María. "Mujeres y minería en la América colonial: una introducción." *Chronica Nova* 46 (2020): 11–20.
- Povea Moreno, Isabel María. "Mineras y parcioneras. La participación de las mujeres en la minería de San Luis Potosí, una aproximación a través de los pleitos, siglo XVIII." *Chronica Nova* 46 (2020): 53–82.
- Real Academia Española. *Diccionario de Autoridades*, <https://apps2.rae.es/DA.html>.
- Suárez, Margarita. *Comercio y fraude en el Perú colonial: las estrategias mercantiles de un banquero*. Lima: IEP, 1995.

- Suárez, Margarita. *Desafíos trasatlánticos. Mercaderes, banqueros y el estado en el Perú virreinal, 1600–1700*. Lima: IFEA, PUCP, Instituto Riva Agüero, FCE, 2001.
- Tandeter, Enrique. *Coacción y mercado: la minería de la plata en el Potosí colonial, 1692–1826*. Buenos Aires: Sudamericana, 1992.
- TePaske, John J. *A New World of Gold and Silver*. Leiden: Brill, 2010.
- Villalba Bustamante, Margarita. “El gran potencial de los pequeños y medianos mineros de Guanajuato en la segunda mitad del siglo XVIII.” *Nuevo Mundo Mundos Nuevos* (2015), <https://doi.org/10.4000/nuevomundo.67764>.
- Villalba Bustamante, Margarita. “Empresarias mineras de Guanajuato, 1714–1803.” *Chronica Nova* 46 (2020): 21–52.
- Von Mentz, Brígida. “La organización y el abasto de insumos de una empresa minera en Zacatecas a fines del periodo colonial e inicios del independiente.” In *Dinero y negocios en la historia de América Latina: veinte ensayos dedicados a Reinhardt Liehr*, edited by Nikolaus Botcher and Bernd Hausberger, 199–230. Frankfurt: Vervuert Iberoamericana, 2000.
- Von Mentz, Brígida. “Plata y sociedad regional. Reales de minas pequeños en la Nueva España, siglos XVI–XVIII: Entre lo rural y lo urbano.” *Nuevo Mundo Mundos Nuevos* (2015), <https://doi.org/10.4000/nuevomundo.67733>.
- Zagalsky, Paula C. “La mita de Potosí: una imposición colonial invariable en un contexto de múltiples transformaciones (siglos XVI–XVII; Charcas, virreinato del Perú).” *Chungará* 46, no. 3 (2014): 375–95.
- Zagalsky, Paula C. “Trabajadores indígenas mineros en el Cerro Rico de Potosí: tras los rastros de sus prácticas laborales (siglos XVI y XVII).” *Revista Mundos do Trabalho* 6, no. 12 (2014): 55–82.

A Silver Bank

*The Renaissance of Potosí and the Heterogeneous World of Its Producers in the Eighteenth Century*¹

Rossana Barragán R.

1 Introduction

A “silver bank” refers explicitly to the institution tasked with purchasing silver from producers and selling them essential raw materials—such as mercury, iron, and timber—on credit or at special rates. A “silver bank” also alludes to, metaphorically, the mountain in Potosí and the economic, social, and political dynamics generated from its exploitation. Finally, it refers to how the bank’s sources provided an opportunity to rethink topics such as the role of the Crown and its policies during the silver mining renaissance of the early Bourbon period, given the presence of the English, Dutch, and French in the Americas. Within this context, I revisit Potosí’s mining industry of the eighteenth century, looking closely at Potosí’s silver producers.

My analysis begins with the emergence of the *Compañía de los Azogueros* (*Azogueros*, concessionaires of mines and owners of silver refineries) and its transformation into a bank for purchasing silver, in a time when the Spanish Empire sought to regain control over its trade and to fight smuggling.² I am interested in situating these events in the broader global context of companies, corporations, and banks. Initially, in 1747 there was an effort to transform the *Gremio de Azogueros* (mining guild) into a chartered company with

1 The term “renaissance” was used by Rose Marie Buechler, albeit for a later period. See Buechler’s *Gobierno, minería y sociedad: Potosí y el “renacimiento” borbónico, 1776–1810*, 2 vols. (La Paz: Biblioteca Minera Boliviana, 1989). I am grateful for the valuable comments made by Saúl Guerrero, Herbert Klein, Guillermo Mira, Kendall Brown, Richard Gardner, Alejandra Irigoin, and Kris Lane. The responsibility for this chapter is mine.

2 William A. Pettigrew and David Veevers, “Introduction,” in *The Corporation as a Protagonist in Global History, c. 1550–1750*, ed. William Pettigrew and David Veevers (Leiden: Brill, 2019); Edgar Pereria, “Iberia,” in *The Corporation as a Protagonist in Global History, c. 1550–1750*, ed. William Pettigrew and David Veevers (Leiden: Brill, 2019). David Brading, “Bourbon Spain and its American Empire,” in *The Cambridge History of Latin America*, ed. L. Bethell (Cambridge: Cambridge University Press, 1984), 410.

shareholders. Chartered companies were conferred a trading monopoly of certain regions (like the Dutch East Indian Company [VOC] in 1602 and the English East Indian Company [EIC] in 1600), and during the seventeenth century several such projects were presented to the Spanish Crown. Over the eighteenth century, several companies emerged: in 1728, the Royal Guipuzcoan Company or Caracas Company was established to prevent the smuggling of cacao and to take back its trade from the Dutch; in 1740, the Royal Havana Company; in 1747, the Royal San Fernando of Seville Company; and in 1756, the company of Barcelona for Santo Domingo, Puerto Rico and Margarita.³

The owners of silver refineries and mines in Potosí (*Gremio de Azogueros*) formed the *Compañía de Azogueros* to sell their silver and to purchase essential mining raw materials under better terms. Spanish authorities, on the other hand, were interested in adjusting tax revenue from the *quinto* (a fifth or 20%) to the *diezmo* or one tenth (a tithe) on silver, in an attempt to avert smuggling. The company was initially converted into the *Casa de Rescates* or *Banco de Rescates* (1752), for purchasing silver ore, and then quickly into the *Banco de la Corona* (1779) and *Banco Real de San Carlos* (1795), which held Potosí's ore purchasing monopoly.⁴ The private initiatives of the *azogueros* were, therefore, combined with the interests of the state or, more specifically, with the administrative and fiscal intervention of the Crown.

As a result of this process, the mining sector became independent from the commercial capital of the *aviadores*—merchants who had been purchasing and transporting silver while supplying the producers. The creation of an entity to buy silver at higher prices than those paid by these merchants allowed for immediate cash payments, and provided credit in exchange for mining ore, improving the situation of the *azogueros* and the mining industry in general.

After this section, I present the world of silver ore producers (in point 3). I show that the *azogueros*,⁵ generally considered Potosí's main silver producers, were in fact responsible for only about 50% of the output between 1754 and 1800. The other 50% came from the *k'ajchas* (artisanal self-employed workers

3 Carla Rahn, "The Growth and Composition of Trade in the Iberian Empire, 1450–1750," in *The Rise of Merchant Empires: Long Distance Trade in the Early Modern World, 1350–1750*, ed. James Tracy (Cambridge: Cambridge University Press, 1990), 97.

4 Contreras mentioned its monopsonic nature in "La minería en el Perú en la época colonial tardía, 1700–1824," in *Compendio de Historia Económica del Perú. Economía Colonial Tardía*, ed. Carlos Contreras (Lima: Banco Central del Perú, Instituto de Estudios Peruanos, ed. digital 2020), 117.

5 Paula Zagalsky's chapter in this volume reveals the complex world of the mine owners and refining mills in the initial period and during Potosí's silver boom.

or “informal workers”),⁶ and “Capchas, Trapiches, and foreign minerals,” or minerals from outside the city. *Trapiche* is the generic name of rudimentary stone mills, and *trapicheros* were the men who operated them. This differentiation in mining ore producers reveals the consolidation of spaces, actors, and units of production occurring outside of the big mills of the *azogueros*.⁷ I stress the paradox that a policy aimed at greater control to increase the Crown’s income and support for the mining sector—after fifty years of demands for change from the miners—led to the acknowledgement and visibility of subaltern sectors, small and medium-sized groups within and outside the city. Their importance and magnitude are impressive.

The diverse and heterogeneous world of *azogueros*, on the one hand, and the *k’ajchas* and *trapicheros* on the other, are scrutinized in sections three and four, respectively.

Daily ledgers of silver purchases bring us closer to the hundreds of persons who come to life in all their complexity thanks to many distinct qualitative sources. Accounts about the *k’ajchas*, discussions and debates about them, *visitas* (inspections) to the *trapiches*, reports from miners/foremen, and sales to the bank help us understand them better.

Finally, I explore the recovery of the mining industry in Potosí to rethink what brought about this renaissance, which must be also linked to the new structure of mining production that I analyze.

2 A Company, a Shareholders Bank, and a Spanish Crown Bank

In 1945, Vicente Palacios Atard wrote an article outlining briefly but accurately the transition from the *Banco de Rescates de Potosí* to the *Banco de San Carlos*

6 The term appears spelled in various ways: “Capchas,” and “Cagchas.”

7 Selected works: Peter Bakewell, *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650* (Albuquerque: University of New Mexico Press, 1984); Jeffrey Cole, *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes* (Stanford: Stanford University Press, 1985); Enrique Tandeter, *Trabajo forzado y trabajo libre en el Potosí colonial tardío* (Buenos Aires: Cedes, 1980); Enrique Tandeter, “Forced and Free Labour in Late Colonial Potosí,” *Past and Present* 93 (1981); Enrique Tandeter, *Coacción y mercado: La minería de la plata en el Potosí colonial, 1692–1826* (Cuzco: Centro de Estudios Regionales Andinos “Bartolomé de Las Casas,” 1992); Rose Marie Buechler, *Gobierno, minería y sociedad*. More recently, see Paula Zagalsky, “La mita de Potosí: una imposición colonial invariable en un contexto de múltiples transformaciones (Siglos XVI–XVII; Charcas, Virreinato del Perú),” *Chungara* 46, no. 3 (2014), 375–95, and the important book by Kris Lane, *Potosí, The Silver City that Changed the World* (Berkeley: University of California Press, 2019).[†]

(1795).⁸ The highest authorities of Potosí were involved: José Herboso in the initial idea, Ventura de Santelices y Venero in configuring its makeup, Pedro de Tagle in its official incorporation to the Crown in 1779, and Jorge Escobedo y Alarcón in the final agreement with the *azogueros* to transfer the bank to the Crown.⁹

The initial step was the creation of the *Compañía de los Azogueros* in 1747, after the long mining crisis of the seventeenth century in Potosí and within the context of the commercial competition between the empires in the eighteenth century.

The then-viceoy of Peru, Duque de La Palata, attempted an extensive reform between 1681 and 1682 to revive Potosí's mining economy by increasing the number of *mitayos* (coerced workers under the *mita* system), which had diminished from around 12,000 workers by the end of the sixteenth century to fewer than 4,000 at the end of the seventeenth century. The project failed dismally. Different regions, groups, and economic sectors were opposed to what they considered to be a major subsidy for the mining industry, given that the mining guild had the advantage of receiving *mitayo* labor channeled through the colonial authorities in exchange for their silver production and the *quinto* (fifth) of the silver production in royal taxes.

La Palata's fiasco gave rise to extended debates over various decades. The arguments raised by the *azogueros* included their great contribution to and support for the Royal Treasury, the constantly diminishing numbers of *mitayo* workers, the high taxes on silver (greater than in Nueva España), the supply and cost of mercury, as well as the difficult access to other key raw materials.¹⁰

At the same time, the Spanish Empire wanted to regain control over the silver trade in the American continent, which entailed tackling smuggling and the stiff competition between the main European powers for overseas trading and production.¹¹

In the viceroyalty of Peru, smuggling occurred along the coast of the Pacific, particularly from the north of Quito toward the Caribbean, Nueva Granada, and Panama; and on the Atlantic coast, from Río de La Plata and Brazil toward Europe and Africa. According to Adrian Pearce, between 1704 and 1708, more

8 Vicente Palacios Atard, "El Banco de Rescates en Potosí," *Anuario de Estudios Americanos* T. II, (1945).

9 ABNB ALP Min 138/11.

10 Ignacio González Casanovas, *Las dudas de la corona: La política de repartimientos para la minería de Potosí (1680–1732)* (Madrid: CSIC, 2000).

11 David Brading, "Bourbon Spain," 410; Stanley Stein and Barbara H. Stein, *Silver, Trade, and War: Spain and America in the Making of Early Modern Europe* (Baltimore: John Hopkins University Press, 2000), 149.

than 150 French ships circled the coasts of the Pacific and exchanged a total of 20 million pesos of merchandise. Additionally, over sixty ships entered Río de la Plata illegally in 1738. Coincidentally, the decline in silver production overlapped with this period. Smuggling intensified through Cape Horn after 1740, strengthening commerce through Río de La Plata or Buenos Aires.¹² Trade along this route “was characterized by the persistence and regularity of smuggling, meaning the direct commerce with non-Spanish powers.”¹³

The Crown also sought to improve the administration of silver production, and its officials began collecting taxes directly, eliminating brokering by the large silver merchants in some *Casas de Moneda* (mint institutions) between 1728 and 1730. According to Pearce, the economic and fiscal authority of the viceroys also increased substantially from 1740 and particularly after 1751.¹⁴ The magnitude of these changes at the start of the Bourbon century has been highlighted by Anthony McFarlane, who contends that the empire transitioned from a royal kingdom to a more centralized kingly state, with new mercantilist and royalist, rather than enlightened, government structures.¹⁵ However, Alejandra Irigoin and Regina Grafe argue that it is also important to consider how absolutism was “bargained.”¹⁶

Measures aimed at reviving mining from 1730 to 1735 consisted of improving the supply and prices of mercury and reducing the tax on silver production from a fifth (*quinto*) to the tithes (*diezmo*), or from 20% to 10%. I argue that the establishment of the *Compañía de los Azogueros* in 1747 was part of the decision to support the mining sector.¹⁷ The company was established with 2,000 pesos per share, which could also be deducted from silver sold by the *azogueros*. They received seven pesos for each mark of silver¹⁸ minus a fraction of

12 Adrian Pearce, *The Origins of Bourbon Reform in Spanish South America, 1700–1763* (Basingstoke: Palgrave Macmillan, 2014), 94, 30, 78.

13 Zacarías Moutoukias, “Power, Corruption, and Commerce: The Making of the Local Administrative Structure in Seventeenth-Century Buenos Aires,” *Hispanic American Historical Review* 68, no. 4 (1988), 772; Zacarías Moutoukias, *Contrabando y control colonial en el siglo XVII. Buenos Aires, el Atlántico y el espacio Peruano* (Buenos Aires: Centro Editor de América Latina, Bibliotecas Universitarias, 1988); see also Geoffrey Walker, *Spanish Politics and Imperial Trade, 1700–1789* (London: Macmillan Press, 1979).

14 Pearce, *The Origins of Bourbon Reform*, 101–2 and 140.

15 Anthony McFarlane, “The Bourbon Century,” in *Early Bourbon Spanish America, Politics and Society in a Forgotten Era (1700–1759)* (Leiden: Brill, 2013), 182.

16 Alejandra Irigoin and Regina Grafe, “Bargaining for Absolutism: A Spanish Path to Nation-State and Empire Building,” *Hispanic American Historical Review* 88, no. 2 (2008).

17 The idea arose in 1727–1728 and was put forward again in 1746 in the house of the Conde de Casa Real de Moneda; see Buechler, *Gobierno, minería y sociedad*, 21–22.

18 Mark of silver in weight = 8 oz = 0.23 kg; 1 mark of silver in value = 8.5 to 8.75 pesos.

2.75 reales for their shares. A shared collective fund had to be used to promote the *labores* (mining extraction and production tasks).

The source of inspiration for these changes is said to have been a company from Caracas. I am interested in making this relationship explicit to understand what they were after. The thriving *Compañía Guipuzcoana*, established in 1728, had exclusive rights to the cacao trade between what is today Venezuela in South America and San Sebastián on the Iberian Peninsula, in Basque country, to curtail smuggling and to reclaim the trade controlled until then by the Dutch.¹⁹ Trading companies from other countries, such as England and France, had demonstrated that not having political sovereignty over many territories did not prevent them from acquiring major profits by obtaining Spanish silver from smugglers.²⁰

Although the company of Potosí did not consider the commerce of silver in Spain, as the company for cacao did, it did boost mining, curtail smuggling, and help its *azoguero* members with necessary material for silver production, starting with mercury. Potosí's royal magistrate, (*corregidor*) Herboso planned for the company to manage the supply of mercury and deduct its cost from the silver sold by the *azogueros*. The Crown had to contribute 50,000 pesos in funding, "as V. M. had done with the companies set up in Europe," for mercury and other expenses.²¹

Rose Marie Buechler has described the tumultuous history of the *Compañía de Azogueros*, which became the *Banco de Rescates* in 1752 and later the *Banco de la Corona* in 1779. The author mentions a succession of bankruptcies, embezzlements, and mismanagement in which private operators and authorities became involved, including various governing local magistrates (*corregidores*). I consider that these problems arose largely because the new institution changed the backdrop of economic interests, in particular of royal officials in charge of distributing mercury and of merchants who purchased and commercialized the *azogueros'* silver.

In the early years of the company, merchants purchased the silver until magistrate Ventura de Santelices proposed turning it into a bank in 1752.²² This

19 Roland Dennis Hussey, *The Caracas Company 1728–1784: A Study in the History of the Spanish Monopolistic Trade* (Cambridge: Harvard University Press, 1934); Montserrat Gárate Ojanguren, *La Real Compañía Guipuzcoana de Caracas* (San Sebastián: Sociedad Guipuzcoana de Ediciones y Publicaciones, 1990); Eugenio Piñero, "The Cacao Economy of the Eighteenth-Century Province of Caracas and the Spanish Cacao Market," *Hispanic American Historical Review* 68, no. 1 (1988); Carla Rahn, "The Growth and Composition of Trade," 97. In turn, the Caracas Company was influenced by the Ostend Company, established in 1722, cf. McFarlane, "The Bourbon Century," Appendix, 169–70.

20 Stein and Stein, *Silver, Trade and War*, 150.

21 AGI Lima 1134. Cajas Reales.

22 Buechler, *Gobierno, minería y sociedad*, 26.

decision was clearly made to support the mining sector and the *azogueros*, to the detriment of the merchants and their commercial network, which was connected to the silver shipping ports.²³

Tensions and conflicts therefore abounded among merchants, royal authorities, and *azogueros*. In 1758, for example, the Potosí Board of Trade objected to the bank because it deprived them of the “freedom” to purchase marks, “curtailing their credit power, as well as their profits, calling for free trade.”²⁴ They demanded that their “old freedom” be restored by ending the monopoly of the *azogueros*.²⁵ Santelices countered with the allegation that the Portuguese were promoting an expensive illicit trade by introducing textiles at high prices without even paying taxes.²⁶ This was happening at the Colonia de Sacramento port in Buenos Aires, known by smugglers as the Jamaica of South America.²⁷ It also meant that some *azogueros* were simultaneously merchants themselves or somehow involved in “illicit dealings,” with the indulgence of local authorities, including high-ranking representatives of the Crown. Finally, exacerbating the discontent, even royal officials were set aside from the trade and power that came from the distribution of mercury.

Close to a decade later, between 1752 and 1769, the bank was transferred to the Crown. Governor Pedro de Tagle achieved this objective, reflected in the Royal Decree of February 9, 1771.²⁸ The viceroy became the “Superintendent

23 Limited research has been done on Potosí's trade and markets. We have nothing like the book by Margarita Suárez, *Desafíos transatlánticos. Mercaderes y banqueros y el estado del Perú Virreinal, 1600–1700* (Lima: Pontificia Universidad Católica del Perú. Fondo de Cultura Económica e Instituto de Estudios Peruanos, 2001).

24 AGI Charcas 481, 1757, f. 4, f. 6v.

25 AGI Charcas 481. Documento n.p. from 1758.

26 AGI Charcas 481. Document of 25 November 1757, n.p. The conflict of interest needs to be considered to understand the bank's problems. In 1776, Francisco de Güemes mentioned the boycott led by the merchants. He noted that there was no *alcabala* to impede incorporating the bank into the Royal Crown, that merchants sought a thousand excuses to block it. He said that one of his most dangerous enemies was Joseph Lopez Liperguer, a royal audiencia judge connected to the *azogueros'* Conde de la Casa Real de Moneda and Pedro Antonio de Soñealega. Potosí 16 April 1776. Nota de Francisco de Güemes, AGI Charcas 692 n.p.

27 Fernando Jumar, “Le commerce atlantique au Río de La Plata, 1680, 1778” (Ph.D. diss. Ecole des Hautes Etudes en Sciences Sociales, 2000).

28 Tagle received from the *azogueros* their authorization or power of attorney (*poder*) in August 1773, seeking, at the same time, to build a mining gallery. See Real Cédula 9 de febrero de 1771 and Testimonio de los autos obrados en virtud de la Real Cédula de S.M. expedida en 20 de noviembre de 1772 sobre que la Real Audiencia del distrito le ynforme si conviene o no incorporarse los fondos del Banco de Rescates de plata desta villa de Potosí a su real corona. AGI Charcas 692, sin foliación. AGI Charcas 692, n.p.

Protector ... with privative and absolute jurisdiction” in civil and criminal cases in all matters pertaining to the bank.²⁹ Tagle was the one who led most of the negotiations with the *azogueros* and formalized the existing rules into a body of 136 articles.³⁰ The next governor, Jorge Escobedo, continued this work. One of the biggest challenges was calculating the different amounts deposited by the *azogueros* in the bank throughout the years, as well as calculating the credits and debits made for the mining materials (iron, wooden planks, and mercury). Escobedo finished the banks’ bylaws, balanced the accounts, and resolved pending disagreements.³¹ The *Banco Real de San Carlos* regulations of 1795, which are the best known so far, thus concluded a difficult course of development. Guillermo Mira conducted a detailed and quantitative study of its later years, between 1780 and 1810.³²

3 The Heterogeneous World of Silver Ore Producers and *Rescatistas*:³³ *Azogueros, k’ajchas, Trapicheros, and Metals from Outside the City*

The *rescate* or purchase of silver ore took place in the Royal Treasury of Potosí, and the *azogueros* were paid immediately by bank officials to help them cover weekly expenses. The bank received *piñas* or conical molds of semi-refined silver (a hundred marks), small refined molds (*piñoncitos*), lamés of silver, and

29 Biblioteca Nacional del Perú (hereafter: BNP) C2000005929, Reglamento del Banco, 1769–1770, Cap. 97, f. 105v. and Cap. 1 and Cap. 2. f. 79v.

30 BNP Continuación del reglamento de compras de plata de la villa de Potosí por el Sr. Oidor don Pedro de Tagle como Juez comisario del Excelentísimo Sr. Virrey don Manuel Amat y Juniet. Cuaderno No. 10. Buechler mentioned that the action by Tagle instigated discontent among the *azogueros* and other people, who even demanded his resignation. See *Gobierno, minería y sociedad*, 47. She asserts the regulations were written in 1780 by Jorge Escobedo, cf. 55. The sources from Peru indicate that a regulation already existed in 1770.

31 See the document in AGI Charcas 437^a, f. 1–2v.

32 Serena Fernández Alonso, “Minería Peruana y Reformismo Estatal: las Ordenanzas del Real Banco de San Carlos de la Villa de Potosí,” *Anuario de Estudios Americanos* 47 (1990): 259–77; Guillermo Mira, “El Real Banco de San Carlos de Potosí y la minería altope-ruana colonial,” in Julio Sanchez Gomez, Guillermo Mira Delli-Zotti, Rafael Dobado, *La Savia del Imperio. Tres estudios de economía colonial* (Salamanca: Ediciones Universidad de Salamanca, 1977), 495.

33 I include those who purchased ores (*rescatistas*) on a small scale, because some people, especially those living in the provinces, acquired silver directly from the producers.

even broken gold. All of these had to be converted into bars of 180 marks,³⁴ which, after paying taxes (the tithe and the *cobos*, or 1.5%), would go to the *casa de la moneda* to become minted coins.³⁵ The bank also managed and sold the mercury to “all miners who wanted to purchase it.”³⁶ The bank’s regulations of 1769, which restored Santelices’ previous policy decisions, ordered payment based on the following differentiations:

1. Higher-grade silver was bought at seven pesos, four reales. This was the price paid to the *azogueros* every Sunday, so they could pay wages to the Indigenous workers in Potosí’s mountain and refining mills.³⁷
2. Silver on *piñas* or molds of semi-refined silver, lamés, or small molds from *capchas* or *k’ajchas* were bought at seven pesos for each mark.
3. Silver *piñas* or molds of semi-refined silver from the *trapicheros* weighing ten to twelve marks were bought at seven pesos, one real for each mark.³⁸

How did they differentiate these silver products? Various aspects merit equal consideration. First, the group of *azogueros* of Potosí was relatively small and well known. Second, the manager “adjusting its value on sight according to visual appearance” was in charge of evaluating the purchased silver, although there would be compensatory measures applied later, including a series of quality assurance measures.³⁹ Finally, there were also physical features that gave away the silver’s distinctive origins depending on the technology used.

In all cases, the bank paid better prices for all involved. The “*capchas*” or *k’ajchas* were paid seven pesos by the bank, compared with only 6 pesos and 4 to 6 reales paid by silver merchants. The *azogueros* received 6 pesos and 4 to 6 reales, instead of 6 pesos and 2 reales. The only group that received less was the *trapicheros*, who Santelices determined would be paid seven pesos, equating them with “*capchas* or *mordedores* of the mountain,” because they purchased their silver instead of mining it themselves.⁴⁰

34 See *Real Cédula de incorporación del Banco de Potosí a la Real Hacienda. Ordenanzas para su Regimen y Gobierno* (Madrid, 1795), Tit. III, Ord. VIII, 19.

35 *Real Cédula*, Ord. II, Tit. II, 10. In this *Real Cédula* it said that there was a custom of “purchasing the silver in a mould of semi-refined silver for a price calculated through random estimation [*calculado al ojo*].” See also BNP C2000005929, Cap.76 and 79, f. 100–100v.

36 BNP C2000005929, Cap. 90.

37 BNP C2000005929, Cap. 52, f. 92–92v. and Cap. 68, f. 98.

38 BNP C2000005929, Cap. 55, f. 93–93v.

39 See AGI Charcas 437^a.

40 BNP C2000005929, Cap. 54 and 55 f. 93 and AGI Charcas 692. Document marked on the left as No. 7, f. 69 and Cap. 55 f. 93.

The lower price paid to *k'ajchas* and *trapicheros* was nonetheless considered adequate.⁴¹ The higher price paid to the *azogueros* was said to compensate and redress the “theft” by the *k'ajchas* and *trapicheros*. Official documents refer to how the silver of the rudimentary mills of the *trapiches* “was taken from the *azogueros* by the same workers and *cacchas* [*k'ajchas*], who did not own mines.”⁴² That is why its lower price “was to be considered ... a fair ... restitution for the damages and theft perpetrated by them.”⁴³

It is possible to compare and evaluate the production of each group based on the differentiation made by the bank. A document from the *Archivo de Indias* reveals that the silver production between 1754 and 1774 came from two sources: 50% corresponded to the “miners” (*azogueros*) and the other half to the “*capchas* & [miners from the surrounding provinces]...” (Figure 8.1 and Table 8.1). Registered production by both groups increased thanks to policies that drove a reactivation of silver mining, including better prices.

The series in Table 8.1 and Figure 8.1 reveals the importance of the “*capchas*” or *k'ajchas* noted in 2016 and 2017.⁴⁴ The question is how much production could be attributed to each group. Luis de Echeverría, a Potosí local and bank manager, stated that the silver from the *trapicheros* and *k'ajchas* was more relevant than the silver coming from the *azogueros* of the city of Potosí and the provinces because the bank paid a lower price for it and did not have to give them additional capital or mercury.⁴⁵ He referred to the *trapicheros* and *k'ajchas* as one group, and the *azogueros* of Potosí’s Rivera neighborhood and “other persons from the surrounding provinces” as a separate group. In so doing, he confirmed the greater significance of the former.

41 “because of the compensation received ... or because they achieved higher profits through the bank establishment than what they previously enjoyed through the town’s silver merchants.” AGI Charcas 692, Reglamento del Banco, f.167. See also BNP C2000005929, Cap. 54, f. 93.

42 AGI Charcas 481, f. 70.

43 AGI Charcas 437^a, Document presented by the governor with the regulation attached, f. 4v. and 32v.

44 Rossana Barragán R., “K’ajchas, trapiches y plata en el cerro de Potosí en el período colonial,” *Anuario de Estudios Bolivianos* 20 (2014): 273–320; Rossana Barragán R., “Dynamics of Continuity and Change: Shifts in Labour Relations in the Potosí Mines (1680–1812),” *International Review of Social History*, 61 (2016): 93–114; Rossana Barragán R., “Working Silver for the World: Mining Labor and Popular Economy in Colonial Potosí,” *Hispanic American Historical Review* 97, no. 2 (2017): 193–222.

45 AGN Sala IX. 33-01-06. Hacienda. Leg. 20 Expediente 466, n.p.

<u>Mineros de Potosí</u>	<u>Capchas</u>	<u>Total</u>	<u>Total</u>
76368. 5	79477. 7	156046. 5	156.046. 5
117337. 3	118250. 2	235587. 5	
128325. 7	131494. 7	259817. 6	} 2662.819.
126897. 4	121817. 6	248715. 2	
121327. 2	147636. 4	271963. 6	
123808. 2	148518. 8	272336. 2	
117323. 5	163076. 3	280400. 8	
122591. 6	142960. 6	265492. 4	
128148. 6	135227. 1	263375. 7	
145418. 8	144025. 3	289473. 3	
144094. 5	131541. 7	275636. 4	
149554. 2	137682. 5	287216. 7	
147802. 1	139077. 6	286879. 7	} 3.094.133.
158883. 7	154256. 7	313140. 6	
156938. 5	162087. 7	319046. 4	
150398. 6	156010. 7	306409. 5	
150746. 5	152691. 5	303378. 2	
165203. 1	154469. 6	319672. 7	
161297. 7	148844. 7	310142. 6	
153014. 1	165514. 6	318328. 7	
157033. 5	172682. 7	329716. 4	
<u>*2903704. 6</u>	<u>*3007293. 7</u>	<u>*5912998. 5</u>	

FIGURE 8.1 Summary of molds of semi-refined silver and small cones, in marks of the *capchas* and *trapiches* from the city of Potosí and miners from the surrounding provinces sold to the *Banco de Rescates* from May 1754 until December 1774

SOURCE: AGI CHARCAS, 692 CUERPO 13

Table 8.1 reveals that silver production by the “capchas & ...”—with a decline in 1756 when the authorities were in conflict with them—rose and soared until 1760, when production reached 58% of the total.⁴⁶

There is another series for the later period, between 1770 and 1801, published by Mira and Buechler (Table 8.2). Here, production is divided between *azogueros* and “Trapicheros, Capchas, and miners from outside.” A witness who knew mining well noted that most of the silver “coming from outside [is] said to be worthless.”⁴⁷

In any case, it is difficult to know how much came from the surrounding provinces since sources could vary greatly on different years over the entire period. In some documents, the provinces of Chichas and Lípez are mentioned,⁴⁸ along with, rarely, Guantajaya (the latter had substantial production in the second half of the eighteenth century). This center initially had a registry

46 AGI Charcas 461 [65] f. 4. The most serious “riot,” however, took place in 1751.

47 Nicolás Pacheco, AGI Charcas 481 f. 70–70v.

48 AGI Charcas 692 f. 69.

of its silver in the Royal Treasury of Arica or Carangas.⁴⁹ Further research could focus on identifying the silver sold by *rescatadores* or small merchants who purchased it from producers on all sides.

TABLE 8.1 Silver from mining by *azogueros* and *k'ajchas* (*capchas*), *trapiches*, and surrounding provinces between 1754 and 1774 in marks

Years	Miners from Potosí	%	<i>Capchas</i> and others	%	Total
1751	76,568.50	49.07	79,477.70	50.93	156,046.20
1755	117,337.30	49.81	118,250.20	50.19	235,587.50
1756	128,325.70	49.39	131,491.70	50.61	259,817.40
1757	126,897.40	51.02	121,817.60	48.98	248,715.00
1758	124,327.20	45.71	147,635.40	54.29	271,962.60
1759	123,808.20	45.46	148,548	54.54	272,356.20
1760	117,323.50	41.84	163,076.30	58.16	280,399.80
1761	122,531.60	46.15	142,960.60	53.85	265,492.20
1762	128,148.60	48.66	135,227.10	51.34	263,375.70
1763	145,448	50.25	144,025.30	49.75	289,473.30
1764	144,094.50	52.28	131,541.70	47.72	275,636.20
1765	149,554.20	52.07	137,662.50	47.93	287,216.70
1766	147,802.10	51.52	139,077.60	48.48	286,879.70
1767	158,883.70	50.74	154,256.70	49.26	313,140.40
1768	156,958.50	49.20	162,087.70	50.80	319,046.20
1769	150,398.60	49.08	156,010.70	50.92	306,409.30
1770	150,746.50	49.69	152,631.50	50.31	303,378.00
1771	165,203.10	51.68	154,469.60	48.32	319,672.70
1772	161,297.70	52.01	148,844.70	47.99	310,142.40
1773	153,014.10	48.04	165,514.60	51.96	318,528.70
1774	157,033.50	47.68	172,282.70	52.32	329,316.20

SOURCE: AGI CHARCAS, 692 CUERPO 13

49 María Concepción Gavira Márquez, "Producción de plata en el mineral de San Francisco de Huantajaya (Chile), 1750–1804," *Chungara* 37, no. 1 (2005): 37–57.

TABLE 8.2 Silver marks (eleven dineros, two grains) from *azogueros*, *k'ajchas* (*capchas*), *trapicheros* and miners from outside the city between 1770 and 1811 (1801)

Year	<i>Azogueros</i>		<i>Trapicheros, capchas</i> and miners from outside the city		Sum obtained	Sum of the document
	Marks	%	Marks	%		
1770	150,746	49.69	152,631	50.31	303,377	303,377
1771	165,203	51.68	154,469	48.32	319,672	319,672
1772	161,297	52.01	148,844	47.99	310,141	310,141
1773	153,014	48.04	165,514	51.96	318,528	318,528
1774	157,033	47.63	172,682	52.37	329,715	329,715
1775						
1776	164,055	100.00		0.00	164,055	291,209
1777	180,569	100.00		0.00	180,569	414,768
1778	176,972	100.00		0.00	176,972	335,848
1779	174,288	59.85	116,921	40.15	291,209	363,682
1780	184,846	44.57	229,922	55.43	414,768	416,676
1781	134,808	40.14	201,040	59.86	335,848	387,034
1782	152,873	42.03	210,808	57.97	363,681	365,539
1783	158,711	38.09	257,965	61.91	416,676	345,497
1784	145,982	37.72	241,052	62.28	387,034	406,900
1785	158,404	43.33	207,135	56.67	365,539	396,191
1786	167,801	48.57	177,695	51.43	345,496	349,562
1787	183,536	45.11	223,363	54.89	406,899	373,283
1788	183,832	46.40	212,359	53.60	396,191	383,910
1789	174,897	50.03	174,665	49.97	349,562	392,893
1790	190,564	51.05	182,719	48.95	373,283	385,170
1791	207,908	54.16	176,002	45.84	383,910	391,170
1792	219,677	55.91	173,216	44.09	392,893	404,029
1793	220,083	57.14	165,107	42.86	385,190	383,386
1794	223,845	57.22	167,350	42.78	391,195	369,371
1795	227,732	56.37	176,296	43.63	404,028	387,339
1796	216,790	56.55	166,595	43.45	383,385	382,370
1797	206,105	55.80	163,265	44.20	369,370	371,416
1798	207,274	56.44	159,954	43.56	367,228	331,807
1799	233,174	60.98	149,196	39.02	382,370	194,535

TABLE 8.2 Silver marks (eleven dineros, two grains) (cont.)

	<i>Azogueros</i>		<i>Trapicheros, capchas and miners from outside the city</i>			
1800	229,016	61.66	142,400	38.34	371,416	242,209
1801	211,885	63.86	119,921	36.14	331,806	320,699
1802						308,170
1803						295,712
1804						307,919
1805						296,932
1806						305,315
1807						311,709
1808						
1809						
1810						
1811	87,909		36,931	12.17	124,840	

SOURCE: GUILLERMO MIRA, "EL REAL BANCO DE SAN CARLOS DE POTOSÍ," 311

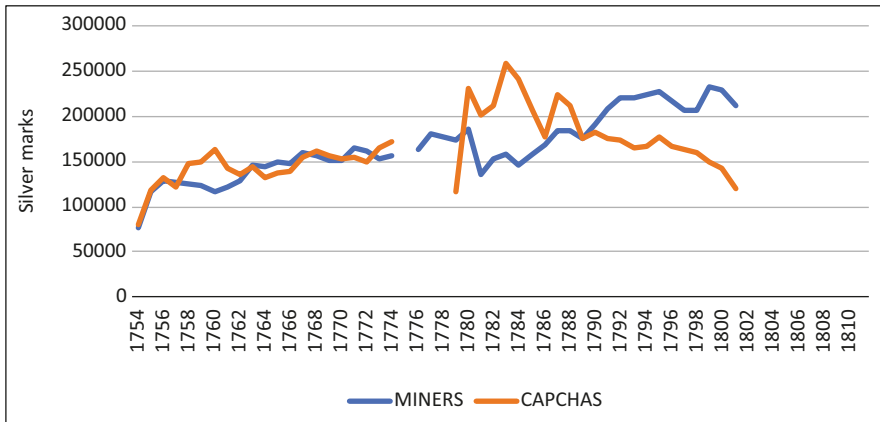


FIGURE 8.2 Marks sold to the bank by *azogueros*, *capchas* (*k'ajchas*), *trapicheros* and miners from outside the city, 1754–1804

In the series from 1770 to 1801 (Table 8.2 and Graph 8.1) the increasing importance of *trapicheros*, “capchas,” and miners from outside the city is striking, especially until the revolts of 1780, when the local *azogueros* seemed to regain momentum. *Azogueros*, *capchas*, and *trapicheros*, however, were highly heterogeneous groups.

4 *Azogueros*: A Unifying and Homogenizing Name

The *azogueros* are often portrayed as individuals with substantial fortunes and political and social power, as enduring families of the oligarchy. An initial comparison of family names between the end of the seventeenth and the end of the eighteenth century reflects little continuity between patronyms. Moreover, the lists of *azogueros* I am reconstructing grow and diminish with great elasticity. In 1692, there were thirty-nine *azogueros* with mines and refining mills, but only twenty-seven had refining mills with *mitayo* workers. A document from 1710 lists only twenty-three *azogueros*, while a *visita* that same year revealed thirty-four concessionaires of “*labores*” (mines) and twenty-four owners of refining mills, and these names do not always overlap. Similar numbers are registered in the *visita* of 1779. Between 1747 and 1762, on the other hand, sixty-four *azogueros* sold widely varying quantities of silver to the bank. A large share of the refining mills was already run by leaseholders, but sources do not always reflect this distinction.

In any case, the wealth was heavily concentrated among a few people. The bank’s records from 1762 show thirty-five *azogueros* and 454 transactions for 134,472 marks, totaling more than 1 million pesos (1,003,582 to be exact; see Table 8.3). Half of those listed, or sixteen *azogueros*, controlled 90% of the silver, although there were also differences between them. Only six *azogueros* sold more than 50% for amounts exceeding 50,000 pesos (or more than 7,000 marks) and ten others another 40% for amounts between 20,001 and 50,000 pesos (between 3,000 and 7,000 marks). Joaquín Bravo and the Conde de la Casa de Moneda stand out as having produced 10% and 12%, respectively, of all the silver sold annually. At the other extreme, 15 *azogueros* sold barely 3% and their amounts are similar to the *k’ajchas* and *trapicheros* who sold less than 1,000 pesos annually.

“Vertical companies”—that is, production units combining a mine and a refining mill—were not always common, although that could be attributed to how mines and refining mills were often leased by different people. The *visita* of 1779 lists names of mine concessionaires/leasers, but these are not always

TABLE 8.3 *Azogueros* according to the number of marks and pesos sold in 1762

Groups by amount of marks	Groups by amount in pesos	Trans.	No. of <i>azogueros</i>	Marks	Total pesos	%/Total
Less than 200	Less than 1,000	10	6	410	3,049	0.30
201 to 500	1,001 to 3,500	24	6	2,000	14,927	1.49
501 to 1,500	3,501 to 10,000	49	3	3,114	20,310	2.02
1,501 to 3,000	10,001 to 20,000	35	4	8,861	63,760	6.35
3,001 to 7,000	20,001 to 50,000	246	10	52,220	392,822	39.14
More than 7,000	More than 50,001	90	6	67,867	508,714	50.69
Total		454	35	134,472	1,003,582	100.00

SOURCE: ARCHIVO HISTÓRICO DE POTOSÍ, BSC 360, 1759–62

the same people who owned/leased the refining mills and we know little about connections between both groups.

The 1779 document registered forty-nine mines or *labores* under twenty-one concessionaires and thirty-two refining mills under twenty-four owners. Some *azogueros* owned both refining mills and mines, but there were also owners concessionaires of *labores* without refining mills. In the first case, for example, Joaquín Bravo de Bovadilla had five *labores* and two refining mills, while Juan Antonio Dorado had two *labores* and Juan de Peñarubia three, but neither owned refining mills (Table 8.4).

Production in the mines was evaluated based on *ayllus*, a local Indigenous measurement, that varied considerably between the distinct *azogueros*: Sixteen mines produced less than nineteen *ayllus* weekly, or 21,545 kilos.⁵⁰ Some of the largest producers were the Conde de la Moneda, Juan de Peñarubia, Manuel de Jaúregui, and Joaquín Bravo de Bovadilla.

50 The measurement was related to the “loads” that llamas and donkeys carried. Buechler mentioned that *ayllu* denoted a herd of twenty llamas or donkeys and the quantity of minerals they carried. One document specifies that each *ayllu* was twenty loads, with each load weighing five arrobas (ABNB, Minas 35/3), meaning that twenty loads were equivalent to one hundred arrobas. Since each arroba weighed twenty-five pounds or 11.34 kilos, twenty loads or one *ayllu* of one hundred arrobas were 1133.9 kilos or 11.33 hundredweights.

TABLE 8.4 Primary proprietors of mines and refining mills in 1779

Concessionaires/ Owners	Mines (labores)			Refining mills		
	No. of mitayos by group or weekly shifts	No. of ayllus by week	No. of ayllu = 1,133.38 kg Labores	No. of mills	No. of mitayos by group or weekly shifts	
Joaquín Bravo de Bovadilla	24	122	13,8276.36	5	1	21
Conde de La Moneda	27	56	63,498.40	2	6	53
Juan Antonio Dorado	13	29	32,883.10	3	0	0
Manuel de Jaúregui	72	126	142,871.40	6	0	0
Juan de Peñarubia	32	110	124,729.00	3	0	0
Antonio Savaleta	27	127	144,005.30	5	1	5
TOTAL	195	570	644,323.00	24	8	79
	54% of the total	62% of the total	49% of the total	25% of the total	24% of the total	

SOURCE: AGN VISITA TO POTOSÍ OF 1779

It is important to highlight the absence of one mining enterprise group exclusively, since many were also successful landowners. Others proprietors lived outside Potosí, leaving managers in charge of their mines, while some also had this type of staff but lived in the city itself. Finally, some *azogueros* were rather poor.

The Conde de la Casa de Moneda, Juan de Lizarazu Beaumont y Navarra Zenteno Fernandez de Heredia, was born in Cuzco in 1710 and was one of the most powerful. His family line originated in Spain and they held significant political-administrative careers in various regions of the Peruvian viceroyalty (Figure 8.2). Public service led them to mining production. One of the Conde's forebears, Juan de Lizarazu from Navarra, was a juris doctor from the University of Salamanca who married a noblewoman (Martina de Arizcun Beaumont y Navarra) and became president of the *Real Audiencia de Charcas* in 1633 and of Quito in 1643. His son, General José de Lizarazu, was the governing local magistrate (*corregidor*) of Aymaraes and purchased the post of treasury of the Casa Real de la Moneda for 124,000 pesos. His second wife was the daughter of the *oidor* (judge) of the *Real Audiencia de La Plata or Charcas*, Joseph Lopez Liperguer. Juan de Lizarazu Beaumont y Navarra became immersed in the mining business, most likely as a silver merchant as well, and went on to become one of the wealthiest *azogueros* of the eighteenth century. In 1740, he purchased his first refining mill, eventually becoming proprietor of more than five: Nuestra Señora de la Concepción in Agua de Castilla, valued at 85,000 pesos; San Marcos, opposite the parish of San Sebastián (purchased from the Ortega presbyter), for 110,000 pesos; the San Diego refining mill, next to San Marcos, valued at 95,000 pesos; and half of Ichuni, valued at 60,000. He bought his title of *Conde* in 1753 in 25,000 pesos.

Upon his death, the Conde left behind, in addition to his refining mills, several haciendas in Porco, which he had inherited from his parents and brothers; vineyards in the Mataka valley (worth around 56,000 pesos); at least eight houses and land plots in La Plata; and more than seven slaves. The total value of his estate was nearly 400,000 pesos. The household items in his home revealed the diverse regional and global origins of his goods, his piety, and his consumption habits. Crystal chandeliers, Chinese vases, silver-plated chairs and seats from Cochabamba; votive paintings of different Virgins, effigies of San José and San Antonio; watches; a map of the Potosí mountain; gold, silver, diamond jewelry, and canes and swords with gold and silver handles.

At the other extreme, Gerónimo de Trigoso owned a company with Colonel Nicolás Francisco de Vallejo y Salado. His assets were seized and records attest to his scarce resources: a new cot, an old ceremonial sword with silver trim, chinaware, two religious paintings, and little else. He was legally declared

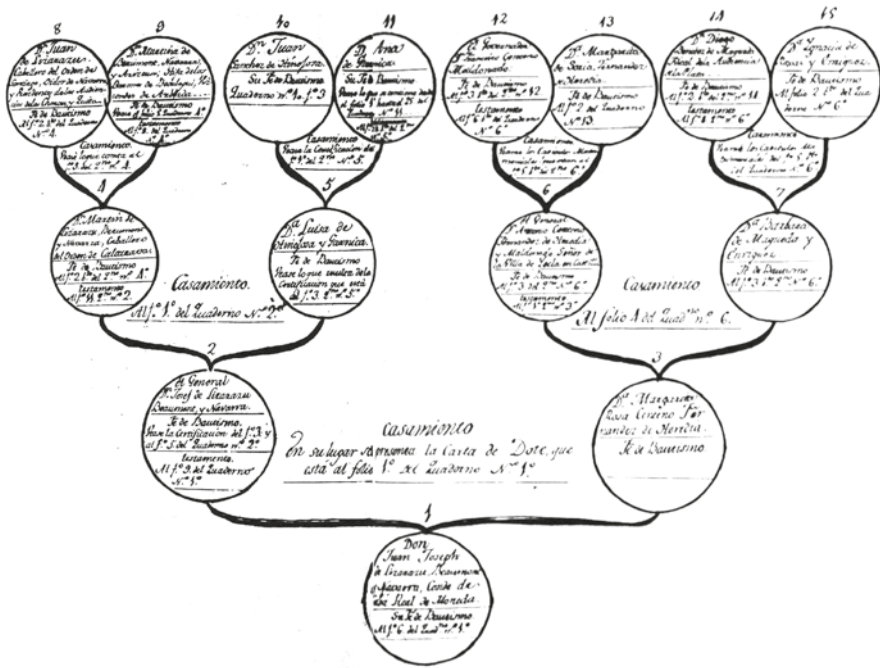


FIGURE 8.3 Genealogy of the Conde de la Casa Moneda
 SOURCE: ARCHIVO HISTÓRICO NACIONAL. PRUEBAS DE JUAN JOSÉ DE LIZARAZU Y NAVARRA. CONDE DE CASA REAL DE MONEDA

“solemnly poor” (*pobre de solemnidad*) by the *audiencia*, so he could face trial, accused of embezzlement by the colonel.⁵¹

Juan de Peñarubia is a different case. Born in Cuenca, he arrived at the Río de la Plata in 1736 as part of a regiment and married the daughter of a well-known Potosí merchant, Pedro Prudencio Pérez. In 1757, he leased the Chaupi refining mills owned by the Herboso family, who lived in Lima. By 1779, three other refining mills appear under his name: those of Ortiz, Flamenco Grande, and Rosario Chico. He went on to become proprietor of all five, leaving in his will a quarter of what the Conde de la Casa de Moneda had bequeathed. Through marriage, he became the owner of refining mills and acquired a reputation as a very powerful man in the mining industry and in the city, someone who controlled and leased several mills.

51 ABNB Minas 29/3 f. 188.

Accounts from the 1779 *visita* also mention the weekly number of coerced *mitayo* workers for each of the refining mills. This meant that the three-week rotation of *mitayo* workers continued, although they were not always strictly observed. Inside the mine, there were other workers: *pongos*, *brosiris*, *compañías de barreteros* (assistants of hewers). There were also “*mingas metaleros*” (ore cutters) and *mingas barreteros* (*hewers*). The *apiris* (mine haulers) are probably unfree *mitayos*, as some sources show. Finally, this *visita* lists *apiris mingas*, meaning that not all of them were *mitayos*, which also calls into question our view of the free *minga* workers as a category of specialized workers.

5 The *k'ajchas*, *trapiches*, and *trapicheros*

In previous works I explained that the *k'ajchas*⁵² were known through the narrative of Arzans Orsúa y Vela, who wrote about the famous and wealthy *k'ajcha* Captain Andrés Quespi,⁵³ and from invaluable articles by Thomas Abercrombie

52 *Kajcha* in Quechua denotes the sound of a slingshot used to chase people away. See also British Library, “Descripción del terreno y lugares comarcanos de Potosí,” 1759, 256 in “Tracts Relating to the Provinces of Buenos Ayres and Patagonia 1756–1802,” Add Ms. 17605. Gunnar Mendoza suggested that, in Quechua, it meant “spirited, bold, daunting.” See Mendoza, “El valor sociológico de la Historia. Bartolomé de Orsúa y Vela: su vida y obra,” in *Historia de la Villa Imperial de Potosí*, ed. Lewis Hanke and Gunnar Mendoza, T.I (La Paz: Plural, 2012), 476n2. In Aymara, its meaning was related to thunder or lightening; Gunnar Mendoza, “Terminología y tecnología minera en el área andina de Charcas: García de Llanos, un precursor (1598–1611),” in *Diccionario y maneras de hablar que se usan en las minas y sus labores en los ingenios y beneficios de los metales (1609)* (La Paz: Museo Nacional de Etnografía y Folklore, 1983), xli. The *k'ajchas* were described as thieves, bandits, and pirates. See Enrique Tandeter, *Coacción y mercado*, 117.

53 “His name ... is Agustín Quespi, his home is this city ...” Thus presented by Potosian chronicler Arzans de Orsúa y Vela, Quespi is a popular hero. He carried a pair of pistols and his tools and had four *apiri* companions with him, and as he did not have his own mine, he entered deserted ones, taking metal but without causing any damage. He was feared by both Indigenous and Spanish; he thrashed the mountain guards and resisted the mayor who was looking for him because of complaints received from the *azogeros*. As they did not manage to catch him, he was said to have a pact with the devil. But many were also his friends because he gave *quintos* to his majesty and was liberal in his religious worship. Many Spaniards and priests respected him for his wealth until his downfall, when he was accused of murder, destroying bridges in the mines, leading bands of thieves, thrashing Spaniards, and obstructing justice. Agustín Quespi was captain of the *k'ajchas*. Bartolomé Arzans de Orsúa y Vela, Edición de G. Mendoza, *Historia de la Villa Imperial de Potosí*, ed. Lewis Hanke and Gunnar Mendoza, 3 vols. (La Paz: Fundación Cultural del Banco Central de Bolivia, 1965–2012), 201.

and Enrique Tandeter in the 1980s.⁵⁴ In various testimonies, the *k'ajchas* were described as silver thieves or mine raiders entering the mountain on weekends in large hostile groups. One of the most compelling accounts comes from the chief magistrate for mining affairs, who sought to “enter” the mountain in 1750 with twelve Spaniards and more than a hundred men with firepower (*bocas de fuego*) to drive them out. When he managed to apprehend some, bringing them tied up into the city “as an example to deter the others,” all of a sudden “they were confronted by Indians, mestizos, mulattos numbering over 600 to 800, all armed with slingshots,” who threw stones at them, disarming them “in a frenzied abundance and with unspeakable shamelessness.”⁵⁵ A decade later, in March 1762, the governor of San Just wrote that the “cagchas” were supplying the trapiches:

... the *caglchas* ... are the thieves of mining, who, as the miners unanimously assured me, were a group exceeding 4,000 men composed of mulattos, mestizos, Indians, and even Spaniards, these people ... live as true vagabonds, with no other pursuit or destiny than to be engaged in the disorder with the stolen metals they supply 235 trapiches or refining mills, as V. M. acknowledged by the accompanying testimony, and none of them own mines; the *trapicheros* encourage and assist the *caglchas*, with weekly supplies of tools, gunpowder, and even weapons ...; they climb the mountain on Saturday night, when miners cease their activities, they stay until Monday afternoon, because that's when the mita comes back, the thieves take over mines and violently hurl the guards away, tearing down and destroying the bridges, dry stone walls, and other works on which the safety of the mines and the lives of those working in them depend.⁵⁶

Trapiche appears to be a generic term denoting “another type of refining mill,” especially various types of rudimentary mills for grinding minerals, such as the two-stone half-moon-shaped boulder and flywheel (Figures 8.4 and 8.5).⁵⁷ The metal obtained was coarser and thicker than those from the large refining mills.

54 Thomas Abercrombie, “Q'ajchas and La Plebe in Rebellion: Carnival vs. Lent in 18th century Potosí,” *Journal of Latin American Anthropology* 2, no. 1 (1996): 62–111; Enrique Tandeter, *Coacción y mercado*, Capítulo 3.

55 ABNB Min 28/1, f. 106–107v.

56 AGI Charcas, 481 19 n.p. Informe del Gobernador San Just, 1 de Mayo de 1762.

57 The theme of the *trapiches* and mills is elaborated in Barragán, “K'ajchas, trapiches y plata en el cerro de Potosí en el período colonial.” This issue merits various approaches, and on the Peruvian vicereignty, we have nothing comparable to Saúl Guerrero's book, *Silver by Fire, Silver by Mercury: A Chemical History of Silver Refining in New Spain and Mexico, 16th to 19th Centuries* (Boston: Brill, 2017). There is also an interesting article by



FIGURE 8.4 *Trapiche*, half-moon-shaped boulder, and flywheel in Potosí in 2019
SOURCE: PHOTOGRAPH BY ROSSANA BARRAGÁN IN POTOSÍ, 2020.

