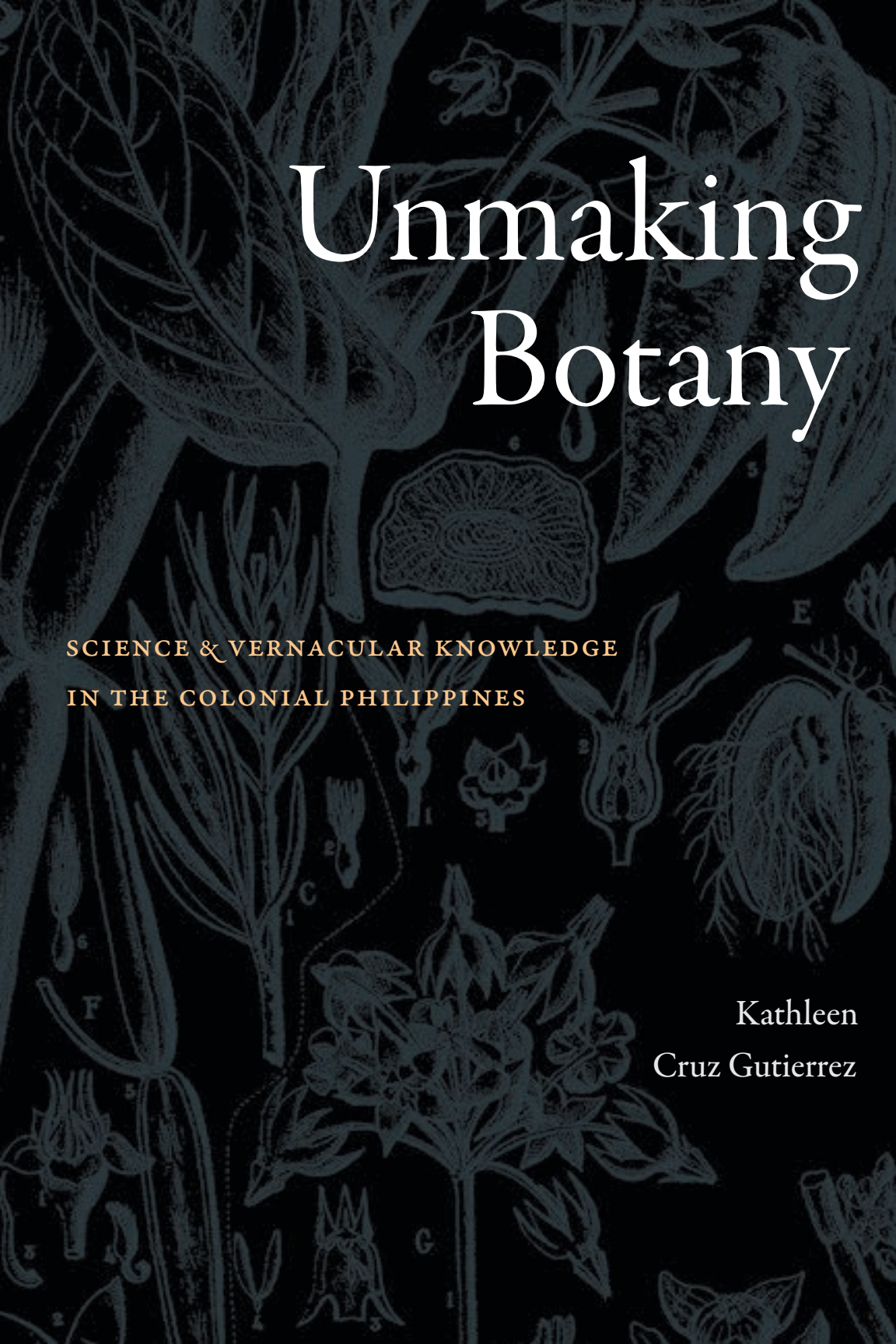


Unmaking Botany

SCIENCE & VERNACULAR KNOWLEDGE IN THE COLONIAL PHILIPPINES

Kathleen Cruz Gutierrez

Unmaking Botany

Unmaking Botany

Science and Vernacular Knowledge in the Colonial Philippines

KATHLEEN CRUZ GUTIERREZ

Duke University Press *Durham and London* 2025

Printed in the United States of America on acid-free paper ∞
Project Editor: Michael Trudeau
Cover design by Matthew Tauch
Typeset in Garamond Premier Pro by Westchester Publishing Services

Library of Congress Cataloging-in-Publication Data
Names: Gutierrez, Kathleen C., author.
Title: Unmaking botany : science and vernacular knowledge in the colonial Philippines / Kathleen Cruz Gutierrez.
Description: Durham : Duke University Press, 2025. | Includes bibliographical references and index.
Identifiers: LCCN 2024025083 (print)
LCCN 2024025084 (ebook)
ISBN 9781478031482 (paperback)
ISBN 9781478028277 (hardcover)
ISBN 9781478060475 (ebook)
Subjects: LCSH: Botany—Philippines—History. | Botany—Spain—Colonies. | Traditional ecological knowledge—Philippines. | Ethnoscience—Political aspects—Philippines. | United States—Territories and possessions—History. | United States—Foreign relations—1865–1921. | Philippines—Colonization—History.
Classification: LCC QK21.P6 G88 2025 (print) | LCC QK21.P6 (ebook) | DDC 581.9599—DC23/ENG/20241217
LC record available at https://lccn.loc.gov/2024025083
LC ebook record available at https://lccn.loc.gov/2024025084

Cover art: Plate 68, "Asclepiadeas," from *Sinopsis de Familias y Generos de Plantas Leñosas de Filipinas*, vol. 2, atlas (Manila: Chofré y Compañía, 1883). Courtesy of Biblioteca Digital of the Real Jardín Botánico.

Support for the publication of this book was provided by the Association for Asian Studies' First Book Subvention Program.

To my parents, ESTRELLA AND HERMES,
for giving me the stars and the gods

Contents

A Note on Orthography, Terms, and Formatting

I do not italicize the proper names of institutions that appear in Spanish or other European languages. Institutional abbreviations follow the Spanish names and not my English translations. For phytonyms or plant names, I include original spellings as they appear in sources. For instance, malacquit and malagcquit both likely refer to the "malagkit" of today. I provide the original Latin spelling for binomials and for the original species name found in my materials even if more contemporary updates have been made to the identification. Such instability is instructive. In the book, I touch on how colonial investigations of plants grappled with changing orthographic or transliterative conventions.

Sources interchange the spelling of Regino García's second surname, Basa (or Baza). I have chosen to use "Basa" to reflect its spelling in the nineteenth-century source material. Since I rely on the orthography that appeared in late nineteenth-century records held in Madrid, I also use "Sebastián Vidal y Soler" instead of the Catalan variant, "Sebastià Vidal i Soler." I do preserve, however, the Catalan variants for other Catalan actors' names that appear in other primary and secondary sources. I provide the birth and death years for historical actors when available, and those years appear only with my first mention of an actor in the book. For all publications and institutions, I include parenthetically the year published or founded at first mention only. Aside from publication titles or purposes of emphasis, Latin is the only language I italicize. I choose to set it apart textually from other languages, such as those of the colonial Philippines including Spanish and English. These languages were and continue to be everyday vernaculars of plant-knowing.

"Filipino" refers to the distinct political identity that emerged through the nineteenth century, whose use accelerated in the final decades of the century to denote people of the Philippine colony. Because of the growth of "Filipino" as

an identity in the late nineteenth century, I hesitate to refer to all Philippine-born actors historically as such, especially if I have information on the ethnolinguistic community to which the actor was known or claimed to belong. "Non-Christian" tribal identity became especially marked in the early twentieth century as US anthropology took to the Philippines. I use identity markers, such as Bagobo, as they emerged in archival material, knowing that these actors' presumed ethnic categories were flexible yet formalizing with enhanced colonial ethnological research. I do not use "Filipinx," the gender-neutral term. "Filipino" and "Filipina" were gendered and gendering markers during the period of the present study, and these, as I show, were part of the floral imagination. I use "US" interchangeably as a demonym and as a modifier. Furthermore, I use "Spanish" as a demonym and as a modifier and to refer to Castilian Spanish or the Iberian Spanish language.

For image captions, the language "once known" replaces "unknown" to describe individuals that I have not been able to identify by name. Following the practice of particular Indigenous scholars in the United States and curators in Australia, I use "once known" to recognize that these individuals, though perhaps "unknown" to me or my reading audience, were nevertheless known individuals at some point in time.

Introduction

SOVEREIGN VERNACULARS

There, crops overflow
beautiful, thick with offerings;
there, forests of pure wealth,
in the river's mud a golden possession,
hundreds of thousands of scallops offer
their jewels at the seashore,
there, along the mountain range,
absent of predators,
abundant in wild honey
—"ANG MUTYÂ NG KASILANGANAN," *Renacimiento Filipino*, 1912

The Philippine environment has engrossed newcomers for centuries. Its charms have beckoned botanists and the botanizing, poets and bureaucrats alike. Today, scientists speculate the archipelago may host the highest concentration of unique

species per unit area in the world.[1] They estimate at least 40 percent of its plants to be endemic, growing nowhere beyond the 7,641 islands embraced by hundreds of miles of open sea.[2] But the very condition for marveling at these figures—for marveling at the notion of a Philippine environment—emerged at the nexus of colonization, science, and nature. Foreign observers put in place the idea that an island chain of polylinguistic littoral, riverine, and upland polities could be investigated as a singular colonial environment. In addition to overwhelming plant forms, which such observers studied, cataloged, and classified, that same environment also presented ways of knowing nature that challenged their investigations.

This book is a history of botany in the colonial Philippines, and within this history are ways people knew plants. These ways, from the embodied to the patriotic, the cosmological to the systematic, illuminate the vegetal thought-worlds present on an archipelago once administered by two successive empires. For both the Spanish and US colonial projects, the science of botany brought order to tropical flora to serve intellectual, commercial, and political interests. Botany's rise as a self-proclaimed international science coincided with the concluding years of the Spanish and the early years of the US colonial regimes, and both deployed similar strategies of botanical systematization.

