New World Drugs in England's Early Empire

Katrina Elizabeth Maydom

Abstract

How were New World drugs received and understood in early modern England? In the seventeenth century, England's first empire was being established and an increasing abundance of medicinal plants arrived in London from across the Atlantic. In this thesis, I argue that commercial and political imperatives drove the production, trade and consumption of New World medicines. I explore trends in the drug trade across the early modern period to identify how the scale and diversity of American medicines fluctuated in the English market. I recognise a critical juncture in the 1650s with a change in political institutions and the collapse of the colonial tobacco economy. In the case of Virginia, merchants and colonial statesmen advised the Parliamentarian government on new forms of plantation governance and economic development. Their recommendations included investment in perceived lucrative new commodities, such as sassafras, sarsaparilla and other medicinal plants. As the supply of American drugs expanded in the English market from the 1650s to the 1680s, medical writers became more engaged in the recommendation of New World medicaments for the treatment of diseases, including scurvy and venereal diseases. I consider the process of knowledge negotiation and commercial policymaking in issues surrounding the trade, propagation and transplantation of American medicinal plants into England during the late seventeenth century. The availability and consumption of New World drugs became commonplace by the early eighteenth century, and they could even be accessed by schoolboys and pensioners at charitable institutions. To formulate this narrative, I employ an integrated historical approach, drawing from economic, colonial, intellectual and medical history. I examine customs records, first-hand colonial accounts, printed books and pamphlets, manuscript commonplace books, letters, prescription lists and medical journals. This study contributes to research programmes on English colonial development, global commodities, the Columbian exchange and the early modern medical marketplace.

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Declaration

This dissertation is the result of my own work and includes nothing which is the outcome of work done in collaboration except as declared in the Preface and specified in the text.

It is not substantially the same as any that I have submitted, or, is being concurrently submitted for a degree or diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text. I further state that no substantial part of my dissertation has already been submitted, or, is being concurrently submitted for any such degree, diploma or other qualification at the University of Cambridge or any other University or similar institution except as declared in the Preface and specified in the text.

It does not exceed the prescribed word limit for the relevant Degree Committee.

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Introduction

> Deficiency is the ignorance of the Husbandry of other places … how they improve their commodities, &c. We will onely sail upon our Northern Plantations, Verginia, New-England, and instance in a few things. Why may not the Silk-grasse of Verginia, the Salsaperilla, Sassarfas, Rattl[e]snake-weed (which is an excellent cordial) be beneficial to us, … infinite are Plants which we have, and they knew not, as well appeareth by their small and our large Herbals; and dayly new Plants are discovered, usefull for Husbandry, Mechanicks and Physick; and therefore let no man be discouraged from prosecuting new and laudable ingenuities. And I desire Ingenuous Gentlmen and Merchants, who travel beyond Sea, to take notice of the Husbandry of those parts.
>
> King James I (1609) [1]

In a letter of 1609 promoting the silk industry, quoted above, King James I recognised three medicinal plants as important commodities: sarsaparilla, sassafras and rattlesnake weed. These plants were esteemed by the monarch for both their potency in physic and their importance in the economic development of the English plantations. The endorsement of the king was a powerful incentive for merchants to expand the English drug trade in North America. Gentlemen who identified new flora and their medicinal virtues could garner the king's favour. The development of practical knowledge was critical for the flourishing of England's expanding colonial empire.

At a time when the foundations of England's first empire were being established, an increasing variety and abundance of plant and animal specimens arrived in London's ports from across the Atlantic. In the seventeenth century, the English directly encountered exotic *materia medica* from their New World colonies for the first time. This thesis provides the first comprehensive study of how the English interpreted and represented the healing virtues associated with plant specimens native to the Americas during an early period of western imperialism. Why did certain plants from the New World become commercial products, how were they understood to work medicinally, and in what circumstances were they consumed?

I argue that commercial and political imperatives drove the production, trade and consumption of New World medicines. The trade in American cures was fostered by a feedback effect of governmental policy and commercial demand. I explore trends in the drug trade across the early modern period to identify how the scale and diversity of American remedies fluctuated in the English

[1] King James I, "Letter to the Lords Lieutenants of the Several Shires of England," in Samuel Hartlib, *The Compleat Husband-man: or, A Discourse of the Whole Art of Husbandry; Both Forraign and Domestick* (London, 1659), pp. 60-62.

market. The importance of American drugs in the English medical marketplace increased significantly from the 1650s due to a variety of factors, including their promotion and advocacy by prominent officials, their larger prominence in medical literature, their expanding supply from a growing colonial economy and their increased use in the treatment of the pox and a wide array of other diseases. I recognise a critical juncture in the 1650s with the confluence of a change in political institutions and the collapse of the colonial tobacco economy. At this time, the new republican government undertook several measures - political, economic and military - to promote and protect their interests in the Americas.

One of the Parliamentarians' primary objectives was to bring order and control over the entire English empire, by subduing Royalist strongholds and eliminating other polities' threats to their governance. They created legislation to mitigate these concerns firstly through the Navigation Act of 1650 that prohibited trade with Royalist colonies in the Americas in an attempt to force them to accede to Parliamentary rule. The following Navigation Act of 1651 stipulated a more comprehensive regulatory regime for overseas trade, most notably by banning non-English ships from transporting goods to England or its colonies. A by-product of these manoeuvres was that colonial goods, including drugs, were more readily streamed directly to England.

The political economy of trade in American drugs operated within a mercantilist culture, in which government-directed operatives promoted the economic interests of England over other countries. Prior to the 1650s, Dutch merchants acted as the primary intermediaries in the trade of colonial American products. The Parliamentarians viewed the trade with their American colonies as a zero-sum game, in which any profit the Dutch gained came at the expense of England. Through the Navigation Acts and the Anglo-Dutch war of 1652-1654, the English republican government aimed to remove the Dutch threat to their colonial trade and thereby strengthen both governmental control over the American colonies and economic prosperity for England and its plantations. This mercantilist focus on goods produced within the English empire for English consumption led to a greater volume of colonial products arriving into London, including drug commodities. This increase in the supply of American drugs sparked a greater interest in their medical properties.

The leader of the republican regime, Oliver Cromwell (1599-1658), endorsed the Western Design expedition of the mid-1650s in which English forces attacked Spanish territories in the Americas and captured Jamaica. This military campaign envisioned future English prosperity in Jamaica and the invasion was therefore orchestrated with aims of colonisation and development rather than short-

term plunder and destruction. The economic vitality of the new English possession was not realised in the mineral wealth of gold, but, as with the earlier English acquisitions, in plantation crops. In the Caribbean climate, the English could expand their range of plant commodities to include sugar, green ginger and other new drug products.

As the supply of American medicaments expanded in the English market from the 1650s to the 1680s, medical writers became more engaged in the recommendation of New World curatives in the treatment of ailments, such as scurvy and venereal diseases. The changes in the importation of medicines represented an expansion of the pharmacopoeia rather than a displacement of older medicines by new botanical materials. I consider the process of knowledge negotiation and commercial policymaking in issues surrounding the trade, propagation and transplantation of American medicinal plants into England during the seventeenth century. The availability and consumption of New World drugs became commonplace by the early eighteenth century, and these medicaments could even be accessed by schoolboys and pensioners at charitable institutions. After these American treatments became well-known, they were co-opted into contemporary debates, such as those between Galenic and chemical physicians, which had little to do with their status as originating from the New World.

The concept of the 'New World' was full of significance to early modern European writers, from the fear of the unknown to the potential discovery of Eden. Myth-making often invoked religious explanations of Europeans' claims to the Americas; the new lands had been 'marvellously' bestowed upon them by God.[2] Possession was declared through literary constructions which declared the Americas *terra nullius*, a place where Europeans could build a New Jerusalem.[3] Nevertheless, many competing portrayals were propounded and contradictions were to be expected. Exaggerated myths diverged from the realities, but they also offered comparative reference points for constructing new knowledge claims. As Benjamin Schmidt has explained regarding the Dutch case, the Americas' "very novelty, as well as its remoteness, sanctioned a certain elasticity, or even experimentation, in its representation. Rather than any single, broadly accepted picture of the New World, a number of "Americas" would compete for viewer's attention."[4]

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[2] Stephen Greenblatt, *Marvelous Possessions: The Wonder of the New World* (Oxford: Oxford University Press, 1991), p. 53.

[3] Jack P. Greene, *The Intellectual Construction of America: Exceptionalism and Identity from 1492 to 1800* (Chapel Hill: University of North Carolina Press, 1997), p. 52.

[4] Benjamin Schmidt, *Innocence Abroad: The Dutch Imagination and the New World, 1570–1670* (Cambridge: Cambridge University Press, 2002), p. 5; Catherine Armstrong, *Writing North America in the Seventeenth Century: English Representations in Print and Manuscript* (Farnham: Ashgate, 2007).

The 'New World' became an object of zealous lust and ambition for establishing a new dominion. I engage with the 'global turn' in the study of empire, following imperial and global historians who aim to write comparative and connected histories. In the view of Simon Potter and Jonathan Saha, these connected histories of empire "seek to uncover links that operated across the formal borders of imperial formations."[5] In this thesis, I use the term 'empire' to refer to the political control over territory, rather than purely trading access, and to denote both company settlement and government-led colonisation. In the English case, imperial expansion was driven primarily by interested parties, rather than through royal patronage and government policy as was the case for other European powers in the Americas, like France or Spain.[6] The economic and political aspirations of English merchants and statesmen fuelled the propaganda of newfound riches. Their charted companies did receive royal endorsement, however, and they were vested with quasi-governmental functions. In King James I's letter referenced earlier, for example, he advocated for gentlemen and merchants to increase their knowledge of "the New-world and the wonders there," which could secure England's economic prosperity and geopolitical position.[7] Yet English projections in the Americas were tenuous and fragile, and they suffered frequent disastrous challenges, including food shortages, disease outbreaks and conflict with indigenous peoples.[8] These issues were compounded by corrupt local governance and divisions within the leadership of companies. For example, these problems led to the dissolution of the Virginia Company (founded in 1607) resulting in a royal takeover of the colony in 1624. As Michael Braddick has observed, this final governmental action "confirmed the emerging consensus, that these settlements represented an extension of the English polity."[9]

The American plantations held a conflicted status in the English consciousness. They were neither fully foreign nor truly English. The 'New World' was adopted in some ways, with English place names, people and customs, but it was also a place of massacre, starvation and white slavery. There was an uncomfortable tension between the familiar and the unknown. The reality of the wider European experience in the Americas was also one of struggle and failure. When the myths of

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[5] Simon J. Potter and Jonathan Saha, "Global History, Imperial History and Connected Histories of Empire," *Journal of Colonialism and Colonial History* 16, no. 1 (2015), para. 1.

[6] James Pritchard, *In Search of Empire: the French in the Americas, 1670-1730* (Cambridge: Cambridge University Press, 2004), p. 245; James Lockhart and Stuart B. Schwartz, *Early Latin America: A History of Colonial Spanish America and Brazil* (Cambridge: Cambridge University Press, 1983), p. 239; J. H. Elliott, *Empires of the Atlantic World: Britain and Spain in America, 1492-1830* (New Haven: Yale University Press, 2006), p. 117.

[7] King James I, "Letter to the Lords Lieutenants," p. 61.

[8] Anthony McFarlane, *The British in the Americas 1480-1815* (London: Longman, 1994).

[9] Michael J. Braddick, *State Formation in Early Modern England c. 1551–1700* (Cambridge: Cambridge University Press, 2000), p. 404. See also L. H. Roper, *The English Empire in America, 1602-1658* (London: Pickering & Chatto, 2009), chapter 6.

unlimited bounty and the ability to create a better society proved elusive, a reassessment of European civilisation began. As J. H. Elliott has argued, early modern Europeans invented the 'New World' in the process of critical self-reflection.[10]

This thesis considers the significance of rhetoric in the promotion of nature as being able to heal both the body and the political realm. The bodies natural and politic had been considered entwined since antiquity, a continuity across political systems and knowledge frameworks of the natural world. The North American colonies were understood as spaces of healing, and so their drugs were not only profitable commodities but perceived to emanate from a space which itself was being cast as a source of salubrity in the political and corporeal domains. The language surrounding the English commonwealth was imbued with metaphors of health and healing, which were invoked in times of upheaval and distress. Medicines were presented as lucrative commodities that could enhance the economic basis of England and its colonies.

Successive English governments attempted revival efforts to uplift their failing fledgling colonies. Many of these rejuvenation campaigns achieved the survival of the English plantations in North America, but not their prosperity. Cycles of scouting, reporting, lobbying, short-term investment, and degradation continued across the early seventeenth century. The civil unrest and political upheaval of the 1640s, the change to a Parliamentarian government, and Cromwell's imperial ambitions presented a unique opportunity to fully reassess and reform the administration and economic foundations of the English plantations. Elliott's classic book on European encounters with the 'New World' concludes in the 1650s, the period in which I identify as a substantial increase in advocacy of American drug development, the production and export of these medicaments and references to them in medical literature.

Plants with medicinal virtues were amongst the supposed wondrous riches of the New World. Early modern writers referred to the 'countless' or 'infinite' variety of candidate plants for commodifying into botanical products. In reality, only a fraction were ever developed to any significant scale. The overarching vision of America as a space of potential healing and the reality of trade were distinct entities that influenced each other. In this thesis, I use 'drugs,' an inclusive contemporary term, to refer to medicinal plants that became traded commodities. In the early modern period, the term drug was more expansive than our modern conceptualisation of the word. While in our

[10] J. H. Ellliot, *The Old World and the New: 1492–1650* (Cambridge: Cambridge University Press, 1970).

contemporary understanding of drugs is restricted to illicit substances or medicines generally, the early modern usage of drugs was broader, encapsulating dyes and other non-medicinal materials. From c. 1400, the terms has referred to "any substance, of animal, vegetable, or mineral origin, used as an ingredient in pharmacy, chemistry, dyeing, or various manufacturing processes."[11] For example, in the Dominican friar and writer Thomas Gage's 1648 *The English-American his Travail by Sea and Land; or, A New Survey of the West India's*, he referred to "[m]uch Cacao, Achiotte, and drugs for Chocolatte; There is also Apothecary drugs, as Zarzaparilla."[12] This quote demonstrates both the contemporary understanding of American drugs at this time to include diverse substances such as 'achiotte' or annatto, whose orange-red seeds were primarily used as food condiment, and 'zarzaparilla' or sarsaparilla, which was identified as an apothecaries' drug and whose usage was primarily medicinal.

The industry required to identify, produce, harvest, process and ship these goods eliminated many possible candidates at any one of these stages. Perhaps the most restricted entry point was creating a market and a demand for new drugs.[13] The winners of this process can be traced in the historical documents, while the losers are much more challenging to locate, especially if they were abandoned at an early stage in their industry. Nevertheless, several hundred medicines did emerge from this process, and a few of them were commonly traded and consumed. In this thesis, I focus on those drugs with the greatest impact and influence on early modern English medicine, namely: cacao, cascarilla, cinchona (also known as Jesuit's bark and Peruvian bark etc.), contrayerva, cortex winteranus, guaiacum (lignum vitae), jalap, mechoacan, nicotiana, pimento, sarsaparilla, sassafras and snake root. I consider these plant remedies collectively to assess their trade and consumption, and I also focus on individual drugs to track their reception in print and their histories of commodification.

This thesis is centred in the seventeenth century with the early expansion of England's empire in the Americas, although the chronological scope extends from the late sixteenth century to the eighteenth century to provide greater contextualisation for the findings of the study. To identify long-run trends in the American drug trade from the initial shipments to the consistent supply, I analyse customs data from the earliest surviving records in 1567 until 1774 using Patrick Wallis' drug

[11] "drug, n.1," *Oxford English Dictionary* (Oxford: Oxford University Press, 2018).
[12] Thomas Gage, *The English-American his Travail by Sea and Land; or, A New Survey of the West India's* (1648), xvii. 113.
[13] Markman Ellis, Richard Coulton, and Matthew Mauger, *Empire of Tea: The Asian Leaf that Conquered the World* (London: Reaktion Books, 2015).

trade dataset.[14] To trace how a healing tree from the New World was received in early modern English print culture, I follow references to sassafras in over 180 texts from its introduction in 1577 until 1680. To explore the influence of commerce and politics on drug production in the American colonies, I closely examine the case of Virginia in the 1650s. To discover how knowledge of nature in the New World was acquired, processed and exchanged, I read the commonplace books of a decision maker in the process of which drugs were adopted or rejected in the English medical marketplace. To this end, I consult the relatively unknown notebooks of Abraham Hill (1633-1721), a merchant, Royal Society Fellow and Commissioner of the Board of Trade and Plantations. To understand how New World curatives were consumed in medical care, I investigate the medical manuscripts of the apothecary James Petiver (1665-1718) and the treatment of patients in his private and institutional practices.

I employ an integrated historical approach drawing from economic, colonial, intellectual and medical history. This thesis combines a variety of methodologies including quantitative examination of trade records, prescription lists and long-run surveys of printed materials and close qualitative analysis of manuscript and printed sources. I examine customs records, first-hand colonial accounts, printed books and pamphlets, manuscript commonplace books, letters and medical journals.

Nature, Politics and Empire in Early Modern Europe

The recent global turn in imperial history has drawn attention to the relationships between a multitude of regions on a global scale. The pursuit of 'bioprospecting,' the search for new and profitable drugs, has been explored by Londa Schiebinger in the eighteenth-century Atlantic World.[15] Pratik Chakrabarti has illustrated in the case of eighteenth century Jamaica that the plantation system fostered the development of medical botany through its "unique agricultural system that required a close knowledge of plants and the art of growing them."[16] Bioprospecting was already underway in the seventeenth century, and this thesis will investigate the wider interplay between prospectors, trading institutions and disinterested imperial powers. The well-known narrative in the historiography is one of powerful monarchs, motivated by the promise of wealth and prestige, directing the search for and exploitation of natural resources in the extra-European world. What

[14] Patrick Wallis, "Exotic Drugs and English Medicine: England's Drug Trade, c. 1550-c. 1800," *Social History of Medicine* 25, no. 1 (2011): 20-46. I provide full information about the data in Chapter 1.
[15] Londa L. Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge, MA: Harvard University Press, 2009).
[16] Pratik Chakrabarti, *Materials and Medicine: Trade, Conquest and Therapeutics in the Eighteenth Century* (Manchester: Manchester University Press, 2011), p. 144.

kindled these covetous ambitions of the European central authorities to invest and risk assets for uncertain rewards? The pull of the 'periphery,' the claims of wonders and cure-alls, strengthened the push of the metropolis. Detailed and sensual descriptions of perishable luxuries, such as fruits and flowers, tantalised European elites who could not experience them directly. For example, Sean Silver has discussed how adventurers' and colonists' reports created an English desire and pursuit for the sweet, ripe and delicious pineapple.[17] Seventeenth-century courts were enticed by the splendour of the exotic displayed before them following successful voyages to faraway lands, such as the Americas, Africa and the East Indies.[18] Reports of naturally abundant commodities, including minerals, medicines, dyes and grains, and examples of intriguing curiosities brought before European elites incited further expeditions and investigations into nature's offerings in the east and west.

The motivations behind writers' claims of natural riches in the Americas changed over the early modern period as the level of investment increased from speculation to survival. Decision-makers and propagandists could express their political concerns indirectly through parallels in their accounts of nature of the New World. Later seventeenth-century reports were often crafted by men who became dependent on the success of the colonial enterprise: settlers and planters, who sought protection for their newfound livelihoods; merchants, whose trade specialised in the West and East Indies; and statesmen who needed colonial governments to succeed. These invested players emphasised the benefits and minimised the obstacles to commercial gains, and never failed to mention when another European power had the upper hand in obtaining land or luxury trading goods. Jealousy and rivalry between European countries were significant forces that should not be underestimated. For example, continual battles were fought over the islands in the West Indies, which provided both high-return commodities and footholds for further territorial acquisitions.

The pivotal difference between the polities of Europe was not the quest and conquest of New World *naturalia*, but the motivations and strategies for achieving this mission, which were founded in their contrasting political structures and ideologies. Governments with strong monarchies, such as Spain and France, tended to form centralised institutions for their colonial endeavours, and their empires were based on territorial acquisition. Weaker monarchies, such as England and Sweden, also attempted to acquire territorial empires but were reliant on subcontracting their colonial projects to

[17] Sean R. Silver, "Locke's Pineapple and the History of Taste," *The Eighteenth Century* 49, no. 1 (2008): 43-65.
[18] Linda Levy Peck, *Consuming Splendor: Society and Culture in Seventeenth-century England* (Cambridge: Cambridge University Press, 2005).

collectives of merchants and other investors. Republics, such as the Netherlands, favoured trade and commerce over large-scale imperial expansion through colonisation.

With the change in English government from monarchy to republic in the seventeenth century, the attribution of colonial bounty transitioned from the king to the commonwealth. The English case is a hybrid model between those of the Netherlands and Spain, neither fully mercantile company-led nor completely under royal control, but one in which the king granted monopolies to companies. The commonwealth system makes for a crucial case study in comparison to other European governments in that the glorification of the monarch ceased to be the primary aim, and alternate rhetorical justifications needed to be made regarding the benefit of the commonwealth. It was primarily the difference in institutions, however, rather than political ideologies that influenced how natural products were pursued and exploited in the Americas. Changes in English government over the seventeenth century allowed for a rethinking of colonial governance structures, but the desire for the harvesting of a wide variety of medicinal botanicals remained consistent. During republican rule, colonial economic development became a greater priority due to the need for the new form of government to consolidate its control over all of its territories. When the royalists regained power with the Restoration, they continued Parliamentarian colonial policies and strategies that had been successful in stimulating trade with the American plantations.

In other European cases, however, a change in political order could result in an alteration of how nature was represented, and which symbolic meanings were assigned to it. Regimes of management of the natural stem directly from political institutions and preoccupations about the relationship between political form and visions of nature. For example, Emma Spary has demonstrated how the Jardin du Roi transformed from a place of royal glorification to a garden of the Republican people during the transition from the French Old Regime to the new French Republic.[19]

Across the early modern period, the interpretation of nature was intertwined with the politics of empire and changes in political regimes. Antonio Barrera has shown that observation and experience in creating natural knowledge of the Americas was critical to the ongoing success and expansion of the Spanish Empire in the sixteenth century.[20] The proliferation of Spanish expeditions to the Americas provided ample opportunities for the Spanish to collect, analyse and categorise natural

[19] E. C. Spary, *Utopia's Garden: French Natural History from Old Regime to Revolution* (Chicago: University of Chicago Press, 2010).
[20] Antonio Barrera, "Empire and Knowledge: Reporting from the New World," *Colonial Latin American Review* 15, no. 1 (2006): 39-54. See also Paula De Vos, "The Science of Spices: Empiricism and Economic Botany in the Early Spanish Empire," *Journal of World History* 17, no. 4 (2006): 399-427.

specimens. In turn, these natural commodities and associated information on their origin, uses and further cultivation were exchanged for wealth and social prestige. Spanish explorers were ordered by royal officials to extract the rich secrets of the Empire's recent acquisitions and report their findings about what commodities were available for exploitation in these places. Just as political spies conspired to obtain restricted knowledge from other kingdoms to exploit and control, these explorers sought the secrets of nature from newly charted lands that could bring prosperity to their empire at the expense of others. Such valuable knowledge needed protection and so was institutionalised under Spain's House of Trade and Council of the Indies, which oversaw the entire process of garnering information and *naturalia* from the New World. Within the regulation and management of the House of Trade and Council of the Indies, all aspects of scientific expeditions to the New World were organised, including instructions on how to record their first-hand experiences of nature and collect specimen samples so that they could be captured, preserved and presented to the Spanish Crown. The House of Trade and Council of the Indies then decided which of the New World's secrets should be further disseminated through publications on topics such as natural history, medicine and navigation.

During the Golden Age of the Dutch Republic in the seventeenth century, the Dutch East India Company (the VOC) flourished as a new form of institution that was chartered by the government but could raise its own armies, claim its own territories, issue its own currency and perform many other civic functions. The VOC's monopoly granted it the rights and resources to not only secure precious spices and medicines from the East Indies, but to establish new colonies there and wage war if necessary. The VOC was integral to the informal networks of information exchange amongst the great merchant families, who comprised the membership of both the VOC and the government. Prominent Dutch merchants and their wives held the most influential political offices as *regenten* or regents, meaning that they oversaw civic institutions as fathers and mothers.[21] As Harold Cook has shown, "the matters they valued most, whether material goods, social manners, cultural symbols, intellectual pursuits, also came to dominate the lives of other people."[22] Cook underscored how values that were important to trade and commerce, such as objectivity, accumulation and description, also shaped how the natural world was investigated. He argued that the culture of the exchange economy resulted in "enormous consequences for how most people of affairs, even

[21] Harold J. Cook, *Matters of Exchange: Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven: Yale University Press, 2007), p. 58.
[22] Ibid, p. 2.

university professors, came to understand the way of nature, for it changed the terms of reference for intellectual investigation."[23]

These studies raise important questions about the ownership of nature, its political territories and identities, its institutional control and the accessibility of natural knowledge. Whether we look to the burgeoning Spanish Empire of the sixteenth century, the Dutch Golden Age of the seventeenth century or the French transition to a Republic in the later eighteenth century, formal and informal institutions were central forces in the study and commodification of nature. In absolutist monarchies and republics alike, the search for desirable exotic natural commodities flourished, indicating that the 'institutionalisation of nature' was perhaps more important than the form of government that exercised political power. For example, Anna Winterbottom has studied the role of institutions, such as the East India Company and the Royal Society, in monitoring bio-prospecting in England's trade relations with India.[24] Her work has demonstrated the importance of control placed on the exchange of knowledge across intellectual centres.

My study will contribute to this literature by offering the English case of imperialistic expansion in the Americas and how political and economic imperatives influenced their investigation of nature. Drug preferences varied across early modern Europe, and often corresponded to the geographical ranges in which medicinal plants grew within the territorial control of different empires. Sassafras and Virginia snakeroot, for example, found greater favour in the English market than elsewhere, and they grew abundantly in England's North American colonies.

The Medical Marketplace for New World Drugs

> [W]hen I tell you the Vertues of Fruits or Drugs which grow in the East or West Indies, I do not bid you go thither and fetch them; the more industrious Merchant hath saved you that labour, and brought them home to your Doors.
>
> Robert Turner (1664) [25]

The 'medical marketplace' has become the most prevalent model for understanding seventeenth-century English healing practices since the 1980s.[26] The model was developed in response to earlier

[23] Ibid.
[24] Anna Winterbottom, "Producing and Using the Historical Relation of Ceylon: Robert Knox, the East India Company and the Royal Society," *The British Journal for the History of Science* 42, no. 4 (2009): 515-538.
[25] Robert Turner, *Botanologia the Brittish physician* (London, 1664), p. 4.
[26] Lucinda McCray Beier, *Sufferers and Healers: The Experience of Illness in Seventeenth-Century England* (London: Routledge, 1987); Roy Porter, "The Patient's View: Doing Medical History from Below," *Theory and Society*, 14, no. 2 (1985): 175-198; Irvine Loudon, "The Nature of Provincial Medical Practice in Eighteenth-

accounts of early modern European medical practice that focused on the tripartite distinction between apothecaries, surgeons and physicians and changes in regulation and professionalisation. One definition of the medical marketplace model, by contrast, was of a "marketplace where services were advertised and sold to those sufferers who cared to shop."[27] Rather than necessarily accepting the claimed learned authority of licensed medical practitioners, patients were "medically promiscuous" and chose healers and treatments based on their own perceptions of effectiveness and cost.[28]

The idea of the 'medical marketplace' has been criticised on several fronts. David Gentilcore, in a study of early modern Italian medicine, advocated for a model of overlapping healing communities, popular, ecclesiastical and medical, including those based on magical and religious treatment.[29] Lawrence Brockliss and Colin Jones have argued that early modern France had a more corporatist medical field than the relatively pluralist English medical marketplace.[30] By comparing and contrasting multiple countries, we can account for regional differences of medical care across early modern Europe.

Further criticisms of the medical marketplace concept include the obscuring of important aspects of medical practice, such as magical services, charitable provision and domestic care. There are dangers, however, that expansion in the scope of the medical marketplace studies could lead to conceptual stretching such that the idea loses analytic traction.[31] Recent research has responded to these criticisms by exploring the "cultural and social construction of particular medical goods and services" and how the "demand' for medical assistance was related to … household and neighbourhood resources."[32] This updated focus of the medical marketplace concept as a mode of

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Century England," *Medical History* 29, no. 1 (1985): 1-32; Harold J. Cook, *The Decline of the Old Medical Regime in Stuart London* (Ithaca: Cornell University Press, 1986).

[27] Beier, *Sufferers and Healers*, p. 9.

[28] Mary Lindemann, *Medicine and Society in Early Modern Europe* (Cambridge: Cambridge University Press, 1999), p. 199.

[29] David Gentilcore, *Healers and Healing in Early Modern Italy* (Manchester: Manchester University Press, 1998).

[30] Lawrence Brockliss and Colin Jones, *The Medical World of Early Modern France* (Oxford: Oxford University Press, 1997).

[31] Margaret Pelling, *Medical Conflicts in Early Modern London: Patronage, Physicians, and Irregular Practitioners, 1550-1640* (Oxford: Oxford University Press, 2003), p. 343.

[32] Mark S. R. Jenner and Patrick Wallis, "The Medical Marketplace," in Mark S. R. Jenner and Patrick Wallis, eds., *Medicine and the Market in England and its Colonies, c. 1450- c. 1850* (London: Palgrave Macmillan, 2007), p. 12. See also the chapters in this volume, particularly those by Lauren Kassell, "Magic, Alchemy and the Medical Economy in Early Modern England: The Case of Robert Fludd's Magnetical Medicine," in Jenner and Wallis, *Medicine and the Market*; Elaine Leong and Sara Pennell, "Recipe Collections and the Currency of Medical Knowledge in the Early Modern 'Medical Marketplace,'" in Jenner and Wallis, *Medicine and the*

analysis permits us to conceptualise the ways in which markets are constructed, the influences on both the supply and demand for medical goods and services, and the relationships between patients and medical practitioners.

Earlier research has demonstrated that there was an expansion of drug production, availability and consumption across the seventeenth and eighteenth centuries. Linda Levy Peck has located trade in novel commodities, including exotic plants from the West Indies, as part of a larger narrative of increasing consumption of luxury goods in seventeenth-century England.[33] Pratik Chakrabarti has recognised the process of drug expansion and diversification as part of the wider impact of the 'Age of Commerce.'[34] Roy and Dorothy Porter have highlighted the rise of the commercial medicine in England in the seventeenth and eighteenth centuries. One factor they attributed to the expansion of the English drug industry was the fame of cures from the Americas and the East Indies, such as ipecacuanha and cinchona.[35]

Some medical historians have argued that the importance of New World remedies did not have much effect on early modern medical practice because only a few of these drugs were incorporated into the pharmacopeia. J. Worth Estes remarked that there was "little of truly lasting therapeutic value from the New World," in early modern Spanish medicine.[36] Valeria Finucci, reflecting on early modern Italy, argued that "New World therapeutics did not have much of an impact on the official pharmacopoeia, which kept its fairly traditional approach well into the eighteenth century."[37] Analysis of the number of New World drugs in official pharmacopeias, however, tells us little about the actual consumption of these medicines. It is not the number of drugs that is important, but rather how often they are prescribed by medical practitioners and used by patients. A few drugs could make an enormous difference if they were frequently prescribed and consumed, a point I will return to in Chapter 5.

Market; Ian Mortimer, "The Rural Medical Marketplace in Southern England c. 1570–1720," in Jenner and Wallis, *Medicine and the Market*.

[33] Peck, *Consuming Splendor*.

[34] Pratik Chakrabarti, *Medicine and Empire: 1600-1960* (London: Palgrave Macmillan, 2013).

[35] Roy Porter and Dorothy Porter, "The Rise of the English Drugs Industry: the Role of Thomas Corbyn," *Medical History* 33, no. 3 (1989): 277-295.

[36] J. Worth Estes, "The European Reception of the First Drugs from the New World," *Pharmacy in History* 37 no. 1 (1995), p. 19. Other accounts arguing that New World drugs made little impact on early modern European medicine can be found in Charles H. Talbot, "America and the European Drug Trade," in Fredi Chiappelli, ed. *First Images of America: the Impact of the New World on the Old*, Volume 2 (Berkeley: University of California Press, 1976) and Guenter B. Risse, "Transcending Cultural Barriers: The European Reception of Medicinal Plants from the Americas," in Wolfgang-Hagen Hein, ed., *Botanical Drugs of the Americas in the Old and New Worlds* (Stuttgart: Wissensschaftliche Verlagsgesellschaft, 1984): 31-42.