A particularly valuable source is the inspection of 218 *trapiches* during the *visita* in 1761–1762, which listed the name of each owner, the number of stones used to grind the ore (*quimbalates*), whether they were operating with a

Raquel Gil Montero and F. Téreygeol, “Ore Dressing Technics in the Andes during the Seventeenth Century: The Case of San Antonio del Nuevo Mundo, Lípez, Present-day Bolivia,” *International Journal of Historical Archaeology* 25, no. 1 (2020): 65–91.

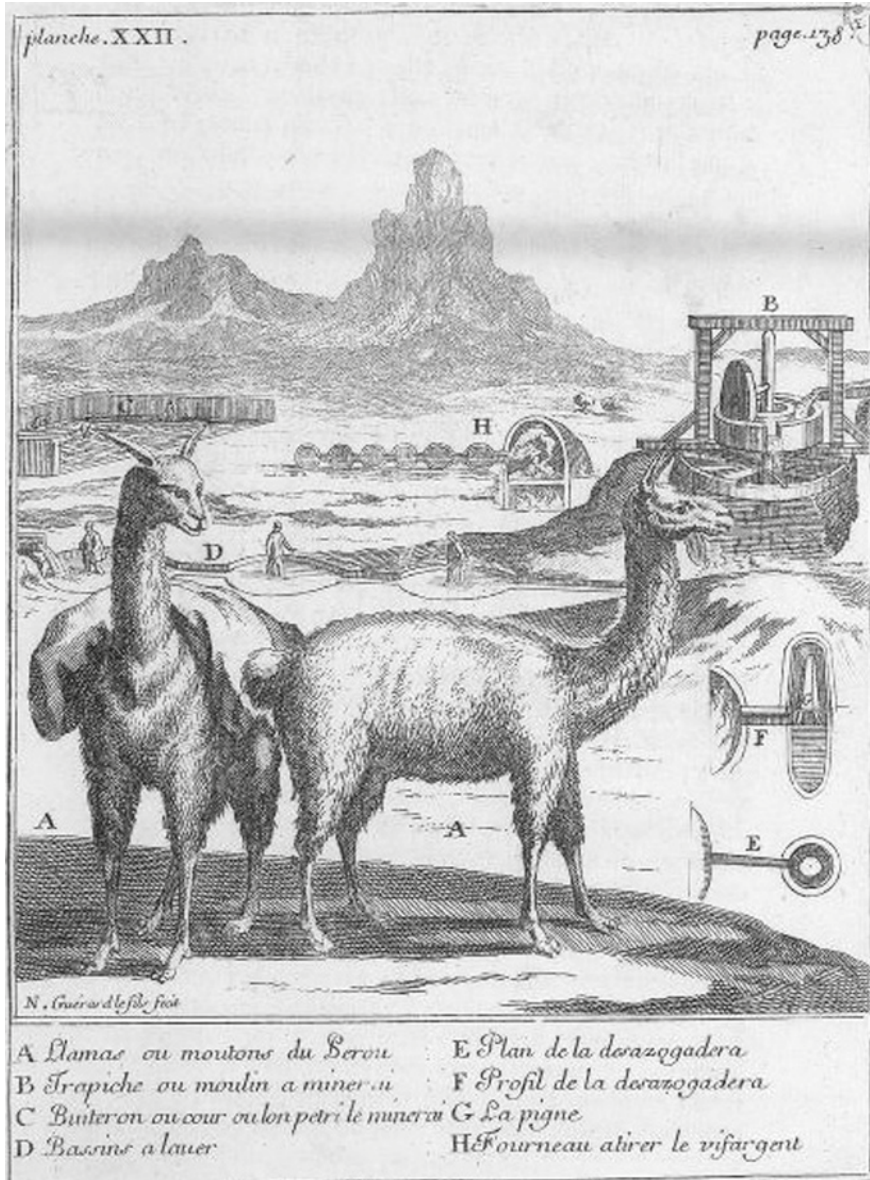


FIGURE 8.5 *Trapiche* according to the engraving by Jean Baptiste Scotin at the French National Library

SOURCE: RELATION DU VOYAGE DE LA MER DU SUD AUX CÔTES DU CHILI, DU PEROU, ET DU BRÉSIL, FAIT PENDANT LES ANNÉES 1712, 1713 & 1714 BY M. FREZIER, PARIS, 1732, PLATE XXII, 138

permit or if they leased or owned mines. This information reveals the boom of the *trapiches*: over forty were established in two years, while only twenty-two *trapiches* date back more than fifty years. Of the 218 *trapiches*, 160 (73%) were under the jurisdiction of the ten *curatos* or Indigenous parishes (*La Ranchería*). A third of the *trapiches* were, moreover, run by women.

The *trapiches* operated in close relationship with the *k'ajchas* and the *mitayos*. Potosí's governor, Jaime San Just, stated that the *trapiches* had been established by "Curacas and Capitanes handling the mita."

Between 1757 and 1758, Nicolás Pacheco, a miner, foreman of the mountain and in charge of the refining mills, described the futility of controlling the workers and the existence of an impressive supply chain of resources. He described how on Mondays, the *azogueros* provided advances to the miners and managers/foremen so they could supply to *mitayos* the *alanocas* (advances) such as money, candles, blasting powder, tools, and everything necessary before they climbed the mountain. The managers could then *quilcar* (identify) hewers and *apiris*.⁵⁸ The hewers went to work guided by experts in the interior paths who could identify the best spots with seams of ore. On Tuesdays, the miner foremen came down from the mountain. At this time, those who were on the mountain hid "the good stones" (rich ores) while at the same time, they instructed the *apiris* to do the same by filling up a boot or receptacle with whatever scrap they could find. The *palliris*, who were the most skilled at hand-picking silver ore, also "diverted" the best metals to be reduced to fine flour and to be taken down by the *indias* (Indigenous women), who brought the workers meals. They extracted approximately six to eight pounds, enough to obtain three or four pounds of *pella* or silver amalgam. Pacheco made clear that the workers used to take the money advances given by employers for powder and tools to extract the metal, which they brought to the *trapiches* to obtain molds of semi-refined silver for their own profit.⁵⁹

Pacheco stressed that except for three individuals, the *trapicheros* did not own mines, and most of them therefore provided the *k'ajchas* with tin, coca salt, candles, spirits, and muffins or bread, later purchasing their silver marks. He stated that each *trapichero* obtained a profit "without any more investment than his home and the stone grinders." He also reported that all people receiving wages had their "wisdom and manners with those who were called *cac-chas*," and many of them "worked as hewers and sometimes also adapted as *palliris*, and they refused to work merely as *apiris*."⁶⁰

58 Pacheco did not specify *mingas* for *apiris*, contrary to the testimony noted earlier.

59 AGI Charcas 481 No. 19, [Informe] de Nicolás Pacheco, 1757, f. 73v.-74.

60 AGI Charcas 481 No. 19, [Informe] de Nicolás Pacheco, 1757, f. 71-72.

This “theft,” however, was not limited to the mines, because what happened in the refining mills was almost irreparable with the “malice of the washers and *repasiris* and operators” (the *repasiris* mixed the silver with the mercury), who often took with them some of the mass incorporated with the mercury and obtained one to two marks of silver. The washers also recovered, in various ways, residues of the amalgam washed by the *caguachiris*.⁶¹ The report stipulated that this second wash yielded some eighty *aillos*⁶² (twenty-five quintals) each year, which were sold for ten pesos each to the *azoguero*, profiting again by obtaining 800 extra pesos “without investing anything themselves.” Additionally, the *trapicheros* benefitted from the silver amalgam and the small silver molds they purchased, turning them into larger molds of semi-refined silver, improving their grade and quality and increasing their price as well.⁶³

Pacheco concluded by stating that, although much was taken from the *azogueros*, everything obtained

... was disseminated ... for the common benefit of the land, in *pulperías* [corner stores], *chicherías* [establishments that sold fermented maize drinks], and in the churches and religious groups for the many church services and rites they ordered and celebrations where they gathered [and] the ceremonies they performed with many fires, boxes, and bugles seen daily ... and they asked ... to return together to the mountain and its diversions where they lived delightfully ... [and] while this way of life does not ashame them, they [are] very peaceful and humble.

And, thus, “the wrongs resulted in greater good ...”⁶⁴

Besides these various sources and Seville’s production charts, one can gather Potosí’s daily ledgers listing *azogueros*, *k’ajchas*, and *trapicheros*, men and women, although no uniform series covers the same geographic universe. The silver sold by the *trapicheros* in the bank’s ledgers reached 196,267 pesos in 1762, while in the summary of the document from Seville, the amount from *k’ajchas*, *trapiches*, and silver from surrounding areas exceeds 2 million pesos

61 These were the people who gathered these remnants from the chutes located outside the refining mill. AGI Charcas 481 No. 19, [Informe] de Nicolás Pacheco, 1757, f. 74v–75.

62 Frédérique Langue and Carmen Salazar-Soler, *Dictionnaire des termes miniers en usages en Amérique Espagnole. Diccionario de términos mineros para la América española (siglos XVI–XIX)* (Paris: Editions Recherches sur les Civilisations, 1993), 44–45.

63 AGI Charcas 481 No. 19, [Report] by Nicolás Pacheco, 1757, f. 71v–72.

64 AGI Charcas 481 No. 19, [Report] by Nicolás Pacheco, 1757, f. 76v–77.

(2,107,000 pesos or 263,375 marks).⁶⁵ In other words, the ledgers of daily purchases amount to a small sample of the total revenue, 9% at most, which is why at this time, comparing both sources is not recommended.⁶⁶

The ledgers of the *trapicheros* and the *k'ajchas*, however, are crucial because they grant access to a world of small-scale producers and ore buyers who were not visible and have been overlooked. I analyzed 3,727 transactions of 1,187 men and women in three years of daily ore sales—1754, 1757, and 1762.⁶⁷ *Trapiches* from Potosí and *azogueros* from outside the city can be found in 1754 and 1757, while in 1762 only the *trapicheros* from the city of Potosí were listed (Tables 8.5 and 8.6). Even though the scope is apparently the same in 1754 and in 1757, in this first year of 1754, 260 persons and 680 transactions were registered (from May to December), while in the second one there were 411 persons and 680 transactions (from January to December).

Although comparing these documents is difficult, I tried to identify the number of people who were from outside the city and the number of *trapicheros* from Potosí. In 1754 (Table 8.6), 24% of the silver resources came from outside Potosí (57,220 pesos), although perhaps not all places were registered systematically. Francisco Alcaide, for example, had two transactions, and only one was noted as coming from Chayanta. The case of Melchor de Arauz is also interesting: he is recorded twice in the register with silver coming from Mizque and from Salinas de Garci Mendoza. Domingo Ramírez is registered three times from three different places: Porco, Tomave, and another unspecified site. All these cases suggest that some people specialized in purchasing silver ore from the distinct provinces (*rescatiris*) to sell it to the *Banco de Rescates* in Potosí.

In 1757, the number of sales registered with a place of origin are much greater (51%), and those without this may be presumed to be from the city, accounting for the other half. The final important observation is that the predominant places of origin for both 1754 and 1757 are Chichas, Guantajaya, and Porco.

The ledger of purchases from 1762 are rather exceptional because it discloses only the *trapicheros* from the city of Potosí: 516 people who conducted 1,617 transactions. Although most were men, women represented nearly 20% of the total, selling 9% of the silver.

65 According to Klein and TePaske, the quinto was 278,218 pesos also in 1762. Herbert Klein and John TePaske, *Excel Alto Perú*, <https://realhacienda.colmex.mx>.

66 The chain of information from the daily silver purchase and sale ledgers and the weekly ledgers needs to be reconstructed, as well as those registering the payment of tithes, turning it into bars, to compose the general synthesizing charts.

67 In 1754 and 1757, the ledgers specify “out-of-town *azogueros*, *trapicheros* from this [city] and other persons”; while the ledger from 1762 is about “the *rescate* from the *trapicheros* of Potosí from 1761 to 1764.”

TABLE 8.5 Silver purchased by the *Banco de Rescatos* of Potosí in 1754, 1757, and 1762

	1754			1757			1762				
	Women	%	Men	Women	%	Men	Women	%	Men	%	total
No. pers.	24	9	236	41	10	370	101	20	415	80	516
No. trans.	63	9	617	95	7	1,336	254	16	1,362	84	1,616
Total pesos	10,889	5	229,749	12,442	3	448,489	18,264	9	177,985	91	196,257

Note: In 1754, the records are from May to December.

SOURCE: ARCHIVO HISTÓRICO DE POTOSÍ, AHP BSC 325 Y AHP, BSC 313 BANCO DE SAN CARLOS

TABLE 8.6 Places of origin of the silver sold in Potosí in 1754 and in 1757

	1754		1757			
	Amount in pesos	%/ 57,220	%/ 240,638	Amount in pesos	%/ 236,044	%/ 460,931
Aullagas	1,558			15,305	6.48	
Aylloma				322		
Cala Cala	520					
Caracollo	127					
Carma	1,333					
Coroma/ Chorama	399					
Chaijama	318					
Chayanta	5,515			30,999	13.13	
Chichas	10,459	18.28		80,889	34.27	
Chocaya				263		
Guantajaya/ Guantajaya	8,527	14.90		43,634	18.49	
Henao	235					
Jerusalem				405		
Latasi	682					
Lipes	963			18,067	7.65	
Lipez	250					
Provincia						
Mizque	409			2,756		
Mizque Provincia	3,770					
Ocuri	2,550			1,008		
Paria				2,762		
Parca	967					
Pica	6,342					
Pocoata				1,414		
Porco	5,100			33,918	14.37	
Salinas	158			98		
De Garci Mendoza						
Soracaya	575			1,521		
Tatasi	279					

TABLE 8.6 Places of origin of the silver sold in Potosí in 1754 and in 1757 (*cont.*)

	1754			1757		
Theran	390					
Thomave/ Tomave	5,471			454		
Titiri (Urari)	323					
Velasco (de Names without clear identification)				815		
				1,414		
Subtotal	57,220	100%	23.78	236,044	100	51.21
Unknown origin	170,418			224,887		48.79
Junquera	10,198					
<i>Trapichero</i>	2,723					
Rescatiri	79					
<i>Subtotal</i>	183,418		76.22			
<i>Total</i>	240,638		100%	460,931		100%

SOURCE: ARCHIVO HISTÓRICO DE POTOSÍ, AHP BSC 325

Of the *trapicheros*, 61% conducted transactions of only two to one hundred pesos, representing 5% of the total in pesos. At the other extreme, barely three people are listed under 171 transactions and account for nearly 35% of the silver sold.

The situation was similar between men and women (Table 8.7). The majority of transactions were below 200 pesos, while a few transactions exceed 800 pesos, nonetheless accounting for the majority of the silver sold.

The most substantial vendors were seven men, who received more than 5,000 pesos for multiple transactions, while only two women achieved sales exceeding 2,000 pesos. Among the former, Francisco Chamoso and Nicolás Aillón are identified in another document as Spaniards. The first sold a total of 19,151 pesos through fifty-six transactions, while the second made smaller sales. Carlos Ríos, in turn, was registered as a *trapichero* in the Indigenous parish of Copacabana. Diego Iporri, on the other hand, rented a house and *trapiche* in the neighborhood "in front of San Pedro" for 110 pesos a year from Vicente

TABLE 8.7 Groups of *trapicheros* by gender, according to the quantity of silver sold in 1762

Groups by amount and quantities sold	Women				Men							
	No.	%	No. Trans.	%	No.	%	No. Trans.	%				
From 2 to 100	57	56.44	72	28.35	2,273	12.45	259	62.41	336	24.85	8,911	5.04
From 101 to 200	21	20.79	31	12.20	2,835	15.52	66	15.90	160	11.83	9,386	5.30
From 201 to 400	11	10.89	56	22.05	3,150	17.25	32	7.71	123	9.10	8,097	4.58
From 401 to 800	8	7.92	61	24.02	3,919	21.46	28	6.75	137	10.13	15,568	8.80
From 801 to 2,000	2	1.98	8	3.15	1,789	9.80	15	3.61	187	13.83	17,381	9.82
From 2,001 to 10,000	2	1.98	26	10.24	4,298	23.53	12	2.89	238	17.60	49,173	27.79
More than 10,000							3	0.72	171	12.65	68,417	38.67
Total	101	100.00	254	100.00	18,264	100.00	415	100.00	1352	100.00	176,933	100.00

SOURCE: ARCHIVO HISTÓRICO DE POTOSÍ, AHP, BSC 313 BANCO DE SAN CARLOS, LIBRO DONDE SE SIENTAN LOS MARCOS QUE SE TRAEAN AL RESCATE DE LOS TRAPICHEROS DE ESTA RIVERA. 1761-1764

Santiesteban and his wife, Ignacia Mango Ccapac.⁶⁸ That same year, another Indigenous woman by the name of María Gutiérrez leased a *trapiche* house with a half-moon-shaped boulder and flywheel to Casimiro Oviedo in the parish of San Cristóbal.⁶⁹

It is worth looking into the cases of women *trapicheras* who sold small quantities. Christina Cupi, identified as Indigenous, sold ore from January to March. She performed a total of fifteen transactions in quantities ranging from eleven to fifty-eight pesos, achieving total sales of 473 pesos. This amount is considerable since the annual tribute due to the Royal Crown was around nine to ten pesos, in comparative terms. Another woman, Thomasa Mercado, achieved almost the same number of transactions, although she sold slightly smaller quantities, obtaining a total of 228 pesos.

Decades later, the new governor of Potosí in 1783, Juan del Pino Manrique, noted that in the period of Ventura de Santelices, the *k'ajchas* had the “audacious” plan of besieging the city and tried to “deprive them of possession of robbing the mountain mines.” Similarly, during the government of Jaime San Just, the *mita* “indios” threatened to flood and destroy the city, and this went unpunished just because “surely the government lacked the strength to command respect.”⁷⁰

In 1789–1790, the *trapiches*, although in declining numbers, were still important: seventy-seven *trapiches* were in operation and many details were provided for each:

No. 35 (*Trapiche*) Jose Gonzales. His own *trapiche* has 2 *quimbaletes*, 3 *cochas* [ponds,] the *capchas* worked with all kinds of metal and sold to the Bank 70 marks weekly for a payment of roughly 7 pesos, one real.⁷¹

No. 36. the *capchas* work with rich metals and metal dust, and the profit is the same as the previous ones ...⁷²

... *Trapiche* of Maria Chuquiguanca, Indian, has a *quimabalate* and 1 *cocha* [ponds] and the *capchas* work without a schedule.⁷³

68 Archivo Histórico de Potosí, EN 161, 1763, f. 237.

69 Ibid. f. 479.

70 AGN Gobierno 6 3 5. Letter from Juan del Pino Manrique to Exmo. Juan José de Vértiz, 16 August 1782.

71 AGI Charcas 700, f. 123v.

72 Ibid. f. 124.

73 Ibid. f. 126.

Relations between *azogueros*, *k'ajchas*, and *trapicheros* could be functional for all but were also subject to the power and pressure of authorities. Mine concessionaires found new seams and deposits, thanks to the prospecting done by the *k'ajchas* and other workers, and the *azogueros* could purchase their production with limited hard work. Regardless, in the second half of the eighteenth century the *azogueros* of the city controlled only 50% of the silver production.

6 Reconsidering the Second Boom in Potosí and Its Causes

Potosí's new boom dates to the decades between 1730 and 1740, when the supply of mercury essential for silver production became more regular (from 1730) and when the *azogueros'* long-standing and longed-for demand for a reduced tax, from the 20% to the 10% or tithe, came into effect in 1735.

The two most important studies on the eighteenth century were done by Enrique Tandeter and Rose Marie Buechler, who both focused mainly on production by the *azogueros* and the mining entrepreneurs who used Indigenous labor through *mitayos* and wage workers (*mingas* or *alquilados*). Tandeter noted that the mines of Potosí should have been abandoned for lack of profitability.⁷⁴ But since Potosian silver production doubled between 1740 and 1790,⁷⁵ the author tried to explain the reasons for this important "renaissance." Since there were no large new technological investments or innovations, the author suggested that the increase in mining production must be attributable to an overexploitation of *mitayo* workers. The author believed that the *mitayos* subsidized the *azogueros'* enterprise through their labor, even though they were not numerically dominant. Tandeter asserted that the workdays and breaks had changed and were replaced by increasing quotas that had doubled in a situation of greater pressure to achieve returns, given the constantly diminishing *mitayo* labor force, resulting, despite all this, in profitability.⁷⁶

Tandeter's perspective needs to be nuanced considering the large quantities of silver production from other groups as well as the policies implemented

74 Tandeter, *Trabajo forzado y trabajo libre*, 4.

75 John TePaske, *A New World of Gold and Silver*, ed. Kendall W. Brown (Leiden: Brill, 2010), 146; Tandeter, *Coacción y Mercado*, 64, and "Forced and Free Labour," 107.

76 Tandeter did a series of calculations based on specific premises about the surpluses generated by the *azogueros*, which in 1797 ascended to 17.4% of their income and, if the *mitayos* were paid for all their shifts, would disappear (based on a document from 1802). Tandeter, *Coacción y Mercado*, 76. The issue of fixed quotas merits additional analysis, as it dates back much earlier. His explanation is one of the most widely disseminated in Potosí's mining historiography.

to encourage mining starting in 1730. In other words, the new boom in Potosí must also be attributed to policies created to support the mining sector and the subsequent importance acquired by the *k'ajchas* and *trapiches*.

Let us first consider the magnitude and chronology of this upturn. Generally, the eighteenth century in Potosí is considered as a century of a mining crisis. This idea, which is firmly embedded, arises from the continuous complaints and demands from the *azogueros* since the end of the seventeenth century. This decline also appears obvious when compared to the first boom in Potosí between 1580 and 1640 or to the heyday of the mines in México of the eighteenth century. However, Richard Garner, based on the work by Herbert Klein and John TePaske, mentioned that during this century the annual growth in Potosí was 1.2%, while in Mexico it was 1.4%.⁷⁷ The Potosian recovery was important, then, and only one mine in Guanajato, Mexico, at the end of the eighteenth century achieved higher production than Potosí. Carlos Contreras also noted that neither Huantajaya in Iquique nor Laicacota in Peru became substantial enough to replace Potosí. Between 1701 and 1775, silver production in Potosí represented 45% of all mines under the Peruvian viceroyalty.⁷⁸ It was well ahead of other sites, such as Cerro de Pasco and Oruro (Figure 8.6).

Various authors have noted the rise and increase in production that continued until at least 1790, although they differ slightly in their chronology. Garner identifies the moment that production was revitalized between 1724 and 1783 and, more evidently, between 1750 and 1770, with a decline beginning in 1784.⁷⁹ In turn, David Brading considered that the growth happened from 1730, a view with which Tandeter agreed and extended it to last until 1790.⁸⁰

In this same period in Mexico, large enterprises started to dominate as part of a process of rationalizing investments, generating capital, and to try to minimize material and labor costs.⁸¹ One of the major conflicts arose from the “share” (*partido*) of minerals that workers could mine outside of their fixed working hours, after accomplishing preestablished quotas. The “shares,” which varied from one mine to another, were targeted for reduction or even

77 Richard Garner, “Long-Term Silver Mining Trends in Spanish America: A Comparative Analysis of Peru and Mexico,” *American Historical Review* 93, no. 4 (1988), 905.

78 Contreras, “La minería en el Perú en la época colonial tardía, 1700–1824,” 104 and 115.

79 Garner, “Long-Term Silver Mining Trends,” 908.

80 David Brading, “Las minas de plata en México y en el Perú colonial, un estudio comparativo,” *Desarrollo Económico* 11, no. 41 (1971): 101–11, 104; Tandeter, *Coacción y Mercado*, 19.

81 David Navarrete, “La minería de Zacatecas, 1546–1950. Una revisión bibliográfica,” *Historias* 36 (1995): 85–103.

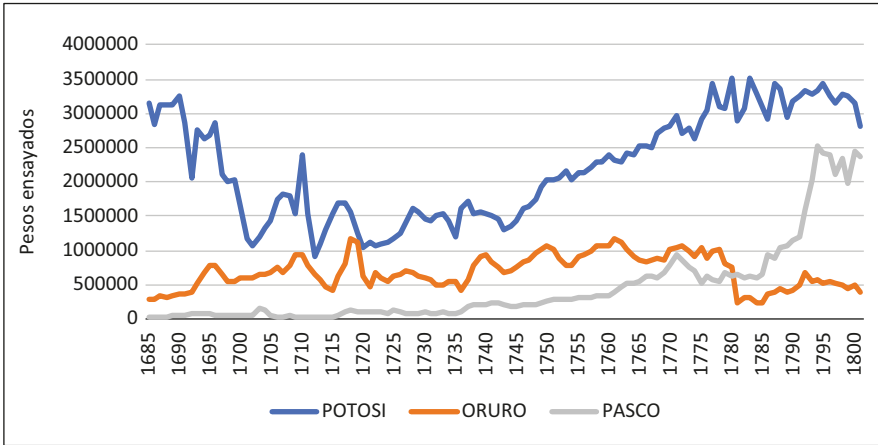


FIGURE 8.6 Silver production between 1685 and 1799 in Potosi, Oruro, and Pasco
 SOURCE: OWN GRAPH BASED ON DATA FROM RICHARD GARNER, PERUSEX, IN [HTTP://WWW.INSIDEMYDESK.COM/HDD.HTML](http://www.insidemydesk.com/hdd.html), ACCESSED ON JUNE 23, 2020

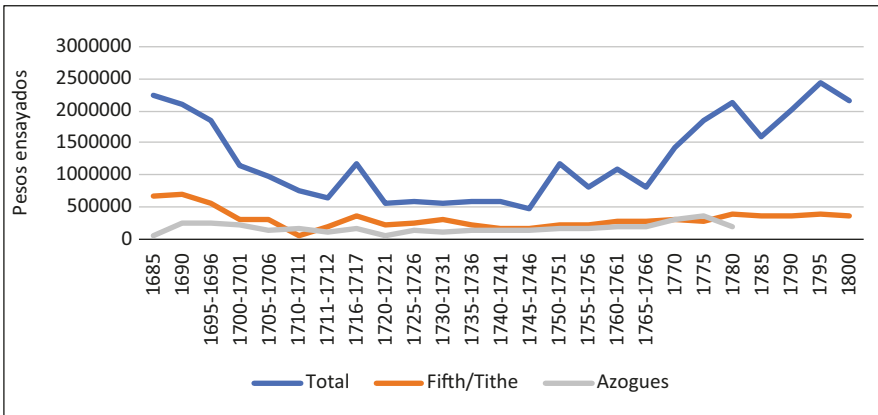


FIGURE 8.7 Income from the Royal Treasury of Potosi (total, quintos/diezmos, and azogues) between 1685 and 1800
 SOURCE: CAJAS DE LA REAL HACIENDA DE LA AMÉRICA ESPAÑOLA, ALTO PERÚ. THE DATA ARE IN PESOS “ENSAYADOS.” THE EXCHANGE WAS DONE INTO PESOS OF 8 REALES (1 PESO TESTED = 1.6544 PESOS), AS NOTED AT [HTTPS://REALHACIENDA.COLMEX.MX](https://realhacienda.colmex.mx), ACCESSED JUNE 23, 2020

elimination by the larger entrepreneurs.⁸² In Potosí, on the other hand, two very significant processes took place: the creation of an important and successful bank set for purchasing silver, which helped explain the new Potosian boom;⁸³ and the emergence and rise of *k'ajchas* and *trapiches*, which really goes to show the consolidation of independent groups of ore producers and ore mineral buyers of small amounts (*recatistas*).

7 Conclusion

Mitayos and *azogueros* have always been identified with the silver production and ore refineries of Potosí—that is why Tandeter highlighted the links

82 On the comparison between Peru and Mexico, see Brading, “Las minas de plata en el Perú y en el México colonial”; Garner, “Long term Silver Mining Trends in Spanish America”; Isabel Povea Moreno, “Coacción y disensión. Protestas frente a los repartimientos mineros en Perú y Nueva España, siglo XVIII,” *Estudios de Historia Novohispana* 53 (2015): 1–17; Paula Zagalsky and Isabel Povea Moreno, “Un mundo diverso: una panorámica de los trabajadores mineros coloniales a partir del análisis de los casos en los Virreinos de Nueva España y del Perú,” *Trabajos y Trabajadores en América Latina (Siglos XVI–XXI)*, ed. R. Barragán R. (La Paz: CIS, 2019); María Concepción Gavira Márquez, “Las condiciones laborales de los trabajadores mineros en Charcas y Michoacán a fines del siglo XVIII. Reglamentos y prácticas,” in *Condiciones de vida y de trabajo en la América colonial: legislación, prácticas laborales y sistemas salariales*, eds. Enriqueta Quiroz, Diana Bonnet (Bogotá: Universidad de los Andes, 2009); Ernst Sánchez Satiró, “La minería novohispana a fines del período colonial. Una evaluación historiográfica,” *Estudios de Historia Novohispana* 27 (2002); Roberto Moreno, “Salario, tequio y partido en las Ordenanzas para la minería novohispana del siglo XVIII,” IV Congreso del Instituto de Historia del Derecho Indiano (Mexico: UNAM, 1976); Elías Gaona Rivero, “Trabajo, Salarios y nivel de vida de los mineros de Real del Monte (México), en los siglos XVIII–XIX,” (PhD. Diss. Universidad de Barcelona, 2010); Doris Ladd, *Génesis y desarrollo de una huelga. Las luchas de los mineros mexicanos de la plata en Real del Monte, 1766–1785* (Mexico: FCE, 1992).

83 The banks were not as successful in other places. Clara Elena Suárez refers to projects in New Mexico in 1743 and 1758–1759. In 1759 in Zacatecas, an integrated public company was launched that lasted only six years. The goals were to increase the circulation of money and to avert interference by merchants advancing money. Gálvez also tried to have more control of the retail of silver in “small-scale” purchases (*rescate*) at very low prices. The *Bancos de Rescate* were established one after another in New Spain, albeit later on, from 1791. Clara Elena Suárez Arguello, “Fuentes y métodos para el estudio de los bancos de rescate de platas en la Nueva España (1790–1810),” *América Latina en la Historia Económica* 9, no. 17–18 (2002): 143–55, 144; Clara Elena Suárez Arguello, “¿Los Bancos de Rescates de platas, incremento en la circulación monetaria y ahorro de fletes? Una nueva propuesta a fines del siglo XVIII,” *Relaciones* 70, no. XX (1999): 85–128, 87–88, 94–97. *Bancos de Rescate* were also established in Hurarochirí, Hualgayoc, Lucanas, Huantajaya, and Lima. Contreras, “La minería en el Perú en la época colonial tardía, 1700–1824,” 116–17.

between the overexploitation of *mitayos* and the new revitalization of silver mining in the eighteenth century. Without overlooking worsening labor relations, an important and transcendental particularity in the eighteenth century deserves consideration: the emergence of small and medium-sized artisanal mining. If Potosí has been and is synonymous with the *mita*, it should also be associated with the silver mining production by heterogenous actors that emerged in the nooks and crannies of the mining industry: the *k'ajchas*, *trapiches*, and mining groups from surrounding provinces were responsible for 50% to 60% of the production from 1754 onward, with a large number of people and families involved.

Various factors over the medium and long term explain this particular situation and peculiarity of the Potosí, which also occurred in other mines, with some variations, in what is now Bolivia.

Over the long term, going back to the sixteenth century, one must recognize the existence of groups, mostly Indigenous, that had more independent access to the minerals, using their melting furnaces (*guairas*) and selling the silver in their *katu* or market.⁸⁴ Throughout the eighteenth and nineteenth century, the work and influence of the *k'ajchas* continued, until the formation of trade unions and, later, with the creation of cooperatives during the first half of the twentieth century. Today, these cooperatives are significant both because of their membership numbers as well as their level of production.

The eighteenth century, therefore, was fundamental. The mining industry that emerged after the failure of La Palata's reform of 1689, after four decades of debates, depended on the *azogueros*, whose refining mills had *mitayo* workers, albeit in reduced numbers. However, silver production in Potosí was also the result in this period of a heterogeneous world of Indigenous, mestizo, mulatto, poor Spaniard, and women workers, who managed to open and consolidate spaces for extracting and processing silver in coexistence with and along the margins of the *azogueros*.

Our understanding of labor relations is enriched by the recognition of the work of the *k'ajchas* and *trapicheros*. Both groups demonstrate that the workers were able to intervene on their own terms and at a higher profit than they could obtain exclusively as casual labor or as wage workers. Their presence in Potosí became clear with their organization and confrontation against local

84 On the importance of trade by the indigenous people in Potosí, see Jane Mangan, *Trading Roles: Gender, Ethnicity, and the Urban Economy in Colonial Potosí* (Durham: Duke University Press, 2005), and Paulina Numhauser, *Mujeres indias y señores de la coca: Potosí y Cuzco en el siglo XVII* (Madrid: Editorial Cátedra, 2005).

authorities in 1751.⁸⁵ They sought greater autonomy by processing minerals in the *trapiches* to sell silver to the *Banco de Rescates*, which was created to support the mining sector. Their presence in the bank's bylaws shows their recognition and significance. Ultimately, the incursion of *k'ajchas* and *trapicheros* explains why labor did not become totally "free," as in the case of the proletariat, since the workers themselves were able to build their own spaces of production.⁸⁶

The renaissance of Potosí in the eighteenth century also helps us think about the magnitude of smuggled silver since it was the higher prices that managed to attract producers and small traders (*rescatistas*). The creation of the bank allows us to realize how silver mining tax revenue conceals other dynamics scarcely visible. Some testimonies in Potosí suggest that the "decline of the mining industry" could be linked to "the diversion of silver via Buenos Aires ... without paying royal duties to be shipped to 'foreign kingdoms.'"⁸⁷

The trajectory of this work also reveals how heterogeneous groups managed to gain access to the mining industry one way or another. Potosí thus stands out as a distinctive city of the "kingdom and the monarchy."

Primary Sources

Real Cédula de incorporación del Banco de Potosí a la Real Hacienda. Ordenanzas para su Régimen y Gobierno. Madrid, 1795.

Archivo y Biblioteca Nacionales de Bolivia (ABNB)

ABNB ALP Minas 138/11. Expediente instruido por la Audiencia de La Plata en cumplimiento de lo ordenado por don Pedro de Ceballos, virrey de Buenos Aires, en orden a formar una razón de los sujetos empleados en los diversos establecimientos y oficinas de la Real Hacienda de Potosí, a saber: Gobierno y Superintendencias,

85 Thomas Abercrombie, "Q'ajchas and La Plebe in rebellion." I am deeply indebted to Thomas Abercrombie and Elizabeth Penry for generously allowing me to access the microfilm of the document from the Archivo de Indias that could not be located otherwise, and I am working on it working on now. See AGI Lima 807, Potosí 1751, Testimonio de la Causa contra varios yndios por querer seguir la costumbre del robo de metales. 2 piezas. Ventura de Santelises Corregidor.

86 Erick Langer, "The Barriers to Proletarianization: Bolivian Mine Labour, 1826–1918," *International Review of Social History* 41, no. S4 (1996): 27–51.

87 BNP C2000005929. Continuación del Reglamento de compras de plata de la Villa de Potosí por el Sr. Oidor don Pedro de Tagle como juez comisario del excelentísimo Sr. Virrey don Manuel Amat y Juniet, Cap. 57, f. 94–94v.

Cajas Reales, Casa de la Moneda, Banco de Rescates y Corregimientos de Chayanta, Porco, Chichas, Lízpez y Atacama, dependientes de dicha Villa en este ramo, 1778, 31 fs. ABBN, Minas 35/3

ABNB Min 28/1 Expediente seguido por don Gerónimo Gómez Trigoso y don José Roque de Arismendi, sobre la culpa que les imputó el Corregidor de Potosí en el destrozo y derribamiento de los estribos, puentes y pilares de las vetas de plata, San Miguel y San José, en la labor de Alkjo-barreno, cerro de dicha Villa, cuando esos desperfectos fueron causados por ladrones denominados K'ajchas, 1751-1753, Fs. 457. Carta del Alcalde Mayor Pedro Franciso de Irribaren, f. 106-107v.

Archivo General de Indias, Sevilla (AGI)

AGI Charcas, 481 19 n.p. Informe del Gobernador San Just, 1 de Mayo de 1762.

AGI Lima 1134. Cajas Reales. Testimonio del Proyecto de la Cia. que formó la Asociación de Azogueros y hace presente los Beneficios que resultaría para el Establecimiento de este Banco. Potosí 21 de Febrero de 1748, n.p. Firma Herboso.

AGI Charcas 437^a

AGI Charcas 481. Testimonio de autos obrados por la Diputación del comercio desta ymperial villa de Potosí del Perú sobre que el estanco y banco de platas perteneciente al gremio de azogueros se suprima y extinga por lo perjudicial que ha sido al rey nuestro Sr. y al reino establecido por don Ventura de Santelices y Venero. Año de 1757, f. 4, f. 6v.

AGI Charcas 481 No. 19, [Informe] de Nicolás Pacheco, 1757, f. 74v-75.

AGI Charcas 692 N.p.

AGI Charcas 461 [65]

AGI Charcas 700. Testimonio de la Visita de Cerro Yngenios y Trapiches del Cerro Rico y Ribera de la Imperial Villa de Potosí con expresion de los nombres de las Minas, sus varas, rumbos y Frontes ... 1789. 22 de febrero de 1790.

Archivo General de la Nación, Buenos Aires (AGN)

AGN Sala IX. 33-01-06. Hacienda. Leg. 20 Expediente 466. N.p.

AGN Sala IX. 6-03-03. 1778-1779 Potosí. Testimonio de la Visita de Ingenios y Minas de la Rivera y Serro de la Villa Ymperial de Potosí asiento y cerro de Guari Guari ... actuada por el Sr. don Jorge Escobedo y Alarcón del Consejo de S.M.

AGN Gobierno 6-3-5. Carta de Juan del Pino Manrique al Exmo. Juan José de Vértiz, 16 de agosto.

Biblioteca Nacional del Perú (BNP)

BNP C2000005929, Reglamento del Banco, 1769-1770

Archivo Histórico de Potosí (AHP)

- AHP BSC 325. Libro de los Azogueros de fuera, trapicheros de esta villa y otras personas, 1754–1757.
- AHP, BSC 313 Banco de San Carlos, Libro donde se asientan los marcos que se traen al rescate de los trapicheros de esta rivera, 1761–64.
- AHP, BSC 360 Banco de San Carlos, Libro donde se asientan los marcos que los señores azogueros de esta villa traen a rescatar a este banco y mercadería que corre a cargo del maestre de campo, 1759–62.
- AHP, IN 161, 1763, f. 237.

British Library

- “Descripción del terreno y lugares comarcanos de Potosí,” 1759, 256 in “Tracts Relating to the Provinces of Buenos Ayres and Patagonia 1756–1802,” Add Ms. 17605.

Bibliography

- Abercrombie, Thomas. “Q’aqchas and La Plebe in Rebellion: Carnival vs. Lent in 18th Century Potosí.” *Journal of Latin American Anthropology* 2, no. 1 (1996): 62–111.
- Arzans de Orsúa y Vela, Bartolomé. *Historia de la Villa Imperial de Potosí*, 3 vols. Edited by Lewis Hanke and Gunnar Mendoza. La Paz: Fundación Cultural del Banco Central de Bolivia, 1965–2012.
- Bakewell, Peter. *Miners of the Red Mountain: Indian Labor in Potosí, 1545–1650*. Albuquerque: University of New Mexico Press, 1984.
- Barragán, Rossana. “K’ajchas, trapiches y plata en el cerro de Potosí en el período colonial.” *Anuario de Estudios Bolivianos* 20 (2014): 273–320.
- Barragán, Rossana. “Dynamics of Continuity and Change: Shifts in Labour Relations in the Potosí Mines (1680–1812).” *International Review of Social History* 61 (2016): 93–114.
- Barragán, Rossana. “Working Silver for the World: Mining Labor and Popular Economy in Colonial Potosí.” *Hispanic American Historical Review* 97 (2017): 193–222.
- Brading, David. “Las minas de plata en México y en el Perú colonial, un estudio comparativo.” *Desarrollo Económico* 41 (1971), 101–11.
- Brading, David. “Bourbon Spain and its American Empire.” In *The Cambridge History of Latin America. Vol. 1*, edited by L. Bethell, 389–439. Cambridge: Cambridge University Press, 1984.
- Buechler, Rose Marie. *Gobierno, minería y sociedad: Potosí y el “renacimiento” borbónico, 1776–1810*, 2 vols. La Paz: Biblioteca Minera Boliviana, 1989.
- Cole, Jeffrey. *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press, 1985.

- Contreras, Carlos. "La minería en el Perú en la época colonial tardía, 1700–1824." In *Compendio de Historia Económica del Perú. Economía Colonial Tardía*, edited by Carlos Contreras. Lima: Banco Central del Perú, Instituto de Estudios Peruanos, ed. digital, 2020.
- Fernández Alonso, Serena. "Minería Peruana y Reformismo Estatal: las Ordenanzas del Real Banco de San Carlos de la Villa de Potosí." *Anuario de Estudios Americanos* 47 (1990): 259–277.
- Frézier, Amédée François, and Bernard Picart. *Relation du voyage de la mer du Sud aux côtes du Chili, du Perou, et du Brésil, fait pendant les années 1712, 1713 & 1714*. Amsterdam: Pierre Humbert, 1732.
- Gaona Rivero, Elías. "Trabajo, salarios y nivel de vida de los mineros de Real del Monte (México), en los siglos XVIII–XIX." Ph D. diss., Universidad de Barcelona, 2010.
- Gárate Ojanguren, Montserrat. *La Real Compañía Guipuzcoana de Caracas*. San Sebastián: Sociedad Guipuzcoana de Ediciones y Publicaciones, 1990.
- Garner, Richard L. "Long-Term Silver Mining Trends in Spanish America: A Comparative Analysis of Peru and Mexico." *American Historical Review* 93, no. 4 (1988): 898–935.
- Gavira Márquez, María Concepción. "Producción de plata en el mineral de San Francisco de Huantajaya (Chile), 1750–1804." *Chungara* 37, no. 1 (2005): 37–57.
- Gavira Márquez, María Concepción. "Las condiciones laborales de los trabajadores mineros en Charcas y Michoacán a fines del siglo XVIII. Reglamentos y prácticas." In *Condiciones de vida y de trabajo en la América colonial: legislación, prácticas laborales y sistemas salariales*, edited by Enriqueta Quiroz and Diana Bonnet, 179–210. Bogotá: Universidad de los Andes, 2009.
- Gil Montero, Raquel and Florian Téreygeol. "Ore Dressing Technics in the Andes during the Seventeenth Century: The Case of San Antonio del Nuevo Mundo, Lípez, Present-day Bolivia." *International Journal of Historical Archaeology* 25, no. 1 (2020): 65–91.
- González Casasnovas, Ignacio. *Las dudas de la corona: La política de repartimientos para la minería de Potosí (1680–1732)*. Madrid: CSIC, 2000.
- Guerrero, Saúl. *Silver by Fire, Silver by Mercury: A Chemical History of Silver Refining in New Spain and Mexico, 16th to 19th Centuries*. Boston: Brill, 2017.
- Hussey, Roland Dennis. *The Caracas Company 1728–1784. A Study in the History of the Spanish Monopolistic Trade*. Cambridge: Harvard University Press, 1934.
- Irigoin, Alejandra and Regina Grafe. "Bargaining for Absolutism: A Spanish Path to Nation-State and Empire Building." *Hispanic American Historical Review* 88, no. 2 (2008): 173–209.
- Jumar, Fernando. "Le commerce atlantique au Río de La Plata, 1680, 1778." Ph D. diss., Ecole des Hautes Etudes en Sciences Sociales, 2000.
- Klein, Herbert, and John TePaske. *Excel Alto Perú*, 1992. <https://realhacienda.colmex.mx>.

- Ladd, Doris. *Génesis y desarrollo de una huelga. Las luchas de los mineros mexicanos de la plata en Real del Monte, 1766–1785*. Mexico: FCE, 1992.
- Lane, Kris. *Potosí, The Silver City that Changed the World*. Berkeley: University of California Press, 2019.
- Langer, Erick. "The Barriers to Proletarianization: Bolivian Mine Labour, 1826–1918." *International Review of Social History* 41, no. S4 (1996): 27–51.
- Langue, Frédérique, and Carmen Salazar-Soler. *Dictionnaire des termes miniers en usages en Amérique Espagnole. Diccionario de términos mineros para la América española (siglos XVI–XIX)*. Paris: Editions Recherches sur les Civilisations, 1993.
- Mangan, Jane. *Trading Roles: Gender, Ethnicity, and the Urban Economy in Colonial Potosí*. Durham: Duke University Press, 2005.
- McFarlane, Anthony. "The Bourbon Century." In *Early Bourbon Spanish America, Politics and Society in a Forgotten Era (1700–1759)*, edited by Francisco A. Eissa-Barroso and Ainara Vázquez Varela, 181–98. Leiden: Brill, 2013.
- Mendoza, Gunnar. "Terminología y tecnología minera en el área andina de Charcas: García de Llanos, un precursor (1598–1611)." In *Diccionario y maneras de hablar que se usan en las minas y sus labores en los ingenios y beneficios de los metales (1609)*. La Paz: Museo Nacional de Etnografía y Folklore, 1983.
- Mendoza, Gunnar. "El valor sociológico de la Historia. Bartolomé de Orsúa y Vela: su vida y obra." In *Historia de la Villa Imperial de Potosí, T.III*, edited by Lewis Hanke and Gunnar Mendoza, CXXVIII–CLXXXI. La Paz: Plural, 2012.
- Mira, Guillermo. "El Real Banco de San Carlos de Potosí y la minería altooperuana colonial." In *La Savia del Imperio. Tres estudios de economía colonial*, edited by Julio Sánchez Gómez, Guillermo Mira Delli-Zotti, Rafael Dobado, 266–320. Salamanca: Ediciones Universidad de Salamanca, 1977.
- Moreno, Roberto. "Salario, tequio y partido en las ordenanzas para la minería novohispana del siglo XVIII." *IV Congreso del Instituto de Historia del Derecho Indiano*. Mexico: UNAM, 1976.
- Moutoukias, Zacarías. "Power, Corruption, and Commerce: The Making of the Local Administrative Structure in Seventeenth-Century Buenos Aires." *Hispanic American Historical Review* 68, no. 4 (1988): 771–801.
- Moutoukias, Zacarías. *Contrabando y control colonial en el siglo XVII. Buenos Aires, el Atlántico y el Espacio Peruano*. Buenos Aires: Centro Editor de América Latina, Bibliotecas Universitarias, 1988.
- Navarrete, David. "La minería de Zacatecas, 1546–1950. Una revisión bibliográfica." *Historias* 36 (1995): 85–103.
- Numhauser, Paulina. *Mujeres indias y señores de la coca: Potosí y Cuzco en el siglo XVII*. Madrid: Editorial Cátedra, 2005.
- Palacios Atard, Vicente. "El Banco de Rescates en Potosí." *Anuario de Estudios Americanos* T. II (1945): 723–38.

- Pearce, Adrian. *The Origins of Bourbon Reform in Spanish South America, 1700–1763*. Basingstoke: Palgrave Macmillan, 2014.
- Pereira, Edgar. "Iberia." In *The Corporation as a protagonist in Global History, c. 1550–1750*, edited by A. Pettigrew and David Veevers, 301–16. Leiden: Brill, 2019.
- Pettigrew, William A., and David Veevers. "Introduction." In *The Corporation as a Protagonist in Global History, c. 1550–1750*, edited by A. Pettigrew and David Veevers, 1–40. Leiden: Brill, 2019.
- Piñero, Eugenio. "The Cacao Economy of the Eighteenth-Century Province of Caracas and the Spanish Cacao Market." *Hispanic American Historical Review* 68, no. 1 (1988): 75–100.
- Povea Moreno, Isabel. "Coacción y disensión. Protestas frente a los repartimientos mineros en Perú y Nueva España, siglo XVIII." *Estudios de Historia Novohispana* 53 (2015): 1–17.
- Rahn, Carla. "The Growth and Composition of Trade in the Iberian Empire, 1450–1750." In *The Rise of Merchant Empires: Long Distance Trade in the Early Modern World, 1350–1750*, edited by James Tracy, 34–101. Cambridge: Cambridge University Press, 1990.
- Sánchez Satiró, Ernst. "La minería novohispana a fines del período colonial. Una evaluación historiográfica." *Estudios de Historia Novohispana* 27 (2002): 123–64.
- Stein, Stanley, and Barbara H. Stein. *Silver, Trade, and War: Spain and America in the Making of Early Modern Europe*. Baltimore: Johns Hopkins University Press, 2000.
- Suárez, Margarita. *Desafíos transatlánticos. Mercaderes y banqueros y el estado del Perú Virreinal, 1600–1700*. Lima: Pontificia Universidad Católica del Perú. Fondo de Cultura Económica e Instituto de Estudios Peruanos, 2001.
- Suárez Arguello, Clara Elena. "¿Los Bancos de rescates de platas, incremento en la circulación monetaria y ahorro de fletes? Una nueva propuesta a fines del siglo XVIII." *Relaciones* 70, no. XX (1999): 85–128.
- Suárez Arguello, Clara Elena. "Fuentes y métodos para el estudio de los bancos de rescate de platas en la Nueva España (1790–1810)." *América Latina en la Historia Económica* 9 no. 17–18 (2002): 143–55.
- Tandeter, Enrique. *Trabajo forzado y trabajo libre en el Potosí colonial tardío*. Buenos Aires: Cedes, 1980.
- Tandeter, Enrique. "Forced and Free Labour in Late Colonial Potosí." *Past and Present* 93, no. 1 (1981): 98–136.
- Tandeter, Enrique. *Coacción y mercado: La minería de la plata en el Potosí colonial, 1692–1826*. Cuzco: Centro de Estudios Regionales Andinos "Bartolomé de Las Casas," 1992.
- TePaske, John. *A New World of Gold and Silver*, edited by Kendall W. Brown. Leiden: Brill, 2010.
- Walker, Geoffrey. *Spanish Politics and Imperial Trade, 1700–1789*. London: Macmillan Press, 1979.

Zagalsky, Paula. "La mita de Potosí: una imposición colonial invariable en un contexto de múltiples transformaciones (Siglos XVI–XVII; Charcas, Virreinato del Perú)," *Chungara* 46 no. 3 (2014): 375–95.

Zagalsky, Paula, and Isabel Povea Moreno. "Un mundo diverso: una panorámica de los trabajadores mineros coloniales a partir del análisis de los casos en los Virreinos de Nueva España y del Perú." In *Trabajos y Trabajadores en América Latina (Siglos XVI–XXI)*, edited by R. Barragán, 245–80. La Paz: CIS, 2019.

PART 4

Local, Regional and Global Impacts



Local Links behind a Global Scandal

The Audiencia de Charcas and the Great Potosí Mint Fraud, ca. 1650

Masaki Sato

1 Introduction

During the colonial period, Potosí was the richest silver deposit in the world. However, production was never uniform but rather cyclical.¹ Potosí silver production in fact declined little by little after peaking towards the end of the sixteenth century and into the first years of the seventeenth century.² Already by this time, Potosí silver had played a transcendental role in the circuits and markets of early globalization (see Bonialian in this volume) and had achieved a global reputation and demand. Despite sustained global demand for its product, the first half of the seventeenth century signaled decline for the famous Cerro Rico.

At this juncture, systematic debasement of Potosí silver began: the royal mint began processing silver bars containing much more copper than was allowed. This type of fraud was not new in Potosí, but it had never been carried out on such a large scale and in such an organized manner. The figures seem to verify this: during the 1630s and 1640s, the amount of silver coined continued to rise despite the steady fall in registered, mined silver production (see Figure 9.1). We see this strange trend only at this time in colonial Potosí. How was such a trend possible? The only answer seems to be, as Kris Lane suggests, that “debasement had been a routine practice.”³ This fraud at the mint, arguably, was a consequence or symptom, rather than a cause, of the decline of the Cerro Rico, which was not yet so visible or generally recognized.

It was during the 1640s when the world became aware of the mint fraud in Potosí. Foreign countries began to reject the Potosí silver coins, which pushed

1 On the concise but detailed history of Potosí, see Kris Lane, *Potosí: The Silver City that Changed the World* (Oakland: University of California Press, 2019).

2 For a series of causes that damaged the Potosí silver industry, see Lane, *Potosí*, Ch. 5.

3 Kris Lane, “From Corrupt to Criminal: Reflection on the Great Potosí Mint Fraud of 1649,” in *Corruption in the Iberian Empires: Greed, Custom, and Colonial Networks*, ed. Christoph Rosenmüller (Albuquerque: University of New Mexico Press, 2017), 38.

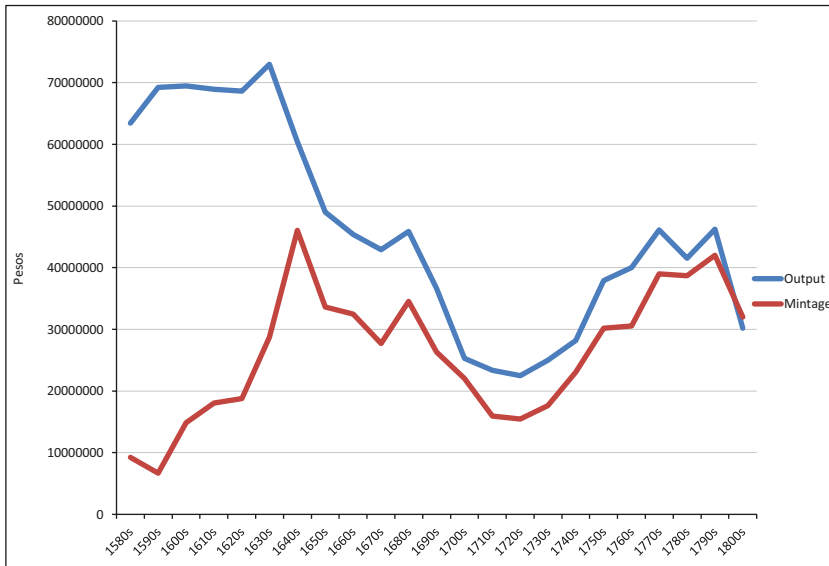


FIGURE 9.1 Potosí's registered silver output versus coin mintage in pesos, ca. 1570–1810
SOURCE: LANE, *POTOSÍ*, 86

the Spanish Crown to investigate the problem in the Villa Imperial. Attempts to investigate failed several times. Finally, Francisco de Nestares Marín, who had been appointed *visitador general* and new president of the Audiencia de Charcas (the regional governing body with judicial and policymaking functions), began investigating the Potosí mint in earnest towards the end of 1648. The probe was at first secret, at least in theory. Nestares Marín's *visita* or inspection lasted about ten years, during which time the *visitador* carried out various reforms.⁴ However, although Nestares Marín succeeded in restoring the quality of Potosí's silver bars and the soundness of its coinage, their lost reputation could not be easily regained. Now, Potosí silver would cause confusion or a "hangover" in many parts of the world (see Lane in this volume). The fraud that occurred in Potosí thus had the dimensions of a global scandal. From this point on, the Potosí silver industry in general entered a sustained decline, until its renaissance or "second boom" around the middle of the eighteenth century (see Barragan in this volume).⁵

4 For a detailed definition of *visita*, and a very unique approach to the *visita* that took place in 1588 in Potosí, see Raphael in this volume.