As this book reveals, even as colonial botanists sought to regiment the Philippine environment along renewed virtues of Linnaean botany, alternative knowledges of nature persisted. I term these "sovereign vernaculars," or insight into plants that made and *un*made the science. Sovereign vernaculars revealed locally nuanced ways by which individuals came to know the plants around them, at times exposing the philosophical unsteadiness, the labor fragility, and the disciplinary limits of botany. Nevertheless, botany's continuance into the early twentieth century came from its encounter with vernaculars. The science's imperial dominance, a sovereignty over how others may come to know plants, thus materialized from its grappling with such divergent insights. The tension present in both categories—of the sovereign, and of the vernacular—drives this book.

The following pages call for a spacious definition of the vernacular, which, in the history of Anglo-European botany, has customarily connoted that which is not Latin or not a Latinized scientific plant name. All plant names—nombres vulgares, local monikers, the common—fell and continue to fall under this category. I reconceptualize the vernacular as more than just the non-Latin and define it instead as expressions of plant knowledge that include and yet are more than names. These expressions emerged both in solitary moments and throughout extensive forest expeditions. They could be heard over a bandurria accompaniment or during a field interview. Sometimes they skirted botanists' gaze or deeply unsettled it. Often, they lived in everyday locations, leaving botanists to puzzle over whether

FIGURE I.1. "Balete tree on Tuai," no. 136, ca. 1910s, Elmer D. Merrill lantern slides, Archives of the New York Botanical Garden. Reproduction permission courtesy of the Archives of the New York Botanical Garden.

they constituted scientific knowledge, its complete opposite, or simply something else. Most significantly, these vernaculars demonstrated expertise that, like the science, remained dynamic, historically contingent, and socially entangled.

This broader definition of the vernacular encourages renewed scrutiny of archival source material and colonial botany tomes. Take, for example, a lantern slide titled "Balete tree on Tuai" (see figure I.1). The name of the black-and-white image

calls attention to a balete, or a species of *Ficus*, growing on the commercially profitable bishop wood tree known locally by some as tuai. The image includes a field assistant, likely hired in the locality, whose name does not accompany the photograph. Captured in the first decade or so of US colonial occupation of the Philippines, the image is but one of thousands that contributed to a visual archive of the empire's new Pacific possession. Scientific personnel embarked on large-scale visual documentation of the archipelago that included Philippine peoples, landscapes, and flora. Images from expeditions circulated through public lectures or by way of government documents, serials, and popular monographs. Brief captions written on slides could point to locations or plant names but hardly much on the local people, usually men, hired during an expedition.

Photographs commonly depicted the relative size of unfamiliar flora for colonial and imperial audiences. Personnel and assistants posed alongside towering tree trunks and dense forests to strike intellectual curiosity or to encourage business investment. Through the lens of the sovereign vernacular, the lantern slide conveys not only the politics of imperial photographic subjection but also an expression of plant knowledge. The field assistant is not standing to show relative height. He reclines, at a moment of leisure, looking down at the photographer in the clearing. Beyond respite, such a pose suggests the field assistant's familiarity with the balete, ability to climb it, and acquaintance with its unique structural integrity, enough to rest against its aerial roots. For a moment, the field assistant, a hired collaborator in colonial plant surveying, demonstrates an ease to which the would-be viewer may not have access. At once, the colonial science is made through the technology of the photograph and local labor, and unmade by the field assistant's repose and a knowing uneasily tapped. The balete, which typically begins as an air plant with roots above ground, eventually girdles and suffocates its host tree. In this photo, the balete, which cradles the field assistant, is in the process of its slow, gnarled encircling—a species' encroachment on what had been a capitalist endeavor during the Spanish regime and would continue to be under the United States. It is vernaculars like this that serve as points of departure in order to set the historical stage and the broader conceptual moves ahead.

Setting the Stage

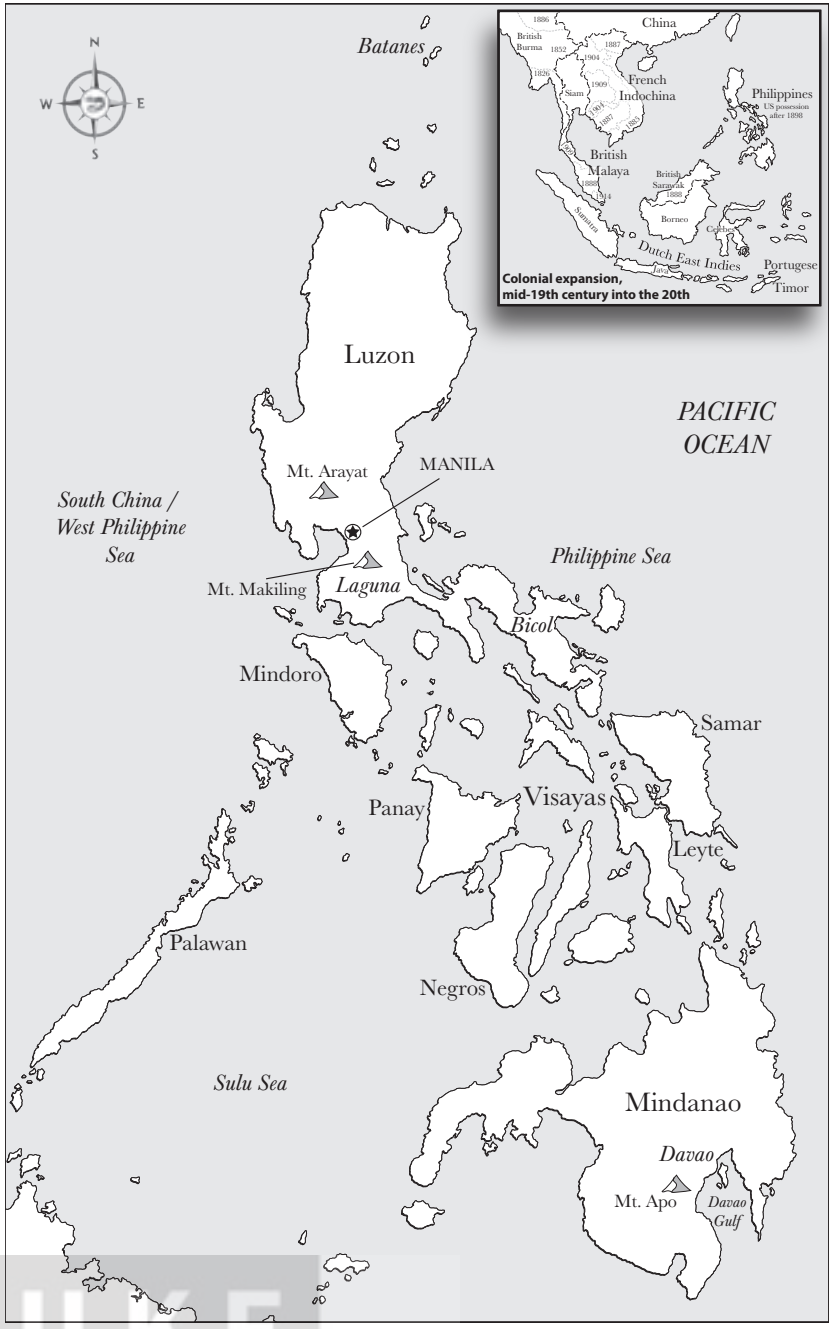
The Philippine Convergence

This book is situated in the last four decades of Spanish colonization (1858–1898) and the first four of US colonial occupation (1898–1935). In 1858, the Spanish colonial government established the Jardín Botánico de Manila. The institu-

tion and its Philippine-born and foreign personnel marked a significant shift for Spanish imperial science and for colonial intellectual production on plants. A revision of a flora on Indochina, a project begun by a leading US colonial botanist during his two-decade station in the Philippines, was published in 1935. The work features key nomenclatural considerations that punctuated ongoing international botany debates and reflects an enhanced effort on the part of the US to explore neighboring colonial terrain. Both moments and their intervening years saw several developments central to the legacy of the science in the archipelago.

The Philippines' historical trajectory and location make it a special locus of analysis for a sustained study of botany. Prior to Spanish contact, the islands were the site of politically independent animist societies and Muslim sultanates linked by trade and war. Maritime polities, such as those located in Sulu, Cebu, Manila, and Tanjay, engaged in terrestrial, interisland, and regional networks that stimulated the circulation of goods from the ports of Majapahit, Champa, Ayutthaya, and Java among others.[3] Oral traditions predominated, and though languages had scripts, no textual material has survived. Iberian fleets, driven to discover competitive trade routes and access to the lucrative plant commodities of the Maluku Islands, arrived at what would become "Las Islas Filipinas," named after Spain's Philip II, in 1521. In 1565, the Spanish established the first permanent settlement on the island of Cebu, administered by the viceroyalty of New Spain. Mass Catholic conversion, enslavement, labor and military conscription, wars, and political subjugation over the next three centuries ensured that the process of colonization was neither peaceful nor categorically unquestioned.