[37] Valeria Finucci, "'There's the Rub": Searching for Sexual Remedies in the New World," *Journal of Medieval and Early Modern Studies* 38, no. 3 (2008), p. 532.

Dismissals of the impact of New World drugs on European medicine have been challenged by Theresa Huguet-Termes, who commented that "(t)he idea that only a few American drugs were used in Europe and therefore had little impact has been perpetuated without much questioning or investigation."[38] Her study of New World *materia medica* in Spanish renaissance medicine concluded that "the use of American drugs in sixteenth-century Spain has been underestimated" due to a failure to comprehensively study a wide range of archival sources.[39] Following Huguet-Termes, Gail Taylor has documented how political, economic and cultural factors shaped the incorporation of New World drugs into early modern German medicine, by drawing on a diversity of sources, including travel and medical literature, official price lists and apothecary inventories.[40]

I offer the case of the reception of New World drugs in early modern England to this emerging body of literature. Comparisons can be drawn between the English case and the cases of Spain and the Germanic regions, provided by Huguet-Termes and Taylor, to bring us closer to an understanding of a European reception of New World remedies in the early modern period. Furthermore, I analyse how New World medicines were prescribed and consumed both on the private market and in charitable institutions, demonstrating that American curatives were influential in early modern English medical practice.

The Global Circulation of Things

Recent historical scholarship on the global circulation of material culture has explored not only how objects were represented and perceived but also how contemporaries argued these objects should function and be experienced across cultural boundaries.[41] Within Atlantic history, Philip Morgan and Jack Greene have called for greater attention to be paid to the circulation of drug commodities, such as logwood, sarsaparilla, ipecacuanha, jalap and cinchona.[42] Recent studies in the history of medicine have called for further research on how medical knowledge and practice were negotiated

[38] Teresa Huguet-Termes, "New World Materia Medica in Spanish Renaissance Medicine: From Scholarly Reception to Practical Impact," *Medical History* 45, no. 3 (2001), p. 360.
[39] Ibid, p. 375.
[40] Gail Marlow Taylor, "Putting Down Roots: The Reception of New World Medicinal Plants in Early Modern Germany, 1492-1648," PhD diss. (University of California, Irvine, 2014).
[41] Paula Findlen, *Possessing Nature: Museums, Collecting, and Scientific Culture in Early Modern Italy* (Berkeley: University of California Press, 1994). For a review of the current literature, see Kate Smith, "Amidst Things: New Histories of Commodities, Capital, and Consumption," *The Historical Journal* 61, no. 3 (2018): 841-861.
[42] Philip D. Morgan and Jack P. Greene, "The Present State of Atlantic History," in Jack P. Greene and Philip D. Morgan, eds. *Atlantic History: A Critical Appraisal* (Oxford: Oxford University Press, 2009), p. 11.

and exchanged as a result of medicinal things moving from place to place.[43] Clearly those at the interface of knowledge exchange, known as intermediaries in centre-periphery accounts, did not merely serve as transportation vessels delivering specimens, raw, unprocessed and stripped of all indigenous beliefs, to the examination tables of European naturalists and medical practitioners.[44] Instead collective English wealthy groups, such as the merchants, and other individual scholarly explorers mediated the unknown through discussions with indigenous peoples, their own first-hand experiences and consultations with both earlier Spanish accounts and the rich array of medical theory and Christian ideologies available in print. The circulation of material objects and print followed trading networks, which further influenced their interpretation.

The importance of commerce in the interpretation of nature and medicine has been investigated in other early modern European contexts. For example, Dániel Margócsy has demonstrated the importance of the growth of global trade during the Dutch Golden Age, where product marketing, patent litigation, and ghost-writing impacted developments in natural history and medicine.[45] He illustrated how a transnational entrepreneurial network of natural historians, physicians and *curiosi* developed their crafts and knowledge-claims to promote their own trade. This resulted in a highly competitive marketplace that shaped scientific knowledge.

European encounters with the New World were often commissioned either by the polity or merchant collectives with the aim of bio-prospecting, the identification and commodification of *naturalia* that would produce the greatest profit. Merchant knowledge-claims about the natural world went beyond the promotional advertisements that were strictly necessary for their trade through rhetorical embellishments, situating their pursuit of natural commodities in terms of a sacred duty that would benefit both the polity and society.[46] Merchants' representations of colonial exotica argued how these foreign botanicals should function in European society as foods, medicines, scientific objects, aesthetics or combinations thereof, and also promised how Europeans

[43] For an overview of the current literature, see Harold J. Cook and Timothy D. Walker, "Circulation of Medicine in the Early Modern Atlantic World," *Social History of Medicine* 26, no. 3 (2013): 337-351.
[44] For information on the importance of intermediaries in knowledge production and circulation, see Lissa Roberts, Kapil Raj, and James Delbourgo, *The Brokered World: Go-betweens and Global Intelligence, 1770-1820* (Sagamore Beach, MA: Science History Publications, 2009); Mark Harrison, *Medicine in an Age of Commerce and Empire: Britain and its Tropical Colonies, 1660-1830* (Oxford: Oxford University Press, 2010).
[45] Dániel Margócsy, *Commercial Visions: Science, Trade, and Visual Culture in the Dutch Golden Age* (Chicago: University of Chicago Press, 2014).
[46] Schiebinger, *Plants and Empire;* Cook, *Matters of Exchange.*

could expect to experience these luxury commodities through vivid details of their appearance, taste, texture and other sensual qualities.[47]

The European reception of American medicinal plants is not a new area of historical inquiry, but the ways in which historians investigate the appropriation of these drugs has changed significantly. Recent research into the Hispanic transoceanic world has provided fresh perspectives on the Andean context, the role of local knowledge and expertise, and the complex power relations between indigenous peoples and their Spanish colonisers. Samir Boumediene has argued against an emphasis on 'connections' and 'circulation,' focusing instead on the importance of power relations in the Spanish appropriation of New World remedies.[48] He understands Spanish authorities' attempts to dominate and control knowledge about American flora as part of their wider colonisation project. Matthew Crawford has highlighted the complex interactions between local and global knowledge, and the political debates in the Spanish empire's ambition to secure a monopoly in the trade of the cinchona tree and its bark.[49] He demonstrated how competing visions of empire, regalist and mercantile, influenced the practice of botany and how tensions between elite merchants and the Crown shaped the understanding and commodification of this 'Andean wonder drug.'

Historians have explored the circulation of other 'exotic' commodities in early modern Europe. In the case of tea, chocolate and tobacco, each of these substances was marketed as a drug before being consumed primarily for pleasure. Marcy Norton has analysed how chocolate and tobacco became commodities in the early modern Iberian-Atlantic world.[50] She found that the indigenous meanings associated with these *naturalia* had not been fully detached before they were ingested by Europeans, leading to significant debates amongst Catholic religious authorities. These medicinal plants were both commodified and secularised while serving to "consecrate … bonds of caste, trust, and intimacy."[51] Norton's work focused on how the Spanish and Portuguese empires assimilated these products into their consumption repertoires.

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[47] Pamela Smith and Paula Findlen, eds. *Merchants and Marvels: Commerce Science and Art in Early Modern Europe* (Abingdon: Routledge, 2013); Alix Cooper, *Inventing the Indigenous: Local Knowledge and Natural History in Early Modern Europe* (Cambridge: Cambridge University Press, 2007).

[48] Samir Boumediene, *la colonisation du savoir: une histoire des plantes médicinales du 'nouveau monde' (1492-1750)* (Lyon: Les Éditions des Mondes à Faire, 2016).

[49] Matthew James Crawford, *The Andean Wonder Drug: Cinchona Bark and Imperial Science in the Spanish Atlantic, 1630-1800* (Pittsburgh: University of Pittsburgh Press, 2016).

[50] Marcy Norton, *Sacred Gifts, Profane Pleasures: A History of Tobacco and Chocolate in the Atlantic World* (Ithaca: Cornell University Press, 2008).

[51] Ibid, p. 174.

Markman Ellis, Richard Coulton and Matthew Mauger have explored how tea became a quintessentially British product through "appropriating, commodifying and incorporating it within daily habits."[52] They investigated the creation of a market for this Asian leaf, promoted by medical literature, grocers' advertisements and the creation of a sociability around tea. Tea was, paradoxically, "inescapably foreign, indispensably British."[53] Christine Jones has analysed how coffee, tea and chocolate were appropriated into French consumption habits. Early modern French writers "worked to normalize foreignness" by describing their qualities in relation to humoral theory.[54] At the same time, "the exoticism of the global tonic remained a potent ingredient in its appeal as hot beverages became a tool of social sophistication."[55]

In this thesis, I encounter many of the same themes as these studies of early modern global commodities. I investigate the creation of markets for New World drugs through the promotional efforts of merchants and colonial projectors. I explore the interaction between religious discourse and commercial marketing in the metaphor of the New World as Eden. I also analyse the identity paradox of New World cures: If English physic was needed to treat English bodies, were drugs from English colonies effective?

The Adoption of New World Drugs in Early Modern England

> Most certain it is, that neither Hippocrates, Dioscorides, nor Galen, ever heard any thing of Amber-greece, no more then they had of the Bezoar-stone, Guayacum, Sassafras, Sassaparilla, Rhubarb, Mechoachan, and many other Drugs … the knowledge is wholly modern, and the origine not well known.
>
> César de Rochefort (1666)[56]

While the New World was portrayed by many as a paradise, full of wondrous healing plants with quasi-miraculous effects, others viewed the foreign plants as unfit for English bodies. Some medical practitioners cited the dangers of consuming such plants through arguments based on the relationship between an individual's constitution and environment.[57] The counter-argument was made by others that the new colonies were now English lands and thus their remedies were suitable

[52] Ellis, Coulton and Mauger, *Empire of Tea*, p. 268.
[53] Ibid, p. 13.
[54] Christine A. Jones, "Exotic Edibles: Coffee, Tea, Chocolate, and the Early Modern French How-to," *Journal of Medieval and Early Modern Studies* 43, vol. 3 (2013), p. 647.
[55] Ibid.
[56] César de Rochefort, *The History of the Caribby-islands*. Translated by Anonymous (London: 1666), p. 118.
[57] For a discussion about the relationship between constitution and the environment, see Andrew Wear, "Place, Health, and Disease: the Airs, Waters, Places Tradition in Early Modern England and North America," *Journal of Medieval and Early Modern Studies* 38 no. 3 (2008): 443-465.

for the English people, albeit with some modifications. Rhetoric of the New World often referred to the English plantations, Virginia and New England, as merely extensions of England to alleviate concerns that these remedies could be unsuitable for English bodies.

The metaphor of the New World as Eden drew on the idea of divine providence or God's direct intervention, which was nearly universally accepted and permeated early modern English culture. As Alexandra Walsham has argued, providentialism was hardly limited to the theological debate between Lutherans and Calvinists; it was a part of everyday life.[58] For example, Presbyterian officials provided their congregations with practical divinity books that instructed their readers on how to approach health, illness and death in accordance with God's favour.[59] Thus the Church and clergy had a strong influence on the understanding and reception of New World *materia medica*. While the Bible, which contained descriptions of over 120 species, was consulted as a resource for learning about the medicinal properties of plants, it did not include American flora. After the fall of man, clergymen reasoned that nature was scattered and that God desired them to use his clues and their reasoning to put the pieces back together as they were complete at the beginning of creation.[60]

While natural history collections, such as cabinets of curiosity and lavish herbals, were in vogue at the court of James I, botanical gardens and public museums did not flourish until the second half of the seventeenth-century.[61] The Oxford Botanical Gardens (1640) and the Chelsea Physick Garden (1673) were established as microcosms of heaven on earth and served the public not only through the possession of nature, but also in healing and spiritual practices. These gardens were intended as places to study the entire world's range of plants available for both physick and botanical purposes as part of the quest to create microcosms of paradise in England. In 1685, John Evelyn described the Chelsea Physic Garden as having "the tree bearing Jesuit's Bark, which had done such wonders in quartan agues."[62] By this time, the pursuit of surveying and classifying all of God's creation had become a serious intellectual endeavour.[63] Ultimately, the process of creating these botanical

[58] Alexandra Walsham, *Providence in Early Modern England* (Oxford: Oxford University Press, 1999).
[59] Andrew Wear, "Puritan Perceptions of Illness in Seventeenth Century England," in Roy Porter, ed., *Patients and Practitioners: Lay Perceptions of Medicine in Pre-industrial Society* (Cambridge: Cambridge University Press, 1985), pp. 62-63.
[60] J. Prest, *The Garden of Eden: The Botanic Garden and the Recreation of Paradise* (New Haven: Yale University Press, 1981), pp. 62-64.
[61] Paula Findlen, "Francis Bacon and the Reform of Natural History in the Seventeenth Century," in Donald R. Kelley, ed., *History and the Disciplines: The Reclassification of Knowledge in Early Modern Europe* (Rochester: University of Rochester Press, 1997): 239-260.
[62] Entry for 7th August 1685 in John Evelyn, *The Diary of John Evelyn*, Volume II, ed. William Bray (London, 1879), p. 230.
[63] Charles Webster, *The Great Instauration: Science, Medicine and Reform 1626–1660* (London: Duckworth, 1975).

collections involved thousands of people, including merchants, travellers, scholars, gentlemen, aristocrats and priests, and a great economic demand, demonstrating their significance in seventeenth-century English culture.

The importance of English merchants' first-hand experience of travel empowered them to identify and commodify rarities that lay beyond the Atlantic. This sentiment is reflected in the anonymously-written *Character and Qualifications of an Honest Loyal Merchant* published in 1686:

> THE Loyal Honest MERCHANT is an Universal Tradesman, and all the World is his Shop ... WITHOUT him the World would still be a kind of Wilderness, one part unknown and unbeholding to the other ... The Art of Healing itself had incurably languisht, our Apothecaries Shops been destitute of the best part of the Materia Medica, or choicest Rarities of the Tripple Kingdom; and an English Herbal might have bounded the studies of our most Learned College of Physicians.[64]

Here merchants are presented as interpreters of the unknown, shedding light on foreign remedies and incorporating them into the English pharmacopeia. This excerpt alludes to the merchants' involvement in making medical knowledge claims about New World exotica. The English merchant and author Lewes Roberts (1596–1641) asserted in his 1638 *Merchants Mappe of Commerce* that merchants had a superior knowledge to 'Druggesters' or any other 'tradesman' skilled merely in a particular trade or commodity. Roberts argued that merchants had an "unlimited knowledge which is not confinable to commodities … his art may be compared to the Poets, whose excellency must consist in a coursory judgement in all sciences."[65] The assertion of merchants' influence on the interpretation of drugs was resisted by many medical practitioners. For example, the physician Timothie Bright (1549/1550–1615) complained "[f]or what hope is there to be had of the provision made by Merchants? [W]ho buy to sell onely, and thereof to reape gaine, and by reason they be unlearned."[66]

Roberts made several medical knowledge claims about the New World. For example, he remarked that Newfoundland "hath beene found to be too extreame for the English constitution."[67] This was a surprising finding to the English, who had assumed that climate corresponded to the latitude, and therefore, Newfoundland was expected to have a moderate climate since it was to the south of

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[64] *Character and Qualifications of an Honest Loyal Merchant* (London, 1686), pp. 1-3.
[65] Lewes Roberts, *Merchants Mappe of Commerce* (London, 1638), p. 42.
[66] Timothie Bright, *A Treatise: Wherein is Declared the Sufficiencie of English Medicines, For Cure of All Diseases* (London, 1580), p. 12.
[67] Ibid, p. 57.

London.[68] Climate was considered an important factor in health and disease because it could disrupt the balance of humours in the body. The English constitution was best-suited to a moist and temperate climate, and there was an anxiety of hot climates, which were perceived to engender a greater susceptibility to fevers and other diseases.[69] In another example, Roberts attributed medicinal qualities to American plants, including the "admirable tree called Metle ... the rinde rosted healeth hurts and sores, and from the top boughes issueth a gumme which is an excellent Antidote against poyson."[70] The ways in which Roberts derived his medical knowledge are instructive. He referenced his interactions with the local environment through the physical senses, especially sight and smell, in determining the qualities of *naturalia*.

Early modern English writers learned about the virtues of American *naturalia* through reports of indigenous medicinal preparations and contemporary European medical practitioners in addition to merchants' first-hand experiential accounts. The clergyman William Crashaw (bap. 1572, d. 1625/6) reported the use of sassafras in indigenous medicine as a preventative against sickness through its promotion of sweating.[71] Sassafras was later adopted to induce sweat in European medicine. Crashaw recognised other similarities between the two cultures of medical practice, including bleeding patients and recommending exercise through singing and dance. He also acknowledged that the Armouchiquois people in Virginia used sassafras in the treatment of phthisis, just as it was in European medical practice.[72] Crashaw concluded that the indigenous peoples' remedies did not always work, but "[i]f they doe not heale them alwaies, one must consider that our Physicians doe not alwaies cure their patients neither."[73]

Other contemporary European physicians were also cited as authorities in their knowledge and practice of New World medicinal treatments by English writers. One of the first people to introduce the range of American healing botanicals was Nicolás Monardes (1493-1588), a prominent sixteenth-century Spanish physician, who gathered information from merchants and clergy upon their return to Spain from the New World and maintained his own physic garden with plants from around the world. The result of his promotional texts, which were translated into many European languages,

[68] Karen Ordahl Kupperman, "The Puzzle of the American Climate in the Early Colonial Period," *The American Historical Review* 87, no. 5 (1982): 1262-1289.
[69] Karen Ordahl Kupperman, "Fear of Hot Climates in the Anglo-American Colonial Experience," *William and Mary Quarterly* 41, no. 2 (1984): 213-240.
[70] Ibid, p. 55.
[71] William Crashaw, *A Sermon Preached in London* (London, 1610).
[72] Ibid.
[73] Ibid.

was one of wealth for his new business venture of commercialising plants from Mexico and Peru.[74] Monardes' work was translated into English in 1577 by John Frampton (fl. 1559–1581), an English merchant working in Spain, as *Joyfull Newes Out of the Newe Founde Worlde*.[75] Frampton and Monardes agreed that this was a suitable title for medicine that they predicted would both help cure diseases that were previously incurable and deliver great profits in the process.[76]

Many English medical writers also cited the French physician Jean de Renou's (1568-1620) experience and knowledge of the medicinal properties and preparations of sassafras. For example, the writer Hamon L'Estrange (1605-1660) highlighted de Renou's infamous command of sassafras: "they [the indigenous Americans] are so much infected with the pox, which is vernacula & endemialis to the Americans, as Renodaeus in his Sassafras."[77]

L'Estrange's reference to the pox as endemic to the Americas is a reminder that it was not only things which travelled in the early modern period: diseases also circulated. The pox was the disease most commonly associated with the Americas in early modern Europe. The Puritan minister Cotton Mather (1663–1728) described the pox as travelling from the New World to the Old, while smallpox moved in the opposite direction.[78] The physician Robert Bayfield (bap. 1629) in *Enchiridion Medicum* (1655) described the pox as: "a contagious evill, gotten for the most part by the use of venery, and of unclean bodies: The part affected is the liver … some have their yards cut off, by reason of a Gangreen."[79] We should not understand the pox as a specific entity analogous with modern syphilis, but rather as a medico-social construction unique to its own time and place. As Claudia Stein has argued, in relation to the pox, "disease identification was a local matter and one of constant negotiation and renegotiation."[80]

Some writers reasoned that the cure for the pox must be found in the New World based on the belief that disease and place were connected. Monardes wrote of guaiacum, "[o]ur Lord God would

[74] Estes, "The European Reception."
[75] Nicolás Monardes, *Joyfull Newes Out of the Newe Founde Worlde*, translated by John Frampton (London, 1577),
[76] Ibid.
[77] Hamon L'Estrange, *Americans no Jewes* (London, 1651), p. 46.
[78] Cotton Mather, *Angel of Bethesda*, Gordon W. Jones, ed. (Barre, VT: American Antiquarian Society, 1972 [1724]), p. 117.
[79] Robert Bayfield, *Enchiridion Medicum* (London, 1655), pp. 161-163.
[80] Claudia Stein, *Negotiating the French Pox in Early Modern Germany* (Farnham: Ashgate, 2016), Preface. See also Margaret Healy, *Fictions of Disease in Early Modern England: Bodies, Plagues and Politics* (Basingstoke: Palgrave, 2001).

from whence the evill of the poxe came, from thence should come the remedy for them."[81] This connection between disease and location was strongly contested, however, with the retort that the pox had a long history in many regions of the world; it was not a specifically American disease. The medical writer Robert Turner (1619/20–c. 1664) argued that disease was associated with climate rather than location in his *Botanologia the Brittish Physician* (1664): "[f]or what Climate soever is subject to any particular Disease, in the same Place there grows a Cure."[82] The climate played an important role in the prevailing Galenic model of medicine in that the four elements (earth, air, water and fire), the four qualities (coldness, dryness, wetness, and heat) and the four seasons all interacted together with the four humours (phlegm, black bile, yellow bile, and blood). Therefore, he posited that if the pox could thrive in the English climate, then its remedies should also flourish there. A further counterargument was that even if God had allowed this disease to travel unchanged, then he would have also permitted the transportation of its remedies unaltered. The surgeon Nicolas de Blégny (1652-1722) accused other medical practitioners of profiteering from the philosophical claim that diseases and their cures were unique to certain places:

> This obliged those that had especially strived to keep them [the Wood Guaiacum, and the Roots of Sassafras, China, and Sarsaparilla] in vogue, to acknowledge and declare that the same advantages could not be drawn from them here [in Europe], as were pretended to be infallible in their Natural Climats [so that they became] generally acknowledged for the soveraign, specifick, & assured Remedies of this Disease [the pox].[83]

The importance of climate and its influence on the perceived medicinal virtues of plants is a topic of philosophical concern that reoccurs throughout this thesis. In Chapter 3, I will investigate the locations attributed to sassafras in English print. In Chapter 4, I will examine the interests of Abraham Hill (1633-1721), a merchant, founding Royal Society Fellow and Commissioner to Board of Trade and Plantations, regarding the suitability of certain American plants for transplantation and the conditions of the colonial environment and their impact on health.

While many of the protagonists in debates over the appropriateness of New World remedies presented their arguments in philosophical terms, they often had vested commercial interests at stake. As I will explore in Chapter 2, the natural philosopher Samuel Hartlib (c. 1600–1662) assisted the publication of a broadside on the many medicinal virtues of sassafras prepared by Virginia Ferrar (c. 1627–1688), a bookbinder and sericulturist, and her father John Ferrar (c. 1588–1657), a

[81] Monardes, *Joyfull Newes*, f. 10.
[82] Turner, *Botanologia,* p. 1.
[83] Nicolas de Blégny, *New and Curious Observations on the Art of Curing the Veneral Disease* (London, 1676), pp. 92, 94.

merchant and politican. In Chapter 3, I will conduct a one-hundred-year survey of printed works on sassafras, in which Hartlib appears again in taking a role of promoting the appropriateness of American cures for New World diseases. In 1651, I find that he further advocated for the consumption of sassafras in the treatment of the pox, writing:

> where any Endemicall or National disease reigneth, there God hath also planted a specifique for it … [s]o in the West-Indies, (from whence the great Pox first came, and where it reigneth very much, that not onely man, but other Creatures are infected with it, so that even Dogs dye of that disease in our Northerne Plantations … there grow the specifiques for this disease, as Gujacum, Sassaperilla, [and] Sassafras.[84]

Hartlib thus agreed with Monardes by citing the argument that the most appropriate cures could be found where a particular disease was believed to originate from. Several other supporters of the marketing of sassafras and other American curatives also propounded the same argument for their consumption and use in treating the pox amongst other diseases, as I will document in Chapter 3.

The arguments against the appropriation of New World remedies were multi-faceted. As Andrew Wear has recognised, opposition to foreign medicines had nationalistic, religious, economic and medical dimensions.[85] In response, regional natural histories and herbals were produced to increase knowledge of medicinal plants within England and to diversify the range of 'native' English remedies. As Alix Cooper has argued, European curiosity about their own 'indigenous' plants was sparked by the increasing trade in exotic medicines from extra-European encounters, such as the Colombian Exchange.[86] The boundaries of what was 'indigenous' altered with colonialism and shifting political borders; what was once 'foreign' could become 'domestic' as part of the English empire. To what extent did English dominions and the flora they contained become truly English? The English plantations were adopted through the rhetoric of belonging to the English or to his Majesty, although they remained contested spaces throughout the early modern period.

Medical historians have used the case of the astrologer and herbalist Nicholas Culpeper (1616-1654), who fought against the elite medical establishment's restriction of medical knowledge and promotion of expensive physic, to illustrate the early modern controversy over the use of exotic medicines.[87] Culpeper raised concerns over their high price, restricted availability and potential for

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[84] Samuel Hartlib, *Samuel Hartlib his Legacie* (London, 1651), p. 94.
[85] Andrew Wear, "The Early Modern Debate About Foreign Drugs: Localism Versus Universalism in Medicine," *The Lancet* 354 (1999), p. 150.
[86] Cooper, *Inventing the Indigenous.*
[87] Andrew Wear, *Knowledge and Practice in English Medicine, 1550-1680* (Cambridge: Cambridge University Press, 2000), p. 61; Alix Cooper, *Inventing the Indigenous*, p. 21.

adulteration, counterfeiting and substitution. While Culpeper raised these issues of drug access and quality, he nevertheless still recommended American drugs for medical treatment in some cases. He was not strictly against the incorporation of the drugs themselves into the English pharmacopeia, but what these drugs stood for: inequality, corruption and greed. In his 1649 translation of the College of Physicians' *London Dispensatory*, he expressed his outrage at physicians, who advocated for rare, costly treatments when, in his view, local, plentiful remedies could achieve the same effect or better. Culpeper wrote, "[w]ould it not pity a man to see whol estates wasted in Physick, (all a man hath spent upon Physitians) both body and purse consumed upon outlandish rubbish?"[88] Culpeper railed against the lack of affordability of exotic remedies and their inappropriate nature for the English body, connecting back to the medical understanding that different peoples' constitutions were suited for particular places and climates. Other medical writers, such as Joseph Blagrave (1610–c. 1682) and William Salmon (1644–1713), agreed with Culpeper. They cited the decayed state of plants arriving from the New World and remarked that even if the herbs were not poisonous to English bodies, they would be ineffective at best.[89] American medicaments had also been referred to in print as "rank poysons" that were often "gathered in unseasonable times, and corrupted by long voyages by sea, counterfeited by Merchants."[90] Yet these critics of medicinal plants from the New World failed to stem the tide of the drug trade with the American colonies and were fighting a battle that they could not win. Furthermore, these medical writers offered mixed views on American drugs, citing their benefits as well as their dangers.

Even Culpeper recognised the efficacy of some New World plants. He wrote of guaiacum as a cure for the pox amongst other maladies, it "dries, attenuates, causeth sweat, resisteth putrifaction, [and] is admirable good for [pox] as also for Ulcers, Scabs and Leprosie."[91] Culpeper also cited de Renou's preparation of mechoacan pills, which he recognised as being able to "purge flegm very violently."[92] Culpeper referenced de Renou several times throughout his work and included a receipt for troches of agnus castus with sassafras as an ingredient, which he also attributed to de Renou. Culpeper also did not think of sassafras as ineffective. In his commentary on the College of Physicians' receipt for the electuary of sassafras, he attributed numerous healing powers to the drug including opening obstructions in the liver and spleen and to helping with coughs.[93] Culpeper's concerns about American and other exotic remedies were based on the cost and availability of these

[88] Nicolas Culpeper, *A Physicall Directory* (London, 1649), The Translator to the Reader.
[89] Graeme Tobyn, "English Herbs for English Bodies: The Promotion of Native Plant Remedies 1548–1659, Nicholas Culpeper and his Antecedents," PhD diss. (Lancaster University, 2017).
[90] Anonymous in Hartlib, *The Compleat Husband-Man*, p. 71.
[91] Culpeper, *A Physicall Directory,* p. 7.
[92] Ibid, p. 137.
[93] College of Physicians, *Pharmacopoeia Londinensis*, Translated by Nicholas Culpeper (London, 1653), p. 125.

drugs rather than their efficacy or suitability for English bodies. There were many shades of grey in the divisions between the acceptance and rejection of New World remedies.

Perhaps the greatest irony was the proliferation of Culpeper's medical treatises in Boston. The demand for Culpeper's medical books was so great that they were among the first published in the British North American colonies. An abridged version of *The English Physician* was printed in Boston in 1708, and the *Pharmacopoeia Londinenis or the London Dispensatory* was the first full-length medical work printed in the colonies in 1720.[94] The English colonists read Culpeper's instructions on the medicinal virtues and preparations of plants as a reference guide. Yet the categories of what counted as a plant of the English nation had shifted. Herbs covering England's countryside had now become the foreign rarities to the English living in the American colonies, whereas sassafras trees were abundant.

His majesty's plantations in America were English enclaves in the New World and had become bound with England through a common people, religion, politics and way of life. As David Cowen has reflected, "[i]t is perhaps fitting that the first full-scale medical book printed in Puritan Massachusetts should have had a place in the religious, social, and political turmoil of the Puritan Revolution in England."[95] Culpeper's discourses of self-proficiency would surely have been valued by the Puritan English settler population. Jennifer Mylander has argued that Nicholas Culpeper's books served as a marker of English identity in the New World, where they held greater ideological importance than practical purpose, in part due to their limited coverage of American flora.[96]

Structure of the Thesis

In Chapter 1, I will analyse the English colonial drug trade between 1567 and 1774 using the Wallis drug trade dataset.[97] Based on this, I reveal that New World medicaments, including guaiacum, sassafras, sarsaparilla and mechoacan, were regularly imported to, consumed in, and re-exported from England in the seventeenth century. In Chapter 2, I will consider first-hand accounts by writers with opposing political viewpoints – merchants, statesmen, planters and projectors – who were all dependent on the Virginian colonial enterprise. Medicinal plants, including sassafras and sarsaparilla, were presented as lucrative products that could restore and maintain the commercial

[94] David L. Cowen, "The Boston Editions of Nicholas Culpeper," *Journal of the History of Medicine and Allied Sciences* (1956), p. 158.
[95] Ibid, p. 162.
[96] Jennifer Mylander, "Early Modern 'How-to' Books: Impractical Manuals and the Construction of Englishness in the Atlantic World," *Journal for Early Modern Cultural Studies* 9, no. 1 (2009): 123-146.
[97] Wallis, "Exotic Drugs and English Medicine."

health of Virginia. In Chapter 3, I will study 182 texts published over a one-hundred-year period that discuss sassafras, a large tree with medicinal properties abundant in England's American colonies. I uncover that discussions of sassafras increased significantly in the wake of a concentrated effort to commercialise the tree in the 1650s. In Chapter 4, I will examine ten volumes of Abraham Hill's commonplace books. Hill occupied a unique position to negotiate knowledge claims about American plants. In Chapter 5, I will investigate the apothecary practice of James Petiver (1665-1718), whose extensive prescriptions and medical journals indicate New World drug consumption by both his private patients and the pensioners and schoolboys he treated at the Charterhouse charity.

Chapter 1

Early Modern English Trade in New World Drugs

The marketplace for New World drugs reflects the economic and qualitative value that the early modern English assigned to these commodities. Imports of medicinal botanicals to England reached unprecedented levels in the seventeenth century due to a high demand for and consumption of these plants. Which American drugs were being imported into England in the early modern period? In what quantities, and how frequently, were different types of drugs imported? How did the importation of these drugs change over time? Which drugs did different American colonies produce for the export market?

The English model for drug commodification in the Americas in the early-seventeenth century was led by merchants, who focused on natural products that were immediately accessible. The potential availability of profitable cures in the New World was one of the rhetorical justifications for exploration voyages and the creation of English settlements.[1] There is no evidence of systematic planning for the cultivation of medical plant crops apart from tobacco. There was also no consideration regarding the sustainability of the trees, shrubs and other flora that were harvested for export. In contrast to other European cases, the English government chartered powers to its colonies and did not take a direct role in the prospecting for natural products. The primary political influences on drug commodification were instead through taxation and the general regulation of trade.

In this chapter, I explore the trade in drugs from the New World in England in the early modern period. I analyse a dataset of drug imports and exports received in England between 1567 and 1774. I examine changes in the number of shipments and the volume of drugs imported from the Americas, the relative importance of different types of drugs over time and the major drugs exports of different American ports. I determine that guaiacum, sassafras, sarsaparilla and mechoacan were regularly imported into, consumed in and re-exported from England in the seventeenth century. In the eighteenth century, sassafras, guaiacum, turpentine, cocoa and coffee were the most important American drug commodities. The diversity and volume of New World drugs increased significantly at

[1] David L. Cowen, "The British North American Colonies as a Source of Drugs," in Georg Edmund Dann, ed., *Veröffentlichungen der Internationalen Gesellschaft für Geschichte Der Pharmazie* (Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1966).

the end of the seventeenth century and continued to increase more gradually during the eighteenth century.