5 One symbolic fact indicates this decline of Potosí, whose production had accounted for almost all the silver in the Peruvian viceroyalty. From the 1670s onwards, total silver

This chapter analyzes this great fraud and the *visita* by Nestares Marín that followed it, arguably a watershed in the history of the Villa Imperial. It is true that these events have been carefully studied, yet many points remain uninvestigated. I will try to fill one major gap. Specifically, the purpose of this chapter is to examine the great fraud and its investigation from the perspective of the administration of justice and to reflect on the role that the Audiencia de Charcas—arguably the political center of the region—played in the fraud itself. In reading the documentary record left by Nestares Marín's *visita*, I reconstruct the links between audiencia officials and Potosí's elite householders or *vecinos*. Such local links help explain why the most important political and legal institution in the region did not take serious action against an obvious crime of *lèse-majesté*. On the contrary, an *oidor* (judge), Pedro de Azaña, came to sponsor the fraud indirectly but decisively.

First, let me review the relevant historiography. In 1963, Antonio Domínguez Ortiz wrote: "We have no complete monograph on the counterfeiting of the *reales de a ocho* of Potosí."⁶ In this work the author reflected on the influence of the Potosí debasement scheme on the Spanish empire, according to which, although the total loss caused by the fraud was estimated at 2 million ducats, "the suspicion soon dissipated and the Spanish silver coin regained its well-earned prestige even in the farthest reaches of the globe."⁷ Domínguez Ortiz's work was based mainly on the documents housed in the National Historical Archive of Spain, and perhaps that is why his analysis emphasized the discourses of the administrative nuclei of the empire, such as those of the Consejo de Hacienda (Treasury Council).

Some ten years later, when Guillermo Lohmann Villena published on the same subject, the situation had not changed much. According to Lohmann, researchers, excepting some numismatists, had not paid due attention to the fraud in Potosí. Inquiring into the development of the fraud and the confusion that resulted from it, Lohmann argued that it was towards the end of 1659 when the viceroyalty's money market regained its former vigor.⁸ Some very detailed descriptions, based on a meticulous reading of voluminous primary

production in the viceroyalty of Peru was, for the first time, lower than that of Mexico and never recovered. John Jay TePaske, *A New World of Gold and Silver* (Leiden: Brill, 2010), 112–13, 190–91.

6 Antonio Domínguez Ortiz, "La falsificación de moneda de plata peruana a mediados del siglo xvii," in *Estudios Americanistas* (Madrid: Real Academia de la Historia, 1998), 150.

7 Domínguez Ortiz, "La falsificación de moneda," 165–66. The author's estimate is based on AHN, Consejos 51359, exp. 32.

8 Guillermo Lohmann Villena, "La memorable crisis monetaria de mediados del siglo xvii y sus repercusiones en el virreinato del Perú," *Anuario de Estudios Americanos* 33 (1976): 579–639.

sources, are a great contribution of Lohmann's work. However, his reflections concentrated on direct economic consequences, overlooking the political situation, specifically the inaction of the Audiencia de Charcas, which was in charge of administering Potosí.

The Potosí mint scandal did not take place only within the Villa Imperial. People, capital, information, and orders circulated and crossed paths between Charcas, Lima, Madrid, and beyond. Therefore, it is not easy to grasp even a general picture of the scandal, although we already have the series of studies carried out by Lane.⁹ In this regard, Peter Bakewell's last monograph, though focused on the period after the fraud, offers a detailed history of the scandal with an essential description of the *mercaderes de plata* (silver merchants), who played a vital role in Potosí until the *visita* of Nestares Marín.¹⁰ Also very useful are the works of numismatic researchers such as Arnaldo Cunietti-Ferrando, who revealed documentary exchanges between Madrid, Lima, and Potosí related to the reforms carried out by Nestares Marín, especially the devaluation of the coins minted before his *visita*.¹¹ Likewise, Alan Craig's work offers useful descriptions of the structure of the silver industry from the mines to the mint, along with the history of fraud in Potosí, although it contains some notable errors.¹²

Among recent works, Carmen Sanz Ayán's 2013 book on the financial agents of the Spanish Empire of Philip IV examines the fraud in Potosí. The important novelty of Sanz Ayán's work is that the author considers Juan de Figueroa, the *ensayador mayor* (senior assayer) of the Potosí mint who lived in Lima, as the true perpetrator of the forgery.¹³ Almost at the same time, Daniel Oropeza

9 Kris Lane, "Corrupción y dominación colonial. El gran fraude a la Casa de la Moneda de Potosí en 1649," *Boletín del Instituto de Historia Argentina y Americana "Dr. Emilio Ravignani"* 43 (2015): 94–130; Lane, "From Corrupt to Criminal"; Lane, *Potosí*, 127–36.

10 Peter Bakewell, *Silver and Entrepreneurship in Seventeenth-Century Potosí: The Life and Times of Antonio López de Quiroga*, 2nd ed. (Dallas: Southern Methodist University Press, 1995), 36–47.

11 Arnaldo J. Cunietti-Ferrando, *Historia de la Real Casa de Potosí durante la dominación Hispánica, 1573–1652* (Buenos Aires: Imprenta Pellegrini, 1995).

12 Alan K. Craig, *Spanish Colonial Silver Coins in the Florida Collection* (Gainsville: Florida Heritage Publication, 2000). Some errors slip in: the timing of the actions of *visitador* Francisco de Nestares Marín and silver merchant Francisco Gómez de la Rocha in Potosí (page 26); the treatment of the different *visitas* of 1646 and 1649 as if they were the same inspection (29); and the confusion of the *visita* of 1648 with that of 1668 (34–35). His drawing on the processing of silver, from the mines to the mint, although very precious, lacks precision (41).

13 Carmen Sanz Ayán, *Los banqueros y la crisis de la Monarquía Hispánica de 1640* (Madrid: Marcial Pons, 2013), 81–83. However, the author does not clarify the source that supports her curious interpretation. Her description seems to be based on the documents

Alba published a book that investigates the matter through the sources preserved in Potosí.¹⁴ Oropesa Alba's enormous contribution consists in clarifying the unknown early career of Francisco Gómez de la Rocha, one of the fraud's main culprits, and in revealing the dense networks linking Potosí's silver merchants. Both authors help to further historicize the Potosí fraud, yet both also get some dates wrong.¹⁵ These errors, although not egregious in and of themselves, reflect a deeper problem: not relying on the documents generated by the *visita* to investigate the debasement and its principals.

As another recent contribution, Kris Lane reflects on the fraud along the lines of the recurrent theme of corruption in the Ancien Régime. In the documents produced by the *visita*, Lane, following anthropologist Claudio Lomnitz and historian Mary Lindemann, looks for "those practices that exploit the contradictions or ambiguities of the normative system for personal gain" and "the limits of tolerance." The author sees Nestares Marín as a man who redrew "the line between what is merely corrupt and what is criminal."¹⁶ His ideas have certain validity for understanding the details that the sources yield, and I will return to them at the end of this chapter.

With this historiographical overview in mind, we can point out some remaining gaps or problems to be solved. The first problem is related to the selection of sources. The *visita general* carried out by Nestares Marín left an enormous quantity of documents, and the majority of these documents are stored in the General Archive of the Indies. However, in general, studies on this subject have not made extensive use of these documents, with the exception of Almeida's study in this volume, and those of Lane.

The second problem lies in the object of analysis. Various people and institutions in Charcas and Lima were involved in the fraud, and its dynamics were to reach Spain itself. However, studies tend to focus only on Potosí or Madrid and thus have neglected to examine the role that the Audiencia de Charcas may have played. Given that the reforms undertaken by the *visita* encompassed a wide variety of persons and institutions, limiting the object of analysis would inevitably result in an oversimplification of the arguments.

that "in the middle of the eighteenth century, were deposited in the Jesuit College of the Villa de Potosí."

14 Daniel Oropesa Alba, *La falsificación de la moneda en la Villa Imperial de Potosí en el siglo XVII* (Potosí: Casa Nacional de Moneda, 2013).

15 As we will see later, Francisco Gómez de la Rocha was executed on January 31, 1650, and Felipe Ramírez de Arellano a month later. Visitador Nestares died in April 1660. For the wrong dates, see Sanz Ayán, *Los banqueros y la crisis*, 81, 83; Oropesa Alba, *La falsificación de la moneda*, 124–25.

16 Lane, "Corrupción y dominación colonial," 128–29; "From Corrupt to Criminal," 35, 55–56.

Finally, there is the problem of disciplinary perspective. Many researchers have worked on the subject solely from an economic angle, typically stressing the economic impact of the fraud on the viceroyalty of Peru and on the Hispanic monarchy. Although this is an important topic, undoubtedly, the great mint fraud should not be treated only as an economic phenomenon. In other words, I believe that close analysis of the enormous documentary record produced by the long *visita* of Nestares Marín opens a broader window on the society, culture, and politics of the Peruvian viceroyalty and even on the global Hispanic monarchy. Further proof of this assertion can be found in Lane's works and in the study carried out by Almeida in this volume, which examines the influence that the 1648–1660 *visita* had not only on the silver industry itself but, beyond it, on the freedoms of slaves who worked at the mint. This chapter, as another example, investigates the links between officials of the Audiencia de Charcas and the powerful locals of Potosí, along with their influence on the development of the fraud.

2 The Audiencia and the Mint Fraud before the Arrival of Nestares Marín

In this section I briefly review the history of the mint fraud up to the beginning of Nestares Marín's *visita general* with an eye on the attitude of the Audiencia de Charcas in relation to the fraud.

The custom of counterfeiting silver, which consisted of altering its nominal and true value by lowering the grade of silver bars and minted coins, was not an entirely new phenomenon and was discovered periodically in the history of Potosí up to Nestares Marín's time. Cases of counterfeiting were usually isolated incidents, and the Spanish Crown was able to curb such acts with exemplary punishments. The fraud that emerged in the 1640s, however, was different from the previous ones; in that decade, there was "a serious collusion between merchants and officials of the mint."¹⁷ The Crown, of course, attempted to investigate and rectify the situation. But the magnitude of collusion caused their various attempts to fail.

According to Domínguez Ortiz, before 1640, debasement of silver bars was already so frequent that it became a generalized abuse.¹⁸ On March 31, 1641, Juan de Palacios, who was carrying out a *visita* in Charcas, informed the king

¹⁷ Cunietti-Ferrando, *Historia de la Real Casa de Potosí*, 121.

¹⁸ Domínguez Ortiz, "La falsificación de moneda," 151–52. The author cites the case in 1638 as one of the earliest examples.

that several silver merchants forged coins in the Potosí mint and obtained enormous wealth in a short period of time. The *visitador*, however, added that it would be difficult to take measures “since the interested parties in these *visitas* are the said merchants and they are so thick with their informants and dependencies, when they perceive an exemplary punishment they leave free without charges and everything is facilitated and the damages remain in the same state or even worse.”¹⁹ Coming into conflict with the president of the *audiencia* at the time, Juan de Lizarazu, Palacios returned to Spain, unable to take any action on the Potosí mint problem.

Potosí's *mercaderes de plata* were those who, as quasi-financiers or bankers, mediated and facilitated various processes of the silver industry. Their radius of action stretched from the mines to the mint. That is to say, the silver merchants lent money to the miners and the refiners or *azogueros*, bought the *piñas de plata* (pinecone-shaped ingots of pure silver) from them, and melted and worked the silver assayed at the mint.²⁰

It was around the year 1641 that Francisco Gómez de la Rocha, who began his career in Potosí as a coca merchant, became a silver merchant representing the Villa.²¹ Rocha was a native of Jarandilla, Extremadura, who came to Potosí in the mid-1630s. Accumulating wealth and power, by 1644 Rocha bore the title of captain and was referred to as an *alcalde ordinario* (municipal magistrate) of Potosí. His renown was such that he was even allowed to use the mint's facilities after hours. Soon rumors spread of the existence of the notoriously pinkish eight-real coins, which, in other words, reflected a greater amount of copper in their composition. Such coins were despised by the Indigenous people in Potosí, and merchants in the viceroyalty did not accept them either, eventually calling them “*rochunas*,” named for Rocha.²²

By 1644, the worsening quality of silver money from Potosí was already being made public, and the viceroy of Peru, Marquis of Mancera, ordered Blas Robles de Salcedo, *oidor* of the *Audiencia de Charcas* and interim *corregidor* (lieutenant) of the Villa Imperial, to investigate the situation. Like earlier *visitadores*, he, too, proved unable to solve the problem. Robles, after many attempts—one

19 Cunietti-Ferrando, *Historia de la Real Casa de Potosí*, 122.

20 The *mineros* and the *azogueros* are almost synonymous (miners), but the difference lies in the fact that the latter owned their own *ingenios* (silver refineries). For an excellent approach to the universe of these “señores de minas e ingenios,” see Zagalsky in this volume.

21 Lane, *Potosí*, 131. The biography of Gómez de la Rocha is based mainly on Oropeza Alba, *La falsificación de la moneda*.

22 Craig, *Spanish Colonial Silver Coins*, 27.

of which was to sequester “the books of *remache* (or strikeover) and shipment of *rieles* (silver straps) since 1636”—finally tried to convince the viceroy of the futility of reforming the mint, and he also gave in. Why? Because “almost the entire guild of merchants and lenders of the mint were involved [in the fraud],” and therefore, if Robles forced the investigation, mint production would cease, and thus the losses to the Royal Treasury would compound.²³

One more thing demands our attention: the relationship between Viceroy Mancera and Francisco Gómez de la Rocha. It seems that Philip IV’s “alter ego” in Lima professed a certain deference to the suspicious silver merchant thanks to the enormous fiscal support Rocha provided the Crown. In 1644, Rocha not only offered the king some 50,826 pesos as gracious service, but he also organized at his own expense 150 troops for the defense of Valdivia, in Chile.²⁴ Philip IV expressed his gratitude for Rocha’s contributions.²⁵ It is very likely that a viceroy of Peru as passionate about viceregal defense as the Marquis of Mancera favorably acknowledged Rocha.²⁶ Thus, it is undeniable that this link, or apparent protection from a sitting viceroy, helped prevent due investigation of Rocha.²⁷ Or perhaps the viceroy, weighing two problems, gave more importance to the defense of Chile than to the mint fraud. In any case, by this time, the level and scale of the fraud in Potosí was already recognized by the highest authorities of the empire.

The attempted *visita* of Robles and Viceroy Mancera failed; meanwhile the rumor—or, rather, the reality—of the bad silver money produced in Potosí was reaching various parts of the world. Against the rumor, the Spanish Crown asserted that “the forgery had not been committed in Potosí, but rather it was a maneuver of the enemies of Spain.”²⁸ However, when Potosí silver came to be rejected not only in its own territory but also abroad, the Spanish Crown was

23 Cunietti-Ferrando, *Historia de la Real Casa de Potosí*, 122–26.

24 Oropeza Alba, *La falsificación de moneda*, 116; Bakewell, *Silver and Entrepreneurship*, 40194.

25 AGI, Charcas 416, lib. IV, ff. 20v–21.

26 On the subject of maritime defense during the viceroyalty of Mancera, see Peter T. Bradley, *The Lure of Peru: Maritime Intrusion into the South Sea 1598–1701* (London: Macmillan, 1989), 72–85.

27 According to the viceroy’s famous enemy, Juan de Medina Ávila, Rocha was a relative of one of Mancera’s maids. Lohmann Villena, who introduced us to this detail, also pointed out a significant fact: “On the other hand, in 1647 the same ruler [Mancera] deported to Spain two assayers of the Potosí mint, Jerónimo Velázquez and Pedro Treviño, accused of fraud, but left the ringleader [Gómez de la Rocha] unpunished.” Lohmann Villena, “La memorable crisis monetaria,” 589n26. The author referred to a dispatch of July 15, 1647, in AGI, Lima 53.

28 Lohmann Villena, “La memorable crisis monetaria,” 594.

finally forced to carry out a serious investigation.²⁹ To lead such an investigation, the king and his Council of the Indies appointed Francisco de Nestares Marín, ex-inquisitor of Valladolid.

On September 7, 1647, Nestares, already designated president of the Audiencia de Charcas, received a royal decree in which he was given thirteen instructions. He was ordered to resolve the fraud in the mint, especially the problem of the weak assay value of silver, to continue the task of the *visita* that his predecessor Juan de Palacios was unable to finish, and to pacify the Indigenous militants in Tucumán, among others. Thus, the new president would perform at the same time the functions of the *visitador*.³⁰ The *visita* under Nestares would last a long time, perhaps longer than the *visitador* himself had imagined (i.e., until his death in 1660), yet he did manage to bring about many changes that previous inspections had failed to achieve.

Now, it is worth asking what the Audiencia de Charcas was doing. Studies to date have clarified much of what happened in Potosí but have not paid sufficient attention to what was happening in the city of La Plata, the political and juridical center of Charcas. Reviewing the minutes of the audiencia, we know that the fraud at the mint was a matter of discussion in the city of La Plata before the arrival of Nestares. The audiencia at that time lacked a president, and its members were the following: the oldest *oidor*, Francisco de Sosa; *oidores* Antonio de Quijano y Heredia, Luis Joseph Merlo de la Fuente, Andrés de León Garavito, Pedro de Azaña Solís y Palacio; and the *fiscal* (prosecutor) Fabián de Valdés Carrillo.

Records indicate that on October 7, 1647, these officials held a meeting in which they discussed the measures to be taken in response to the report “of the misuse and disorder in the Potosí mint,” submitted by one Alonso Carvajal. In order to investigate the case, *oidor* Pedro de Azaña examined “some black slaves of Juan Hidalgo, *capataz* (foreman)” at the request of the *fiscal* Valdés. But taking into account the presence of a royal order that “said not to do anything without consulting His Excellence [viceroy],” the most senior *oidor*, Sosa, proposed that “the pursuit of this matter be suspended,” and the officers agreed. That is, they suspended the investigation until the viceroy of Peru sent his own recommendation.³¹

29 For example, France prevented the entry and circulation of altered silver in 1646. On the other hand, cities such as Genoa and Antwerp began to avoid it earlier, by 1641. Sanz Ayán, *Los banqueros y la crisis*, 80; Lane, *Potosí*, 128.

30 AGI, Charcas 416, lib. IV, ff. 59v–82v.

31 José Miguel López Villalba (ed.), *Acuerdos de la Real Audiencia de Las Charcas*, Vol. 5 (Sucre: Corte Suprema de Justicia de Bolivia, Archivo y Biblioteca Nacionales de Bolivia,

A few months later, on February 6, 1648, this subject was again discussed at the meeting of the *audiencia*. The same Alonso Carvajal presented a petition, in which he reported “how the *capataces* of the mint, Juan Hidalgo and Pedro Hernández, are about to leave [Potosí] for not having done the diligence as he [Carvajal] requested, and that they have sold their *hornazas* (coin-blank workshops) and that an *oidor* should go to see it.” In this meeting, however, the officers did nothing more than report “the state of affairs” to the oldest *oidor*, Sosa, who was absent that day.³²

As far as the minutes document it, it was only these two times that the *audiencia* discussed the fraud in Potosí before the arrival of the royal *visitador*, Nestares. The historiography has not paid much attention to this fact, although it is also difficult to suppose that the *audiencia* was not aware of the problem occurring in Potosí, a city so close to La Plata and also an important hub for all of colonial Charcas. Reviewing the minutes, it is certain that the attitude of the officials of the *audiencia* was not very diligent.

Thus, the *audiencia*'s reaction to mint fraud accusations was slow, but some five months later an important change took place in Potosí. On July 3, 1648, the *corregidor* of Potosí, Juan de Velarde Treviño, began a *visita* in the mint.³³ Velarde inspected the official dispatches and, as a result, arrested Felipe Ramírez de Arellano, acting assayer (*ensayador*) at the mint.³⁴ The assayer's job was to select silver bars of low grade and have them remelted. But Ramírez, having been bribed, did not fulfill this task; this was his crime, according to the *corregidor*. According to Ramírez himself, however, this was a false accusation. He was in fact a scapegoat and the real perpetrators of the fraud were silver merchant Francisco Gómez de la Rocha and his friends and colleagues, especially Juan Hidalgo. Ramírez's friends left testimonies that Rocha and his accomplices threatened the assayer, who did not want to collaborate with the fraud.³⁵ I would like to note that it was Juan Hidalgo who was censured, being mentioned in the *audiencia*'s minutes. Although the purpose of this study is not to find out who the real perpetrators of the fraud were, it seems that this inspection by Velarde was done to keep up appearances, and Ramírez was a

Embajada de España en Bolivia, Agencia Española de Cooperación Internacional, 2007), 270–71.

32 López Villalba, *Acuerdos de la Real Audiencia*, Vol. 5, 279.

33 AGI, Escribanía 869A, no. 2, pieza 3, ff. 1–39v.

34 Strictly speaking, Ramírez rented his post from the *ensayador y fundidor mayor*, Juan de Figueroa.

35 On the case against Ramírez, two documents remain. AHN, Consejos 20372, exp. 1, pieza 36; AGI, Charcas 687. The second document appears to be a partial copy of the first, made in later years. Lane summarizes it in his “From Corrupt to Criminal,” 40–43.

victim, as he himself insisted. What happened was that, as we will see later, this *corregidor* Velarde was also deeply involved in the fraud. In any case, on July 8, 1648, Velarde sent the results of his *visita* to Lima, to inform Francisco de Nestares Marín, who had just arrived there.³⁶

By coincidence, Nestares reached the viceregal capital just as a new viceroy of Peru was about to take office. On September 20, 1648, the Marquis of Mancera gave up his post and was succeeded by the Count of Salvatierra, outgoing viceroy of Mexico. I suppose that at that time in Lima there were meetings between Mancera, Salvatierra, and Nestares about the Potosí problem. Later, however, *visitador* Nestares and the new viceroy Salvatierra were quite opposed to each other regarding the measures to be taken in relation to Potosí. Nestares arrived in the city of La Plata on November 2, and in December he secretly started his probe into the affairs of the Villa Imperial.³⁷

3 The *Visita General* of Nestares Marín and the Audiencia de Charcas

In this section, I briefly summarize the history of Francisco de Nestares Marín's *visita* as historical context before reflecting on the relationship between the Audiencia de Charcas and the mint fraud.

The most important task of Nestares's *visita* was to put the Potosí silver industry in order, especially the mint. This task followed two axes: first, to review and make the processes of silver and coin production more rigorous; second, to sanction or replace those who had committed fraud. In reviewing what Nestares Marín did, we may divide his long *visita* into three phases. The first phase was the period in which there was much resistance to his *visita*. As tension reigned in Potosí, Nestares Marín began to gather information about the fraud. Despite several attempts, he failed to restore the quality of the silver coins produced in the mint and also to reach an agreement with the fraudsters. This phase ended in the first months of the year 1650, symbolically, with the execution of Francisco Gómez de la Rocha, one of the main counterfeiters. From this moment on, I believe that Nestares Marín no longer needed to fear the possibility that his *visita* would fail, as had happened to his predecessors. Then, beginning in the first months of 1650, the second phase began, in which the *visitador* concentrated on judging the culprits and resolving problems caused by the counterfeit currency. This second phase ended in mid-1652, with

36 AGI, Escribanía 869A, no. 2, pieza 3, f. 39.

37 López Villalba, *Acuerdos de la Real Audiencia*, Vol. 5, 311–15.

the implementation of a royal devaluation proclamation, or *baja de la moneda*. This entailed the blanket call-in and physical marking or melting of the previous poor-quality coinage. To this was added the abolition of the tax called *Cobos*, a step Nestares believed necessary to maintain the high silver grade for the new coinage.³⁸ Finally, in the third phase, Nestares directed his reforming efforts towards the system of the *mita* (rotational labor draft), but he was interrupted by the conflict over this issue with the new *corregidor* of Potosí, Francisco Sarmiento de Mendoza, and he could do almost nothing substantive about it until his death on April 24, 1660.³⁹

Here I would like to reconstruct Rocha's actions and his punishment, since both are central to understanding Nestares's reforms.⁴⁰ In the first months of the *visita*, Nestares, after repeated trials and errors, desisted from excluding the silver merchants from the mint. They, before the eyes of the *visitador*, fearlessly continued to debase the coinage.⁴¹ But no one wanted to mint coins except them. Without coins, Potosí's *mita* system would cease, long with the silver industry itself.⁴²

The next step taken by Nestares was an arrangement with those he called "men of such incorrigibility and pertinacity." Nestares proposed to the viceroy Count of Salvatierra that "once the excesses of this mint have been remedied and its ministers punished, it would be wise to admit the *composición*

38 The *Cobos* was a tax on the gross production of silver and introduced in Potosí apparently in 1559, in addition to *quinto real*. Its rate was 1.5% during the Nestares Marín's *visita*. See Bakewell, "Registered Silver Production in the Potosí district, 1550–1735," *Jahrbuch für Geschichte Lateinamerikas* 12 (1975), 75–77. On the devaluation of the currency and the abolition of the *Cobos* tax, one of the most detailed documents is in ABNB, Min 135/3.

39 AGI, Contaduría 1780B, no. 5, R. 4. Since the *visitador* Nestares addressed the problem of the *mita* in his last years, and since the date of his death was almost the same day as that of Dominican Francisco de la Cruz, who tried to abolish the *mita* radically and was assassinated, some researchers think that Nestares was assassinated as well. However, reviewing the document about his last moments, Nestares died from the illness he suffered for a long time, and it will be difficult to find any significant relationship between the death of Nestares and the assassination of Cruz. On the "assassination theory," for example, see Cole's description: "Cruz went to bed the night of April 23, 1660, in perfect health and died in his sleep. President Nestares Marín, by no coincidence, died that same evening, quite possibly murdered by the same means." Jeffrey Cole, *The Potosí Mita 1573–1700: Compulsory Indian Labor in the Andes* (Stanford: Stanford University Press, 1985), 93.

40 I would like to add some curious details, although Bakewell and Lane already leave sufficient descriptions. Bakewell, *Silver and Entrepreneurship*, 40–42; Lane, "Corrupción y dominación colonial," 111–12.

41 Letter from Nestares to Salvatierra (Apr. 28, 1649), AGI, Lima 54, no. 22–4.

42 Letter from Salvatierra to the king (Apr. 3, 1650), AGI, Lima 54, no. 22–4. The viceroy cited "an extraordinary mail" from Nestares written on October 14, 1649, in Potosí.

TABLE 9.1 The main culprits and their fines (peso of eight reales)

Name	Profession	Fines
Francisco Gómez de la Rocha	<i>mercader de plata</i>	500,000 pesos
Diego Fernán Rodríguez	<i>mercader de plata</i>	200,000 pesos
Miguel de Casanova	<i>mercader de plata</i>	no info. at this moment
Bartolomé Hernández	<i>tesorero</i> (treasurer) of the mint	300,000 pesos
Francisco Jiménez de Cervantes	<i>tesorero</i> of the mint	200,000 pesos
Miguel Ruiz	<i>mercader de plata</i>	100,000 pesos
Felipe Ramírez de Arellano	<i>ensayador</i> of the mint	60,000 pesos
Juan de Figueroa	<i>ensayador mayor</i> of the mint	no info. at this moment

SOURCE: LETTER FROM NESTARES TO SALVATIERRA (AUG. 31, 1649) AGI, CHARCAS 113

(agreement to pay fines) with the [silver] merchants serving Your Majesty, with a great respect for the instructions given in the Council [of the Indies] seeing the long necessity of these men and [noting] that their lending to the *azogueros* and miners must not cease.” Although the viceroy in Lima did not like Nestares’s idea, he admitted it as “the last resolution.”⁴³ From the fines that Nestares calculated it is obvious that Rocha was the biggest forger (see Table 9.1).

This last resolution, however, also failed, because many merchants hid their goods to feign poverty. In settling accounts, the most problematic broker was again Rocha. Although primary sources on the figure of Rocha at this time are frustratingly thin, what is certain is that after going through many vicissitudes, Potosí’s top silver merchant found himself finally stuck in a dead end. Unable or unwilling to pay his fine, Rocha sought to eliminate the *visitador* toward the end of 1649, and thus the minimum diplomatic attitude that had been maintained between two men was lost.⁴⁴ Rocha, who recovered his post of *alcalde*

43 Letter from Salvatierra to the king (Apr. 3, 1650), AGI, Lima 54, no. 10, lib. III, ff. 41v–43.

44 According to Nestares, Rocha tried to poison the *visitador*. Nestares considered *corregidor* Juan de Velarde and the *oidor* Pedro de Azaña as the main promoters of Rocha’s behavior,

provincial by paying a part of the fine, was imprisoned again. And on the night of January 31, 1650, after being tortured, he was killed by garrote in the mint. The following day his body was “hung on three poles” to be used as a warning. In spite of the adverse rumors, Francisco Gómez de la Rocha was undoubtedly a distinguished character in the Villa Imperial. For that reason, his “accelerated” execution caused in Potosí “much scandal.”⁴⁵

Rocha’s execution, and that of mint assayer Ramírez de Arellano that followed, examined in retrospect, mark a crucial turning point in Nestares’s *visita*.⁴⁶ With these two capital punishments, the *visitador* demonstrated his unwillingness to permit the citizens of the Villa Imperial to commit fraud against the king. Proof of this watershed would be the fact that after Rocha’s execution, Nestares continued his trials, but now in public.⁴⁷ Likewise, at that time, Nestares managed to keep certain local authorities away from Potosí, those who shared interests with the fraudsters and thus pressured for the *visita* to be frustrated. These local power brokers were the Treviños: the *corregidor* of Potosí, Juan de Velarde Treviño, and his cousin, the canon of La Plata, Diego Treviño.⁴⁸ On March 22, 1650, Nestares ordered Juan de Velarde to leave the Villa.⁴⁹ Canon Treviño, after being reprimanded by the *cabildo eclesiástico* (cathedral chapter) of La Plata, fled to Spain.⁵⁰ After having expelled the Treviños from Potosí, Nestares extended his *visita* beyond the mint. One of his principal objectives was to clean up the Audiencia de Charcas.

“ultimately having put the poison in the kitchen by Rocha’s hand, of which the said two ministers [Juan de Velarde Treviño and Pedro de Azaña] were complicit authors and main movers, as proven by the records and information sent to His Majesty.” Letter from Nestares to the king (Sep. 30, 1651), AGI, Charcas 114.

- 45 On Rocha’s execution, the most detailed source is a file with a note “Acordada del Cabildo al Sr. Canónigo” on its cover, in AGI, Charcas 114, from which I calculate Rocha’s date of death.
- 46 On February 10, 1650, Nestares began his trial against Felipe Ramírez de Arellano—who was already in jail by the mandate of *corregidor* Velarde—and executed him significantly quickly on February 25, almost without hearing any pleas from Ramírez. AHN, Consejos 20372, exp. 1, pieza 36, ff. 203–298v; AGI, Charcas 687; Lane, “From Corrupt to Criminal,” 40–43.
- 47 In the *auto* (order) of February 4, 1650, Nestares ordered the fiscal of the *visita* to pursue his cause “in open court (*en juicio abierto*).” AGI, Escribanía 871D, unidad 2, pieza 1, f. 3v.
- 48 In fact, there were more Treviños around Potosí: the vicar of Potosí, Joseph Treviño, was the brother of Canon Diego; the *alcalde ordinario* of Potosí Gerónimo Julián, was married to a sister of Canon Diego.
- 49 *Auto* of Nestares (Mar. 22, 1650), AGI, Charcas 113; Escribanía 869A, no. 2, pieza 3, ff. 271–271v.
- 50 ABAS, Actas Capitulares 11, 279–87. This source has pagination like modern books instead of foliation; Letter from Nestares to the king (Apr. 24, 1651), AGI, Charcas 114.

We have already seen that the audiencia's reaction to the fraud was somewhat passive. There was reason for such an attitude. Not a few officials of the audiencia were involved in the fraud, even if indirectly. Fortunately for *visitador* Nestares, when he arrived in Charcas with the title of president, the members of the audiencia were not united; for example, *fiscal* Fabián de Valdés Carrillo, for getting on badly with the *oidores*, sent to the Council of the Indies several letters criticizing them.⁵¹ In addition, two *oidores* were often absent from the city of La Plata collecting donations (*donativos*), which would facilitate the *visitador's* investigation.⁵² The crux of *fiscal* Valdés's complaints was that the administration of justice was impeded by family ties and other links between the *oidores*. Valdés referred to the illegal behaviors of each judge. Here I would like to point out that in Valdés's letters there was no mention of the mint fraud. So, were the *oidores* not tied to the fraud, or was it only the *fiscal* who was not aware of it? Shortly after the beginning of the *visita*, it would become clear that the situation did not correspond to either of these two possibilities.

Investigating the audiencia led to a problem similar to that of the mint. That is to say, since many officials of the audiencia were linked to the fraud, sanctioning all of them at the same time could cause suspension of the functions of the institution itself. During the *visita*, it was discovered that several *oidores* played cards when they visited Potosí, and among the players were found many of the top fraudsters (see Table 9.2). The friendly relations between audiencia officials and the mint fraud culprits were not limited to gambling. Several officials made loans to silver merchants, such as Francisco Gómez de la Rocha, at 12% interest. According to Nestares's investigation, substantial sums were lent by *oidores* Sosa, Azaña, Merlo de la Fuente, and *fiscal* Valdés.⁵³

Nestares faced a conundrum. He had to find ways to punish the officials' problematic behavior without interfering with the audiencia's functions. Even so, applying severe sanctions to such high-ranking colonial officials was next to impossible; they were protected by their robes. So, the measure taken by the *visitador*, in appearance, consisted of a kind of relative qualification of faults. In other words, it seems that Nestares gave preference to punishing the major offenses while ignoring the minor ones. For example, *oidor* Antonio de Quijano, who had been criticized by the *fiscal* for his conduct, did not receive any punishment in this *visita*, although he was given six *recusaciones* (an

51 AGI, Escribanía 863C, pieza 12, ff. 1–15.

52 In August 1648, a few months before Nestares's arrival in La Plata, *oidores* Pedro de Azaña and Joseph Merlo de la Fuente left to the south and north of Charcas respectively, of which we will see in the following section.

53 AGI, Escribanía 863A, pieza 1.

TABLE 9.2 Participants in the card game with each *oidor*

Name of <i>oidor</i>	Participants whose names we can confirm from sources (<i>italicized those guilty of fraud</i>)
Pedro de Azaña	<i>Miguel de Casanova, Bartolomé de Uceda, Juan Hidalgo, Bartolomé Hernández, Luis de Ledesma y Vila,</i> <i>Juan de Velarde Treviño, Fabián Velarde,</i> Manuel Baez, Pedro Rubio, Juan Antonio Muñoz de Cuellar
Luis Joseph Merlo de la Fuente	<i>Luis de Ledesma y Vila, Juan Hidalgo, Bartolomé Hernández, Juan de Velarde Treviño,</i> Ignacio de Azurza, Lorenzo de Boreda, Manuel Baez, Santiago de Lariz, Alonso de Carrión
Francisco de Sosa	<i>Bartolomé Hernández, Francisco Gómez de la Rocha, Juan de Velarde Treviño,</i> Juan Estevañez de Acevedo
Andrés de León Garavito	<i>Diego Fernán Rodríguez, Bartolomé Hernández,</i> Andrés de Sandoval, Diego Manrique, Alonso de Carrión

SOURCE: AGI, ESCRIBANÍA 863A, PIEZA 1, FF. 3–14

instance that allowed revoking the magistrate's vote alleging multiple causes) in the course of two years, perhaps because his intervention in the mint fraud was not directly observed by witnesses.⁵⁴ Rather, Nestares mobilized Quijano to assist in his *visita*.⁵⁵ Nestares then went after the most culpable officers in a diplomatic way, administering punishments that to us may not appear to be punishments. In the end, three *oidores* and *fiscal* Valdés were ordered to move to other audiencias (see Table 9.3).

Among these high-level removals or transfers, there was an exceptional case, that of the *oidor* Pedro de Azaña. Table 9.3 may not give the impression that the measure taken against Azaña was more severe than the others, yet it was. *Visita* records tell us that *Oidor* Azaña contributed indirectly but decisively to

54 AGI, Escribanía 863C, pieza 12, ff. 14–14v. Of the definition of the term *recusación*, I refer to Sergio Hernán Angeli, "Un temprano juicio de residencia colonial: el licenciado Juan Fernández, primer fiscal de la Audiencia de Lima," *Revista Investigaciones y Ensayos* 60 (2014), 440.

55 Letter from Quijano to the King (Apr. 30, 1651), AGI, Charcas 113.

TABLE 9.3 The state of the officials of the Audiencia de Charcas after the *visita*

Name	the state
Francisco de Sosa	He was moved to the Audiencia de Quito and died soon after.
Pedro de Azaña	Suspension from January 1651. He then was moved to the Audiencia de Chile as <i>oidor</i> (1654) and died there (1661).
Luis Joseph Merlo de la Fuente	He was moved to the Audiencia de Santa Fe (from April 1651 to December 1654), then to the Audiencia de Quito, and was allowed to return to his post in Charcas.
Antonio de Quijano y Heredia	He continued in his post. In December 1653, he was appointed <i>fiscal</i> of the Audiencia de Lima.
Andrés de León Garavito	He continued in his post. He retired in April 1670.
Fabián de Valdés Carrillo	He was moved to the Audiencia de Panama in May 1651. He died shortly thereafter.

SOURCE: ERNESTO SCHÄFER, *EL CONSEJO REAL Y SUPREMO DE LAS INDIAS*, 2ND ED. VOL. II (MADRID: MARCIAL PONS, 2003), 440, 442

the great Potosí mint fraud and that his forced transfer to Chile corresponded precisely to the gravity of his fault. I will elaborate on this point below.

4 Merits and Demerits of Pedro de Azaña

To understand Azaña's faults, we first need to know, paradoxically, his merits. Trusting the minutes of the audiencia, *oidor* Azaña did not cause as many problems as one might suppose, having only had a few quarrels with the fiscal Fabián de Valdés Carrillo. As for merits, in addition to his work on the bench, Azaña organized several contributions to the Monarchy, among which the *donativo* he collected for the king was outstanding.⁵⁶

⁵⁶ On the merits of Azaña, see AGI, Charcas 93, no. 24.

On August 9, 1648, a few months before Nestares's arrival, the audiencia decided to ask for donations to support the king's marriage to Mariana de Austria, for which *oidor* Merlo de la Fuente would be in charge of the northern region and Azaña, the southern region of Charcas.⁵⁷ Investing almost nine months, Azaña collected 68,453 pesos (of eight reales) in the following eight provinces: Chichas, Tarija, Lipez, Potosí, Porco, Tomina, Yamparaez, and Pilaya y Paspaya (see Table 9.4). Among these districts, the contribution collected in Potosí was enormous: here alone, Azaña gathered 36,865 pesos, close to the total amount collected by Merlo.⁵⁸

TABLE 9.4 Amounts of *donativos* collected by Azaña in each province

Province	Amount of peso of eight reales
Chichas	295
Tarija	1,451
Chicha y Tarija	3,476
Lipez	13,940
Potosí	36,865
Porco	3,948
Tomina	5,528
Yamparaez	2,670
Pilaya y Paspaya	280

SOURCE: AGI, ESCRIBANÍA 863C, PIEZA 14. FF. 155–75

Donations usually consisted of small sums from numerous *vecinos*. In this sense, two provinces were exceptional: Potosí and Lipez, where many householders donated more than one hundred pesos. Potosí and Lipez have in common the fact that they are mining areas abundant in silver. Although the wealth of Potosí was outstanding, Lipez, where rich veins had just been discovered in its southeastern interior in the 1640s, boasted the highest silver production after Potosí during the second half of the seventeenth century.⁵⁹ The

57 López Villalba, *Acuerdos de la Real Audiencia*, Vol. 5, 304. The corresponding royal order can be found in AGI, Indiferente General 429, lib. 39, ff. 26–28v.

58 AGI, Escribanía 863C, pieza 14, ff. 154–80; AHP-CNM, Cajas Reales 913. *Oidor* Merlo traveled through the following provinces: Mizque, Cochabamba, Oruro, Sicasica, Pacajes, Chuquito, and La Paz.

59 At the beginning, Lipez was a poor province whose economic activity was based on cattle raising. The southeastern part, where veins were discovered, was called San Antonio

Lípez *donativo* amounted to 13,940 pesos. Among those who gave large sums in both Lípez and Potosí, the most important were powerful locals, such as the *corregidor*, and those who were dedicated to the silver industry, such as silver merchants, miners, and officials of the mint. However, the high donations in these provinces did not result only from the fact that they were relatively wealthy areas; linkages built between *oidor* Azaña and the donors were also indispensable. In other words, no matter how rich these provinces were, no other official—except Azaña—would have been able to collect the same sums. Documents produced by Nestares's *visita* shed light on this point.

As we saw in the previous section, the *visitador* punished chief mint fraud culprits gradually, so that the activity of Potosí would not stop. I would like to underline the fact that *oidor* Pedro de Azaña was the first among the ministers of the Audiencia de Charcas to be punished by the *visita*. On January 7, 1651, the audiencia ordered Azaña to suspend his work and to leave Charcas for Arequipa within ten days, without passing through Potosí.⁶⁰ At first, Azaña had not been told specifically what he was accused of, about which he protested, but Nestares Marín had already obtained all the authority he needed from the king beforehand. Reading the fifty-four charges that Nestares Marín had brought against Azaña by December 1652, one can see the webs that this *oidor* had woven in the mining district.⁶¹

The charges against Azaña were of two types: gambling and abuse of authority. According to the *visitador*'s inquiries, every time Azaña visited Potosí he organized card games. Gambling was a common practice.⁶² The particularity here was that the participants in the games organized by Azaña gambled amounts of money that exceeded what was considered “fun (*de diversión*).”⁶³ Many players were later found guilty of practicing mint fraud. In addition, all of Azaña's top gamblers provided large donations (see Table 9.5).

For Azaña, organizing high-stakes card games had two benefits: the first was to obtain private goods. According to *mercader de plata* Luis de Ledesma y Vila, when Azaña came to Potosí for the first time to ask for the *donativo*, the *oidor*

del Nuevo Mundo, and enjoyed a short silver rush until the beginning of the eighteenth century. See Bakewell, *Silver and Entrepreneurship*, 81–99; Raquel Gil Montero, *Ciudades efímeras: El ciclo de la plata en Lípez (Bolivia), siglos XVI–XIX* (La Paz: Plural, IFEA, 2014).

60 López Villalba, *Acuerdos de la Real Audiencia*, Vol. 5, 387. But the order itself had already been prepared by Nestares on November 2, 1650. See AGI, Charcas 113.

61 AGI, Escribanía 863A, pieza 3, ff. 1–20v.

62 On the gambling in Potosí at that time, see Lane, *Potosí*, 108–11.

63 In contrast, the witnesses cited by the *visita* reflected that the amount of money wagered in the game of *oidores* Sosa and Garavito was very little. AGI, Escribanía 863A, pieza 1, ff. 11v, 14.

TABLE 9.5 Donation providers of more than 100 pesos (of eight reales) in Potosí

Name	Amount of donation	Occupation (when identifiable by documents)
<i>Juan Rodríguez Lorriaga</i>	500	<i>mercader de plata</i>
<i>Juan Hidalgo</i> ^a	400	<i>mercader de plata</i>
<i>Diego Fernán Rodríguez</i>	1,000	<i>mercader de plata</i>
Fernando Dorado	400	
Antonio Enríquez	500	
<i>Miguel de Casanova</i> ^a	1,000	<i>mercader de plata</i>
<i>Bartolomé de Uceda</i> , ^a	380	<i>mercader de plata</i>
Antonio Durán		
<i>Juan de Velarde Treviño</i> ^a	500	<i>corregidor</i> of Potosí
<i>Fabián Velarde</i> ^a	100	<i>teniente</i> (assistant) of <i>corregidor</i> of Potosí
<i>Melchor de Escobedo</i>	1,000	<i>contador</i> (accountant) of the Caja Real (Royal Treasury) of Potosí
<i>Francisco Gómez de la Rocha</i>	1,000	<i>mercader de plata</i>
<i>Bartolomé Hernández</i> ^a	2,000	<i>tesorero</i> of the mint
<i>Luis de Ledesma y Vila</i> ^a	1,000	<i>mercader de plata</i>
Diego de Padilla	500	<i>alférez real</i> (royal ensign) of Potosí

a Participants in the games sponsored by Azaña; italicized those guilty of fraud.

SOURCE: AGI, ESCRIBANÍA 863A, PIEZA 1, FF. 3–14; 863C, PIEZA 14, FF. 154–80; AHP-CNM, CAJAS REALES 913

organized games every night and won about 2,000 pesos in total.⁶⁴ Another benefit he derived from setting up tables was to build a bond with the powerful locals of Potosí. Azaña and the participants in his games forged friendly and daily relationships. For example, asked with what “purpose and effect” he went to the house of the said *oidor*, Bartolomé de Uceda answered that he “does not know if they had been called on purpose to play, but they usually come

64 AGI, Escribanía 863A, pieza 1, f. 4v.

perhaps to his [Azaña's] house, since they are friends."⁶⁵ The fact that none of the participating players cited by the *visitador* left any trace of complaint or criticism against Azaña seems to verify their friendship with him. Perhaps the card games themselves were played, ironically, with fairness or without fraud. In the nightly games, in addition to betting a lot of money, bribes and secret conversations about fraud were also exchanged.⁶⁶ I have not found documents that directly and clearly prove the communications between them about the fraud, yet as we will see below, it is obvious that *Oidor* Azaña intentionally overlooked mint malfeasance that he might have stopped.

As for abuse of authority, Azaña held two positions in addition to that of *oidor*. He was also judge of Censos de Indios and Caja de Comunidad de Indios, and judge of Bienes de Difuntos.⁶⁷ The *visita* revealed that Azaña took advantage of these offices to commit blackmail and embezzlement and to provide loans to his friends. For example, in 1644, Azaña sent his son of the same name, Pedro, to Potosí on commission as judge of Censos de Indios, taking 22,000 pesos from the Royal Treasury. After embezzling 480 pesos, the *oidor* transferred the money to the Caja de la Comunidad de Indios and lent them at 12% interest to Francisco Gómez de la Rocha. The interest was not recorded in the Caja's books.⁶⁸ Azaña also made such loans to his gambling partners, Miguel de Casanova and Luis de Ledesma y Vila.⁶⁹ All these silver merchants would be sentenced to severe punishment as principal culprits of the mint fraud, yet they too provided for the *oidor*: money loans, lodging, serving as his agents.⁷⁰ Thus, *Oidor* Azaña had established a reciprocal and close relationship with the powerful locals of Potosí, most especially its top merchants.

By contrast, outside Potosí, Azaña proved a powerful man who blackmailed vulnerable *vecinos*. In Lízpez, the *oidor* commissioned his son Pedro as judge of Bienes de Difuntos and made him intervene in local mining operations. The

65 AGI, Escribanía 863A, pieza 1, f. 3v.

66 Of one night's gambling, the silver merchant Juan Hidalgo testified that more than 50,000 pesos were wagered. AGI, Escribanía 863A, pieza 1, ff. 13–13v.

67 Of these two positions, see *Recopilación de leyes de los reynos de las Indias* (Madrid: Julián Paredes, 1681), lib. 6, tít. 4; lib. 2, tít. 32, respectively.

68 AGI, Escribanía 863A, pieza 3, ff. 1v–2v. Although there is no mention of why the money from the Caja Real was transferred to the Comunidad de Indios fund, it seems that there were some loans from the second to the first.

69 AGI, Escribanía 863A, pieza 3, ff. 13–13v.

70 For example, when he visited Potosí, Azaña always stayed at Casanova's house. His expenses were paid by Casanova, and the merchant lent Azaña 2,000 pesos to help him buy a *trapiche* (rudimentary mill). See AGI, Escribanía 863A, pieza 1, ff. 9–11v; pieza 3, ff. 13v–14. Ledesma y Vila performed public and private duties on behalf of Azaña, mainly in La Paz and Oruro. See AGI, Escribanía 863A, pieza 3, ff. 75v–84.

junior Pedro entered LÍpez with some 200 soldiers, interfered in several executions of the wills of wealthy miners, and snatched their silver bars. Miner Domingo de Unda, one of his victims, fled to Potosí and asked *corregidor* Juan de Velarde Treviño for help but was refused. The *corregidor* “said that he did not want to confirm them [the filched bars] and that Unda had to return them to the Azaña’s court.” We must remember that *Corregidor* Velarde was also Azaña’s playmate, and it is very possible that both agreed to block Unda’s petition. Finally, to ask forgiveness and ingratiate himself, Unda gave four large *piñas* or untaxed silver ingots to Doña Ana de Oña, *oidor* Azaña’s wife.⁷¹ *Visita* documents mention four of Azaña’s victims in LÍpez, and it is notable that three of them offered royal donations above 1,000 pesos.⁷² In addition, Azaña appropriated part of the donation received.⁷³

In Carangas, a major mining province west of Oruro, Azaña tried to force a marriage between his sister-in-law and wealthy local miner Francisco Martínez de Avellaneda. Martínez refused three times, so Azaña accused him before the *audiencia* and issued a royal provision to sequester his goods and those of his companions. When Martínez changed his attitude, Azaña dropped the lawsuit, an act not contradicted by any of the other *oidores*.⁷⁴ Here we see a miscarriage of justice.

Taking advantage of his authority with a carrot-and-stick approach, Azaña exerted powerful influence throughout southwestern Charcas. Indeed, the size of the donation that Azaña collected reflects the extent of his influence. Superficially, he brought significant benefit to the Crown, yet we know from *visita* records that in this process the royal treasury suffered a loss. In order to establish a reciprocal relationship with the silver merchants in Potosí, Azaña used money from the Caja Real, and in LÍpez he embezzled the donation itself. However, if Azaña had limited himself to such deviations, he might have

71 On Azaña’s abuses of his authority in LÍpez, see AGI, Escribanía 863A, pieza 3, ff. 3–5.

72 Domingo de Unda, Domingo de Madariaga, Domingo Fuertes, and Ignacio de Azurza gave their testimonies about the blackmailing by Azaña over the silver mines. Among them, Unda offered 1,000 pesos, Fuertes with other miners 2,490 pesos, and Madariaga offered almost 4,000 pesos. See AHP-CNM, Cajas Reales 913, ff. 11–12; AGI, Escribanía 863A, pieza 3, f. 13.

73 Azaña received from Domingo de Madariaga as *donativo* for the king “thirteen *piñas* ... worth about four thousand pesos and he did not give him a receipt for more than two thousand pesos.” See AGI, Escribanía 863A, pieza 3, f. 13.

74 AGI, Escribanía 863A, pieza 3, ff. 17v–19. The minutes of the *audiencia* corresponding to these episodes can be found in López Villalba, *Acuerdos de la Real Audiencia*, Vol. 5, 262–63. Incidentally, *oidor* Azaña also tried to marry his sister-in-law to another miner in LÍpez, Domingo de Unda. See AGI, Escribanía 863A, pieza 3, f. 7.

been able to continue with his position in Charcas, even after the *visita*, simply because the benefits he brought in outweighed the damage. But there was more: Azaña's network provoked another great loss to the Crown. The problem was that this *oidor* had intentionally overlooked the mint fraud that was advancing in Potosí at that time of the *donativo* collection.

As we saw earlier, in October of 1647—that is to say, almost a year before the beginning of the *visita general* by Nestares—the audiencia held a meeting regarding the fraud in the mint. Significantly, it was *Oidor* Azaña himself who at that time examined the slaves of Juan Hidalgo, the accused foreman.⁷⁵ It was an opportunity to investigate the fraud, but the officials of the audiencia maintained a *laissez-faire* attitude. Why? Because these high-ranking colonial authorities had established links to the fraudsters in Potosí. Pedro de Azaña simply stood out among them. On October 23, 1652, *visitador* Nestares expressed this point in the following words:

The crime of the false currency that the silver merchants of the said Villa were working was public and notorious. It was public and notorious according to the same currency itself, the clamors of the whole republic, and the denunciations presented in the said Royal Audiencia about this crime. [But Azaña] not only did not deal with the punishment and remedy of the said crime, but also publicly communicated it as a friend [... And] if he had wanted to [remedy the crimes] and had not had the aforementioned correspondences, the crimes would not have reached such gravity and atrocity.⁷⁶

In short, Azaña prioritized his friendship with the silver merchants, not only tolerating a fraud that he could have stopped with his authority as *oidor*, but also giving it cover. For example, in a letter exchanged between Azaña and a silver merchant from Potosí, we can find words that suggest his collusion in the fraud. On November 23, 1648, just when the *visita* was beginning, Azaña wrote to Miguel de Casanova, in Potosí, from La Plata. Azaña's main message was to inform Casanova that the *oidor* had finished collecting donations and was going to return to Potosí soon. But in the margin of the letter, Azaña wrote in small letters: "In that town [of Potosí] we will talk about what is not for a letter."⁷⁷

Azaña's behavior, although indirect, implied an active participation in the crime of *lèse-majesté*, that is to say, the counterfeiting of currency. In the

75 López Villalba, *Acuerdos de la Real Audiencia*, Vol. 5, 270–71.

76 AGI, Escribanía 863A, pieza 3, ff. 16–16v.

77 AGI, Escribanía 863A, pieza 1, f. 101.

course of the *visita*, many ministers of the audiencia were sanctioned, but Azaña's punishment was the most serious, and its cause can be found in his deeper participation in the crime against the king.

At the *visitador's* request, on May 16, 1651, the king decided to transfer four audiencia officials—including Azaña—out of the district of Charcas, while the *visita* continued.⁷⁸ Here the transfer or removal of officials amounted to a political solution. All were assigned a post of *oidor* in another audiencia, and particular care was taken to ensure that none of these “exiles” landed in the same audiencia. Regarding Azaña, we can observe a significant change in the stance of the Council of the Indies between February and May 1651. First, the council proposed to the king to transfer Azaña to the Audiencia de Quito, but later proposed any Audiencia de Peru, not excluding that of Chile “because his faults were more serious.”⁷⁹

Pedro de Azaña, expelled from Charcas, stayed a few years in Lima before embarking for Chile, again as *oidor*. In this context, the connotation of Chile as a punishment was clear. Azaña himself recognized it and wrote: “I find myself exiled in this kingdom.”⁸⁰ Before arriving in Chile, Azaña lost his wife and one of his three children. The king also forbade him to bring his married children. Chile was at this time in a difficult situation. In February 1655, the Araucanian Indians rose up in rebellion. There followed another uproar: the expulsion of governor Antonio de Acuña y Cabrera by the householders of Concepción.⁸¹ As a new *oidor* in Chile, Azaña would be busy dealing with these problems. It seems that an already elderly Azaña had neither family networks nor time left to take root again in this new arena, and he died in September 1661.