Spanish hold over the colony weakened by the nineteenth century. An influx of capital and business enterprise coursed through the archipelago, especially with the end of Spain's trade monopoly in 1815. Liberal politics ascended within the broader ecosystem of political upheavals in Latin America and in Europe. Creole (referring to a Philippine-born Spaniard, also originally known as Filipino) agitators embraced the ideals of revolution in the face of an ennobled friar class and differential political rights. Reformist and anti-colonial movements that had been developing since the early nineteenth century became more visible by the century's end. A crop of middle- and upper-class Philippine-born mestizo (mixed-race of Chinese or Spanish and native parentage) and native intellectuals produced literature, serials, artwork, and intensive studies of the islands, marking what can be considered the "Filipino Enlightenment."[4] No longer reserved for a European class, the "Filipino" identity became a patriotic one for an entire people.[5] With this self-fashioning, a burst of politically revolutionary and liberal activity critiqued the Spanish administration and advanced a new proto-national self-determination. Yet what climaxed in the Philippine Revolution



MAP 1.1. Map of the contemporary Philippines. Inset map demonstrates European and US colonial expansion from the mid-nineteenth century into the twentieth in the region that would become Southeast Asia. Reference map courtesy of *Philip's Atlas of World History*. Cartographic design courtesy of John Wyatt Greenlee, Surprised Eel Mapping.

of 1896, the first far-reaching, multiethnic anticolonial revolution in Asia, was immediately followed by the arrival of another foreign colonial power.[6] At the conclusion of the Spanish–American War in 1898, the United States purchased the Philippines from Spain through the Treaty of Paris. Formal colonization continued through the mid-twentieth century. After the United States granted commonwealth status to the Philippines in 1935, the colony obtained independence in 1946 at the end of World War II.

To foreign colonials from both Spain and the United States, the Philippine geography was a strategic asset: its position, a prime location for trade and military outposts, and its natural resources, an oft-cited storehouse of wonder and wealth. At the same time, the Philippines' location within the Pacific Ocean made it a rather distant colonial holding from its imperial metropoles, unlike Spain's American colonies or the United States' eventual Caribbean possessions. Fleets of foreign colonials could not land at its several key ports at the same volume as they arrived at La Habana, San Juan, or San Francisco de Quito. The presence of neighboring imperial powers in the Dutch East Indies, British Malaya and Burma, Portuguese Timor, and French Indochina also reduced the likelihood of colonial expansion beyond the archipelago's shorelines. In earlier centuries, nearby empires spelled fierce competition.[7] By the turn of the nineteenth and twentieth centuries, as this book shows, their proximity meant more collaborative potential.

ENTANGLED EMPIRES, EMPLACED SCIENCE. Existing scholarship has painted the two empires as exceptionally different. Indisputably, Spain's first motives for imperial exploration in the sixteenth century were distinct from those that prompted US overseas expansion in the late nineteenth. The global milieu within which these empires operated further affected the level of interimperial hostility or cooperation they practiced. Their programs of race, education, and bureaucracy also diverged.[8] For the Philippines, scholars have also distinguished Spanish colonial science from US. For the anthropological sciences, for example, the Spanish prosecuted less ethnological research compared to other European empires of the late nineteenth century, including the nascent German Empire.[9] The US Empire, on the other hand, ballooned with anthropological investigations that have been the basis for prolific scholarship on the early twentieth-century colonial Philippines.[10] However, a particular brand of simplification has eroded the complexities across the two empires' scientific traditions, often to the detriment of Spanish-era scientific discourse, in service to US triumphalism, and at the expense of local intellectual production.

When the United States assumed control of the archipelago, colonial botanists joined in the chorus of critics to lambaste "Spain's decadence" and

its failure "to grow intellectually." Consequently, the Philippines, until the dawn of US Empire, only made scientific contributions "through the mouths of Spaniards."[11] The US colonial tendency to represent the Spanish period as bereft of science left a stubborn imprint, made manifest in Philippine historiography that can oversimplify the colonial past in general and colonial science in particular.[12] Iberian science has faced the same slanted treatment elsewhere.[13] Recent scholarship of the Philippines has disqualified these early accounts, tracing carefully how the purported success of US colonial science rested on the original infrastructures laid by the Spanish and by the local intellectuals who trained in the nineteenth century.[14] With others, therefore, I continue to complicate this distorted interpretation.[15] A focus on the Philippines in the decades surrounding 1898 offers a more symmetrical analysis of two regimes. In this book, I highlight both regimes' approaches to botanical science, their turn to more region-wide interimperial collaboration and research, and more significantly, the contributions of local actors to such work. I probe how a place like the Philippines constituted the "very conditions of existence and enunciation of the [colonial] knowing subject."[16] Such an attempt reincorporates and re-localizes important knowledge-claims that can too easily be divorced from *place*. Emplacement, writes Harri Englund, sees a subject as "inextricably *situated* in a historically and existentially specific condition." Quoting the work of Edward S. Casey, Englund reminds, "'We are never anywhere, anywhen, but in place.'"[17] This approach unseats science, and especially imperial sciences, as ambiguously globalist forces absent of particularity.

This book, therefore, is about more than interimperial squabbling. Such squabbling has hidden the important social and political contours of the Philippines from the mid-nineteenth into the early twentieth century. Even though colonial agents ostensibly brought botany to the Philippines, local conditions and actors (human and vegetal) shaped the course of the science. I cast light on the Philippine-born field assistants, craftspeople, illustrators, and intellectuals, many of whom lived and worked across the historiographical divide. They transformed plant fibers into woven thread, sketched sepals, and warned of spirits in the forest. Their knowledge and labor contributed to the colonial scientific outfits. Their fluency with plant life exhibited knowledges that predated, existed beside, and transformed with the colonial encounter. Particular plant varietals and species, some understood to be endemic to the archipelago, propelled research and commerce for some foreign botanists. For some local actors, they constituted lifeways, political aspirations, and independently developed knowledge of the surrounding environment. Furthermore, as excellent scholarship has drawn attention to the role of the arts and what may be

considered the humanities and social sciences in nineteenth-century Philippine nationalist thought, I maintain that botany had a place in such a profound political current, too. This history may resonate with other accounts of colonial botany elsewhere. At the same time, I uphold a politics of difference that recognizes the heterogeneity of historical experiences that, while perhaps generalizable to the larger colonial world, surface from the specificities of place, time, and source material.

Knowing Plants

Exploring botany requires understanding the science historically as a constituent part of a cluster of knowledge systems and not simply a "metonymy of knowledge" itself.[18] Science, or the amalgam of various disciplines that seemingly emerged in Europe, could only attain such a premier position because of its co-constitution with empire and colonialism.[19] I deploy the word "science" to summon the Anglo-European history of which the discipline of botany is a part. The philosophical fervor with which botanists strove to order plant life erected a way of knowing that could hierarchize all other ways. European imperial powers' expansion into Asia and other parts of the world in the early modern period engendered a belief that the world's plants could be cataloged to establish a universal register. The expectation that Carl Linnaeus (1707–1778), considered the father of modern botany, and his apostles could achieve this aim ran headlong into a diversity of ways people understood—and in several respects, continue to understand—plants in Asia and, as this book will cover, in the islands of the Philippines.

I use "ways of knowing" interchangeably with epistemologies and knowledge systems. The phrase emerged in early feminist theory, and I apply it to recognize the context-dependent, experiential processes through which knowledge is made.[20] In this application, I see Anglo-European science with its attendant disciplines as ways of knowing, undivorceable from the contingencies of history and subject-position. The numerous insights into plants that I also cover in this book fall under this larger umbrella category. I hesitate to call or categorize such insights as "sciences." While excellent scholars in feminist science and technology studies and Indigenous studies have argued the place of Indigenous knowledges as sciences in their own justifiable right, particularly with present-day case studies, I consider how the historical source material of my project sharply distinguished between who was a scientist and who wasn't, who practiced science and who didn't.[21] These divisions were stark but at times slippery. It is in some of these slippages that I am able to pinpoint botany's making and umaking. My redefining of the vernacular, as I discuss later, allows

what I believe to be a more potent historical intervention into the acute intellectual hierarchies once defined by practicing colonial botanists.

Considering botany as but one knowledge system also emphasizes the rather localized dimensions of its historical development in key sites in Europe and in colonial contexts such as the Philippines. This framing insists that all knowledge systems have identifiable localness: the political contexts, social contours, and material structures that may impact knowledge production. Moreover, this approach underscores the variety of knowledges of which plants were a part and how such systems interfaced, combined, or stood in contention. As Helen Watson-Verran and David Turnbull have noted, the epistemic authority and credibility of Indigenous peoples might be readily labeled as "closed, pragmatic, utilitarian, value laden, indexical, [and] context dependent," as opposed to the virtue of scientific objectivity.[22] In this book, even if botanists working under the banner of international botany aspired for a certain brand of objectivity, their efforts were no less pragmatic, value laden, and context dependent.

WORLDS OF PLANTS. In artifactual, visual, written, and oral records, plants have long been instructive and significant to human knowledge systems. Forbidden fruit, blessed grass, and tutelary trees comprise stories of earthly origins. Extraordinary plants, for example, populate the universe of Mount Meru, the hallowed mountain of Hindu, Jain, and Buddhist cosmology, at times acting as icons and reminders of a non-anthropocentric moral order.[23] Reflecting this sentiment, the Hindu *Mahābhārata* epic, compiled between 400 BCE and 400 CE, contemplates trees as pleasure- and pain-feeling sentients.[24] Plants have also operated as channels between human and spiritual realms, such as the lotus medallions engraved on temple ceilings of Angkor Wat that mark both cosmopolitan power and sacred space.[25] Likewise, the monumental banyan tree has been revered as the location where Siddhartha Gautama gained enlightenment, and where, in animist belief, guardian deities and spirits live.[26]

Alongside their cosmological and archaic importance, plants have been prominent for nomadic communities, agriculturists, forest gardeners, and medical practitioners. Archaeological research suggests that early inhabitants of Tabon Cave on the island of Palawan may have relied on plant technologies, such as pliant fibers for basketry, weaving, and boating, as early as the late Pleistocene.[27] In the textual record, plants' healing virtues have comprised a significant part of intellectual inquiry, trade, and practice. Classical-era documentation reveals how Indic, Chinese, and early Hellenic medical traditions relied considerably on plants for elemental or humoral wellness. The early Tang Dynasty sponsored the compiled pharmacopoeia, the *Shen Nong Ben Cao Jing*, and a systemization

of *materia medica* knowledge became a central element of the bureaucracy's regulation of the practice of medicine.[28] Scholars in antique Mediterranean Europe participated in analogous developments.[29] Thinkers of the Persianate Age, like Abū al-'Abbās al Ishbīlī (d. 1239), studied plants' medicinal properties together with their morphological features in an empirical manner.[30] Over centuries, trade and tributary relationships facilitated the movement of medicinal plants like frankincense from the Arab world through Srivijaya to China, or conversely, a Chinese varietal of cinnamon to Arab apothecaries, and their enfolding into local medical custom.[31] At the same time, these exchanges included firm recognition of difference, as in the case of Vietnamese practitioners' resistance to aspects of Chinese medical practice to protect a distinct "southern" tradition.[32]

Land and maritime networks accelerated the exchange of plant material and the knowledge of their commercial potential. The trade in natural objects—vegetal, animal, and mineral—wrought prestige: aromatic resins, pangolin skins, and unblemished lapis lazuli traveled from ports to the palms of royalty. Asian and European courts salivated for exotic plants and the cachet they brought as worldly, collectible objects. These expressions of aesthetic and intellectual dominance increased certain plants' economic value, especially those traded from present-day Southeast Asia.[33] Clove from the Maluku Islands, for example, not only caught the attention of early modern Iberian and Dutch traders. Third-century BCE Chinese courtiers had been expected to have the breath-freshening dried flower buds in their mouths when in the emperor's presence.[34] Plant products for ritual ceremonies, feasts, adornment, and visual indulgence were brought to Buddhist temples, Javanese celebrations, Arab perfumery workshops, and Habsburg curiosity cabinets.