Scholars have consulted a range of sources to study the appropriation of drugs from the Americas into European markets. Contemporary medical literature, archaeological finds and trade records all provide an indication of the variety and relative acceptance of diverse drugs but vary in their specific strengths and what questions they allow us to answer. Contemporary medical literature reflects the importance writers assigned to these drugs and often discusses both the state of knowledge surrounding these drugs and what their intended uses were. Archaeological finds suggest the locations in which these drugs were consumed. Trade records provide a representative measure of the volume of drugs that were consumed and when these drugs were acquired. Together, these different types of sources can inform us about several aspects of the wider reception of New World drugs in the early modern period.

The presence and prevalence of New World drugs in printed literature reflects their value in medical practice and contemporary knowledge at the time of publication, which directly influences the market for these drugs. Teresa Huguet-Termes has assessed the impact of New World drugs on sixteenth-century medical theory and practice through a close reading of medical texts and early reports from Spanish conquistadors and additional information from apothecaries' inventories.[2] Her findings refuted earlier studies which claimed that the arrival of drugs from the New World had little impact on European medicine.[3] Daniela Bleichmar has analysed the relationship between printed books, learning and commerce in the case of Monardes' work on medicinal flora from the New World.[4] As I highlighted in the Introduction, Monardes' book provided a much-needed reference manual for new medicaments from the Americas, and he gave recommendations for the most lucrative medicinal plants for retail sale by apothecaries. Bleichmar suggests that the promotion of New World *naturalia* as medical commodities depended on both the volume and distribution of trade and the accreditation granted to them by written and oral testimonies of physicians like Monardes.[5]

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[2] Teresa Huguet-Termes, "New World Materia Medica in Spanish Renaissance Medicine: From Scholarly Reception to Practical Impact," *Medical History* 45, no. 3 (2001): 359-376.

[3] For examples, see Charles H. Talbot, "America and the European Drug Trade," in Fredi Chiappelli, ed., *First Images of America: the Impact of the New World on the Old* (Berkeley: University of California Press, 1976): 833-44 and J. Worth Estes. "The European Reception of the First Drugs from the New World," *Pharmacy in History* 37, no. 1 (1995): 3-23.

[4] Daniela Bleichmar. "Books, Bodies and Fields: Sixteenth-Century Transatlantic Encounters with the New World," in Londa Schiebinger and Claudia Swan, ed., *Colonial Botany*: *Science, Commerce and Politics in Early Modern World* (Philadelphia: University of Pennsylvania Press, 2007): 83-99.

[5] Ibid.

Another avenue of trade identification and access to rare products has been through archaeobotanical finds of plant matter, such as pollen, seeds, twigs and leaves, which hav been recovered from different archaeological contexts, including cesspits, wells, water trenches and vault infills. Michal Preusza et al conducted plant macro-remains analyses in the Czech Republic and demonstrated through sediment dating that spices from the New World, such as allspice and peppers used in treatments for dropsy, were available to elite consumers as early as the sixteenth century.[6] They emphasised that the excavation finds of these luxury goods were exclusive to the milieu of the royal courts and other higher social groups, such as the nobility. Daphne Gallagher has considered the effects of the Atlantic slave trade on the adoption of America plants in Sub-Saharan Africa and found evidence for at least thirteen American plants being used for medicinal purposes by Africans before 1700.[7]

Trade records have been used by scholars to explore the acquisition, variety, volume and value of New World drugs imported into Europe in the early modern period. Stefanie Gänger presented the global reach of medicinal plants from the Spanish American colonies through import figures into Germany, France, Spain and the Philippines in the eighteenth and early nineteenth centuries.[8] Clare Griffin consulted the Moscow court's Apothecary Chancery archive and records of drug shipments as an entry point into the drug trade in seventeenth-century Russia.[9] In the English case, R. S. Roberts compiled drug import figures into England from 1567 to 1638 and showed that New World drug imports increased 25 times in the seventeenth century.[10] Patrick Wallis provided a wealth of evidence for the expansion in English medical consumption through his analysis of customs records from c. 1550 to c. 1800.[11] He demonstrated that the supply of and demand for all imported drugs increased over the early modern period and that the increase in American drugs was faster than that for drugs from other regions of the world.[12]

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[6] Michal Preusza, Kateřina Kodýdkováa, Petr Kočárb, and Zdeněk Vaněčekc, "Exotic Spices in Flux: Archaeobotanical Material from Medieval and Early Modern Sites of the Czech Lands (Czech Republic)," *Interdisciplinaria Archaeologica* 6, no. 2 (2015): 223-236.

[7] Daphne Gallagher, "American Plants in Sub-Saharan Africa: a Review of the Archaeological Evidence," *Azania: Archaeological Research in Africa* 51, no. 1 (2016): 24-61.

[8] Stefanie Gänger, "World Trade in Medicinal Plants from Spanish America, 1717–1815," *Medical History* 59, no. 1 (2015): 44-62.

[9] Clare Griffin, "Russia and the Medical Drug Trade in the Seventeenth Century," *Social History of Medicine* 31, no. 1 (2018): 2-23.

[10] R. S. Roberts, "The Early History of the Import of Drugs into Britain," in F. N. L. Poynter, ed*., The Evolution of Pharmacy in Britain* (London: Pitman, 1965): 165–85.

[11] Patrick Wallis, "Exotic Drugs and English Medicine: England's Drug Trade, c. 1550–c. 1800," *Social History of Medicine* 25, no. 1 (2011): 20-46.

[12] Ibid.

In this chapter, I expand upon Roberts' and Wallis' work by focusing on the relative importance of different American colonial economies as drug exporters for England, analysing the re-exportation of New World drugs to other destinations and highlighting the diversity of American plants that were developed into drug commodities. My contribution in this chapter is to offer an account of trends in the supply and demand of New World drugs in England across the seventeenth and eighteenth centuries. Through an examination of trade data, I document the variety of American drugs imported, which indicates the choice of New World remedies available to the early modern English consumer. The frequency of shipments and volume of imported drug cargo provide evidence on the supply and demand for American drugs. Through my analysis on the level of drug exports from different colonial ports, I determine the relative importance of different English colonies in the Americas to the English drugs trade.

Sources on the New World Drug Trade

Source Selection

The only extant systematic records kept about the volume and value of drug imports in early modern England were those used to manage the process of customs duty collection: Port Books and Customs Ledgers. These records offer long-standing and consistent annual data regarding trade in taxable goods and have been used extensively by economic historians of the early modern period to explore trends in trade. Ralph Davis provided estimates of English overseas trade broken down by types of commodity and import/export region.[13] His figures explored the expansion and diversification in trade in the early modern period and showed that, by the end of the seventeenth century, American and Asian re-exports accounted for 30% of total exports from London. Frederick Fisher examined trends in the cloth export trade in seventeenth-century London using the Port Books, indicating that there was unprecedented diversification in the types of fabrics exported during this period.[14] Nuala Zahedieh has used the surviving Port Books for the 1680s along with Customs Ledgers for 1697-1700 to explore the English Atlantic economy in the latter seventeenth century.[15] She found that imports

[13] Ralph Davis, "English Foreign Trade, 1660–1700," *The Economic History Review* 7, no. 2 (1954): 150-166 and Ralph Davis, "English Foreign Trade, 1700–1774," *The Economic History Review* 15, no. 2 (1962): 285-303.
[14] Frederick J. Fisher, "London's Export Trade in the Early Seventeenth Century," *The Economic History Review* 3, no. 2 (1950): 151-161.
[15] Nuala Zahedieh, *The Capital and the Colonies: London and the Atlantic Economy 1660-1700* (Cambridge: Cambridge University Press, 2010).

from the American plantations doubled in value between 1660 and 1700.[16] By 1700, the plantations accounted for around 20% of London's total imports and a third of its re-export trade to Europe.[17]

Description of the Sources

The Port Books contain lists of the taxable cargoes of ships entering or leaving English ports. The books were kept by local customs officials with chronological entries ordered by the date when customs duties were paid. Two separate books were kept at each port: one by the Controller, who received the customs duties; and one by the Searcher, who inspected ships' cargoes when they arrived in port.[18] Two concurrent Port Books were kept in this manner to be checked against each other by central government officials as a measure against fraud.

Each record contains: the name, tonnage and origin port of the ship, the name of the ship's master, the port of departure and the weight and value of the shipment, organised by the name of the merchant to whom it belonged. Here is a transcribed extract from the 1567 Port Book:

> Prym Rose of Milton (80) Harry Church; Antwerp … Roger Warfyld: 400 lbs ginger, 600 lbs pepper, 4 cwt litmus, 200 lbs crossbow thread, 1 cwt orpiment, 150 lbs marmalade, 2 cwt lignum vitae £67 13s 4d.[19]

We see here a record of an American medicinal drug import: two hundredweights of lignum vitae (or guaiacum) were carried on the *Prym Rose* of Milton that had sailed from Antwerp. The ship carried the cargo of 69 merchants, including Roger Warfyld, who imported lignum vitae in addition to ginger, litmus, pepper, crossbow thread, orpiment and marmalade.

The Customs Ledgers are annual summaries of taxable imports and exports that were produced for the Inspector-General of the Customs following the 1696 Navigation Act. They record the nature and quantity of goods imported and exported, documented separately for the port of London and the outports. The entries are organised geographically, with the English plantations having their own section. Distinction is made between goods carried on English and foreign ships. A sample entry from the Customs Ledger for 1700 is displayed in Figure 1. This entry includes a summary of all the goods imported from New England, including a large section devoted to those designated as drugs.

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[16] Ibid, p. 184.
[17] Ibid.
[18] For a detailed account of the Port Books recording process and reforms related to the keeping of customs records in the seventeenth century, see the Introduction in Brian Dietz, *The Port and Trade of Early Elizabethan London: Documents* (London: London Record Society, 1972).
[19] National Archives E190/4/2, f. 11. Transcribed by Dietz, *The Port and Trade of Early Elizabethan London*.

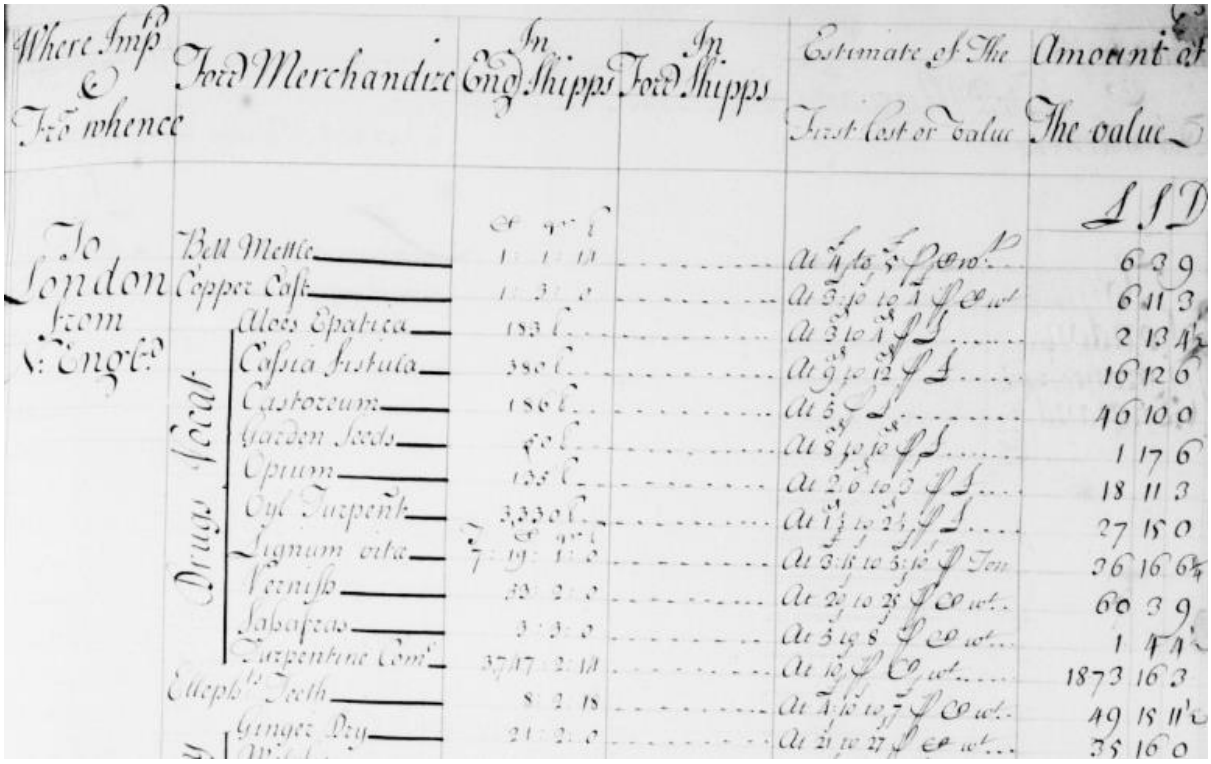

Figure 1. *Example of a Customs Ledger Entry, Imports from New England in 1700*
Source: The National Archives, Ledgers of Imports and Exports, CUST 3/4

The Port Books and Customs Ledger data used in this chapter were provided by Patrick Wallis, who has used these records to explore the exotic drugs trade in England from 1550 to 1800.[20] From 1567 to 1685, Wallis consulted the Port Books for London, which is the port with the most extant Port Book manuscripts. London was the primary port for drug imports and exports; Wallis estimated that 95% of the English overseas drug trade was carried out through the port of London, based on the Customs Ledgers for 1699-1774, which includes data on both London and the outports. Wallis' database contains data on all products listed as 'drugs' in the Rate Books from the surviving Port Books for: 1567-8, 1588-9, 1599-1600, 1609, 1617, 1621, 1624, 1630, 1633, 1638, 1662-3, 1668-9 and 1686.[21] The database for these years consists of entries for each shipment of a drug listed in the Port Books, detailing the year it was entered into the Port Book, the weight, customs valuation and the port from which the ship carrying it sailed (for imports) or the ship's destination (for exports). The Wallis database also includes data from sample periods in Customs Ledgers, comprising: 1699–1701, 1722–1724, 1752–1754 and 1772–1774. These data consist of individual entries for each drug

[20] Wallis, "Exotic Drugs and English Medicine."
[21] The Port Books and Customs Ledgers are available at the National Archives, E190, CUST 2-17 and CUST 22-37. The rate books used were Commissioners of Customs, *The Rates of Marchandizes* (London, 1604) and *An Act for Rating Such Unrated Goods and Merchandizes* (London, 1725). For a history of customs records and information about the using them as a source for research, see Edward Carson, "Customs Records as a Source for Historical Research," *Archives* 13, no. 58 (1977): 74-80.

from each location to London and to the outports, which are annual aggregates of imports or exports.

The Port Books and Customs Ledgers provide us with different kinds of information. The Port Books include individual entries for each shipment, while the Customs Ledgers report annual aggregate totals. Both sources can be used to estimate the volume and value of drugs imported from different locations in the Americas. The Port Books give us more information about individual shipments, although long-term stock retention of apothecaries, inconsistent shipping and opportunistic wholescale drug auctions could make their interpretation at the individual level problematic. The Customs Ledgers provide us with a fuller accounting of imported drugs; there are very few missing records and data from both London and the outports are included.

Limitations of the Sources

While the Port Books and Customs Ledgers offer a great deal of information about trade, care is required when handling the data gathered from them. As T. C. Smout has emphasised, these books "were designed merely as a record of dues paid to the Crown, and were not meant … as a mirror of commercial trends or as a register of the volume and value of goods passing in and out of the country."[22] Goods which were duty-free, smuggled or mislabelled in order to evade taxes were not recorded.[23] The data should therefore be treated as the absolute minimum of the quantities imported and not as an accurate annual total.

The surviving Port Books are not temporally complete (particularly for the sixteenth and early seventeenth century) and some have portions that are damaged or illegible. English citizen and foreign merchants were recorded in different books and often only one of the books survives, particularly for the 1567 to 1629 period.[24] The earliest extant Port Book is from 1567, and there are twenty-one extant Port Books for the period between 1567 and 1662. There are between one and three surviving Port Books for each decade between the 1560s and 1620s, so although there are only a limited number of Port Books remaining, they are not concentrated in a particular decade during the first seventy-year period of analysis. Seven of the surviving Port Books are from the 1630s, and there are no surviving Port Books from the 1640s or 1650s, the period of the Civil Wars

[22] T. Christopher Smout, *Scottish Trade on the Eve of Union*, 1660-1707 (Edinburgh: Boyd, 1963), p. 32.
[23] On smuggling and fraud in the tobacco trade, see Robert C. Nash, "The English and Scottish Tobacco Trades in the Seventeenth and Eighteenth Centuries: Legal and Illegal Trade," *The Economic History Review* 35, no. 3 (1982): 354-372.
[24] Specifically, English merchant Port Books survive for the years: 1567, 1588, 1621, and 1629, while alien merchant Port Books survive for the years: 1589, 1600, 1609, 1617 and 1624.

and Interregnum. From 1670, many more Port Books survive, and Wallis has sampled four years: 1662-3, 1664, 1668-9 and 1685. While we cannot construct an uninterrupted annual series of drug trade statistics for the seventeenth century, the surviving Port Books are distributed such that they are not concentrated in any particular period that could unduly influence any larger trends when analysing the results of the data.

Only one Rate Book drug is not included in the Wallis database: tobacco. The tobacco trade has been well-studied by economic historians.[25] Tobacco was the largest export from Virginia by weight and value in the seventeenth century. Davis calculated that £70,000 worth of tobacco was imported annually into London in 1663-1669, rising to £161,000 annually in 1699-1701.[26] Niels Steensgaard has discussed how the tobacco industry in colonial America grew from 1,250lb in 1616 to 50,000,000lb per year by the middle of the eighteenth century.[27] Unfortunately, we cannot compare these figures with those in the Wallis dataset due to differences in the records available. Certain Port Books included in Davis' figures were no longer in a suitable condition for research when Wallis developed his dataset. While we cannot directly compare, it is evident that the scale of tobacco importation was vastly larger than all other American drugs combined in the early modern period.

The Port Books have limitations in terms of the information that can be meaningfully derived from them. Attempting to locate the origin of shipping goods or determining their earliest arrival into England, for example, are both problematic, as can be seen in the Port Book entry discussed earlier in this chapter. Here we have the earliest extant import record of a New World drug import into England: two hundredweight of lignum vitae. It is recorded that the ship on which it was carried set sail from Antwerp, but we cannot determine the provenance of the drug. It could have arrived in Antwerp from many different European possessions in the Americas. The movement of New World natural products did not necessarily follow the trade trajectory from colony to metropolis. For example, the potato was first transplanted in the Canary Islands, then shipped to Antwerp and Rouen in the mid-sixteenth century.[28]

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[25] Charles Malcolm MacInnes, *The Early English Tobacco Trade* (London: K. Paul, Trench, Trubner & Co., 1926); Stanley Gray and Vertrees Judson Wyckoff, "The International Tobacco Trade in the Seventeenth Century," *Southern Economic Journal* 7, no. 1 (1940): 1-26; Nash "The English and Scottish Tobacco Trades."

[26] Ralph Davis, "English Foreign Trade, 1660–1700."

[27] Niels Steensgaard, "The Growth and Composition of the Long-distance Trade of England and the Dutch Republic before 1750," in James D. Tracy, ed. *The Rise of Merchant Empires: Long Distance Trade in the Early Modern World 1350-1750* (Cambridge: Cambridge University Press, 1993).

[28] J. G. Hawkes and J. Francisco-Ortega, "The Early History of the Potato in Europe," *Euphytica* 70, no. 1-2 (1993): 1-7.

While the Port Books and Customs Ledgers can be used to estimate drug imports into England from the New World, we cannot know the full scale of export from the Americas. Before the first Navigation Act of 1651, drugs could have been legally exported from England's colonies in the Americas to other European ports, and even after the Navigation Acts some ships did not comply with the law's restrictions. Also, some cargoes were lost to pirates, bad weather, ship disrepair, poor seamanship, other accidents and spoilage on the journey.[29]

Despite these limitations, the Port Books and Customs Ledgers can inform us about several aspects of England's trade in New World drugs. We can learn how the importation of New World drugs in England changed across the early modern period and show trends in the diversity and relative quantity of these import commodities.

Methods

I employed two identification strategies to isolate data on drugs from the Americas in the Wallis database, which contains data on drugs from across the world. First, I included data about drugs which were imported in ships that set sail from American ports. Second, I chose data about medicinal plants native to the Americas. Teresa Huguet-Termes has considered the difficulties of identifying American drugs in early modern Spanish sources due to similarities in nomenclature between certain New World drugs and those grown in Europe, Africa and Asia.[30] I therefore follow her conservative strategy by only evaluating those drugs documented in the Port Books and Customs Ledgers that are identifiable as native to the Americas. The drugs meeting these selection criteria were: gum carannae, guaiacum, mechoacan, sarsaparilla, sassafras, cascarilla, cocoa, snake root, lignum nephriticum, guaiacum, jalap, cinchona, cortex winteranus, contrayerva, balsam capivia, barbados tar, peruvian balsam, balsam tolu and pink roots.

These two identification strategies are not without caveats. Drugs carried on ships sailing from American ports may be re-imports that were initially imported into American ports from elsewhere.[31] Shipments of New World drugs into London may have been re-exported to other

[29] On the dangers to Atlantic trade and the development of insurance to manage the associated risks, see Christopher Ebert, "Early Modern Atlantic Trade and the Development of Maritime Insurance to 1630," *Past & Present* 213, no. 1 (2011): 87-114. One the specific problem of piracy, see Bryan Mabee, "Pirates, Privateers and the Political Economy of Private Violence," *Global Change, Peace & Security* 21, no. 2 (2009): 139-152.
[30] Huguet-Termes, "New World Materia Medica in Spanish Renaissance Medicine."
[31] For example, some of James Petiver's collections of plants were sourced from Africa via the American colonies through the triangular slave trade. Kathleen S. Murphy, "Collecting Slave Traders: James Petiver, Natural History, and the British Slave Trade," *William & Mary Quarterly* 70, no. 4 (2013): 637-670.

European countries. The Customs Ledgers record these re-exports and show that around 50% of drugs were re-exported in the eighteenth century. Despite these caveats, these identification strategies nevertheless provide us with data on all imports of New World drugs, which could not have been imported into England before the European voyages to the Americas, and exports of drugs from England's territorial possessions in the Americas. I can, therefore, use this data to explore the questions raised at the beginning of this chapter about the trends in the trade in drugs from the New World in the early modern period.

Which Drugs Were Imported into England from the Americas?

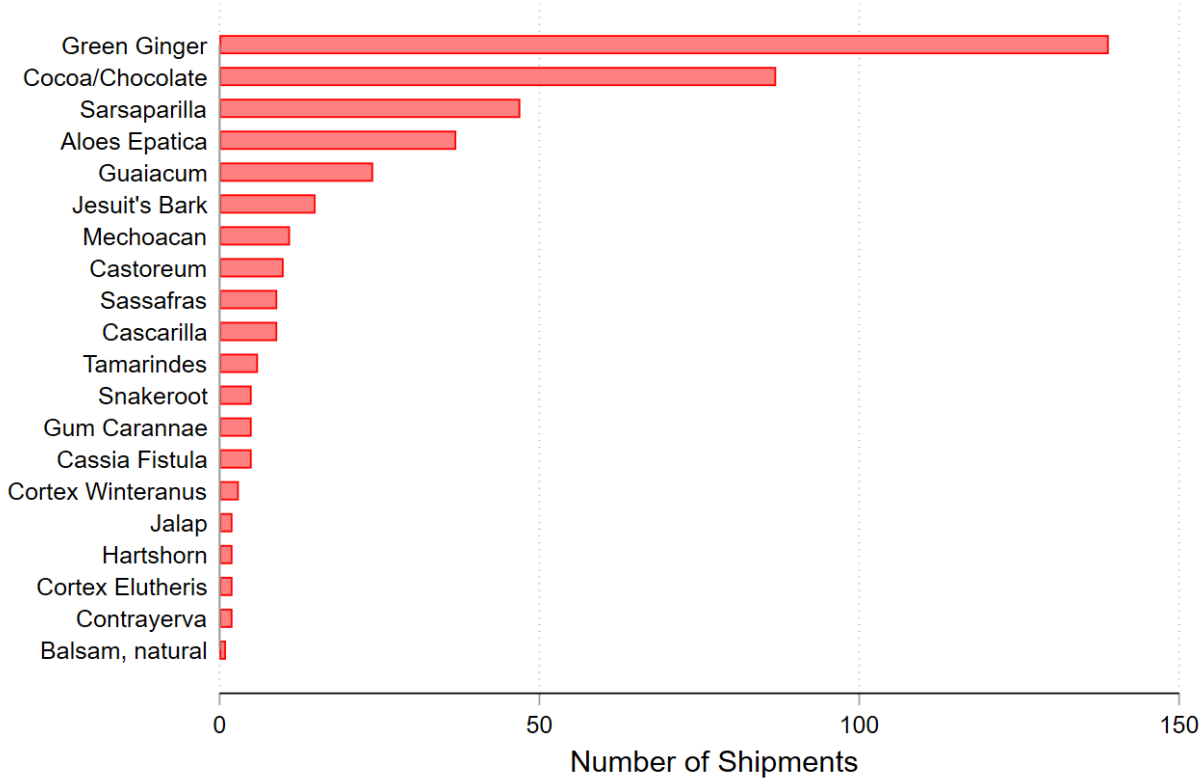

Figure 2. *Number of Drug Shipments from the Americas, 1567-1685*
Source: Port Books

In Figure 2, I display the numbers of shipments of all drugs with at least ten entries in the dataset, which are either recorded as shipped from destinations in the Americas or are native to the Americas in the surviving Port Books in the period 1567-1685. The top five drug commodities with the greatest number of shipments into London in 1567-1685 were: green ginger (138), cocoa (86), sarsaparilla (46), aloes epatica (36) and guaiacum (23). The number of shipments corresponds to the relative supply of drugs from the Americas. Following the Navigation Act of 1660, ginger was one of the enumerated commodities, alongside tobacco and sugar. These lucrative commodities had a restricted trading status and could only be transported to English ports. The Customs House sent

reminders to the colonial governors of the importance in protecting the safeguard of these commodities and the necessity of shipping them directly to England with the threat of significant financial penalties.[32]

In Tables 1 and 2 below, I show the total weight of the shipments of New World drugs imported into London by year, which generates information about the quantity of various drug products entering the London market. Table 1 presents weights by the pound, and Table 2 displays weight by the 1,000lb. I make this change of scales due to the vast increase in the trade of these drugs in the eighteenth century. At a conservative estimate, the total volume of imported drugs from the Americas increased from 576,850lb in the seventeenth century to 70,287,300lb in the eighteenth century (Tables 1 and 2).

Guaiacum, sarsaparilla, mechoacan and sassafras were regularly traded in the seventeenth century and other drugs were likely to be imported less often, as suggested by the data in Table 1. Of the frequently traded drugs, the imported weight of guaiacum was greater than that of all the other New World drugs combined in the 1567-1685 period. Guaiacum was also brought to Europe as carpentry wood, which explains the high volume of imports. Unfortunately, we cannot distinguish how much of it was used for each purpose after it arrived in England. Nevertheless, I will document in Chapter 5 that guaiacum was the most commonly-dispensed New World drug in James Petiver's apothecary practice at the turn of the eighteenth century. Furthermore, I will examine the references to guaiacum in English medical literature in Chapter 3 and establish that guaiacum was the most commonly-discussed New World drug in the first half of the seventeenth century, until it was overtaken by sassafras.

The top five drugs by total shipment weight from 1567-1685 were guaiacum, green ginger, sarsaparilla, cocoa and aloes epatica. We can see in Table 1 that the Port Books of the sixteenth century only record four different drugs imported from the New World: guaiacum, sarsaparilla, mechoacan and alum. The first record of sassafras imports is in 1605 when two shipments totalling 518lb were imported. In Chapter 3, I will explain the chronology of the medical reception of sassafras in English print, which began in 1577, suggesting that sassafras was imported into England prior to 1605. Seven of the drugs were only recorded in the 1685 Port Book, including some which were discussed in print before that date, such as Peruvian bark, snakeroot and cocoa. It is therefore unlikely that 1685 was the first year that each of these drugs were imported. In Chapter 5, I will

[32] "America and West Indies: May 1697, 1-15," in *Calendar of State Papers Colonial, America and West Indies: Volume 15, 1696-1697* (London: His Majesty's Stationery Office, 1904): 473-489.

demonstrate that snakeroot was regularly dispensed in James Petiver's apothecary practice at the turn of the eighteenth century, indicating a longer tradition of its use in medical practice before this time.

In Table 2, I present the volume of New World drugs imported into England from 1699-1774. Most of the drugs appear to have been traded regularly across the eighteenth century. The top five drugs by volume imported in this period were turpentine, coffee, guaiacum, cocoa and sassafras. It is important to note that the top two drugs were from the Old World, and this is likely due to the establishment of coffee plantations in the Americas and the use of abundant pine trees to manufacture turpentine. In Table 2, I illustrate when different drugs either became import commodities or ceased trading. Coffee and cortex elutheris are documented as first arriving into London ports in the 1720s. Ginseng root is first recorded as a drug import in the 1750s. Cascarilla was no longer imported in the 1750s, and guinea grain stops being imported in the 1770s.

The variety of drugs imported during the eighteenth century was nearly double that of the seventeenth century with 47 drugs imported in the 1567-1685 period and 86 drugs imported in 1699-1774 period (Tables 1 and 2). Green ginger was heavily imported in the seventeenth century, but its relative demand compared with other drugs fell dramatically in the eighteenth century. This drug was the root of ginger that was harvested before the plant was fully ripe. It was used in a variety of common medical applications, such as colic and indigestion. Green ginger was the second most imported drug by volume in Table 1, but it was imported in such a low volume in 1699-1774 that it does not have an entry in Table 2. Other drugs followed the same trend of declining demand in the eighteenth century, such as cassia fistula, mechoacan and snakeroot, which all appear amongst the top imported drugs in Table 1 but not in Table 2. Of these drugs, mechoacan, a white tuberous root, was the most consistently traded in the seventeenth century. Although mechoacan was traded in small volumes, this does not signal it was less important in medical practice than other drugs because a small amount of mechoacan was very efficacious as a violent purgative.

Table 1. *Drug Imports into England from the Americas, by Pound, 1567-1685*

	Total	1567	1588/9	1605	1617	1621	1624	1629	1633	1638	1662	1668	1685
Guaiacum	357,616	224	4,928	0	0	0	0	45,360	23,072	448	121,856	116,704	40,096
Green Ginger	95,320	0	0	0	0	0	0	0	0	0	0	0	95,320
Sarsaparilla	35,436	0	130	0	0	1,390	550	400	5,188	4,650	2,629	0	16,749
Cocoa/Chocolate	18,489	0	0	0	0	0	0	0	0	0	0	0	18,489
Aloes Epatica	15,491	0	0	0	0	0	0	0	0	0	0	0	15,491
Sassafras	9,222	0	0	0	30	7,030	0	0	426	0	0	0	1,736
Cascarilla	8,156	0	0	0	0	0	0	0	0	0	0	0	8,156
Cinchona	2,768	0	0	0	0	0	0	0	0	0	0	0	2,768
Cassia Fistula	2,270	0	0	0	0	0	0	0	0	0	0	0	2,270
Mechoacan	1,696	0	12	12	0	94	0	80	30	1,060	0	0	408
Snakeroot	360	0	0	0	0	0	0	0	0	0	0	0	360
Jalap	265	0	0	0	0	0	0	25	240	0	0	0	0
Other[1]	29,761	0	224	0	16	0	0	0	70	95	16,128	0	13,228
Total	**576,850**	**224**	**5,294**	**12**	**46**	**8,514**	**550**	**45,865**	**29,026**	**6,253**	**140,613**	**116,704**	**215,071**

Source: Port Books

[1] The drugs in the other category were: Adiantum, Almonds Bitter, Aloes Cicotrina, Alum, Balsam, Balslam natural, Black Lead, Callamus, Cassia stones, Castoreum, Chemical Oil, Contrayerva, Coral, Cordial Water, Cortex Elutheris, Cortex Winteranus, Fenugreek, Gum Animi, Gum Carannae, Gum Elemni, Granadilla Wood, Hartshorn, Hypocacuana, Lemon Water, Lignum Nephriticum, Opium, Orange Flower Water, Pepper, Polium Montanum, Sanguis Draconis, Spermaceti, Strong Water, Talk, Tamarindes and Varnish.