5 Conclusion

In this chapter I have examined the relationship between the Audiencia de Charcas and the mint fraud in Potosí. The minutes of the audiencia give us the impression that the king's ministers did not actively address the problem.

78 AGI, Charcas 416, lib. IV, ff. 194–196v.

79 To deal with this problem, the Council of the Indies held four sessions (February 25, March 27, April 28, and May 8, 1651), and the council gradually hardened its opinion with Azaña. Meanwhile, the council excluded the fiscal Valdés from the Audiencia de Chile “since his faults were not so serious.” AGI, Charcas 114.

80 AGI, Chile 13, R. 1, no. 2.

81 Kazuhiro Nakamitsu, “Alboroto popular en Concepción (1655): los chilenos que deseaban la reconciliación con los indios,” *Iberoamericana* (Tokyo) 32, no. 2 (2010): 85–102.

Considering the administrative structure of the Hispanic monarchy, it is true that the *audiencia* could not take action without consulting its head, the viceroy of Peru, on such a serious issue as the counterfeiting of currency. However, there was a more sinister reason for the passive attitude of the ministers of the *audiencia*: most had links to Potosí's powerful locals, many of whom were accused of the fraud. Such links can be seen in the high-stakes card games held in the Villa Imperial and in the loans made among these intertwined parties.

The most serious case of lettered collusion was that of *oidor* Pedro de Azaña Solís y Palacio. Azaña, although he himself did not participate directly in the fraud, built reciprocal relationships with the fraudsters and ignored malfeasance that he could have stopped. Because of these local ties that distorted the rules, a fraud that occurred inside the mint grew to global dimensions. As we have seen at the beginning, the loss to the Royal Treasury due to the fraud was estimated at some 2 million ducats.⁸² Although it may not be fair to take this figure at face value, it amounts to about 2,750,000 eight-real pesos. This sum, of course, easily exceeds the amount of the donation that Azaña obtained. The remaining ministers of the *audiencia* could have stopped the fraud or even the rogue action of *oidor* Azaña, but they let him be. Considering all this, we can conclude that the Audiencia de Charcas, albeit indirectly, supported the fraud. To change radically, the *audiencia* had to wait for the arrival of its new president, *visitador* Francisco de Nestares Marín.

Now, what did the mint fraudsters think they were doing? Was it possible that they thought they were going to get away without guilty verdicts or capital punishments? Those who have studied this scandal would concede such doubts.⁸³ And it is necessary to approach "the visions of these players in the terms of their own time."⁸⁴ Before closing this chapter, I would like to reflect on this point.

My hypothesis is the following: in the society of the Peruvian viceroyalty of the 1640s, there would not have been such a defined norm that showed people where exactly the line between criminal and non-criminal acts lay. In other words, I believe that the fraudsters, even if they had some awareness of committing a crime, also thought that punishments were avoidable. This idea is based on that developed by Lane. In his thorough review of the rich historiography of corruption, Lane turns his attention to one key idea as a productive research tool: Mary Lindemann's proposition to search for the "limits of tolerance" in

82 AHN, Consejos 51359, exp. 32, cited in Domínguez Ortiz, "La falsificación de moneda," 165–66.

83 Lane, "From Corrupt to Criminal," 48–49.

84 Lane, "From Corrupt to Criminal," 56.

records of specific events rather than saying that corruption existed or did not.⁸⁵ I believe that this tool is relevant and that these limits were elastic. For, as Tamar Herzog convinced us, “to be fair” meant “to be socially acceptable” and such fairness depends on “implicit popular consent.”⁸⁶ These ideas will help us understand some curious details recorded in the *visita* documents.

First, I would like to note the fact that Francisco de Nestares Marín executed only two fraudsters in his long *visita*.⁸⁷ I would also like to highlight changes in Nestares’s policy regarding the execution of assayer Felipe Ramírez de Arellano. At 5 a.m. on February 26, 1650, Nestares ordered Ramírez to be placed on the gallows in a plaza in the Villa Imperial and a proclamation made “so that his crimes would be recorded and serve as an example for this republic.” But soon after, on the same day, “for the peace of this republic” the *visitador* “ordered and commanded that Felipe Ramirez’s head not be cut off as ordered by the sentence given ... and in this conformity he be removed from the gallows and buried.”⁸⁸ This sudden change seems to show that the *visitador* was examining whether or not his behavior would be acceptable in Potosí.

Another detail: On November 30, 1649, Nestares judged more than a hundred people as guilty.⁸⁹ However, it seems that in the end relatively few trials were carried out and even fewer punishments recorded in the documents.⁹⁰ Stranger still is that some major fraudsters, such as Juan Hidalgo and Diego Fernán Rodríguez—whose fine was estimated at 200,000 pesos—ceased to appear in the documents of the *visita* already in its first months. Where did they

85 Lane, “Corrupción y Dominación,” 129; “From Corrupt to Criminal,” 56.

86 Tamar Herzog, *Upholding Justice: Society, State and the Penal System in Quito (1650–1750)* (Ann Arbor: University of Michigan Press, 2004), 156, 256–59.

87 Nestares condemned to death at least three more people: Luis de Ledesma y Vila, Miguel Ruiz, and Francisco Jiménez de Cervantes. However, all of their executions were hindered by Juan de Padilla, the *alcalde del crimen* of the Audiencia de Lima. See AAL, Inmunidad 9, exp. 8; AGI, Escribanía 871C; 871B, unidad 1, respectively. Another main defendant, Bartolomé Hernández, died on July 7, 1651, during the case against him, and Nestares sentenced the dead Hernández to forfeiture of all his property. AGI, Escribanía 871D, unidad 2, pieza 1, ff. 442–443v.

88 AGI, Charcas 687.

89 In his report, made on November 30, 1649, Nestares recorded 119 persons whom he considered to be guilty. AGI, Charcas 113. At the end of the memorial, Nestares left a significant note: “All the *veinticuatro*s (municipality members of Potosí) who are *azogueros* are included in the fraud because they sold their silver at twenty percent to the ministers being ordinary *visitadores* of the mint.”

90 The individuals whose cases remain in the General Archive of the Indies are Felipe Ramírez de Arellano, Juan de Velarde Treviño, Fabián Velarde, Bartolomé Hernández, Juan de Figueroa, Miguel de Casanova, Luis de Ledesma y Vila, Pedro de Posada Alfeyran, Miguel de Lizagarate, Francisco Jiménez de Cervantes, and Miguel Ruiz.

go? Possibly they paid their fines, their so-called compositions. In other words, there was likely room to settle even after having committed *lèse-majesté*.

It may be that the fraudsters considered their behaviors to be “socially acceptable” up to a certain point. One of the elements that defined the degree of such acceptability or limits of tolerance was the community or society to which they belonged. This is important, since a good part of this society was represented by far-reaching networks or familial and other kinds of links. That is what I have investigated in this chapter, even if only partially.

Acknowledgements

I wish to thank the anonymous reviewer along with Rossana Barragan, Paula Zagalsky, Kris Lane and James Almeida for their valuable comments and contributions. I wish to thank Kris Lane for editorial suggestions. I am solely responsible for the final result of this article. All the translations from Spanish are my own.

Primary Sources

Archivo Arzobispado de Lima (AAL), Perú

- Inmunidad 9

Archivo General de Indias (AGI), España

- Audiencia de Charcas (Charcas) 93, 113, 114, 416, 687

- Audiencia de Chile (Chile) 13

- Audiencia de Lima (Lima) 52, 54

- Contaduría 1780B

- Escribanía de Cámara de Justicia (Escribanía) 863A, C, 869A, 871B, C, D

- Indiferente General 429

Archivo Histórico de Nacional (AHN), España

- Consejos 20372, 51359

Archivo y Biblioteca Nacionales de Bolivia (ABNB), Bolivia

- Minas 135/3

Archivo-Biblioteca Arquidiocesano “Monseñor Taborga” (ABAS), Bolivia

- Actas Capitulares 11

Arhivo Histórico de Potosí-Casa Nacional de la Moneda (AHP-CNM), Bolivia

- Cajas Reales 913

Bibliography

- Angeli, Sergio Hernán. "Un temprano juicio de residencia colonial: el licenciado Juan Fernández, primer fiscal de la Audiencia de Lima." *Revista Investigaciones y Ensayos* 60 (2014): 437–57.
- Bakewell, Peter J. "Registered Silver Production in the Potosí district, 1550–1735." *Jahrbuch für Geschichte Lateinamerikas* 12 (1975): 67–103.
- Bakewell, Peter J. *Silver and Entrepreneurship in Seventeenth Century Potosí: The Life and Times of Antonio López de Quiroga*. 2nd ed. Dallas: Southern Methodist University Press, 1995.
- Bradley, Peter T. *The Lure of Peru: Maritime Intrusion into the South Sea 1598–1701*. London: Macmillan, 1989.
- Cole, Jeffrey. *The Potosí Mita, 1573–1700: Compulsory Indian Labor in the Andes*. Stanford: Stanford University Press, 1985.
- Craig, Alan K. *Spanish Colonial Silver Coins in the Florida Collection*. Gainesville: Florida Heritage Publication, 2000.
- Cunietti-Ferrando, Arnaldo J. *Historia de la Real Casa de Potosí durante la dominación Hispánica, 1573–1652*. Buenos Aires: Imprenta Pellegrini, 1995.
- Domínguez Ortiz, Antonio. "La falsificación de moneda de plata peruana a mediados del siglo XVII." In *Estudios Americanistas*, edited by Antonio Domínguez Ortiz, 149–66. Madrid: Real Academia de la Historia, 1998.
- Gil Montero, Raquel. *Ciudades efímeras: El ciclo de la plata en Lipez (Bolivia), siglos XVI–XIX*. La Paz: Plural, IFEA, 2014.
- Herzog, Tamar. *Upholding Justice: Society, State and the Penal System in Quito (1650–1750)*. Ann Arbor: University of Michigan Press, 2004.
- Lane, Kris. "Corrupción y dominación colonial: El gran fraude a la Casa de la Moneda de Potosí en 1649." *Boletín del Instituto de Historia Argentina y Americana "Dr. Emilio Ravignani"*, Tercera serie 43 (2015): 94–130.
- Lane, Kris. "From Corrupt to Criminal: Reflection on the Great Potosí Mint Fraud of 1649." In *Corruption in the Iberian Empires: Greed, Custom, and Colonial Networks*, edited by Christoph Rosenmüller, 33–61. Albuquerque: University of New Mexico Press, 2017.
- Lane, Kris. *Potosí: The Silver City that Changed the World*. Oakland: University of California Press, 2019.
- Lohmann Villena, Guillermo. "La memorable crisis monetaria de mediados del siglo XVII y sus repercusiones en el virreinato del Perú." *Anuario de Estudios Americanos* 33 (1976): 579–639.
- López Villalba, José Miguel, dir. *Acuerdos de la Real Audiencia de La Plata de los Charcas*, Vol. 5. Sucre: Corte Suprema de Justicia de Bolivia, Archivo y Biblioteca Nacionales

- de Bolivia, Embajada de España en Bolivia, Agencia Española de Cooperación Internacional, 2007.
- Nakamitsu, Kazuhiro. "Alboroto popular en Concepción (1655): los chilenos que deseaban la reconciliación con los indios." *Iberoamericana* (Tokyo) 32, no. 2 (2010): 85–102.
- Oropeza Alba, Daniel. *La falsificación de la moneda en la Villa Imperial de Potosí en el siglo XVII*. Potosí: Casa Nacional de Moneda, 2013.
- Recopilación de leyes de los reynos de las Indias*. Madrid: Julian Paredes, 1681.
- Sanz Ayán, Carmen. *Los banqueros y la crisis de la Monarquía Hispánica de 1640*. Madrid: Marcial Pons, 2013.
- Schäfer, Ernesto. *El consejo real y supremo de las Indias*, 2nd ed. Vol. II. Madrid: Marcial Pons, 2003.
- TePaske, John Jay. *A New World of Gold and Silver*. Leiden: Brill, 2010.

The Hangover

Global Consequences of the Great Potosí Mint Fraud, c. 1650–1675

Kris Lane

I'll pass them on.

YVON, in Robert Bresson's *L'Argent* (1983)



1 Introduction

Addressing factors at a trading post in western Java, English East India Company officials complained in 1667 of a longstanding problem.¹ Spanish pieces of eight stamped with a “P” for Potosí remained unacceptable in Asian markets after decades of rejection, and desired coins stamped “M” for Mexico or “S” for Seville were too scarce to fill the void. Since 1652, the “P” coins had proved sound, assured by a new “pillar” design, but local traders remained wary. Even in the Spanish Netherlands, “pillar dollars” from Potosí had to be stamped with the Golden Fleece to circulate legally. It was a matter of trust.

Located high in the Andes Mountains of what is today Bolivia, the silver mines of Potosí were the world's richest, and the city's mint, established in 1574, was for years the world's most productive. Registered mine output peaked in 1592, but new finds in Potosí's hinterland, including major strikes near Oruro in 1607, kept Alto Perú's overall silver production high, and mint production

1 British Library, EIC Letter Books, IOR G/10/1, 103 (fol. 52), East India Company Court of Committees to Bantam, October 4, 1667. Special thanks to Philip J. Stern for this and other EIC references in this chapter. This essay is dedicated to the memories of Arthur Attman, Charles Boxer, Carlo Cipolla, Earl Hamilton, Antonio Domínguez Ortiz, Guillermo Lohmann Villena, and Frank Spooner, who solved much of this puzzle decades ago. I have simply stitched together a global narrative and filled in some blanks. For a prequel, see Kris Lane, “Money Talks: Confessions of a Disgraced Cosmopolitan Coin of the 1640s,” in *Commercial Cosmopolitanism? Cross-Cultural Objects, Spaces and Institutions in the Early Modern World*, ed. Felicia Gottmann (London: Routledge, 2021), 72–91.

grew along with it.² Potosí's ubiquitous pieces of eight followed the Spanish standard at just over 27 grams of c.93% fine silver. The balance was copper, just under 7%.

For a time, the coins were sound, but mining booms wane, and crisis sometimes breeds desperation. Beginning in the late 1630s, a debasement scheme metastasized within the Potosí mint. Systematic debasement of hard money from within a royal institution was an unusually bold crime, requiring considerable collusion and a mafia-like code of silence, and thus it proved difficult to halt and prosecute despite being a capital offense. Fraud was not inevitable, but it appears that declining silver production (due to deepening mines, refractory ores, labor shortages, even drought); rising miner-refiner indebtedness; subcontracting of sensitive posts and operations; lax municipal and royal oversight; plus a string of corruptible mint officials and high-level bureaucrats made possible a full decade of debasement (see Sato, this volume).

Mint operators in Mexico City and, for that matter, Seville, faced similar temptations, as did those at the much smaller mint at Bogotá, which produced mostly gold coins, but Potosí was uniquely distant from royal eyes, not located in a viceregal capital or audiencia seat. Local power groups were entrenched (the refiners' guild or *gremio de azogueros* was incorporated by 1635; see Zagalsky, this volume), and the mint's location right next to the famous Cerro Rico added to the temptation. Merchant-lenders known as *mercaderes de plata*, Potosí's high financiers, effectively took over the royal mint, treating it as a cash machine. At first, debasing some but not all Potosí coins may have been imagined as a "patch" to offset temporary mining losses amid high taxes, emergency royal "cash calls" or *donativos*, and other stresses, but it soon became an intoxicating fast track to illicit profit.

King Philip IV, in his defense, was a bit distracted when the Potosí mint fraud took off. In 1640, Portugal and Catalonia rejected Castilian domination amid war with France and the Netherlands. The Count-Duke of Olivares fell from grace in 1643, creating a power vacuum, and high-level conspiracies—from Medina Sidonia in 1641 to Híjar in 1648—kept everyone off balance. Spiraling war costs forced Philip IV to squeeze "Old Christian" Genoese and "New Christian" Portuguese creditors alike, along with the diverse merchants of Seville and Cádiz, all while banking on Potosí's unshakeability and praying for the safe arrival of the annual silver fleets. Adding to the troubles, Spain's fiscally vital colonies of Naples and Sicily rebelled in 1647, pacified only at great

2 John J. TePaske, *A New World of Gold and Silver* (Leiden: Brill, 2010), 141–212; 241–59 (and Bonialian, this volume).

cost. Meanwhile, Castile suffered droughts, floods, frosts, and plague through the end of the decade.³ Italy was similarly affected, and food prices skyrocketed all over the Mediterranean.

Amid “Old World” uncertainty and general crisis, Potosí’s silver merchants saw an opportunity for fiscal experimentation, not counterfeiting coins outright (i.e., creating fakes), but rather extracting and skimming off a portion of their weight and purity, hoping no one would notice. They profited handsomely by severely debasing the Potosí peso—the king’s money but also the world’s standard currency—for over a decade. Royal debasements were hardly unknown in Europe—for example, under Henry VIII in England (1544–51)—but they followed official decrees and served to augment state revenues in tough times—although at no small risk to a realm’s overall economic health. As for the money itself, coins debased in this way faced external rejection or wholesale discounting, killing a currency’s value as a global trade coin (which is why the Venetians never debased the silver ducat or gold sequin). Restoring faith in a once-debated currency took decades, and in this and other internal debasement-related concerns in the era of the Potosí fraud, the Ottoman experience is instructive.⁴

Potosí’s debasement scam was something else altogether, an insider takeover of a royal franchise for personal gain. At the risk of overdoing the metaphors, private parties were spiking the king’s punch, but with no clue as to how much or how little it had been spiked. As will be seen, such variable debasement was far more toxic than debasement by decree, which was at least consistent. We do not know exactly how many coins were debased in Potosí’s mint in the 1640s, but reams of testimony show that the fraud’s dimensions were substantial and grew over time (see Sato, this volume). The Spanish crown lost millions, some said hundreds of millions, but most of what I am calling “the hangover” was suffered by ordinary working people, those stuck with money they could not easily “pass on.”

Creating debased coinage was one thing; moving it without detection was another. Potosí’s silver merchants learned to blend bad money with good, forcing end users to sort coins before passing on the bad. Evidence suggests that top Lima merchants with Potosí connections (i.e., some of the richest men in the realm) knew what was going on in the Imperial Villa and chose not to

3 Geoffrey Parker, *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century* (New Haven: Yale University Press, 2013).

4 See, for example, Ceyhan Elgin, Kivanç Karaman, and Şevket Pamuk, “Debasements in Europe and their Causes, 1500–1800,” unpublished paper (June 2015), <https://cepr.org/sites/default/files/Pamuk%20-%20oslo%20text%20June%202015.pdf>.

report it. As investigators later suggested, these financiers stood to benefit from an expanded money supply as long as there were still plenty of good coins in circulation to cull.

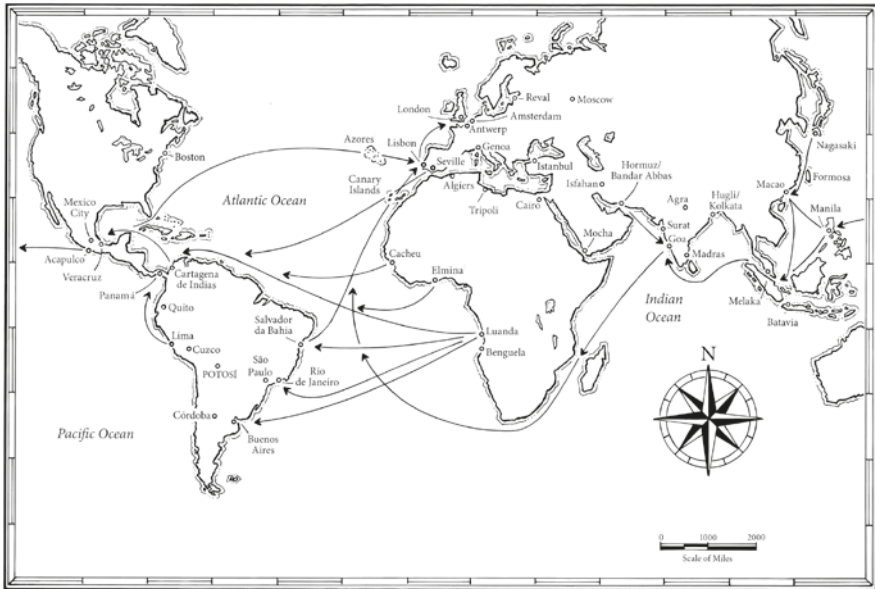
Coins were shipped out of Potosí seasonally on mules carrying sealed leather bags containing 2,200 pesos each, but teamsters, merchants, priests, and ordinary people took the money everywhere, in all kinds of amounts. Where light and less-than-pure coins were rejected and where they circulated without complaint varied, sometimes altered only by decree. Debased Potosí pesos and smaller coins were intentionally flushed into cash-poor Spanish-American provinces like Chile, Buenos Aires, Quito, Venezuela, and Guatemala. They also showed up in Brazil, the French Caribbean, and as will be seen below, British North America. Potosí's debased coins then crossed oceans to intoxicate Mediterranean, Baltic, Near Eastern and South Asian money markets, finally swirling into East and Southeast Asian bourses (see Bonialian, this volume).

Throughout the decade of the 1640s, the Potosí mint churned out nearly 5 million pieces of eight and several hundred thousand pesos' worth of fractional coinage each year.⁵ The mint had never been so productive before, nor would it ever be again. Even if only a million pieces of eight per year were debased, trust in *all* Potosí coinage was compromised. Good or bad, the coins were mostly produced in the same way: founded by Indigenous draftees, hand-cut by enslaved African men, and stamped by free men classified as Spaniards. Documents suggest that forced workers were silenced and free workers were bought off. That said, it was enslaved African mint workers who explained the mechanics of the fraud under oath (Almeida, this volume).⁶

Potosí pesos went out into the world in the 1640s as they always had (see Map 10.1), relying on their trustworthy reputation for full weight and purity. Only thus could any coin circulate beyond national or imperial boundaries at face value. One had to trust that the King of Spain had his money house in order. It did not take long for global traders to spot troubling inconsistencies in Potosí pieces of eight, however, particularly in places like Surat, where, according to Mughal law, all incoming silver and gold coins were melted down to be

5 Registered annual totals were (in pesos of eight reales): 1641 (3,947,481), 1642 (4,791,284), 1643 (5,180,968), 1644 (4,600,411), 1645 (4,839,251), 1646 (5,005,126), 1647 (4,494,745), 1648 (4,592,238), 1649 (4,856,889). Source: TePaske, *A New World of Gold and Silver*, 256. Although official mint output only exceeded 5 million pesos annually in 1643 and 1646, records from the fraud investigation suggest that several hundred thousand more debased and lightweight pesos were produced each year "off the books" at night and sometimes off-site throughout the 1640s.

6 See also James Almeida, "Suspicious Possession: Policing Silver and Making Race in Colonial Potosí," *Colonial Latin American Review* 30, no. 4 (December 2021): 545–64.



MAP 10.1 Maritime trade routes in the age of global silver

reincarnated as high-grade rupees and mohurs. One might think that debased coins were no big deal since all incoming currency was already treated as bullion at the Mughal border, but highly variable purity threw off calculations and advance bids to the point that money changers declared “Peru reales” not worth the trouble.

Such were the headaches caused by toxic Potosí silver in places where pesos were treated as a raw commodity. Yet these were few, and bullion buyers were quick to catch on. Much bigger headaches developed in other world markets where the “Spanish rial of eight” or “piece of eight” was standard currency. This included much of the Indian Ocean basin and a portion of the Pacific, not to mention the Mediterranean, where North African corsairs accepted the peso as ransom with a caveat: “minted by the enemy of Religion, may God destroy him!” Unbeknownst to Potosí’s shortsighted defrauders, chronic debasement in the remote high Andes had spawned an intoxicating global tide of panic and distrust by the mid-1640s. Batavia’s pepper market and Antwerp’s textile bourse were among hundreds of commercial clearinghouses forced to clean up in the aftermath.

Restoring Potosí’s coins to standard weight and purity required a decade-long investigation, yielding over one hundred convictions and several

high-profile executions (Sato, this volume).⁷ Yet it also required dismantling and rearticulating the city's silver production apparatus, including its banking and mercury supply systems, an administrative overhaul up to the level of the regional circuit court and royal magistracy, and much follow-up salesmanship in global money markets. This last bit of "marketing" was what annoyed English East India Company factors in late-1660s Java, where princes proudly rejected Potosí's coins long after their soundness was restored.

Throughout the seventeenth century, firms like the Dutch and English East India Companies shipped Spanish American pesos to the Near and Far East by the ton to trade for spices, dyes, gems, porcelain, luxury fabrics, and other commodities and manufactures. In this, they simply followed the Spanish and Portuguese, who had done the same since at least 1571. Trading "Spanish" silver in the interstices of empire, and sometimes lending cash to "John Company" factors, were far-flung merchant colonies including Armenians, Banya, Basques, Huguenots, Jains, Jews, Malays, Venetians, and south coastal Chinese. As these long-established merchants knew, counterfeits came and went, but serially debased Potosí pesos posed special problems.

The debasement's consequences were much more serious for imperial Spain, as bad coins froze military payroll disbursement and all manner of accounts settling. Ultimately, millions of coins were scrapped and sold as bullion in places where they had formerly been legal tender. By 1652, many European princes and city-states followed the Mughal money changers' example by banning Potosí coins altogether. The King of Spain recalled the coins to be melted or countermarked beginning on October 1, 1650, but this only added to the uncertainty. In Andalusia it sparked riots. What if the Potosí coin you had in your hand was a good one? Should you hide it or turn it in to royal officials at great loss as ordered?

Confidence shattered, merchants and monarchs scrambled to fill their chests with pieces of eight minted in Mexico City and Seville, even as debased and faked versions of these coins added to the crisis of confidence. By coincidence, Mexico's scattered silver mines struggled in the 1640s, keeping the Mexico City mint's output well below Potosí's. Coins marked with an "M" could not fill the gap (and there is some evidence that they lost a little weight as well). Seville's mint could not keep up either, as it relied entirely on Mexican and Peruvian bullion. As it happened, Potosí's silver bars, too, were suspect, their widespread debasement overlapping with the great mint fraud. It appears

7 For a general overview, see Kris Lane, "Corrupción y dominación colonial. El gran fraude a la Casa de la Moneda de Potosí en 1649," *Boletín del Instituto de Historia Argentina y Americana "Dr. Emilio Ravignani,"* Tercera serie, 43 (2015): 94–130.

that in the mid-seventeenth century, despite a number of crises (including the collapse of the Ming dynasty), world silver suppliers could not meet demand.

Alternatives to American silver were limited. Central Europe's mining boom ended in around 1550, and although the Danes found silver in Norway at Kongsberg in the early 1620s, it was too scarce to make a dent outside Scandinavia. More abundant Japanese silver circulated in select Asian markets, but only a handful of Dutch and Chinese merchants had access to it after 1639, when the Portuguese were expelled. Tokugawa authorities moved toward export restrictions even with favored partners as the Iwami silver mines played out.

Gold values shot up as a result of silver uncertainty, but gold remained too scarce to substitute for silver in ordinary exchanges. Besides, there were no great gold rushes in these years, only steady trickles from New Granada, sub-Saharan Africa, and a few other places. Meanwhile, copper currencies plunged in value as they were backed, like early paper notes, by silver. In parts of Spain, currency inflation meant a pound of butter cost more than its weight in copper. Sweden, Europe's main copper producer, issued currency in the form of thick sheets. The equivalent of a good peso weighed nearly two kilograms and was the size of a dinner plate.⁸

By 1652, just as they were being outlawed worldwide, Potosí's silver coins were back to their full weight and purity. A design featuring the Pillars of Hercules, *Plus Ultra*, and Atlantic swells was meant to restore confidence (see Figure 10.1). Yet as East India Company factors knew well, sultans and shahs, and many merchants, were not convinced. Chalice and tin cups alike had been poisoned by the Potosí fraud for over a decade. As this chapter shows, the intoxication of the world money supply caused by the great Potosí mint fraud of the 1640s was not easily purged. Like most financial bubbles and panics, it left a lasting hangover.

What I am calling "the hangover" was the end of a cycle. First came the debased Potosí coins themselves, seeping into the world economy after about 1640. After this initial "intoxication" phase came regional decrees banning Potosí coins or calling them in for re-founding, culminating in Philip IV's empire-wide recall orders. These 1650 decrees prompted a secondary intoxication, flushing debased coins into still more vulnerable world money markets. Philip IV's decrees, which rolled forward in time, in turn sparked new bans in France, the Spanish Netherlands, East Prussia, and elsewhere. Royal decrees,

8 Rodney Edvinsson, "Early Modern Copper Money: Multiple Currencies and Trimetallism in Sweden, 1624–1776," *European Review of Economic History* 36 (2012): 408–29.

though well intentioned and perhaps necessary, only exacerbated the proverbial headaches, nausea, and shaky nerves one associates with a hangover.

2 Total Recall

Let it be known that having learned by various means that many of the silver reals of eight and four [i.e., pieces of eight and half-pesos] that presently circulate in these our kingdoms and that have come here for several years from the provinces of Peru are not of the purity and weight they ought to be in accordance with our laws and according to the regulations established for the mints of all our kingdoms and dominions, which has resulted in the public prohibition of their use in the kingdoms of Navarre, Aragon, and Valencia, and their not being wanted in Italy and Flanders except when melted and assayed ... And considering the obligations of justice, we find ourselves unable to permit or tolerate in our kingdoms any money short in purity or weight due to the obvious damage that follows from it to those who trade in it and receive it in payment for their estates as good and adjusted money, being left fooled and damned by its shortcomings; and alongside this the prevailing discredit in foreign provinces for all the silver money of these kingdoms, having always been the most esteemed and desired of all, with which we find ourselves unable to send emergency payments to our armies and outposts in Flanders, Italy, Catalonia, and other provinces, all which serve to support the conservation of this Crown, the public peace, and [the good of] its vassals ... [We order] that within two months all private persons in possession of this money from Peru take it to the [nearest] public mint so that once melted and brought to proper fineness the remaining value may be returned [to the owner] in the form of adjusted, current money ... And the said two months having passed, any person whosoever found with any quantity whatsoever of coin fabricated in Peru short in purity, except those who have registered and cut it [to pieces for refounding] at the mints, in no way shall they use it, and they shall incur the loss of it, plus two years of exile, and the second time the penalties shall double.⁹

9 "Premática en que su Magestad manda que toda la moneda de plata labrada en el Reyno del Perú se reduzga y ponga conforme a la ley." Madrid, October 1, 1650. The decree was published and sold by a local book seller, Domingo García y Morrás, and it was read by town criers on the same day at the doors of the royal palace and Gate of Guadalajara, where merchants congregated. See https://ddd.uab.cat/pub/pragmatiques/pragmatiques_80.pdf.

In 1650, a jubilee year, monetary panic gripped Spain. The Council of Castile reported on April 6 that rumors of a plan to call in all silver coins with a “P” mark were emboldening counterfeiters.¹⁰ Foreigners were already pumping fakes into Castile in exchange for good money. According to the councilors, the “P” coins had already killed “the credit of the money of Spain, the public faith, and the conservation of universal trade,” as echoed in the October 1, 1650 public announcement cited above. Unaware of the extent of the fraud, handled mostly by the Indies Council, the Castile councilors argued that the post of Potosí mint assayer should never have been auctioned, as if this alone had caused such a colossal headache. A note from August 25, 1650, again pushed the claim of foreign fakes inundating Castile, “the unique harvester of this bad silver metal.”¹¹

Castile was hardly unique in “harvesting bad silver,” but fear prodded Philip IV’s highest ministers to act. They set up a special “Junta de la Moneda del Perú.” Seemingly unaware of what Indies Councilors—and the king’s new favorite, don Luis Méndez de Haro—already knew, these men called for Seville’s mint to be the site of collection and re-founding of all Potosí coins. By September 28, 1650, the Council of Castile feared bread riots in Madrid, with the currency call-in likely to strangle peninsular commerce more broadly. After inspection by the royal assayer, bad Potosí coins were found to contain as much as three quarters silver, but foreign fakes came in as low as three sixteenths.¹² In light of these variations, the king’s councilors promised only five reales in silver for a standard piece of eight, a biting 37.5% discount. Worse, most people who sought to redeem bad Potosí coins would not receive the promised five reales in “current silver” but rather eight reales in copper billon, which by this time was deeply devalued and due for another major adjustment (as happened in 1652). “Detox” would rattle Castilian money markets for several years, even though the king, in his various decrees, declared himself willing to absorb his share of the poison.

That poison quickly came. An October 5, 1650, report to the Council of Castile from a royal official in Ávila said that half the coins collected in *aras* or mortgage interest payments had Potosí mint marks. The rest were made in

10 Archivo Histórico Nacional (Madrid, hereafter AHN) Consejos, 7144. I am indebted to the classic account of Antonio Domínguez Ortiz, “La falsificación de moneda de plata peruana a mediados del siglo XVII,” in *Homenaje a don Ramón Carande*, Vol. II (Madrid: Sociedad de Estudios y Publicaciones, 1963), 143–55. I followed many of Domínguez Ortiz’s leads into the archives and found only a few tiny errors and much that I would not have grasped.

11 AHN Consejos 7144.

12 AHN Consejos 7144.

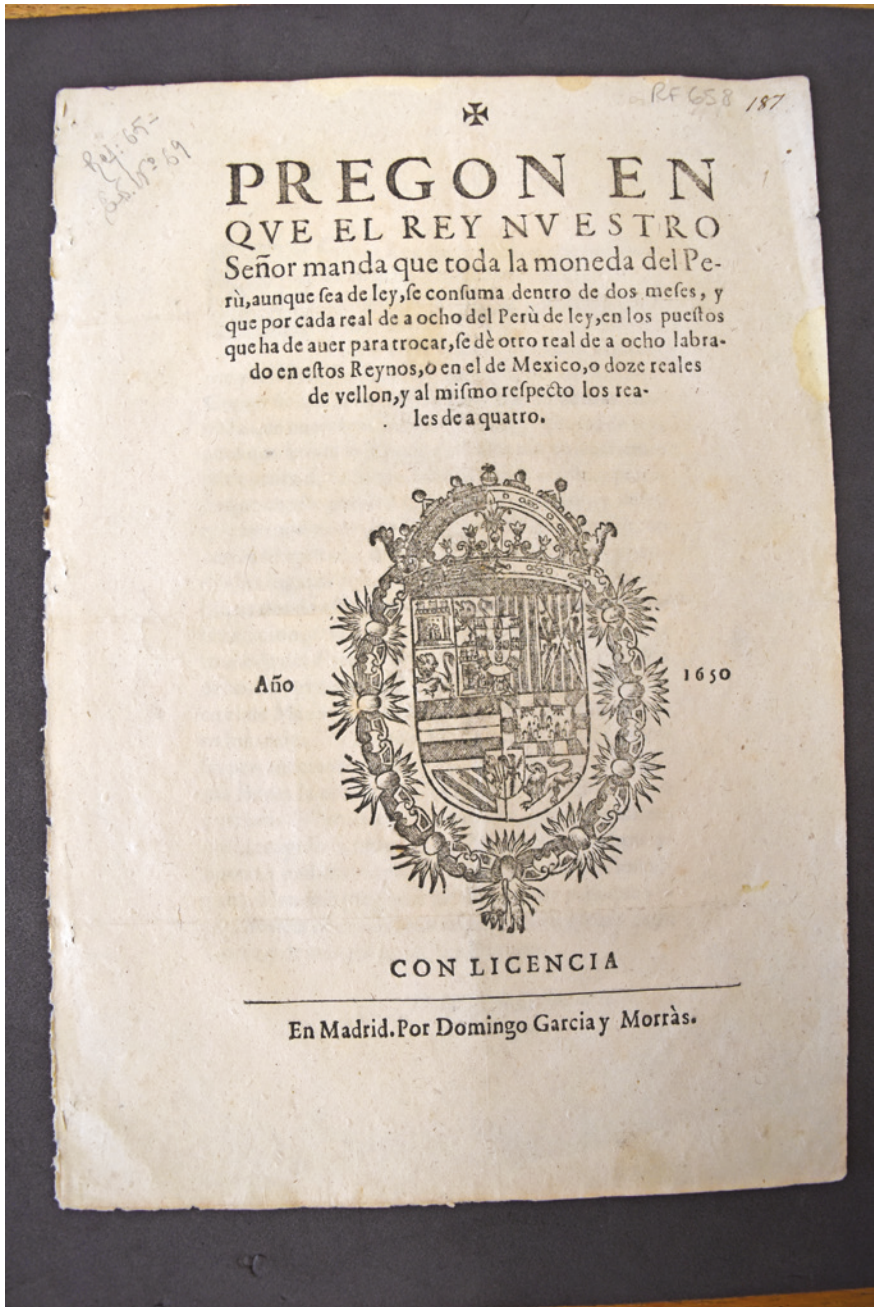


FIGURE 10.1 First page of Philip IV's October 1, 1650, decree recalling Potosí pesos
COURTESY LATIN AMERICAN LIBRARY, TULANE UNIVERSITY

the peninsula or in Mexico. Apparently, Castilian subjects were already smart enough to pay taxes and service debts in suspect money, and similar patterns emerged elsewhere in the empire. Philip IV's advisors could not agree on what to do. Councilor Lic. don Lorenzo Ramírez del Prado offered a rambling opinion citing Bernardo Vareño's 1649 *Description of the Kingdom of Japan* and other obscure works to argue for caution rather than overreaction in "purifying" the currency. Citing a Dutch treatise next, Ramírez del Prado seemed to think the problem would work itself out, a kind of "natural detox." Others were not so laissez-faire.

Indeed, the king's men, including his top bankers, had been wrangling over money policy for years, but their main concern had been how to price Castilian copper currency against silver, with its attendant headaches and unintended consequences. Philip IV's "bankruptcies" and *vellón* or copper coin flips—often blamed on the fallen Count-Duke of Olivares—had long kept silver-copper exchange rates in play. The Potosí problem was something different and far more dangerous to Spain's international standing, hurting not just its reputation but, as seen in the aforementioned decree, its ability to pay troops stationed abroad.

Curiously, many of the king's top councilors seem not to have learned about the Potosí mint *visita*, the great fraud investigation, which had been sent off from Cádiz in late 1647, until late 1650 at the earliest. This is even more strange since this same batch of documents contains a letter from November 20, 1649, to the royal favorite or *valido*, Luis de Haro, describing the challenges of bringing Potosí's currency back to standard weight and purity. I have no proof, but it may be that Haro was trying to play it safe in allowing Dr. Francisco de Nestares Marin, the Potosí mint *visitador*, to do his job without fanfare. Spain's many competing councils and juntas may not have been as corrupt as the Audiencia de La Plata (Sato, this volume), but they could not be trusted to keep secrets.

As Earl Hamilton noted in his famous 1934 book on the price revolution in Spain, the king's October 1, 1650, decree to call in "Peruvian reales" was unequivocally harsh. As noted previously, Philip IV promised exile to anyone with bad coins after December 1. The tone softened and deadlines were extended in subsequent decrees, though, when Castilians and others threatened riot.¹³ Citing the examples of the Burgos mint and a Seville hospital, Hamilton suggested that the Potosí debasement was hardly as severe as some councilors claimed, but he modified this view in his 1947 sequel after studying more evidence.

13 Earl J. Hamilton, *American Treasure and the Price Revolution in Spain, 1501–1650* (Cambridge: Harvard University Press, 1934), 68–70.

Unaware of the extent of the rot in Potosí and throughout much of Peru, Hamilton cited a 1740 treatise in which it was claimed that “the treasurer of the Peruvian mint, Pedro de Rocha [sic], was detected in his crime, executed, and burned.”¹⁴ Clearly the story of the great Potosí mint fraud of the 1640s was not clarified with the passage of time.

News from Peru did little to change things on the ground in Castile. A letter from October 24, 1650, with many signatures noted that in Seville “old-style” Potosí pesos (*antiguos*) were trading at 10.5 reales in copper billon, down from 11.5, but then the king’s edict dropped them to nine (or six reales in silver, a 25% discount, but well above the 37.5% official rate). Commerce froze, in part because “much Peru money” was allegedly of full weight and purity. Sudden uncertainty meant even honest people with good cash stood to lose a quarter or more of their liquid savings. Wheat prices shot up to eighty reales a *fanega* (55.5 liters) and barley to fifty. The people of Seville begged for suspension of the call-in but the Council of Castile offered no relief. Meeting in Luis de Haro’s posada in Madrid, the council claimed that bad coins could be traced to French counterfeiters (in effect, a separate issue).¹⁵

In Seville, the October 1, 1650, recall was posted one morning in front of the audiencia building on San Francisco square, provoking an instant uprising. After a year of devastating plague and several bad harvests, the city was on its knees. Declaring people’s cash savings “useless” was the last straw, or so said Seville’s archbishop, serving as interim audiencia president. He reported on October 25 to the Council of Castile that the 1649 plague had killed most of the city’s militiamen, and “bad people” were using the currency recall to stir up trouble. Pasquinades were posted saying “Viva el Rey y muera el Mal Gobierno!” The archbishop’s attempts to establish a curfew failed, and he cautioned: “Squeeze this orange any further and it will turn bitter.”¹⁶

Similar panic gripped Córdoba, site of Haro’s patrimony, and also Granada. Like Seville, both cities had suffered a plague followed by failed harvests. People were starving. Granada’s entire town council pleaded with the king to suspend the Potosí coin recall twice in October 1650, claiming that citizens and residents had spent their copper coins on taxes (especially the *millones*). Now they needed their silver reserves to buy food. Aldermen tried to fill the town granary

14 Earl J. Hamilton, *War and Prices in Spain, 1651–1800* (Cambridge: Harvard University Press, 1947), 11–12.

15 AHN Consejos 7144.

16 AHN Consejos 7144. The archbishop was Lic. Pedro de Zamora Hurtado: “si se aprieta mas esta naranja ha de amargar.” For more juicy details, see Antonio Domínguez Ortiz, *Alteraciones andaluzas* (Madrid: Narcea Ediciones, 1973).

to meet *abasto* or minimum supply requirements, but “with the changes in the currency they have withheld wheat and it is impossible to find much less buy what is necessary.”¹⁷ Many subjects had lost big in the devaluation and recall, and others were now speculating and hoarding, causing widespread hunger. Still, the Council of Castile was unmoved.

By 1651, “consuming” bad Potosí coins (*consumo* was now the operative word) had become a royal hassle as well as a business in its own right. The royal treasure fleet that left Panama in December 1650, arriving in Sanlúcar de Barrameda in February 1651, carried some 3 million pesos but these were largely paid out for freight taxes (*averías*) and other commitments before reaching Seville’s House of Trade, leaving royal officials scratching their heads. Bad coin kept slipping away even as it infected more of Spain’s money supply. Also in February 1651, royal inspector-general Lic. Bartolomé de Morquecho rejected an offer by Cádiz and Sanlúcar merchants to “compose” or pay a fine of 140,000 pesos for contraband dealings. It was difficult to say who was driving the train: the markets, the merchants, the crown, or bad money itself? Luckily, one could always blame the French.

A letter from May 4, 1651, noted that chests containing bad Potosí coin had not been properly marked and thus had gotten mixed back into the general money pool. All this was made more confusing in that the king owed money to merchants and bankers in Seville and Madrid, and some of these men’s agents jockeyed for rights to claim specific batches of incoming silver coin to be re-founded at other mints on the peninsula, including those at Madrid, Segovia, Toledo, and Granada.

Businessmen like Bernardo de Valdés were betting on individual treasure chests without knowing the purity of their contents, offering six reales on the peso, better than the Crown rate. By May 27, 1651, Valdés and his company had melted 255,000 “pesos peruleros” arriving on that year’s galleons. The margins are difficult to parse from these documents, which refer in passing to Valdés’s royal contract, but it appears this merchant-arbitrageur did quite well buying “bad” pesos at twenty-five percent discount and paying the king his due in “new money.”¹⁸ From the king’s perspective, losses suffered on this type of exchange were the price of restoring confidence in the coinage. Yet “instant detox” proved impossible.

On May 29, 1652, Philip IV wrote his spiritual confidante, Sor María de Ágreda, to lament the Andalusian currency convulsions. “The people of Seville

17 AHN Consejos 7144.

18 Archivo General de Indias (hereafter AGI) Indiferente 767.

rose up with fury," he noted, adding that thankfully the city's noble citizens had regained control. It was only the "pueblo inquieto" or "excitable folk" that had rebelled, "the city's most vile."¹⁹ Continuing in this condescending tone, Philip added that royal pardons had also calmed the situation. Sor María responded on June 1, 1652, lamenting that "the vassals of this Crown have grown rotten," prone to abuse power and subvert justice. All told, it was a world upside down. Philip should follow the example of King David. On June 26, 1652, the king wrote Sor María to tout his merciful new decree on the coinage. He believed it would calm those "unquiet" spirits in Andalusia.

The nun was not done. On May 10, 1653, Sor María pushed Philip to be strong even as he put his faith in the Almighty. In her words: "Although David was a saint and a prophet he knew that by himself alone he was useless to adequately carry out the obligations of a king." Philip replied on May 14, 1653, to thank Sor María for her repeated exhortations to be like David, which he would take to heart, yet he could not help but express his profound frustration. "I confess to you that everything and everyone is so perverted that governing properly is nearly impossible, and this I confess to you has me greatly afflicted."

Not to be outdone, Sor María responded by citing St. Bernard's nightmare visions of vice. The first man he saw grasped and swallowed beach sand "with great agony," but he could not stop. "This signified those who fall into greed for riches, to seek out and accumulate treasures; they eat of them, and yet for all they consume they cannot satisfy or satiate their appetites."²⁰ It seems that Sor María knew something about addiction.

The aftereffects of Philip IV's devaluation decrees constitute a painful chapter in the Potosí mint scandal's long and tortured story. These decrees, when read in the various capitals of the Spanish Empire, generated new waves of panic that then rippled across the countryside. Similarly, in Europe the decrees disrupted everyday life by serving as official acknowledgement that bad pieces of eight were simply toxic. They could not be taken back into the Spanish realms except at enormous discount. We must now follow the money to assess the damage beyond Spain, which was hardly alone in lurching through a multi-stage hangover.

19 Carlos Seco Serrano, ed., *Cartas de Sor María de Jesús de Ágreda y de Felipe IV*. BAE T.108 (Madrid: Atlas, 1958), 276–81. "Los vasallos desta Corona se han viciado."

20 *Ibid.*, 308–11.

3 Genoa

We begin with the Genoese not because they were the first Europeans to notice debased coins from “Peru,” but because the city’s highest officials were quickest to ban such coins outright. As early as 1641, certain *pezzi da otto reali* were declared short in weight and purity, and by 1642, the city council, mint, and bank of San Giorgio had issued broadside decrees or *gride* describing and illustrating problematic coins (see Figure 10.2).²¹ Suspect pesos were to be immediately delivered to the city’s mint for re-founding or their owners would be punished.

It was not yet clear to the Genoese that Potosí coins were the main culprits, and the earliest bans pointed to allegedly debased or short-weight Mexican pesos as well. In fact, as a major clearinghouse for European currencies, Genoa received all kinds of suspect coins in the 1640s, including bad *soldi*, but of particular and growing concern were Peruvian pieces of eight. As in Surat, they entered by the ton, not all from Spain.

What is curious about Genoa is both its early awareness of the toxic peso and its creative response to its appearance. As the 1640s progressed, the city known as La Superba’s decrees banning bad pieces of eight grew more specific and more draconian. Regional officials all over Liguria were charged with collecting as many pesos as they could seize, both Peruvian and Mexican, all to be funneled to Genoa’s mint. Documents show that city officials policed everyday exchanges down to the level of grocery shopping, confiscating any peso with a “P” or “M” on it.

By the late 1640s, Genoese port officials searched all incoming vessels for “suspect” coin, much of it Mexican, which was then embargoed in exchange for a kind of bank note, copies of which fill several bundles in Genoa’s state archive (see Figure 10.3). It is unclear how or even if such notes could be redeemed, but presumably people tried. By this time nearly everyone knew not to carry Potosí coins, but the fact that Mexican pieces of eight remained a problem for the Genoese throughout the 1640s seems to have struck visitors as an unwelcome surprise.

21 I followed the pioneering work of Carlo Cipolla into the Archivio di Stato di Genova. I have drawn from the section Finanzas, Monetarum Diversarum/Zecca Antica, hileras 38–43. See Cipolla, *Conquistadores, piratas, mercaderes: La saga de la plata española*, trans. Ricardo González (Buenos Aires: Fondo de Cultura Económica, 1998). Key are pages 69–72. Cipolla flubs a few details—for example, referring to “Francisco Nestares Rocha” on page 70.



FIGURE 10.2 April 1645 Genoa decree regarding debased "Spanish reales" COURTESY ARCHIVIO DE STATO DI GENOVA



FIGURE 10.3 1649 Genoese receipt for confiscated “old-style” Peruvian pieces of eight
 COURTESY ARCHIVIO DI STATO DI GENOVA

Mexican pesos from this period were occasionally light and under-fine, but generally they were within tolerance or very close to it. They had not been systematically debased like the coins of Potosí. So why seize them? In short, because Genoa was strapped for silver in the 1640s as it struggled to renegotiate its position within the tense triangle of Spain, Rome, and France. The city’s big investors also needed silver cash to launch new enterprises such as the doomed East India Company, which ran into trouble in Batavia in 1648.

Seizing Mexican pesos that could either be re-founded into *soldi* or shipped abroad to the Levant, India, Southeast Asia, or China made sense, at least temporarily. Thus, Spain’s monetary intoxication could be played to advantage and good silver culled by decree. In short, the Genoese were far ahead of the game despite their claims of huge losses, and by the time Philip IV issued his “total recall” in late 1650, La Superba had long since made its move beyond simple “detox.”

4 Portugal

For embattled but newly independent Portugal, the decade of the 1640s demanded a “great recoinage.” A November 13, 1647, decree or *alvará* issued

in Lisbon followed the Genoese model by prohibiting *patacones* or “patacas” (i.e., pieces of eight) with the “P” mark entirely. They had to be sold to the mint as scrap.²² Taking a cue from Philip IV’s October 1, 1650, decree, the order was reissued and expanded by João IV on June 6, 1651:

[I]t was necessary to resolve and order by this law that henceforth in these, my kingdoms and realms, there do not circulate nor are used the said *patacas* founded and fabricated in Peru, old or new, which in their circles contain cordons or rosaries or whatever form or quality they may have, nor should they be received nor given in payment as current and legal tender, both those that entered previously and those now entering out of fear that those of the newly founded type are quite short in weight and quality of silver and there are many false ones, and those of the old type founded in Peru, although they may be good, they cannot be differentiated from those they have recently re-melted and fabricated and thus in all of them there is well-known danger.²³

King João ordered his subjects to take all “Peru” coins to the mints at Lisbon, Évora, and Porto to be melted down.

If João’s 1651 recall decree prompted popular resistance, I have found no record of it, but certainly it hurt many ordinary Portuguese subjects who still had Spanish coins under their mattresses. The dust seems to have settled somewhat by July 17, 1655, when a new *alvará* announced that new Peruvian “column” money of eight and four reales—Potosí’s newly designed coins—had assayed well. These could circulate legally in all of João’s kingdoms and conquests.²⁴ Portugal remained at war with Spain and yet its merchants, like its armed forces, needed all the silver cash they could get. Perhaps war weariness and long experience offset the effects of the great Potosí hangover.

5 France

Like Portugal, France was at war with Spain in 1650, and its treasury was nearly empty. To add insult came the Frondes, which drove Cardinal Mazarin and even the queen (Philip IV’s sister) out of Paris. Yet it seems that amid wartime

22 Tomás Dasí, *Estudio de los reales de a ocho, también llamados pesos, dólares, piastras, patacones o duros españoles*, 5 vols. (Valencia: Sucesor de Vives Mora, 1950), 1: cxxxix.

23 Dasí, *Estudio*, 1:cxlviii.

24 *Ibid.*, clix.

bankruptcy and growing civil strife, the periodic appearance of bad Spanish pieces of eight was more irritant than crisis in France, usually afflicting merchants or their customers in border regions—for example, Bayonne and Béarn. As Frank Spooner noted long ago, coins with the mintmark “P” were banned from circulation on December 11, 1650, soon after Philip IV’s decree. Even so, badly debased coins showed up in Bordeaux in March 1651, as described in the following notice:

[T]here is a great trade in the present town with the Spaniards during the two famous fairs held here in March and August and the Spanish merchants and others trading with Spain cull out the worst Peruvian coins and take them to change at the mint and leave the better Peruvian coins in the mints of Madrid, Zaragoza, Aragon [sic], Pamplona in Upper Navarre and others in the said Kingdom of Spain.²⁵

As Spooner put it: “Whether they were good or bad, these silver reals flowed into the mints of France, especially in Paris, and offered material for coinage.” This solution sounds vaguely Genoese, but minus the harsh decrees and daily inspections. In a way it made sense, this more *laissez-faire* approach. After all, the coins of “Peru” were rarely counterfeit. The vast majority were simply debased, containing well over 50% silver. Some with suspect marks were perfectly good. Merchants might decide which ones could not circulate, saving work for treasury officials and reducing popular panic.

Some Potosí pesos were thus melted and remade as *écus*, a coin of similar size and weight, but others were likely re-exported by French merchants to Turkey and the Levant, where they wreaked havoc on Ottoman markets. Even so, the problem of bad Peruvian coins kept popping up in France despite periodic rejigging of the domestic coinage. As Spooner describes it:

The silver problem concerned, without specifying, the silver reals of Spain. Light and defective reals were refused currency at the beginning of the 1650s, yet this effort was in vain. They were again prohibited by the *Cour des Monnaies* on October 23, 1658, and still they continued to circulate. Their presence was noted in the report of June 10, 1666, on the activities of goldsmiths and other craftsmen. They made a further appearance

25 Frank C. Spooner, *The International Economy and Monetary Movements in France, 1493–1725* (Cambridge: Harvard University Press, 1972), 189.

and were on July 16, 1672, refused circulation in the province of Artois on order of the Conseil d'Etat.²⁶

Intoxicated by bad Potosí silver coins beginning in the 1640s, the French, like almost everyone else, were in for a long hangover. However one approached it, “detox” took decades.

6 Flanders

Philip IV's bankers dispatched huge quantities of silver coin to Flanders, often via Genoa but also through English shippers in the 1640s, when the French pinched off the fabled “Spanish Road.” As in Genoa, a wide variety of silver coins circulated in Antwerp, Brussels, Bruges, and other Flemish cities, but the workhorse currency had long been the Spanish American peso or “real of eight.” It is therefore unsurprising that debased and light pesos were described and illustrated in published pamphlets similar to the Genoese broadsides.²⁷ Merchants used these small guidebooks to stay up to date, and ordinary citizens watched them for sudden changes that might endanger their savings.