A systematic ordering of vegetal life arose with courtly expansion and increased foraging. Regal imperial posturing and resource extraction predicated stricter classificatory systems, particularly as naturalists encountered unrecognizable flora. As empires obtained neighboring or distant lands, ordering plant life could wield material, moral, and aesthetic power. Put another way, the taming of nature (and the nature of others) could evidence magisterial control. The Mughal emperors of South Asia, for example, contracted the production of intellectual knowledge on plants and gardens to govern the natural environment. Visualizing and establishing royal gardens was an imperial approach that simultaneously reordered the environment and mapped authority onto it.[35] The accumulation of plant knowledge and plant material surged with the intensification of European empires from the fifteenth century onward. "Exotics" from Asia, the Americas, and the European "margins," such as Scandinavia

and northern Muscovy, prompted Renaissance naturalists to describe with urgency.[36] Naturalists joined maritime explorations to record the most bizarre, the most useful, and the most marketable. Such was the case for the earliest Iberian voyages that necessitated novel observational and descriptive methods of peoples and landscapes, which catalyzed an unparalleled European interest in natural history.[37]

LINNAEAN SYSTEMATIZATION. While classical and early modern scholars worldwide studied and wrote on plant life, botany in its Anglo-European formation, with which this book deals, reached a defining moment with the work of Linnaeus. Linnaeus tried to fortify an "autonomous science of plants," which had long been practiced and perceived as an auxiliary of medicine. In 1751, his *Philosophia botanica* rigidly distinguished "real botanists," a class of plant illustrators, collectors, classifiers, and describers, from "botanophiles," or medical practitioners, gardeners, and enthusiasts, who did not advance systematization. He and other botanists, backed by stately royals and trading companies, patronized a vast web of collectors and like-minded practitioners to re-entrench the discipline with new plant material and systematic plant investigations.[38]

Linnaeus, alongside his French contemporaries, sought a standard language, set of empirical rules, and quantifiable approach that coincided with European Enlightenment-era tenets.[39] Plant material from surveyed, conscripted, and colonial territories challenged the philosophy of the discipline. At the same time, the deluge of novel material motivated European naturalists to create more localized florae (those on their own backyard, so to speak) in an effort to discover what could be considered "indigenous" to Europe itself. Linnaeus began his career studying his local and national flora, only to eventually dismiss local florae of Europe and elsewhere for their "methodological eclecticism."[40] His *Species plantarum*, published in 1753, built on a genealogy of centuries of botanical writing and popularized a methodological consistency for European botanical studies. Prior to Linnaeus's work, Renaissance naturalists had not necessarily espoused a taxonomic scheme for plant life. As Brian W. Ogilvie has detailed, Linnaeus stood apart from his predecessors because he differentiated "species" (a single taxonomic unit for similar organisms) from "genera" (a class of organisms with similar characteristics of which several different species can be a part) based on floral organs and proposed a system that could anticipate previously unknown plants.[41]

Linnaeus attempted to identify all plants with a Latin-based two-part naming scheme, as others had before. Yet his publication did away with an unregulated polynomial system that left species with a dribbling mouthful of Latin. Communities still rely on this two-part system, which consists of a plant's

genus followed by its species designation, like *Ananas comosus* for piña or pineapple. Linnaeus also promoted a system of arrangement following the "sexual" characteristics of a plant: "female" and "male" organs and anthropomorphized nuptiality practices (some unbelievable to the time) could reveal similarities across species.[42] Contemporary botany still uses these Linnaean designations, despite the well-known limitations of his "artificial" approach—that is, the prioritization of specific plant morphological structures to indicate relation.

European botany and the social position of "the botanist" flourished following *Species plantarum*. Lexical research reveals that the word "botany" was more than fifty times more frequent than the word "botanist" in the first half of the eighteenth century. By the early nineteenth, botany was only three times more frequent. Interpreting these findings, René Sigrist suggests a growing "affirmation" of the botanist. Linnaeus's systematics grew in popularity as botanophilia among the broader public became more widespread. Alongside these trends, public and private concern with botany's value increased as observers identified profitable connections between economy and the science. As much as there existed a refined "Botanical Republic"—an "ego-network" of correspondents with Linnaeus at the center—so too was there a brute commercial lust for plants.[43]

The discipline advanced as European states realized material gain from domestic agricultural development and imperial expeditions. Botany assisted in the social governance of territories, cultivating a productive, patriotic class of human subjects, domestically in Europe and abroad.[44] It also offered a methodical approach to agriculture. Research on economic plants targeted species that could be introduced and acclimatized to new landscapes, selectively bred for their most marketable qualities, and grown in mass quantities. Cinchona, nutmeg, cinnamon, pepper, tobacco, and cacao, to name a few, tantalized merchants and botanical investigators. The Spanish, Portuguese, Dutch, English, and French empires guarded their colonies' natural resources under the threat of what Londa Schiebinger calls "biopiracy" from rival empires.[45] Competition over trade networks to acquire these species—and the lands upon which they grew—escalated.[46]

A PROFESSIONAL, INTERNATIONAL SCIENCE. Anglo-European botany confronted epistemic distress in the nineteenth century. The philosophical and practical concerns of the previous century had been worsening. Continued colonial exploration inundated botanists with nontemperate plant material, which did not neatly conform to temperate-plant-driven systematics. Botanists tried to fit new tropical material, for instance, into genera with which they had more familiarity, incapable of rectifying plant diversity within their

arrangement. The number of botanizing practitioners also increased, as natural history enthusiasts, travelers, Linnaean protégés, and artisans from varied class backgrounds took to the field.[47] At the same time, "botany's ancien régime" could not readily discipline the influx of plants or new practitioners.[48] Publication venues proliferated. New Latin binomials went unaccounted. "Amateurs" set foot, some driven more by sacrament and self-improvement than by systematics.[49]

By the mid-nineteenth century, the increase of botanical practitioners pushed self-defined elites toward stricter delineation of what botany was and who practiced it. Furthermore, a continental European approach to systematics had slowly begun to eclipse Linnaeus's northern European artificial system. This approach, championed by Swiss botanist Augustin Pyramus de Candolle (1778–1841), considered all morphological structures of a plant rather than one isolated characteristic. A new botany thus emerged.

Victorian Britain viewed the ancien régime as polite, unserious, and ladylike. Prevailing gender ideology from the previous century branded the discipline as fit for feminine urbanity in middle- and upper-class society.[50] Early commentators cautioned against the unlearned and the "fair sex," who stood to defile botany and its pure language.[51] By the middle of the nineteenth century, "professionalization of botany," argues Ann B. Shteir, "meant its masculinization as well." The formally trained, male botanist ascended as the prototypical professional. Botanical writing, too, shifted direction. Discourse divested of individuality, personal style, and traces of the feminized "familiar" more widely became the standard.[52]

The establishment of the International Botanical Congress (IBC) formalized the discipline even further; hence the organization's role as the backdrop of this book. The IBC's development over the course of several decades modified the self-declared ethos of imperial botany. This modification occurred within the milieu of the "consolidating imperial world" that saw the circulation of politics, ideas, and scientific knowledge beyond the axes once limited to metropoles and their colonies.[53] Spanish and US colonial botanists positioned themselves in dialogue with other colonial and metropolitan scientists as intellectual collaboration became self-consciously international in scope. Convenors of the IBC set out to standardize nomenclatural rules, herbarium norms, botany instruction, a master bibliography, and subfields within the discipline.[54] The IBC catered foremost in its original conception to the old and emerging empires of Europe and came to include the United States more centrally as the country ascended as an overseas imperial force. Under the rubric of "Olympic internationalism," botanists championed the nations they represented in support of an international fraternity first largely limited to the Anglo-European world.[55]

The Moves of This Book

Redefining the Vernacular

Redefining botany's vernacular requires knowing the origin of the term in both its general and intellectual usage. The word's etymology and its study imply uneven relation. The term, which has a possible proto-Indo-European origin, comes from the Latin *verna* for "a slave born in the home of his master." *Verna* became the Latin *vernaculus* for "domestic" or "native" before emerging in English in the early seventeenth century as "vernacular," or that which uses the native language of a country or district.[56] The term carries a profound association with servitude and steep inequality. Based on its provenance, the vernacular is relational, necessitating someone or something enslaving and superior. That the domestic or native had been constituted under the ownership of a master reveals the material and the social histories undergirding the vernacular's formation. The term, to put it another way, has always reflected scales of power, emplacement, and indigeneity.