Table 2. *Drug Imports into England from the Americas, by 1000 lb, 1699-1774*

	Total	1699	1700	1701	1722	1723	1724	1752	1753	1754	1772	1773	1774
Turpentine	33,000	68.8	551.8	377.4	957.2	2,000	2,700	4,200	6,100	5,600	2,200	3,000	5,700
Coffee	20,000	0	0	0	0	0	0.2	28.9	49.1	82.9	7,300	6,000	6,600
Guaiacum	11,000	240.0	1,200	156.2	35.9	89.9	74.7	1600	1,300	1,200	2,400	985.4	1,400
Cocoa/Chocolate	3,000	29.3	0	222.0	31.1	42.5	278.3	206.0	68.2	12.2	605.9	875.1	656.1
Sassafras	1,100	2.8	13.9	15.1	189.5	234.9	140.5	204.4	106.6	37.0	54.6	32.8	27.1
Cinchona	643.1	5.6	0.6	0	13.4	147.8	67.0	59.6	148.0	88.9	34.6	18.8	58.9
Sarsaparilla	405.6	2.7	12.0	18.3	1.6	0.1	2.1	25.0	88.8	35.7	38.6	100.9	79.8
Aloes Epatica	300.8	0	3.0	3.0	56.0	42.9	39.2	15.9	14.2	19.2	35.4	33.1	38.8
Jalap	97.6	2.2	10.0	8.8	5.0	6.0	7.7	25.1	19.1	4.3	1.4	1.3	6.4
Cortex Winteranus	86.0	6.3	7.2	3.0	0.3	0.1	8.8	20.5	11.9	10.7	7.2	5.3	4.7
Ginseng root	79.7	0	0	0	0	0	0	0.3	47.6	3.1	20.9	3.4	4.3
Cascarilla	66.3	1.1	0.1	0.1	1.8	4.8	58.4	0	0	0	0	0	0
Guinea Grain	41.1	1.1	1.8	9.8	0.5	0.5	0.3	3.5	11.6	12.0	0	0	0
Cortex Elutheris	35.8	0	0	0	0	1.0	0.8	1.5	0.1	1.8	26.3	2.2	2.3
Tamarindes	30.4	2.2	1.8	0.4	0.8	0.4	2.1	2.7	3.4	2.4	3.8	4.3	6.2
Other[2]	372.6	36.8	10.2	7.4	7.8	53.4	32.7	47.9	28.6	34.4	17.9	48.5	64.0
Total	**70,287.3**	**398.9**	**1,812.4**	**821.5**	**1,300.9**	**2,624.3**	**3,412.8**	**6,441.3**	**8,007.5**	**7,144.6**	**12,747.6**	**11,111.1**	**14,648.6**

Source: Customs Ledgers

[2] The drugs in the other category were: Adeps Ursi, Adiantum, Almonds Bitter, Aloes Cicotrina, Alum, Ambergrease, Aqua Vite, Balsam Tolu, Balsam, Barbados Tar, Bayberries, Black Lead, Callamus, Cassia Fistula, Cassia Lignea, Cassia Stones, Castor Oil, Castoreum, Cetrach, Chemical Oil, China Roots, Coloquintida, Contrayerva, Coral, Cordial Water, Fenugreek, Gardenseed, Gentiana, Granadilla, Guinea Pepper, Gum Animi, Gum Arabeck, Gum Carannae, Gum Copal, Gum Elemni, Gum Sandrack, Gum Senegal, Green Ginger, Hartshorn, Hungary Water, Hypocacuana, Isinglas, Juniper Berries, Lemon Water, Lignum Rhodium, Lignum Nephriticum, Manna, Marmelade, Mechoacan, Opium, Orange Flower Water, Palm Oil, Pepper, Peruvian Balsam, Pink Roots, Polium Montanum, Pomegranate Pille, Prunellos, Rhubarb, Sanguis Draconis, Saunders Red Alias Stock, Saunders Yellow, Senna, Snakeroot, Spermaceti, Squilla, Squinathum, Strong Water, Succus Liquoritiae, Talk, Treacle of Venice, Varnish and those recorded just as "Drugs."

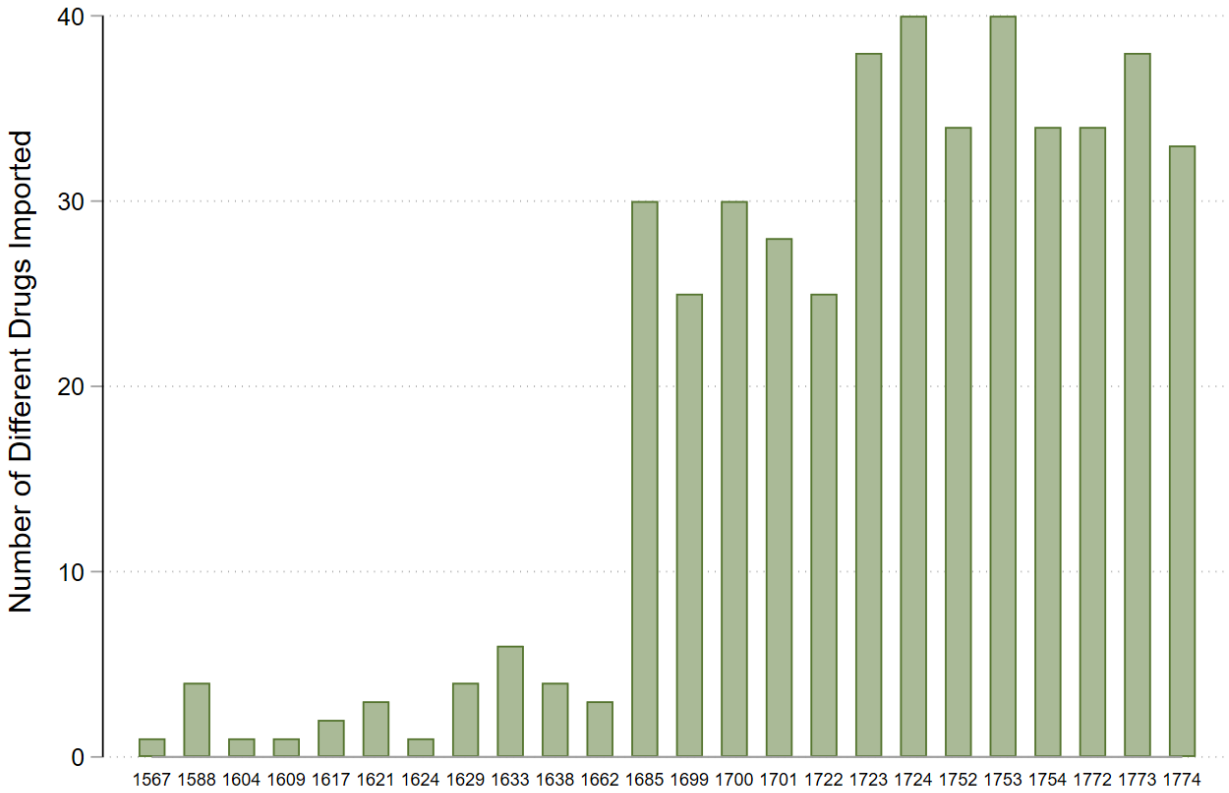

Figure 3. *Number of Drug Varieties Imported from the Americas from 1567 to 1774*
Source: Port Books and Customs Ledgers

In Table 1, I showed that many American drugs were not present in the Port Books until the latter half of the seventeenth century. Only guaiacum, sarsaparilla, sassafras and mechoacan appeared regularly in the Port Books before the middle of the century. In Figure 3, I investigate this trend in diversity further through yearly counts of different drugs imported from the Americas between 1567 and 1774.[1] I provide an overview of how the total number of different drugs from the Americas imported into England changed over time. The most striking change is between 1662 and 1685, when the total number of drugs imported from the Americas increased from 3 to 30. These figures offer evidence that a wider range of different drugs from the New World became available over this period, with a jump in the second half of the century. This result suggests that a greater variety of American drugs became available to consumers from the latter half of the seventeenth century onwards.

[1] Only those drugs for which at least ten shipments are recorded in the dataset are included. Many of the drugs were only recorded as being imported once or a few times over the 1567-1774 period and so were not significant commodities.

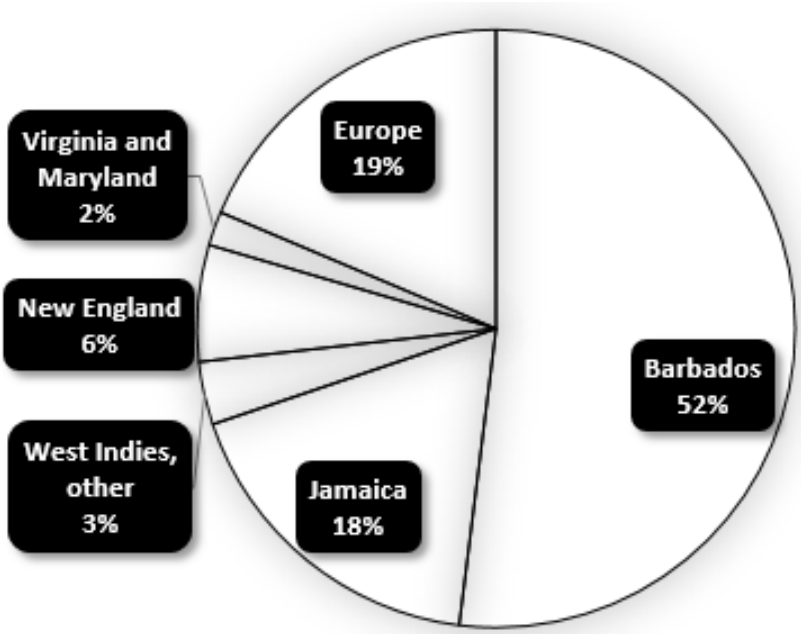

Figure 4. *New World Drug Shipments by Port of Departure, 1567-1685 (All Drugs)*
Source: Port Books

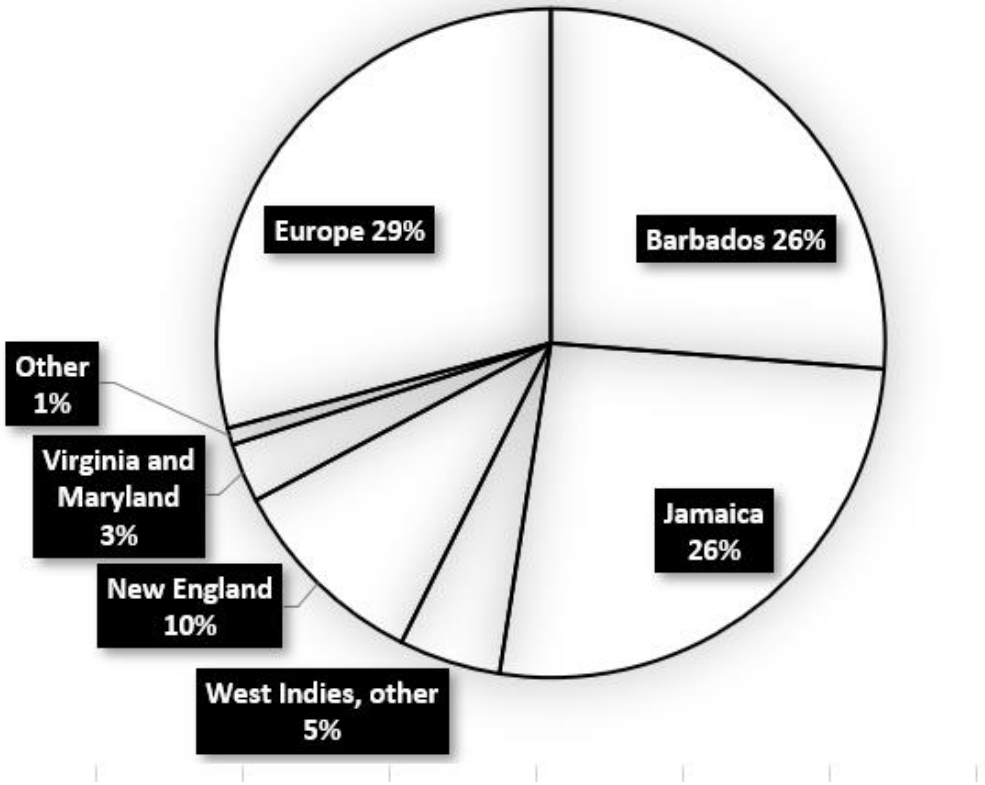

Figure 5. *New World Drug Shipments by Port of Departure, 1567-1685 (Excluding Green Ginger)*
Source: Port Books

In Figures 4 and 5, I illustrate the relative importance of different regions as American drug exporters to England. In 1685, there was a very high number of shipments of green ginger (134) from Barbados. To prevent this huge single-year influx from skewing the interpretation of the data, I assess graphs both with and without green ginger shipments. For each region, I give the percentage of the total number of drug shipments over the 1567 to 1685 period. In the late sixteenth and seventeenth centuries, the West Indies was the most important region for New World drug imports to England. Ships sailing from Barbados, Jamaica and other islands in the West Indies totalled 73% (57% without green ginger) of the recorded drug shipments into London. Europe accounted for 19% (29% without green ginger) of drug imports due to drug production by other European possessions in the Americas. The remaining shipment of drugs directly from England's North American colonies amounted to 8% (13% without green ginger) of the total shipments.

Table 3. *Percentage of New World Drug Shipments Organised by Port of Departure, 1567-1685*[2]

	1567-1638	1662-1685	1662-1685	**Total**	**Total**
Including green ginger?	Yes	Yes	No	**Yes**	**No**
Barbados	0	55	28.96	**51.7**	**26.23**
Jamaica	0	18.89	28.96	**17.8**	**26.23**
West Indies, other[3]	21.74	2.22	3.17	**3.4**	**4.92**
New England	0	6.67	10.86	**6.3**	**9.84**
Virginia and Maryland	8.7	1.39	2.26	**1.8**	**2.26**
North America, other[4]	4.35	0	0	**0.3**	**0.41**
Europe	65.22	15.56	25.34	**18.5**	**29.1**
Other	0	0.28	0.45	**0.3**	**0.41**

Source: Port Books

[2] The ports of departure are unavailable for 2.78% of the sources, and there are more missing departure ports in the earlier Port Books than in the later Port Books and Customs Ledgers (see below). Those shipments with unknown departure ports were either unrecorded or their ports were unclear; for example, some shipments were documented as coming from "Warehouse" or "Spanish Prizes." The shipments with unknown departure ports are excluded from Table 3 and the ensuing discussion.

[3] This row includes all shipments recorded as coming from islands or ports in the Caribbean Sea. It would be preferable to be able to distinguish between those drugs imported from British, Spanish and French colonies in the West Indies. Unfortunately, this is not possible because a large number of the shipments are recorded as coming from "West Indies, in general," and some of the West Indian ports change hands between European countries repeatedly during the early modern period. The islands grouped under the "West Indies, other" category are Antigua, Bahamas, Bermuda, Dominica, Grenada, Montserrat, Nevis, St Christopher's, St Vincent, Tobago and Tortola.

[4] The regions included in the "North America, other" category are Canada, Florida, Georgia, Hudson Bay, Mosquito Shore, Newfoundland, Nova Scotia, Pennsylvania and the Surrey Islands.

In Table 3, I offer detailed information about the providence of the ships carrying New World drugs imports into London. Table 3 includes data solely from the Port Books from 1567-1685 because we do not know the number of shipments of drugs in the data from the Customs Ledgers in 1699-1774 because only annual aggregates are provided. In the earliest time period, 1567-1638, the majority of these drugs (65%) came from Europe. Most of these drugs are likely to have been re-imports; they would have been originally loaded onto ships in the American colonies of European countries, dispatched to a European port such as Antwerp, Hamburg or Amsterdam and then re-exported to London. The second most important source of drug commodities in 1567-1638 was the West Indies, principally the islands of St Lucia and St Christopher's, which accounted for 22% of drug shipments. The combined category of Virginia and Maryland was the third largest source of American drugs in this period, accounting for 9% of total shipments.

During the 1662-1685 period, there were rising exports of drugs from the English colonies in the Americas, especially Barbados and Jamaica, which accounted for more than half of the New World drug imports during this time. When green ginger was excluded from the analysis, Jamaica had equal importance to Barbados as a drug exporter to England. However, when green ginger was included in the data, Barbados was much more dominant than Jamaica, as displayed in Table 4. The proportion of New World drugs imported from European countries also dropped significantly in 1662-1685 compared with the earlier period of 1567-1638. The customs duties on drugs increased from 5% in 1643 to 10% in 1654, making it less profitable for other European countries to export American drugs to England.[5] Additionally, a Navigation Act was passed in 1651, which meant that all commodities exported from the Americans colonies, including drugs, were required to be shipped directly to English ports.[6] Prior to the Act, Dutch merchants had regularly imported drugs from the English plantations in America and re-exported them to England and other European countries. The Navigation Act was designed to capture more of the wealth being generated from England's investment in its American colonies and coincided with the critical juncture of the 1650s, which I recognise as a pivotal point of economic and political change. In Chapter 2, I illustrate this crucial time period in the case of Virginia.

[5] "September 1643: An Ordinance for the Speedy Raising and Leavying of Moneys by Way of Charge and New-Impost," in *Acts and Ordinances of the Interregnum, 1642-1660* (London: Her Majesty's Stationary Office, 1911), pp. 274-283; "March 1654: An Ordinance for Continuing the Excise," in *Acts and Ordinances of the Interregnum*, *1642-1660*, pp. 845-853.

[6] For a discussion of the importance of the Navigation Acts in the growth of English mercantilism and the development of England's early colonies, see Curtis P. Nettels, "British Mercantilism and the Economic Development of the Thirteen Colonies," *The Journal of Economic History* 12, no. 2 (1952): 105-114. On the contemporary debate about the Navigation Acts, see Thomas Leng, "Commercial Conflict and Regulation in the Discourse of Trade in Seventeenth-century England," *The Historical Journal* 48, no. 4 (2005): 933-954.

Table 4 displays the percentage of the total weight of drugs arriving in England from 1567 to 1774 by port of departure. The interpretation of the percentage of the total weight of all New World drug imports may be impaired by the inclusion of guaiacum. As discussed earlier, a much greater volume of guaiacum was imported in comparison to other drugs at various points in my study. Two figures are thus displayed for each place and time period: the first includes guaiacum and the second (in parentheses) excludes guaiacum. The impact of guaiacum can be observed in these figures by raising or lowering the relative importance of export regions by several percentage points. For example, in 1699-1701, New England's relative importance as a drug exporter is halved from 61.4% to 30.1% when guaiacum is excluded (Table 4). The reverse relationship can be found for the early period of 1567-1638, when several regions, such as Virginia and Maryland and the West Indies, delivered a greater percentage of New World drug imports when guaiacum is included.

Table 4. *Percentage of New World Drug Imports by Weight, by Port of Departure, 1567-1774*

	1567-1638	**1662-1685**	**1662-1685 (excl. green ginger)**	**1699-1701**	**1722-24**	**1752-54**	**1772-74**
Barbados	0 (0)	62.3 (70.5)	33.0 (36.2)	4.5 (3.9)	3.4 (3.5)	1.4 (0.7)	0.8 (0.4)
Jamaica	0 (0)	28.8 (20.7)	51.2 (44.5)	8.4 (12.9)	5.9 (5.7)	9.9 (3.2)	8.2 (5.6)
West Indies, other	73.7 (26.2)	1.9 (0.5)	3.4 (1.0)	46.6 (1.4)	3.6 (1.6)	5 (0.8)	55.5 (59.1)
Carolina	0 (0)	0 (0)	0 (0)	0.7 (1.3)	5.1 (5.1)	36.9 (43.7)	20.3 (21.4)
New England	0 (0)	0.6 (0.7)	1.0 (1.5)	30.1 (61.4)	67.5 (69.3)	17.4 (18.5)	1.7 (0.6)
New York	0 (0)	0 (0)	0 (0)	3.2 (6.5)	8.9 (9.2)	10.0 (11.4)	2.2 (1.3)
Virginia and Maryland	18.1 (53.6)	0.8 (0.8)	1.4 (1.8)	3.4 (6.7)	3.6 (3.6)	11.4 (13.1)	7.1 (7.7)
North America, other	0.6 (1.7)	0 (0)	0 (0)	0.3 (0.1)	0.2 (0.1)	6.5 (7.3)	3.9 (3.1)
Europe	7.7 (18.4)	5.6 (6.8)	9.9 (14.8)	2.8 (5.9)	1.9 (1.9)	1.3 (1.4)	0.6 (0.6)
Other	0 (0)	0.1 (0.1)	0.0 (0.1)	0 (0)	0 (0)	0 (0)	0 (0)

Source: Port Books

When considering weight rather than shipments, Europe becomes a less important source of New World drugs in the earliest period, 1567-1638, accounting for only 7.7% or 18.4% of drug imports by weight depending on whether guaiacum is included. When measuring the volume imported, the most important sources of drug imports in 1567-1638 are either the West Indies or, without guaiacum, Virginia and Maryland. Every subsequent time period saw a fall in the share of imported

drugs from Europe, a shift away from re-exports to direct imports -which indicates that England began to rely more and more on its own colonies for its supply of New World drugs.[7]

In the latter half of the 17th century, the largest sources of New World drug imports were the English West Indian possessions of Jamaica and Barbados, which collectively accounted for over 90% of drug imports by weight. Virginia and Maryland became much less important suppliers of drugs in this period, exporting only 0.8% of American drugs imported into England, although this share gradually increased between each subsequent time period. By the turn of the eighteenth century, New England had become the largest colonial supplier of drugs to the English market, accounting for 30.1% of the drug supply from the Americas, or 61.4% if guaiacum is excluded from the figures. New England remained a dominant supplier in 1722-24, but later in the century Carolina became a more important exporter of drugs. In the eighteenth century, the North American colonies became increasingly valuable to England, both as a source of natural resources and as a market for English manufactured goods. The value of colonial imports significantly outweighed English exports to North America and the West Indies, however, and the gap only began to close in the 1770s.[8]

Table 5. *Top Ranked Drug Exports by Port of Origin*

Rank by weight of drug imports	**Barbados**	**Jamaica**	**New England**	**New York**
1	Guaiacum	Coffee	Turpentine	Turpentine
2	Aloes Epatica	Guaiacum	Guaiacum	Guaiacum
3	Cocoa/Chocolate	Cocoa/Chocolate	Sassafras	Cocoa/Chocolate
4	Green ginger	Cinchona	Cortex Elutheris	Sassafras
5	Barbados Tar	Sarsaparilla	Cocoa/Chocolate	Sarsaparilla

Rank by weight of drug imports	**Carolina**	**Virginia and Maryland**	**Europe**
1	Turpentine	Turpentine	Cocoa/Chocolate
2	Guaiacum	Sassafras	Cinchona
3	Sassafras	Guaiacum	Jalap
4	Coffee	Ginseng root	Guaiacum
5	Cortex Winteranus	Snakeroot	Balsam Capivia

Source: Port Books and Customs Ledgers

[7] When the West Indies become the largest supplier of drugs again in 1772-1774, this category was almost entirely made up of the English West Indian possessions such as Antigua, Bermuda and Montserrat.
[8] See Tables 8.1 and 8.2 in Anthony McFarlane, *The British in the Americas 1480-1815* (London: Longman, 1994), p. 227.

Which drugs did different English colonies specialise in? In Table 5, I present the most important drug commodities for each of the six largest drug-exporting English possessions in the Americas and, for comparison, Europe. Guaiacum is in the top four drugs by weight imported from all the different locations. Turpentine is the most important drug import from all four of the major North American plantations. Cocoa and sassafras are in the top five drug exports in at least three plantations. Some of the drugs are only found in the one of the lists, indicating that they are either drugs which only grew in certain environments or that those places specialised in specific types of drugs. Amongst the top five drug exports, aloes epatica and green ginger are only found in Barbados, cinchona in Jamaica, cortex elutheris in New England, cortex winteranus in Carolina and ginseng root and snakeroot in Virginia and Maryland. Jalap and balsam capivia are only found in the top five list of drug imports from Europe, likely because they come from plants native to South America, where the Spanish and Portuguese empires dominated.

Exports of New World Drugs from England to Europe

So far in this chapter, I have focused on the English importation of New World drugs and have not yet discussed their re-exportation to other destinations from England. As described earlier, not all of the drugs imported from the Americas were intended for domestic consumption; there were significant re-exports of New World drugs from England to other European countries.[1] Certain regularly imported New World drugs, such as cascarilla and cassia fistula, were, however, rarely exported from London. We can infer that, for these drugs, most of the imports were for domestic consumption, while other drugs, such as sarsaparilla and guaiacum, were both used domestically and re-exported to other European countries.

In Table 6, I display New World drug exports by weight (lb) from England, 1567 to 1685. The top five American drug commodities exported were sarsaparilla, sassafras, guaiacum, mechoacan and cocoa, together totalling 10,220lb. In Table 7, I present exports of America drugs by weight (1000lb) from England, 1699-1774. The top five exported American drugs from England to Europe during this period were: cocoa, guaiacum, sassafras, sarsaparilla, and cinchona, together totalling 3,797,060lb. Most of the American drugs were regularly exported to Europe throughout the eighteenth century, except for a few drugs, such as contrayerva, cascarilla and balsam capivia, which were exported more sporadically and in lower volumes. The top English exports of American drugs were all well-established by 1700 apart from snakeroot, which was regularly exported to Europe from the 1720s.

[1] For a study on the import of European drugs into the American colonies, see Renate Wilson, "Trading in Drugs through Philadelphia in the Eighteenth Century: a Transatlantic Enterprise," *Social History of Medicine* 26, no. 3 (2013): 352-363.

Table 6. *Volume of New World Drug Exports to Europe, lb, 1567-1685*

	Total (lb)	1576	1599	1605	1639	1663	1685
Sarsaparilla	5450	50	5135	25	240	0	0
Sassafras	2240	0	0	0	0	2240	0
Guaiacum	2016	336	1680	0	0	0	0
Mechoacan	454	0	50	0	404	0	0
Cocoa/Chocolate	60	0	0	0	0	0	60
Total	**10220**	**386**	**6865**	**25**	**644**	**2240**	**60**

Source: Port Books

Table 7. *Volume of New World Drug Exports to Europe, 1000 lb, 1699-1774*

	Total (1000/lb)	1699	1700	1701	1722	1723	1724	1752	1753	1754	1772	1773	1774
Cocoa/Chocolate	1812.66	4.84	0	0.70	5.94	10.19	12.98	32.40	51.61	26.53	520.78	632.27	514.43
Guaiacum	903.20	23.60	151.31	135.04	24.73	48.36	17.84	7.84	9.98	131.37	97.97	95.03	160.12
Sassafras	595.35	15.99	18.39	32.25	158.08	97.40	94.80	90.33	65.40	3.36	0.01	8.90	10.46
Sarsaparilla	267.08	0.35	1.60	2.95	0.51	0.70	0	5.84	69.34	24.27	32.96	78.92	49.65
Cinchona	218.77	0.09	1.74	1.74	0.90	27.47	33.13	12.79	64.75	35.21	14.70	24.37	1.90
Cortex Winteranus	81.37	5.13	4.54	1.51	2.52	0	8.04	20.42	18.47	1.20	12.93	6.47	0.14
Jalap	15.28	0	0.20	0.08	4.21	3.28	3.61	0.49	2.72	0.70	0.01	0	0
Contrayerva	4.23	0	0	0	1.72	1.05	0.85	0	0	0	0.03	0	0.58
Snakeroot	3.26	0	0	0	0	0.11	0.23	0	0.06	0.63	0.82	0.63	0.79
Cascarilla	2.42	0	0.45	0.45	0	0	1.53	0	0	0	0	0	0
Balsam Capivia	0.07	0	0	0	0	0	0.01	0	0	0.05	0	0	0
Total	**7807.36**	**50.01**	**178.22**	**174.71**	**198.61**	**188.55**	**173.01**	**170.10**	**282.31**	**223.31**	**680.21**	**846.60**	**738.05**

Source: Customs Ledgers

Conclusion

This chapter has explored changes and continuities in the English trade of New World drugs in the early modern period and answered the questions posed at the outset: What American drugs were imported into England in the early modern period? In what quantities, and how frequently, were different types of drugs imported? How did the importation of these drugs change over time? Which drugs did different American colonies produce for the export market?

I have demonstrated that certain drugs from the Americas were regularly imported in significant volumes throughout the period, including guaiacum, sassafras and sarsaparilla. The number of New World drugs available in the England increased significantly during the seventeenth century. Some drugs were initially in vogue in the seventeenth century and later fell out of favour in the eighteenth century. Most of the drugs from the Americas traded into England in the early modern period were available from the end of the seventeenth century, and the volume of these drug imports continued to expand until the mid-eighteenth century. These results provide the background for the rest of the chapters in this thesis. In Chapter 2, I will provide the trajectory for the commercialisation of a diversity of drugs in the case of Virginia. In Chapter 3, I will analyse how one of the regularly traded New World drugs, sassafras, was received in contemporary medical literature. In Chapter 4, I will consider how American medicinal plants were evaluated by a member of the Board of Trade and Plantations, a body that was established to manage and foster growth in England's colonial trade. In Chapter 5, I will examine the adoption of a variety of imported New World drugs in the provision of medical care in both retail and institutional settings.

Frequency measures of importation, such as the number of shipments, provide indications of consumption of various drug commodities in early modern England. In the 1567-1685 period, green ginger, cocoa, sarsaparilla, aloes epatica, guaiacum were the most often-imported American drugs into England. In the 1699-1774 period, cocoa, turpentine, tamarinds, sassafras were the most commonly-imported New World drugs. Guaiacum and cocoa were the drugs imported most frequently into England from the Americas across the early modern period.

The quantity of New World drug imports offers evidence about the accessibility of American drugs to English medical practitioners and consumers. The total volume of imported drugs from the Americas increased from 576,850 in the seventeenth century to 70,287,300 pounds in eighteenth century. The drugs with the largest imported volumes in the 1567-1685 period were guaiacum, green ginger, sarsaparilla, cocoa and aloes epatica. In 1699-1774 period, turpentine, coffee, guaiacum, cocoa and

sassafras were imported in the greatest volumes. Future research could build upon this work to investigate the fashions in the consumption of exotic drugs across the eighteenth century. In this chapter, I have documented a dramatic increase in the scale of New World drug imports into England and an increasing number of American plant specimens that were developed into drug commodities in the eighteenth century.

The variety of American drug imports is related to the diversification in the market, the expansion of apothecaries' inventories and the choice of drugs available to the English consumer. The number of different kinds of drugs imported during the eighteenth century was nearly double that of the seventeenth century. There was a gradual increase in the variety of New World drugs imported from the late sixteenth century through the first half of the seventeenth century and a steady growth rate across the late seventeenth and eighteenth centuries. The greatest shift occurred in the later half of the seventeenth century when many more drugs began to be imported. These shifts corresponded with an increasing diversification in the English colonial economy and a greater volume of trade in colonial products more generally. The increasing variety of medicinal plant products was not due to a coordinated search for new medicines but was part of wider colonial economic developments.

No particular American plantation dominated the export of drugs across the early modern period. Virginia and Maryland were the most important sources of New World drugs at the end of the sixteenth and the beginning of the seventeenth century, but the West Indies, particularly Jamaica and Barbados, came to dominate the drugs trade in later in the seventeenth century. In the eighteenth century, the North American plantations became the most important sources of drugs from the New World. The American colonies largely traded in turpentine, guaiacum, sassafras, sarsaparilla and cocoa. There was also specialisation in colonial drug commodities, in which some drugs were only traded in large quantities from certain plantations: aloes epatica and green ginger from Barbados, cinchona from Jamaica, cortex elutheris from New England, cortex winteranus from Carolina and ginseng root and snakeroot from Virginia and Maryland. The specific development of drug commodification in each colony depended on several factors, including climate, soil quality, market competition and level of colonial development. In Chapter 2, I will focus on the case of Virginia to explore the confluence of plantocracy interests, the role of government intelligence and the rhetoric of healthfulness on the diversification of the drug economy.

England also exported a significant volume of New World drugs to other European countries; cocoa, guaiacum, sassafras and sarsaparilla were amongst the top five exports by volume in both the seventeenth and eighteenth centuries. Mechoacan was a more important export in the seventeenth

century, while cinchona was a more significant export in the eighteenth century. The volume of American drugs exported from England to Europe also increased significantly from the seventeenth to eighteenth century; as England gained a greater supply of American drugs, it could export more of its surplus.

By comparing import and export customs records, I recognise that most American drugs, such as sarsaparilla and guaiacum, were both consumed domestically in England and re-exported by England to other countries. However, a minority of drugs from the New World appear to be imported primarily for English consumption, such as cascarilla and cassia fistula, and were not regularly traded as export goods.