The pamphlets were published in Antwerp every few years, following royal orders as to what coinage could legally circulate in this corner of Philip IV's empire, including Peruvian “reales.” A 1644 version of the *Ordonnantie des Coninghs (Coin Ordinances)* illustrates pesos with Peruvian, Mexican, and Seville mint marks, but offers no comment on their value. A 1647 version includes decrees on billon, or copper currency, but no illustrations. The pamphlet ends with warnings on untrusted silver “bars, reals, and ingots” but it does not refer specifically to silver from Peru. The emphasis on Potosí coins only gets specific in the Antwerp booklets *after* Philip IV's 1650 decrees calling in nearly everything with a “P” on it.

Of special interest is a section midway through the 1652 Antwerp edition of the *Coin Ordinances* (see Figure 10.4) called “Aengaende de Realen van Spaignien,” or “Regarding the Reals from Spain,” which illustrates Potosí coins with assayer initials T, O, R, Q, and B, all declared “billon” (*billoen*, i.e., debased). These are set against illustrations of coins minted in Seville and Mexico City for comparison (see Figures 10.5a and 10.5b). The decree is confusingly worded,

²⁶ Spooner, *International Economy*, 193.

²⁷ Hieronymus Verdussen, *Ordonnantie des Coninghs op het reglement van siine munte* (Antwerp: H. Verdussen, 1652). As always, I am indebted to C. R. Boxer. I was able to view and photograph his copy of this item in the Lilly Library at the University of Indiana.

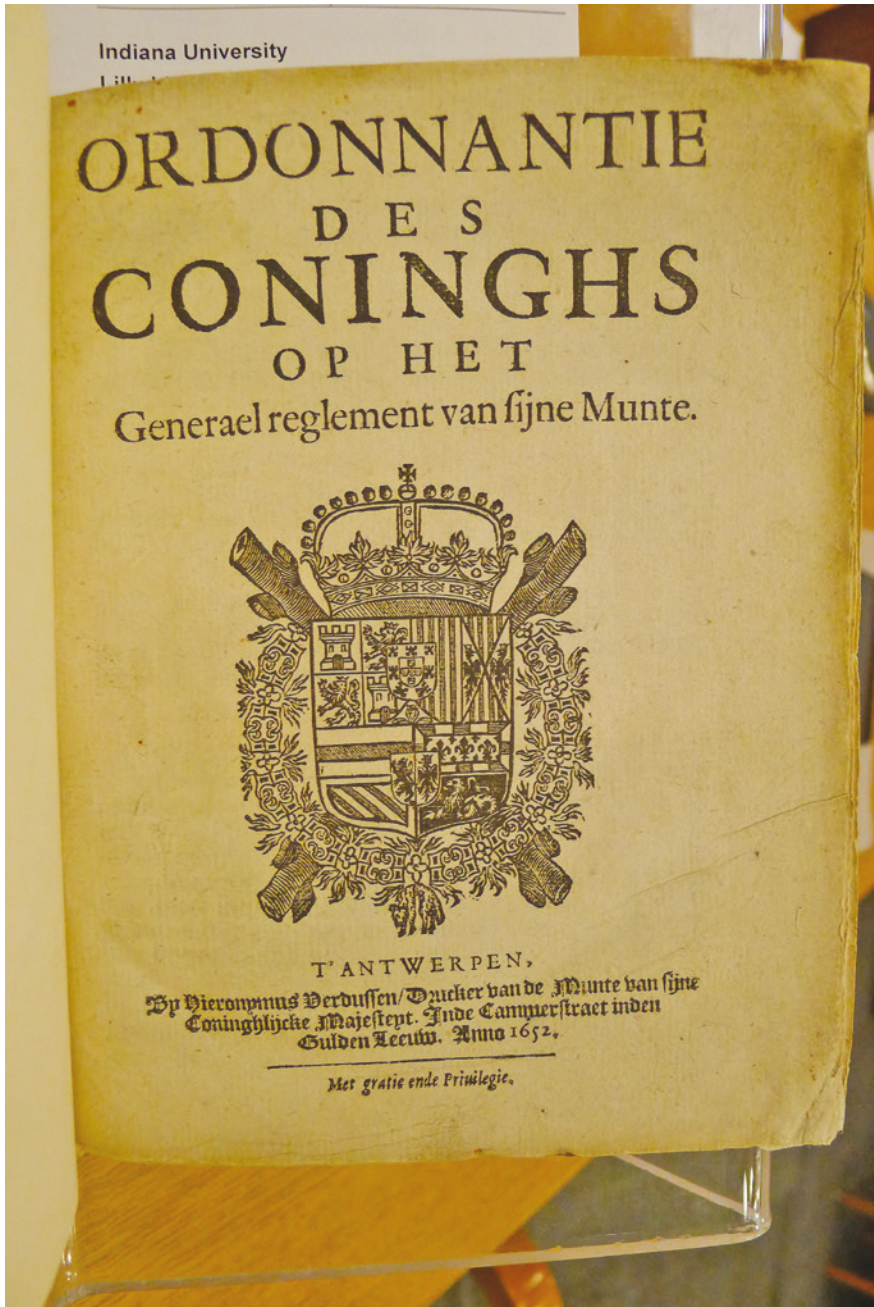


FIGURE 10.4 Title page of 1652 Antwerp Coin Ordinances
COURTESY LILLY LIBRARY, UNIVERSITY OF INDIANA

but the upshot is that Potosí coins were to be called in, weighed, assayed, and identified with countermarks or removed from circulation.

Here is a translation of the relevant section:

One: let it be known that among the many *reals* called Matten [whole], half, quarters, one-eighth, and sixteenth parts of the same, it is found, when assay is done, that a large number of those from Peru and others vary, are falsified, and are of unequal alloy and weight; because of this one cannot assess their true price and one cannot distinguish one from the other; for this reason we pronounce and declare them again billon as well as the *reals* from Spain and Mexico that have been issued by the city [certified by the city of Antwerp, apparently] for the amounts of forty, twenty, ten, five, and two-and-a-half *stuivers*, being all too light; we command that those [faulty reales] have to be brought into the mints or to the bonded exchange agents [*wisselaers*] in order to get from them the true value according to assays performed there. And to better distinguish the *reals* from Spain and Mexico (by weight and alloy) from those of Peru, we order that before they circulate they have to be brought to our aforementioned mints, or in cities where there are no mints to the exchange agents, in order to be assigned a special mark listed on the aforementioned plates. The *reals* of Spain and Mexico are indicated with this mark and are issued with a value of 48 *stuivers*.²⁸

A major concern by this time was distinguishing Mexican and Spanish pesos and fractional coins from those minted in Potosí. Mint marks and dates were often obscured, so one had to search for a variety of clues. It is difficult to say if Antwerp's officials and merchants were profiting from the confusion in the way noted for Genoa—that is, by seizing tons of perfectly good money by fiat to meet other ends—but several of the mintmarks listed in the 1652 booklet (all of the Q and B, but also many with the R and T) were from *years before* the Potosí mint fraud of the 1640s.²⁹ These coins would likely have been of full weight and purity.

28 Ibid. I thank Dr. Mark Meuwese for this translation.

29 The "B" was for Ballesteros, who died well before things got out of hand, as did de la Quadra, whose coins bore the "Q." Tapia, whose coins carried a "T," was assayer from 1617, when Potosí coins first bore dates. Only a few of his last coins from the 1640s were suspect. The vast majority of "R" coins were from the Ramos Laceta era, long before the fraud, although a few "R" coins from the late 1640s were the product of Ramírez de Arellano, who was executed for fraud in February 1650. The "O" surely refers to assayer Rodas, whose coins from 1649–1650 were only slightly below grade.



FIGURE 10.5A Images of Mexican and Peruvian pesos with suspect marks, declared “billon”
COURTESY LILLY LIBRARY, UNIVERSITY OF INDIANA



FIGURE 10.5B Images of Peruvian pesos with suspect marks declared “billon,” cont.
COURTESY LILLY LIBRARY, UNIVERSITY OF INDIANA

As the great mint fraud “hangover” rolled into its later stages in the Spanish Netherlands, Potosí “pillars” of regular weight and fineness were stamped with the seal of the Golden Fleece to prove legal currency in the 1660s and 1670s. As happened nearly everywhere, a mix of confusion, fear, cunning, and Gresham’s Law slowed the process of “detox” in Flanders.

7 The Baltic

Spanish-American silver cash flowed into the Baltic by the 1640s thanks to Dutch and Hanseatic merchants trading for timber, grain, pelts, and other boreal commodities. As elsewhere, a rising portion of this American coinage was debased. Merchants must have caught on by at least the mid-1640s, but state officials in the ducal Prussian capital of Königsberg (now Kaliningrad) were slower than the Genoese to ban the coins outright. More like the Antwerpens, the Prussians seem to have followed the Spanish general decrees of October 1650.³⁰

Hanseatic merchants routinely exchanged Dutch thalers, Flemish *pata-gones*, and “Spanish reales” (i.e., Spanish and Spanish-American pesos) for Baltic goods, and coin hoards found in the twentieth century support this. Caches of Spanish American coins have been discovered as far inland as Moscow.

East Prussia’s “Great Elector,” Frederick William (r.1640–88), banned Potosí coins in June 1651 (see Figure 10.6):

By the Grace of God, We, Friedrich Wilhelm, Margrave of Brandenburg, Arch-chamberlain of the Holy Roman Empire, and Elector at Magdeburg,

³⁰ Artur Attman, *American Bullion in the European World Trade, 1600–1800*, trans. Eva and Allan Green. *Humaniora* 26. (Göteborg: ACTA, 1986), 89. As Attman says, “Thus the citizens of Königsberg were familiar with Spanish reales which enjoyed the same high reputation there as the Hungarian gyllens and rix-dollars. It was therefore natural for the Prussian authorities to react sharply when short-weight Spanish reales from newly opened mines in Spanish America were imported into Königsberg by sea in large quantities in the middle of the seventeenth century; and in 1651 such reales were declared to be invalid.” See also Attman, *Dutch Enterprise in the World Bullion Trade, 1550–1800*, trans. Eva and Allan Green. *Humaniora* 23 (Göteborg: ACTA, 1983); and Klaus Weber, “Linen, Silver, Slaves, and Coffee: A Spatial Approach to Central Europe’s Entanglements with the Atlantic Economy,” *Culture and History* (CSIC Madrid) 4, no. 2 (2015). On Frederick William and the rise of Königsberg, see Christopher Clark, *Iron Kingdom: The Rise and Downfall of Prussia, 1600–1947* (Cambridge: Belknap Press, 2006), 38–66.

in Prussia, at Jülich, Cleve, Berge, Stettin, etc. ... make public and give to understand that in great quantities new Spanish *reals* or thaler are being brought here over the sea from the new Spanish mines, and in imprint not unlike the others, but very different in weight and fineness [*Schrot und Korn*], and of lesser value, so that those in proofing and determination of content [*Probe und Wardierung*] were found to be in weight [*Korn*] invalid in two fifths parts, and most of them are not worth more than 40 *Groschen*, and so we have been warned by neighboring locations. So that nobody should be shortchanged or cheated in trade or commerce, be amply warned and receive justice, because no means has been found to separate the invalid ones from the old and good *reals*. Therefore We are compelled to prevent such fraud and warn amply not to accept those invalid *reals* as payment in trade and commerce. Because those invalid and false *reals* according to law shall be forfeited and confiscated and the first to disobey will be subjected to the punishment that is otherwise ordered. Those, however, who have accepted them out of imprudence, and see themselves shortchanged or cheated, should demand redress from those from whom they have received them. All shall comply broadly and protect themselves against damages. This is documented with our Elector's seal, Königsberg, 19 June 1651.³¹

Folio 3 in the same batch of papers is nearly identical, but the date is from a few days earlier, June 16, 1651.

The text differs as follows:

We are compelled to prevent such fraud, but choosing the lesser of two evils we make this the damage and danger of each person, according to whether he wishes to accept those [coins] in trade and commerce as payment. Warning that anyone who accepts those *reals* after this decree [*placat*] and sees himself shortchanged or cheated, that no lawsuit will be accepted, but that he will have to keep them as his damage for his imprudence. As those *reals* will be considered as false and invalid, they will be forfeited and confiscated.

31 The documents are in the East Prussia Archive in Berlin, subsection Staatsarchiv Königsberg: Etatsministerium: 99e/42-43 (Patent 16/6 1651, Patent 19/6 1651, Schreiben 22/6 1651, Schreiben 26/16 Juli 1651) 99a/81 (Münzwardein C. Melchior 8/6 1651). Special thanks to Arndt Schreiber, U. of Freiburg, for help with Königsberg currency units, and to Prof. Christoph Rosenmüller for hunting down these records and for these excellent translations.

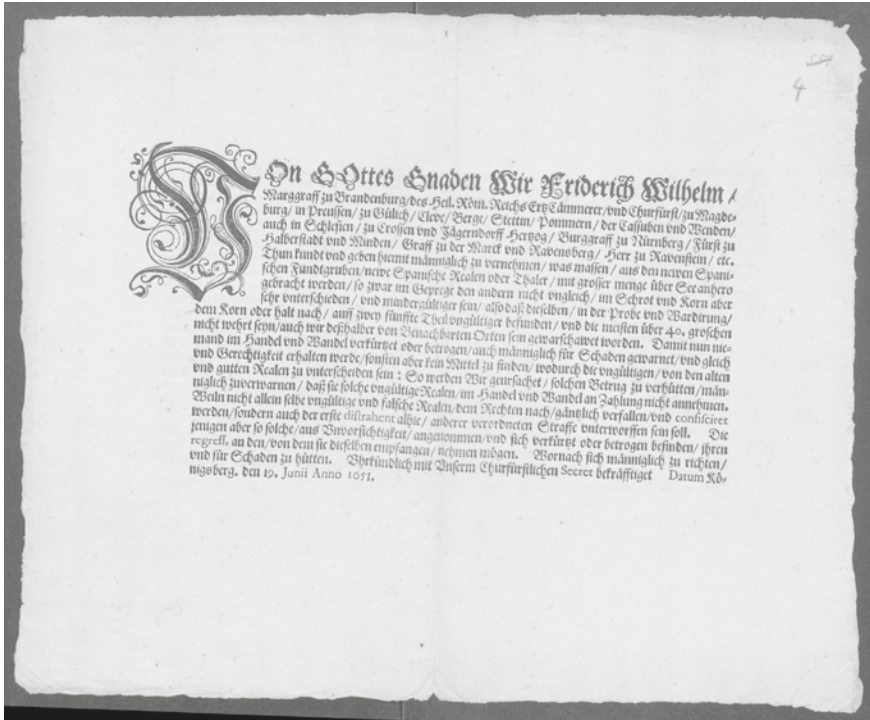


FIGURE 10.6 June 19, 1651, decree by Elector Friedrich Wilhelm banning Peruvian “reales”
COURTESY EAST PRUSSIA ARCHIVE, BERLIN

As we can see, East Prussia’s Great Elector took a nuanced if not flaccid approach to the problem of “Potosí silver intoxication,” responding somewhere between the French and Genoese. Rather than put the entire onus of “detox” on his treasury ministers, Frederick William put it mostly upon his subjects. Instead of issuing a draconian recall, as Philip IV had done, the elector preferred a “fair warning.” The Elector’s subjects were told they could handle bad Peruvian money at their own risk, but that it would ultimately be subject to confiscation.

Reasonable as it may sound, this flexible response did not “detoxify” East Prussia’s money supply, as noted six years later by Frederick William’s chief mint overseer, Christoff Melchior.³² Melchior’s letter of advice is from June 8, 1657, probably written in Königsberg:

32 Lizent- und Münzverweser [administrator of licenses and coins] to Friedrich Wilhelm; see Thomas Kerth and George Schoolfield, eds., *Life’s Golden Tree: Essays in German Literature from the Renaissance to Rilke* (Columbia: Camden House, 1996), 84. Christoff was the

The *reals* (because the greatest fraud was found amongst them) were prohibited entirely in Holland, and they are not accepted in Danzig anymore either. Those were conducted in great mounds [or quantities] hither to Prussia, and were declared as Reichsthaler [imperial thaler or “dollars”], although most of them are not worth more than 40 Groschen. On account of this, I once more, and most obediently, remind and request that all *reals* (because the common man cannot distinguish the evil from the good), be rapidly and entirely prohibited by decree, and whatever arrives on the seas from Danzig ought to be confiscated.

In the realms of vodka and aquavit, hangovers could be intense. In the case of East Prussia, the temptation presented by debased Potosí coins had proved difficult to resist. They were, after all, (mostly) silver coins in a time when such coins were essential to interstate commerce. But by dithering, “detox” was slowed. As Christoff Melchior put it, one simply *had* to rid the kingdom of poisoned “dollars.”

8 New England

English colonists in Massachusetts and Virginia responded to their own silver currency shortages by “crying up” or overvaluing the Spanish American peso of eight reales precisely as its purity and weight came into question in the early 1640s. The peso was set at five shillings local money of account in Massachusetts in 1642, and at six shillings in Virginia in 1645, specifically to attract “peeeces of Eight in Spanish money.”³³ Virginians used tobacco as currency, so the high rate was to be offset or backed by copper pennies. These were never produced, however, and tobacco continued to drive out silver. With news of the Potosí debasement scam and European devaluations, the “Spanish”

object of a wedding poem by Simon Dach as he and his bride moved to Königsberg in 1648 from Danzig.

- 33 Sylvester S. Crosby, *Early Coins of America and the Laws Governing their Issue* [1875] (New York: Burt Franklin, 1970), 21–23. See also Philip L. Mossman, *Money of the American Colonies and Confederation: A Numismatic and Historical Correlation* (New York: American Numismatic Society, 1993), 19–20; Philip L. Mossman, “The Potosí Scandal and the Massachusetts Mint” in *The Colonial Newsletter* 48, no. 2 (2008): 3289–3309; Philip L. Mossman, *From Crime to Punishment: Counterfeit and Debased Currencies in Colonial and Pre-Federal America*, ANS Numismatic Studies 27 (New York: ANS, 2013); and Jonathan E. Barth, “A Peculiar Stampe of our Owne’: The Massachusetts Mint and the Battle over Sovereignty, 1652–1691,” *New England Quarterly* 87, no. 3 (Sept. 2014): 490–525.



FIGURE 10.7 A so-called Pine Tree Shilling minted in Boston by John Hull
COURTESY DANIEL FRANK SEDWICK, AUCTION 17, LOT 204

peso dropped back to five shillings in 1655. As we saw in the case of France, detoxification was not so easily achieved. Still attracted by relative advantage, bad pieces of eight continued to “poison” the Virginia colony’s impoverished money supply, valued at four shillings each in 1679.

New Englanders, meanwhile, were trying to attract Spanish America’s silver money in an economy lubricated by wampum (sea shells) and codfish. Shell money was used for ferry crossings and other small transactions in the late 1640s, its value fixed by color in 1650 at “40 shillings the white, at eight a penny; and the black at four.”³⁴ Wampum worked at the local level, but New England’s “clams” were worthless for foreign exchange.

Setting an attractive exchange rate for pieces of eight may have ultimately worked better in New England than in Virginia, and the arrival of variable quality coins led to the creation of a mint in 1652 in the house of Boston silversmith John Hull. Hull noted in his diary that, among other causes, “upon occasion of much counterfeit coin brought in the country, and much loss accruing in that respect (and that did occasion a stoppage of trade), the General Court ordered a mint to be set up.”³⁵

Hull’s mint, declared illegal by Restoration authorities, was to act much like the exchange houses of Surat frequented by East India Company factors, with

34 Crosby, *Early Coins*, 27.

35 Crosby, *Early Coins*, 31.

Hull as the colony's "shroff" or money changer. The Massachusetts Assembly decreed on May 26, 1652: "That all persons what soeuer have liberty to bring in vnto the mint howse at Boston all bulljon plate or Spannish Cojne there to be melted & brought to the allay of sterling Silver by John Hull master of the sajd mint and his sworne officers ..."36

Looking back three decades later, Massachusetts officials explained illegal minting as the result of "cumbersome and troublesome" mechanics of barter and the arrival of "a considerable quantity of light base Spanish Money, whereby many people were cousened [defrauded], and the Colony in danger of being undone thereby; Which put vs upon the project of melting it down, & stamping such pieces as aforesaid to pass in payment of Debts amongst our selves."37 Documents mentioning old "Peruvian" pieces of eight versus the newer pillar design appeared well into the reign of Queen Anne in the early eighteenth century.

As Mark Peterson, Jane Knodell, and Catalina Vizcarra have shown, John Hull's shilling (which bore images of willow, oak, and pine trees in successive issues, see Figure 10.7) was given a high face value and low weight to make it stay local.³⁸ The colonial coin thus contained only 75% of its face value in metal. As further "subterfuge," the coin was issued across several decades but was always stamped with the date 1652. It was as if the great Potosí mint fraud had stopped time in Boston. And yet the creation of a local mint does not seem to have "detoxified" New England's currency. The hangover persisted for generations.

9 The Wreck of the *Vergulde Draeck*

The wreck of the Dutch VOC ship *Vergulde Draeck* ("Gilded Dragon") off the west coast of Australia adds another sad chapter to the story of the great Potosí

36 Crosby, *Early Coins*, 34.

37 Crosby, *Early Coins*, 76.

38 Mark A. Peterson, "The World in a Shilling: Silver Coins and the Challenge of Political Economy in the Early Modern Atlantic World," in *Early Modern Things: Objects and their Histories, 1500–1800*, ed. P. Findlen (New York: Routledge, 2013), 252–73. There are some howlers here, as when Peterson claims that the only mints in the western hemisphere at this time were in Boston, Potosí, and Zacatecas, but the attempt to link things up is admirable. Jane Knodell and Catalina Vizcarra offer a provocative comparison between the great Potosí debasement and the Hull coins of Boston in "Resource Endowments and the Problem of Small Change: Insights from Two American Mints, 1600–1700," *Financial History Review* 28, no. 3 (Dec. 2021): 344–63.



FIGURE 10.8 A 1652 “column”-type Potosí piece of eight from the wreck of the *Vergulde Draeck*
COURTESY WESTERN AUSTRALIAN MUSEUM

mint fraud and its long and tortured hangover. As Charles Boxer noted in his classic article, “*Plata es Sangre*,” the nearly 300-ton *Vergulde Draeck* hit a reef on April 28, 1656, carrying an interesting mix of Spanish American silver coins, many of them recovered by divers in the 1960s and 1970s.³⁹

As we have seen, Potosí pesos had by 1656 been “reformed” and redesigned, the so-called pillars or *columnas*. The *Vergulde Draeck* carried a considerable number of these (see Figure 10.8). But since they were new and they carried the mint mark “P” for Potosí, Dutch merchants worried they might not be accepted in Southeast Asian markets, at least not at first. This suspicion proved correct, as we saw at the opening of this essay and as will be seen below. As insurance, the ship carried a large number of pesos minted in Mexico City (see Figure 10.9).

The *Vergulde Draeck* was on its way to the Dutch East India capital of Batavia, where the silver coins would be disbursed to factors buying pepper, cloves, nutmeg, mace, and other spices, along with porcelain, silk, lacquerware, and other fineries. Unfortunately, the *Draeck* went down in rough waters on a lee shore. Prevailing winds and currents stymied rescue efforts in the years immediately following the wreck and although almost a third of the crew of nearly 200 survived and made it to shore, none were found by the subsequent rescue parties,

39 C. R. Boxer, “*Plata es Sangre*: Sidelights on the Drain of Spanish-American Silver in the Far East, 1550–1700,” *Philippine Studies* (Manila) XVIII, no. 3 (July 1970): 457–78. The ship’s name is spelled *Vergulde Draak* in modern Dutch. Images of coins now held by the Western Australian Museum are on its website: museum.wa.gov.au.



FIGURE 10.9 A 1651 Mexican piece of eight from the wreck of the *Vergulde Draeck*
COURTESY WESTERN AUSTRALIAN MUSEUM

nor was any treasure recovered. The only known survivors were the seven men sent to Batavia in the ship's boat a week after the accident. Otherwise, no one would have known where the wreck occurred. This true and harrowing tale from "Batavia's Graveyard" points again to the global dimensions of the Potosí mint fraud "hangover."

10 East and South Asia

We find that Civell [Seville] and Mexico mony is oftentimes scarce to bee had, and Piller mony is full as weighty & as fine. And therefore wee would have you againe desire ye King of Bantam that they may passe wch will bee a meanes to fill his Country with Silver.

English East India Company Court of Committees to Bantam, October 4, 1667⁴⁰

40 British Library, EIC letter books, 103 (fol. 52). And seven years later: "London 6th May 1674, To Our Agent & Councill att Bantam: In ours by this Ship dated pr Instant we did intend to have acquainted you wth what quantity of pce of 8t we should send you by her, but they arriving late, & the Purser staying for or packett, wee only menconed what was then on board, but having now procured (upon the arrivall of some ships from Spaine) the quantity of 24000 pce of 8t we have also laden them on board in Six Chests as p Invoice,

Throughout the 1660s and 1670s, English East India Company officials in London complained that they could not procure sufficient silver dollars or “pieces of eight” minted in Seville or Mexico City to meet the needs of their factors in Bantam, where the company was competing with the Dutch for pepper. Pepper was sold by local intermediaries who controlled production. Silver cash was in many cases all Europeans could offer when trading in the Far East, and the principal source of such cash for over a century had been Spanish America, specifically the mines and mints of Mexico and Peru, along with American silver minted in Seville. European merchants traded goods for these coins at Cádiz, Antwerp, Genoa, and many other places.

It seems the coins that English EIC officials referred to as “pillars” in their letters from the 1660s and 1670s, which the Spanish called *columnas*, were not yet accepted by the King of Bantam. Why? Because they came from Peru, more specifically from the royal mint at Potosí, site of the great fraud. As we have seen, since pieces of eight from Potosí were restored to full weight and purity in 1652, they bore a new design on one side: the Pillars of Hercules, symbol of bygone emperor Charles V. Despite being “full as weighty and as fine” as the more trusted coins of Mexico City and Seville, wise Asian princes were loath to accept them. The new design was not enough. If anything, it made rejection easier.

Not everyone in Asia had responded so harshly to the great Potosí debasement. In the port city of Surat, on India’s Gujarati coast, debased Potosí pesos had been discounted since the early 1640s, much as in Genoa. For a time this

by wch we hope we have soe fully Supplied you that you will according to our direcon in our former L[ett]res not only hasten the dispeed of these ships but alsoe goe in hand to provide good quantities of pepper in readiness against the next. Note that in regard wee cannot this year procure Sortable pce of 8t fitt for yor parts we are forced to take (although to or Loss) many that are much overweight, and therefore you must endeavor to imploy them to our best advantage & not to put the Inhabitants in expectation of the like for the future, And indeavor to dispose the King as we have formerly written to take piller [i.e., “pillar” or new-style Potosí] pce of 8t wch are as good Silver, for Sivell [Seville] & Mexico are very difficult to be procured & if we should be tyed only to those sorts & not able to get them & wee not adventuring to send piller Money, the Inhabitants might be disappointed, in the vent of their Commodities as well as our selves in the trade, And advise us what you doe therein, And soe we leave you to the Almighty & remaine—yor very loving friends [signed].” East India Company Court of Committees to Bantam, May 6, 1674, 10R E/3/88, 125 (fol. 63); and “Wee send you a Stock amounting to £8149:13:02. Wee send no more because of ye large effects you have in yor hands and also for that Wee Could Not gett Civill [Seville] & Mexicoe Mony. You must endeavor to perswade yt Kinge to accept of Pillar Mony for those Sorts yearly growe Scarcer.” East India Company Court of Committees to Bantam, May 10, 1676, 10R E/3/88, 299 (fol. 151). I owe special thanks to Prof. Philip J. Stern of Duke University for kindly collecting these choice quotes for me.

was a routine matter, causing great headaches for English and Dutch merchants, but mostly taken in stride by local money changers or *serrafs*.⁴¹ By the end of the decade of the 1640s, however, “Peru” coins got so unpredictable in their badness that they were not wanted at all. VOC and EIC traders, as well as Armenian, Banya, and Jain merchants, were forced to fob them off to distant corners of the Indian Ocean where consumers were not so savvy. In the end, there were always some merchants willing to buy debased “Dockany” pesos, as they were sometimes called, at severe discount. They would then either melt the coins down or ship them out yet again, much as happened in Seville, Genoa, and elsewhere in Europe and the Mediterranean.

There is ample evidence that Levantine merchants were as sharp as the King of Bantam in assaying coins. The same was no doubt also true in East Africa’s Swahili entrepôts and along the coasts of Arabia. Merchants knew how to move suspect coins, or to reject them. By contrast, official government reactions to the influx of bad money differed among the many kingdoms and empires of Eurasia just as they did within Spain’s own sprawling realms. It seems the Ottoman treasury suffered as a result of the Potosí fraud, as did Safavid Persia’s. States (and religious establishments) had to absorb toxic taxes and tributes.

China suffered, too, but its experience was different. As in India, the Chinese did not use the Spanish piece of eight as money within the empire, preferring to melt it, extract its copper, and produce ingots of varying size and weight. Merchants effectively put up a monetary firewall. The Mughals did the same, demanding that their border merchants produce rupees. Even so, the massive debasement of Potosí coinage in the 1640s bred lasting mistrust, making it easier to simply reject anything “Peruvian” outright. Those who had already been intoxicated were anxious to get past the hangover. Some praised Allah for Mexico. Others sought the fleeting silver of Japan.

11 Conclusion

This chapter has said nothing about the matter of fixing Potosí’s coinage, which entailed unwinding another skein of entangled credit relations. More convoluted still were the trials of dozens of mint fraud culprits, several of whom outlived the special prosecutor, who died in 1660 (see Sato, this volume).⁴² Yet another chapter could focus entirely on the hangover that afflicted Spanish

41 See Lane, “Money Talks.”

42 Bourbon reformer Pedro Vicente Cañete y Domínguez looked back on the great Potosí mint fraud of the 1650s, and he marveled at *visitador* Nestares Marín’s fix. Cañete also

America's regional money markets, including those of Chile, Buenos Aires, Quito, Venezuela, and Guatemala, where chopped and stamped toxic remnants circulated well into the nineteenth century.

The Potosí mint fraud hangover rippled throughout the globe, mostly harming indebted fiscal-military states (like Spain, France, and the Ottoman Empire) and small consumers (almost everywhere). By contrast, as we have seen in the cases of Genoa and Surat, and even Massachusetts, treating bad money as bullion could be profitable for some. Pragmatic princes like East Prussia's Frederick William remind us that not all was panic, and that "detox" could blend state and private initiatives. Even so, nobody needed a monetary headache in an era already marked by great uncertainty and more than a few calamities.

Hangovers eventually wear off, and Potosí's mint scandal faded from memory as the decades passed. In Potosí itself, the fraud became a folk legend. The Imperial Villa's coinage was already back to its full weight and purity in 1652, thanks to the tireless efforts of royal inspector and audiencia president, Francisco de Nestares Marín. The fix was permanent despite ongoing recall decrees, and eventually people came to trust the new "Pillars of Hercules" design, with its multiple dates and assayer initials. Toxic 1640s Potosí pesos gradually disappeared, worn out or melted into the general pool—although this took a long time in outlying provinces.

Unfortunately for Spain, Potosí itself suffered mightily from the effects of its own bad money binge. Output from the Cerro Rico spiraled downward for decades after 1650 before finally rebounding in the 1720s, lifted by major tax breaks, folk innovation, and ever more punishing labor regimes (Barragán and Scott, this volume).⁴³ In retrospect, the 1640s mint fraud might be seen as a last-gasp inflationary bubble that mimicked prosperity, aided by new silver finds in Potosí's hinterland (Los Lipes, Titiri, Berenguela, and Carangas; see Sato, this volume). When the bubble burst in 1650, the promise of these satellite camps fizzled, although others subsequently popped up.

Judging from inspector-general Nestares Marín's anguished correspondence with the king and Council of the Indies (and with his rival, Viceroy Salvatierra, also noted by Sato in this volume), he knew that if he succeeded in fixing Potosí's coinage, he would have to kill the city's notorious appetite for risk—precisely the "animal spirit" that had driven successive waves of bonanza and rebirth.

sorted out the math. See his *Guía Histórica, geográfica, física, política, civil y legal del Gobierno e Intendencia de la Provincia de Potosí* (Potosí: Editorial Potosí, 1952), 161–66.

43 On eighteenth-century labor in Potosí, see Enrique Tandeter, *Coercion and Market: Silver Mining in Colonial Potosí, 1692–1826* (Albuquerque: University of New Mexico Press, 1993).

Such was the paradox of early modern Spanish American precious metals mining: it only thrived in an atmosphere of hype and speculation. The subsequent rise of Galician mining entrepreneur Antonio López de Quiroga, as detailed by Peter Bakewell, could be seen as the exception that proved this new rule, yet little about this individual's approach to mining suggests irrational exuberance.⁴⁴ According to Bakewell, López de Quiroga was in fact almost the opposite of the "old-school" *minero* or *azoguero* (Zagalsky, this volume); he went from silver merchant or banker to silver producer, a cautious calculator of risk.

In the wider world, a certain monetary wariness prevailed after 1650. Even merchants from Japan, which had its own sources of silver, could not avoid the Potosí scandal since Japanese silver was also subject to assay and even counterfeiting. The whole episode, with its strange mix of copycat "absolutist" decrees, popular revolts, dubious arbitrage, and bureaucratic foot-dragging, taught everyone who handled silver coins of any kind to beware, to worry that some new revelation of fraud might wipe out savings or simply render an otherwise vital coin useless in everyday exchange, eroding interpersonal trust or reputation. Most people held their breath and followed the old adage about "la falsa moneda": just pass it on. Yet as Robert Bresson, inspired by Tolstoy, brilliantly showed, the ensuing wreckage could make a hangover look like small change. *Voici l'argent fondue.*

Primary Sources

- Archivio di Stato di Genova (Genoa State Archive): Finanzas, Monetarum Diversarum/Zecca Antica, Hileras 38–43
- Archivo General de Indias (AGI, Seville): Indiferente 767
- Archivo Histórico Nacional (AHN, Madrid): Consejos, 7144
- British Library (BL, London), East India Company (EIC) letter books, 103 (fol. 52); East India Company Court of Committees to Bantam, May 6, 1674, 10R E/3/88, 125 (fol. 63), East India Company Court of Committees to Bantam, May 10, 1676, 10R E/3/88, 299 (fol. 151)
- Geheimes Staatsarchiv Preußischer Kulturbesitz (East Prussia Archive, Berlin), subsection Staatsarchiv Königsberg: Etatsministerium: 99e/42–43 (Patent 16/6 1651, Patent 19/6 1651, Schreiben 22/6 1651, Schreiben 26/16 Juli 1651) 99a/81 (Münzwardein C. Melchior 8/6 1651).

44 Peter J. Bakewell, *Silver and Entrepreneurship in Seventeenth Century Potosí: The Life and Times of Antonio López de Quiroga* (Albuquerque: University of New Mexico Press, 1988).

“Premática en que su Magestad manda que toda la moneda de plata labrada en el Reyno del Perú se reduzga y ponga conforme a la ley.” Madrid, October 1, 1650. https://ddd.uab.cat/pub/pragmatiques/pragmatiques_80.pdf.

Bibliography

- Almeida, James. “Suspicious Possession: Policing Silver and Making Race in Colonial Potosí.” *Colonial Latin American Review* 30, no. 4 (December 2021): 545–64.
- Attman, Arthur. *Dutch Enterprise in the World Bullion Trade, 1550–1800*, translated by Eva and Allan Green. *Humaniora* 23. Göteborg: ACTA, 1983.
- Attman, Arthur. *American Bullion in the European World Trade, 1600–1800*, translated by Eva and Allan Green. *Humaniora* 26. Göteborg: ACTA, 1986.
- Bakewell, Peter J. *Silver and Entrepreneurship in Seventeenth-Century Potosí: The Life and Times of Antonio López de Quiroga*. Albuquerque: University of New Mexico Press, 1988.
- Barth, Jonathan E. “‘A Peculiar Stampe of our Owne’: The Massachusetts Mint and the Battle over Sovereignty, 1652–1691.” *New England Quarterly* 87, no. 3 (2014): 490–525.
- Boxer, Charles R. “Plata es Sangre: Sidelights on the Drain of Spanish-American Silver in the Far East, 1550–1700.” *Philippine Studies* (Manila) XVIII, no. 3 (July 1970): 457–78.
- Cañete y Domínguez, Pedro Vicente. *Guía Histórica, geográfica, física, política, civil y legal del Gobierno e Intendencia de la Provincia de Potosí*. Potosí: Editorial Potosí, 1952.
- Cipolla, Carlo. *Conquistadores, piratas, mercaderes: La saga de la plata española*. trad. Ricardo González. Buenos Aires: Fondo de Cultura Económica, 1998.
- Clark, Christopher. *Iron Kingdom: The Rise and Downfall of Prussia, 1600–1947*. Cambridge: Belknap Press, 2006.
- Crosby, Sylvester S. *Early Coins of America and the Laws Governing their Issue* [1875]. New York: Burt Franklin, 1970.
- Dasí, Tomás. *Estudio de los reales de a ocho, también llamados pesos, dólares, piastras, patacones o duros españoles*. 5 vols. Valencia: Sucesor de Vives Mora, 1950.
- Domínguez Ortiz, Antonio. “La falsificación de moneda de plata peruana a mediados del siglo XVII.” In *Homenaje a don Ramón Carande*, Vol. II, 143–55. Madrid: Sociedad de Estudios y Publicaciones, 1963.
- Domínguez Ortiz, Antonio. *Alteraciones andaluzas*. Madrid: Narcea Ediciones, 1973.
- Edvinsson, Rodney. “Early Modern Copper Money: Multiple Currencies and Trimetallism in Sweden, 1624–1776.” *European Review of Economic History* 36 (2012): 408–29.
- Elgin, Ceyhun, Kivanç Karaman, and Sevket Pamuk. “Debasements in Europe and their Causes, 1500–1800,” unpublished paper, June 2015. <https://cepr.org/sites/default/files/Pamuk%20-%20oslo%20text%20June%202015.pdf>.

- Hamilton, Earl J. *American Treasure and the Price Revolution in Spain, 1501–1650*. Cambridge: Harvard University Press, 1934.
- Hamilton, Earl J. *War and Prices in Spain, 1651–1800*. Cambridge: Harvard University Press, 1947.
- Kerth, Thomas, and George Schoolfield. *Life's Golden Tree: Essays in German Literature from the Renaissance to Rilke*. Columbia: Camden House, 1996.
- Knodell, Jane E., and Catalina M. Vizcarra. "Resource Endowments and the Problem of Small Change: Insights from Two American Mints, 1600–1700." *Financial History Review* 28, no. 3 (2021): 344–63.
- Lane, Kris. "Corrupción y dominación colonial. El gran fraude a la Casa de la Moneda de Potosí en 1649," *Boletín del Instituto de Historia Argentina y Americana "Dr. Emilio Ravignani,"* Tercera serie 43 (2015): 94–130.
- Lane, Kris. "Money Talks: Confessions of a Disgraced Cosmopolitan Coin of the 1640s." In *Commercial Cosmopolitanism? Cross-Cultural Objects, Spaces and Institutions in the Early Modern World*, edited by Felicia Gottmann, 72–91. London: Routledge, 2021.
- Mossman, Philip L. *Money of the American Colonies and Confederation: A Numismatic and Historical Correlation*. New York: American Numismatic Society, 1993.
- Mossman, Philip L. "The Potosí Scandal and the Massachusetts Mint." *The Colonial Newsletter* 48, no. 2 (2008): 3289–3309.
- Mossman, Philip L. *From Crime to Punishment: Counterfeit and Debased Currencies in Colonial and Pre-Federal America*. ANS Numismatic Studies 27. New York: American Numismatic Society, 2013.
- Parker, Geoffrey. *Global Crisis: War, Climate Change and Catastrophe in the Seventeenth Century*. New Haven: Yale University Press, 2013.
- Peterson, Mark A. "The World in a Shilling: Silver Coins and the challenge of Political Economy in the Early Modern Atlantic World." In *Early Modern Things: Objects and their Histories, 1500–1800*, edited by P. Findlen, 252–73. New York: Routledge, 2013.
- Seco Serrano, Carlos, ed. *Cartas de Sor María de Jesús de Ágreda y de Felipe IV*. BAE T.108. Madrid: Atlas, 1958.
- Spooner, Frank C. *The International Economy and Monetary Movements in France, 1493–1725*. Cambridge: Harvard University Press, 1972.
- Tandeter, Enrique. *Coercion and Market: Silver Mining in Colonial Potosí, 1692–1826*. Albuquerque: University of New Mexico Press, 1993.
- TePaske, John J. *A New World of Gold and Silver*. Edited by Kendall Brown. Leiden: Brill, 2010.
- Verdussen, Hieronymus. *Ordonnantie des Coninghs op het reglement van siine munte*. Antwerp: H. Verdussen, 1652.
- Weber, Klaus. "Linen, Silver, Slaves, and Coffee: A Spatial Approach to Central Europe's Entanglements with the Atlantic Economy." *Culture and History* (CSIC Madrid) 4, no. 2 (2015).

From the Ratio to Rothschild

Silver and Quicksilver—Recovering the Past for the Future in Nineteenth-Century Potosí (1800–1858)

Tristan Platt

1 Introduction

In this final chapter, I shall examine the role of quicksilver in the silver-refining economy of Potosí before, during, and after the War of Spanish American Independence (1810–1825).¹ Quicksilver (or mercury) had, since 1573, been the essential ingredient for refining by amalgamation all but the richest of Potosí's silver ores (which could be hammered or smelted with lead). It was first supplied to Potosí from the cinnabar mines of Huancavelica, in Peru, to amalgamate the ores that Andean wind furnaces (*wayras*) had left unsmelted since the Spanish first learned of the Rich Mountain in 1545.² The installation of industrial amalgamation in Pachuca (New Spain) by Bartolomé de Medina in 1555, in Guadalcanal (Spain), in Huamanga (Peru, 1565), and then in Potosí (upper Peru) in 1573, with the ensuing worldwide avalanche of silver coins, heralded

1 Bolivian sources were consulted and photocopied during a project on “Mining and Andean Space” (1980–1982) with the Institute of Peruvian Studies (Lima), the National Archive of Bolivia (Sucre) and the Potosí Historical Archive. Correspondence in the Rothschild Archive London (RAL) was consulted in 2004–5 and in 2010–11, during a fellowship at the Institute for the Study of the Americas (University of London). I am grateful to Guillermo Mira Delli-Zotti and Julio Sánchez Gómez at the University of Salamanca; to Juan Marchena and the Universidad Pablo de Olavide (Seville); to the General Archive of the Indies (Seville); to the British Library (London); and to the Carnegie Foundation (Scotland) for a visit to the Archive of the Banque Rothschild held by the Archives Nationales du Monde du Travail (Roubaix). Thanks, too, to Concepción Gavira, Alejandra Irigoín, Saúl Guerrero, the editors of this volume, and the anonymous reviewers for their comments.

2 Carlos Sempat Assadourian, “Base técnica y relaciones de producción en la minería de Potosí,” in *Ciencia, Vida y Espacio en Iberoamérica*, T.11, ed. José Luis Peset (Madrid: CSIC, 1989); Ana María Presta, “La Compañía del Trajín de Azogues de Potosí: Un capítulo inédito de la financiación de los repartimientos indígenas surandinos al desarrollo de la minería colonial,” *Boletín del Instituto de Historia Argentina y Americana “Doctor Emilio Ravignani”* 43 (2015): 31–58; Tristan Platt and Pablo Quisbert, “Tras las huellas del silencio: Potosí, los incas y el virrey Toledo,” *Bulletin de l’Institut Français d’Études Andines* 37, no. 2 (2008):1–32.

the appearance of industrial as well as mercantile capitalism and was a key alchemical technology that made possible the early modern transformation of the world economy.

But the amount of silver that could be amalgamated with each pound (or quintal of one hundred pounds) of quicksilver, involving different ores, refiners, and refining recipes at different times and places, was a recurring theme of debate.³ Here I will examine the ratio of quicksilver to silver as amalgamated in Potosí, first, from 1800 to 1811—when the Rich Mountain belonged to the upper provinces of the viceroyalty of La Plata, with its capital in Buenos Aires—and then during the first period of the War of Independence, from 1811 until December 1815, when cheap state quicksilver supplies from the great cinnabar mines at Almadén in Spain came to an end. Meanwhile, control over upper Peru was disputed between the insurgent provinces of La Plata, in alliance with upper Peruvian guerrillas, and Spanish troops based in Potosí and Oruro but dependent on Lima, capital of the old viceroyalty of Peru.

In 1816, the United Provinces of La Plata declared Argentine independence from Spain at the Congress of Tucumán, and the Spanish general, Joaquín de la Pezuela, moved from Potosí to Lima to assume the defense of the Peruvian viceroyalty (including Potosí). He sent a final consignment of Spanish quicksilver

3 For the chemistry of amalgamation, see David Johnson and Karl Whittle, "The Chemistry of the Hispanic-American Amalgamation Process," *Journal of the Chemical Society, Dalton Transactions* 24 (1999): 4239–43. Saul Guerrero, "Chemistry as a Tool for Historical Research: Identifying Paths of Historical Mercury Pollution in the Hispanic New World," *Bulletin for the History of Chemistry* 37, no. 2 (2012): 61–70: "Mercury plays a double role in ... silver amalgamation. On the one hand, it is a chemical reagent that forms native silver and calomel by reducing the fraction of silver chloride present in the amalgamation mix. On the other hand, it also acts to form the physical mix with the elemental silver that is called an amalgam, and as such is the fraction of mercury that is potentially recoverable from every cycle of the process." The art of refining included toasting silver sulfides, crushing and sieving the ore to mineral flour, then amalgamating the powdered silver in it by adding quicksilver, salt, water, and the magistral of copper or iron before washing the rubbish away. Numerous texts and treatises on silver amalgamation in America were produced from the sixteenth to nineteenth centuries. Ore classification in Potosí, and the combination of ores with different magistral, still await ethnochemical analysis. Cf. Alonso Barba, *El Arte de los Metales* (Potosí: Colección de la Cultura Boliviana, [1640] 1967); Anonymous, "Las adiciones y rectificaciones al Padre Barba" (Potosí: [early nineteenth century] 1967); Inocente Agustín Telles, *Principios Físico-Químico-Prácticos en memorias para extraer la plata que contengan los minerales* (Chuquisaca: Imprenta Boliviana, 1831); Modesto Bargalló, *La minería y la metalurgia en la América española durante la época española* (Mexico: Fondo de Cultura Económica, 1955); Tristan Platt, "The Alchemy of Modernity. Alonso Barba's Copper Cauldrons and the Independence of Bolivian Metallurgy (1790–1890)," *Journal of Latin American Studies* 32, no. 1 (2000): 1–54.

from Lima to Potosí in 1817, which lasted until 1819. But guerrillas and local autonomies (*republicuetas*) in upper Peru continued resisting Spanish control until, in 1824, Grancolumbian general Antonio José de Sucre, coming down from the north with Simón Bolívar (who went to Lima), won a decisive victory against Crown forces at the battle of Ayacucho.⁴ Both Lima and Buenos Aires were then rejected in August 1825 by the emerging Bolívar Republic (Bolivia), based on the colonial Audiencia of Charcas, with a large indian majority and its capital and provisional seat of government in Chuquisaca.⁵

Straddling the pre- and post-independence periods, I will then look at quicksilver and refining during the first decades of independent Potosí (1825–1858). In 1825, the refiners' guild, the Royal Mining Bank of San Carlos and the Royal Mint (formed or re-established in 1779 by Spanish intendent Jorge Escobedo) became key institutions in early republican Bolivia. Renamed the National Mining Bank and the National Mint in the new prefecture of Potosí, they continued to depend on imported Spanish quicksilver for Bolivian refiners to amalgamate and produce molds (or “pineapples,” *piñas*) of semi-refined silver. These were sold by the miners to the bank to be cast into refined silver bars of eleven dineros, and the bars were sold by the bank to the mint to be squeezed into rails, cut into discs, and stamped into coin.⁶

4 John Lynch, *Latin America between Colony and Nation: Selected Essays* (London: Macmillan Press, 2001); José Luis Roca, *Ni con Lima ni con Buenos Aires: La formación de un Estado nacional en Charcas* (La Paz: Plural editores, 2007); María Luisa Soux, *El complejo proceso hacia la independencia de Charcas (1808–1826): Guerra, ciudadanía, conflictos locales, y participación indígena en Oruro* (Lima: Institut Français d'Études Andines, [2010] 2015). A few months after Ayacucho, Colonel Carlos Medinaceli seceded from the absolutist General Pedro Olañeta, defeating him in the last battle of the war in Charcas at Tumusla, Chichas. Medinaceli was then named governor of Chichas province by English general William Miller, president of Potosí. AHP PD 3, Potosí, 20 August 1825.

5 The first choice of capital for Bolivia was Cochabamba; Chuquisaca was not named Sucre until 1840. Different cities were chosen as seats of government by successive presidents until after the War of the Pacific (1879–83).

6 On Spanish quicksilver supplies during the War of Independence, see Guillermo Mira Delli-Zotti, “El Real Banco de San Carlos de Potosí y la Minería Alto Peruana Colonial, 1779–1825,” in Julio Sanchez, Guillermo Mira Delli-Zotti, and Rafael Dobado, *La Savia del Imperio* (Seville: Ediciones Universidad Salamanca, 1997); Guillermo Mira Delli-Zotti, “Panorama de la organización y las bases de la producción de plata en Potosí durante el período colonial (1545–1825),” in *Potosí, Plata para Europa*, ed. Juan Marchena Fernández, and María José Villa Rodríguez (Seville: Universidad de Sevilla, Fundación El Monte, 2000). See also Table 11.2 in this chapter. Also Kendall W. Brown, “La distribución del mercurio a finales del período colonial, y los trastornos provocados por la independencia hispanoamericana,” in *Minería Colonial Latinoamericana*, ed. Dolores Ávila, Inés Herrera, and Rina Ortiz (México: Instituto Nacional de Antropología e Historia, 1992), 155–66; and Fernando Cajías, *La Provincia de Atacama, 1825–1842* (La Paz: Instituto Boliviano de Cultura, 1977).

During the late eighteenth and early nineteenth centuries, Bourbon ministers in Madrid were well aware of the strategic importance of cheap quicksilver supplies on credit for the future of Spanish colonial rule in America. Beginning in 1779, the viceroyalty of La Plata licensed the transport of Spanish quicksilver by cart from Buenos Aires via Tucumán to Salta and Jujuy, thence by mule to the Bank of San Carlos in Potosí and so on to the northern treasuries of the viceroyalty in Carangas, Oruro, La Paz, and finally Puno on the shores of Lake Titicaca.

In 1810, following Créole pronouncements and assemblies (*juntas*), and colonial repression in Chuquisaca and La Paz during 1809, Juan José Castelli from the United Provinces of La Plata advanced north as far as the lake. Blocked by royalist troops from Peru at Guaqui, he returned south to occupy Potosí, where, in December 1810, he executed the repressive Spanish intendent, Francisco de Paula Sanz. Potosí was then occupied by revolutionary patriots from La Plata during 1810–11, again for nine months in 1813, and for another six months in 1815,⁷ until, in 1816, the Rich Mountain and the city were recovered for the viceroyalty of Peru by the royalist Pezuela during the remainder of the war.

From January 1816, Spain ceased sending cheap quicksilver to Montevideo, Buenos Aires, and upper Peru. But in 1817, a final 3,000 quintals were sent to Potosí via Arica by Viceroy Pezuela from stocks in Lima; and until 1819, Potosí's Royal Bank of San Carlos still sold cheap quicksilver to the refiners, although credit was suspended.⁸ Thereafter, and until 1831, Potosí refiners and the bank had to depend on more expensive quicksilver direct from merchant ships reaching Arica or Cobija via Cape Horn and Valparaiso. But these merchants were also unwilling to give credit.⁹ The lack of cheap quicksilver on credit from

7 Carlos Sempat Assadourian and Silvia Palomeque, "Los circuitos mercantiles del 'Interior Argentino' y sus transformaciones durante la Guerra de la Independencia (1810–1825)," in *La Historia económica y los procesos de independencia en la América Hispana*, ed. Susana Bandieri, 40–70 (Buenos Aires: AAHE-Prometeo Libros, 2010).

8 AHP EN 200, f.600 sgg. "Responsabilidad mancomunada de los Diputados del Ilustre Gremio de Azogueros caucionando la seguridad del empréstito de 50,000 pesos que hace el Real Banco de San Carlos para compra de azogues. Potosí, 27–30 October, 1819."

9 See, for example, AHP BNRP 115 Libro de Actas, 58v. Lamar [= Cobija], 8 January, 1831: "A los Señores Ministros del Banco Nacional de Rescates de Potosí. El conductor José Abelino Ortiz de Aramayo ha entregado en Tesorería los diez mil pesos que vs remite para emplear en la compra de Azogues; y se ha podido berificar en el numero de 150 quintales al precio de 55 pesos [/quintal]. Hoy empiezan a salir algunas partidas a Calama, en donde he tomado ya medidas para que con la posible brevedad lleguen a ese punto [Potosí]. Luego que se me presente la razon de los fletes pasará a Ud la cuenta con los respectivos documentos que acrediten su imbercion. Es imberificable conseguir a menos presio esta especie cantidad que el Supremo Gobierno quiere que se negocie con plazos hasta veinte

1816, prolonged after 1819, was a serious blow that will have shaken refiners' faith in the Spanish Crown.

In nineteenth-century Potosí, as in earlier centuries, refiners' attention to quicksilver prices and credit was accompanied by concern over the amount of silver that could be refined with each pound (or quintal) of quicksilver. This relation—known in Spain, Mexico, and the Andes as *el correspondido* (“the ratio”)—was used by the Royal Mining Bank until 1816, and by the National Mining Bank after 1830, to calculate the amount of quicksilver to advance weekly to each refiner. The ratios applied were derived from the quantity of quicksilver advanced by the bank to each refiner during the previous week to produce the current week's quantity of silver (although some refiners' resort to market and other sources of quicksilver made the calculation inexact, as we shall see). In 1831, the use of the ratio returned (with similar imprecisions) until the mid-nineteenth century.

Quicksilver is a liquid metal, condensed from the vapor of roasted cinabar, whose deposits are found mainly in the Iberian peninsula (Almadén and Asturias), Austro-Hungary (Idria in today's Slovenia), Italy, and around the Pacific Rim (particularly in China, California, and Peru, with a little in Mexico and Chile).¹⁰ During Sucre's government of Bolivia (1825–1828), private speculators with Spanish quicksilver on the Pacific coast supplied most of Potosí's quicksilver, eager for cash down payments of “strong” silver *pesos de a ocho reales* (“pieces of eight”), each peso containing ten dineros twenty granos of silver. Minted in Potosí, these coins commanded a premium in Buenos Aires and London, and they were independent Bolivia's first response to the demands of world trade.