Philologists, linguists, and classicists have typically contrasted the vernacular (both in its nominal and adjectival forms) with the languages of power and high intellectualism, yet vernacular production—in its oral, textual, and cultural forms—historically maintained its own spheres of influence, which captivated intellectual elites. Humanists of Renaissance Europe eagerly collected relics of popular culture, heritage, and language. Likewise, elites upheld local traditions as emblems of a venerable past in the face of fast-centralizing states. By the early nineteenth century and with imperial expansion, European intellectuals treated the peasant, the provincial, and the primitive as relics "to be recorded in text but eradicated from practice." In tight correlation with the development of the field of folkloristics, the vernacular was both the crossroads of societies' lowest social strata and the location of revolution and social contestation.[57] Scholars in Germany, the Philippines, Japan, and elsewhere from the nineteenth century through the early twentieth investigated the vernacular as sites of folk life-worlds in tandem with dethroning a particular brand of European elite exceptionality.[58]

Parallel developments in imperial sciences systematically studied "primitive knowledge" in colonial territories. The intensification of the discipline of anthropology into the mid-twentieth century legitimized science practitioners' sifting for practices and epistemologies unlike—and in several ways, perplexingly similar to—their own. Helen Tilley has investigated how turn-of-the-century Anglo-European intellectuals who studied African knowledge systems reinforced their own epistemological superiority by cherry-picking information.

Instead of relying on the modifiers these scientists deployed, such as "primitive," "traditional," "folk," and "ethno-," Tilley suggests that historians of science use "vernacular science" to refer to self-identified scientists' investigations into such other (and Othered) ways of knowing.[59] Juno Salazar Parreñas has argued similarly within the context of Southeast Asia. Instead of applying the term "Indigenous," a word that carries specificity to North American contexts and can potentially convey mere contradistinction to settler-white colonialism, "vernacular ideas" communicates the multiple ways of knowing that have bearing on historiography and ethnography.[60] Tilley's and Parreñas's proposals not only emphasize the contingency of knowledge-claims and practices of knowing but also reflexively acknowledge how investigations continue to be prescribed by scientists and academic elites from North America and Europe.

BOTANY'S VERNACULAR. In botany's long history, Europeans translated Latin to and from linguistic vernaculars. Among Renaissance naturalists, Latin operated as the *lingua franca*. Yet, herbals in Flemish, French, and Italian, among others, ensured a steady translation enterprise for those who could make use of *materia medica* but could otherwise not access Latin.[61] Even if Renaissance naturalists used Latin to ensure a bigger reading audience and to correspond with fellow intellectuals, their works followed what we may consider today a kind of folk taxonomy. These naturalists did not advocate for any single classificatory scheme for plants, but their work fed into a universalizing tendency as methods of observation changed. Herbaria and botanical gardens prompted new observational techniques that required removing plants from their ecological contexts—a key element to folk taxonomists' plant identifications. These techniques boosted the number of species and genera that could be compared among naturalists, paving the way for Linnaeus and others to theorize how to classify such an abundance of plant material.[62]

In spite of botany's emergence from folk taxonomies, the vernacular has long implied linguistic and intellectual hierarchy. *Trivalia* (the commonplace or vulgar) in Linnaeus's *Species plantarum* referred to all non-Latin, "barbaric" plant names.[63] Among Linnaeus's eighteenth-century contemporaries, *vernaculus* described common practices or even that which could be considered endemic.[64] English versions of Linnaeus's work translated species' non-Latin synonyms as "vernacular ones."[65] Botanists used the term fearing pollution of "the Linnaean language" by one's vernacular, which could lower the drawbridge to the "absurdities and barbarisms" at the "choice of the ignorant."[66]

Not all European naturalists and botanists treated nomenclatural vernaculars the same way. Missionizing and secular colonists had varied relationships

to local nomenclatural systems and spent considerable effort gaining fluency in local languages. In the eighteenth-century Spanish Empire, creoles dismissed the Linnaean system. José Antonio Alzate y Ramírez (1737–1799), considered a doyen of the Mexican Enlightenment, contradicted laws espoused by European naturalists, finding Linnaean systematics ill-equipped to attend to Mexican plant species, poorly contrived on the basis of resemblance, and morally corrupting for its overemphasis on plants' sexual characteristics.[67] Alzate y Ramírez and naturalist Francisco José de Caldas (1768–1816) in Colombia celebrated Nahua and Quechua taxonomies. In Peru, some creole naturalists advocated for the inclusion of Quechua instruction at institutions that educated students in natural history.[68] The techniques of language acquisition and translation in the Philippines, as I discuss in chapters 1 and 3, served the ends of missionary work and of naturalist investigation, even if later derided by hardline systematists. Furthermore, key figures in colonial Philippine botany, such as the Manila-born Spanish mestizo Regino García y Basa (1840–1916), did not dismiss the nomenclatural vernacular. His racial and class position likely informed some of the ease with which he engaged Latinate systematic botany and local plant names.

By the late nineteenth and early twentieth centuries, botanists still wrote in their own linguistic vernaculars and, as chapters 1 and 6 cover, still struggled to standardize the language of the science. In 1905, the IBC upheld Latin as the premier language of plant naming and description. Conference convenors nonetheless accepted German, English, Spanish, Flemish, Dutch, French, Italian, and Portuguese papers. Wherever possible, presenters needed to summarize their findings in the "international" languages of French, German, English, or Italian. Moreover, every governing motion of the congress had to be in French.[69] Latin proved to be more of an ideal than a shared reality.[70]

These hierarchical conceptions of vernaculars within the science were themselves classed, gendered, and racialized. They mapped onto notions of the ideal scientific practitioner, who in the nineteenth century was envisioned as Anglo-European and male, and onto the litany of laborers and knowledge-bearers assisting his scientific conceits. Like the imagined body of the practicing botanist, one's scientific writing had to be refined and use the tongues of empire. In the Philippines, Latin, Spanish, and English were the principal languages of scientific production under the colonial regimes, and the most prolific authoring botanists were Iberian and US personnel. As more Philippine-born men trained in the science, their authorial practices, social status, and clothing style more visibly distinguished them from those outside of botany's modern pomp, including informants and field assistants hired in situ, which I cover in chapter 5. The vast majority of these men hailed from wealthy families and

could write and speak fluently in Spanish (or eventually English), skills enjoyed by a tiny fraction of the population. While Iberian, Philippine-born, and US women contributed to the science as illustrators, plant collectors, and hired and *ad hoc* administrators, they could not enroll in the Spanish or US botany training programs that were exclusively for men.

At the same time, the racial configurations of the colonial Philippines lent a distinctive dimension to scientific production. Racial categorizations were at once politically and ethnologically defined. Unlike in Latin America, a creole *class* never fully materialized since Spanish settlers could not and did not arrive in the Philippines at the same magnitude. Until the mid-nineteenth century, Philippine society distinguished creole status more by way of culture and wealth than by blood quantum alone.[71] By the 1880s and 1890s, the notion of *who* exactly constituted a Filipino began to shift. This porosity of identities contributed to the production of scientific knowledge constructed within the interplay of class and shifting racial identifications. Peninsulares (or peninsula-born Spaniards), creoles, and mestizos dominated scientific writing, and class background secured their access to scientific institutions and training.

Intellectuals of the late nineteenth century both in Europe and in the Philippines, also known as ilustrados (enlightened ones), laid claim to local knowledge. These intellectuals proudly engaged in the most up-to-date scholarship from Europe while brandishing a superiority over, most especially, Spanish intellectual production. Among ilustrados, tracing native knowledge became a major activity, one that showed they could unearth their civilizational past and write expertly on it. They brought into dialogue local knowledge systems and the European disciplines to which their elite stature afforded them access. They deployed the concept of race to establish differences and similarities found within the Philippine population, "albeit unevenly and with exclusions," as Megan C. Thomas caveats.[72] A similar parallel developed in botany. Trained and highly experienced Philippine-born mestizo and native personnel excelled at plant illustration, local nomenclatures, and collecting plants. Compared to their foreign contemporaries, their language skills and familiarity with the environment helped them tap information otherwise difficult to ascertain. These local experts also classed and gendered vernaculars in the colonial Philippine setting. As the following chapters will suggest, these processes were neither straightforward nor purely produced by white colonials.

In light of the term's history, I redefine the vernacular as much more than linguistic expression, as botanists once and may still uphold. Such a limitation avoids the multidimensional human-plant engagements of the past and of today. Instead, I see the vernacular as the insight derived from the varied ways by which

people come to know plant life and communicate such knowing. These ways include, and yet still exceed, botanical names, visual artwork, creative writing, intellectual production, material manipulation, bodily knowledge, cosmology, and ritual belief. The following chapters present my expanded definition, taking into account varied experiences with and knowledges made of the plant world: from the culinary textures of rice, through the lyrics crooned to honor a flower, to the haptics of a skirt woven from banana fiber, to name a few. These, I maintain, offer new vantage points from which to examine the history of botany. Given the vernacular's etymology, historical use, and racialized and gendered configurations, the term is generative because of its ongoing recognition of a world unequal. The category of the vernacular could not exist without material inequality and perceptions of difference. At the same time, Anglo-European botany's foundation could not be without the vernacular. Their co-constitution troubles any notion of a "durable" dichotomy and ensures that neither can be fully disambiguated.[73] Disambiguation is itself a practice of putting-in-relation. In these relations, the sovereign arises.

The Sovereign

Even as colonial Spanish and US botanists often wrote in their own linguistic vernaculars, they viewed their work as intellectually distinct from that of nonspecialists (and even one another). What distinguished their vernaculars from the ones I bring to light was their subservience to an Anglo-European systematic orthodoxy. I offer the modifier "sovereign" to emphasize such tension found in the vernacular. In my interpretation, the vernacular does not fully surrender to the sovereign of orthodoxy. At the same time, the sovereign's very existence relies on the vernacular.