In this chapter, I have given an account of trends in the trade of drugs in England from the New World across the seventeenth and eighteenth centuries. The frequency, volume and variety of these drugs have been used as measures to reveal information about the supply and demand of American medicines in early modern England. Through an examination of these measures, I have identified the relative importance of various New World drugs in the English marketplace. We can infer which drugs became normalised and regularised as shown in this chapter through their trade and which remained relatively unknown and obscure, as will be evaluated in the scholarly inquiries in Chapter 4. Why did different colonies diversify their drug exports at certain points in the early modern period? In the next chapter, I will investigate how the political and economic situation in one colony, Virginia, influenced its drug production for the English market.

Chapter 2

Healing the Commonwealth: Producing Drugs in Virginia

Introduction

In the wake of the final stages of the English Civil War and the rise of the Interregnum, the English lands were left barren and blood-soaked following years of political turmoil and war. The extended disruption to the established administration of colonial governance also resulted in a loss of productivity for the plantations. The political turmoil that racked the metropolis radiated out to its colonies, depressing trade and limiting opportunities for the further identification and exploitation of natural resources in the New World. The disruption to the political order created a depression in trade, and the possession and submission of England's foreign territories dangerously swayed in the balance, requiring strong political and military measures so that they did not seek to obtain their independence from the English Empire.

The language used by contemporary writers during this transition of political authority was especially vivid about the early imperial aspirations of England when political upheaval racked not only the traditional motherland but its new distant English possessions. The extent to which inhabitants of the colonies could be considered as English with the same rights and privileges thereof was also contested in the rhetoric. The tone in New World imaginaries shifted in the 1650s to emphasise the ability of American lands to heal the wounds of England caused by political and religious conflict. The discourse of the healing power of these spaces served both metaphorical and practical purposes, aiming to fuel the belief in the potential benefits of investing in the colonies. As Margaret Healy has argued, "All 'bounded' structures (nations, societies, cities) must imagine their conditions of disunity – problems relating to boundaries, internal structures and the relationship between parts – in much the same way as they imagine the physical body's conditions of disharmony."[1] By emphasising drug commodities within this promotional medicalised language, the early modern proponents of these discourses offered tangible examples of substances that literally heal the sick while metaphorically sustaining the body politics of empire through greater economic self-sufficiency.

[1] Margaret Healy, *Fictions of Disease in Early Modern England: Bodies, Plagues and Politics* (Basingstoke, Palgrave, 2001) pp. 16-17.

In this chapter, I will explore how perceptions of natural commodities, particularly medicines, in Virginia reflected and influenced politics and empire in seventeenth-century England. I consult five writers, who produced accounts of the political and economic situation in Virginia following the English Civil Wars. I examine all the known, extant accounts of Virginia from this period — those of John Ferrar (c. 1588–1657), William Bullock (fl. 1649), Edward Williams (fl. 1650), Benjamin Worsley (1617/18–1677), and Sir William Berkeley (1605–1677). The writers came from diverse backgrounds – merchants, statesmen, planters and projectors – and held opposing political viewpoints, but they were each dependent on the success of the Virginian colonial project. Their accounts of Virginia offered tantalisingly sensual descriptions of the natural bounty in this New World to entice their readers to invest in a remote outpost of the English empire. Similarly, Amsterdam merchants sought to destigmatise tobacco and portrayals of tobacco in Dutch art transitioned from signaling deviance and disorder to the mundane and everyday use of the drug.[2] Medicinal plants, such as sassafras, anise seeds and sarsaparilla, were portrayed as particularly lucrative products that could restore and maintain the commercial health of Virginia while also healing the sick in England. This marketing approach of the New World as a bountiful Garden of Eden was not a new idea, but the agenda at this time was much more about the commodification of *naturalia* rather than the encouragement of colonial settlement as it had been in the earlier reports on the Virginian plantation.

With the transfer of power to the new Commonwealth government, there was an opportunity to once again present Virginia as a venture worthy of investment. Following the decline of the tobacco industry, the writers made proposals to the Parliamentarian government for the revitalisation of the economy in Virginia for the benefit of England following the fallow years of the Civil Wars. The main point of contention between the writers was whether they viewed poor colonial governance or historical contingency to be the primary cause for the failure to realise Virginia's economic potential. All of the writers, however, agreed that there was an over-reliance on tobacco, and that developing new natural commodities, including drugs, was necessary for the recovery of Virginia.

The tobacco economy had experienced previous cycles of boom and bust, and there was a correlation between its portrayal as a virtuous medicine when it was profitable and a vice when it is was an economic failure. Tobacco, one of the first medicinal plants to be exported from Virginia, had shifted to become a poison for the commercial health of the colony. The move towards a diversified drug economy had also been considered before with designs in various stages of development

[2] Ivan Gaskell, "Tobacco, Social Deviance, and Dutch Art in the Seventeenth Century," in Wayne Franits ed., *Looking at Seventeenth-Century Dutch Art: Realism Reconsidered* (Cambridge: Cambridge University Press, 1997): 68-77.

abandoned. What was new about the critical juncture of the 1650s was the confluence of events – a change in governmental regime and the collapse of the Virginian tobacco economy – which allowed the writers to reinvent Virginia and imagine a new beginning for the colony. The suggestions for the development of a larger and more diversified drug economy were also facilitated by the increasingly open, experimental and diverse medical landscape in 1650s England, which I analyse in Chapter 3.

From the 1640s to the 1690s, marked political instability resulted in a tangled succession of various committees and commissions considering colonial governance, including various councils of trade and plantations. These disruptions to the political structure greatly impacted colonial investment and development, making it difficult to gather the continued momentum needed to diversify colonial industries and products. The process began many times, reaching different stages of assessment, planning and implementation, but it was continually disrupted by political turmoil in England and malfunctioning local governments in the American colonies. Furthermore, deep rivalries and divisions meant that the information garnered by one government was not necessarily shared with the next one in power, resulting in a loss of progress and a need to begin the cycle anew of soliciting information and identifying areas worthy of investment. The first stable and long-standing institution was the Board of Trade and Plantations established in 1696, which lasted for three generations. In Chapter 4, I will consider the creation of this institution and its intended purposes in greater detail through an examination of one of its founding Commissioners' notebooks.

In the 1650s, there was an incentive for the Virginian writers to address the Parliamentarian government through print rather than manuscript because the writers would then have a larger audience. Colonists' previous attempts in reaching the government had been ignored. Their letters were dismissed by a government already overwhelmed with its own problems in England. In this chapter, I focus on the period when the colonists attempt to persuade the Parliamentary government to invest in the Virginia colony. The writers made repeated use of medical metaphors and suggested drugs as one of the key commodities for the commercial development of Virginia.

English Trade with its American Colonies, 1620-1660

The Royal Exchange was a major centre for the mercantile activity relating to natural commodities from the English territorial possessions in the western Atlantic. The two engravings below by the Bohemian artist Wenceslaus Hollar (1607-1677) reflected the dramatic decline of commerce and trade in the centre of the English empire through the periods of the Civil Wars and Interregnum. Hollar vividly conveys the impact of regime change on English commerce through his sequential

images of London's Royal Exchange, which follow the timeline of political events. Its commercial rise from the 1620s to 1640s and its fall from the 1640s to 1660s mirror the trade in colonial commodities. In the first engraving dated c. 1644, there is a general atmosphere of vivacious exchange in news and merchandise; a woman in the foreground sells broadsheets while merchants can be seen deep in conversation (Figures 6 and 7).

Figure 6. *The Interior Court of the Royal Exchange, c. 1644*
Source: Wenceslaus Hollar, *Royal Exchange,* c. 1644, Folger Shakespeare Library, Source Call Number: ART Vol. d86 no.1

Figure 7. *Illustration of Commerce Activity in the Royal Exchange, c. 1644*
Source: Wenceslaus Hollar, *Royal Exchange,* c. 1644, Folger Shakespeare Library, Source Call Number: ART Vol. d86 no.1

Imagery was produced by both Royalists and Parlimentarians, each blaming the other for the disruption in trade at the Royal Exchange. Later in the same year as the first engraving of the Royal Exchange, Hollar took up arms for the Royalist side, was imprisoned briefly before escaping to Holland, and did not return to England again until 1652. In the second engraving dated c. 1647, foreign traders have departed, signalling the decline in the reputation of England as a commercial centre (Figure 8). Hollar presented the reason for their departure in his illustration; Parliamentarian violence and disorder disrupted English prosperity. A tall, domineering Parliamentarian wielding a man-catcher threatens tradespeople, who flee in terror; he is supported by other troops who are chasing, whipping and beating the merchants and townspeople (Figure 9). Supporters of the Parliamentarians had their own figurative response. Following the execution of Charles I, the statue of the King in the Exchange was beheaded, its spectre removed, and a message added declaring that the tyrant had been terminated and liberty restored. As Julie Spraggon has argued, the Commonwealth government felt threatened by the continuing presence of any Stuart symbolism and decided that it was not enough to simply remove these statues, arms and inscriptions, but they needed to be defaced and thus permanently conquered. [3]

Figure 8. *Interior Court of the Royal Exchange, c. 1647*
Source: Wenceslaus Hollar, *Royal Exchange,* c. 1647, Metropolitan Museum of Art, Accession Number: 29.102.128.

[3] Julie Spraggon, *Puritan Iconoclasm during the English Civil War* (Woodbridge: Boydell Press, 2003), p. 81.

Figure 9. *Depiction of Violence and Disrupted Trade in the Royal Exchange*
Source: Wenceslaus Hollar, *Royal Exchange,* c. 1647, Metropolitan Museum of Art, Accession Number: 29.102.128.

As I presented in Chapter 1, Virginia exported drugs to England from the early seventeenth century. Even in this early period of colonial development, the English government recognised the importance of valuable trade in drugs from Virginia. In 1610, they issued:

> [i]nstructions for such things as are to be sent from Virginia with instructions for their better preservation, and the prices they sell for in England. They include sassafras, worth 50l. a ton, sarsaparilla, 200l. a ton, galbanum, 100l. a ton, walnut, and other oils, wine, silk grass, beaver and otter skins, pitch and tar, sturgeon, caveare, and various sorts of wood, &c.[4]

The first three listed items are medicines, which are also the only commodities with selling prices recorded. Prospects for the viability of the colonial economy initially appeared positive, and trade and investment increased significantly in the 1620s. It is notable that the drugs that the English were interested in developing into commodities were those that could be readily gathered and no drugs that required extensive cultivation were recommended in early reports.

The prosperity of the 1620s to the 1640s is further illustrated by the explosion in population of English colonists in the New World. Between 1624 and 1640, the population of English colonists in Virginia increased eightfold and the first permanent English settlements were established in the West Indies.[5] As Robert Brenner has explained, this boom was a result of the rise of a new merchant leadership following the dissolution of the Virginia Company in 1624.[6] The trading companies were rather conservative and risk averse and had difficulties securing additional investments without being able to deliver short-term profits. This approach made plantation development difficult and diversification in crops a virtual impossibility. Since tobacco had already demonstrated its

[4] "America and West Indies: December 1610," in W. Noel Sainsbury, ed., *Calendar of State Papers Colonial, America and West Indies: Volume 1, 1574-1660* (Her Majesty's Stationery Office, London, 1860), pp. 10-11.
[5] Wesley Frank Craven, *The Southern Colonies in the Seventeenth Century, 1607-1689* (Baton Rouge: Louisiana State University Press, 1949), pp. 147 and 183.
[6] Robert Brenner, *Merchants and Revolution: Commercial Change, Political Conflict, and London Overseas Traders, 1550-1653* (London: Verso, 2003), p. 112.

commercial value, it was the only medicinal plant grown in significant quantities as a staple commodity under the bureaucracy of the trading companies.

By the 1620s, however, the commercial viability of tobacco was in serious decline, such that begging petitions from the planters and adventurers were sent to King James I requesting a reduction on the tobacco tariffs. In one such petitioning letter from a collective group of captains, gentlemen, planters and adventurers, suggestions were made to plant a 'real commodity' in lieu of tobacco because cultivating tobacco was recognised as time misspent.[7] The prominent London merchant and colonist, Edward Bennett (1577-1651), wrote in 1620 of the necessity to diversify natural commodities as they needed to "quickely finde better Commodies then Tobacco, as the *Spaniards* have done."[8] Bennett put forth several potential alternatives: "Ginger, Hides, Sugar, Sarsaparilla, Balsam, Peeta Carana, Gumme, Allome and Woud."[9] He termed these commodities to be "beneficiall and necessary" not just for the profit of the King and the merchants, but for the "generall good it would bring to all this Common wealth, cannot be imagined."[10] Most of Bennett's suggestions of lucrative replacements for tobacco were in fact drugs. As the companies were failing, the desperation for a profitable lifeline fueled the search for flora that could be marketed as miraculous cure-alls. Despite the promise of wealth and bounty through the diversification of natural commodities, the requirement for a quick financial return meant a large-scale project of exploration was not possible. Small-scale explorations did continue, however, with the collection of seeds and specimens of American plants by the gardener to Charles I, John Tradescant the Younger (1608-1662) on his voyage to Virginia in 1637. The Royalist Government's State Papers described Tradescant's mission in the colony as being one to "gather all rarities of flowers, plants, shells, &c" to enable a full display of American naturalia in the royal gardens.[11] The Crown was primarily interested in collecting specimens in order to display dominion rather than developing trade goods.

The crippling dependence on the tobacco plantations led to a near economic collapse for the Virginia colony in the 1640s, bringing into question the viability of the colony itself. During the English Civil War, transatlantic shipping was severely disrupted, and England's limited market was in disarray such that it easily became flooded with the Virginian leaf. Political turmoil in England extended directly to Virginia, leaving the colonists to face fallow years with their tobacco rotting away in

[7] "America and West Indies: December 1622," in Sainsbury, ed., *Calendar of State Papers*, pp. 34-35.
[8] Edward Bennett, *A Treatise Divided into Three Parts, Touching the Inconveniences that the Importation of Tobacco out of Spaine hath Brought into this Land* (London, 1620), pp. 5-6.
[9] Ibid, p. 5.
[10] Ibid.
[11] "America and West Indies: 1606-1640," in Sainsbury, ed., *Calendar of State Papers*, p. 5.

storage houses. The Virginian planters looked to other European markets, but France and Russia were not viable for various reasons, including governmental intervention through tariff barriers. The exorbitant French custom duties on the Virginian leaf, for example, made its price in France prohibitive. Even if Virginian tobacco had been able to bypass French governmental controls, it would have faced difficult competition from French domestic varieties. Many French districts had reputations of being able to produce tobacco of the same or a finer quality to the Virginian leaf, leaving the desire for Virginian tobacco in France questionable at best.[12] In Russia, the czars enforced a tight prohibition on tobacco with extreme penalties for violations, ranging from tortuous forms of corporal punishment like spilt noses to deportation and death in Siberia.[13] Ecclesiastical officials supported the czars' position on tobacco, forming a nearly impenetrable barrier to all legal trade in foreign tobacco with Russia until the end of the seventeenth century.[14] While there was some hope for Virginian tobacco in Holland and the Spanish Netherlands, where markets were more open with fewer fiscal regulations, the demand in these countries could never absorb the vast supply from Virginia.[15]

Accounts of Natural Commodities in Later Seventeenth-Century Virginia

The merchant John Ferrar (c. 1588–1657) was responsible for the day-to-day administration of the Virginia Company and was heavily devoted to the Virginia project. Even after losing about £3,000 in unfulfilled investments, he still believed so much in the colony that he named his daughter Virginia, who was one of the first women in England with that name.[16] Virginia Ferrar worked closely with her father and produced *The Wonderful and Admirable Vertue of the Sassafras-Tree in Virginia* (1650), a broadside advertising the beneficial effects of sassafras, its history in the European experience and its preparation as taught by indigenous peoples.[17] In the following year, the Ferrars created a detailed map of Virginia, shown in Figure 10, depicting the flora and fauna of the territory. Amongst the many illustrations, the sassafras tree is the only plant or animal labelled with its name, emphasising the importance the Ferrars attributed to it.

[12] Stanley Gray and Vertrees Judson Wyckoff, "The International Tobacco Trade in the Seventeenth Century," *Southern Economic Journal* 7, no. 1 (1940), pp. 7-8.
[13] Joel Best, "Economic Interests and the Vindication of Deviance: Tobacco in Seventeenth Century Europe," *The Sociological Quarterly* 20, no. 2 (1979), p. 173.
[14] Gray and Wyckoff, "The International Tobacco Trade," pp. 8-9.
[15] Ibid, p. 4.
[16] Peter Peckard, *Memoirs of the Life of Mr. Nicholas Ferrar* (Cambridge, 1790), pp. 167-168.
[17] Virginia Ferrar, *The Wonderful and Admirable Vertue of the Sassafras-Tree in Virginia* (London, 1650).

Figure 10. *Map of Virginia*

Source: Virginia and John Ferrar, A Mapp of Virginia Discovered to ye Hills, Library of Congress, Shelf ID: G3880 1667.F3. The original version of this map dates from 1650, but the version displayed here is a 1667 reproduction.

Ferrar compiled *A Perfect Description of Virginia* (1649) from letters, reports and answers to questionnaires sent to colonists from Virginia that he had received by 1648.[18] In this work, Ferrar provided an overview of the present state of the plantation, including an inventory of all of the kinds of commodities available, highlighting that some flora and fauna did not yet have English names and that others remained completely unknown. Ferrar asserted that English knowledge of the New World would have been more complete if government matters had been handled more effectively in the English plantations. He complained bitterly that Virginia had faced twenty-five years of stagnation since the dissolution of the Virginia Company, leading planters to become reliant on a tobacco monoculture and the failure of the colony to develop a diversified economy. After discussing the problems of poor government leadership of the plantations, such as corrupt English officials and poor relations with the indigenous peoples, Ferrar proposed that the situation was now more favourable. A peace settlement with the indigenous Emperor Necotowance had recently been

[18] John Ferrar, *A Perfect Description of VIRGINIA: BEING, A Full and True Relation of the Present State of the Plantation* (London, 1649).

established and a greater knowledge had been obtained from the indigenous peoples about the acclaimed south-west passage that Francis Drake had found connecting Virginia and the West Indies with the East Indies and China, which Ferrar also demarcated on his map of Virginia (Figure 10).

The absentee Virginian estate owner, William Bullock's (fl. 1649) *Virginia Impartially Examined* (1649) was published in the same year as the execution of King Charles I and is an example of the type of intelligence sources available to the new Commonwealth Government as it consolidated power in the wake of the Civil Wars. While there is no direct evidence that Bullock was commissioned by the new government, it appears that he was requested to make this report to a demanding schedule by gentlemen of repute. In Bullock's address to "the Knights and Gentlemen that importuned this Worke," he complained that they only allowed him six nights to produce this work. Given more time, Bullock claimed, he would have produced a more substantial report.[19] The Parliamentary government likely read informal intelligence reports, including Bullock's, to inform their decisions on colonial policy. Indeed, Bullock stated in his address to the Earl of Arundel and Surrey that he hoped this report would be useful in establishing a new government in Virginia that would no longer be dependent on subsidies from England.[20] An example of one of Bullock's instructions to the planters was that they "that they enquire after all advantagious Commodities that are produced from the Earth, and learn how to bring them to perfection."[21] Samuel Hartlib described Bullock as having royalist sympathies and perhaps Bullock viewed this type of social inclusiveness as necessary to align himself with the new political order rising to power.[22] Whatever Bullock's motivations were, his descriptions of the social characteristics of Virginians have been informative for historical research.[23]

Bullock's *Virginia Impartially Examined* has been well-cited in the secondary literature, where Bullock has been treated as a contemporary authority on matters from the literature of reform to Virginian perceptions of climate and health.[24] As Peter Thompson has aptly assessed, *Virginia*

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[19] William Bullock, *Virginia Impartially Examined, and Left to Publick View* (London, 1649), Preface.
[20] Ibid.
[21] Ibid, p. 62.
[22] See Samuel Hartlib, *Ephemerides 1649 Part Two*, in Samuel Hartlib, *The Hartlib Papers: A Complete Text and Image Database of the Papers of Samuel Hartlib* (Ann Arbor: UMI, 1995), 28/1/2IA.
[23] For example, Bullock has been used as a source for research on social characteristics of Virginia's population, David W. Galenson, "The Social Origins of Some Early Americans: Rejoinder," *The William and Mary Quarterly* 36, no. 2 (1979): 264-277; and on the morale of indentured servants, T. H. Breen, James H. Lewis, and Keith Schlesinger, "Motive for Murder: A Servant's Life in Virginia, 1678," *The William and Mary Quarterly* 40, no. 1 (1983): 106-120.
[24] Edmund S. Morgan, *American Slavery, American Freedom: The Ordeal of Colonial Virginia* (New York: W. W. Norton & Company, 1995), p. 435, describes Bullock's place in the literature of reform in its "A Note on the

Impartially Examined offers "a polemical treatment of the colony's development … balanced by an optimistic description of its potential."[25] While Bullock's views on the current problems of the governance of Virginia may have been coloured by his loss of thousands of pounds in investments, he maintained a positive, even ambitious attitude to what a reformed government could achieve.[26] Bullock would have been familiar with the previous governance situation of Virginia as his father had lived there for twelve years, and he inherited the family estate. While Bullock had no direct experience of Virginia himself, he conducted interviews with planters and captains and gathered other first-hand written accounts. Bullock claimed that his account of Virginia was the first of its kind to provide a comprehensive assessment of the current state of the colony and make recommendations for its future reform and prosperity. While he acknowledged that other experienced authors had produced respectable histories of Virginia, they had not uncovered the "true grounds and reason why the prosperitie thereof hath beene so long obstructed."[27] Just as health was restored to the physical body by removing its obstructions and restoring balance, the obstructions of poor governance needed to be expelled for the colony to flourish.

Bullock proposed that if his instructions were followed like a medical receipt and "maintained by a sweet and orderly Government" … "'twill [Virginia] be like a pleasant Garden, where you may gather simples for many speciall uses."[28] Bullock advised that if Virginia was cultivated in an informed and coordinated manner, the commonwealth could harvest all of its natural riches, including a large variety of medicinal plants. He recognised that there were "truly great quantities of these [plants]" and that they should "make them Drugges indeed" to sale to England and its trading partners.[29] Bullock included "many Drugs" in his evaluation of Virginian natural commodities alongside other luxury items, such as silk, wine and pearls. He listed sassafras explicitly but omitted others since they did not yet have English names. He wrote that there were "all sorts of Herbes for Physick or Pot; all which grow without any such trouble as is taken for them in England."[30] Before addressing the heavy task at hand of governmental reform, Bullock lured his readers with promises of wealth and riches and discoveries that could bring them honour and "eternize their Names" in a place of Eden with

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Sources." See also Karen Ordahl Kuppermann, "Fear of Hot Climates in the Anglo-American Colonial Experience," *The William and Mary Quarterly* 41, no. 2 (1984): 213-240.

[25] Peter Thompson, "William Bullock's 'Strange Adventure': A Plan to Transform Seventeenth-Century Virginia," *The William and Mary Quarterly* 61, no. 1 (2004), p. 109.

[26] Bullock acknowledged his losses in the report reassuring his readers that he blamed only the specific men he entrusted to be at fault. William Bullock, *Virginia Impartially Examined,* Preface.

[27] Ibid, p. 2.

[28] Ibid, Preface.

[29] Ibid, p. 33.

[30] Ibid, p. 8.

eternal blessings.[31] He presented Virginia as a place worthy of investment with a vast natural bounty that could easily be claimed, and in Bullock's words, "you shall not finde the Earth [in Virginia] ungratefull for any thing you trust her with," like a fertile Eve.[32]

Bullock then cautioned that there was an impending obstacle that must be overcome before these riches could be realised. He implored that a political solution needed to be found before Virginia's natural resources could be efficiently exploited. He used medicalised language to make this point, "the Cure, … to discover the Disease of this Country, and how contracted; of which, The Government is the greatest of all."[33] In order to harness the bounty of *naturalia* in Virginia, Bullock argued, it was necessary to first resolve the issue of government, which required a change in colonial loyalties from the recently executed monarch to the newly empowered Parliament.

We also have a direct response to Bullock's *Virginia Impartially Examined* pamphlet from John Ferrar. Peter Thompson has identified Ferrar as the writer of extensive marginalia in the Bodleian Library's copy of Bullock's work.[34] Considering this source, it is clear that Ferrar was fervently engaged with Bullock's report as he completely filled all available space on its pages with his notes. Bullock's text became entirely surrounded by Ferrar's hand, and Ferrar expressed his desperation in reaching Bullock to convey his views. While Ferrar strongly agreed with many of the points that Bullock raised in his current assessment of Virginia, Ferrar felt the need to defend the past situation of Virginia, especially in relation to the role of the Virginia Company and the despairing state of the colony. He explicitly corrected Bullock, writing, "we had greate Incouradgment to Invite the planters unto it [trialing new commodities] more then this Gentellman Ever heard of for if he would he would here alsoe have put it in his booke as it deserved."[35] In the endpapers of *Virginia Impartially Examined*, Ferrar wrote of his frustration and disappointment that before he was able to send his annotated copy to Bullock, Bullock had perished in Virginia after his boat capsized on a river during a storm.[36] Ferrar's marginalia was meant for an audience, to begin a conversation with Bullock, and to ultimately attempt to influence the current Parliamentarian government.

As a well-known royalist, who had briefly harboured Charles I at Little Gidding during the Civil War, Ferrar chose to work through intermediaries instead of addressing the Commonwealth government

[31] Ibid, p. 9.
[32] Ibid, p. 10.
[33] Ibid, p. 11.
[34] See Peter Thompson, "William Bullock's 'Strange Adventure.'"
[35] John Ferrar's marginalia within William Bullock, *Virginia Impartially Examined* held at the Bodleian Library, p. 34.
[36] Ibid, endpapers.

directly. In addition to his attempts to influence Bullock, an intelligence source for the government, he also solicited his own mouthpiece in the little-known Cambridge-educated author, Edward Williams (fl. 1650). Williams published *Virgo Triumphans or, Virginia in Generall* (1650) the year following Bullock's *Virginia Impartially Examined*. William specifically referenced "Mr. Bullocke" twice when Williams argued that he was correcting misinformation and providing a more complete account of certain issues, signalling to the reader that Williams was knowledgeable of Bullock's intelligence report and was situating himself in the debate over Virginia's future. While Williams presented a humble image of himself by speaking of his 'lownesse,' he took great care to establish himself as a valuable information source. He dedicated his book to the Parliament of England and the Council of State, likening them to the leaders of the Roman Republic, "who inriched the heart and strengthned the armes of their Dominions by dispersing Colonies in all Angles of their Empire."[37] After seeking the Parliamentarians' favour, Williams revealed the source for his information was none other than John Ferrar. Williams admitted that "there is little of mine in this, but the Language… [it] was communicated to me by a Gentleman of merit and quality … Mr. John Farrer of Giding in Huntingdonshire."[38]

Williams then warned the English Parliament that there was a pressing danger to their empire from other European states. He claimed that the negligence of the previous Royalist government and its merchant adventurers had allowed the Dutch, Spanish and Portugese to "Lord over us [the English] in both the Indies." [39] Williams further cautioned that if the new government failed to invest in its colonies, it would exacerbate the perilous situation of the plantations, which were not able to defend themselves from Spanish ambitions. Williams cited the historical case of Henry VII's refusal to finance the Columbus brothers in their early westward explorations, resulting in the substantial loss of American prospects claimed by the Spanish.[40] Williams thereby warned the Parliamentary government that, if they did not take measures to support the Virginia colony, England would be once again outmaneuvered by Spain. Williams offered hope as well as caution by emphasising that there were still many riches to be discovered: "who knows but providence has reserved the present opportunity to your times … the enlargement of the English greatnesse by extending its Empire."[41]

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[37] Edward Williams, *Virgo Triumphans, or, Virginia in Generall* (London, 1650), see section "To the Supreme Authority of this Nation, The Parliament of ENGLAND."
[38] Ibid, To the Reader.
[39] Ibid, To the Supreme Authority of this Nation, The Parliament of ENGLAND.
[40] Ibid, To the Conservers and Enlargers of the Liberties of this Nation, the Lord President, and Counsell of State.
[41] Ibid.

Following the execution of Charles I, the American colonies had refused to accept the authority of Parliament arguing their governance was based on Royal Charters not Parliamentary Acts.[42] In 1650, the projector Benjamin Worsley (1617/18–1677) was ordered by the Committee of the Admiralty to prepare a report on the current trading and military situation in Virginia and how to achieve the "reduction of the government of Virginia to the obedience of the Commonwealth."[43] Worsley was trusted as an intelligence gatherer because he had past experience in collating economic and scientific information in Amsterdam for the Hartlib Circle. He was also a strong supporter of the Parliamentarian cause having served as surgeon-general in Ireland during the Civil Wars. In 1649, Worsley sought new employment and began with the possibility of establishing a sugar grinding venture in Barbados, but before he fully developed these plans, another opportunity presented itself. As Thomas Leng has discussed, Worsley identified an avenue to progress a state official career on Virginia matters by exaggerating his connections to the English mercantile elites, who he claimed were willing to advance considerable investments to the Parliamentary government in return for the reduction of Dutch competition in trade with the English colonies in America.[44] While Worsley knew of these English merchants by reputation only, he had correctly recognised their frustrations and declining commercial situation.[45] Following the greatly diminished English mercantile trade with their plantations in America during the fallow era of the Civil Wars, the Dutch merchants had entered the empty trading space and thrived. Ultimately, the Dutch won domination over trade in England's own colonial products during this period, including Virginian tobacco and sugar from Barbados.

The combination of Virginia's royalist sympathies and the flowing of Virginian wealth to a rival polity (the Netherlands) made the colony's subjugation under Parliamentary rule a pressing matter. The barrage of reports, such as Williams', that vividly portrayed the natural wealth of Virginia only heightened the sense of urgency that Virginia needed to be brought back under its motherland's control immediately. Worsley was entreated to report on the situation in Virginia, specifically on its potential value through trade. His report to the Parliamentarians, "A Memorandum of the Virginia Plantation," is divided into three sections: "1. The benefit which it [Virginia] may yeeld to this state

[42] For an account of this situation in more detail, see chapter 3 on 'Regicide and Royalist Rebellions' in Carla Gardina Pestana, *The English Atlantic in an Age of Revolution, 1640–1661* (Cambridge, MA: Harvard University Press, 2004).

[43] "America and West Indies: May 1650," in Sainsbury, ed., *Calendar of State Papers*, pp. 339.

[44] Thomas Leng, *Benjamin Worsley (1618-1677): Trade, Interest and the Spirit in Revolutionary England* (Woodbridge: Royal Historical Society, 2008), pp. 49-51.

[45] This was not the only time that Worsley would present himself as having more credentials than he possessed. Later in the 1650s, Worsley would begin proclaiming himself as a physician despite there being no evidence that he ever received a degree. See Charles Webster, "Worsley, Benjamin (1617/18–1677)," *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004).

and Nation. 2. The present obstruction of it benefit whence it doth proceed. 3. The way to remove that obstruction without difficulty."[46] Worsley's overall assessment of Virginia was that while the current value of the colony to the English nation was limited, through a reformed Parliamentary government and a diversified economy, "Virginia might be made to this state as Considerable, as Brasil ever was to the Hollander, or is to the Portugall, though upon different respects."[47] Worsley argued the venture and industry needed to procure these natural riches had been obstructed by the colony's Royalist loyalties, which were upheld by the current governor, Sir William Berkeley (1605–1677). Therefore, Worsley concluded, the solution to Virginia's political and economic obstruction was straightforward: the governor must be deposed.

The colonial governor of Virginia, William Berkeley, was indeed devoted to the Stuarts and the Royalist cause. Berkeley was first appointed as governor by Charles I in 1642, when he was given the instructions to restrict the planting of tobacco and to inquire into and to expand upon the cultivation "of Orchards and Gardens for Roots and fruits, wch [which] that Countrey is so proper for and that every Planter be compelled for."[48] Just one month after Worsley had been granted his commission in 1650 to investigate political and commercial matters in Virginia by the Parliamentarians, Berkeley was appointed governor of Virginia by the Stuart regime in exile at Breda. Berkeley was ordered by Charles II to continue his discoveries in Virginia and to find out what trades would "benefit and advantage of the sd. [said] Colony & Plantation [Virginia]."[49] Establishing successful trades in natural commodities would secure the future of Virginia, allow the colony to prosper and preserve a royal legacy.