However, in 1829 the new government of Andrés Santa Cruz began to mint “weak” coins of eight dineros in low denominations to serve as small change in the Bolivian internal market, leaving “strong” pesos to be exported as specie. Bolivian weak coins spread far and wide to the internal markets of Argentina, Peru, and Ecuador, even Cuiabá in Brazil.¹¹ Strong and weak coins were of different denominations and usually had different destinations, so they did not compete directly.¹²

y treinta mil pesos; porque los que se presentan con este artículo ecsijen el dinero de contado y no quieren dar a credito ... = Gabino Ybañez.”

10 Bolivia also has a little, but in 1838 prospecting at the quicksilver deposits of Carvisa was abandoned for lack of production. Bolivia also participated in early Peruvian attempts to launch the “Huancavelica Society.”

11 Antonio Mitre, *El monedero de los Andes* (La Paz: Plural, 1986).

12 Under José Ballivián (president 1841–1847), refiners requested the bank to pay for their silver half in weak coinage to pay their workers and half in strong to buy quicksilver and

On July 2, 1830, Santa Cruz attempted to inject dynamism into the mining industry by ordering \$10,000 in strong pesos to be taken from the funds of the Mining Bank and delivered to the refiners as credits (*auxilios*), with another \$10,000 to come from the (delayed) Indian tribute for September 1829. The bank ministers objected, and the refiners then pressed for \$10,000 to be used to buy quicksilver on the Pacific coast, which would be deposited in the bank and advanced each week to the refiners against delivery of the previous week's silver production, as in the late colonial period until 1819.¹³ In August 1830, several refiners even signed a pledge that they would buy quicksilver from the bank, staking the value of their properties.¹⁴ And in January 1831, the government authorized the Bolivian consul in Valparaiso, Dámaso de Uriburu, to buy quicksilver as cheaply as possible with money sent from Cobija for resale to the Potosí miners at (or even below) cost.¹⁵

With the continued development after independence of Chile's silver mines in the Norte Chico (Copiapó), and the consolidation of the route from Cádiz and Montevideo via Cape Horn, the port of Valparaiso emerged as a new hub for the quicksilver trade in the South Pacific, replacing Buenos Aires on the Atlantic.¹⁶ But costs from Valparaiso to Bolivia's port at Cobija were high. The Bolivian Mining Tribunal¹⁷ even proposed paying 9% premium to

other imported inputs; the bank proposed that they should pay for their quicksilver in the same coinage that they received in exchange for their silver. See Tristan Platt, "Estado tributario y librecambio en Potosí durante el siglo XIX: mercado indígena y lucha de ideologías monetarias," in *América Latina: Dallo Stato Coloniale allo Stato nazionale*, ed. Antonio Annino et al. (University of Turin: Franco Angeli, 1987).

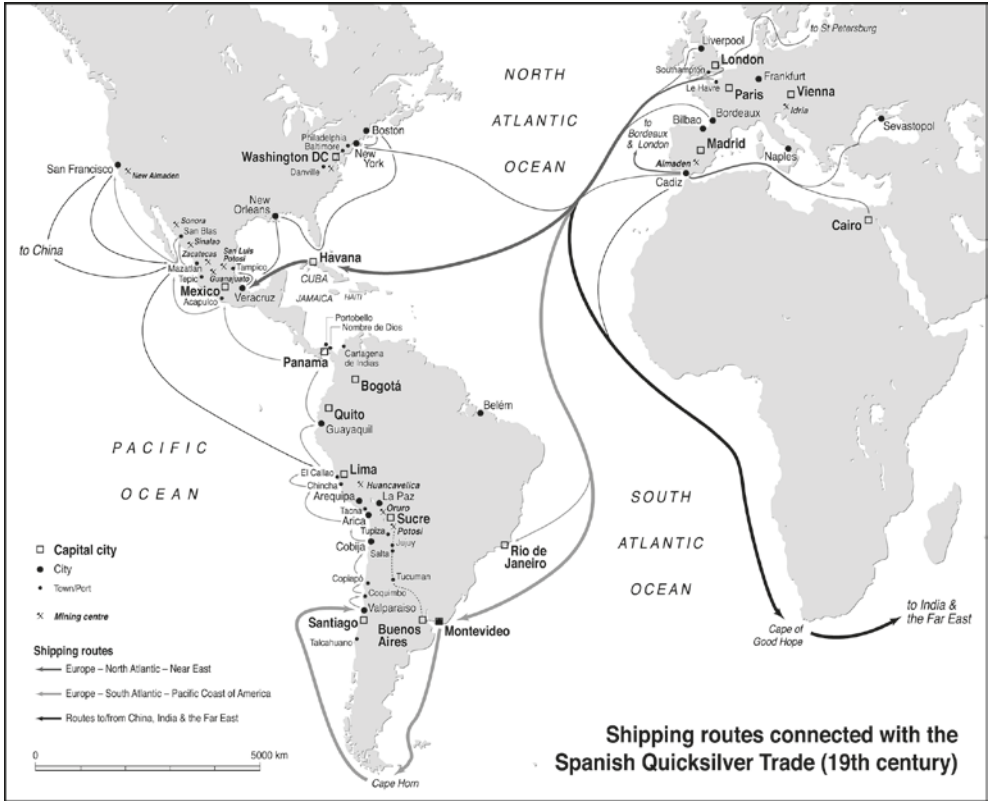
- 13 AHP PD 91, no. 87 (*Correspondencia de varios*), Martín Jaureguí to the Prefect, Presidency of the Mining Tribunal, Potosí November 29, 1830. On Jaureguí, an experienced miner and refiner, see Platt "The Alchemy of Modernity," 39–42.
- 14 AHP EN 356, 1829–31, fs. 179. August 17, 1830: "Caución de 10.000 pesos que otorguen los señores Azogueros con las fincas que se espresan."
- 15 In the bank, low prices for one consignment were balanced against higher prices for others. See William Lofstrom, *Dámaso de Uriburu, un empresario minero* (La Paz: Empresa Editora Gráfica [1973] 1982). In 1836, the bank sent the Spanish miner Clemente Sánchez de Resa to London to buy \$70,000 of quicksilver direct from Rothschild, paying Sánchez de Resa \$10,000 for expenses. He left his hacienda, mines, and mill in Portugaleta, Chichas, as guarantee. See AHP EN 411, August 29, 1836.
- 16 Eduardo Cavieres, *Comercio chileno y comerciantes ingleses, 1820–1880* (Santiago de Chile: Editorial Universitaria, 1988). For silver mining in the Chilean Norte Chico, see Leland Pederson R. *The Mining Industry of the Norte Chico* (Illinois: Department of Geography, Northwestern University Studies in Geography 11, 1966).
- 17 The tribunal, already mooted in the late colonial period, was requested in 1826 by the Refiners' Guild to replace the Directory of Mines. It was finally founded in 1829 on the Mexican model by President Santa Cruz, but was suspended by the president in 1836 because its members, all miners and refiners, would not accept clauses protecting the

cover embarkation, disembarkation, transport from Valparaiso to Cobija, and insurance—all to be reimbursed by the Potosí Refiners' Guild.¹⁸

Unlike Argentina and Peru, Chile chose to defend her own "strong" monetary system by refusing to accept Bolivian "debased" small change (*feble*). In 1836, Chilean and Colombian ounces appeared in tribute delivered by the governor of Lipez Province to the Potosí Treasury, collected from Indian muleteers and llama herders.¹⁹ These tributaries descended regularly from the Altiplano to collect flasks of quicksilver in Calama (a depot town and desert canton inland from Cobija) and were paid to transport them up the Cordillera to San Cristobal de Uyuni, south of the great saltlick at 4,000 meters above sea level, and on to Potosí; or, following the trail west of the saltlick, to Carangas, Oruro, and La Paz (see Map 11.1).²⁰ In the 1830s, then, the transport of quicksilver from Calama to the Potosí Mining Bank was paid for with Chilean (or Colombian) ounces, which were then used in Indian tribute payments; in exchange, bags (*talegas*) weighing one hundred ounces of silver,

mine workers in Santa Cruz's new mining code. Bolivian mining therefore continued subject to the *ordenanzas* of Mexico.

- 18 ANB MH T.29, no 9. TGM *recibidos* 1832. Spanish quicksilver was transported in iron flasks from Almadén to Seville and Cádiz, then by sea to London and canal to Liverpool, thence to Montevideo, Valparaiso, and Cobija, and finally up the Cordillera via Calama and Canchas Blancas to Potosí, Oruro, and beyond. Argentine muleteers took other imports from Cobija via Calama and Chiu-chiu to San Pedro de Atacama, Jujuy, and Salta; Argentine mules went north from Cobija to southern Peru, crossing the river Loa to Iquique, Tarapacá, and Arica. Cf. Tristan Platt, "Tiempo, movimiento, precios: Los caminos del azogue español de N. M. Rothschild entre Almadén, Londres y Potosí. 1835–1848," *Diálogo Andino* 49 (2016): 143–65.
- 19 AHP PD 244. Subprefectura de Nor Lipez [sic], 1836, no. 5, P. Mariano Zenteno, Gobernador, to the Prefect. San Cristobal, July 31: "En el enterro del semestre pasado de Navidad, le decorbieron [sic] a my apoderado cuarenta y tantas onzas entre chilenas y colombianas, y no las recibieron; y en la actualidad, por este motibo no quiero resebir dhas onzas, pero como de los fletes que les satisfacen en Calama son en estas onzas no tienen otra moneda." With a note from Mariano Revilla, August 11, 1836: "por Supremas Ordenes ... esta mandado se proiva enteramente la circulacion de las onzas del Cuño antiguo de Chile, por haberse suscitado una entera desconfianza en el Comercio de la Republica. Por esta última Suprema Orden se ordena a que se reciban las del Nuevo Cuño que ha establecido aquel Gobierno; en su virtud, puede mandar que el S. Gobernador de Lipez reciva las que se presenten de estas Segundas en el cobro de la Contribucion Yndigenal, y de ningun modo las primeras ..." Cf. Tristan Platt, "Ethnic Calendars and Market Interventions among the Ayllus of Lipes during the Nineteenth Century," in *Ethnicity, Markets, and Migration in the Andes*, ed. Brooke Larson, Olivia Harris, and Enrique Tándeter (Durham: Duke University Press, 1995).
- 20 Platt, "Tiempo, movimiento, precios."



MAP 11.1 Quicksilver flows between Europe, America, and the Far East

each containing 1,200 strong pesos (*fuertes*), were sent down on muleback from Potosí to Calama, Cobija, Valparaiso, and thence to Montevideo and Europe.²¹

Prices increased again when the Spanish Crown, now separated from its former colonies, contracted out the sale of quicksilver from Almadén to private merchant houses in Europe in order to pay the interest on its external debt.²² In 1830, Iñigo Ezpeleta of Bordeaux, and from 1835 Spain's main creditor, Nathan

21 See AHP EN 239, for the appointment, in 1833, of the Chilean Bartolomé Navarrete by the Mining Tribunal as *conductor* of quicksilver from Cobija to Potosí, for two years renewable, at 2% of the value of quicksilver in Potosí and 1% of the strong pesos taken down to the coast in payment. But Navarrete seems to have spent most of his time in the Chichas mining district, leaving his guarantors—Benito Martinez, founder in the Potosí Mint, and his wife Francisca Velasco from Buenos Aires—to take care of the transport of the quicksilver so as not to lose the *hacienda* they had given in guarantee for Navarrete. See AHP EN 334, September 25, 1835.

22 Victoriano Martín Martín, *Los Rothschild y las minas de Almadén*. Instituto de Estudios Fiscales, Ministerio de Hacienda (Madrid: Fábrica Nacional de Moneda y Timbre, 1980).

Mayer Rothschild and Sons of London,²³ used their monopolies to seek high quicksilver prices all over the world. Rothschild sold flasks in Mexico through his commissions agents, de Drusina and Lionel Davidson, and in the South Pacific through his agent in Lima, Tacna, and Valparaiso, Huth Gruning, a subsidiary of Rothschild's "friend," Frederik Huth of London and Liverpool.²⁴ In 1848, however, Rothschild cannily withdrew from the Spanish contract just as cheap Californian quicksilver, produced in New Almadén near San Francisco by the English merchants (and smugglers) Barron, Forbes of Tepic and San Blas, was entering the Pacific mining markets distributed by another powerful English merchant company, specialized in Latin American trade: Anthony and William Gibbs.²⁵

From 1850 to 1852, Rothschild decided to sell quicksilver accumulated by the Spanish Crown, and in 1856 he took up the contract again for a few years, in competition with Barron, Forbes and Gibbs. In 1866, when Californian quicksilver began to be sent to the new silver mines and refineries in Washoe, Nevada (US), Rothschild took up the Spanish contract for the last time, maintaining it until 1921.

The main attraction of South America and Mexico for Rothschild lay in the constant demand for Spanish quicksilver among American silver refiners, whose purchases generated an inverse and equally steady supply of "strong" silver coins, with a premium on their face value, to be used in international trade or as bullion. This raises the question (to which we will return) of how Bolivia could pay for quicksilver under the protectionist governments of Belzu and Córdoba (1848–1857) when, for several years, the minting of "strong" coinage was suspended and only "weak" coinage circulated.

Many colonial refining structures persisted, or were recovered, during what we may call the "neo-Bourbonic" years of early republican silver mining. Only in 1873 did amalgamation begin to lose its importance in Bolivia, when the export of uncoined silver and unamalgamated silver ore was legalized under

23 The Rothschilds had loaned Spain 15 million francs to pay the interest on the Cortes bonds issued during the liberal triennium (1820–23). See Tristan Platt "Spanish Quicksilver: A Preliminary Note. The London Market, Global Trade and the Rothschild Monopoly," *The Rothschild Archive: Review of the Year* (London 2010–11).

24 Frederik Huth had moved to England in 1809 from Hamburg and become a "friend" (business ally) of N. M. Rothschild. He specialized in trade with Spain and Spanish America, as well as Germany, and allied with Johannes Gruning, another German migrant from Bremen. See Manuel Llorca-Faña, *The Globalization of Merchant Banking before 1850: The Case of Huth and Co.* (London: Routledge, 2015).

25 Martín Martín, *Los Rothschild*, 1980; cf. RAL Correspondence of Ezpeleta, Drusina and Lionel Davidson.

political pressure from Bolivia's emerging silver patriarchs.²⁶ Amalgamation finally ceased in the 1890s following the introduction from the US of silver refining with cyanide.

To understand the vital role of quicksilver in the process of silver production before and after independence, we must observe the treatment of the silver ore brought down from the Rich Mountain to the city.

After being sorted at the minehead, the ore was loaded onto llamas, or Indian *cumuris* (*k'umu* Quechua = "hunchback"), and taken down to one in the long line of hydraulic stamping mills built along the Rivera.²⁷ There, the ores were crushed on a mortar by heavy copper- or iron-headed drophammers, lifted and left to fall by the rotating axis of a large waterwheel suspended between two stone walls (*castillos*). The axis, protruding on each side of the walls, formed the two "heads" (*cabezas*) of the mill; the wheel was driven round with water channeled onto it from the Rivera and the reservoirs built above the city back in the 1570s by Viceroy Toledo.

The "mineral flour" was then sieved, sifted, and stored before being tipped out onto the mill yards for amalgamation with quicksilver under the bare feet of Indian "trampers" (*repasiris*; see Figure 11.3). Silver was extracted from the ore by chemical reactions and then amalgamation with the quicksilver to form the *pella* (amalgam). The waste was then washed down the canals and sluices, inevitably taking a little silver and quicksilver with it, which was collected by other workers downstream. The washed amalgam remaining in the yard was squeezed in a press and then volatilized with an alembic to recover as much quicksilver as possible for reuse, before burning off further traces while turning the semi-refined silver into *piñas* for the bank.

I will be concerned particularly with the process of amalgamation in the yards along the Rivera and with attempts to determine the amount of silver amalgamated with each pound of quicksilver (the "ratio").²⁸ This calculation

26 Antonio Mitre, *Los patriarcas de la plata* (Lima: Instituto de Estudios Peruanos, 1981).

27 One of the wealthiest Potosí refiners before and after independence was, however, Pedro Laureano Quesada from Arequipa, who relied on surface collection rather than deep mining. His ore was mainly gathered in the waste heaps and sorted by women ore collectors (*palliris*). From the 1830s until the 1850s, he became the next most profitable refiner in Potosí, after the deep-mining brothers from Salta, Francisco de Paula and Serapio Ortiz. See Tristan Platt, "Historias unidas, memorias escindidas: las empresas mineras de los hermanos Ortiz y la construcción de las élites nacionales. Potosí y Salta, 1800–1880," *ANDES* 7 (1996): 137–220.

28 In the provinces, a new version of Alonso Barba's copper cauldrons was widely adopted; this enabled amalgamation by boiling in only twenty-four hours. See Tristan Platt, "The Alchemy of Modernity," and "Caccheo y minería mediana en las provincias de Potosí: López

was used in Spain to determine broadly how many quintals of one hundred pounds of quicksilver should be sent to each viceroyalty and mining district according to its annual silver production (see Table 11.1). In the mining districts it was used by the banks and treasuries to calculate how many pounds of quicksilver should be advanced each week to each refiner, according to his or her production during the previous week. But refiners with rich ores might buy additional, more expensive quicksilver on the open market, thus increasing their silver production for selling to the bank without limiting themselves to bank quicksilver.

However, the bank, keen to save on quicksilver advances while maximizing the silver received from refiners, also pressed for an “official” ratio of 1.6 marks per pound of quicksilver, which was higher than the ratios actually achieved by the refiners in their mill yards. The ratio of 1.6 also appears in New Spain at Guanajuato, Zacatecas, and Guadalupe during the colonial period.²⁹ There was clearly a debate by refiners and bank ministers between the northern and southern viceroyalties, and this was taken up after independence by the Potosí bank in the face of individual refiners’ ratios, which were much lower (see Table 11.8).

Hence the discussion concerning the number of silver marks to be amalgamated with each pound of quicksilver. In eighteenth-century Mexico and Peru, one pound of quicksilver was often said to refine one mark of eight ounces of silver. However, in 1785, intendent Jorge Escobedo wrote from Lima to Minister José de Gálvez in Spain that ratios could not be used to match silver production to quicksilver consumption because poorer refiners sometimes gave ores to private lenders (*aviadores*) in exchange for quicksilver, which escaped the accountancy of the Crown treasuries. Or they might receive quicksilver from one treasury while selling their silver to another, producing distortions in the apparent ratios of both, as occurred at Huantajaya near Iquique in southern Peru.³⁰

y Porco (1830–1850),” *Estudios Atacameños. Arqueología y Antropología Surandinas* 48 (2014): 85–118.

29 Guerrero, “Chemistry as a Tool for Historical Research” (2012, Table 1).

30 John Fisher, *Silver Mines and Silver Miners in Colonial Perú, 1776–1824* (Liverpool: Centre for Latin American Studies, University of Liverpool, 1977). María Concepción Gavira Marquez, *Historia de una Crisis. La Minería en Oruro a fines del período colonial* (Lima: Institut Français d’Études Andines, 2006) and *Población indígena, sublevación y minería en Carangas. La Caja Real de Carangas y el mineral de Huantajaya, 1750–1804* (Arica: Institut Français d’Études Andines, Centro de Investigaciones del Hombre en el Desierto, 2008). Deep mining at the quicksilver mine of Santa Barbara in Huancavelica itself was suspended in 1786, although small-scale production by *pallaqueros* continued, and some new mining companies were established in the nineteenth century. See

Until 1819, the Refiners' Guild of the Potosí Rivera continued to buy cheap quicksilver in the Royal Bank of San Carlos. However, we can distinguish periods when the ratio reflects advances of cheap quicksilver by the bank from others when refiners bought additional, more expensive quicksilver in the open market while continuing to sell their silver to the bank. As we shall see, this distinction is reflected in fluctuations in the size of the *apparent* "ratio" between 1816 and 1822 (Figure 11.1).

Ratios were also used to project future silver production and quicksilver demand. In 1785, for example, Escobedo aimed for a future annual production in Peru of 540,000 marks, which (he believed) would require 6,000 quintals (600,000 pounds) of quicksilver each year (in 1784, only 305,000 marks had been produced).³¹ In Potosí, too, we can distinguish "past" from "target" ratios. Thus, what in 1827 appeared as the (average) ratio of the last colonial decade (1.6 marks for each pound of quicksilver) became a target ratio for the bank in the early republican period (see Table 11.5). But 1:1.6 was considerably more than Potosí refiners' actual individual ratios, which were scattered around 1:1, as we will see in the *visita* (inspection) of eight mills carried out on the Rivera in 1837–1838. The higher ratio of the pre-war years, prolonged "officially" by the bank after independence, may have been designed to protect the bank's solvency by requesting more silver from refiners in exchange for each pound of quicksilver advanced, regardless of actual refining practices.

However, the ratio held little interest for the European merchant bankers who contracted with the Spanish Crown from 1830 to sell the quicksilver of Almaden. Instead of trying to improve what might appear to be an indispensable technical calculation, Rothschild paid no attention to the ratio (although it was sometimes mentioned in his agents' letters), preferring to respond to and "play" the market, sometimes staggering shipments (like an angler) to draw out demand. The transition after Bolivian independence between these

Mervyn Lang, "El derrumbe de Huancavelica en 1786," *Histórica* x, no. 2 (1986): 213–26; Carlos Contreras and Ali Díaz, "Los intentos de reflotamiento de Huancavelica en el siglo XIX," *Doc de trabajo* 261 (Lima: Pontificia Universidad Católica del Perú, 2007); José Deustua, *La minería peruana y la iniciación de la República, 1820–1840* (Lima: Instituto de Estudios Peruanos, 1986). After independence, until the arrival of cheap Californian quicksilver in 1850, Huancavelica and Chonta produced up to 50% of the quicksilver needs of the Republic of Peru; see RAL Correspondence with Huth Gruning; and Tristan Platt, "Container Transport: From Skin Bags to Iron Flasks. Changing Technologies of Quicksilver Packaging between Almadén and America (1780–1840)," *Past & Present* 214 (2012): 205–53.

31 Fisher, *Silver Mines* (Chapter 5). This ratio comes out at one pound of quicksilver to 0.9 marks.

two modes of relating quicksilver demand and supply forms the wider context of this chapter.

I first note the changing paths of quicksilver, following the opening of the route to the South Pacific via Cape Horn, from Almadén to Potosí, with the creation of the viceroyalty of La Plata in 1776; I then consider the annual figures for the ratio from 1800 till 1822 as compiled by Felix de Matos for the Potosí Mining Bank in 1827 (Table 11.2). With independence, bank officials like Matos were scrutinizing the archives of the bank, seeking the bases of colonial mining prosperity whose revival might help republican recovery, and copying out production figures since the 1770s and before, with lists of unpaid debts accumulated by the refiners' guild in 1802–1805 (although these had been pardoned by the Crown).³²

I then compare the average ratio registered for the last decade of colonial rule under Buenos Aires (1.6) with the violent fluctuations of the *apparent* ratio during the war, when Potosí returned to the viceroyalty of Peru and in 1817 received its last colonial consignment of cheap quicksilver from Lima.

I next examine comments made by the president of the Potosí General Mining Tribunal in 1833 on the real complexity of the quicksilver supply to refiners, showing that the official ratio of 1.6 was still being applied by the National Bank to calculate the quicksilver consumption of all refiners, on the Rivera and in the provinces.

Finally, the inspection (*visita*) of eight mills and refineries on the Potosí Rivera, carried out in 1837–1838, will enable us to distinguish lower individual ratios—which vary from one refiner to another—from the official ratio of 1.6. However, we will see that the ratio of 1.6 was still invoked towards mid-century by the Potosí bank to “demonstrate” smuggling at the smaller mining centers of Oruro and La Paz.

2 From Colonial Reform to War

2.1 *From Almadén to Potosí: New Routes*

The second half of the eighteenth century saw a thorough reorganization of the quicksilver supply to the South Pacific and Potosí. During the British blockade of the Caribbean during the Seven Years' War (1756–1763), Spanish

32 Rose Marie Buechler, *Gobierno, minería y sociedad. Potosí y el renacimiento borbónico, 1776–1810* (La Paz: Biblioteca Minera Boliviana, 1989); Enrique Tandeter, *Coerción y Mercado. La minería de la plata en el Potosí colonial, 1692–1826* (Buenos Aires: Editorial Sudamericana, 1992).

galleons from Cádiz were unable to reach Portobelo to send quicksilver to Panama and the Pacific coast. “Lone ships” (*navíos sueltos*) began to frequent the route to the Pacific via Montevideo, Cape Horn, and Valparaiso.³³ By the 1780s, with the decline in quicksilver production at Huancavelica, most quicksilver for the South Pacific came from the Spanish mines of Almadén (Map 11.1).³⁴ Some boats chose again to brave the seas of Cape Horn to transport boxes of Spanish quicksilver from Montevideo to Arica without entering the port of Buenos Aires.³⁵ From Arica, the mines of Potosí lay some ninety leagues up the Western Cordillera of the Andes, then across the Altiplano provinces of Carangas and Quillacas and on into the high puna mountains of the province of Porco in the intendency (later department) of Potosí.³⁶

The opening of the route via Cape Horn between the Atlantic and Pacific oceans fostered the growth of Valparaiso in the nineteenth century.³⁷ But boats in the eighteenth century still sometimes returned to Montevideo battered by the seas round the Horn. With the formation of the viceroyalty of La Plata in 1776, therefore, the first contract was approved in 1779 for transporting quicksilver in carts from Buenos Aires via Tucumán as far as Salta, then at three flasks per mule via Humahuaca to the Royal Bank of San Carlos in Potosí, and thence on mule to the refineries of Carangas, Oruro, La Paz, and Puno. Some traders took quicksilver from Buenos Aires to the South Pacific via Mendoza and Valparaiso, crossing the cordillera to avoid the Horn and joining the Pacific route north from Valparaiso to Copiapó, Arica, Lima, and on up to Piura and Trujillo, Guayaquil, Acapulco, and Mazatlán (Map 11.1).

33 Antonio García-Baquero González, *Andalucía y la carrera de Indias, 1492–1824* (Granada: Universidad de Granada, 2002).

34 Two official contracts had been sealed previously by the Crown for additional quicksilver, one with Idria (Austria-Hungary) in 1784 for six years and another with China in 1790.

35 For the transport of quicksilver in the 1780s from Montevideo to Arica via the Horn, see Jorge Hidalgo, “Dos documentos inéditos y un mapa de Cobija: informes del comisionado Dr. José Agustín de Arze, 1786–1787,” *Revista Chungará* 10 (1983: 139–45). Hidalgo quotes de Arze: “Así como en los dos años anteriores [1784–85] han venido hasta el Puerto de Arica desde Montevideo dos Barcos con Asogue para el abasto de esta Intendencia, ocasionando no poco afán en su conducción por falta de Mulas, y otras Providencias que han sido inevitables: con menos demora se hubiera facilitado el transporte por el Puerto de Cobija, así por estar en la Jurisdicción de esta Intendencia como por que los Harrieros huvieran aplicado su empeño por acreditar el Puerto, y su Carrera.” Cobija became Bolivia’s national port on the Pacific in 1829 under President Andrés Santa Cruz.

36 AGI Lima 1335. Mariano Rodríguez de Olmeda, Diputado en las Cortes para el Perú. Cádiz, July 20, 1813.

37 Cavieres, *Comercio chileno*.

Silver coins from the Potosí mint were brought back to Buenos Aires by returning contractors in payment for quicksilver. Newly minted pesos of eleven dineros were transported from Potosí to Salta at two boxes per mule, each box containing 6,800 pesos; then by cart to Buenos Aires, with 1% paid to the main contractor (*Rentista General*).³⁸ After independence, and increasingly during the 1840s, coined and uncoined silver was also smuggled out from Chichas to Salta, and thence via the *ruta de las pastas* (the “silver trail”) to Valparaiso rather than to Buenos Aires.³⁹ Bolivian strong coins were sent down legally via Canchas Blancas, Chiu-Chiu, and Calama to Bolivia’s Pacific port of Cobija in payment for imports, especially quicksilver from Spain bottled in iron flasks of seventy-five pounds, which were transported from Cobija to Calama and then up to Potosí and Carangas at three flasks per mule.

Following the British invasion of Buenos Aires in 1806 and the revolution of the United Provinces in 1807, the French invaded Spain in 1808 until 1814. With Spanish King Ferdinand VII captive in France, quicksilver supplies for the American mines were of prime concern to the Regency in Cádiz. Proposals were considered for seeking further quicksilver in Austria, Huancavelica, and China.⁴⁰ But in 1811, Cádiz declared free trade in Spanish quicksilver, authorizing its transport to America in foreign as well as Spanish vessels.⁴¹ Transport in Spanish ships was legally reimposed in 1812, but smuggling by French, British, and other ships continued, with Spanish viceregal authorities turning a blind eye in support of the silver refiners. The Spanish *Junta de Reemplazos* was established in Cádiz in 1812 to send reinforcements to America, with fresh supplies of quicksilver as ballast in the ships: hire of the ships and wages for the soldiers were to be paid from the sale of quicksilver.⁴² But prices rose, as

38 AGI Buenos Aires 433. *Providencias e informes sobre azogue, 1735–1811, Propuestas de Tomás Antonio Romero*. AGI Buenos Aires 438. Rafael Antonio Rodríguez to Ex S D Francisco Saavedra. Madrid, January 24, 1798.

39 Viviana Conti, “Circuitos mercantiles, medios de pago y estrategias en Salta y Jujuy (1820–1852),” in *La desintegración de la economía colonial. Comercio y moneda en el interior del espacio colonial (1800–1860)*, ed. Alejandra Irigoin and Roberto Schmidt (Buenos Aires: Biblos, 2003), 113–33.

40 For China, see AGI Indiferente General 1783 and 1791: *Informe de Ramon Gil de la Quadra*, Cádiz July 4, 1810. See also Vicente Basadre to Jose Pablo Valiente and Ciriaco Gomez de Carbal: “Recomendaciones sobre como llevar a cabo negocio con China,” Cádiz, September 18, 1810.

41 AGI Indiferente General 1791, e.g., Eusebio del Bardari y Azara to Sr Esteban Varea, Cádiz, July 24, 1811, concerning the English frigate *Inconstant*, which took 1,000 quintals of quicksilver from Portsmouth to Veracruz, selling it profitably to the Royal Treasury in Mexico.

42 AGI Lima 1335. Cádiz, August 31, 1813. Francisco Osorio. Cf. Tristan Platt, “Container Transport.”

patriots and royalists competed for the liquid metal to resell to intermediaries and refiners: silver coin was needed to sustain both royal soldiers and revolutionary guerrillas at the base of the conflict. Circulating coin became scarce; in Huancavelica, exchanges with small amounts of quicksilver replaced cash transactions.⁴³

The consequences of these developments had been predicted in Spain since the beginning of the century. In 1802, the Spanish finance minister for the Americas, Miguel Cayetano Soler, declared that Spanish rule in America was secure as long as Spain provided cheap supplies of quicksilver.⁴⁴ Indeed, quicksilver occupied a neuralgic position in the economic and political system of Spain's silver-mining domains. But in December 1815, the cessation of quicksilver credits in Potosí's Bank of San Carlos anticipated the end of the subsidized price of fifty pesos per quintal, current since 1809 (see Figure 11.2).⁴⁵ Spain's reluctance from January 1816 to send more cheap quicksilver to the silver refiners anticipated the end of Spanish rule in Potosí, as Cayetano Soler had foretold. This was postponed by the delivery of 3,000 quintals of Crown quicksilver from Lima via Arica to the Potosí bank, ordered by viceroy Pezuela. In 1810, 3,000 quintals had been little over a year's consumption in Potosí (see Table 11.1), but by 1816 silver production and quicksilver consumption had fallen sharply (Table 11.2) and the agreement by the Potosí refiners and the bank to commission another consignment in 1819 came to nothing, as we shall see.

2.2 *Periodizing the Ratio, 1800–1822*

The figures presented in Table 11.2 allow us to compare annual quicksilver consumption, silver production, and the ratio during Potosí's last decade in the viceroyalty of La Plata (1800–1811), with the erratic situation that developed during the war, especially in 1816, when the Upper Provinces and Potosí were reincorporated into the viceroyalty of Peru following the withdrawal of patriot forces from Potosí to Jujuy and Salta. While the early figures during the quicksilver crisis of 1800–1805 may be inflated (although they correctly show the lack of quicksilver in 1801–1802),⁴⁶ the later figures after 1816 can be circumstantially validated.

43 AGI Lima 1335. Cádiz, October 20, 1813. Rafael Orozco to Manuel Lopez Araujo. With copy of letter to the Intendent of Huancavelica Juan Vives: "a mas de seis meses que no corre mas moneda que el azogue, y este explotado por los Yndios Pallaqueros quienes aprovechandose del abandono de las Minas de los Minereros sacan lo que pueden para vender al precio infimo."

44 AGI Lima 1357. Miguel Cayetano Soler to the viceroy of Peru, October 18, 1802.

45 See Guillermo Mira Delli-Zotti, "El Real Banco de San Carlos."

46 Guillermo Mira Delli-Zotti, "Panorama de la Organizacion," 122–24.

TABLE 11.1 Annual quicksilver demand by viceroyalty, as seen from Spain (in Spanish quintals of 100 pounds)

Viceroyalty	Destination	1804		1810	
		Quintals	%	Quintals	%
New Spain	Veracruz	15,935.25	61.9	15,000	63.3
	Guatemala	1500	5.8	700	2.95
	Total		67.17		65.98
Peru	Lima	5001	19.40	5000	21.10
La Plata	Montevideo	2655.75	10.30	3000	12.65
	[for Potosí]	Total	29.70		33.75
Spain	Ferrol—Coruña	641.25	2.5	-	-
Total		25,733.25	99.37	23,700	99.73

SOURCES: AGI ARRIBADAS 293. *ESTADO EXPRESIVO DE LAS PARTIDAS DE AZOGUE DE LAS REALES MINAS DE ALMADÉN*. JUAN PIZARRO. TROCADERO, FEBRUARY 20, 1805
 AGI INDIFERENTE GENERAL 1791. *COMENTARIO SOBRE INFORME R GIL DE LA QUADRA, Y RIBADANEYRA Y TEXADA*. VICENTE BASADRE. CADIZ, AUGUST 7, 1810

We do not know the exact source of the early figures given by Felix de Matos, although they are clearly from the bank's archive. Rose Marie Buechler emphasizes a period of chaos in the Royal Bank's accounts during the first four years of the century.⁴⁷ Her Table III is based on the weekly account books in the Potosí bank, but gives no figures for 1800–1804, nor for 1813–1815. Nor, of course, does it show the spikes and dips given by Felix de Matos for 1816–1822 (see Figure 11.1), since it omits quicksilver consumption and therefore the ratio too.⁴⁸

From 1800 to 1811 (omitting 1801–2), the bank ratio remained between one and two marks per pound of quicksilver, averaging 1.62 marks. During the same period, Potosí's annual quicksilver consumption averaged close to 2,000 quintals. Average annual silver purchases from refiners by the bank during the same years reached slightly over 300,000 marks per annum. The first two of

47 Buechler, *Gobierno, minería y Sociedad*, 478.

48 See Mira Delli-Zotti, "El Real Banco" (Table 9), for quicksilver ratios to silver production.

these average figures, corresponding to Potosí's pre-war mining regime, continued to be invoked after independence: 1.62 marks produced with each pound of quicksilver issued by the bank, and 2,000 quintals of quicksilver consumed annually.

In 1811, the Upper Provinces of La Plata, including Potosí, were restored by the Crown to the jurisdiction of Lima, after barely thirty-four years under the sway of Buenos Aires. Argentine patriot efforts to wrest upper Peru and Potosí back from the royalists finally failed in 1815, but from 1812 till 1815 (when General Belgrano emptied out all the quicksilver he could find in Potosí before retreating south), annual quicksilver consumption fell to only 515 quintals and in 1816 to a mere 254 quintals, when supplies from Buenos Aires were finally exhausted.⁴⁹

From January 1816, following Napoleon's final defeat at Waterloo in 1815, Spain no longer risked transporting flasks of liquid metal across the Atlantic patrolled by British ships, and quicksilver credits ceased in Potosí's Royal Bank of San Carlos. On December 30, 1815, Spain invited American miners to come to Cádiz to buy quicksilver at only thirty-eight pesos per quintal (provoking ironic questions about why American miners should risk the voyage if the Crown would not).⁵⁰ In 1816—the year of the Congress of Tucumán—when quicksilver sales in the Potosí bank fell to 250 quintals before ceasing altogether, the ratio apparently leapt up to 7.3 (Figure 11.1). Why? In the circumstances, there can be little doubt that the spike reflects the refiners' need to buy quicksilver from private merchants at higher prices, to compensate for the lack of Crown supplies in the bank. Additional quicksilver from outside the bank enabled refiners to produce more marks than bank quicksilver could alone,

49 AGI Lima 1358. Viceroy Pezuela to Minister of Finance, Lima, April 29, 1817: "Los autores de todo mal, con el fin de destruir las entradas de la Real Hacienda, esterilizando el mas fecundo manantial de ellas, han procurado llevar consigo o derramar, si otra cosa no han podido, todo el azogue existente en los lugares de que han sido arrojados por las Armas del Soberano."

50 AGI Lima 1358. Answering a royal order that the miners of Peru be supplied with quicksilver, the Directors of Public Credit replied from Madrid on October 24, 1817: "es un punto resuelto por el Rl Decreto de 30.XII.1815 que los mineros de aquellos dominios vengan a comprar a España. De escusarse ahora a hacerlo se deduce claramente que temen el resultado de la navegacion, y el mismo temor retrahe a los compradores de la peninsula para enviarlo con bandera española. No pudiendo por este inconveniente surtirse aquellos por si, ni por los especuladores españoles, tendrán que hacerlo a mas precio de los extranjerios ... Por la Rl orden de 30.XII.1815, los mineros ya sea en cuerpo ya individualmente tienen la facilidad y preferencia de adquirirlo en Sevilla por el moderado precio de 38 pesos quintal embasado en frascos de hierro." The royal offer was taken up by the captaincy of Chile, whose own silver production and demand for quicksilver was expanding.

TABLE II.2 Silver purchases and quicksilver sales in the bank of Potosí, 1800-1822

Year	1 Total silver inc. provinces and <i>Cacchias</i> (marks)	2 Silver from Refiners' Guild on Potosí Rivera (marks)	3 Percentage Rivera of total	4 Mercury sales (quintals)	5 Ratios [1/4] (silver marks per pound of quicksilver)	6 Average ratios by period
1800	371,416	229,016	62	2159	1.72	La Plata
1801	331,807	211,886	64	0	-	1.62
1802	194,534	82,686	42.5	0	-	
1803	242,209	136,896	56.5	222	1.08	
1804	320,699	169,252	53	1700	1.89	
1805	308,170	156,058	51	2086	1.48	
1806	293,713	171,738	58.5	1502	1.95	
1807	307,920	175,456	57	2099	1.47	
1808	296,932	153,849	52	1536	1.93	
1809	305,315	149,882	49	1917	1.59	
1810	311,710	157,555	50.5	2102	1.48	
1811	338,034	145,640	43	2146	1.57	
1812	240,641	76,461	32	111	2.13	Peru
1813	221,433	80,386	36	941	2.35	2
1814	237,157	72,877	31	1058	2.24	
1815	67,347	23,283	34.5	515	1.3	
1816	187,015	31,535	17	254	7.36	
1817	176,305	49,916	28	504	3.5	Delivery of
1818	155,564	49,146	32	805	1.93	3,000 quintals
1819	145,097	43,865	30	396	3.67	from Lima
1820	132,433	33,397	25	179	7.4	
1821	138,909	22,411	16	250	5.56	
1822	161,033	34,290	21	229	7.03	5.2

SOURCE: ANB MH T.8, NO. 15. FELIX DE MATOS, POTOSÍ, FEBRUARY 23, 1827. "RAZON DEL AZOGUE VENDIDO EN ESTA CASA DE RESCATES DESDE EL AÑO DE 1800."

marks that were nevertheless assigned to the bank by accountants, producing an artificially high ratio in their books.

There followed an equally precipitous dip in the (apparent) ratio to 3.5 in 1817 and 1.9 in 1818, with an increase in quicksilver sales by the bank, accompanied by a small rise in silver production on the Rivera alone (nearly 50,000 marks in 1817 and 1818) within an overall context of decline. In 1818, quicksilver advanced by the bank reached 805 quintals (Figure 11.2), followed by another dramatic leap in the ratio back to 3.6 in 1819 and 7.3 in 1820. These upward leaps reflect renewed purchases of expensive quicksilver from private merchants after Viceroy Pezuela's strategic deposit of 1817 had run dry. However, silver sales to the bank by the *k'ajchas*⁵¹ and the provincial mining centers reached almost 80% of the total bought by the bank in 1822, while sales by industrial refiners on the Rivera shrank to barely 20%.

To understand these fluctuations, we should again recall the political conjuncture. In 1816, Spanish General Pezuela left Potosí for Lima, where, as the new viceroy, he received fresh appeals for quicksilver from Francisco Huarte Jaureguí, superintendent of the Potosí mint (while in Potosí, Pezuela had made the same request himself, so he knew the urgency). In spite of demand from the newly flourishing mines at Cerro de Pasco in Peru (due to the installation of drainage machinery from England),⁵² Pezuela ordered 3,000 quintals to be deposited in Arica as a last effort by the beleaguered colonial viceroyalty to help the southern miners and encourage their loyalty to the Crown against a newly independent Argentina. But he warned that they should expect no more.

The 3,000 quintals of quicksilver reached Arica in 1817, and their arrival in Potosí can be seen in the sale of c. 800 quintals for the year 1818 shown in Figure 11.2 (based on Table 11.2).⁵³ Pezuela accepted that, regardless of

51 *K'ajchas* were small-scale miners and ore collectors. See, for the city of Potosí, Enrique Tandeter, "La producción como actividad popular: ladrones de minas en Potosí," *Nova Americana* 4 (1981): 43–65; Rossana Barragán, "Ladrones, pequeños empresarios o trabajadores independientes? K'ajchas, trapiches y plata en el cerro de Potosí en el siglo XVIII," in *Nuevo Mundo, Mundos Nuevos* (2015) <https://doi.org/10.4000/nuevomundo.67938>. For the *jukus* of Aullagas-Colquechaca at the time of Tomás Katari's rebellion (1780–1781), see María Concepción Gavira Marquez, *Minería en Chayanta. La sublevación indígena y el auge minero 1775–1792* (La Paz: Plural Editores, 2013). For the Potosí provinces of Porco and Lipez during the early Republic, see Platt in *Estudios Atacameños* 48 (2014): 85–118. Both *k'ajchas* and provincial refiners received slightly lower prices for their silver, but in 1830 Martín Jaureguí, director president of the Mining Tribunal, requested the minister of finance to concede the same two *granos* in their silver of eleven dineros, twenty granos to the provincial refiners as were granted to the refiners of the Potosí Rivera.

52 Fisher, *Silver Mines*.

53 AHP EN 200 (1818–1819).

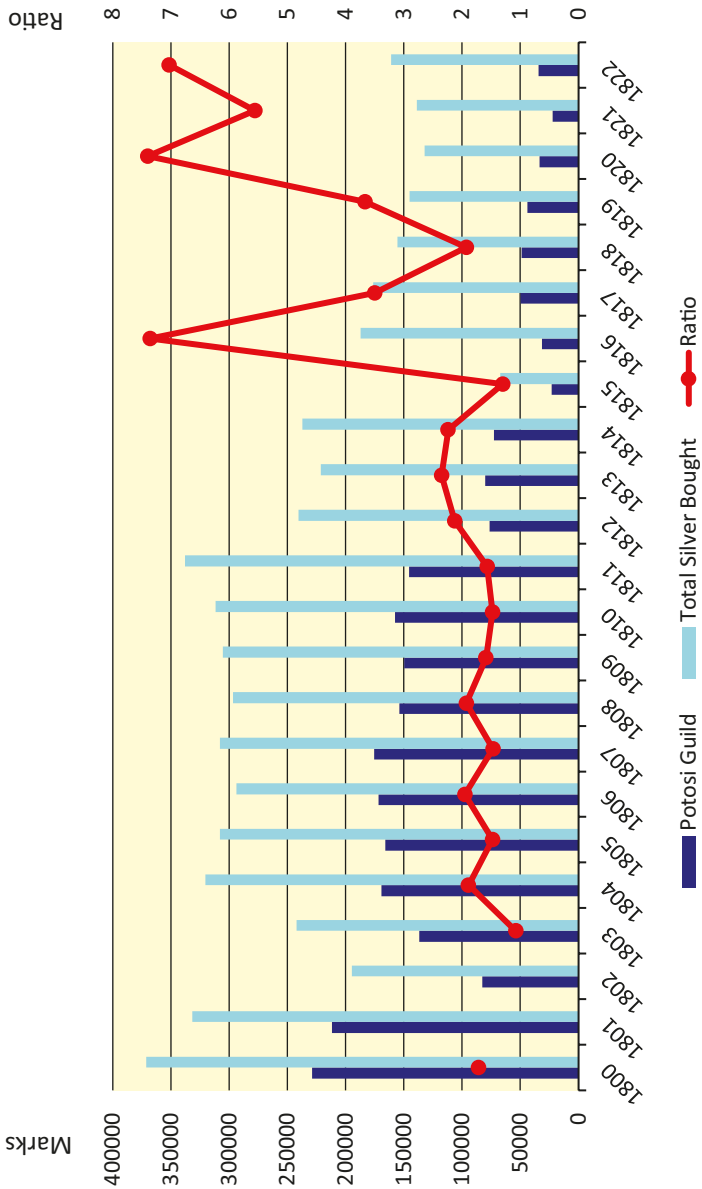


FIGURE 11.1 Ratio of mercury sales to silver purchases, bank of Potosí, 1800-1822

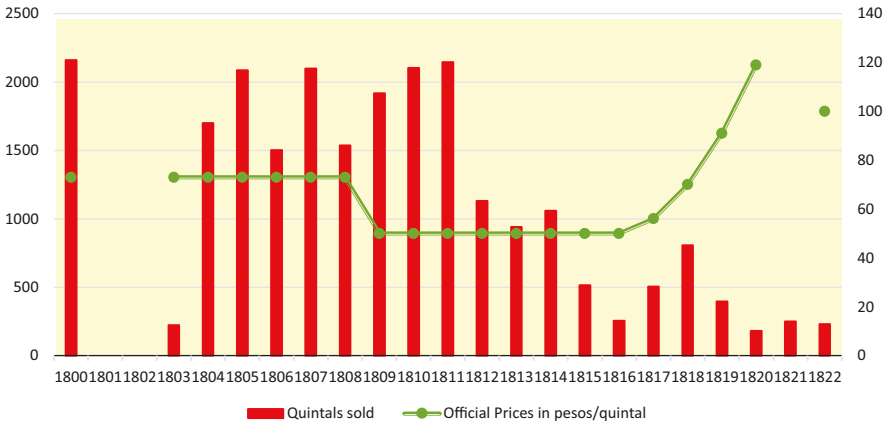


FIGURE 11.2 Mercury sales and prices in the Potosí mining bank, 1800–1822

regulations, the Potosí miners would be unable to pay for the new quicksilver in advance. To transfer it in lots of 500 quintals from Arica to Potosí, the viceroy ordered the Potosí Refiners' Guild to send an attorney to Arica with money to pay for mule transport and return to Potosí with the quicksilver under armed guard to be provided by the subdelegate of Tacna. The guild should take charge of it once it was safely housed in the Bank of San Carlos. It would then be advanced and sold by the bank at the price of fifty pesos per quintal, but with a surcharge added to cover the costs of transport from Lima.

The quicksilver reached Potosí, as is reflected by the drop in the ratio and a rise in bank sales to refiners during 1817 and 1818. This last effort by the viceroy meant sufficient quicksilver in the Bank of San Carlos for refiners to reduce briefly their dependence on the market, although the bank no longer gave credit. But 3,000 quintals were enough for a year or two, particularly with the fall in industrial ore production, and it was no longer necessary to pay high market prices.

Nevertheless, in 1818 the refiners of Potosí foresaw the end of their brief bonanza. As quicksilver became scarce again, they picked up Cayetano Soler's argument and brandished it with cries that barely veiled a threat. While the 1817 consignment was still being consumed, the superintendent of Potosí wrote to the bank ministers in 1818 to request a release of funds to buy more quicksilver. He indicated the terrible consequences that a suspension of silver production would bring to

this population, the Treasury, and even the Army itself ... for the branch of Mining alone produces profit for the Royal Treasury, and only because

of this business do other products circulate and bring in profits to sustain the troops that defend the Rights of the King and these Provinces.⁵⁴

So another attorney was chosen, Colonel Pedro de Arrieta,⁵⁵ and entrusted with 30,000 pesos as an advance on 50,000, in bills drawn on the Treasury of Huamanga. He left with the money to buy quicksilver in Lima, to be delivered in Arica or Arequipa. The guarantee document gives a summary of the state of mining on the Rivera in 1819, as “owners” (many of them in fact rentiers) pledged the mills they worked to secure their share of quicksilver (Table 11.3).⁵⁶

But this new consignment of quicksilver never materialized. In 1826, after Bolivian independence had been declared in August 1825, León Galindo (a Grancolumbian named prefect of Potosí by Sucre) was still trying to recover 12,000 pesos from Pedro de Arrieta, now settled back in Arequipa.⁵⁷ From 1819 till 1822 the bank's sales of quicksilver show steep rises in prices (see Figure 11.2), as cheap Spanish quicksilver was exhausted. The ratio had fallen

54 AHP EN 200 (1818–19). “Responsabilidad mancomunada de los Diputados del Ylustre Gremio de Asogueros caucionando la seguridad del empréstito ... que hace el Real Banco de San Carlos para compra de Asogues.” The meeting of July 6, 1818, was presided over by Francisco Huarte Jauregui, “Tenant-Colonel, General Commander of the Engineers of the Army, Governor Intendent of the Province of Potosí, Military Chief and Superintendent of the Royal Mint, Mines, Mita, and Royal Bank of San Carlos.”

55 In 1804, Pedro de Arrieta was renting part of the Concepción mill then belonging to Gregorio Barragán and Juan José de La Rua. AGI Charcas 699. *Ministros Principales de Real Hacienda de Potosí*, Planilla no. 5, Potosí, 26.ii.1804. In 1812, Pedro de Arrieta was allocated the Ramirez mill, then in ruins, to build a *rastra*. AHP EN 198 (1811–12), f.349r. In 1819, he sold the Ramirez mill with a house and two mines to Pedro Laureano Quesada, also from Arequipa, for 15,000 pesos. AHP EN 200 (1818–19), f.519. Arrieta was probably selling up before returning to Arequipa, as the Potosí Guild's attorney, with 30,000 pesos “for buying quicksilver.” AHP EN 200 (1818–19), f.460v. Also f.175r: “Poder del Ilustre Gremio de Azogueros para que en el Puerto de Arica, o en la Ciudad de Arequipa, resiba el Apoderado los azogues procedentes de la Capital de Lima.” Potosí, 22.vii.1818.

56 Esther Aillón, in her rich account of the conflicts between the Potosí mercantile and mining élite and the patriot guerrillas, cites Buechler (1989), who affirms that no colonial miners survived the war; see Aillón, *Vida, Pasión y Negocios. El propietario de la viña ‘San Pedro Mártir’ Indalecio González de Socasa (1755–1820)* (Sucre: Archivo y Biblioteca Nacionales de Bolivia, 2009), 183. But compare my Tables 11.3, 11.4, 11.5, and 11.7, with text concerning, for example, the descendants and affines of the owners of the Muñoz refining mill; also note 57 in this chapter, concerning Pedro Laureano Quesada; and the old colonial miner Salvador Fullá (whose daughter married Manuel Ortiz) at the Guariguari mill in 1828.

57 For Arrieta's remaining debt in 1826, see ANB MI PPR, T.13, no. 17. León Galindo to the Ministry of the Interior, July 26, 1826. Given that Arrieta had taken 30,000 pesos with him in 1819, it is possible that he had sent 18,000 pesos' worth of quicksilver, retaining the balance of 12,000 pesos to buy more; however, this does not show up in Table 11.2.

TABLE 11.3 Mill heads working on the Potosí Rivera in 1819

Refining mills	"Owners"	Mill heads— active	Weekly washes	Ore grade (marks/ box of 50 quintals)	<i>Existencias en buitrón</i> [boxes?]
Agua de Castilla	Gregorio Plaza	1	5	4	20
Pampa Barragán	Antonio Zabaleta	1	6	7	18
	Juan José de la Rúa	1 of 2	8	10	n.d. ^a
ditto	Manuel María Garrón	1 of 2	8	9	28
Guailaguasi	Miguel Barriga	1	7	7	28
Ramirez	Francisco Calvo Ecos	1	8	9	16
San Marcos	Gregorio Plaza	2	12	6 ½-7	48
San Diego	Joaquín Aguilar	2	11	7	38
Uribes	Manuela Mesia	2	10	6	30
Calicanto	José Zubieta	1	6	7	18
Gambarte	Pedro Laureano Quesada	1	7	15	21
Trapiche	Aguilar	1	7	8	21
Monteros	Estate of Leyseco	2	Under construction		
	Nicolás Mora	2	12	7	48
Máquina	José Felipe Salas	2	10	10	30
Cantumarca	Eduardo Subieta	2	11	7	33
TOTAL	16	23	128		397

a Possibly included in the mill total of twenty-eight, divided between the two heads.

SOURCE: AHP EN 200 (1818–1819). "RESPONSABILIDAD MANCOMUNADA DE LOS DIPUTADOS DEL YLUSTRE GREMIO DE ASOQUEROS CAUCIONANDO LA SEGURIDAD DEL EMPRÉSTITO." WITH THE INSPECTION (*VISITA*) BY JOSÉ ANTONIO ESTEBES, POTOSÍ, AUGUST 6, 1819 (F.609V). SIGNED BY DEPUTIES OF THE REFINERS' GUILD ON OCTOBER 27, 1819, GUARANTEEING WITH THEIR PROPERTIES THE VALUE OF UP TO 50,000 PESOS, TO BE SUPPLIED TO ARRIETA BY THE BANK ACCORDING TO THE QUANTITY OF QUICKSILVER CONTRACTED IN LIMA AND THE TERMS AGREED

back with Pezuela's 3,000 quintals in 1817 and 1818, but now it climbed again, reflecting purchases on the open market, and staying high, no doubt, until well after independence.

One effect of war and quicksilver prices was to reduce the number of industrial refiners from twenty-seven in 1810 to sixteen in 1819. At the same time, the total amount of silver purchased by the bank from the refiners' guild, the provinces, and the *k'ajchas*, fell by over half, from 311,710 marks in 1810 to 145,097 marks in 1819. But it should again be noted that this period witnessed the decline of the share in silver production corresponding to the refiners' guild, from 61% in 1800 to 20% in 1822. We can see the predominance at independence of artisanal and provincial silver production over that of the few remaining industrial silver mills on the Potosí Rivera.