A VEXED TERM. Like *vernaculus*, sovereign's etymology emerged from the coconstitution of what was perceived as above and what was below. From the Latin *super*, or above, came "sovereign," a Middle English combination of the Old French soverain and the English reign. In its use, the word has had political, gendered, and territorial valences. As a noun, sovereign refers to rulers, majesties, and in one obsolete form, husbands in relation to wives. As an adjective pertaining to things or qualities, the word describes that which is paramount, principal, or most notable.[74] In one of its most distinguished academic configurations from the twentieth century, sovereign describes an "imagined community" deriving power not from some divine or foreign source but, in fact, from the nation.[75]

A troubled and liberatory essence saturates the modifier sovereign. On the one hand, the term implies enforcement of authority and European styles of governance, classed as elite and gendered as masculine. On the other hand, the

term evokes a declaration of power against prevailing hegemony. Indigenous studies scholars, for example, invoke the term in relation to territory, rights, and political theory to counteract historical and ongoing settler-colonial effacement.[76] Simultaneously, sovereign*ty* remains a European term whose adoption and application in post- or decolonial discourse and activism has untold implications.[77] Observing this vexed definition, Joanne Barker traces two declarations of sovereignty: that conceived through the project of white supremacy, and that of Indigenous feminism. For the former, an individual sovereignty takes precedence as state-defined rights protect liberal ideals of property, freedom, and political autonomy. Conversely, an Indigenous feminist declaration objects to such an imperial, neoliberal project that operates in the name of accumulation and is conceived, instead, through ethical concerns of relations.[78] In science studies, the "post-sovereign" has been deployed to signal a more recent moment in which science has failed to approach its universalist aspirations. Scientific experts have lost hold of default supremacy, conceding instead to intellectual conflict.[79] Present-day society exists, one might say, beyond the sovereignty of Enlightenment-era science.

Indeed, the project of an all-sovereign science dates back to the European Enlightenment. That Enlightenment-era practitioners proclaimed a universality of knowledge is now a truism in the history of science. This avowal of universalism took form in the early modern Republic of Letters and continued through the surge of scientific nationalism of the late eighteenth century into the nineteenth, due in large part to the French Revolution (1789–1799) and Napoleonic Wars (1803–1815). Patriotic impulses that fueled nationalist science contributed to the formation of supranational bodies—twenty-three, the IBC among them, founded between 1860 and 1899—that governed the practices, theories, and cooperation of member states. By the 1930s, scientists championed the sovereign of a world-universal science, particularly with the rise of violent German nationalism, a moment I discuss in chapter 6.[80]

For the Philippines, the turn of the nineteenth and twentieth century was a critical colonial, proto-national, and imperial juncture. Politically speaking, the language of sovereignty was on many lips. For polymath writer José Rizal's (1861–1896) *Noli me tangere* (1887), the "sovereigns" of the fictional town of San Diego were neither the most landed nor God himself but rather the feuding, self-serving ensign and friar of the township. Such a satirical stab at the Catholic church and the colonial government implored a different political future for the Philippines. Not long after the *Noli*'s publication, reformist intellectuals and revolutionary insurgents toppled a regime, yet as one imperial power waned, another waxed.

In the following pages, I show botany's importance in this period as it served colonial intellectual enterprise and as it offered a vocabulary by which to conjure important emblems of Philippine knowledge. The environment was a muse, a source of the territorial and intellectual sovereign that I explore in chapter 3. As in the epigraph of this introduction, the stanza from "Ang Mutyâ ng Kasilanganan" paints a setting of floral and faunal opulence. The poet writes of an idyllic "Jewel of the East," echoing the same wonder that befell foreign naturalists upon arrival in the Philippines. But we readers remain distant from that place. We must trust the poet, who writes of "there," contemplating both our location and the poet's. By the time of the poem's publication in a serial openly critical of the US colonial regime, the Philippines had witnessed remarkable unrest. Thus, the stanza not only promises a lush location but also intimates the Philippines' recolonized position in the early twentieth century.

Within this historical context, I uphold Danilyn Rutherford's view of sovereignty as a "value that social actors . . . seek to have recognized as their own but never can fully possess"; something "internally disturbed: unsettled, inconsistent, fraught with contradictions, never quite as supreme as it may seem."[81] Whereas Rutherford examines the relationship between "would-be sovereigns" and the audiences they need to secure their authority (a never complete and unruly expectation given audiences' own sovereignties) in Indonesia, I trace a similar dynamic between the sovereign and the vernacular. Like the vernacular, the sovereign's premise is relational: someone or something must be lorded over, or someone or something defies such an assault. In this book, my usage of "sovereign" takes a doubled meaning: the sovereign of imperial botany fed by the vernacular, and the sovereignty of the vernacular. For, as I show, sovereign vernaculars outpaced the aims of Linnaean science, simultaneously making and unmaking the science—advancing its utmost aims or challenging its tenets.[82] Botanists iterated upon the science, formulating and reformulating standards at signs of philosophical and practical distress. Different ways of knowing plants and the actors who espoused them contributed to this need for iteration, pushing botanists to insist what did and did not constitute the science. The title of this book emphasizes this ongoing dialectic. One can only *un*make that which has been made and so on.

SOVEREIGNTY OF THE VERNACULAR. Colonial scientists from both Spain and the United States, driven by international science's obligations, contended with sovereign vernaculars in their local environments. As botanists in the Philippines sought to be interlocutors with the greater scientific world, one gathers a sense that the world*s* with which they were contending were numerous. In my

reading, vernaculars expressed order, lent meaning to, stabilized, and cohered their participants' lives and experiences. However, my available material, a good deal of which comes from colonial interlocutors, hampers my ability to fully argue the existence of multiple ontologies.

Instead, I embrace an "onto-epistem-ological" approach, as Karen Barad articulates, that sees knowing as a product of the "intra-action" of material (what, as can be gleaned, were understood to be plants by historical actors) and the cultural (the meaning-laden ideas, studies, and projects on such material). Different from "interaction," which presupposes the existence of at least two predetermined entities (for instance, a human-botanist and a plant), intra-action accounts for the emergent character of material becoming. Plants may, therefore, be understood as phenomena "constituted and reconstituted out of historically and culturally specific iterative intra-actions of material-discursive apparatuses."[83] In other words, plants, in my reading, do not exist as independent material entities outside of a botanist's study of them—and vice versa. They made and make each other. Such an approach also enables me to consider how historical actors spoke of or confronted, among other things, the spiritual vitality of a forest or of a textile derived from botanical matter.

For some, plants' physical structures could reveal long evolutionary relationships between species. For others, spirits inhabited living plants and even resided in plant matter as it underwent material transformation. To several observers, foreign and Philippine-born, these latter knowledges were deemed "superstition." In their view, superstition meant the opposite of a modern, scientific intellect. This diametric opposition operated under the presumption that science provided a singular, objective take on reality. In the history of science, but perhaps especially in the history of colonial science, proponents of this singular take confronted other knowledge systems—an axiom in a field largely concerned with epistemic conflict. For the Philippines case, actors cast these systems as quackery or exceedingly irrational, which I explore in chapter 5. My aim in this book is not to pronounce what one critic might allege to be "epistemic charity," an upholding of difference that may consequently deny once colonized peoples the opportunity to change their own knowledge systems.[84] It is, in fact, these sorts of hardened categories ("superstition" versus "science") that make for teleological history, or what Davide Wade Chambers and Richard Gillespie characterize as "pushing back the frontiers of superstition and ignorance, with religion and belief retreating in the face of superior scientific explanation."[85]

Instead, this book examines the interplay of different knowledge systems—how they abutted, how they functioned, and how they perhaps sailed as ships in

the night. I look to lexicographic records, drawings, published writings, newspapers, photographs, textiles, and weaving implements beside botany tomes, herbarium specimens, specimen tags, and field correspondence. I necessarily include the objects of other disciplines to paint a fuller picture of engagements with plant life. My sovereign move, therefore, is also methodological. The material analyzed in this book points to the labor and knowledge of informants, artists, commentators, weavers, dyers, field guides, and collectors, whose direct perspectives can appear threadlike across colonial botany documentation. Treading into the disciplines of anthropology, literature, visual studies, and language analysis permits wider understanding of more ways of knowing plants than what botanists themselves acknowledged. At the same time, it underscores the science's discipline-making. The sources I examine do not come without colonial social entanglement, the problems of authorial power, and the recognition that some ways of knowing were actively extinguished or written of disparagingly.[86] As scholars have done tremendous work to correctly stress imperial botany's epistemological, linguistic, and commercial violence, I study botany from a number of angles that neutralize just how all-encompassing the science has been perceived to be.

The Chapters Ahead

I have divided this book into three roughly chronological sections, each with two chapters. Each pair focuses on aspects of contention and scientific escalation, covering Spanish and US presence in the Philippines. All provide accounts of sovereign vernaculars and their distinct role in unmaking and making botany. The IBC figures in the first and third sections to capture the sweep of imperial botany's transformation. The work of Philippine intellectuals and insurgents during the political unrest of the 1890s into the 1900s appears in the second.

Part I, "A Botany at Its Most Defined," follows the development of Spain's most sophisticated expression of botany in the Philippines in its over three-century hold over the colony. Its first chapter ambles into the fledgling Jardín Botánico de Manila. In its early years, the institution did not live up to its promise as an illustrious pleasure and research garden. Deprived of much metropolitan support, Regino García, the garden's first Philippine-born employee, began systematically arranging the garden's seed bank. The increasing collection included varieties of rice known to grow locally, the near majority of which did not have a Latin name. Despite the varieties' morphological similarity to *Oryza sativa*, the

binomial for common rice, those most versed in the grains distinguished them upon sensory and cultural parameters outside of colonial botany's purview. This difference in knowledge systems had been annoying European naturalists for over a century. The problem of the plant variety even factored into the formal standards the IBC first pursued upon its founding. I characterize the interaction between European botanical taxonomy and modes of distinguishing varieties as an "asymptotic taxonomy" to refer to botany's far—but never complete—reach to ascertain the "fluctuating" plant form.