In fact, Berkeley had searched for commodities and trade routes since he first arrived in Virginia and acquired land west of Jamestown, where he established his plantation Green Spring. As one of the planter elites, Berkeley had the means to carry out his own experiments into alternative natural commodities to tobacco, and "[w]ithin five years he was exporting rice, spirits, fruits, silk, flax, and potash through an extensive network of commercial contacts."[50]

Before Berkeley could complete his pursuit of the new commodities and markets, his endeavours were interrupted by the change of government in England. Berkeley, along with other colonial

[46] Benjamin Worsley, *A Memorandum of the Virginia Plantation*, 61/5/1A, The Hartlib Papers.
[47] Ibid.
[48] "Sir William Berkeley's instructions, 5 Jul 1642," CO 5/1354, The National Archives.
[49] "Commission to Sir William Berkeley to be governor and commission to him etc. to be of the council; of Virginia, 3 Jun 1650," CO 5/1354, The National Archives.
[50] Warren M. Billings, "Berkeley, Sir William (1605–1677)," *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004).

governors, defiantly refused to recognise the Parliamentary government's legitimacy and pledged allegiance to Charles II. In response, the Parliamentary government punished the colonies by issuing *An Act for prohibiting Trade with the Barbadoes, Virginia, Bermuda and Antego* in 1650, which was enforced until it was replaced by the more developed *Navigation Act* of 1651. Worsley's report discussed how Virginia was virtually defenceless, having no ships of their own, and would be unable to respond to Parliamentary action.[51] After a brief show of force by a squadron of Parliamentary warships, Berkeley was deposed as governor of Virginia in 1652, but he was permitted to remain in Virginia as a private citizen residing at his Green Spring plantation.

Following the Restoration in 1660, Charles II reinstated Berkeley as governor of Virginia with the instructions that he should advance the wealth, honour and reputation of that colony through the diversification of commodities and the restraint of the planting of tobacco.[52] Berkeley had received markedly similar instructions almost twenty years earlier from Charles I. Virginia had come full circle, returning to its earlier position of dependence on tobacco and the necessity of new commodities following the chaos and disorder of the Civil Wars and Interregnum. Berkeley once more began the quest for Virginia's economic prosperity through diversification and wrote his designs for achieving this in his *Discourse and View of Virginia* (1662/63). In Berkeley's report to Charles II, he referenced his twenty years experience of living in Virginia, and then proceeded to argue that the development of trade in "[s]ugar, Cotten, Drugges, Dyings, and Tobacco" would lead to great English "power, strength, and reputation … in this new Western World."[53] Here again drugs are cited as one of the primary commodities for rescuing the commercial health of the Virginian colony.

The accounts of John Ferrar, William Bullock, Edward Williams, Benjamin Worsley and William Berkeley all discuss the critical economic situation in Virginia during the English Civil Wars as a fallow period for trade and commerce. The five writers differed in their occupations and political affiliations, but they all agreed that there were significant unrealised natural commodities in Virginia with medicinal plants being amongst those of particularly high value. These men were all stakeholders in the colonial enterprise of Virginia, each playing a different role but dependent on the success of the plantation venture. In crafting these reports, these merchants, planters and state officials, emphasised the beauty and bounty of Virginia to convince the current government, whatever its form, that it was worthy of further attention and resources. These accounts all agree that the tobacco monoculture was detrimental to the development of trade and industry in Virginia,

[51] Worsley, *A Memorandum of the Virginia Plantation*.
[52] "Sir William Berkeley's instructions," Item 25, 12 Sep 1662, CO 5/1354, The National Archives.
[53] William Berkeley, *Discourse and View of Virginia* (1663), p. 10.

and diversification in drug production was imperative to ensure future prosperity of the colony. Disagreement between these men lay in the perceived historical roots of the problem, present obstructions and potential remedies for the recovery of Virginia.

The writers clearly held deeply vested interests in the economic prosperity of the 'foreign plantations,' but perhaps that is exactly why they were chosen to inform the government on matters concerning the natural world, because they too were stakeholders in the success of the colonial project. The English Parliamentarian government was obviously aware of the biased nature of these men's reports and so commissioned alternative sources of information. The Royal Society was consulted by the Restoration Government to make inquiries into the natural commodities available in the King's expanding Empire. Interestingly, a significant portion of the information sourced about natural knowledge in Virginia was provided by the former Virginia colonial governor Edward Digges (1620–1674/75). The fellow of the Royal Society who had carried out these inquiries, Thomas Povey (b. 1613/14, d. in or before 1705), who was a colonial entrepreneur himself, also recommended that the Royal Society should further solicit knowledge from the then current governor William Berkeley.[54] The men who had acquired the greatest amount of knowledge about nature in Virginia were the ones consulted, but they also had the most to gain by presenting Virginia as a colony of unrealised prosperity.

Reasons for the Fallow Years of the Virginia Plantation

According to Bullock, the reason for Virginia's previous economic difficulties was simple and straightforward: the colony had been poisoned by malignant non-republican governmental ideologies and practices. Without the principles of a well-functioning Commonwealth government, Bullock argued that Virginia had fallen dangerously ill and was near to the point of commercial collapse. Disease and starvation contributed to a high mortality rate in seventeenth century Virginia. He wrote passionately and urgently of the Virginian settlement's health and vitality, stressing its dire condition in relation to governmental mismanagement of natural resources. The ambition of recognising, obtaining and commodifying the flora and fauna of Virginia could not be achieved, Bullock insisted, without a people's government. He claimed that even in the infancy of the Parliamentary government, Virginia was showing promising signs of recovery and revitalisation. Its government had begun to develop its divisions of labour according to settlers' specific mental and

[54] Thomas Povey, "Enquiries Concerning those Several Kinds of Things, which are Reported to be in Virginia & the Bermudas, not Found in England," Sloane MS 2903, British Library, ff. 112-113.

physical attributes, and this diversification in labour could lead to a wider variety of natural commodities. Here Bullock proposed both a diagnosis and a remedy for Virginia's perilous condition:

> Studie this Modell of Government, and compare it with any other that hath been, or is now in being, and you shall finde prevented those mischiefes, that like so many degrees of poyson make some giddy, others deadly sick, swelling them to bursting. In it you may, see every man harmoniously working, according to his severall indowments of minde and body: first, to preserve it in health … resolving with speed to make their Commonwealth flourish … whilst the Adventurer is searching for, and sending materialls from all places.[55]

The persistently medical language in which this prosposal is framed suggests that a model of healthy governance could enhance the productivity of the colony for the prosperity of the commonwealth. As I explored earlier in this chapter, the colonies were portrayed as salubrious spaces and sources of health in the metropolis. The fruitfulness and natural resources of the English plantations could in turn heal the commonwealth through trading goods, such as medicinal plants. Thus, a healthy colonial government was required for a healthy populace.

From Bullock's consultations, he concluded that the primary reason that commerce had been obstructed in Virginia was not because Virginia lacked profitable commodities but because it required an established government with settled and fair laws. He criticised the short-term thinking of the Virginian governors, who did not make plans for Virginia's future beyond their brief three-year tenures. Even worse, the governors, who Bullock described as "Stranger[s], sent from England," were not even knowledgeable of what Virginia could offer in terms of natural commodities in the first place.[56] For the republican Worsley, by contrast, the structure of the colonial government was not a central "obstruction" of Virginia's development, although he did agree that it needed to be reformed to the Commonwealth way. Worsley further complained that Berkeley favoured trade relations with the Dutch over the English, and also accused Berkeley of carrying out "some privat designes of his owne."[57] The image that Worsley portrayed of Berkeley was one of a corrupt, rebellious royalist seeking his own autonomy, which was threatening to the interests of England.

Berkeley could not respond immediately to Bullock's and Worsley's criticisms on his governorship in Virginia due to probable repercussions during the Interregnum. Once he had the safety of the Restoration and was reappointmented as governor, he defended his record in his *Discourse and View of Virginia*, in which he aimed to correct the "general and popular error" of considering Virginia

[55] Bullock, *Virginia Impartially Examined*, p. 31.
[56] Ibid, p. 11.
[57] Ibid.

as a failed project.[58] Berkeley argued against the protrayal of Virginia as being an unmanageable wilderness full of treacherous savages that had resisted nearly sixty years of English attempts at domestication. Bullock also conceded that there were many mistaken ideas about the life in Virginia that were circulating in England, "I know it is a common opinion received, that such as go to Virginia, come to a wildernesse, and they must lie in the fields, till they can build them a house, such false rumours hath lockt up this paradice of the earth from many a deserving man."[59] Bullock suggested that these misconceptions had prevented the growth and development of the Virginia colony. He illustrated the potential of Virginia as a place of healthfulness and bounty, a paradise yet to be unlocked.

Berkeley felt that mistaken beliefs had resulted in a lack of support for the Virginian enterprise, and that the physical distance between Virginia and England had created dissociation with the colonists. Berkeley claimed, for example, that since all provisions "came from England, and provided for those [the colonists] they never saw nor cared for, was not likely to be very good."[60] Ferrar agreed with Berkeley about the disinterest and neglect of England towards its Virginian colony. He wrote that "the Colony [was] never looked after, whether [to] sinke or swimme; and hath now these twenty foure yeares since [the dissolution of the Virginia Company], and they having little Incouragement, and great uncetainties, whether ever to be continued a Colony."[61] Moreover, Berkeley complained that only desperate people, who had no other choice, would come to Virginia: "such servants as have been brought up to no Art or Trade, hunger and fear of prisons bring to us." [62] Berkeley argued that the main obstacle to the progression of commodities in Virginia was that the Englishmen who arrived in Virginia were debaucherous, slothful and unskilled. He wrote that he and the Virginia assembly could hardly be blamed for this problem: "there is with us a great scarcity of good men; that is, of able Workmen, at whose doors ought this defect to lie? not at ours."[63] Despite all of these hardships that the colonists endured, Berkeley could not resist pointedly reminding his readers that their lust for "[t]he vicious ruinous plant of Tobacco … brings more money to the Crown, then all the Islands in America besides."[64]

For Williams, the structure of colonial governance and the personage of the Virginian governors were not the central issues hindering the production of diversified commodities in Virginia. He

[58] Berkeley, *Discourse and View of Virginia*, p. 2.
[59] Bullock, *Virginia Impartially Examined*, p. 52.
[60] Berkeley, Discourse *and View of Virginia*, pp. 2-3.
[61] Ferrar, *A Perfect Description of VIRGINIA,* p. 10.
[62] Berkeley, Discourse *and View of Virginia*, p. 4.
[63] Ibid.
[64] Ibid, p. 2.

reminded his readers that the "languishing condition" of Virginia was not caused by a lack of natural wealth, but rather due to historical contingency. Williams suggested that the colonial project would have "growne to a full perfection, if the treachery of the Indians had not crushed it in the beginning, and the backwardnesse of the Virginia Merchants to reerect it, hindred that Countrey from the benefit arising from that universall Staple [tobacco]."[65] Berkeley agreed with Williams about the malign effect of the Virginia Massacre of 1622, and that the danger of insecurity from indigenous peoples meant that "none but such as were forced could be induced to plant or defend the place; and of those that came, there was not one woman to thirty men."[66]

Williams discussed additional historical reasons why the plantation was left desolate and in poverty: "by the prevailency of Gondamore the Corporation [the Virginia Company] was dissolved, their patent cancelled ... the Gold of Spaine, the disincouragement of the Court, [and] the discontent of the better sort of Planters."[67] Don Diego Sarmiento de Acuna, the first Count of Gondomar (1567 – 1626) was the Spanish ambassador to England from 1613 to 1622. Referred to by Williams as "Gondamore," he was believed by officials in the Virginia Company to have played a role in its dissolution through bribery with large sums of gold and manipulation of James I, but historians have largely dismissed this accusation.[68] Here it is evident that Williams was a mouthpiece for Ferrar; the same issues and sentiments are discussed in Ferrar's work. For Ferrar, the enterprise of the Virginia Company had collapsed due to the lack of initiative in locating and commercialising natural resources. Both the adventurers and planters had been too conservative and reliant on a limited range of natural commodities. In his view, they lacked "the harts and beleife to adventure … for they want Nothinge to Effect it but Couradge and Will: what a Pitty Alas."[69] In Williams' and Ferrar's view, the problems lay with the risk-averse and disinterested English court, merchants and planters and the resistance of the Spanish and the indigenous peoples to the English colonial project.

These five writers presented two main points of contention - governance and historical contingency - regarding the failure to realise Virginia's potential as a flourishing colony. All of the writers agreed that there was an over-reliance on tobacco and that new natural commodities were necessary for the recovery of Virginia. Williams conveyed the deleterious condition in Virginia in terms of health

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[65] Williams, *Virgo Triumphans*, p. 5.
[66] Berkeley, *Discourse and View of Virginia*, 3. For a discussion of the importance of the indigenous attacks against English settlements on English colonial policy, see: Alden T. Vaughan, "'Expulsion of the Salvages': English Policy and the Virginia Massacre of 1622," *The William and Mary Quarterly* 35, no. 1 (1978): 57-84.
[67] Williams, *Virgo Triumphans,* p. 44.
[68] See Charles H. Carter, "Gondomar: Ambassador to James I," *The Historical Journal* 7, no. 2 (1964): 189-208 and Emily Rose, "The End of the Gamble: The Termination of the Virginia Lotteries in March 1621," *Parliamentary History* 27, no. 2 (2008): 175-197.
[69] John Ferrar, marginalia within William Bullock's *Virginia Impartially Examined*, p. 2.

and sickness, "those Planters who are so infected with that disease [tobacco] of the Countrey, that they cannot admit of any other Staple." [70] Berkeley explained the heavy dependence on tobacco as a staple commodity in Virginia due to its habit-forming nature:

> this vicious habit of taking Tobacco possesse the English Nation, and from them has diffused it self into most parts of the World; this I say being brought to us from Spain at great prices, made our Governour suppose great wealth might be raised to particulars by this universal vice … This was the first and fundamental hinderance that made the Planters neglect all other accessions to wealth and happiness, and fix their hopes only on this vicious weed of Tobacco, which at length has brought them to that extremity, that they can neither handsomely subsist with it, nor without it.[71]

Worsley conceded that the only substantial value Virginia had contributed to England was in the form of tobacco.[72] Ferrar also asserted that the uncertainty about whether the plantation would continue and high selling prices of tobacco left the planters with little incentive to develop any alternative commodities. He recorded that "true Tobaco boore 5' [i.e. five shillings] pound price made the Planters madd upon it and would not be beaten of it [by the Virginia Company]."[73] Furthermore, Ferrar saw that "men have had no heart to Plant for Posterity, but every man for the present, Planted Tobacco to get a livelyhood by it."[74] So instead of inventorying all of nature's riches, the Virginian people had focused their efforts on just one drug that was contentious but known to turn a fast and ready profit: tobacco.

The singular focus on tobacco resulted in overplanting and then oversupply to England, which reached such a point that it became a loss-making venture with shipping and custom taxes consuming most of the price of sale. Bullock explained that:

> the Disease growes by the Commoditie … they have made *Tobacco* their Staple, which hath been sent for England in such quantities, as many yeares there hath beene some hundred thousand pounds weight, not worth the fraught and custome, and by this means many a poore Planter hath been destroyed.[75]

Here tobacco, once a medicinal drug, had become a poison and the cause of disease that destroyed poor planters. Small-holders could not afford to diversify, and their dependence on tobacco for their livelihood led to their demise when the wealthy plantocracy flooded the market with their large-

[70] Williams, *Virgo Triumphans,* p. 21.
[71] Berkeley, Discourse *and View of Virginia*, pp. 5-6.
[72] Worsley, *A Memorandum of the Virginia Plantation* [61/5/1A]
[73] John Ferrar, marginalia within William Bullock's *Virginia Impartially Examined*, p. 11.
[74] Ferrar, *A Perfect Description of VIRGINIA,* p. 10.
[75] Bullock, *Virginia Impartially Examined*, 11.

scale tobacco production. The figurative relationship between commodity and health is clearly drawn by Bullock to convince his readers in the Parliamentary government of the necessity to create new medicines and to expel Virginia's poisons.

Advice for the Recovery of the Virginia Colony

Bullock reminded his readers that while Barbados had initially encountered the same problem as Virginia of a dependence on the single staple commodity of tobacco, it had now risen above the "languishing of the disease Virginia now grones under."[76] Through diversification, Barbados had emerged from the shadow of Virginia, surpassed it in esteem, and achieved a reputation as a place of rich natural commodities yielding high returns on investments. Bullock suggested that it was possible for the same coveted goods, such as sugar, indigo, cotton and ginger, to be grown in southern Virginia as in Barbados. Worsley agreed that the example of Barbados was encouraging to Virginia; by expanding into new commodities, colonists in Barbados had "so prospered that their ground which was at first worth nothing almost is now dearer then in England." [77] Williams put forward that Virginia could actually become even more valuable to England than Barbados because of the "immoderate heate" of Barbados and the "exact temper" of Virginia's climate meant that the latter was "much lesse toylesome."[78]

Once the writers had established that the avenue to the recovery of Virginia's economy was through diversification, they compared the benefits and problems associated with each potential candidate to determine which commodities would be viable and in what order their production should take place. They agreed that the first priority should be crops and industries essential for the survival of the colonists themselves. For example, Bullock concluded that the Virginians should begin with basic staple crops like wheat because they would soon famish without subsistence. As he wrote, "I am sure we can all be masters of the Plough, and shall soon be Masters of the rest."[79] The language of mastering nature and turning its bounty into commodities in Bullock's report was not unexamined exuberance, but a considered plan to expand Virginia's trading power one industry at a time.

Worsley offered a time-scale of when each industry should be developed.[80] Some commodities could "instantly" yield a trade, including wood, rice, flax, anise seeds and fennel seeds. Other natural commodities needed "a little Industry" and included hogs, bees, hides, alcoholic drinks made from

[76] Bullock, *Virginia Impartially Examined,* p. 31.
[77] Worsley, *A Memorandum of the Virginia Plantation* [61/5/1B].
[78] Williams, *Virgo Triumphans,* p. 43.
[79] Bullock. *Virginia Impartially Examined,* p. 32.
[80] Worsley, *A Memorandum of the Virginia Plantation* [61/5/1A].

fruit or corn and linen. With further investment, or "Settlement," Worsley claimed that the following commodities would certainly bring profit: licorice, almonds, pistachios, olives, soda made from the barilla plant and three types of oak. He chose to list medicinal plants alongside other staple commodities as crops that could be both immediately garnered from natural groves and also be regularly cultivated on plantations. It is interesting to note that Worsley was later granted a monopoly for the cultivation of the drug senna in Virginia for fourteen years.[81] This was an example of how Worsley, in words of Charles Webster, "also tried to turn his knowledge to profit."[82] Worsley had withheld senna from his report for the government's designs, reserving this potentially lucrative natural commodity for his own projecting. Williams also contributed that "all sort of excellent Fruits will grow there [Virginia] in full perfection" with little effort, such as: oranges, lemons, pineapples, plantains, peaches, apricots, pears and apples. [83] Sugar, indigo, cotton and ginger, however, would "require a greater industry." [84]

Bullock proposed that the next steps should include enacting the dormant designs that had already been drawn up for the industry of natural materials with the most potential for commercial success. He weighed the advantages and disadvantages of each potential known commodity, noting issues such as production time, profitability and shipping expenses to market. Williams also included a valuation of commodities for consultation that were "growing and to be had in Virginia" from 1621 for reconsideration.[85] In this list, more than half of the commodities had medicinal uses, including anise seeds, roses, mastic, saffron, sumac, madder, puccoon root, various forms of sarsaparilla and allium, and many other "Sweet Gums, Roots, Woods, Berries for Dies and Drugs."[86] Drugs were amongst the best sources of revenue for the colony due to their light shipping weights and good profitability ratios, although Bullock remarked that they did take some initial investment in order to "be brought to perfection."[87]

Bullock viewed expanding the cultivation of drugs, such as sassafras, as an especially valuable opportunity to heal the body, natural and politic. He exerted, "Drugges; truly great quantities of these, will make them Drugges indeed."[88] The first reference to drugs is to the medicinal plants,

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[81] "America and West Indies: October 1666," in Sainsbury, ed., *Calendar of State Papers*, pp. 414-422.
[82] Webster, "Worsley, Benjamin."
[83] Williams, *Virgo Triumphans,* p. 43.
[84] Ibid.
[85] Ibid, pp. 45-47.
[86] Ibid, p. 46. Here Williams appears to be citing John Bonoeil, *Observations to be Followed, for the Making of Fit Roomes, to Keepe Silk-wormes in as also, for the Best Manner of Planting of Mulbery Trees, to Feed Them* (London, 1620).
[87] Bullock, *Virginia Impartially Examined,* p. 32.
[88] Ibid.

while the second is to the metaphorical impact of these plants healing the economic and social situation in Virginia. The development of a diversity of drug products could make Virginia a source of healing for the commonwealth. Many drugs were included in Bullock's list for the Parliamentary Government's consultation on the economic development of Virginia supported by a detailed analysis dismissing the various difficulties the settlers faced in harvesting them. Indeed he asserted that "Herbes for Physick [in Virginia] … grow without any such trouble as is taken for them in England, and for delicacie farre exceeding the best Gardens here in England."[89] Williams advocated the view of the "small toile" and "considerable profit" in gathering wild medicinal plants that did not even require tending.[90] He added that "[s]arsaparilla be an extraordinary vendible Commodity" and so deserved particular attention.[91] Ferrar recommended that the "Physicke Flowers" and other "kinds of Druggs ... that the Indians use" should also be investigated as future commodities. [92]

In the search of new medicinal plant commodities, lessons could be learned from the experience of large-scale tobacco production as the excessive volume of tobacco produced was not the only reason for its demise. Tobacco's requirement for labour was intensive, dangerously so in the summer months: "the poore Servant [who] goes daily through the rowes of Tobacco stooping to worme it, and being over-heated he is struck with a Calenture or Feaver, and so perisheth: This hath been the losse of divers men."[93] The irony here was stark: the process of cultivating a new healing drug for export to Englishmen had caused its Virginian labourers to perish. The consumption of Virginian drugs by the English elite was responsible for the death of the English poor, who were rounded up and sent to Virginia to work as indentured servants.[94] While tobacco had been successful in generating wealth in the early years of the plantation, the combination of a small labour force and high mortality of tobacco workers was a clear problem. The writers expressed how they had learned from the lessons of tobacco that while a drug could be very profitable, it needed to be attained with less intensive labour. Additionally, a diverse range of drugs would need to become commodities so that Virginia would not become dependent again on a single staple commodity.

The writers contemplated how many more commodities in Virginia awaited discovery by the English. Ferrar emphasised that countless valuable commodities could be found just beyond the current

[89] Ibid, p. 7.
[90] Ibid, p. 43.
[91] Ibid, p. 41.
[92] Ferrar, *A Perfect Description of VIRGINIA,* pp. 2, 9.
[93] Bullock, *Virginia Impartially Examined,* p. 12.
[94] For more information about the early white slavery in the English plantations in America see Don Jordan and Michael Walsh, *White Cargo: The Forgotten History of Britain's White Slaves in America* (New York: NYU Press, 2008).

plantation's borders. He claimed that "they [the Virginians] doubt not to find some rich and beneficiall Country, and commodities not yet known to the world that lies West and by South now from their present Plantation."[95] Williams pondered that Virginia's "Cabinets of excellency" had many more secrets to uncover "by that uncabinetting and deciphring of Nature."[96] Bullock advocated for a complete inventory of nature to be undertaken, "wherefore, we will examine all, and make choice of the best."[97]

The next step for the expeditions to come to fruition would be for them to gain government endorsement and support. Worsley and Williams both advocated for more adventurers to be commissioned for further exploration near Virginia in their reports to the Parliamentarian government. Worsley requested "that more adventurers will bee drawen in upon the engagements ... to carry on the worke unto some good perfection."[98] Williams provided a plan for how the discovery mission of "exemplars of all Mineralls, Drugges, Dies, Colours, Birds and Beasts" should be conducted. [99] He proposed that two hundred men would be needed and that they should set up garrisons every twenty to twenty-five miles because "the industrious Spanyard practiseth in his designe of discoveries."[100] He urged that uttermost secrecy was imperative for the mission to succeed and that "by conference with the Indians, [they could] discover with much ease" new natural commodities. [101] Williams also addressed the adventurers directly with instructions about how to investigate nature for medicinal substances. For example, he advised that, "[i]n the month of June, bore holes in divers sorts of Trees, wherby you shall see what gums they yield, and let them bee well dried in the Sun every day, and send them home in very dry caske."[102]

Ferrar also advised that the properties of trees deserved particular attention as there were likely to be "many more kindes excellent [and] good" trees like sassafras and that there were "[t]rees above 20 kinds, and many no English names." [103] Williams agreed that there were various trees "of whose vertues wee are yet ignorant" and that by "collecting the juce thereof, a scrutiny be made which are fit for Medicinall Liquor and Balsomes." [104] He also suggested that such trials could be conducted on the trees' bark and berries "since the labour is little or nothing, and the issue if succesfull of

[95] Ferrar, *A Perfect Description of VIRGINIA,* p. 8.
[96] Williams, *Virgo Triumphans,* pp. 35, 39-40.
[97] Bullock, *Virginia Impartially Examined,* p. 32.
[98] Worsley, *A Memorandum of the Virginia Plantation* [61/5/2B]
[99] Williams, *Virgo Triumphans,* pp. 36-37.
[100] Ibid.
[101] Ibid.
[102] Ibid, p. 47.
[103] Ferrar, *A Perfect Description of VIRGINIA,* p. 19.
[104] Williams, *Virgo Triumphans,* pp. 5-6.

remarkable advantage." [105] Williams added that, if their experiments were successful, then the trees could easily be turned into commodities as there were plentiful "naturall Grove[s] of Oakes, Pines, Cedars, Cipresse, Mulberry, Chestnut, Laurell, Sassafras, Cherry, Plum-trees.[106] As well as commodifying and transpositioning "Wild Plants," Williams proposed that "Fishes may be unwilded, and become Domestick" as well. [107] For example, he contended that experiments should be performed to extract medicinal oils from the livers of the "more delicate Fishes" like the sturgeon. [108] Williams also considered the repurposing of tobacco by altering its form from a dried leaf to a liquid or fresh leaf. He reported alternative medicinal uses and preparations for tobacco:

> Yet is not Tobacco without its vertues: … the juice thereof (when greene) applyed to any wound … will heale it speedily, and almost miraculously; the leafe bruised or stamped, and applied to any bite or sting of a venemous quality, to any wound made by a poysoned arrow, the green leafe heated in hot ashes, and layd upon any part of the body afflicted with aches, will worke effects answerable to the most powerfull operations of Nature.[109]

Williams maintained that "wee justly entertaine beliefe that many excellent Medicines" in Virginia after relating a story of how sassafras infused and boiled in water could cure "a contagious disease, of which Phisitians could give no Reason or Remedy." [110] Therefore, it was incumbent upon Williams and his contemporaries to conceive and propagate their own medical receipts to also include the New World's *naturalia* lest "the World had continued in ignorance, and must for ever have layne sick of an incurable folly in the Fooles Hospitalls."[111] Yet this 'receipt' was both literal and metaphorical; Williams drew on parallels between medicine and politics to express his political arguments with fewer constraints under the veil of medicalised language. As I discussed in the Introduction, this same tactic that had been applied in writing natural histories to express ideal forms of political order through allegories.

For the five writers, Virginia was part of the New World, a Garden of Eden, with infinite possibilities for new natural commodities, including "the admirable abundance of Minerals, vegetables, [and] medicinall drugs." [112] Bullock contended that Virginia could even become an English store cupboard

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[105] Ibid.
[106] Ibid, p. 1.
[107] Ibid, pp. 42, 15-16.
[108] Ibid, pp. 15-16.
[109] Williams, *Virgo Triumphans,* p. 21.
[110] Ibid, pp. 5-6. Interestingly, Williams described the providence of the information about the preparation and use of sassafras. During the French voyages to Canada, they and the indigenous people fell ill and could only be cured by the native recipe for medicinal sassafras. I will discuss this 'origin myth,' which was repeatedly retold in English printed texts, in more detail in Chapter 3.
[111] Ibid.
[112] Ibid, To the Supreme Authority of this Nation, The Parliament of ENGLAND.

for all of nature's goods. He wrote that Virginia "may well deserve the name of the New-Paradice … a land full of pleasure and delight, yielding abundance of the best Staple commodities in the whole world." [113] Williams argued that Virginia could restore its reputation through its natural treasures, which could be easily grown in its untouched, fertile soil. He vividly portrayed Virginia as "the incomparable Virgin [who] hath raised her dejected head, cleared her enclouded reputation ... her unwounded wombe full of all those Treasuries ... entitle her selfe to an affinity with Eden, to an absolute perfection above all but Paradize."[114] Ferrar echoed Williams in his evocation of Virginia's fertility and professed that it would produce "whatsoever is committed into the Bowells of it … [with its] fat rich Soile … and wholesome Waters."[115] Berkeley further claimed that Virginia was "capable of the diversities of all Northern and Southern commodities" due to its climate and location.[116] The metaphor of Virginia as a new Eden or paradise was not a new tactic in the promotion of England's American colonies, but the medicalised imagery of Virginia as having an 'unwounded wombe' was in stark contrast with the injuries and death of warfare and religious persecution that England had recently experienced; the womb of Virginia could give birth to the medicines that could heal these wounds.

Through their allusions to Virginia as Eden or paradise, the writers were attempting to evoke desire and longing in their readers. They provided specific examples of Virginia's luscious natural bounty, for example, "multitude[s] of flowers," "large and delicious Strawberries" and "West Indie Potatoe[s] … [that were] excellently delicious and strongly nourishing."[117] Both Bullock and Ferrar praised the quality and taste of Virginian bacon, writing that "the flesh [was] pure and good" and that it "surpasseth our *English.*"[118] Williams also enticed his readers with reports of "infinites of wilde Turkeyes, which have beene knowne to weigh fifty pound[s]."[119] The writers gave these stimulating examples as evidence of natural riches that could be found in Virginia. Their ambition was for Virginia to become as prominent as China or Persia for trading, and thus "increasing its wealth, reputation, and greatnes." [120] Williams cited that "already can Virginia boast of Cinamon, which if transplanted might not be inferiour unto any" and that "Cloves perfume Virginia with as aromatick

[113] Bullock, *Virginia Impartially Examined*, pp. 3, 32.
[114] Williams, *Virgo Triumphans,* p. 44.
[115] Ferrar, *A Perfect Description of VIRGINIA,* p. 9.
[116] Berkeley, *Discourse and View of Virginia*, p. 1.
[117] Williams, *Virgo Triumphans,* pp. 1, 39, 42.
[118] Bullock, *Virginia Impartially Examined*, p. 53 and John Ferrar, marginalia within William Bullock's *Virginia Impartially Examined*, p. 1.
[119] Williams, *Virgo Triumphans,* p. 2.
[120] Ibid, To the Supreme Authority of this Nation, The Parliament of ENGLAND.

redolency as the Philipine Gardens."[121] Virginia's latitude, temperate climate and fertile soil meant that it could produce the same drugs that "China may presume to boast of: Whether Nitre, Allum, Quicksilver, Rhubarb, and China Root."[122] Ferrar concluded that in fact there were many commodities that only Virginia could provide and could not obtained from trade with European countries.[123]

Conclusion

The turmoil of the Civil Wars in England and the downturn in the tobacco market disrupted the colonial project in Virginia and left the plantation in a state of economic distress. With the transfer of power to the new Commonwealth government, there was an opportunity to once again present Virginia as a venture worthy of investment. Through the lens of five writers, men who were all dependent on the prosperity of the Virginian enterprise, we can view the central arguments proposed for the revitalisation of the colony following the fallow years of the Civil Wars. While the writers disagreed about the political structures that would best achieve this recovery, they all portrayed Virginia as a new paradise, full of bounteous natural commodities, ripe for harvesting. The writers offered vivid descriptions of the flora and fauna in this New World in order to tempt their readers and encourage them to invest in remote outposts of the English empire. Medicinal plants, such as sassafras, anise seeds and sarsaparilla, were viewed as particularly lucrative products that could restore and maintain the commercial health of Virginia. These plants could heal both the bodies natural of English patients and the body politic of the English nation by contributing to a strong and diversified colonial economy. This idea was part of the persistently medicalised language used by all of the writers as an allegory for political discussions. Virginia and England were suffering economic and political ill-health for which the writers offered remedies.

Of the five writers, it was Benjamin Worsley who was most influential in reaching the Parliamentarian government. The others were viewed with suspicious due to their Royalist sympathies, and in the case of Berkeley, outright rebellion. Worsley's recommendations for subduing the Virginia colony and deposing Berkeley as governor were supported by the Admiralty Committee and enacted by the Council of State to protect trade with the plantations. Despite differing political ideologies, the writers largely agreed on the economic designs for the future of Virginia, including the development of diversified drug economy. However, before the writers'

[121] Ibid, p. 39.
[122] Ibid, p. 19, see section 'VIRGINIA compared to CHINA'.
[123] Ferrar, *A Perfect Description of VIRGINIA*, title page.

grander ambitions could be realised, the English government would change regime once again resulting in a further delay in the prospecting and full inventory of *naturalia* in Virginia. In the next chapter, I will explore how a drug from Virginia, sassafras, was perceived in English print culture.