In spite of Escobedo's warnings in his 1785 letter to Gálvez, then, the Potosí bank's figures for the (apparent) "ratio" between silver bought and quicksilver advanced can help resolve an important question in the study of Potosí silver mining during the war: until when did the Crown continue sending cheap quicksilver to the state's Mining Bank? And when did refiners find themselves wholly dependent on more costly quicksilver sold by private merchants and speculators? The movements of the (apparent) ratio in the Mining Bank indicate periods when the role of the state grew, and others when it shrunk. The fluctuating bank ratios between 1811 and 1822 reflect, after December 1815, the inability of the Crown to send more cheap quicksilver to La Plata, although until 1819 the Potosí refiners still had access to the remains of the 3,000 quintals sent from Lima by Pezuela. But without state subsidies, the price of quicksilver introduced to the Rivera by private merchants shot up, reaching 145 pesos per quintal in 1826.⁵⁸ Thus, Bolivia became independent with silver production more than halved and quicksilver supplied without credit, solely by private merchants, and at prices nearly three times what they had been in 1815—much as Cayetano Soler had feared at the beginning of the century.

3 The Republic

3.1 *The Republican Ratio*

In 1825, Potosí's refining mills were in a lamentable state. Refining on the Rivera had become dependent on the surface collection of mineralized rocks lifted from the rubble and slagheaps that covered the Rich Mountain. Adits

58 ANB MI PPR, T.13, no.17. Leon Galindo to the Ministry of the Interior, Potosí, July 26, 1826.

were blocked and deep mining abandoned.⁵⁹ Even the few remaining hydraulic stamping mills on the Rivera were suspended during the dry months, due to the broken sluices of the crumbling reservoirs in the mountains above the city.⁶⁰ The same problem affected the smaller watermills operated by some of the artisanal refiners, or *trapicheros*, who refined the ores of the *k'ajchas* (although many of these used *quimbaletes*, stone mills).⁶¹ Other obstacles to recovery were said by members of the refiners' guild and the Mining Tribunal to be the informality of labor arrangements and—again—the lack of cheap quicksilver.⁶²

The British consul in Bolivia, Joseph Pentland, attributed to French speculation the high prices of quicksilver in 1825 (when the British were selling quicksilver mainly in Mexico).⁶³ Pentland put Bolivia's annual consumption at 2,000 quintals, a figure way beyond the requirements of Bolivian silver refiners

59 AHP PD 12 (1826). Potosí, February 4, 1826. *Alcalde veedor* to the departmental president. However, surface collection could be very profitable, as in the case of Pedro Laureano Quesada (Arequipa 1775–Potosí 1851), one of the richest refiners in Potosí, who left property and goods to the value of 337,904 pesos (AHP EN Libro 379 (1851), ffs. 37 a 108v). In 1819 he worked the Gambarte mill, refining higher grade ores than other refiners (see Table 11.3). This led him, in 1824, as deputy of the refiners' guild, to offer a loan of twelve *piñas de plata mayores* (1,220 marks) to the ailing Royal Bank of San Carlos, “penetrado del sentimiento de ver los prejuicios que sufre el Estado y los particulares por falta de fondos en el Banco de Rescates” (AHP EN Libro 202B f. 144). He continued surface collection during the Republic, combining refining with other activities (as tithe collector and *hacendado*). *K'ajchas*, on the other hand, could sometimes extract from their *pallacos* twice as much silver as was extracted from the same ore by guild refiners on the Rivera with the same quicksilver consumption. See Telles, *Principios Físico-Químico-Prácticos*, 125, and Appendix 2 of this chapter.

60 In 1826, the sluices of the reservoirs were repaired to enable the mills to run again from January 1827 (Leon Galindo to the Ministry of Interior, Potosí, July 26, 1826. ANB MI PPR Potosí T.13, no.17). But the problem was recurrent in the early years of the Republic.

61 Rossana Barragán, “Ladrones, pequeños empresarios.”

62 For the difficulties in managing the Indian workforce in Potosí during the first years of the Republic, see Gustavo Rodríguez Ostría, *El socavón y el sindicato: ensayos históricos sobre los trabajadores mineros, siglos XIX–XX* (La Paz: ILDIS, 1991). Some free Indian laborers took advances (*alanocas*) from several mine owners, and then worked for only one—or none.

63 House of Commons Parliamentary Papers, UK, with Joseph Barclay Pentland, “Report on the Republic of Bolivia, 1827,” *Camden Miscellany* 25:169–267 (London: Offices of the Royal Historical Society, [1826] 1974). France was the country of several miners and merchants in Potosí during the early Republic. For the failure of British mining capital in Potosí with the crash of 1826, see Enrique Tandeter, “Attempted Economic Reform and Innovation in Bolivia under Antonio José de Sucre, 1825–1828,” *Hispanic American Historical Review* 50 (1970). Also Enrique Tándeter, *Coerción y Mercado. La minería de la plata en el Potosí colonial, 1692–1826* (Buenos Aires: Editorial Sudamericana, 1992).

at that moment. However, as can be seen from Table 11.2, this amount simply reiterated the average quicksilver demand of the last colonial decade (1800–1811) and was no doubt what Pentland had been told by Bolivian miners eager to recover pre-war levels of production.

We have seen that Prefect Galindo insisted on the need to recover 12,000 pesos for quicksilver still held by Pedro de Arrieta in Arequipa.⁶⁴ Galindo also urged asking Simón Bolívar to order the introduction of quicksilver by every boat bringing merchandise to Peruvian ports, thus making mandatory what the Crown had been unable to prevent (though we do not know if this was put into effect). In May 1826, the refiners' guild rejected 1,000 quintals of quicksilver from Buenos Aires at seventy-seven pesos/quintal (forty-four pesos was the maximum price then authorized by the bank), also rejecting a proposal by Parish Robertson and the House of Lezica to send 2,000 quintals within ten months at sixty pesos/quintal.⁶⁵ In December 1826, however, Sucre more realistically authorized 1,000 quintals to be bought in Lima at eighty to one hundred pesos/quintal for sale in the Potosí bank, without prejudice to other imports or sales by private merchants.⁶⁶

With independence in 1825, markets in Chuquisaca were flooded briefly by English textiles entering from Buenos Aires, in exchange for Potosí's silver coinage pouring out. Bolivian strong pesos of ten dineros twenty granos were valued in Buenos Aires at 5–10% above their face value.⁶⁷ The plan for devaluing denominations of less than one peso to aid circulation in the internal market and save silver in the bank was not adopted until 1829, when it was hoped devaluation of small change would allow the export of strong pesos, while the internal market would profit from the circulation of weak coinage of lower denominations (values of one, two, or four reales, with only eight dineros silver).⁶⁸

64 ANB MI PPR T.13, no. 17, León Galindo to Ministry of Interior, Potosí, July 26, 1826.

65 ANB MI PPR T.13, no. 1, León Galindo to Ministry of Interior, Potosí, May 20, and May 26, 1826.

66 ANB MI PPR T.13, no. 17, León Galindo to Ministry of Interior, Potosí, December 20 and December 8, 1826.

67 ANB MH PPR T. 3, no. 13, León Galindo to the Finance Secretary [*Secretario de Hacienda*], Casa de Gobierno de Potosí, June 11, 1826. With project by Leandro Osio, evaluator of the Mint. Potosí, September 24, 1825: "Sobre que las Casas de la Moneda en Americas pueden haserse actualmente de nuevos fondos"; see page 2: "Sobre valor de monedas bolivianas de Sol y Rostro en Buenos Aires."

68 It has been argued that Santa Cruz ordered minting weak coinage (alloyed with copper) to pay the army of the Peru–Bolivian Confederation, but the decree of 1829 specifies that it was to ease circulation in the internal market, while saving silver in the mint. Not until 1835 was the annual amount of weak coinage increased from \$200,000 to \$500,000 to pay

More silver production seemed the only way forward, given the intensity of demand for specie; this signified greater Bolivian demand for quicksilver.

The quicksilver crisis continued at Sucre's fall in 1828, with high prices from private speculators, no credit, and low silver output. By then the reserve fund of \$70,000 for purchasing silver from the miners had been restored in the bank, but it was promptly spent on resistance to Peruvian invasion.⁶⁹ The crisis was confronted from 1829 by Santa Cruz, who established Bolivia's national port in Cobija (while relinquishing Arica to Peru) and, on October 13, decreed the establishment of the General Mining Tribunal.⁷⁰ Santa Cruz aimed, under pressure from the refiners, to reestablish the Mining Bank with stocks of cheap quicksilver to advance to the refiners, as had been the practice under Spain until 1816.⁷¹ He also restored, briefly, a "voluntary *mit'a*" from the provinces, at the request of the refiners, and 350 "voluntary *mitayos*" from Porco province duly arrived in Potosí in 1830–32.⁷²

the army of the Peru–Bolivian Confederation. For exchange values in kind for half a real or less, see Tristan Platt, "Estado tributario."

69 Platt, "Estado tributario."

70 This was modeled on the Mexican Mining Tribunal, abolished in 1826; see Inés Herrera Canales and Alma Parra Campos, "La fiscalidad minera en México en la transición a la Independencia," in *Cambio institucional y fiscalidad. Mundo hispánico, 1760–1850*, ed. Michel Bertrand and Zacarías Moutoukias (Madrid: Collection de la Casa de Velásquez, Volume 164, 2018). For the members of the Potosí Mining Tribunal at its foundation, see ANB MH PPR T.29, no. 9. *Acta de la Honorable Junta General y en cumplimiento del Supremo Decreto de 19 de Diciembre de 1829*.

71 See Philip T. Parkerson, "La política minera de Andrés Santa Cruz (1829–1839)," *Historia y Cultura* 2 (1976): 151–70 for the creation by Santa Cruz of the Credit Bank (*Banco Refaccionario*), operational between 1833 and 1838.

72 For the Supreme Decree of October 15, 1829, on the "voluntary *mita*," see AHP PD 68 no. 2, February 28, 1830, Nicolás Dorado, Governor of Porco Province, to the Prefect. Cf. PD 91 nos 10, 48, and 50, on the need to rebuild the ruined houses of the colonial *mitayos*, the complaints of the Curacas against the confiscation by city guards of subsistence brought by Indians "returning to the old service," and the lack of replacements for those completing their turn. Cf. PD 91 no. 87: Martín Jaureguí, Presidency of the Mining Tribunal, to the Prefect. Potosí, November 29, 1830: "han venido de la Provincia de Porco 300 y tantos indígenas de la mita voluntaria." Also AHP PD 109 no. 7, January 27, 1831, Diputación Territorial de Minería de Potosí to the Prefect: "Los Curacas se quejan contra el Zelador en el punto de Santa Barbara por haber quebrado la puerta donde estaban alojados, y extraidoles siete carguillas o talegas de harina de trigo, y quatro de harina de maíz, violentándolos a pagar contribución, quebrantando las repetidas ordenes de este Gobierno, que los ha exonerado de esta pensión por antigua costumbre, y porque estos comestibles su comunidad los proporciona y remite para mantener y socorrer a los Yndigenas, que distribuidos por tres puntas al trabajo, descansan las dos, y en este intervalo cuidan los Curacas de socorrerlos y alimentarlos, especialmente con los enfermos."

In 1830, the prefect of Potosí informed the president's secretary general that the ministers of the bank had been ordered to send 10,000 pesos to the administrator of customs in Port Lamar (Cobija) to buy quicksilver on the Pacific coast. As in 1819, the refiners offered property guarantees for their future quicksilver purchases from the bank.⁷³ Meanwhile, the president of the Mining Tribunal, Martín Jaureguí, again insisted that the solution was to oblige ships to include quicksilver, loaded as ballast, among their saleable cargo (as in the instructions of the *Junta de Reemplazos* at Cádiz in 1812).

The money reached the port in early 1831; it represented a practical sign of state determination to reduce private sales and fix a price at cost in the bank for the essential ingredient to be issued in exchange for silver produced with previous quicksilver advances. The aim was to restore the colonial structure of mining and refining on the basis of state quicksilver advances, together with tighter control of the workforce and cheap quicksilver in the bank. The number of refiners was now eighteen, according to the *visita* (inspection) of 1830, with seventeen mills on the Rivera and thirty-one heads between them (Table 11.4).

So, how many silver marks could be refined at this time by a pound of quicksilver? It is striking that, in 1833, we find a reiteration by the bank of the late colonial "average ratio" of one pound of quicksilver to 1.6 marks of silver. Learning that the prefect was leaving for a month, the president of the Mining Tribunal, Nicolas Corominola, feared the miners might be left without quicksilver and asked the prefect to authorize the bank to advance quicksilver to each miner in his absence. The prefect replied that only he himself could authorize advances of quicksilver, and his authority could not be delegated. He asked the Mining Bank for each miner's estimated quicksilver consumption, and a copy was sent to Corominola (Table 11.5).⁷⁴

Table 11.5 gives figures for miners in business, weekly silver sales in marks, and estimated weekly quicksilver consumption in pounds for the Rivera and the provinces in July 1833. Fifteen refiners appear for the Rivera of the city, and nine for the provinces.⁷⁵ The figure for silver purchases from the refiners comes from the "Office Books" kept by the bank; however, the title of the table explains that the quicksilver is "what they probably consume," i.e., the

73 AHP EN no 356. 1829–31. fs. 179.

74 Some of this quicksilver was probably from a consignment of 300 flasks (each of seventy-five pounds) bought from the House of Lezica (Valparaiso), and sold at one hundred pesos/quintal. But the price did not include transport and "other costs inherent to the business." ANB MH BNRP, T.39, no. 19. Potosí, March 13, 1833.

75 In 1830, Martín Jaureguí proposed equalizing the privileges of the Potosí refiners with those of the provinces. ANB MH T.18, no 7, Jaureguí to the Minister of Finance, Tribunal General de Minería, Potosí, 20 de agosto de 1830.

TABLE 11.4 Mill heads active on the Potosí Rivera in 1830, with owners, refiners and weekly production (in boxes of 50 quintals)

Mill	Owner	Heads	Refiner (<i>conductor</i>)	Boxes/ week
Agua de Castilla	Marquess of Otavi	1	Diego Barrenechea	6
Jesús María Quintanilla	Count of Carma	1	Francisco Paula Ortiz	8
		2	Francisco Xavier Menendez	10
Concepción	Barragán	2	Juan José Rua (1 head) Manuel María Garrón (1 head)	15
Concepción	The Countess and partners	2	Pedro José Bravo	12
Guayllaguasi	The State	2	Diego Barrenechea	12
Ramirez	Pedro Laureano Quesada	2	Pedro Laureano Quesada	5
San Marcos Dolores	The Countess The Fariñas	2	Manuel Lizarazu	10
		2	Heirs of Joaquín Aguilar	10
Laguacayo	The Quintanas	2	José Antonio Estebes	14
Velarde	The Monteros	2	José María Velasquez	12
Trinidad	José Andrés Sanz	2	Andrés Argüelles	6
Turu	Nicolás Corominola	2	Nicolás Corominola	9
Chaca	La Agorreta	2	José Eustaquio Gareca	10
Máquina	The late Orueta	2	José Felipe Salas	10
Cantumarca	[The Potosí Society]	1	The Potosí Society	6
Calicanto	The Prudencios of Córdoba	2	José María Velasquez	12
17		31	18	167

SOURCE: ANB MH T.18, NO 7. TGM *RECIBIDAS* 1830

TABLE 11.5 "Approximate calculation, based on office books which the bank ministers have formed of the weekly sales made by the miners of the department, and of their probable quicksilver consumption" (1833)

District	Refiner	Weekly silver sales (in marks)	Est. quicksilver consumption in pounds	Ratio [calculated TP]	
The city	Manuel Ortiz	66	41	1.609	
	Manuela Orueta	66	41	1.609	
	Manuel Antonio Tardío	56	35	1.6	
	José Cabezas	48	30	1.6	
	Nicolas Corominola	56	35	1.6	
	Eustaquio Gareca	30	19	1.57	
	Testamentaria de Barrenechea	72	45	1.6	
	Juana Mercado Aguilar	56	35	1.6	
	José María Velásquez	160	100	1.6	
	Manuel Lizarazu	96	60	1.6	
	Pedro Laureano Quesada	134	84	1.595	
	Francisco Paula Ortiz	500	312	1.602	
	Manuel María Garrón	90	56	1.607	
	Juan José Rúa	36	23	1.565	
	Pablo Rozas	50	31	1.613	
	The provinces <i>Chichas</i>	Diego Obando	130	81	1.605
		Manuel Gregorio Mendivil	100	62	1.613
		José Sánchez de Resa	130	81	1.605
		Testamentaria de Jaureguí	130	81	1.605
<i>Porco</i>		Pedro Malpartida	280	175	1.6
	Testamentaria de Uzin	280	175	1.6	
	Andres Arguelles	40	25	1.6	

TABLE 11.5 Approximate calculation, based on office books (*cont.*)

District	Refiner	Weekly silver sales (in marks)	Est. quicksilver consumption in pounds	Ratio [calculated TP]
	José Figueroa	70	44	1.591
<i>Chayanta</i>	Agustin Careaga	48	30	1.6
Total		2724	1701	1.6

SOURCE: ANB MH T.35, NO. 8. *TRIBUNAL GENERAL DE MINERÍA AL PREFECTO DEL DEPARTAMENTO DE POTOSÍ*. POTOSÍ JULY 8, 1833. *BANCO NACIONAL DE RESCATES DE POTOSÍ*, JULY 3, 1833. BANK MINISTERS BONIFACIO DE ALBA, PEDRO ANTONIO DE LA PUENTE, NARCISO ALZERRECA

quicksilver figures are not based on registered quantities but are estimated. This means that a ratio was used to match quicksilver to silver production, and we can see that it was practically the same as the average for the last colonial decade (as noted by the bank in 1827): 1:1.6—that is, one pound of quicksilver to amalgamate 1.6 marks of silver. The reappearance in this table of the bank's conventional figure cannot be considered coincidental. Rather than giving the actual consumption of each refiner, the bank ministers chose simply to project the “official” version of the ratio. The ratio *actually achieved* by each individual refiner would only be investigated five years later.

However, in 1833, the president of the Mining Tribunal, Nicolas Corominola, protested that the ratio of 1.6 was far too low. He held that 6,800 pounds (sixty-eight quintals) per week for all the refiners would be a sounder calculation than 1,701 (seventeen quintals and one pound). According to Corominola, 1,701 pounds weekly was a figure suited to a situation where refiners already had 800 to 1,000 pounds of quicksilver in their storehouses and produced eight to ten boxes to be washed weekly. But now quicksilver stocks in the refineries were exhausted, and demand was high. Quicksilver credits from the bank were insufficient, it seems, without the additional quicksilver that each mill owner used to have in store. Corominola argued that the weekly advances by the bank were equivalent to only about a quarter of the total quicksilver required, of which the other three quarters were drawn from different sources, much of it recovered after amalgamation, borrowed, or bought from other refiners, from merchants, or from the bank itself, and stored in his mill by each refiner for

future use. Clearly, there was (or had been) a vast “pool” of quicksilver in Potosí at any one moment, with many flows from partial loans and exchanges organized by refiners outside the bank and in private hands.⁷⁶

The tribunal also made the standard objections that each business varied in its weekly loss of quicksilver due to differences in ore qualities, quantities refined, and refining methods. It recommended an inspection (*visita*) of the mills on the Rivera to see how much quicksilver each had in store in relation to their weekly needs. The tribunal argued that, from the moment each miner received his advance of quicksilver until the following week when he paid it off, miners might supply each other with quicksilver; so, when they came to ask for a new advance from the bank, they could find themselves with *more* silver *piñas* to sell than could be justified by the previous week’s advance of quicksilver.

The prefect replied that he would only be away fifteen days and asked the tribunal to give a figure for that period. He then left Potosí and, when the tribunal answered, he was in Betanzos on the road to Chuquisaca. Nicolás Corominola wrote that forty-two flasks might be sufficient for *two* weeks for the city miners (3,150 pounds, or 31.5 quintals, a little less than twice the bank’s estimate of seventeen quintals for *one* week), but he had no information on the needs of the provincial miners (he did not mention the *k’ajchas*). The prefect sent authorization to the bank to issue forty-two flasks during his absence.

3.2 *The visita of the Potosí Rivera, 1837–1838*

The inspection (*visita*) of the Rivera recommended by the tribunal in 1833 took place five years later (after the suspension of the tribunal in 1836) during a period of eight or nine weeks between November 16, 1837, and the week of January 16, 1838. This *visita* reveals the quicksilver consumption of eight individual refining mills, rather than subsuming differences within global averages or invoking the bank’s ratio of 1.6. It includes refiners’ fears for the fate of their businesses, often on the verge of closure due to the scarcity of quicksilver, the lack of water in the Rivera, and so on. In 1835, when N. M. Rothschild and Sons of London took over the worldwide sales of Spanish quicksilver, Rothschild’s first annual speculations were in the US, China, and Mexico rather than the

76 Guillermo Mira Delli-Zotti (“El Real Banco,” 334) gives a similar picture for the pre-war period: “sale of quicksilver was not the same as consumption, and refiners often took out more advances of quicksilver than they needed: as reserve, through facilities offered by the bank, or to attempt speculative deals. The latter were conjunctural because at this time Potosí did not suffer from lack of quicksilver.” In 1833, however, quicksilver was scarce and dear.

South Pacific. The lack of new quicksilver imports, and the decline in silver production, no doubt prejudiced the Peru-Bolivian Confederation during the war with Chile and Argentina between 1836 and 1839.⁷⁷

The inspection was carried out, refinery by refinery, in two stages: the first in the week of November 16, 1837, the second in the week of January 16, 1838. Two months elapsed between the surveys, during which no quicksilver credits were advanced by the bank. The fall in quicksilver stocks in these mills during the period therefore corresponds to on-the-spot consumption and can be expressed in relation to silver production as, in each case, an actual, individual ratio. The amalgamation process took several weeks; this was probably the reason why consumption during eight weeks was chosen for the *visita*: the time was enough to complete a cycle of amalgamation before calculating the ratio for the refiner.

The refiners whose businesses were inspected were not exactly the same on each occasion. In November 1837, the mills belonging to ten businesses were inspected, eight with a single refining mill each. In the case of the old colonial refiners Manuel María Garrón and Juan José de la Rúa, these two continued to use one head each of the same mill, Concepción “de los Muñoces,” one of which had been worked by Gregorio Barragán since before 1799 on behalf of himself and his two sisters (cf. Table 11.7).

Also inspected in November 1837 were five refining mills—Agua de Castilla, Jesus María, Zavaleta, Quintanilla, Guayllaguasi—which together formed the largest business on the Rivera. This belonged to two brothers from Salta, Francisco de Paula and Serapio Ortiz, who (together with a third brother, Manuel, who married the daughter of old colonial miner Salvador Fullá and worked the Guariguari mill with his wife) used their own refining method of “circuses” (*circos*) to save on labor costs during amalgamation.⁷⁸ But in November 1837, three of the five mills of Francisco de Paula and Serapio were inactive from lack of quicksilver during the Peru-Bolivian war with Argentina and Chile, when the two brothers were exiled to Salta by General Braun, commander of the Confederation’s southern army. This exile (or forced repatriation) of the two Ortiz brothers was considered a body-blow to the Potosí Rivera by Santa Cruz’s Spanish-born finance minister, José María de Lara; it also accounts for their omission from the second inspection in 1838.

In January 1838, then, only eight businesses were inspected; absent are the five mills of the Ortiz brothers and that of Pablo Rosas in Chectacala. In the

77 See Tristan Platt, “Historias unidas, memorias escindidas”; Tristan Platt, “Spanish Quicksilver.” Chile also controlled the supply of quicksilver to Bolivia and Peru from Valparaiso.

78 For the system of refining by *circos*, see Platt “Historias unidas, memorias escindidas”.

remaining businesses, we can observe the consumption of quicksilver over the two months, together with their silver production during the same period.

Before proceeding, let us note the percentage place of quicksilver in the costs of refining a single box of fifty quintals of sieved mineral flour. Table 11.6 shows the itemized costs in 1828 for the mill of Guariguari belonging to Salvador Fullá, whose daughter had married the third Ortiz brother, Manuel (see Table 11.7).

It should be noted that the amount of quicksilver whose consumption during amalgamation was foreseen, and could at least in part be recovered when compressing and volatilizing the amalgam, was distinguished from quicksilver used beyond that amount whose loss was not foreseen. Consumption and loss (*consumo* and *pérdida*) represent two different categories of quicksilver, although they were not always accounted for separately. In Guariguari, however, we can see that “consumption according to ore” (based on prior sampling with “a prudent calculation”) came to 5½ pounds of quicksilver in 1828, and cost 5½ pesos (16% of total costs); while “loss (*pérdida*) in the yard [*buitrón*], corresponding quicksilver” (i.e., unforeseen losses, perhaps in the cracks of the refining floor) came to four pounds at four pesos (12% of costs). Together, both categories of quicksilver made up 28% of costs. Estimates of quicksilver used in refining that ignore the distinction between consumption and loss are misleading, although the two categories are often conflated, both in the sources and in studies of refining.

We will now look at the stocks of quicksilver that each of the eight businesses declared available in their mills in November 1837 and then the amounts used to amalgamate with the powdered silver in the sieved mineral flour by the week of January 16, 1838. Some of the quicksilver had been issued on credit by the Mining Bank, but some will have been recovered from previous washes or been bought or borrowed from neighboring businesses and accumulated in store, as described by Nicolás Corominola in 1833.

Ores are described as a) “incorporating” (i.e., sieved mineral flour tipped into the yard and mixed with quicksilver); b) “in flours” (i.e., crushed and sieved, and probably tipped into the yard, but not yet amalgamated with quicksilver); and c) “in store.” The ore qualities are given as the number of marks expected per box of fifty quintals of mineral flour, together with its provenance: surface collection (*rodados*), reselection (*repallas*), deep mining, and so on. If we divide the marks produced by the amount of quicksilver used in each wash, we obtain the ratio (marks per pound) of each refiner.

The estimate of quicksilver consumption between the first inspection and the second presents relatively few difficulties. It is harder to estimate the number of boxes amalgamated, so our results are approximate.

TABLE 11.6 Costs of amalgamating one box of fifty quintals of silver ore in the Guariguari mill (owner Salvador Fullá) in 1828, excluding cost of mining, selection (*palliris*) and transport down from mine to mill

Milling of the box	4 pesos 0 reales
Trampling of box divided into four bodies ^a and three weeks labor of one peon @ 4 reales daily	9 pesos 0 reales
For the workers in the wash, cost for one box	0 pesos 4 reales
Consumption hammerheads (<i>almadanetas</i>) and mattocks	0 pesos 3 ½ reales
5 quintals salt (ground)	2 pesos 4 reales
Lead and tin	0 pesos 4 reales
Loss in Buitrón, corresponding quicksilver 4 pounds at 8 reales/pound	4 pesos
<i>Piñeros</i> and charcoal	3 pesos 4 reales
According to the metals and a prudent calculation, and [quicksilver] <i>consumption</i> acc. to ore, 5½ pounds at 8 reales/pound	5 pesos 4 reales
For the workmen and their salaries, excluding the administrator namely the serviris, carpenter, captain of trampling, and refiner	3 pesos 1 real 32 7 1/2
TOTAL	

a For the four bodies, or *cuerpos* (Quechua *tawantin* = "all four"), see Figure 11.3.

b It should total thirty-three pesos, ½ real.

SOURCE: ANB CJS, NO. 27 (F.13R). *JUICIO SEGUIDO POR PEDRO COSTAS CON SALVADOR FULLÁ SOBRE ENTREGA DE LA HACIENDA GUARIGUARI (1825–1831), CUARTO CUERPO, "CUENTA DADA POR ADMINISTRADOR DE GUARIGUARI DON DOMINGO GARRÓN," 22.XI.1828*

In the first inspection, a certain number of boxes are registered as "being washed" (i.e., the mineral rubbish has been, or is about to be, washed down the canals and sluices, leaving in the yard only the amalgam of silver with quicksilver: the *pella*); another figure registers the boxes in the yard which are still "in flours" (i.e., without added salt, copper, quicksilver, lime, saltpetre, or water). In the second inspection in January 1838, the same distinction is made, but we can assume that some or all of the boxes in flours in November 1837 will be among those "incorporated" (amalgamated) by January 1838.

During amalgamation, the mineral flour and quicksilver in each yard (*buitrón*) were divided into rows of four piles, or "bodies" (*cuerpos*), which were formed, mixed, and redivided several times by the barefooted indian treaders (*repasiris*) according to instructions received from the refiner (*beneficiador*). The treaders might be told to "marry" the "body" (or pile) at one end of the

row with the “body” at the other “extreme” (*uma pura*), or with the “next” in the row (*cailla pura*), or alternating leaving one body in between (*saltasqa*), or the first with the fourth and the second with the third (*taguantinta saltasqa*), while adding quicksilver, salt and water, copper, lime, and/or nitrate to each pile. Precise instructions were communicated by the refiner who posted up signs for the keywords in Quechua (Figure 11.3): this is where the refiner’s skill came in. Finally, the process was “flagged” as complete (*bandera*), and the combined body was ready for washing.

I will now calculate the silver production of two refiners each occupying one of the two heads of the historic “Mill ‘of the Muñoces,” or Concepción (see Table 11.7), in relation to the quicksilver used—this will yield their ratios—before comparing the results for all the refiners as summarized in Table 11.8.

1. Manuel María Garrón. Deep mining and tailings.

In the inspection of November 1837, Manuel María Garrón declared one wash of seven boxes incorporated, one wash with an unspecified number of boxes, and one wash of seven boxes still in flours (i.e., in the yard but not yet amalgamated with quicksilver). For present purposes, I will assume that the second wash of 1837 was also of seven boxes. In January 1838, Garrón registered “1½ washes of seven boxes each” as incorporated, and two washes of seven boxes as still “in flours.” The boxes still in flours we will discount, as they contain no quicksilver. The others will have been freshly sieved and sifted, together with mineral flour brought from the stores to the yard and amalgamated after November 1837; they probably include ores registered as still “in flours” in 1837.

On this basis we can infer that, during the period under consideration, there were 4½ washes of flours incorporated with quicksilver: 31½ boxes in all. Since his ores are given as containing 6–6½ marks/box, Garrón’s production over the full period of two months would reach 189–204 marks 6 ounces, with a consumption of 188 pounds of quicksilver. If we divide these figures by eight, we reach his weekly production of between twenty-three marks four ounces to twenty-five marks four ounces, with a consumption of twenty-three pounds of quicksilver. This yields a ratio of a little over one (one pound of quicksilver to refine one mark), which we have seen to be a common ratio among refiners in Peru, Potosí, and Mexico.

2. Juan José de la Rúa crushed the tailings he accumulated with the other head of the same stamping mill as Garrón: “Concepción de los Muñoces.” A colonial miner and refiner, he had married the daughter of Nicolás Urzainqui, a Potosí silver refiner and *subdelegado* of Chayanta province at the end of the eighteenth century. In the 1830s, de la Rúa still appears as *Protector de los Naturales* (“Protector of the Natives”), a colonial post that persisted during the early republican years.

During the inspection of November 1837, de la Rúa declared two washes of seven boxes each “incorporated” (amalgamated), and another seven boxes of

26.

Cuerpos y sus señales Voses en Quichua, Su Traducción

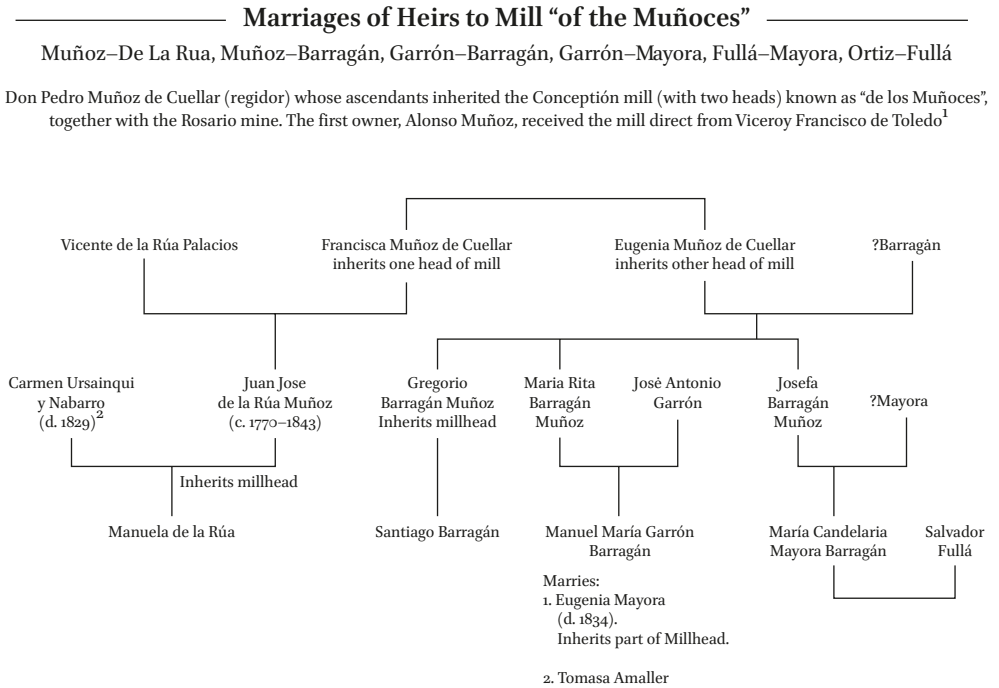
	Dobla.	Significa Repaso.
	Parti Señal	Cobre ò Masistral
	Parti Muñu.	Cal, Sal, ò Salitre
	Vg Muñu.	Duplicada Cantidad
	Yapa.	Anãbir Asogüe
	Cailta pura.	Casamiento de un cuerpo con el inmediato en una fila.
	Vina pura.	Casamiento de cuerpo que estan en opuestas Cá- ceseras.
	Saltasca.	Casamiento del 1º con el 3º y el 2º con el 4º
	Zaguantinta Saltasca.	Casamiento dejando un cuerpo por el medio
	Pasai.	Dejar descansar.
	Zagua rãia.	Quatro bueltas de repaso
	Yscari rãia.	Yapar 2 Hº de Asogüe.
	Queta Quetalla Sarun- qui.	Preparar el cuerpo bien aguinoso.
	Sumac masa Napi.	Enduesi estado la masa
	Bandera.	Ajustado el cuerpo y en estado de labor

FIGURE 11.3 "Bodies [of mineral flour] and their signs, words in Quechua, their translation"

Note: Archivo Nacional de Bolivia, Sucre, *Cuerpos y sus señales/Voses en Quichua/Su traducción* (photocopy by Tristan Platt, Sucre, 1982)

still unamalgamated mineral flour. I will assume that all three washes (twenty-one boxes) will have been amalgamated by the week of January 16, 1838. The January inspection registered two further washes, each of six boxes of unamalgamated flour, with a further half wash. I will assume that the quicksilver

TABLE 11.7 Marriages of heirs to mill “of the Muñoces”



1 See *Testamento de Don Manuel María Garon*, AHP EN 373 (14th July 1843), ff. 200v-212; and *Testamento del Doctor Don Juan José de la Rúa*, AHP EN 375 (1847), ff. 188-199v. Also f. 189r (#7). For Alonso Muñoz, see Francisco de Toledo, *Disposiciones Gubernativas* (1986 [1569-1574], t. I: 279). Toledo Created the post of “minero mayor” of Perú for Alonso Muñoz when he arrived form Guadalcanal (Spain), where industrial amalgamation with quicksilver had already been introduced from Mexico. Muñoz may have acted as technical overseer during the creation of the quicksilver-mills on the Potosí Rivera, as well as supervising his own. He was also charged by Toledo with creating an inventory of all the mines in Peru (Assadourian 1989: 190).

2 See AHP EN 197 f. 178v. 7.iV.1810: “*Venta de una quinta parte de Yngenio en el de los Muñoces, Sra. Da Clara Zamudio a Da María del Carmen Urzainqui, en 3500 pesos.*” Clara Zamudio was the wife of Colonel and Regidor Pedro Antonio de Azcarate, refiner and “universal heir of the late Tenant Colonel don Pedro Zamudio owner of the Yngenio de la Concepción known by the name of the Barraganes or Muñozez, a fifth part of wich Pedro Zamudio bought from don Agustín and don Bernardo Muñoz on 30.i.1796.” In 1810, Clara Zamudio sold her inherited fifth to María del Carmen Urzainqui, wife of Juan José de la Rúa, himself grandson of don Pedro Muñoz de Cuellar.

necessary to amalgamate the silver dust in these flours will have been added to them soon after. That would mean thirty-three amalgamated boxes yielding 4–4½ marks per box, amounting to 132–148 marks 4 ounces, with a consumption of 162 pounds of quicksilver over eight weeks: a weekly production of between sixteen marks four ounces and eighteen marks four ounces, with a consumption of twenty pounds four ounces of quicksilver. This yields an “actual ratio” of between 0.8 and 0.9 marks per pound of quicksilver.

I take these ratios as confirming *grosso modo* the procedure followed. If we now consider all eight refiners whose mills were inspected, we get a scatter of individual ratios all lower than the pre-war average or official ratio of 1.6, recognized by the bank in 1827 and invoked by bank ministers in 1833 (Tables 11.2 and 11.5). The inspection does not, however, specify the proportion of the quicksilver recovered and stored for future use after each wash, nor does it distinguish more expensive quicksilver, bought on the market, from cheaper quicksilver received on credit from the bank. A similar procedure with the other businesses inspected yields the following results (Table 11.8). The “real” ratios shown in Table 11.8 (column 7) are again approximate, but their range is plausible and shows their difference from the average ratio for 1800–1810 (1.6) used by the Royal Bank (and, in 1833, by the National Bank). The lowest ratios no doubt reflect clumsy refining techniques. But clearly the refiners aimed to accumulate as much quicksilver as they could by drawing on the “pool” described by Nicolas Corominola in 1833, which would allow them to increase silver production, rather than confining themselves to what they could produce with the weekly advance from the bank calculated on the basis of the previous week’s production. This led some to make speculations in the quicksilver market. We can observe a scatter of ratios above and below 1 (0.4–1.2), but all well below the “official” ratio of 1.6 pursued since independence by the bank.

The *visita* of 1837–1838 asked whether each refiner’s quicksilver included acquired quicksilver kept in store, beyond his or her credits from the bank; the answers, however, were understandably brief, and in January 1838 several simply repeated that their mills were at the point of closing for lack of quicksilver. Weekly bank credits are not distinguished from additional quicksilver bought from the bank, or on the market, or bought/borrowed from other refiners. The detailed workings of the shared “pool” of quicksilver alluded to by Corominola in 1833 have still to be unraveled. But the aim of this *visita* was to calculate and compare the actual ratios achieved by the silver refiners and estimate quantities held in store, while forecasting each mill’s immediate future in 1838. Quicksilver was irregular and expensive in Potosí and the South Pacific during

TABLE 11.8 Eight individual ratios of the Rivera of Potosí by mill and refiner November 1837–January 1838

1. Refiner	2. Mill	3. Quicksilver used (pounds) Nov. 1837– Jan. 1838	4. Ore washed (boxes of 50 qq)	5. Ore quality (silver marks per box)	6. Silver marks produced per week	7. The ratio = marks per pound. of quicksilver
1. Manuel María Garrón	Concepción (one head)	188	31½	6–6½	23.5–25.5	1+
2. Juan José de la Rúa	Concepción (one head)	162	33	4–4½	16.5–18.5	0.8–0.9
3. Manuel Lizarazu	San Marcos	427	60	8½–9	63.75	1.2–
4. Juana Subieta	Laguacayo	366	32	7–7½	28–30	0.6+
5. José Felipe Salas	Máquina	250	60	10	75	0.4
6. Avelino de la Torre	Turu	235	36	6½	29.25	1–
7. José María Velasquez	Calicanto	366	54	8	54	1.18
8. Executors of Diego Barrechea	Trinidad	314.5	35	7½	32.81	0.83

SOURCE: AHP PDE 1066, VISITA DE LOS YNGENIOS DE ESTA RIVERA (1837–1838)

the early years of the Rothschild monopoly, at a time when the southern army of the Peru-Bolivian Confederation urgently needed silver coins, both strong and weak, to finance the war with Argentina and Chile. However, one great advantage brought by European merchant and finance capitalists was access to credit—for example, for six months with a small price increase, or a discount of 6% at 1% per month. This was important for Spanish American refiners eager to postpone paying their amalgamation costs until they had produced the silver whose sale to the bank would cover the cost of the quicksilver used in refining it.

What, then, of the ratio achieved by the *k'ajchas*? The prices they received in the bank for their silver were generally lower than the prices paid to the members of the refiners' guild. But they were sometimes able to achieve higher ratios than the guild using their own methods of refining, which could produce more silver for the same amount of quicksilver. Bolivian metallurgist Inocencio Manuel Telles, author of a treatise on contemporary refining practices published in Chuquisaca in 1831, described the Potosí *k'ajchas*' methods in some detail:

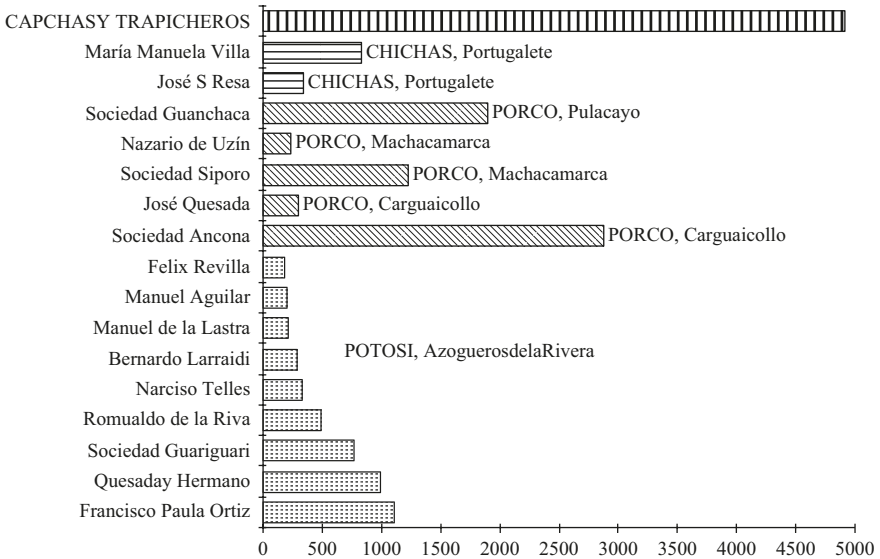
They manage sometimes not to lose the half pound of quicksilver which is lost in the yard, and achieve consumption of four ounces per mark; but at other times they lose more or double what is lost in the yard (which they call *Descabelladas*).⁷⁹

Consumption of four ounces per mark is equivalent to a ratio of 1:2, well above 1:1.6 and double the ratio of 1:1 common in the industrial yards. This must have helped the *k'ajchas* compensate for lower silver prices and the occasional loss of "more or double what is lost in the yard"; their methods as described by Telles await laboratory examination.

The recurrent coexistence of industrial and artisanal mining and refining has characterized Andean mining production from the sixteenth century until today. In 1856, Francisco de Paula Ortiz from Salta still owned the leading industrial business on the Rivera, but his production had fallen, and he was closely followed by the sons of Pedro Laureano Quesada from Arequipa, who were reliant on surface collection (Table 11.9). Moreover, in 1856, *k'ajcheo* was again an important source of silver for the Potosí Mining Bank, at a time when much of Potosí's industrial growth was shifting to the provinces. Ahead of the

⁷⁹ Telles, *Principios Físico-Químico-Prácticos*, 125–26, "Método que se sigue en los Trapiches por los *Pucheros Cagchas*" (cf. Appendix 2, this chapter).

TABLE 11.9 Silver sales to the bank, by producer, June 1856 (in marks)



SOURCE: *EL MINERO* NO. 22, 16 VII.1856 (BIBLIOTECA NACIONAL DE BOLIVIA, PERIÓDICOS BOLIVIANOS, POTOSÍ 8A)

impending boom of the Huanchaca Company in Porco province (which would later become the fourth largest silver producer in the world), the Ancona Company was flourishing in Carguaicollo (also belonging to Porco province). Here the first modern worker contracts had replaced several years of *k'ajcheo* by introducing wage deductions to cover medical care, following German practice; this led to the (temporary) replacement of *k'ajcha* relations of production (akin to agricultural *alpartir*, or “share-cropping”) by those of wage labor.⁸⁰

4 Balance and Projections

The history of the ratio between silver and quicksilver in early nineteenth-century upper Peru reveals a distinctive narrative of Potosí mining during the War of Independence and its neo-Bourbonic aftermath. It seems probable that the expense of free-market quicksilver, the lack of credit, and the decline of industrial silver production on the Rivera had awoken, by the end of the war, some silver refiners’ almost wistful memories of past prosperity and cheap

80 Tristan Platt, “Caccheo y minería mediana,” 85–118.

quicksilver under the Crown. The same ambiguity probably affected the bank ministers, and at least part of the shrunken population of post-war Potosí, though not the *k'ajchas*, *trapicheros* or provincial refiners, whose share of sales to the Royal Bank had reached 80% in 1822 and was still significant in 1856.⁸¹ The official ratio of 1.6 was maintained by the bank until the middle of the nineteenth century, when Rothschild had imposed market demand over the calculus of the ratio. Ratios can still be found later in the century, in California as well as in Mexico and the Andes; by then, though, they were part of miners' and refiners' private business accounts rather than expressing state administrative or bank fiscal policy.

Under the Spanish Crown, however, the ratio had been used by the bank not only to administer mining and refining, but also to detect smuggling. Hence, bank officials aimed to advance on credit only the quicksilver that corresponded to each refiner's silver production during the preceding week. This colonial procedure was restored by Santa Cruz in 1831, under pressure from the bank and the refiners themselves. Some refiners also used quicksilver they had in store, or had bought from speculators in the marketplace, to increase the amount advanced by the bank; others with less silver production might argue that their ores had declined or allege some other technical block. But if the bank thought their sales had gone down because they were selling silver elsewhere, they might have some explaining to do—or find themselves without advances of cheap quicksilver.

After the fall of Santa Cruz in 1839, the ratio of 1.6 continued to be used to detect smuggling. In 1841 we find it invoked when the Potosí bank, again low on quicksilver, requested in a letter to the prefect that some be sent from a recent delivery from Calama to Oruro.⁸² The bank argued that Oruro already had far more than it needed, given its lower silver production, implying that its miners were selling their marks privately rather than to the bank. And the ratio of 1:1.6 can be detected behind the calculations given in the letter of 1841, although it is not mentioned explicitly. Informed that the banks of Oruro and La Paz were to be allocated 500 flasks of quicksilver (375 quintals) and anxious to retain as much as possible in Potosí, the ministers of the Potosí bank argued that, in 1840, Oruro and La Paz had sent 15,558 marks to Potosí corresponding to only

81 From 25,000 souls in 1810, the population of the City of Potosí had fallen to around 8,000 in 1825, recovering to 16,711 in 1849. See, for 1810, ANB Minas T.42, no IV, 1816–1824. *Autos obrados con motivo de la representación que hicieron los vecindarios de La Plata, Potosí y La Paz ...* (ff.49v–50r); for 1825, see John Miller, *Memorias del General Miller* (London: Longman, Rees, Orme, Brown, and Green, 1829), 243–53; for 1849 (20.1), see Anonymous, “*Oficina de Estadística*,” in *El Eco del Sud* 1, no. 15 (February).

82 ANB MH PPR T.85, no. 20 (1841), Bank Ministers to the Prefect, Potosí, August 19, 1841.

ninety-seven quintals of quicksilver, while Potosí's department alone had produced 256,000 marks with a consumption of 1,600 quintals. Certainly, 1840 had been a boom year for Potosí's silver production.⁸³

Now, in both these pairs of figures—97:15,558 and 1,600:256,000—the number of marks per pound of quicksilver comes to exactly 1.6. But if we apply the same ratio, the 375 quintals assigned to Oruro and La Paz should produce 60,000 silver marks, which was way beyond the amounts actually received from these mining districts by the Potosí bank. The ministers of the bank suggested that 150 quintals should be sent to Oruro and La Paz, enough—if we again apply the ratio of 1.6—to produce only 24,000 marks. Here the ratio was being used with the aim of controlling smuggling, for if the refiners of Oruro and La Paz really needed 500 flasks (375 quintales), then clearly they were not sending all their silver to the Potosí Mining Bank.

In 1847, the ministers of the Potosí bank wrote again to the prefect affirming that they had always kept a strict record of the silver production and quicksilver consumption of each refiner. Their aim (they said) was to ensure

that the Miners of this Department invest quicksilver precisely in the refining of their metals, without fear that they may be diverting their refined silver (*pastas*) [sc. to other buyers], for the quicksilver that they buy [sc. from the bank] is found to be in proportion to the marks they present for sale to the bank.⁸⁴

Nevertheless, the Potosí departmental boom of 1838–1842 was accompanied and followed by increasing contraband of silver from Chichas to Valparaiso via Cobija, or overland via the “silver trail.”⁸⁵ The effectiveness of the ratio as a means of controlling contraband was clearly limited.

But long before the law of 1872 permitting the Free Export of Uncoined Silver (*Libre Extracción de Pastas*), which from 1873 would sweep away the

83 This high total was part of a substantial rise in production in the city of Potosí and in the provinces during 1840, especially in Aullagas-Colquechaca, Chayanta province, due to the short-lived boom of the Gallofa Society. For the decrease in production by the Gallofa in 1842–43, see AHP PD 422, no. 5, JM Berdeja, Governor of Chayanta Province, to the Prefect of Potosí, Macha, Jan. 24, 1843. In 1842, production in Aullagas fell back as its rich ore-shoots became exhausted, but production continued rising in the provinces of Chichas and Porco until, in 1848–1849, miners' registered production collapsed in the bank accounts due to a further rise in smuggling (Platt, *Historias unidas, memorias escindidas*, Table 6).

84 ANB MH PPR T.110, no. 44 (1846), Bank Ministers to the Prefect, Potosí, January 30, 1846.

85 See Viviana Conti, “Circuitos mercantiles.”

bank monopoly of silver purchases and open the Bolivian mining economy to the international capitalist market, European merchant banking had already penetrated the structure of American silver production through control of the quicksilver supply, thanks to successive contracts with the defeated colonial power, still a major producer of quicksilver: Spain. After 1835, N. M. Rothschild and Sons distributed Spanish quicksilver to leading buyers in the US (New York 1835), the Far East (1836), and then to their best customer, Mexico (1837), before sending more flasks to the South Pacific in 1838.⁸⁶ However, Rothschild and Huth Gruning were undercut for some years after 1848 by the cheaper quicksilver produced by Barron, Forbes at New Almadén in California. In the early 1850s, William Gibbs distributed Californian quicksilver from San Francisco to Mexico and down the Pacific Coast to Valparaiso, deliberately lowering prices in Peru, under instructions from Barron, Forbes, in a direct and explicit attempt to drive the Peruvian quicksilver miners at Chonta and Huancavelica out of business.⁸⁷ Gibbs's low prices even forced Huth Gruning to request permission from Rothschild to sell stocks of Spanish quicksilver at below fifty pesos per quintal, a request that was granted in 1850⁸⁸ and again in 1856.⁸⁹

86 See Tristan Platt, "Spanish Quicksilver."

87 RAL. See FHG to NMR, Lima January 9, 1852. "[The holders of Californian quicksilver] have received orders to push sales without regard to prices, as they have consulted the opinions of parties, well conversant with the consumption of the article in the interior and the productive cost of the Huancavelica quicksilver, whether by lowering their prices to \$50/ql it would be possible to stop the working of the Huancavelica quicksilver mines, so as to crush all competition. In order to maintain prices, we tried to come to an agreement with them regarding sales and prices, but they preferred to be independent.... Their object is evidently to sell and to supply the wants of this country, that as soon as they learn we stop selling at a certain figure, they will lower their rates to such a price as will give them the entire market."

88 RAL Correspondencia Huth Gruning. FHG to NMR, Valparaiso February 25, 1850. "We note with pleasure that you remove the limits you had given us for your quicksilver, which reaches us in good time as some parcels have already come into our market from California, the holders of which would otherwise have undersold us."

89 For later negotiations between Gibbs and Huth Gruning, see RAL Correspondence, FHG to NMR, Lima, July 26, 1856, when Huth Gruning was in turn undercutting Gibbs by selling below fifty pesos/quintal: "Messrs Wm Gibbs & Co finding that as long as we could sell the quicksilver at a lower rate than their established price of \$50, their stocks which consist at least of 5 to 6000 flasks at present, was too much accumulating, proposed to us to come to an agreement regarding the sale of this article on our market, into which we did, however, not consider ourselves authorized to enter as long as your last limit of 1/6 London price, equal at 44d to about 45½ \$ p/ql, permitted us to compete with the sales of the Californian quicksilver. They then resolved to undersell us, and although our limit is not known to them and we had not effected any sales at less than \$48 p/ql 6 mnths credit, they reduced their price at once to \$44, at which rate they placed 300 flasks with 6% discount."

We have seen how, at Bolivian independence in 1825, the quicksilver supply for Potosí had gravitated away from the Atlantic, Buenos Aires, and the land route via Salta and Jujuy, preferring the route around the Horn to the Pacific ports of Valparaiso, Copiapó, Cobija, Arica/Tacna, and Lima. At the same time, Chile rejected the weak currency so much in demand in Argentina, Peru, and Ecuador, as well as in Bolivia itself, while still showing keen interest in Bolivian silver production and the quicksilver trade. So what happened during the decade of 1848–1858, when President Manuel Isidoro Belzú and his immediate successors reduced, and then in 1854 practically suspended the coining of hard currency, again leaving Bolivian “weak” small change as almost the only coinage in circulation in the Andean countries and (with paper money) in Argentina?⁹⁰

A contemporary analysis can be found in a speech given on August 9, 1871, to the legislative assembly in Sucre by Potosí political economist Tomás Frías,

At this price we should consequently according to your instructions not have been able to compete with their sales, and ... we have now both agreed not to offer any further sales of quicksilver at less than \$50 p/ql 6 mnths credit, or with the corresponding discount of 1% p month, which agreement will be binding on both parts until four months after warning, unless we should mutually agree to annul or to alter the same, or you should in reply to the present refuse to ratify it.” [Asks for instructions, for] “if once our customers should get in the habit of purchasing of the agents of the Californian quicksilver, we incur the risk of losing them altogether, whilst at equal prices we trust always to have the larger share in the sales of this article.” Cf. FHG to NMR, Lima October 12, 1856: “we observe with pleasure that you ratify the agreement entered into between Messrs Wm Gibbs and Co and ourselves respecting the sale of quicksilver on our market.”