As the Manila botanical garden failed to impress the metropole, Madrid decided to intervene by shifting the oversight of the garden to the Inspección General de Montes or the empire's scientific forestry unit. Under the newly appointed leadership of Sebastián Vidal y Soler (1842–1889), a Catalan forester and botanist, the botanical garden grew into a much larger institution. Vidal's work with the garden and more important, his collaboration with García, who was also a trained classical painter, contributed to the apex of modern Spanish colonial botany in the Philippines. In the second chapter, I cover this history and closely examine their collaboratively produced publication, *Sinopsis de familias y generos de plantas leñosas de Filipinas* (Synopsis of families and genera of Philippine flowering plants), published in 1883. Relying on García's systematic visual ingenuity, which was informed by the local contours of arts education and production, the work became part of Spain's scientific statecraft as it continued to position itself as an intellectually competitive empire in the closing decades of the nineteenth century.

However, as Jorge Cañizares-Esguerra has shown for Latin America, "Once the imperial science of Linnaean botany arrived in the 'tropics,' it took on a life of its own, and it was eventually deployed by local patriot-naturalists to undermine the very goals that Linnaean natural history had set out to accomplish . . . namely, to revamp and strengthen the empire."[87] Part 2, "Science in a Place of Flux," therefore, covers a period of extreme political activity: the roar of anticolonial politics and the rise of the US Empire in the Philippines. Chapter 3 situates readers in the political foment of the late nineteenth century, when native intellectuals, workers, and peasants amplified critiques against the Spanish colonial state in efforts toward political self-determination. These years were a time of heightened cultural and intellectual activity among ilustrados. Their writings and creative works drew up gendered, everyday renderings of the sampaguita, which is currently the national flower of the Philippines. The chapter demonstrates, among other things, how Manila-based intellectuals used botany's vocabulary but cast aside its other specifying elements to position the sampaguita as an emblem of unique cultural bearing.

Chapter 4 pivots to the beginning of the US colonial period. After a short-lived glimmer of independence from Spain, the US colonial administration established itself in the colony, erecting institutions of scientific research to, among other objectives, survey the commercial profitability of the islands. US botanists most certainly had a hand in these pursuits. Their writings specifically on Philippine weaving and dyeing demonstrate the type of systematic work of identification they invested in to serve commercial interests seeking to scale up plantation production. In this chapter, however, I also offer a contrapuntal story within this larger narrative of settler-colonial enterprise. I provide an example of a US anthropologist conducting fieldwork among a Bagobo community in the Davao Gulf in Mindanao and the knowledge of weavers this anthropologist obtained. This ambivalent case study—and the attendant objects and information that come with it—pushes against the worldview with which botanists entered the Philippines at the time.

Finally, part 3, "Assembling a Wider Expanse," follows US botany's attempts to master not only the Philippine natural landscape but neighboring colonial ones as well. As US botany expanded in the Philippines during the Philippine–American War (1899–1902), botanists immediately realized the need to rely on Philippine-born field guides, translators, and laborers to fully assess the colony's floral landscape. This reliance on native personnel, however, proved tenuous and, at times, dangerous. Chapter 5 examines the tricky dynamics between botanists and native personnel and homes in on the matter of "superstition" tied to forests and lands among native field labor. US personnel observed the frequency and diversity of superstition, which had impeded proper excavating of Philippine domains. Complaints of superstition, I trace, were not new to the US colonial period or to foreign observers alone. At the same time, I argue that critiques of it were seated within US botanists' own fears of their vulnerability in prosecuting botanical work in places altogether new to them. Philippine-born personnel themselves had their own views on the difficulty of field labor that complicate botanists' early appraisal that most laborers were saddled by "superstition."

Chapter 6 returns to the matter of names but examines how non-Latin plant names served as a methodological ingredient to making sense of Latin nomenclature. I recount the collaboration between Mary Strong Clemens (1873–1968), a US plant collector, and Elmer D. Merrill (1876–1956), one of the most revered US botanists in the Philippines, toward the revision of Portuguese botanizing friar João de Loureiro's (1717–1791) *Flora cochinchinensis* (1790). Merrill relied on Clemens to extract material and local knowledge for the grand revision of *Flora cochinchinensis*, an extensive flora of present-day Vietnam and southern China. A Linnaean taxonomist and presiding member of the

IBC, Merrill critiqued international botany practice that failed to account for local plant names—a position reinforced by his time in the Philippines. For generations, the nomenclatural vernacular necessitated the creation of a global language to bring comprehensibility to the "Babel" of local names, a characterization used by scientists and historians alike. Instead, this chapter focuses on a moment when a vernacular exposed the Latin *babble*: the diachronic capricious use of Latin binomials.

Notes

INTRODUCTION. SOVEREIGN VERNACULARS

An earlier version of portions of this introduction appeared in *History Compass* as "From Objects of Study to Worldmaking Beings: The History of Botany at the Corner of the Plant Turn." I thank the three reviewers with *History Compass* for recognizing the potential in plant worldmaking.

1. Myers, Mittermeier, Mittermeier, de Fonseca, and Kent, "Biodiversity Hotspots for Conservation Priorities," 853–58; "Philippine Biodiversity," *Expeditions at the Field Museum*. I thank Peter Fritsch for these references.

2. Pelser, Barcelona, and Nickrent, Co's Digital Flora of the Philippines website.

3. Orillaneda, "Maritime Trade in the Philippines during the 15th Century CE," 83–100.

4. Mojares, *Brains of the Nation*, 381–466.

5. Joaquin, *A Question of Heroes*, 5.

6. Claudio, *Jose Rizal*, vii.

7. Schiebinger, *Plants and Empire*.

8. For a comparative examination of Spanish and US racial regimes and how these influenced Cuban antiracist nationalism of the turn of the nineteenth and twentieth century, see Ferrer, *Insurgent Cuba*. For the Philippines, an effective overview of US educational and bureaucratic policies after US takeover of the colony can be found in Abinales and Amoroso in *State and Society in the Philippines*, 113–25.

9. Thomas, *Orientalists, Propagandists, and Ilustrados*, 40–44.

10. See, for example, the chapter "The Undead," in Rafael, *White Love*, 77–102; Vergara, *Displaying Filipinos*; Rice, *Dean Worcester's Fantasy Islands*; and Balce, *Body Parts of Empire*.

11. Harley H. Bartlett, "Nationalism, Imperialism, and Spheres of Influence in Natural Science," manuscript, pp. 4–43, folder 3, Concerning Botanical Subjects, box 7, correspondence, Harley H. Bartlett Papers (hereafter BHL).

12. W. Anderson, "Science in the Philippines," 288. The historiographical tendency can be found in Agoncillo, *Prelude to 1896*, 2. See also Agoncillo, *Introduction to Filipino History*; Zaide, *History of the Filipino People*, 220–21.

13. In addition to "Prescott's paradigm," coined by Richard L. Kagan as the trope of "Spain as America's antithesis," other scholars have addressed the impact of "la leyenda

negra" ("the black legend") on Spanish imperial studies and efforts to revise histories of the European science. See, among others, Kagan, "Prescott's Paradigm," 423–46; Eamon, "'Nuestros males,'" 13–30.

14. The work of Bankoff has been especially vital to this historiographical correction. Among his writings, some of the most instructive include Bankoff, "A Month in the Life of José Salud," 8–47; "The Science of Nature and the Nature of Science," 78–108.

15. For coverage of this historiographical trend and its implication for colonial science studies on the Philippines, see Bankoff, "The Science of Nature and the Nature of Science," 78–79.

16. Restrepo and Rojas, *Inflexión decolonial,* 140–41, as partially translated in De Lima and Schuster, "Decolonizing Global History?," 444. See also W. Anderson, "Science in the Philippines," 289.

17. Englund, "Ethnography after Globalism," 267. See also Casey, "How to Get from Space to Pace in a Fairly Short Stretch of Time," 39.

18. Santos, Nunes, and Meneses, "Opening Up the Canon of Knowledge and Recognition of Difference," li.

19. Banu Subramaniam, "Science and Postcolonialism."

20. Barbour, "Embodied Ways of Knowing." See also Anderson's deft treatment of "feminine 'ways of knowing'" vis-à-vis feminist epistemology in "Feminist Epistemology," 61–66. I use "ways of knowing" as a feminist methodological stance rather than an assertion of essentialized difference between male and female knowers and knowledge-producers.

21. Important readings on this include Schaeffer, *Unsettled Borders*; Taylor, Moggridge and Poelina, "Australian Indigenous Water Policy"; Whyte et al., "Weaving Indigenous Science." See also Salvador-Amores, *Anthropological, Mathematical Symmetry and Technical Characterisation of Cordillera Textiles Project*, which firmly considers Cordilleran weaving practices as scientifically legible.

22. Watson-Verran and Turnbull, "Science and Other Indigenous Knowledge Systems," 116; Daston and Galison, *Objectivity*.

23. Schwartzberg, "Cosmography in Southeast Asia," 714–15.

24. *Mahābhārata Book Twelve*, 105–7.

25. Green, "Angkor Vogue," 448.

26. Barnes, "An Introduction to Buddhist Archaeology," 165; Ryan, "Banyan," 23.

27. Xhauflair et al., "The Invisible Plant Technology of Prehistoric Southeast Asia."

28. Ho and Lisowski, *A Brief History of Chinese Medicine, Second Edition*, 31–33.

29. Greek herbals took hold as an important genre for recording plants, and many histories of European botany laud Pedanius Dioscorides (ca. 40–ca. 90) and his five-volume *De materia medica* as precursory to botanical science.

30. Esposito, *The Oxford History of Islam*, 212. See also Dallal, *Islam, Science, and the Challenge of History*, 43.

31. Margaret, email communication with author, November 18, 2021; Ho and Lisowski, *A Brief History of Chinese Medicine*, 32; George, "Direct Sea Trade between Early Islamic Iraq and Tang China," 609.