Chapter 3

The Reception of a New World Drug: 100 Years of Sassafras in English Print

Introduction

> The Spaniards and the Portugals, that came from new found Spaine,
> Doth use to boyle them Sassafras, to ease them of their paine;
> And taking of no other drinke, for this they thinke most sure,
> Save that each other fourth day, whilst this drinke doth endure,
> They purge them with Mechocan and so performe the cure.
>
> J. T. (1619)[1]

Sassafras is a deciduous tree that can grow up to 100 feet tall with aromatic leaves, bark and roots. It has green apetalous flowers and dimorphous leaves that have a citrus-like aroma. The sassafras roots, leaves and bark were gathered for their medicinal virtues in treating the pox, scurvy and women's infertility and many other diseases. The origin of the name sassafras is uncertain. It is either derived from a Spanish representation of the Latin *saxifraga*, meaning rock breaking, or adopted from an American indigenous language.[2] In Chapter 2, I discussed how the English learnt of sassafras as healing commodity both in terms of the economic and political vitality of the Virginia colony and as medicinal drug. In this chapter, I analyse how sassafras was discussed in a large sample of English printed texts published before 1680. The stanza above, from an early modern English satirical book of verse, reveals how medicinal plants from the New World were understood in early modern England. Stories of the earlier medical encounters of the Spanish and Portuguese with the New World permeated into amusing and cheap English print, providing evidence that American drugs, such as sassafras and mechoacan, were widely known in the early seventeenth century. The method of preparation and consumption of these drugs could easily be remembered in a simple rhyme. The conviction of their efficacy and appropriateness in treating the pain and disease of the pox was not questioned. The sassafras drink was consumed in its entirety and with the aid of mechoacan, a purgative white tuberous root, the cure was perfected.

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[1] J. T., *The Hunting of the Pox* (London, 1619).
[2] "sassafras, n." *Oxford English Dictionary* (Oxford: Oxford University Press, 2018).

The story of the first European encounter with the healing properties of sassafras was that of the Breton explorer Jacques Cartier (1491-1557), on his second voyage to the Saint Lawrence Bay region in Canada. In 1535–1536, his fleet of three ships sailed down the Saint Lawrence river to the town of Hochelaga. During the winter, the expedition was afflicted with disease and many of its members perished. What that disease was, and how many of them died, varies between accounts.[3] Indigenous people aided the Frenchmen to treat their disease with a decoction of sassafras roots. The men were believed to have been miraculously recovered from the sap and leaves of a sassafras tree. Several versions of the story praise the virtues of sassafras unreservedly, and advocate its use in England, reiterating the line: "[s]assafras; for the last and soueraigne remedie, I send backe the Patient to the tree of life."[4] The association of sassafras as a 'tree of life' was a biblical allusion to greater longevity and the restorative virtues of the plant. The implications of 'tree of life' in this culture was connected to the religious ideology of discovering a New Eden of medical knowledge healing both bodies, natural and politic, as I discussed in Chapter 2. As Sarah Irving has argued in reference to Baconian science, that "colonies were not simply new commonwealths, they were places which potentially produced the natural knowledge vital for the recreation of man's original, epistemic empire over the world."[5] The quest to recover Eden, containing the tree of life and the tree of knowledge, was a powerful motivating factor for the European scientific exploration and colonisation of the Americas.[6]

Cartier's story of how sassafras was discovered to work and how it should be consumed was a powerful 'origin myth.' It promoted experience and discovery. By working with the indigenous populations to overcome obstacles, Europeans would be able to realise the riches of the New World. It was an excellent device for profiteers looking to benefit from commercialising new medicinal plants from British America.

The first, brief, reference to the Cartier story was in Monardes' *Joyfull Newes*, and through time it was retold, adapted and expanded to fit each author's agenda. More frequent retellings corresponded with periods when authors attempted to promote the commercialisation of sassafras. The first complete rendition of this encounter in English-language printed sources comes nearly one hundred years after Jacques Cartier's 1535–1536 expedition, in Samuel Purchas' work.[7] In 1625,

[3] Samuel Purchas, *Purchas his Pilgrimage* (London, 1625); Robert Evelyn, *A Direction for Adventurers* (London, 1641). These accounts are discussed further below.
[4] Purchas, *Purchas his Pilgrimage*.
[5] Sarah Irving, "'In a Pure Soil': Colonial Anxieties in the Work of Francis Bacon," *History of European Ideas* 32, no. 3 (2006), p. 249.
[6] Carolyn Merchant, *Reinventing Eden: The Fate of Nature in Western Culture* (London: Routledge, 2003), chapter 7.
[7] Purchas, *Purchas his Pilgrimage*.

Purchas reported that these men suffered from scurvy that winter, which killed twenty-five of the men. He related this story to his own promotion of the trade in sassafras and spoke of it in the highest regard, emphasising that they were assured of sassafras' excellent medicinal virtues, and that it was "a tree of high price and profit … [the] roots whereof at three shillings the pound are three hundred thirty sixe pound the tunne."[8] In 1641, the colonist Robert Evelyn repeated the story, although in his version sassafras treated the ague rather than scurvy, thereby expanding the usage of sassafras for other diseases while extending the tradition of sassafras as a cure for scurvy.[9]

These vignettes attest to the cultural and economic importance of sassafras in early-seventeenth-century England. Through a survey of the reception of sassafras in literary, medical, religious, travel, georgraphical and political texts, I follow the trends in how sassafras was perceived as economic commodity, medical drug and cultural marker. This chapter speaks to two forms of consumption of a New World drug. The first is the consumption of knowledge about sassafras, and the second is the consumption of the physical drug. By analysing medical texts for both practitioners and lay people, I have recognised how sassafras would have been prepared and for which diseases it was taken.

The importance of sassafras was driven by the commercial and political imperatives of England's early empire. It was a natural commodity that grew in abundance in England's American territories and could be easily harvested, creating an industry requiring little investment. Groves of large sassafras trees grew in abundance in the English North American colonies, but as their roots and bark were stripped the trees died back, creating a boom-bust cycle in exports of sassafras. As early colonial settlements grew in size and population, they could cover a larger radius of territory in the search for new sources of sassafras, but these new sources were eventually exhausted due to a lack of sustainable harvesting.

How was knowledge about New World drugs presented, consumed and contested in early modern print? In this chapter, I will consult 182 texts published in England between 1577 and 1680 that consider sassafras, including letterpress books, pamphlets, serials, newspapers and other ephemera. While physicians were the most common authors of works discussing sassafras, clergymen, poets, explorers and colonists were also engaged in sharing knowledge about sassafras. I find that sassafras was not regularly referred to immediately after its introduction in English print, but rather after a concentrated effort to commercialise the drug, resulting in a delay of nearly seventy years for sassafras to become regularly referenced. From 1650, the frequency of discussions of sassafras and

[8] Ibid, p. 1651.
[9] Evelyn, *A Direction for Adventurers*.

the diversity of diseases that it was recommended to treat, increased significantly in scale. After sassafras became more prevalent, it was co-opted into contemporary debates, such as those between Galenic and chemical physicians, which had little to do with its status as originating from the New World.

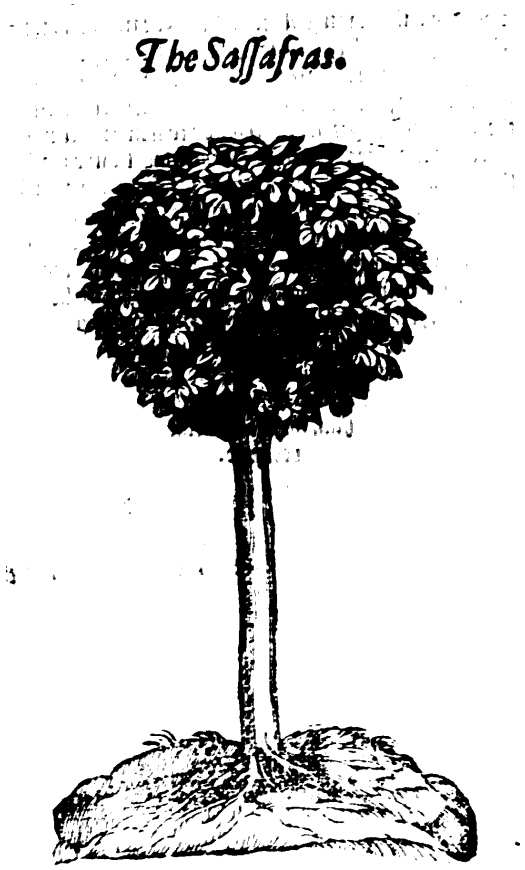

Figure 11. *Sassafras Tree Depicted in* Joyfull Newes Out of the Newfound World*, 1580*
Source: Nicolás Monardes, *Joyfull Newes Out of the Newe Founde Worlde,* p. 46.

As I mentioned in the Introduction, the earliest book printed in England about sassafras was Frampton's 1577 translation of Monardes' publications on New World drugs entitled *Joyfull Newes out of the Newfound World*.[10] Monardes' work has been discussed in the historiography as one of the earliest sources to introduce sassafras to Europeans.[11] However, locating an entry point for a drug or its associated knowledge does not mean that its further diffusion or permanence within the new culture are inevitable. We need to explore the trajectory by which New World drugs were made

[10] Nicolás Monardes, *Joyfull Newes Out of the Newe Founde Worlde*, translated by John Frampton (London, 1577).
[11] See, for example, Daniela Bleichmar, "Books, Bodies, and Fields: Sixteenth-century Transatlantic Encounters with New World Materia Medica," in Londa Schiebinger and Claudia Swan, eds., *Colonia Botany: Science, Commerce, and Politics in the Early Modern World* (Philadelphia: University of Pennsylvania Press, 2005): 83-99; Donald Beecher, "The Legacy of John Frampton: Elizabethan Trader and Translator," *Renaissance Studies* 20, no. 3 (2006): 320-339.

available, experienced and acculturated. For example, Klein and Pieters have shown that while cinchona entered the European market in the 1640s, it was only decades later that it became an accepted medical remedy for fevers.[12] This chapter contributes to the emerging literature on drug trajectories within the wider context of the global circulation of things.[13]

Sassafras was unknown to the English experience before the sixteenth century, which allows us an entry point for studying the reception of knowledge about a specific drug in early modern print. While these medicines from the New World had not yet been appropriated into European medical culture, there was a long-standing precedent for incorporating drugs outside the Mediterranean-centric texts of Galen and Hippocrates into later medical theory and practice.[14] Sassafras makes for a particularly useful case study for investigating the development and dissemination of knowledge about an exotic drug. Firstly, it was not referred to in English print prior to the late-sixteenth century, and so had not accumulated layers of past understandings from direct experience and Biblical, classical and medieval writers.[15] Secondly, the number of references to sassafras in early modern English printed works is sufficient to examine wider trends without compromising an attentive, qualitative study.

It is crucial to use large sample sizes over long periods if we want to make claims about the trajectories of knowledge. Small sample sizes and short durations can lead us to misleading results. An example here is Russell M. Magnaghi's comparison between Monardes' 1580 list of diseases cured with sassafras and the list presented in herbalist and botanist John Gerard's (c. 1545–1612) herbal published in 1633. From Magnaghi's comparison of these two texts, he claimed that "the exaggerated benefits of sassafras and other plants were questioned" across the seventeenth century.[16] While Gerard did not include all of Monardes' recommendations in his herbal, he also did not refute any of Monardes' claims regarding the medicinal benefits of sassafras. Furthermore,

[12] Wouter Klein and Toine Pieters, "The Hidden History of a Famous Drug: Tracing the Medical and Public Acculturation of Peruvian Bark in Early Modern Western Europe (c. 1650–1720)," *Journal of the History of Medicine and Allied Sciences* 71, no. 4 (2016): 400-421.

[13] Harold J. Cook, and Timothy D. Walker, "Circulation of Medicine in the Early Modern Atlantic World," *Social History of Medicine* 26, no. 3 (2013): 337-351; Anna E. Winterbottom, "Of the China Root: a Case Study of the Early Modern Circulation of Materia Medica," *Social History of Medicine* 28, no. 1 (2014): 22-44; Wouter Klein, Kalliopi Zervanou, Marijn Koolen, Peter van den Hooff, Frans Wiering, Wouter Alink, and Toine Pieters, "Creating Time Capsules for Historical Research in the Early Modern Period: Reconstructing Trajectories of Plant Medicines," *HistoInformatics* 2017, no. 1 (2017).

[14] Paul Freedman, *Out of the East: Spices and the Medieval Imagination* (New Haven: Yale University Press, 2008), chapter 2; Heidi Hausse, "European Theories and Local Therapies: Mordexi and Galenism in the East Indies, 1500-1700," *Journal of Early Modern History* 18, no. 1-2 (2014): 121-140.

[15] Anthony Grafton, *New Worlds*, *Ancient Texts: The Power of Tradition and the Shock of Discovery* (Cambridge: Harvard University Press, 1995).

[16] Russell M. Magnaghi, "Sassafras and its Role in Early America, 1562–1662," *Terrae Incognitae* 29, no. 1 (1997), p. 20.

Gerard, although highly influential, was not representative of all the writers of the seventeenth century. Many of Monardes' proposed uses returned in texts published after Gerard's herbal. In fact, medical practitioners in the later seventeenth century argued that even more diseases could be cured with sassafras including gout, scurvy and palsy. My survey evaluates which of Monardes' original recommendations continue through a one-hundred-year reception period, and it also investigates new uses that came to be attributed to sassafras over time.

By studying the form and structure of historical records, we can understand how early modern writers managed and presented information.[17] Reflecting on the use of techniques of data visualisation to understand a large corpus of seventeenth-century medical records, Lauren Kassell warns that these techniques potentially "privilege the quantitative over the qualitative and the certain over the uncertain."[18] We must critically reflect on what we can and cannot know, recognising the limitations while embracing the potential to illuminate continuity and change.

Many of the texts examined in this chapter are compilations; bodies of knowledge collected in one place. The creators of these texts often presented them as current and complete, containing all known information on a particular topic. Ann Blair has shown that these printed works often originated as personal manuscripts, and that they reflected many of the problems of information management, collaboration and wider sharing of these notes.[19] Compilers selected materials that would promote their own agendas and viewpoints, or those of the person who had commissioned the work. Examples include collections of travel accounts by a variety of authors who had all visited the same place, herbals that brought together botanical descriptions of all plants and their uses, and medical treatises that were enlarged to address new diseases and remedies.

Within these compilations, naming was an important device for readers to locate information. Dániel Margócsy has highlighted the importance of naming in the identification of exotic plants. He discussed how a common language and agreed name, often used in conjunction with encyclopaedias, were needed to avoid mistaken identities before the widespread adoption of the Linnaean binomial classification system.[20] Sassafras was applied consistently as a name identifier in Latin, French, Spanish and English, allowing Europeans who spoke these languages to exchange

[17] Ann M. Blair, *Too Much to Know: Managing Scholarly Information before the Modern Age* (New Haven, CT: Yale University Press, 2010).
[18] Lauren Kassell, "Paper Technologies, Digital Technologies: Working with Early Modern Medical Records," in Anne Whitehead, Angela Woods, Sarah Atkinson, Jane Macnaughton and Jennifer Richards, eds. *The Edinburgh Companion to the Critical Medical Humanities* (Edinburgh: Edinburgh University Press, 2016), p. 130.
[19] Ann M. Blair, *Too Much to Know*.
[20] Dániel Margócsy, "'Refer to folio and number': Encyclopedias, the Exchange of Curiosities and Practices of Identification before Linnaeus," *Journal of the History of Ideas* 71, no. 1 (2010): 63–89.

valuable written information about this drug with less concern about misattribution. While we cannot be certain that all Europeans writing about sassafras were referring to the same plant, none of the writers demarcated distinctions between the sassafras specimens discussed by other Europeans in this period. The writers did, however, pay careful attention to the indigenous peoples' names for sassafras, such as *winauk*, *pavane*, *ameda* and *hanneda*, so that they could attribute information received under those names correctly.[21]

The spread of sassafras and other New World drugs in early modern Europe is often attributed to Monardes' books on *materia medica.* These works may have been the first point of access in European languages to information about these drugs, although several writers did cite earlier medical practitioners as being familiar with medical plants from the New World in their medical practice. For example, the clergyman Robert Burton referenced the Italian physician Johannes Baptista Montanus (1498–1551) as regularly using the decoction of guaiacum, sarsaparilla, sassafras and the flowers of Carduus benedictus (a type of thistle) in his consultations.[22] When I analysed how often early modern writers considered these drugs in the English case, however, I discovered that the reception of associated knowledge was not immediate. The data presented in this chapter reveals that there were very few references to sassafras in the English medical literature in the first fifty years after Frampton's translation of Monardes, except in relation to treatment of the pox.

A Longitudinal Analysis of New World Drugs in Early Modern English Print

> Sassafras.
> A tree of great vertue, which groweth in the Florida of the West Indies: the rinde hereof hath a sweet smell like Cinnamome. It comforteth the lyver, and stomack, and openeth obstructions of the inward parts, being hotte and dry in the second degree. The best of the Tree is the roote, next the boughes, then the body, but the principall goodnesse of all resteth in the ryndes.
> John Bullokar, *An English Expositor* (1616)[23]

Sassafras as a Case Study

Sassafras is a useful case study for the development of knowledge about an American drug in early modern England. It is possible to examine sassafras as a case study because it had limited non-

[21] Winauk (or Wynauk) was mentioned in six of the texts and Pavane (or Pavame or Paccame) in eight texts. Ameda and hanneda were only included as the indigenous names for the sassafras tree in Richard Hakluyt, *The Principal Navigations, Voyages, Traffiques and Discoveries of the English Nation* (London, 1599).
[22] Robert Burton, *The Anatomy of Melancholy* (London, 1621).
[23] J. B. (John Bullokar), *An English Expositor Teaching the Interpretation of the Hardest Words Used in Our Language* (London, 1616).

medical uses, was imported into England across the seventeenth century, had only one synonym, and was described by contemporary writers as being prevalent in England's North American colonies. In contrast, other New World drugs did not meet all of these conditions. For example, guaiacum was also imported as a carpentry wood (as highlighted in Chapter 1), and it had multiple synonyms, including lignum vitae and lignum sanctum. Cinchona was referred to by writers as originating primarily in the Spanish colonies and was only regularly imported into England from 1685. It also had several synonyms, such as Jesuit's bark and Peruvian bark.

The quote above is the entry for sassafras in the physician and lexicographer John Bullokar's (1574–1627) *An English Expositor*, which was a dictionary "teaching the interpretation of the hardest words used in our language."[24] This definition included a summary of the same information of medicinal plants that was the standard format in herbals: their place, medicinal virtues and identifying properties. This dictionary was wide-ranging in its coverage, including entries for words in religious, medical and literary texts amongst many other fields of study. Sassafras appeared in dictionaries across the seventeenth century with entries becoming increasingly detailed as new information about its sensual properties and medicinal uses became known and were developed.

The *Oxford English Dictionary* (OED) records the word 'sassafras' as being used to refer to the sassafras tree between 1577 and 1887 and as a medicine between 1577 and 1912. Within my period of study, the OED definitions for sassafras are: 1) "A small tree, Sassafras officinale (N. O. Laurineae), also called Sassafras Laurel and Ague-tree, with green apetalous flowers and dimorphous leaves, native in North America, where it is said to have been discovered by the Spanish in 1528" 2) "The dried bark of this tree, used medicinally as an alterative; also an infusion of this." The earliest reference for both of these definitions in the OED is given as John Frampton's translation of Monardes.[25] The only commonly-used synonym for sassafras was 'ague tree,' which was found in six of the texts. For example, the botanist William Coles (1626–1662) wrote that, aside from the native peoples of the Americas, "(a)ll other Countryes call it Sassafras, and amongst them the English, who call it also the Ague-Tree, from its Vertue in healing the Ague."[26] All six mentions of 'ague tree' were accompanied by the term sassafras or a variant spelling. The existence of only a single, little-used synonym suggests that 'sassafras' gained general acceptance in England as the term for the plant.

[24] Ibid.
[25] The OED also records definition of sassafras as "The wood or timber of this tree," beginning in 1728, but this is based on a list of trees growing in the Boston area, which may or may not have been used in the timber industry. See the entry "sassafras, n.," *Oxford English Dictionary* (Oxford: Oxford University Press, 2018).
[26] William Coles, *Adam in Eden, or, Natures Paradise* (London, 1657), p. 306.

Sassafras was traded throughout the seventeenth century between England and its plantations. In 1602, sassafras was imported in such quantities by Samuel Mace, Bartholomew Gosnold and Bartholomew Gilber that Walter Raleigh was concerned about the potential for a glut in the English market, which would depress its price.[27] In response, a cargo of two hundredweight of sassafras was sold to the German merchant J. B. Zechelius, who re-exported it to Nuremburg in 1603.[28] In the Port Books data analysed in Chapter 1, sassafras shipments were recorded in 1617, 1621, 1633 and 1685, totalling 9,222lb. Furthermore, we saw in Chapter 2 that the reports of William Bullock, Edward Williams and John Ferrar promoted sassafras as a commodity that could be developed for export from Virginia in the middle of the seventeenth century.

The supply of sassafras produced internally in England is not known. To date, there are no figures available for any of England's internal production and commerce of medicines in the early modern period. However, it seems unlikely that England would have grown significant volumes of the sassafras tree domestically. All of the discussions in this print survey refer to sassafras as either a rare specimen grown in speciality gardens or as an import commodity. For example, John Gerard wrote in 1633 that he had given a "figure of a branch taken from a little [sassafras] tree, which grew in the Garden of Master Wilmote at Bow."[29] Another point made against the propagation of sassafras in England was due to the environment in which sassafras throve. For example, Samuel Purchas reported that the English observed that they could only locate sassafras in sandy soil.[30] Many of the texts corroborated this, and it became the suitable environment for sassafras described in herbals. Furthermore, as we will see in Chapter 4, American medicinal plants such as sassafras, sarsaparilla and guaiacum were not good candidates for transplantation due to their difficult propagation in the English climate and the extra costs involved meant that domestic production would not have been profitable or viable.

In the texts consulted, only three potential non-medical uses for sassafras were proposed: a pomade, a foodstuff and a material for carpentry. Each of these was mentioned in only a single text, and thus sassafras was unlikely to have been widely utilised for these purposes.

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[27] David B. Quinn, "Thomas Hariot and the Virginia Voyages of 1602," *The William and Mary Quarterly* 27, no. 2 (1970): 268-281.
[28] "James I: Volume 3, August-September, 1603," in Mary Anne Everett Green, ed. *Calendar of State Papers Domestic: James I, 1603-1610* (Her Majesty's Stationery Office: London, 1857), pp. 26-43.
[29] John Gerard, *The Herball or Generall Historie of Plantes* (London, 1633), p. 1524.
[30] Purchas, *Purchas his Pilgrimage*.

Sources

A wide range of printed materials was consulted, including letterpress books, pamphlets, newspapers and other ephemera, and the complete list of works consulted is provided in an appendix.[31] The diversity in sources allows us to see how sassafras was understood in different aspects of print culture, and how knowledge of sassafras would have been consumed through print. The focus on print permits us to engage with the preservation and transmission of knowledge. It also allows us to explore public knowledge of sassafras available to who were literate or who were read to, had access to print publications and were interested in consuming them. There was also the issue of 'medical literacy,' or the understanding and familiarity of medical theory, terminology and other medical references that required a specialist knowledge, which would have restricted access to some portions of the text to the common reader. I will discuss the complicated issue of medical literacy after I have accounted for the trends in general literacy.

In 1580, estimated literacy rates in England were around 10% for women and 25% for men. By 1680, the proportions had increased to 25% and 40% respectively for women and men.[32] This significant increase in literacy meant that many more people could access knowledge about sassafras directly through text. Female literacy rates and authorship began to significantly increase around the 1640s.[33] This correlates with an increase in the attention paid to women's health issues in discussion of medical uses of sassafras. Before 1650, only three texts referred to female-specific medical uses, related to menstruation and conception. Between 1650 and 1680, many more female-specific health issues were discussed in the texts, including the prevention of miscarriages and easing childbirth.

While these national-level estimates provide an indicator of the general level of literacy, there was significant variation between geographical regions, urban/rural areas, occupations, religious

[31] In order to capture the breadth of voices in the medical understanding of sassafras, priority was given to single editions of each printed text, rather than reprints and later editions. Exceptions include works that were enlarged with additional sections, such as Samuel Purchas' *Purchas his Pilgrimage* (1613) or Richard Bunworth's *A New Discovery of the French Disease* (1656).

[32] David Mitch, "Education and Skill of the British Labour Force," in Roderick Floud and Paul Johnson, eds., *The Cambridge Economic History of Modern Britain, Vol. I: Industrialisation, 1700-1860* (Cambridge: Cambridge University Press, 2004), p. 344. These estimates are based on the ability to sign documents and are, at best, rough proxies for literacy.

[33] On women's literacy rates, see David Cressy, *Literacy and the Social Order: Reading and Writing in Tudor and Stuart England* (Cambridge: Cambridge University Press, 1980), p. 177. On female authorship see, Patricia Crawford and Richard Bell, "Women's Published Writings 1600–1700," in Mary Prior, ed. *Women in English Society 1500–1800* (London: Routledge, 1985).

denominations and birth cohorts.[34] There were not clear distinctions between these categorisations, however, and groups of people could move between them. For example, the country gentry would move to London for the season. When they returned to their rural estates, they would bring their medical supplies and knowledge with them which were obtained in the metropolis.[35]

Although a small percentage of readers could read works in Latin or Greek, the vernacular works considered here were far more widely available. By focusing on texts published in England, we reach the largest proportion of possible readers. Imported books were banned for most of the sixteenth and seventeenth centuries, with the aim of limiting Catholic texts and protecting the Stationers' Company's monopoly.[36] In 1644, only 1% of books sold in England were published abroad; this increased to 4% in 1676 and remained relatively stable at 3% by 1688.[37] Imported books were thus a small minority of total sales in England in the seventeenth century. Furthermore, Freyja Cox Jensen has found that even classically-trained readers often preferred to read English texts that they could navigate with greater ease than those written in Latin and Greek. She has provided evidence that the majority of classical texts published in England between 1550 and 1640 were English translations.[38] We can therefore have confidence that the majority of printed works influencing English readers' perceptions of sassafras were works published in England and in English. All the texts in the database were published in England, and all but three were published in English. Many of the works on sassafras originally written in other European languages, such as French and Spanish, were translated into English. Translations comprise 20% of the total texts discussing sassafras published in England between 1580 and 1680.

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[34] David Cressy, *Literacy and the Social Order*, p. 191-201. For example, literacy rates ranged from 91% in St Mary Magdalen parish in London to 6% in certain parishes in Lincolnshire and Westmorland, as measured by the proportion of marks and signatures in subscriptions to the Protestation, the Vow and Covenant and the Solemn League and Covenant in the 1640s. For an overview of the historiography on literacy in the early modern period, see R. A. Houston, *Literacy in Early Modern Europe*, 2nd edition (Abingdon: Routledge, 2002).

[35] For a discussion of the movement of medical knowledge across geographical places, see Elaine Leong, "Collecting Knowledge for the Family: Recipes, Gender and Practical Knowledge in the Early Modern English Household," *Centaurus* 55, no. 2 (2013): 81-103.

[36] The Act of 1534 'Concerning printers and binders of books' stipulated "That no person or persons resiant or inhabitant within this realm, after the said feast of Christmas next coming shall buy to sell again any printed books brought from any parts out of the king's obedience, ready bounden in boards leather or parchment." The Stationers' Company charter of 1557 granted them a monopoly on printing in London. For a discussion of the imported book trade in the sixteenth and seventeenth centuries, see Julian Roberts, "The Latin Trade," in John Barnard and D. F. McKenzie with Maureen Bell, eds. *The Cambridge History of the Book in Britain, Volume 4: 1557–1695* (Cambridge: Cambridge University Press, 2002): 141-173.

[37] John Barnard and Maureen Bell, "Appendix I: Statistical Tables," in John Barnard and D. F. McKenzie with Maureen Bell, eds. *The Cambridge History of the Book in Britain, Volume 4: 1557–1695* (Cambridge: Cambridge University Press, 2002), p. 792.

[38] Freyja Cox Jensen, *Reading the Roman Republic in Early Modern England* (Leiden: Brill, 2012), p. 63.

The performance of plays and the common practice of reading aloud provided avenues for a greater proportion of the English population to access printed information about sassafras.[39] Although the actual attendance at plays by those lower in the social hierarchy is debated, the historiographical consensus is that theatre was at least accessible to a wide section of society.[40] Many early modern plays were not printed, and the survival rate of those which were printed is likely to be lower than other types of publication that mention sassafras such as medical treatises.[41] Nevertheless, by examining the references to sassafras in plays that are extant, I reveal many cultural understandings of sassafras.

Medical texts present a different challenge in terms of who could have accessed them. Medical literacy was another barrier to the consumption of medical knowledge through print. This was on a sliding scale with the level of engagement the reader desired to have with the text. On one hand, general readers could follow dietary advice and regimes, prepare medicinal receipts and take command of their healthcare in numerous ways. On the other hand, to be fully abreast of the medical debates, it was not sufficient to have access to the printed work and the ability to read. It was also necessary to have the competence to understand and interpret complicated medical terminology, or references in Latin, Greek and Hebrew, and to assess the weight of evidence for a particular theory and its corresponding practice. Additionally, to be in full command of these medical debates, the reader would need to be able to recognise and evaluate references to a number of other books being cited as supporting evidence for the author's standpoint on various issues.

Yet the author's intended readership did not define a medical text's actual readership. As Andrew Wear has discussed, "(d)istinctions between lay and medical readerships were blurred and both groups read works which were ostensibly for the other."[42] The general reader consumed medical works that were intended to be purely for practitioners, and in this process, they could witness some of the debates occurring in medical theory and practice. Furthermore, the political infighting between practitioners was visible to the patients through print, which undermined the authority of

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[39] Joyce Coleman, *Public Reading and the Reading Public in Late Medieval England and France* (Cambridge: Cambridge University Press, 2005).

[40] Andrew Gurr, *Playgoing in Shakespeare's London* (Cambridge: Cambridge University Press, 1987). The debate on early modern theatre-going centres on whether audiences were primarily from the lower or higher social standing. See Alfred Harbage, *Shakespeare's Audience* (New York: Columbia University Press, 1941) and Ann Jennalie Cook, *The Privileged Playgoers of Shakespeare's London, 1576-1642* (Princeton: Princeton University Press, 1981).

[41] On the publication of playbooks in the early modern period, see Zachary Lesser, *Renaissance Drama and the Politics of Publication: Readings in the English Book Trade* (Cambridge: Cambridge University Press, 2004).

[42] Andrew Wear, *Knowledge and Practice in English Medicine, 1550-1680* (Cambridge: Cambridge University Press, 2000), pp. 40-41.

licensed medical practitioners.[43] In this study, the medical texts were not only consulted by medical practitioners and lay people, they were also referenced by projectors and colonists to bolster their arguments for diversification in the colonial economy, as I analysed in Chapter 2.

Methods

I constructed the collection of texts under study from a search of all extant transcribed English printed materials published until 1680. These texts were found using a search of Early English Books Online (EEBO, 180 texts) and JSTOR (two texts) in January and February 2018. A search was also conducted on the Burney and Nichol newspaper collections, which include a large selection of newspapers published in the seventeenth and eighteenth centuries, but the earliest reference to sassafras in these publications was in 1682. The most recent update of EEBO at the time of the search was completed in November 2017, and more texts may have been transcribed since my study. At this time, EEBO included transcribed copies of 44% of extant texts published in England and its territories in all languages until 1700.[44] JSTOR includes historical periodicals such as the *Philosophical Transactions* which are relevant for this period.

Digital tools allow us new historical approaches to locating and managing information. They permit us to search across a large number of early modern texts for a topic of study in ways which were not previously possible, and thus allow us to investigate how a particular issue was understood across a certain period of time. Before the advent of these tools, the only way to find print discussions of a specific term not included in indices would be a manual reading of many thousands of books in libraries and archives across the world. The method I employed in this chapter could be applied to any other distinct word, such as terms used in fashion, cookery or husbandry. For example, Tinde van Andel has explored a related method of tracking the earliest references to New World drugs in Afro-Surinamese medicine in the early modern period by examining a collection of fourteen texts.[45]

Using “sassafras” as a search term, I parallel the manner in which information was organised in the early modern period. Many of the texts contained “alphabetical tables,” in which herbs were ordered by their “common English name,” so that they could be easily found by readers. Discussions of sassafras were found by searching for several different spellings and abbreviations: “sassafras,”

[43] Peter Murray Jones, “Medical Literacies and Medical Culture in Early Modern England,” in Irma Taavitsainen, and Päivi Pahta, eds. *Medical Writing in Early Modern English* (Cambridge: Cambridge University Press, 2011).
[44] EEBO has digitised 96% of the titles in the ESTC and has transcribed 46% of these printed works.
[45] Tinde Van Andel, “The Reinvention of Household Medicine by Enslaved Africans in Suriname,” *Social History of Medicine* 29, no. 4 (2015): 676-694.