For Gibbs’ perspective on the same deal, see Guildhall Library London MS 11469/2 no. 258. “Valparaiso Store to Lima August 15, 1856: “Quicksilver. We duly note the arrangements you have made with Messrs Huth and Co to sell this article henceforth @ 50\$ either @ 6 mnths or 6% disc. Messrs Huth here have just disposed of all their stock amounting to about 880 flasks and as we are now the only holders we intend to raise our price to 52\$ at 6 mnths or 6% disc.” Compare no. 261: “Valparaiso Store to Lima. 30th Sept 1856. Quicksilver. Our fixed price is now 47\$ cash without discount, at the same time we think that your port charges, duty pd on this article require at least 1\$ per qql more than here, as far as the result to Barron Forbes and Co is concerned.”

- 90 For the relation between Buenos Aires paper currency and Bolivian weak coinage, see Alejandra Irigoin, “Las consecuencias económicas de la desintegración social y monetaria del imperio español. La ‘producción’ de moneda en Bolivia y el Río de la Plata,” in *Moneda y mercado. Ensayos sobre los orígenes de los sistemas monetarios latinoamericanos, siglos xviii a xx*, ed. José Enrique Covarrubias and Antonio Ibarra (México: Universidad Nacional Autónoma de México/Instituto Mora, 2013). A study of the presidency of Belzú can be found in Andrey Schelchkov, *La utopía social conservadora en Bolivia: el gobierno de Manuel Isidoro Belzu, 1848–1855*. Instituto de Historia Universal, Centro de Estudios Latinoamericanos (Moscow: Academia de Ciencias de Rusia, 2007).

minister of finance under President Linares (1857–1861) and himself to be president of Bolivia in 1872. Frías considered, first, Bolivia’s monetary situation at mid-century, which is what interests us here.⁹¹ He began by stating the principles guiding his analysis of the exchange value of weak coinage, leading him to subordinate the cost of production of money (its so-called “intrinsic value”) to the principles of supply and demand, and particularly to the speed of circulation and the capacity of absorption by the internal market:

That an increase in circulatory coin raises prices and a decrease reduces them, is the most elementary proposition in the theory of circulation. But, an increase in circulatory coin in proportion to the increase of transactions, and which does not last longer, does not have a tendency towards a rise in prices.

Frías observes that Andean and Argentinean demand for small change was such that the exchange value of the “weak” coins had risen well above the level of depreciation that corresponded to their much lower silver content (25%). This reflected the desire and capacity of Andean producers to expand participation in their markets with the increase in available means of exchange, together with the demand in Buenos Aires for Bolivian weak coinage as a debased form of “treasure” to support the paper money in circulation—perhaps a local variant of Gresham’s Law, as Irigoien (2013) has suggested.

In 1854, Peru decided to follow Chile and prohibit the entry of Bolivian “weak” coinage. Belzú responded by reducing the emission of “strong” coinage to only a few thousand pesos, while increasing the emission of “weak” coinage to the value of 2½ million pesos.⁹² On the nitrate pampa in the south Peruvian desert of Tarapacá, inland from Iquique, nitrate workers (many of them Bolivian) were still paid with Bolivian “weak” coinage, which circulated at its face value without depreciation. At the same time, demand for small change in Bolivia was so intense that bills (*letras*) for “strong pesos,” drawn on Valparaiso, could be bought in Potosí with “weak” pesos *at only 6% discount on their face value* (rather than 25%).⁹³ Thus, the sheer demand for means of exchange

91 See Sucre newspaper *La Patria* (August 25, 1871) (Appendix 1 of this chapter).

92 See Tristan Platt, “Estado tributario,” Cuadro VI: “Distribución global de las tres clases de Moneda (doble, sencilla y oro) producidas en la Casa de la Moneda, 1825–1863.”

93 Remittances by Huth Gruning in payment for Spanish quicksilver could be compensated further through arbitrage. Their daily letters to Rothschild regularly note the relative values of “hard dollars” (*pesos fuertes*), silver bars, gold ounces, and bills. In June 1849, FHG announced silver “at about \$10 1 real for mark ley 11.22 on board,” as well as the relative value of *pesos fuertes*, Californian gold dust, and bills on England. FHG to NMR, Lima June

compensated, during a few years, for the absence of “strong” pesos by enabling payment in Potosí for bills on Valparaiso with only lightly depreciated “weak” money, thus making it possible to pay for imported Spanish quicksilver with extremely *cheap* “strong pesos.”

However, Belzú’s huge increase in weak coinage finally overwhelmed the demand. By December 1857, its abundance on the pampa of Tarapacá, and in Bolivia, had grown to the point where its full depreciation of 25% was finally realized.⁹⁴ It was replaced promptly in 1858 by Tomás Frías (as finance minister for President Linares) with new hard coins of 400 granos, equivalent to eighty Chilean cents and known as “Frías pesos.” And in 1863, these were replaced by a new Bolivian peso of 500 granos, equivalent to the Chilean peso.⁹⁵

So what induced Rothschild in 1866 to pick up again the contract for quicksilver with the Spanish Crown? This new contract took place just as Californian quicksilver, which since the 1850s had been exported to China⁹⁶ as well as to Mexico and the South Pacific, began to respond to a new wave of internal US demand due to the recently discovered silver deposits of the Comstock Lode and the formation of new refineries at Washoe, Nevada. In 1866, the bank of California assumed the capitalization of the Comstock Lode, substantially reducing the supply of Californian quicksilver to the South Pacific, where space and opportunities once again became available for Spanish quicksilver.

In 1871, over half of California’s production was consumed in the United States, while another quarter was sold to China, leaving only a quarter for Mexico and the South Pacific, Australia, and New York (Table 11.10). We can

13, 1849. (The Californian gold “will probably be sent home for account of the owners, as it is not easy of sale, unless melted and properly assayed.”)

94 For the concept of monetary “overflow,” Sp. *rebose*, see Appendix 1 of this chapter: “there was still no overflow because the area in which the weak coinage circulated, including Peru and the Argentine Republic, was big and in proportion to the need of circulation.”

95 The success of the Peruvian prohibition was relative, as we can see when, in 1860, Rothschild objected to the attempt by Huth Gruning to raise their commission to 2%. From Lima, HG acquiesced, returning to their previous commission of 1.5%, while observing that 1.5% for collecting and remitting was “well earned, considering the difficulties we experience at present in making remittances from here, owing to the base coin in circulation and the scarcity of other means.” RAL Correspondence Huth Gruning. FHG to NMR, Lima April 12, 1860.

96 Unlike Japan, China had few silver deposits of its own and used quicksilver mixed with sulfur to fabricate vermilion and lacquer, as well as for medical purposes. See AGI Indiferente 1783, December 12, 1812. In the second half of the nineteenth century, following the political disruption of its own substantial cinnabar production in Kweichow and Yunnan, China imported Spanish quicksilver as well as Californian quicksilver. See F. R. Tegengren, “The Quicksilver Deposits of China,” *Bulletin of the Geological Survey of China* ([1915] 1920).

TABLE 11.10 Destination of Californian quicksilver production in 1871

Destination	Quintals (100 pounds)	Flasks (75 pounds)	% incl. US	% Exports only
New York	600	800	2.5	5.3
China	5925	7900	24.7	52
Mexico	2310.75	3081	9.6	20.3
South America	1650	2200	6.9	14.5
Australia	825	1100	3.4	7.2
Other countries	93	124	0.6	0.8
Subtotal	11,403.75	15,205	47.7	100
United States	12,507	16,676	52.3	
Total	23,910.75	31,881	100	

SOURCE: *LA DISCUSIÓN* NO. 70, POTOSÍ, FEBRUARY 16, 1876 (FROM THE *MINING JOURNAL*)

observe, therefore, how conditions were revived for Rothschild to be able to sell Spanish quicksilver again to Potosí and the South Pacific at prices as high as they had been in the years before 1850, when cheap Californian quicksilver had begun its temporary influx.⁹⁷

But by the end of the century, both California and Rothschild had jointly diverted their quicksilver exports away from the American mines, where cyanide was now replacing quicksilver during the last years of silver production, sending it instead to China, where demand for quicksilver was high due to the resurgence and expansion of vermilion and lacquer production.

• • •

I will end with a question concerning the effects of the introduction of Bolivian weak coinage by Santa Cruz, and carried to its extreme by Belzú, over nearly thirty years. As Tomás Frías pointed out, for as long as there was production

97 In 1873, *El Demócrata* (Potosí), no. 4, stated: “[Quicksilver] Scarcity... More than double what it cost before”; the price was 150 pesos/quintal. On August 4, 1874, *La Discusión* gave 140–160 pesos/ql. On June 2, 1875, the price had dropped to 112 pesos/ql. But on September 8, 1875, the “price in Potosí was 180 pesos/flask” of seventy-five pounds.

available beyond the value of the money in circulation, there is no reason to suppose the devaluation of Bolivian weak currency, which circulated at its face value until 1858, even allowing the purchase of *cheap* “strong pesos” (at only 6% discount) for importing quicksilver, an essential ingredient for silver production. This reflected the persistence of the demand for means of circulation current in the last years of the colonial internal market (1800–1811), which was greater than the means of exchange available during the early Republic. And as long as the demand for small change continued, there is no reason to suppose depreciation of the “weak coins”; indeed, the economy would no doubt have expanded further as a result of the greater liquidity available.

We do not know how long this process might have continued if Belzú had not increased so dramatically the supply of weak coinage in 1854. The question demands an evaluation of the effects of the *rhythm and speed* with which monetary reforms are introduced. If a smaller supply of weak coins had been continued for a longer time period, thereby postponing depreciation, might Bolivia also have experienced for longer the effects of recovering and expanding a greater part of the late colonial internal market *before* receiving the effects of monetary depreciation and a (partial) opening of the country to “free trade”?⁹⁸ But a discussion of this intriguing issue must remain beyond the scope of this chapter.

Appendix 1

Tomás Frías on the Monetary Question⁹⁹ (abbreviated, translation by Tristan Platt)

From 1830 to 1849 weak coinage circulated in Peru and the Argentine Republic at its face value, due to the need for means of circulation and without realizing the consequences which this must have later. The nitrate deposits of Iquique were the main takers of our weak coinage; there it was sent by traders who obtained in exchange bills on Valparaiso and Europe at almost the face value of the weak.

From 1849 until 1852 bills were acquired in Potosí at 3% profit, and those who sent strong pesos, which were still minted in equal proportion to the weak, gained 2 or 3%,

98 For an alternative view of the development of the internal market in relation to imports during the early Republican decades, see Erick Langer, “Bajo la sombra del Cerro Rico. Redes comerciales y el fracaso del nacionalismo económico en el Potosí del siglo XIX,” *Revista Andina* 37 (2003).

99 *La Patria*, Sucre, owner and editor Santiago Vaca Guzmán 1, no. 3. August 25, 1871 (Biblioteca Nacional Boliviana, Periódicos Bolivianos 20).

after deducting the costs of transport etc., due to the difference in their intrinsic value between the [Bolivian] strong pesos of 542 grains and the Chilean pesos of 500 grains.

Until then it may be said that there was no alteration in their values and what there was was very limited, due to the difficulties that began to be felt; but there was still no overflow (*rebose*), because the area in which the weak coinage circulated, including Peru and the Argentine Republic, was big and in proportion to the need of circulation.

In 1854 there was interdiction between Peru and Bolivia, and the Peruvian government prohibited the introduction of Bolivian weak coins to Peru. Then Belzu said that Bolivia was sovereign and could choose the money it liked, and from 1854 he suspended the emission of strong pesos and only emitted weak, changing the stamp with the bust of Bolívar *a la heroica* and the breadtree [sic] on the anverse [back side]. Till then there was no change of year, all the weak circulated as though emitted in 1830; from that date Belzú decided to add the date of emission.

With the weak coin rejected in Peru, money was sent via Cobija to Iquique, where it continued circulating. In 1856 bills on Valparaiso were still being bought in Potosí at 6% exchange, with money [weak coinage] being brought there. But at the end of 1857 the affluence of weak coinage in Iquique began to overflow that market; the nitrate companies began to decline to the point where several firms went broke and many businessmen were ruined, such as Freraut, Rojas and others.

This, and the lack of cordiality in the relations between the two governments [Bolivia and Peru], led the excess of circulating coin to be noticed, and the cost of bills to increase rapidly, such that in the month of December 1857 the exchange rose from 6% to 28%, which made the weak coinage exportable, being reduced to its intrinsic value and the values increased in equivalent proportion. With this measure fulfilled in Iquique, which supplied bills in exchange to our traders, without strong pesos nor anything else to offer them to export, the weak coinage was immediately depreciated in the interior of the Republic [as well].

In these circumstances the September Revolution occurred, and Mr. Frías, the finance minister, found the values leveled [between weak and strong], so that the commercial interests sent a solicitude begging the government to supply strong pesos, or weak silver with 25% increase. Mr. Frías, not choosing either of these solutions, emitted the Frías pesos of 400 grains in weight and nine tenths in quality [*fino*], which being worth exactly 80 Chilean cents fulfilled the desired object. Afterwards in 1863 these were substituted with Bolivianos of 500 grains, equivalent to the Chilean peso.

Appendix 2

The refining method of the *k'ajchas*¹⁰⁰ (abbreviated, translation by Tristan Platt)

In the *trapiches*, after roasting the minerals, they mill them again (*conar*), using measures they call *Viches*, usually of an arroba and a half,¹⁰¹ which they empty into rounded skins of ox or cow. They add salt in proportion, and wet the [mineral] flour (which they call *Pirincha*). According to their estimate of how much silver it contains, they amalgamate lead or tin with quicksilver. For example, they melt four pounds of tin, and when it has melted they add four of quicksilver; then they cool it with a quantity of water, and with one stone upon another they scrape or squeeze it till it is soft and reduced to a ball of *pella*, which they call *Masilla*.

They proceed to add in proportion some of this *Masilla* to the mineral flour, trampling it violently and treading it, adding the necessary water or reducing it to mud. When they see amalgam [*pella*] appearing in the testing dish [*chua*], and that the *Lis*¹⁰² when pressed with the finger cracks, or is rolled up, or forms a tube, they throw the mud out of the skin. Several of these small quantities [*puchas*] form a body, or volume, which they trample continuously, adding quicksilver until the *Lis* is made of quicksilver, and the *pella* is not scattered but is gathered together, whether in a sheet or as a lump, and they wash it.

When the small quantities that have merged, which they also call *carga*, show in the testing dish the quicksilver colored dark blue, which when poked dyes the water white (which they call heat), they add the *Masilla* piece by piece until they see that it has turned its natural colour, and has begun to increase [*esparcir*] the *pella*.

When on the other hand they see that, with *Masilla* added, the quicksilver looks fragmented and black, without turning silvery, they add burned mineral flour, until they observe it in all its whiteness, and they have managed—as they say—to “un-touch” [*destocar*] it, and set it refining, because before, when the quicksilver was black, they say it was “settled” [*sentado*] ...

They manage sometimes not to lose the half pound of quicksilver which is lost in the yard and achieve consumption of four ounces per mark; but at other times they lose more or double what is lost in the yard (which they call *Descabelladas*).

100 Inocencio Agustin Telles, *Principios Físico-Químico-Prácticos*, 125–27.

101 An *arroba* is a Spanish measure equivalent to twenty-five pounds of sixteen ounces each. For the reader who wishes to study the method of the Pucheros, a more extended description is available in Telles' text.

102 See *Lis de Azogue*, *Lis de pella*, *Lis de plata*, etc., in Frédérique Langue and Carmen Salazar, *Dictionnaire des termes miniers en usage en Amérique espagnole (XVI–XIX siècle)*, Éditions Recherche sur les Civilisations (Paris: Éd. Recherche sur les Civilisations, 1993), 223–24.

Primary Sources

- AGI—Archivo General de Indias (Sevilla)
 AHP—Archivo Histórico de Potosí
 ANB—Archivo Nacional de Bolivia
 BNB—Biblioteca Nacional de Bolivia
 BNR—Banco Nacional de Rescates
 CJS—Corte de Justicia Suprema
 EN—Escrituras Notariales
 FHG—Frederik Huth & Grüning
 MH—Ministerio de Hacienda
 MI—Ministerio del Interior
 NMR—Nathan Mayer Rothschild
 PB—Periódicos Bolivianos
 PDE—Prefectura Departamental Expedientes
 PD—Prefectura Departamental Correspondencia
 PPR—Prefectura Potosí Recibidas
 RAL—Rothschild Archive London
 TGM—Tribunal General de Minería

Bibliography

- Aillón, Esther. *Vida, Pasión y Negocios. El propietario de la viña 'San Pedro Mártir' Indalecio González de Socasa (1755–1820)*. Sucre: Archivo y Biblioteca Nacionales de Bolivia, 2009.
- Alonso Barba, Álvaro. *El Arte de los Metales* [1640], edited by Armando Alba. Potosí: Colección de la Cultura Boliviana, 1967.
- Anonymous. "Oficina de Estadística," *El Eco del Sud* 1, no. 15 (February 1849).
- Anonymous. "Las adiciones y rectificaciones al Padre Barba." In *El Arte de los Metales*, edited by Armando Alba, 201–38. Potosí: Colección de la Cultura Boliviana, 1967.
- Assadourian, Carlos Sempat. "Base técnica y relaciones de producción en la minería de Potosí." In *Ciencia, Vida y Espacio en Iberoamérica*, T.II, edited by José Luis Peset, 121–42. Madrid: CSIC, 1989.
- Assadourian, Carlos Sempat, and Silvia Palomeque. "Los circuitos mercantiles del 'Interior Argentino' y sus transformaciones durante la Guerra de la Independencia (1810–1825)." In *La Historia económica y los procesos de independencia en la América Hispana*, edited by Susana Bandieri, 40–70. Buenos Aires: AAHE-Prometeo Libros, 2010.

- Bargalló, Modesto. *La minería y la metalurgia en la América española durante la época colonial*. México: Fondo de Cultura Económica, 1955.
- Barragán R., Rossana. “Ladrones, pequeños empresarios o trabajadores independientes? K’ajchas, trapiches y plata en el cerro de Potosí en el siglo XVIII.” *Nuevo Mundo, Mundos Nuevos*, 2015, <https://doi.org/10.4000/nuevomundo.67938>.
- Brown, Kendall W. “La distribución del mercurio a finales del período colonial, y los trastornos provocados por la independencia hispanoamericana.” In *Minería Colonial Latinoamericana* edited by Dolores Ávila, Inés Herrera, and Rina Ortiz, 155–66. México: Instituto Nacional de Antropología e Historia, 1992.
- Buechler, Rose Marie. *Gobierno, minería y sociedad. Potosí y el renacimiento borbónico, 1776–1810*. La Paz: Biblioteca Minera Boliviana, 1989.
- Cajías, Fernando. *La Provincia de Atacama. 1825–1842*. La Paz: Instituto Boliviano de Cultura, 1975.
- Cavieres, Eduardo. *Comercio chileno y comerciantes ingleses, 1820–1880*. Santiago de Chile: Editorial Universitaria, 1988.
- Conti, Viviana E. “Circuitos mercantiles, medios de pago y estrategias en Salta y Jujuy (1820–1852).” In *La desintegración de la economía colonial. Comercio y moneda en el interior del espacio colonial (1800–1860)*, edited by Alejandra Irigoin and Roberto Schmidt, 113–33. Buenos Aires: Biblos, 2003.
- Contreras, Carlos, and Ali Díaz. “Los intentos de reflotamiento de Huancavelica en el siglo XIX.” Doc de trabajo 261. Lima: Pontificia Universidad Católica del Perú, 2007.
- Deustua, José. *La minería peruana y la iniciación de la República, 1820–1840*. Lima: Instituto de Estudios Peruanos, 1986.
- Fisher, John. *Silver Mines and Silver Miners in Colonial Perú, 1776–1824*. Liverpool: Centre for Latin American Studies, University of Liverpool, 1977.
- García-Baquero González, Antonio. *Andalucía y la carrera de Indias (1492–1824)*. Granada: Universidad de Granada, 2002.
- Gavira Márquez, María Concepción. *Historia de una Crisis. La Minería en Oruro a Fines del Período Colonial*. Lima: Institut Français d’Études Andines, 2006.
- Gavira Márquez, María Concepción. *Población indígena, Sublevación y Minería en Carangas. La Caja Real de Carangas y el mineral de Huantajaya, 1750–1804*. Arica: Institut Français d’Études Andines, Centro de Investigaciones del Hombre en el Desierto, 2008.
- Gavira Márquez, María Concepción. *Minería en Chayanta. La sublevación indígena y el auge minero 1775–1792*. La Paz: Plural Editores, 2013.
- Guerrero, Saúl. “Chemistry as a Tool for Historical Research: Identifying Paths of Historical Mercury Pollution in the Hispanic New World.” *Bulletin for the History of Chemistry* 37, no. 2 (2012): 61–70.
- Herrera Canales, Inés, and Alma Parra Campos. “La fiscalidad minera en México en la transición a la Independencia.” In *Cambio institucional y fiscalidad. Mundo*

- hispanico, 1760–1850*, edited by Michel Bertrand and Zacarías Moutoukias, 199–214. Madrid: Casa de Velázquez, 2018.
- Hidalgo, Jorge. “Dos documentos inéditos y un mapa de Cobija: informes del comisio- nado Dr José Agustín de Arze, 1786–1787.” *Revista Chungará* 10 (1983): 139–45.
- Irigoin, Alejandra. “Las consecuencias económicas de la desintegración social y mon- etaria del imperio español. La ‘producción’ de moneda en Bolivia y el Río de la Plata.” In *Moneda y mercado. Ensayos sobre los orígenes de los sistemas monetarios latinoamericanos, siglos XVIII a XX*, edited by José Enrique Covarrubias and Antonio Ibarra, 175–235. México: UNAM/Instituto Mora, 2013.
- Johnson, David A., and Karl Whittle. “The Chemistry of the Hispanic-American Amalgamation process.” *Journal of the Chemical Society, Dalton Transactions* 23 (1999): 4239–43.
- Lang, Mervyn. “El derrumbe de Huancavelica en 1786.” *Histórica* x, no. 2 (1986): 213–26.
- Langer, Erick. “Bajo la sombra del Cerro Rico. Redes comerciales y el fracaso del nacio- nalismo económico en el Potosí del siglo XIX.” *Revista Andina* 37 (2003).
- Langué, Frédérique, and Carmen Salazar-Soler. *Dictionnaire des termes miniers en usage en Amérique espagnole (XVI–XIX siècle)*. Paris: Éditions Recherche sur les Civilizations, 1993.
- Llorca-Faña, Manuel. *The Globalization of Merchant Banking before 1850: The Case of Huth and Co*. London: Routledge, 2015.
- Lofstrom, William. *Dámaso de Uriburu, un empresario minero* [1973]. La Paz: Empresa Editora Gráfica, 1982.
- Lynch, John. *Latin America between Colony and Nation*. London: MacMillan, 2001.
- Martin Martin, Victoriano. *Los Rothschild y las Minas de Almadén*. Instituto de Estudios Fiscales, Ministerio de Hacienda. Madrid: Fábrica Nacional de Moneda y Timbre, 1980.
- Mayo, John. *Commerce and Contraband on Mexico's West Coast in the Era of Barron, Forbes & Co., 1821–1859*. New York: Peter Lang Publishing Co, 2006.
- Miller, John. *Memorias del General Miller*. London: Longman, Rees, Orme, Brown, and Green, 1829.
- Mira Delli-Zotti, Guillermo. “El Real Banco de San Carlos de Potosí y la minería altoperuana colonial, 1779–1825.” In *La Savia del Imperio*, edited by Julio Sánchez, Guillermo Mira Delli-Zotti, and Javier Dobado, 265–80. Salamanca: Universidad de Salamanca, 1997.
- Mira Delli-Zotti, Guillermo. “La minería de Potosí. Las élites locales y la crisis del sistema colonial.” In *Dos décadas de investigación en historia económica comparada en América Latina. Homenaje a Carlos Sempat Assadourian*, edited by Margarita Menegus Bornemann, 105–24. México: El Colegio de Mexico / Instituto Mora/ UNAM, 1999.

- Mira Delli-Zotti, Guillermo. "Panorama de la organización y las bases de la producción de plata en Potosí durante el período colonial (1545–1825)." In *Potosí, Plata para Europa*, edited by Juan Marchena Fernández and María José Villa Rodríguez, 105–24. Sevilla: Universidad de Sevilla, Fundación El Monte, 2000.
- Mitre, Antonio. *El monedero de los Andes*. La Paz: Plural, 1986.
- Mitre, Antonio. *Los patriarcas de la plata*. Lima: Instituto de Estudios Peruanos, 1981.
- Osio, Leandro. *Proyecto para el Fomento de la Minería de Potosí* [1830]. Chuquisaca: Imprenta Boliviana, 1832.
- Parkerson, Philip T. "La política minera de Andrés Santa Cruz (1829–1839)." *Historia y Cultura* 2 (1976): 151–70.
- Pederson, Leland R. *The Mining Industry of the Norte Chico*. Evanston: Department of Geography, Northwestern University Studies in Geography, No 11 (1966).
- Pentland, Joseph Barclay. "Report on the Republic of Bolivia, 1827." *Camden Miscellany* 25, 169–267. London: Offices of the Royal Historical Society, 1974.
- Platt, Tristan. "Estado tributario y librecambio en Potosí durante el siglo XIX: mercado indígena y lucha de ideologías monetarias." In *América Latina: Dallo Stato Coloniale allo Stato nazione*, edited by Antonio Annino et al. Turin: Universidad de Torino, Franco Angeli, 1987.
- Platt, Tristan. "Ethnic Calendars and Market Interventions among the Ayllus of Lipes during the Nineteenth Century." In *Ethnicity, Markets, and Migration in the Andes*, edited by Brooke Larson, Olivia Harris, and Enrique Tandeter. Durham: Duke University Press, 1995.
- Platt, Tristan. "Historias unidas, memorias escindidas: las empresas mineras de los hermanos Ortiz y la construcción de las élites nacionales. Potosí y Salta, 1800–1880." *Revista ANDES* 7 (1996): 137–220.
- Platt, Tristan. "The Alchemy of Modernity. Alonso Barba's Copper Cauldrons and the Independence of Bolivian Metallurgy (1790–1890)." *Journal of Latin American Studies* 32, no. 1 (2000): 1–54.
- Platt, Tristan. "Spanish Quicksilver': A Preliminary Note. The London Market, Global Trade and the Rothschild Monopoly." *The Rothschild Archive. Review of the Year* (2010–11): 38–48.
- Platt, Tristan. "Container Transport: From Skin Bags to Iron Flasks. Changing Technologies of Quicksilver Packaging between Almadén and America (1780–1840)." *Past & Present* 214 (2012): 205–53.
- Platt, Tristan. "Caccheo y minería mediana en las provincias de Potosí: Lipez y Porco (1830–1850)." *Estudios Atacameños. Arqueología y Antropología Surandinas* 48 (2014): 85–118.
- Platt, Tristan. "Tiempo, movimiento, precios: Los caminos del azogue español de N. M. Rothschild entre Almadén, Londres y Potosí, 1835–1848." *Diálogo Andino* 49 (2016): 143–65.

- Platt, Tristan, and Pablo Quisbert. "Tras las huellas del silencio: Potosí, los incas y el virrey Toledo." *Bulletin de l'Institut Français d'Études Andines* 37, no. 2 (2008): 1–32.
- Presta, Ana María. "La Compañía del Trajín de Azogues de Potosí: Un capítulo inédito de la financiación de los repartimientos indígenas surandinos al desarrollo de la minería colonial." *Boletín del Instituto de Historia Argentina y Americana "Doctor Emilio Ravignani"* 43 (2015): 31–58.
- Roca, José Luis. *Ni con Lima ni con Buenos Aires. La formación de un Estado nacional en Charcas*. La Paz: IFEA/Plural editors, 2007.
- Rodríguez Ostría, Gustavo. *El socavón y el sindicato: ensayos históricos sobre los trabajadores mineros, siglos XIX–XX*. La Paz: ILDIS, 1991.
- Schelchkov, Andrey. *La utopía social conservadora en Bolivia: el gobierno de Manuel Isidoro Belzu, 1848–1855*. Moscow: Academia de Ciencias de Rusia. Instituto de Historia Universal, Centro de Estudios Latinoamericanos, 2007.
- Soux, María Luisa. *El complejo proceso hacia la independencia de Charcas (1808–1826): Guerra, ciudadanía, conflictos locales, y participación indígena en Oruro*. Lima: Institut français d'études andines, [2010] 2015.
- Tandeter, Enrique. "Attempted Economic Reform and Innovation in Bolivia under Antonio José de Sucre, 1825–1828." *Hispanic American Historical Review* 50, no. 2 (1970): 279–95.
- Tandeter, Enrique. "La producción como actividad popular: ladrones de minas en Potosí." *Nova Americana* 4 (1981): 43–65.
- Tandeter, Enrique. *Coerción y Mercado. La minería de la plata en el Potosí colonial, 1692–1826*. Buenos Aires: Editorial Sudamericana, 1992.
- Tegengren, F. R. "The Quicksilver Deposits of China." *Bulletin of the Geological Survey of China*, [1915] 1920.
- Telles, Inocente Agustín. *Principios Físico-Químico-Prácticos en memorias para extraer la plata que contengan los minerales*. Sucre: Imprenta Boliviana, 1831.

Index

- Acosta, José de 21n67, 114, 115, 116n36, 128n79, 129, 131
- Africa 2, 19, 20n62, 212n7, 213, 247, 248, 252, 317
- Ágreda, María de 400, 401n19
- Alanocas* 337, 450n62
- Albiz, Martín 199n104
- Almadén 12, 34, 35, 426, 429, 431n18, 432n22, 433, 436n30, 437, 438, 441, 470
- Al-Mawsili, Elias 21n68
- Amalgamation 12, 29, 30, 34, 127, 143, 204, 281, 425, 426n3, 433, 434n28, 456, 458, 459, 461, 466
- Amsterdam 2n4, 8, 13, 17, 18n55, 67n90, 268
- Ancona Company 467
- Andean environment 33
- Andean hydrological language 185
- Angola 19, 257n25, 258
- Antillas 18
- Antwerp 12nn28–29, 367n29, 392, 407n27, 408, 409, 419
- Apiris* 26, 186, 333, 337n58
- Apu Challku Yupanqui 66
- Arawak 58, 86
- Architects 179, 191, 193, 194, 204
- Arequipa 83, 269, 377, 434n27, 447n55, 450n59, 451, 466
- Argentina 5, 22, 74n19, 130n88, 134, 136, 147n20, 195, 211n3, 233n78, 362n9, 393n7, 425n2, 429, 431, 458, 466, 471
- Ari Capac Iqui 84, 85, 92n203
- Arica 195n78, 215, 269, 270, 325, 428, 431n18, 435n30, 438n35, 440, 444, 446, 447n55, 452, 471
- Arrieta, Pedro de 447nn55–57, 448, 451
- Artisan 5, 28n99, 33, 150, 155n38, 176, 203, 258
- Asia 2, 3n4, 5, 7, 8n19, 13, 15, 17n52, 21, 246, 247, 249n11, 252, 260, 264, 268, 419
- Asiento 19, 20, 60n42, 249, 351
- Atlantic Ocean 17
- Audiencia de Charcas/Audiencia [Audiencia (of Charcas)] 25n83, 30, 34, 106n3, 188, 193, 195, 202, 310, 331, 359–367, 369, 372, 375, 377, 382, 383, 385
- Audits/Inspections 229, 230–233
- Australia 416, 473, 474
- Aviador* 315, 435
- Ávila, Pedro de Avila 201–203
- Aymara 58n30, 61n47, 64, 66, 67n84, 75, 79, 80, 87, 88, 90–95, 142n6, 218, 331, 333
- baja de la moneda/devaluación [devaluation] 370
- Baltic Sea 17
- Banco de Rescates, Casa de Rescates*, see also Bank Banco de San Carlos
- Bantam (Banten) 388n1, 418n40, 419n40, 420, 422
- Barba, Alonso 60n44, 112, 114, 192, 426n3, 434n28
- Barretero* 26, 193n66, 333
- Barron, Forbes 433, 470, 471n89
- Basque country 13, 199n104, 277, 288, 289, 319, 393
- Batavia 17, 34, 392, 404, 417, 418
- Belgrano, Manuel 442
- Belzú, Manuel 433, 471n90, 472–476
- Bengal 17
- Benino, Nicolás de 62n57, 63, 68n95, 110, 114–116n36, 117, 192, 198n101
- Billon (*vellón*) 396, 399, 407, 409, 410
- Bolívar, Simón 161n60, 277n4, 427, 451, 476
- Boston 2n3, 213n8, 334n57, 415, 416n38
- Bovadilla, Bravo de 329, 330
- Brabant 6, 13
- Brittany 13
- Bry, Theodor de 21n69
- Buccaneers 7, 10
- Caiza 67, 90, 93
- Cajas de aguas 160, 175, 347, 351, 376n58, 378, 380, 385
- Callao 8–10, 247, 248, 251, 252, 259n35, 261, 265, 266, 269, 270
- Calomel 426
- Caltama 62, 90–93, 96
- Campo de la Rynaga, Nicolás Matías del 121–125, 132n96, 135, 234
- Canas 89, 191, 217
- Canchis 89, 191, 217
- Cantabria 13

- Canton 10, 259, 261, 266, 271, 431
 Cantumarca (Kantu Marka) 448, 454
 Capacique 89, 90
Capacocho 79, 92, 96
 Capchas, see k'ajchas 316, 322–328, 344
 Cape Horn 318, 428, 430, 437, 438
 Cape Verde Island 19
 Capoche, Luis 21n67, 62n54, 63n65, 68, 110,
 114, 115, 148, 149, 186n43, 192–195n79,
 200n105, 284, 286n31, 290, 292,
 299, 308
 Carabaya 82, 83, 85, 86, 93, 95–97
 Carangas 319, 22n74, 91, 123, 218n29, 325,
 380, 421, 428, 431, 435n30, 438, 439
 Carguaycollo, silver mines 467
 Caribbean Sea 10, 16
 Caricari, dam 175n1, 176, 177, 194
Carrera of Indias 8n19, 13, 18, 39,
 249n11, 438n35
 Carpenters 28n97, 191, 193, 194, 204, 292
Casa de Contratación 7, 8
Casa de La Moneda / Casa de la Moneda/
 ceca [mint] 37, 211n3, 322, 351,
 362n9, 393n7
 Cavendish, Thomas 10
 Cayetano Soler, Miguel 440, 446, 449
 Cerro de Pasco 22n74, 51n2, 59, 346, 444
 Ceylon 17
Chacaneadores 26
 Chalco 60, 61, 64, 67n87, 80n150, 91
 Chaqui 68, 69, 286n31
 Charazani 84, 87
 Chayanta 127, 293, 294, 339, 341, 351, 444n51,
 456, 463, 469n83
 Chichas 83, 91, 120, 123, 324, 339, 341, 351,
 376, 427n4, 430n15, 432n21, 439,
 467, 469n83
 Chinese goods 248, 264, 267
 Chinese silk 270, 271
 Chiriguano 162n60, 186
 Choquechinchay 86, 87, 93, 94
 Chucuito 141n5, 186n43
 Chuquisaca, or La Plata (later Sucre) 70,
 426n3, 427n5, 428, 451, 457, 466
 Cinnabar 425, 426, 429, 473
 Clerck, Jacques de (also known as Jacques
 l'Hermite) 10
 Cobija 428n9, 430, 431n18, 432n21, 438n35,
 439, 452, 453, 469, 471, 476
 Cobos (derecho de) 28n101, 322, 370n38
 Código Carolino 127n75–76, 134, 136
 Colaert, Pedro de 13
 Compañía, Companies,
 Compañía Dutch East India Company
 (VOC) 10, 17n52
 English East India Company (EIC) 3n4,
 388, 393, 419
 Compañía Guipuzcoana 319
 Compañía de Azogueros 35, 315, 319
 Comstock Lode (Nevada, USA) 473
 Conde de la Moneda 329, 330
 Consulate of Seville 14
 Copiapó 80n150, 195, 430, 438, 471
 Córdova Messia, Pedro 201
 Coromandel 17
 Corominola, Nicolas 453–457, 459, 464
Corpa 27
Correspondido (Ratio) 159n51, 429
 corrupción [corruption] 362, 370n40,
 393n7
 Corzo de Leza, Carlos 287
 Corzo, Carlos 140, 142, 146, 147, 150, 152, 153,
 155, 156, 158–161, 164, 165
 Council of Castile 396, 399, 400
 Cumuri (from Quechua *k'umu* = hunchback):
 Indians loaded with silver ore
 26, 434
 Cupi, Christina 344
 Curu 74, 75
 Cuzco 23, 31n100, 32, 52n4, 61, 64, 65, 78, 79,
 81, 86, 90, 95n221, 140n1, 165, 184n33,
 186, 188n51, 197, 233n78, 289, 316n7,
 331, 349n84
 Cyanide 434, 474
 Damascus 6
 De la Rúa, Juan José 447n55, 448, 458,
 463, 465
 Debasement 359, 361, 363, 364, 389, 390n4,
 392, 393, 398, 414, 416n38, 419, 420
 Dependency 21n71
 Desaguadero River 32
 Diego Iquisi 91
 Diezmo 8, 315, 318, 347
 Dollar; Spanish Dollar 4n10, 388, 411n30,
 414, 419, 472n93
 Don Quixote 1, 6n13
 donativos [donations] 373, 376, 389
 Drake, Francis 10

- Drophammers 434
 Dutch East India Company (*Vereenigde Oostindische Compagnie* or VOC) 10, 17n52
 Empiricism 158n46
 Engineers 179, 184n33, 191, 193, 194, 204, 447n54
 English East India Company (EIC) 3n4, 388, 393, 418, 419
 Enríquez, Martín, viceroy 141, 186n43, 286, 290, 292, 378
 Ensayador [assayer] 217, 362, 368, 371
 Enslaved laborers/Slaves 210, 214, 215, 218n25, 218, 221, 223, 225, 235, 237
 Escape 68, 233, 235, 237, 238, 435
 Escobedo y Alarcón, Jorge 317, 351
 Esquilache, Príncipe de, viceroy 196n84, 198
 Experimental trial 158, 159, 163, 165
 Expertise 35, 113n29, 115, 130, 150, 152, 154
 Eyewitnessing 145, 163, 167
 Felipe IV or Philip IV of Spain 12n29, 401n19
 Flanders 12, 34, 395, 407, 411
 Florence 6
Flota de Indias 8
 Foundry 217, 218n29, 219n30, 223, 225, 226, 230, 232n78, 234, 237, 238
 Fountains (pilas) 175, 181, 184, 185n34, 186, 187, 192, 200, 203
 France 4, 5, 12, 15, 20n63, 35, 247, 319, 367n29, 389, 394, 405–407
 Franco, Matías 201, 297, 430n12
 Frederick William (Elector) 411n30, 413, 421
 Frías pesos 473, 476
 Frías, Tomás 22n76, 23n78, 277n2, 471–476
 Fuggers 12, 12n27
 Galindo, León 447n57, 450n60, 451n67
 Gálvez, José de 132n96, 348n83, 435, 449
 Gambarte 448, 450
 Garrón, Manuel María 448, 454, 455, 461, 463, 465
 Gazettes 7, 8n6, 11, 12, 15, 16n48, 19
 Genoa 12, 262, 367n29, 402–404, 407, 409, 419–422
 Ghent 13
 Gibbs, Anthony and William 433, 470n89
 Globalization; Early Globalization 2, 4n10, 31, 195, 245n1, 246–248, 255, 259, 262, 271, 359, 433n24
 Gómez de la Rocha, Francisco 362n12, 363n15, 365n21, 366n27, 368, 369, 371–374, 378, 379
 Granada 7n14, 8, 20, 34, 270, 317, 394, 399, 400
 Great Britain 5, 12, 20n62, 35
 Gresham's Law 411, 472
 guairas, see huayra 349
 Gualpa 60–65, 70, 96, 97
 Guantajaya, also Huantajaya 324, 339, 341
Hacenderos 281
 Haro, Luis de 396, 398, 399
 Havana 4n10, 8, 213, 315
 Hawkins, Richard 10
 Heads (*cabezas*) 434
 Herboso, José de 317, 319, 332, 351
 Highland ecology 35, 184
 Hinestroza, Juan Fernández de 118n43, 119, 135
 History of archives 144n16
 Huancavelica 28n10, 30n107, 34, 35, 143, 147n20, 151, 185n37, 196n81, 268n59, 425, 429n10, 435n30, 438–440n43, 470n87
 Huanchaca Company 467
 Huantajaya/also Guantajaya 22n74, 325n49, 346, 348n83, 435n30
 Huarte Jauregui, Francisco 444, 447
 Huascar inca 65, 82
 Huayna Capac 65, 66n82, 69, 79, 91
Huayrachina 29
 Hull, John 415, 416n38
 Humahuaca 438
 Huth, Frederic 433n24, 478
 Huth, Gruning 433, 436n30, 470n88, 89, 472n93, 473n95
 Hydraulic infrastructures
 Hydraulic policy 178, 181, 182
 Hydraulic technologies 179
 Inca hydraulic engineering 195
 Indigenous workers 5, 126, 130, 143, 161, 177–179, 181–185n37, 186, 187n49–50, 189, 190n50, 191n62, 193n66, 198, 199n102, 200, 201, 203, 204, 284, 288, 291, 304, 305, 322
 Ingenio 33, 63n62, 126n71, 146–149, 156, 159, 161, 168, 185n36, 194, 215, 278, 281, 365n20
 Intermediate Period 1150–1450, 56–59, 85, 97, 204

- Invention 36, 131, 141, 146, 152, 154, 157, 202
 Iquique 346, 431n18, 435, 472, 475
 Jamaica 16, 320
 Japan 5, 246, 247n6, 258, 259, 265, 398, 420, 422, 473n96
 Jaúregui Manuel de 329, 330
 Jaureguí, Martín 430n13, 444n5, 452n72, 453n75
 João IV of Portugal 405
 Kallawayas 82, 85, 87, 97
 Kari-Kari Mountain Range 54, 175n1, 176, 178–180, 182, 183, 189, 190n58, 191, 193, 201, 203
 Königsberg 411n30, 412n31, 413, 414n32, 422
La Angostura 197, 199
 Labores 62n57, 63n62, 116n34, 185n36, 281n12, 319, 328–330, 333n52
 Lacquer 417, 473n96, 474
 Laguna Lobato 56
 Lake Titicaca 32, 56n18, 57n22, 59n35, 65, 72, 75–77, 79, 85, 86, 184n32, 185nn38–39, 186n43, 217, 428
Lamas 148, 149, 156, 159, 290
 Leisure 226, 236
 Levant 17, 18, 246, 404, 5406
 liberal regime 145
 Lípez 195, 202, 324, 335, 341, 376, 377, 379, 380n74, 431, 444n51
 Lisbon 12, 17, 19, 262, 405
 Lizarazu Beaumont y Navarra Zenteno Juan de, Conde de la Moneda 331
 Lizárraga, Reginaldo de, fray 195, 292, 296
 Llanos, García de 63n62, 64, 65, 88, 110, 114, 185, 192, 281, 284, 285, 300, 303, 306, 333
 Local elites 180
 Lodeña, Pedro de 176n3, 181n25, 187n50, 188, 201
 Long-distance world trade 245, 268
 López de Quiroga, Antonio 23n78, 232n75, 288, 362n10, 422
 López de Zúñiga, Diego, doctor 286
 Lords of mines and mills 34, 284
 Lorraine 13, 158n45
 Lyon 13
 Machacado 63
 Machuca, Joan Lozano de 149, 195
Maestros (technicians) 33, 35, 175, 177–179, 182, 191–194, 199, 201–204
 Magistrals 142, 426n3
 Magistrate 175, 210, 225, 228n64, 230, 235, 237, 319, 331, 334, 365
 Mama 61, 64, 66, 67, 90, 91, 94, 184n34
 Mancera, Marqués de, viceroy 365, 366nn26–27, 369
 Manila galleon 8n19, 10, 13n35, 246n2, 247, 249, 260, 267, 268
 Manrique, Felipe 289
 Manrique, Juan del Pino 133n99, 344, 351
 Manumission 212, 213n9, 215, 220n33, 221n34, 222, 224, 225, 227, 229, 238
 Massachusetts 136, 414n33, 416, 421
 Matos, Felix de, statistician in the Potosí Bank 437, 441, 443
mayordomo (steward) 281, 282
 Mazatlan 438
 Mediterranean Sea 17
 Mendoza 64, 125, 180n17, 183n28, 189n55, 197n87, 199n102, 225, 227, 264, 267n56, 280n11, 305, 333nn52–53, 341, 370, 438
 mercaderes de plata [silver merchant] 362, 365, 389
 Mexico City 14, 181, 193, 194, 260, 271, 389, 393, 407, 417, 419
 Middelburg 17
 Mineralogy 35, 108, 113n27, 114
mingas metaleros 333
 mining entrepreneurs
 mining mills (refineries); mining *reales*;
 mining centers
 mint fraud 5, 30, 34, 232n74, 359n3, 364, 366, 368, 369, 373, 374, 375, 377, 379, 381–383, 388, 389, 393, 394, 399, 409, 411, 416–418, 420, 421
 mita
 mita for hydraulic labor 182–189
 mita nueva 127, 134
 Mondragón, Pedro de 286, 287, 289, 301, 303
 Mendoza, 111 marqués de
 Montesclaros 289, 303
 Montevideo 428, 430, 431n18, 432, 438n35, 441
Mordedor 284, 322
 National Mining Tribunal.
 National Mint 35, 176n4, 427
navíos de registro 15, 253
 Nestares Marín, Francisco de/Nestares Marín, Francisco de
 Netherlands 12, 35, 388, 389, 394, 411

- New Almadén 433, 470
 New Granada 8, 20, 394
 New Spain
 Nordenflicht, Baron von 112, 127n76,
 129, 144n14
 North Sea 17
 notarial practice 158, 160, 162, 164, 165
 Nuevo Potosí 108n10, 118n43, 119
 Núñez de Anaya, Juan 15, 265, 269
 Ocaña, Diego de, fray 21n67, 64, 176n5,
 197, 284
 Olivares, Count-Duke of 389, 398
 Omasuyu 82
 Ortiz de Aulestia,
 Francisco 199n104, 200
 Ortiz de Sotomayor, Rafael 176, 188–190,
 201, 289
 Ortiz de Zárate, Juan 140–168
 Oruro 3n9, 22n24, 30n108, 66, 71, 72, 74, 75,
 88, 89, 96, 110, 120, 123, 202, 233, 251,
 346, 347, 376n58, 379n70, 380, 388, 426,
 427n4, 428, 431n18, 435n30, 437, 438,
 468, 469
 Osoreo de Ulloa, Pedro 33, 176, 195, 196n81,
 197, 198n98, 199n102, 202, 301–305
 Overseer 200n105, 218, 222, 225, 226, 235,
 236, 281, 300, 306, 413
 Oxenham, John 10
 Pacajes 82, 217, 376n58
 Pacheco, Nicolas 337, 338, 351
 Pacific Ocean 262, 438
 Palacios Atard, Vicente 316
 Palla 72
Palliris 337, 434n27, 460
 Panama 8, 252–254n21, 259n35, 260–263,
 266, 271, 317, 375, 400, 438
 Paria 202, 292, 294, 300, 341
Partido 27, 346, 348
 Patio 161, 210, 217, 226, 236
 Paula Sanz, Francisco de 127, 129, 130n88,
 133, 428
 Pawllu Inca 65
 Pedro de Azaña (Solís y Palacio) 361, 367,
 371n44, 373n52, 374, 375, 377, 381–383
pella, amalgam 162, 337, 434, 460,
 477n102
 Penal Labor 215, 224, 228, 238
 Peñarubia, Juan de 329, 330, 332
 Pérez Durazno, Sebastián 201
 Perulero 14, 15, 29, 33, 35, 247, 248, 249, 259,
 261, 262n50, 263–266, 268, 271, 400
pesos peruleros 400
 Pilcomayo River 199, 286n31
piñas, pineapples 291, 321, 322, 365, 380n23,
 427, 434, 450n59, 457
Piñoncitos 321
 Pipes 75, 175
 Pirates 7, 10n26, 333
 Piura 438
 Pizarro, Gonzalo 60, 61, 68n95
 Plague 390, 399
 Political Ecology 180n19
 Political Geology 31, 36, 109–114
 Poma de Ayala, Guamán 21n67, 72, 73, 82,
 84, 177
pongo, punco (door) 193n66, 281, 282, 333
 Porco, Potosí Province 114
 Portobelo 8, 10, 13, 14, 20, 33, 248, 250, 253,
 254n21, 257–259, 262, 263, 438
 Portugal 19, 20n62, 140, 232, 389, 404, 405,
 430n15, 467
 Potosí
 Potosí hydraulic system 191
 Potosí Mint, Casa de la Moneda 359–385
 Potosí Ribera 300
 Potosí Royal Mint; after 1825,
 National Mint (*Casa Nacional de
 Moneda*) 35, 427
 Prefecture of Potosí 35, 427
 Privateers 10
 public sphere 145
Pukina 32, 52n3, 57, 58, 64, 76, 80, 82–
 90n195, 91, 93, 94, 97
 Puno 295, 428, 438
 Qaraqara Charca 90
 Quespi, Andrés 333n53
 quicksilver; From: Almadén (Spain); Huan-
 cavelica (Perú); Kweichow (China);
 Idria (Austria); New Almadén (Califor-
 nia); Packaging: in boxes; in iron flasks
 Quillacas 293, 295, 438
 Quinto 8, 119, 315, 317, 318, 333n53, 347, 370
 Ramírez de Arellano, Felipe 363n15, 368,
 371n46, 384n90, 409n29
Rancherías 181
 Refiners' Guild
 Refining methods 146, 152–162, 457
 Refining mills 174, 302, 328=349

- Relaves* 148, 159, 290
Repasiris 26, 338, 434, 461
 Reservoirs of Potosí 177, 178, 189n55, 203
 Rio de La Plata 3, 16n46, 17, 127n75, 136, 256,
 257n28, 262, 317, 318, 332, 471n90
 Robertson, William 131n92, 132n95
 Rotterdam 17
 Rouen 6, 13
 Royal Mining Bank of San Carlos 35, 427
 Royal Mint, renamed the National Mining
 Bank 35, 427, 439
 Salta 74n19, 93, 257, 271, 428, 431n18,
 434n27, 438, 439n39, 440, 458, 466,
 461
 Salvatierra, Conde de, viceroy 369–371, 421
 San Francisco 2, 87, 125n69, 196, 283,
 325n49, 399, 433, 470
 San Ildefonso, Ravine 176, 194, 197, 204
 San Pablo, Reservoir 176, 194, 204
 San Sebastián, Dam 191, 195n76, 197, 204,
 319n19, 331
 Sánchez, Garçi 152n31, 153n32, 157,
 284n21, 307
 Sande, Pedro 194, 195n46, 197–199, 202,
 204, 294
 Sandoval y Guzmán, Sebastián 119n46
 Santelices y Venero, Ventura de 220n31,
 317, 351
 Sao Paulo de Loanda 19
 Sao Tome 19
 Sarmiento de Sotomayor, Francisco 289
 Scientific Revolution 144n14, 145, 158n45,
 163n65, 192n65
 Self-determination 212, 220, 223, 229, 238
 Serapio, Manuel 434, 458
 silk road 35, 246n3, 271
 Silver Age
 Silver Bank 314–352
 Silver coinage, strong (*fuerte*) and weak
 (*feble*) 451
 Silver Connections 6–31
 Silver of Potosí 245–272
 Silver Trail, *la ruta de las pastas* 439, 469
 Slavery 211n3, 212n7, 213n7, 214–216, 220n33,
 222, 223, 232
 Slaves 15, 19, 20n62, 25, 26, 33, 183, 196n83,
 212n7, 213n8, 232, 237, 257, 258, 262,
 270, 331, 364, 367, 381, 411n30
 smuggle; Smugglers; Smuggling 10, 34, 251,
 257, 319, 320, 350, 433, 439
Socavón 29, 115, 127, 191, 198n101, 278,
 300, 450n62
Soldado 33, 161n60, 278n4, 284, 288n39
 Solórzano de Pereira, Juan 198
 Soroche 54, 60n44, 62, 75
 South Sea (Pacific Ocean) 14, 20, 366n26
 Spanish Empire; Spanish Crown 5, 18, 37,
 177, 181, 182, 203, 232, 248n9, 314, 317,
 361, 362, 401 / 6, 7, 19, 186, 259, 315, 316,
 360, 364, 366, 390, 429, 432, 433, 436,
 468, 473
 Spooner, Frank 388, 406
 stonecutter/stonemason 186, 191, 193, 194,
 199n104, 200, 201, 204
 Strait of Gibraltar 17
 Sucre, Antonio José de: Grancolombian
 General; victor of Battle of Ayacucho;
 First President of Bolivia.
 Surat 4n10, 391, 402, 415, 419, 421
 Tabaconuño Lagoon 189, 190, 200, 201
 Tacana 63, 64, 90
 Tacna 433, 446, 471
 Tagle, Pedro de 317, 320n28, 321n30, 350n87
 Tarapacá 61n51, 69, 195n78, 431n18, 472, 473
 Tarapaya 146–149, 159, 164n31, 165n71,
 195n79, 197, 199, 286, 287, 291, 301–306
 Tarapaya valley 197, 199, 287
 technical expert 145, 150–152
 Thaler 4, 411, 412, 414
Tierra de la Canela 61
Tierra Firme 8n18, 12, 255
 Titicaca Idol 80, 94
 Toropalca 67, 90, 93
 Trapiches; trapicheros 26n91, 27n94,
 126n71–72, 306, 316, 323n44, 324, 325,
 333, 334n57, 335, 337, 338, 339, 344, 346,
 348–351, 444n51, 466, 477
 Treasures 6–8, 31, 60, 401
 Trigoso, Gerónimo de 331, 351
 Tucuman 86n169, 367, 426, 428, 438, 442
 Tupac Yupanqui 76, 79, 80, 85, 94
 United States 5, 36, 127n73, 473, 474
 Uruquilla 57
 Valparaíso 428, 430, 431n18, 432, 433, 438,
 439, 453n74, 458n77, 469, 470n88,
 471n89, 472, 473, 475, 476

- veedor del Cerro* (overseer of the Mountain) 281, 300
 Venice 1, 12, 268
 Veracruz 20, 259, 439n41, 441
Vergulde Draeck 416–418
 Vermillion 473n96, 474
 Visisas 67, 90, 91, 93
 Wages 23n79, 25n85, 26, 123, 190, 227n62, 230, 237, 322, 337, 439
 Wari empire 56, 57, 59
 Wari Wiracocha 70, 71
 Watchman 237
 Water shortage 177, 189
willaq umu 65, 66
 William, Rudolph 176, 185n35, 203
 witness testimony 151n27, 157, 163, 164
Yanakuna (Quechua), *yanacona* (Spanish) 60, 65, 96
 Yocalla 187, 204
 Yura 67, 91