32. Monnais-Rousselot, Thompson, and Wahlberg, introduction to *Southern Medicine for Southern People*, 1.

33. Reyes, "Glimpsing Southeast Asian Naturalia in Global Trade, c. 300 BCE–1600 CE," 108.

34. Reyes, "Glimpsing Southeast Asian Naturalia," 105. Reyes cites and usefully engages Wheatley, "Geographical Notes on Some Commodities Involved in Sung Maritime Trade."

35. Ray, *Climate Change and the Art of Devotion*, 101–2.

36. Ogilvie, *The Science of Describing*, 231–58.

37. Butzer, "From Columbus to Acosta," 545. See also Kelley, *Clandestine Marriage: Botany and Romantic Culture*, 5. Kelley cites Mitchell, "Cryptogamia," 631–51.

38. Sigrist, "On Some Social Characteristics of the Eighteenth-Century Botanists," 205–11.

39. Bonneuil, "The Manufacture of Species." Bonneuil refers to Lesch, "Systematics and the Geometrical Spirit," 73–111.

40. Cooper, *Inventing the Indigenous*, 166–72.

41. Ogilvie, *The Science of Describing*, 218.

42. For Linnaeus, plants that did not display clear sexual organs, like fungi or algae, became "cryptogamia," or those who married in secret. See Moore, "Linnaeus and the Sex Lives of Plants," 132. See also Müller-Wille, "Linnaeus and the Love Lives of Plants," for Müller-Wille's excellent reading of the cameralist politics behind Linnaeus's anthropomorphized approach to plants. On cultural bias and the centuries-long debate over plant sexuality, see Taiz and Taiz, *Flora Unveiled*. For an updated commentary on the legacy of Linnaeus's system, see Subramaniam and Bartlett, "Re-imagining Reproduction."

43. Sigrist, "On Some Social Characteristics," 211–22.

44. Drayton, *Nature's Government*, 55–67.

45. Schiebinger traces the biopiracy of Nicolas-Joseph Thiéry de Menonville (1739–1780), a French botanist who sought to acquire and propagate the cochineal beetle from Spanish-colonized New Spain for its valuable crimson dye. Thiéry de Menonville, according to Schiebinger, succeeded others such as Pierre Belon (1517–1564), Pierre Poivre (1719–1786), and Jean-Baptise Leblond (1747–1815), who also poached prized plants from rivals' colonial terrain. See Schiebinger, *Plants and Empire*, 35–46.

46. Mackay, "Agents of Empire," 38–48.

47. Bonneuil, "The Manufacture of Species," 190–91. See also Secord, "Corresponding Interests."

48. Bonneuil, "The Manufacture of Species," 191–92.

49. Keeney, *The Botanizer*s.

50. Shteir, *Cultivating Women, Cultivating Science*, 35–36.

51. Martyn, "Observations on the Language of Botany," 147–48.

52. Shteir, *Cultivating Women*, 156–57.

53. Stoler and Cooper, "Between Metropole and Colony," 28.

54. "International Botanical Congress, 3rd 1910 Circulaire" and "Congrès international de botanique Bruxelles 1910: 4eme circulaire: Sur la bibliographie et la documentation botaniques," International Botanical Congress, Vertical Files, LTML-NYBG.

55. Somsen, "A History of Universalism," 365–67.

56. *Oxford English Dictionary*, under "vernacular."

57. Noyes, *Humble Theory*, 61–62.

58. Taylor, "Characteristics of German Folklore Studies," 293–301; Thomas, *Orientalists, Propagandists, and Ilustrados*; Mojares, *Isabelo's Archive*; Shimamura, "What Is Vernacular Studies?"

59. Tilley, "Global Histories, Vernacular Science, and African Genealogies," 110–19.

60. Parreñas, "From Decolonial Indigenous Knowledges to Vernacular Ideas in Southeast Asia," 413–16.

61. Ogilvie, *The Science of Describing*, 36–37.

62. Ogilvie, *The Science of Describing*, 215–29.

63. Linnaeus, *Species plantarum*, iv.

64. Kaempfer, *Amoenitatum exoticarum politico-physico-medicarum fasciculi* V, 604; Denis Diderot et al., *Encycopédie* 17:649.

65. Linnaeus, *A System of Plants*, 13.

66. Martyn, *The Language of Botany*, xi; also referenced in Martyn, "Observations on the Language of Botany," 147–48.

67. Cañizares–Esguerra, *How to Write the History of the New World*, 283–84.

68. Cañizares-Esguerra, *Nature, Empire, and Nation*, 56.

69. "5th Circulaire of the Permanent Committee of the International Congress of Botany"; "International Botanical Congress (2nd: 1905—Vienna, Austria)"; "International Botanical Congress, 3rd 1910 Circulaire: Congrès international de botanique Bruxelles 1910: Première circulaire," International Botanical Congress, Vertical Files, LTML-NYBG.

70. Gordin, *Scientific Babel*, 48–49.

71. Joaquin, *A Question of Heroes*, 66–69.

72. Thomas, *Orientalists, Propagandists, and Ilustrados*, 47–96.

73. W. Anderson, "Introduction: Postcolonial Technoscience," 644.

74. *Oxford English Dictionary*, under "sovereign."

75. B. Anderson, *Imagined Communities*.

76. For a concise political and intellectual history of the term in Indigenous activism and scholarship, see Brown, "Sovereignty," 81–90. Other deployments include the special issue "Native Feminisms: Legacies, Interventions, and Indigenous Sovereignties," edited by Goeman and Denetdale; Mortimer, "Kateri's Bones," 55–86. Mortimer engages Alfred, *Peace, Power, Righteousness*. On language and sovereignty, see Viatori and Ushigua, "Speaking Sovereignty," 7–21. On self-determination vis-à-vis the national body politic, see Robbins, "A Nation Within?," 257–74. See also Rutherford's focus on some of Biaks' shared vision of a "full sovereignty" in *Laughing at Leviathan*, 3.

77. Nadasdy, *Sovereignty's Entailments*, 46. Nadasdy compellingly opens with Alfred, "Sovereignty," in Barker, *Sovereignty Matters*, 39.

78. Barker, "Sovereignty," in *Keywords for Gender and Sexuality Studies*. For more elaboration on "critical sovereignty" in Indigenous studies and its taking account of gender, sexuality, and feminism, see Barker, *Critically Sovereign*.

79. Blok, "War of the Whales," 60–70.

80. Somsen, "A History of Universalism," 363–70.

81. Rutherford, *Laughing at Leviathan*, 10–13.

82. I acknowledge the work of Manuela Lavinas Picq that offers the term "vernacular sovereignties" with respect to Indigenous women's roles in influencing international politics. For Picq, "Indigenous sovereignties are practiced in vernacular contexts, thus transforming a singular form of authority into a plurality of forms adaptable to contextual realities." Indigenous women strategically deploy international legal norms to, in effect, vernacularize conventional, state-based notions of sovereignty to create local enact-

ments of authority. Whereas Picq's important ethnographic study frames the vernacular "in opposition to the supranational, placing Indigenous political practices at the antipode of European ones," I see the vernacular in generative relation to that which is sovereign, particularly in the history of science. See Picq, *Vernacular Sovereignties*, 18–21. I laud Deborah A. Thomas and Joseph Masco's edited volume, *Sovereignty Unhinged*, for its examination of sovereignty through affect, eschewing the temporally linear, utilitarian manifestations of the concept. The organization of their volume by "opposite impulses," not unlike my making and *un*making, opens exciting theoretical possibilities for sovereignty within such tensions. See Thomas and Masco, *Sovereignty Unhinged*, 10.

83. Barad, *Meeting the Universe Halfway*, 214–17.

84. Nanda, "The Epistemic Charity of the Constructivist Critics of Science," 288.

85. Chambers and Gillespie, "Locality in the History of Science," 235. Chambers and Gillespie engage Nanda's writing and gently refute its position by pointing to the highly situated nature of science, as any other knowledge system.

86. Haraway, "Situated Knowledges," 575–99. The literature on epistemic violence is vast. Foundational resources for me include Spivak, "Can the Subaltern Speak?," 271–313; Santos, *Epistemologies of the South*.

87. Cañizares-Esguerra, *Nature, Empire, and Nation*, 13.

CHAPTER 1. AN ASYMPTOTIC TAXONOMY

1. Gutaker et al., "Genomic History and Ecology of the Geographic Spread of Rice," 492–98.

2. Junker, *Raiding, Trading, and Feasting*, 234–35.

3. Fernandez, *Palayok*, 15–16. See also Fernandez, "The World of Miguel Ruiz," 74–79.

4. Nabhan and St. Antoine, "The Loss of Floral and Faunal Story," 231–32.

5. Reedy et al., "A Mouthful of Diversity," 12–13.

6. Mears, *Rice Economy of the Philippines*, 7.

7. Aguilar, "Rice and Magic," 304–9.

8. Efforts dotted the late eighteenth century, most notably under Juan José Ruperto de Cuéllar y Villanueba (ca. 1739–1801) of the Real Compañía de Filipinas, founded in 1785 to oversee the Spanish monopoly of the colony. Though blueprints and instructions for the garden's development had been drafted, the project was abandoned, and Cuéllar lost his post at the Real Compañía. See Llanos, *Ang Pagbubukid ng Kalikasang*, 348–53. In 1821, Madrid sent a royal order to Governor-General Mariano Fernández de Folgueras (1766–1823) to establish a public botanical garden in Manila to facilitate the study of commercial and medicinal plants. Only two years later, Governor-General Juan Antonio Martínez (1769–1826) issued a similar order on behalf of a garden that could cultivate indigenous and exotic flora. Neither attempt saw progress. See Rodriguez, "El Jardín Botánico de Manila," 77–78.

9. Borromeo-Buehler, "The 'Inquilinos' of Cavite," 69–98; De Jesus, *Tobacco Monopoly in the Philippines*; Legarda, *After the Galleons*, and Legarda, "Economic Background of Rizal's Time."

10. Lopez, *Orígen é historia del Jardín Botánico*, 3–9.

11. Ultramar, legajo 527, expediente 1, número 2, AHN.

12. Sánchez, "La etnografía de Filipinas," 157–85.