"sassafra," "sassafr," "sassaf," "sassa," and "sasa," with the variant option enabled which locates orthographical alternatives, such as "sasafras," "sassaphras" and "sarsafras." I also searched all variants in which the letter 'f' was exchanged for the 's' and vice versa. The most common spellings in both English and Latin texts were "sassafras" and "sassaphras," and the most frequent abbreviation was "sassafr." As discussed above, there was only one synonym for sassafras, "ague-tree," and all mentions of this term included it in the format "sassafras, or the Ague Tree." This idea was explicitly discussed in 1633 in John Gerard's Herbal, for its "English name we are contented to call it the Ague tree, of his vertue in healing the Ague."[46] Yet 'ague tree' was rarely used, and it was always presented alongside the name sassafras, as I discuss later in this chapter. Thus, the search protocol discovered the majority of references to the drug. We should be aware, however, that there may be instances in which sassafras was spelled in such a manner that it was not found by the search. It is difficult for us to know the extent to which this may have occurred, but no substantially different spellings or names were used in the 182 texts consulted. We can therefore be confident that any missing references to sassafras do not significantly alter the results reported in this chapter.

The consulted sources cannot be treated as a complete record of every mention of sassafras in printed materials between 1580 and 1680. The search protocol would not capture any references to sassafras in books that EEBO has yet to transcribe, in those of which no extant copy remains, or in those unknown to the EEBO project.[47] It is unlikely, however, that the inclusion of these sources would significantly alter the results presented in this chapter. EEBO's selection criteria are unrelated to any factors that could either under- or over-represent the prevalence of sassafras or medicine in general being discussed.[48]

This method is more robust with EEBO than other online collections, such as Eighteenth Century Collections Online (ECCO). EEBO has 131,773, or 96%, of the 137,088 records in the English Short Title Catalogue (ESTC) for 1473-1700. ECCO, by contrast, has 202,718, or 58%, of the 346,539 records for 1701-1800. Furthermore, ECCO's transcriptions were generated by Optical Character Recognition, which is significantly less accurate than the human rekeying performed for EEBO.

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[46] John Gerard, *The Herball*, p. 1525.

[47] EEBO contains all of the materials in the English Short Title Catalogue (ESTC) except for the George Clarke Print Collection (GCPC), which is mostly composed of prints of buildings and portraits. A separate search was conducted of the GCPC, and no results were found for sassafras. For information about the creation and coverage of the EEBO project, visit https://eebo.chadwyck.com/about/about.htm, and for a discussion of the use of EEBO for historical research, see Ian Gadd, "The Use and Misuse of Early English Books Online," *Literature Compass* 6, no. 3 (2009): 680-692.

[48] EEBO's priority selection criteria for transcribing texts is that the name of the author of the text appears in New Cambridge Bibliography of English Literature, the text is a first edition and written in English. See https://eebo.chadwyck.com/about/about.htm for further information.

Each search result was manually checked and verified as a reference to sassafras. The sassafras texts were of diverse genres, and I categorised the texts according to the following typology: medical, dictionary, geographical/travel accounts, literary, natural philosophy, political, religious and other. The medical genre comprises pharmacopeias, practical guides and books of receipts written for both practitioners and lay people, theoretical treatises, discourses about specific diseases, and herbals.[49] I consider dictionaries to be all texts whose primary purpose was the exposition of the meaning of words. Under geographical/travel accounts, I include descriptions of places and accounts of voyages and explorations, some of which are miscellanies. Literary texts include poems and plays. Natural philosophy texts include philosophical discussions about the natural world which are not primarily medical, and include topics such as metaphysics, experimental philosophy and philosophical language. Political texts are petitions, acts, royal charters and other published government documents. Religious texts include published sermons, histories of religion and religious discourses and disputes. Other texts comprise husbandry manuals, a history of the world, an autobiography, a book review and a cookery manual.

In addition, I recorded the occupation of the person primarily attributed as writing, editing or compiling the text. Authorship was difficult to determine for all the texts. For example, 13 texts were either anonymous or had authors identified only by initials. Other works were miscellanies that included texts by multiple authors. Furthermore, some books were published posthumously many years after the death of the author. The name attributed to the text on the front page was highly visible to contemporary readers, however, and information about sassafras contained in the text would be associated with this person.

I also collected data on all diseases for which sassafras was considered a remedy. I grouped together all the diseases with variant spellings, or which had multiple recognised names in the early modern period, and recorded them under the name most commonly-used in the texts, with modernised orthography. For example, I recorded as "dropsy" all those texts which included sassafras as being used to treat various swellings in the body, such as 'phlegmaticke Tumor,' 'evil habit of the body,' 'Odema,' 'Oedema,' 'Dropsie in the womb,' 'the Dropsie of the Brest,' 'Anasarca,' 'Ascites and Tympanie' and 'Hydrope Ascite.'

[49] For an analysis of the different forms of medical writing in early modern England, see Irma Taavitsainen, Peter Murray Jones, Päivi Pahta, Turo Hiltunen, Ville Marttila, Maura Ratia, Carla Suhr and Jukka Tyrkkö, "Medical Texts in 1500–1700 and the Corpus of Early Modern English Medical Texts," in Taavitsainen and Pahta, *Medical Writing in Early Modern English*.

Who Wrote About Sassafras, When and In What Context?

In Figure 12, I display the relative frequency of four New World drug names - sassafras, jalap, sarsaparilla and contrayerva - in the EEBO corpus between 1560 and 1700.[50] The trend lines represent a twenty-year moving average of the annual frequency of the occurrence of these drug names.[51] While this n-gram analysis does not include variant spellings or alternate names, and is therefore an underestimate, it still allows us to view general trends in how often these drugs were discussed in early English printed texts. By using a word frequency measure, rather than an absolute number of references, we can consider the variation in the increased volume of printed works over this period.

The earliest of the four drugs to be discussed in the EEBO corpus was sassafras, introduced in the 1570s. Sarsaparilla was next in the 1620s, followed by contrayerva in the 1630s, and jalap in the 1640s. The use of sassafras, sarsaparilla and jalap accelerated from the 1640s onwards, while contrayerva had a later trajectory with a boom in the 1670s. The frequency of 'sassafras' word use increased more than three times between 1640 and 1680, even accounting for the significant increase in the total number of texts included in the corpus during this time.[52] The other drugs also saw significant increases in the frequency with which they were mentioned in the EEBO corpus during the same period. While references to jalap, sarsaparilla and contrayerva decreased between 1680 and 1700, total uses of the word 'sassafras' in the corpus continued to increase. In part this trend is due to sassafras being a typical example on both sides of the Galenic versus Chemical debates discussed later in this chapter. At the end of the seventeenth century, sassafras was included 1.5 times more often than the next most frequently-used New World drug name (jalap), suggesting that it had become well-established within the English corpus. Over the 1560-1700 period, sassafras was the most frequently-used New World drug name in English texts. This challenges the historiographical focus on guaiacum and cinchona as the only New World drugs of importance in early modern European medicine.

[50] The graph was generated using the EEBO N-gram Browser developed by the Humanities Digital Workshop at Washington University in St. Louis. More information is available at https://earlyprint.wustl.edu/eebotcpngrambrowser.html.

[51] The moving average is the annual mean for ten years before and ten years after each year entry. As an example, the frequency for the usage of the term 'sassafras' was 0.0000003 in 1600, which is the mean annual average for 1590-1610.

[52] There are 6,313 texts in the corpus in the 1630s, compared with 11,569 texts in the corpus in the 1670s.

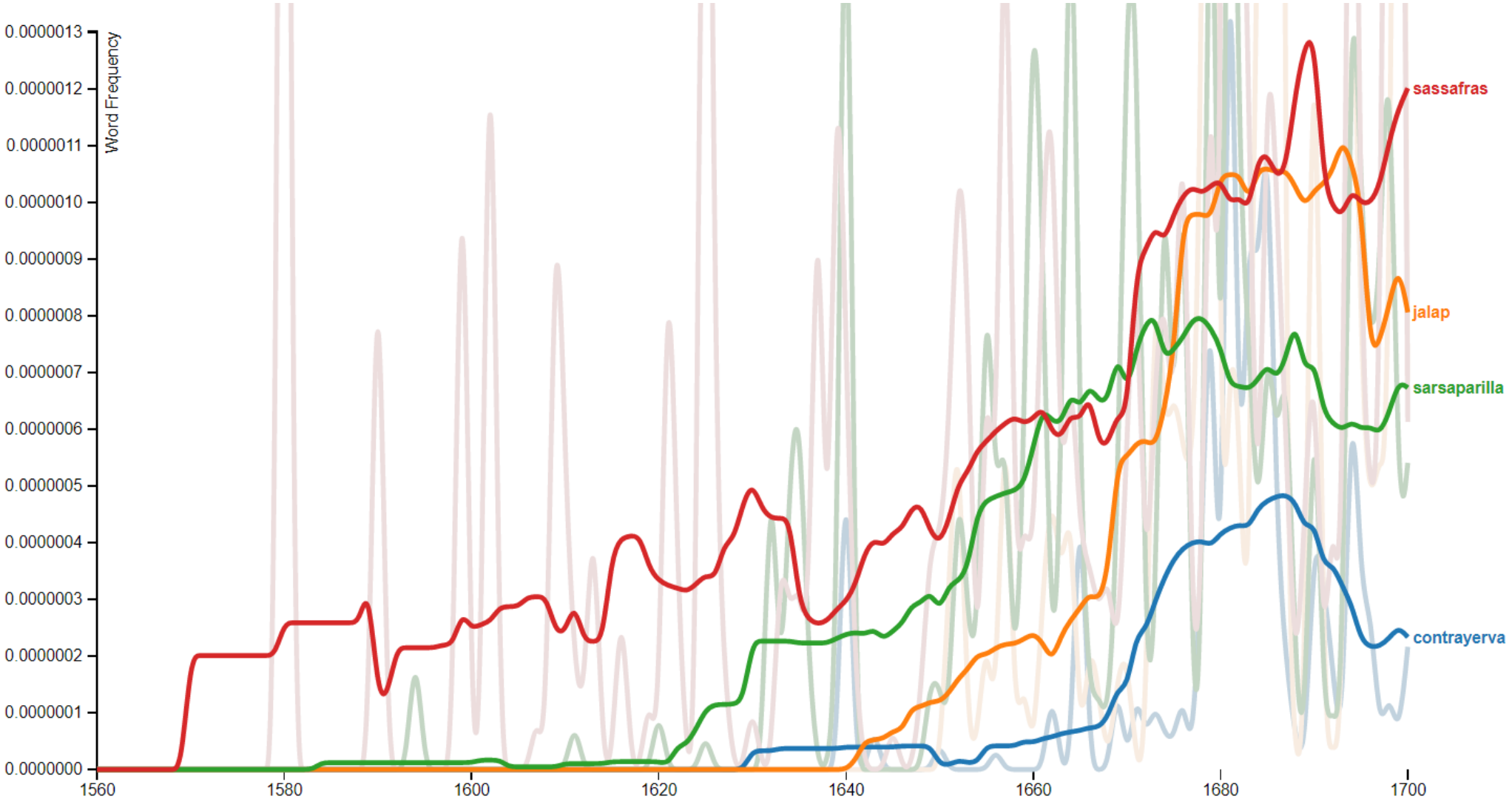

Figure 12. *Sassafras, Jalap, Sarsaparilla and Contrayerva in the EEBO Corpus, 1560-1700*

Table 6. *Descriptive Statistics of the Sassafras Texts Collection*

	Total		1580-1649		1650-1680	
	n	% of texts	n	% of texts	n	% of texts
Type of book						
Medical	114	62.6%	21	38.2%	93	73.2%
Geographical/travel accounts	30	16.5%	19	34.6%	11	8.7%
Literary	10	5.5%	7	12.7%	3	2.4%
Dictionary	6	3.3%	3	5.5%	3	2.4%
Natural Philosophy	7	3.9%	0	0%	7	5.5%
Political	5	2.8%	2	3.6%	3	2.4%
Religious	4	2.2%	2	3.6%	2	1.6%
Husbandry	2	1.1%	0	0%	2	1.6%
History	1	0.5%	0	0%	1	0.8%
Autobiography	1	0.5%	0	0%	1	0.8%
Cookery	1	0.5%	0	0%	1	0.8%
Book review	1	0.5%	0	0%	1	0.8%
Occupation of writer						
Physician	56	30.8%	11	20.0%	45	35.4%
Surgeon	12	6.6%	4	7.3%	8	6.3%
Apothecary	8	4.4%	1	1.8%	7	5.5%
Midwife	1	0.5%	0	0.0%	1	0.8%
Other medical practitioner	17	9.3%	1	1.8%	16	12.6%
Clergyman	14	7.8%	10	18.2%	4	3.2%
Natural philosopher	10	5.5%	2	3.6%	8	6.3%
Poet/playwright	10	5.5%	7	12.7%	3	2.4%
Merchant/explorer	4	2.2%	2	3.6%	2	1.6%
Colonist	4	2.2%	3	5.5%	1	0.8%
Guild/company (corporate authorship)	5	2.8%	4	7.3%	1	0.8%
Government (corporate authorship)	3	1.8%	1	1.8%	2	1.6%
Other[1]	15	8.2%	1	1.8%	14	11.0%
Unknown	23	12.6%	8	14.6%	15	11.8%
Language						
English	179	98.4%	55	100%	124	97.6%
Latin	3	1.6%	0	0%	3	2.4%
Translation status (into English)						
Translated	37	20.2%	7	12.7%	30	23.6%
Not translated	145	79.8%	48	87.3%	97	76.4%
Total number of books	*182*		*55*		*127*	

Source: Sassafras Text Collection

Table 6 above provides descriptive statistics about the types of books, occupations of writers, language and translation status of the sassafras texts collection. The occupation of the writer was identified using the *Oxford Dictionary of National Biography*. If no entry for the writer was available,

[1] Other occupations included: bookseller, cartographer, schoolmaster, merchant, and general writer.

I included the occupation indicated in the text itself. The category of 'other medical practitioners' comprises all other practitioners who were not licensed physicians, surgeons, apothecaries or midwives.

The majority of the writers across the entire period of study were medical practitioners, and most of the books were primarily medical in their subject matter. There were also a significant number of travel and geographical accounts, most relating to journeys to and descriptions of England's American colonies, four of which were examined in detail in Chapter 2. The third most common type of text was literary, written by poets or playwrights.

Table 6 shows that there was significant change in the occupations of authors and the genres of publications mentioning sassafras between the 1580-1649 and 1650-1680 periods, which will be discussed in more detail later in this chapter. In Table 7 below, I highlight the changing proportions of translated texts in the collection over the two time periods. Significantly more translations were found in the second period (23.6%) compared with the first (12.7%).

Table 7. *Number and Percentage of References to Sassafras in Different Types of Texts, 1580-1679*

Decade	**Total texts printed in England**	**Texts referencing sassafras**	**Literary**	**Medical**	**Other**	**Geographical/travel accounts**
1580s	2,724	1	0 (0%)	1 (100%)	0 (0%)	0 (0%)
1590s	2,987	3	0 (0%)	1 (33%)	0 (0%)	2 (67%)
1600s	3,935	6	2 (33%)	1 (17%)	0 (0%)	3 (50%)
1610s	4,883	9	1 (11%)	2 (22%)	4 (44%)	2 (22%)
1620s	5,635	11	0 (0%)	2 (18%)	3 (27%)	6 (55%)
1630s	6,394	15	3 (20%)	10 (67%)	0 (0%)	2 (13%)
1640s	18,247	10	1 (10%)	4 (40%)	1 (10%)	4 (40%)
1650s	13,991	51	0 (0%)	39 (76%)	8 (16%)	4 (8%)
1660s	9,624	31	3 (10%)	20 (65%)	6 (19%)	2 (6%)
1670s	12,695	45	0 (0%)	33 (73%)	5 (11%)	5 (11%)
Total	*81,115*	*182*	*10 (%)*	*114 (%)*	*28 (%)*	*30 (%)*

Source: Sassafras Text Collection

The distribution of sassafras discussions in medical, literary, geographical/travel accounts and other texts between 1580 and 1680 is shown in Table 6 above and Figure 13 below. The type of text is the subject matter of the work as a whole, not necessarily the manner in which sassafras is referenced. Figure 13 displays the moving average of the annual absolute number of references in these different types of printed material in a stacked area graph. We can see from this figure that medical texts substantially increased, both in absolute numbers and as a proportion of all the texts from the 1650s onwards. The first fifty years of writing about sassafras (1580-1630) occurred mostly in texts classified as geographical/travel accounts (43% of the total texts). This trend suggests that knowledge of sassafras was initially developed primarily in the context of travel to and discoveries in the American colonies. Medical texts constitute the largest category in the collection (63%), followed by geographical/travel accounts (16%) and literary texts (6%). As Table 7 reveals, however, it was only from the 1650s that medical texts constituted the majority of texts in each decade. This shift from travel to medical texts came soon after the reports from Virginia discussed in Chapter 2. These reports recommended that the natural commodities produced in the colony should be diversified to include more drugs, including sassafras.

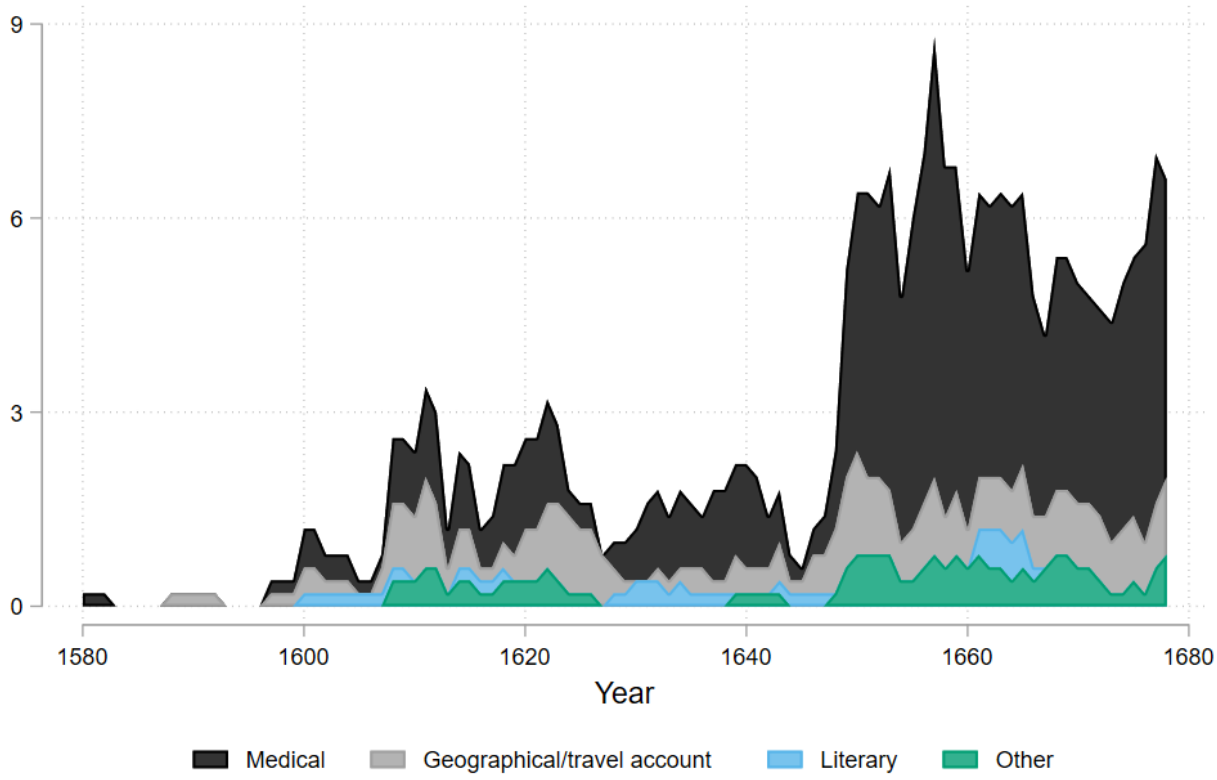

Figure 13. *Types of Texts Mentioning Sassafras, 5-year Moving Average, 1580-1680*
Source: Sassafras Text Collection

Figure 13 presents four periods of sassafras discussions in English print between 1580 and 1680. The first period between 1580 and 1610 saw a limited number of sassafras references. This can be seen as the 'exploratory phase,' coinciding with the English explorations of North America, when sassafras was identified as an early commodity for export. Between 1610 and 1630, there was an increase in terms of scale and diversity in the types of text discussing sassafras, reflecting a wider knowledge of and engagement with the medicine: the 'expansion phase.' During this phase, England established permanent settlements in Virginia and New England, where sassafras trees were abundant. Between 1630 and 1645, there was a decline in sassafras references, driven by a reduction in the number of geographical and travel accounts referencing sassafras: the 'dormancy phase.' This phase reflects the disruption in colonial interest during the period of the Civil Wars. After 1650, there was a shift in scale of the total number of texts published that mentioned sassafras, with the largest increase being in medical texts: the 'expansion phase.' The number of geographical and travel accounts discussing sassafras also increased significantly. This phase corresponds with an increased interest in England's overseas empire during the Interregnum and after the Restoration. Cromwell's Western Design aimed to revitalise England's imperial ambitions by capturing Spanish possessions in the Americas, and Charles II's imperial policies aimed to consolidate English control in North America between Virginia and Spanish Florida.

In addition to these imperial policies, there was a specific promotion of sassafras by Virginian colonists in the early 1650s. Chapter 2 examined John and Virginia Ferrars' broadside on *The Wonderful and Admirable Vertue of the Sassafras-Tree in Virginia* (1650). This advertisement promoted the medicinal virtues of sassafras, as well as explaining that the high mortality in the colony was due to poor provisioning on the Atlantic voyage rather than the state of health of Virginia.[2] This renewed interest in sassafras in the 1650s matches the trend shown in Figure 12 above with the acceleration in the frequency of sassafras in the EEBO corpus occurring at the same time. A similar trend has been demonstrated in the publication of alchemical books, the number of which increased tenfold in the 1650s.[3]

The increase in medical texts in the 1650s was in part fuelled by the writings of unlicensed medical practitioners, with their first entry in the sassafras text collection coming in 1648. At this time, there was greater competition between medical writers, particularly between physicians and unlicensed practitioners. Both groups wrote a greater proportion of the texts after 1650 compared with the

[2] Virginia Ferrar, *The Wonderful and Admirable Vertue of the Sassafras-Tree in Virginia* (London, 1650).
[3] Lauren Kassell, "Secrets Revealed: Alchemical Books in Early-Modern England." *History of Science* 49, no. 1 (2001), p. 61.

earlier period. This coincides with the College of Physicians' loss of authority over the regulation of medicine and an increase in the diversity of medical writers.[4] The increasing proportion of authors who were physicians demonstrates sassafras' importance as a medical good developed in the later period.

After medical texts and geographical/travel accounts, the third most common type of book was literary works. References to sassafras in these texts began in the early 1600s, when sassafras was mentioned in the composer, poet and physician Thomas Campion's (1567-1620) *Observations in the Art of English Poesie* (1602) and the playwright Ben Jonson's (1572-1637) play *Volpone* (1607).[5] Campion and Jonson were clearly both knowledgeable about sassafras and its medicinal use and their references suggest that they anticipated that their readers and audiences would be familiar with the term. Discussions of sassafras in literary works will be considered in more detail later in this chapter.

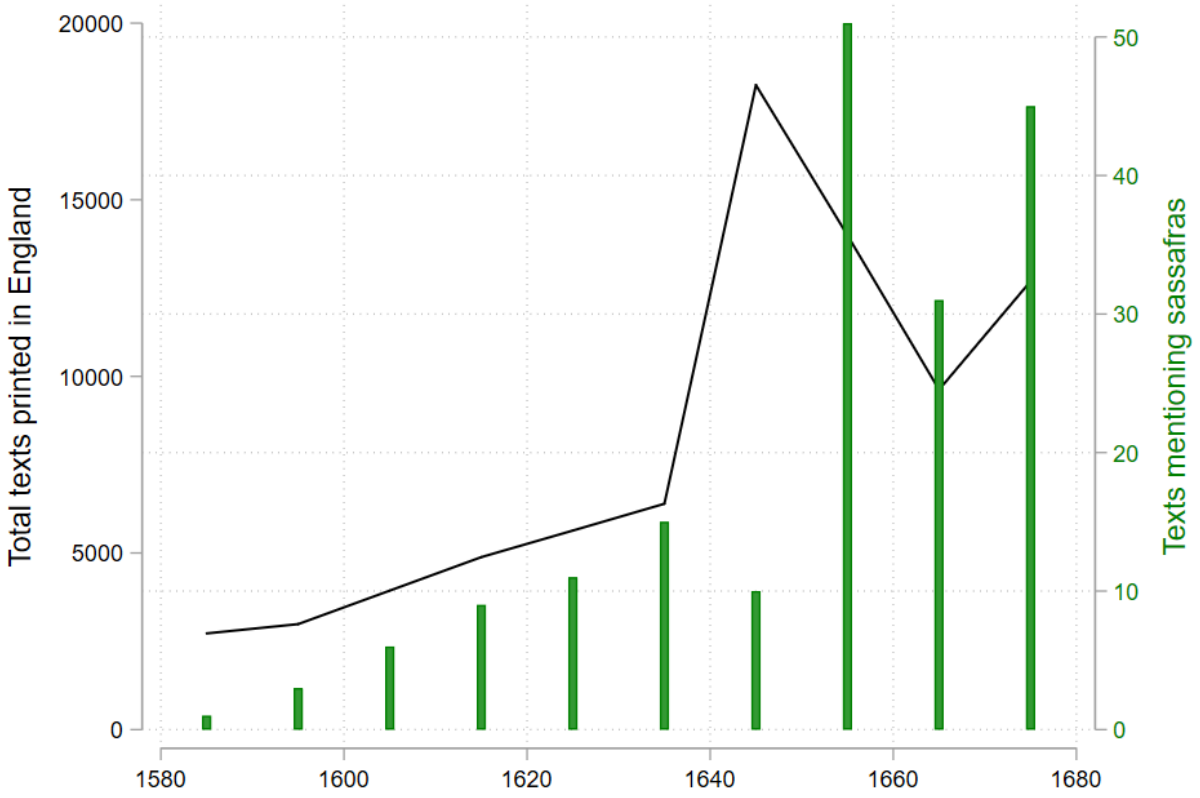

Figure 14. *Total Books Printed in England and Texts Referencing Sassafras by Decade, 1580-1680*

[4] Charles Webster, *The Great Instauration: Science, Medicine and Reform 1626–1660* (London: Duckworth, 1975) and Harold J. Cook, *The Decline of the Old Medical Regime in Stuart London* (Ithaca: Cornell University Press, 1986).

[5] Thomas Campion, *Observations in the Art of English Poesie* (London, 1602); Ben Jonson, *Ben: Jonson his Volpone or The Foxe* (London, 1607).

Figure 14 above plots the number of texts mentioning sassafras against the estimates of the total number of texts published in England by decade from Table 7.[6] The figure shows us that from the 1580s to the 1630s, the rise in sassafras discussions followed the same upward trend as the total number of English texts published. During the 1640s, however, sassafras references followed a different pattern from total text production. The total text production had a rapid rise of more than 300% between the 1630s and 1640s, while references to sassafras declined by a third (Figure 14 and Table 7). The general increase in the number of publications in the 1640s was driven by the proliferation of political pamphlets in the context of the English Civil Wars.[7] In the 1650s, there was a 23% decline in the total number of texts published compared with the 1640s, but the number mentioning sassafras rose more than five-fold. These trends demonstrate that the rise in the number of sassafras discussions in English print in the 1650s was a result of its increasing importance in the medical literature.

How important was sassafras to early modern medical discussions, compared with other New World drugs? In Figure 15, I present a comparison of the prevalence of three New World drugs - sassafras, guaiacum and mechoacan - in English medical texts from 1550 to 1680. In this analysis, I account for lignum vitae and other synomyns within the category of guaiacum. I find that by the 1660s, sassafras was the most commonly-referenced New World drug amongst those examined in the English medical corpus. Guaiacum is the most-important drug in medical texts prior to the 1660s and was referred to three or four times as often as mechoacan and sassafras in the sixteenth century. Guaiacum became less dominant in the early seventeenth century, as the importance of other American drugs grew. Sassafras became increasingly important across the seventeenth century, eventually displacing guaiacum as the leading New World drug in the 1660s.

[6] Data on total book production is from John Barnard and Maureen Bell, "Statistical Tables," pp. 781-784.

[7] On the increase in political pamphlets published in the 1640s, see Jason Peacey, *Politicians and Pamphleteers: Propaganda during the English Civil Wars and Interregnum* (Farnham: Ashgate, 2004).

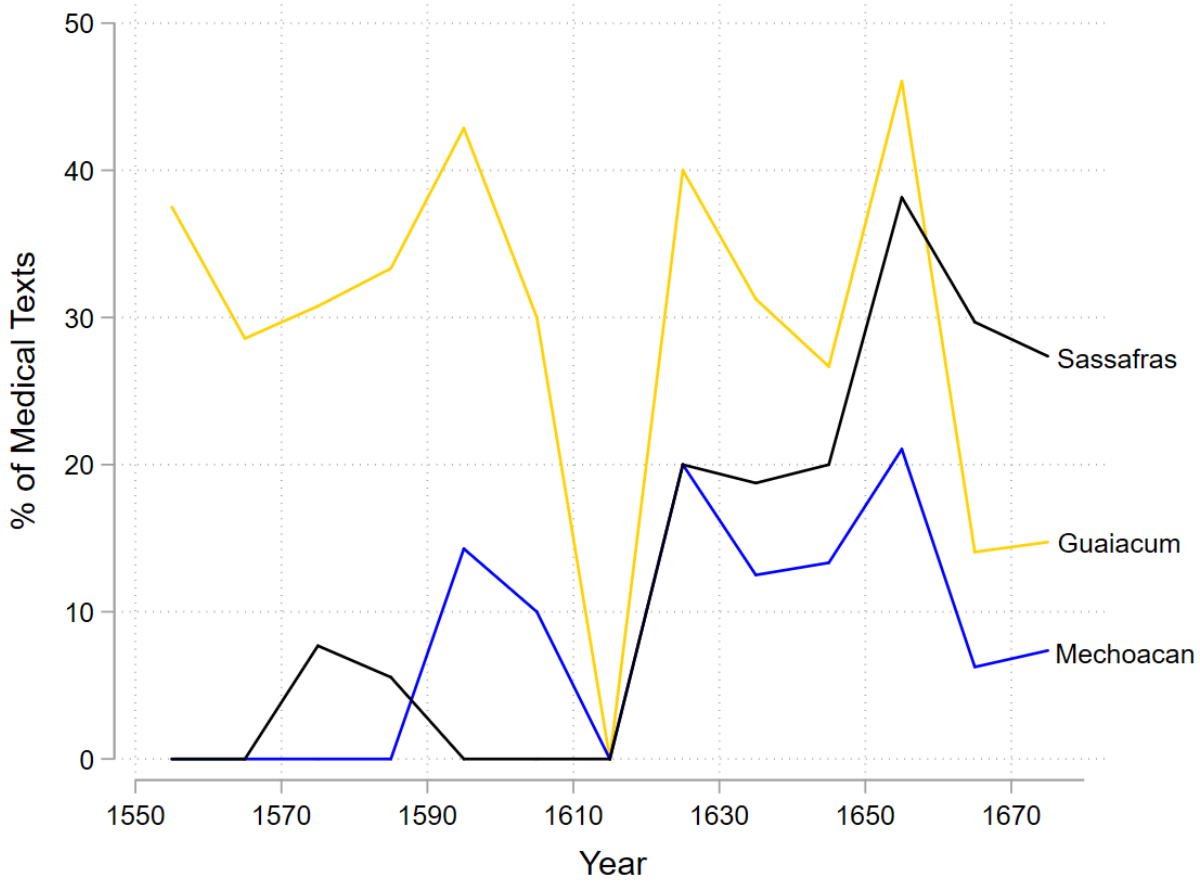

Figure 15. *Prevalence of Sassafras, Guaiacum and Mechoacan in English Medical Texts, 1550-1680*

How does the prevalence of sassafras in early modern medical writings compare with drugs from other regions? In Figure 16, I display the trajectories of three exotic drugs in English medical literature, from 1550 to 1680. I contrast sassafras to two drugs primarily sourced from Asia: cloves and nutmeg. Cloves were the dominant drug across the period of study until the 1670s, when sassafras became the leading drug. Until the 1620s, both Asian drugs were more prevalent. By the 1630s, however, sassafras was discussed twice as often as nutmeg. Over the seventeenth century, sassafras became increasingly important compared with these Asian drugs.

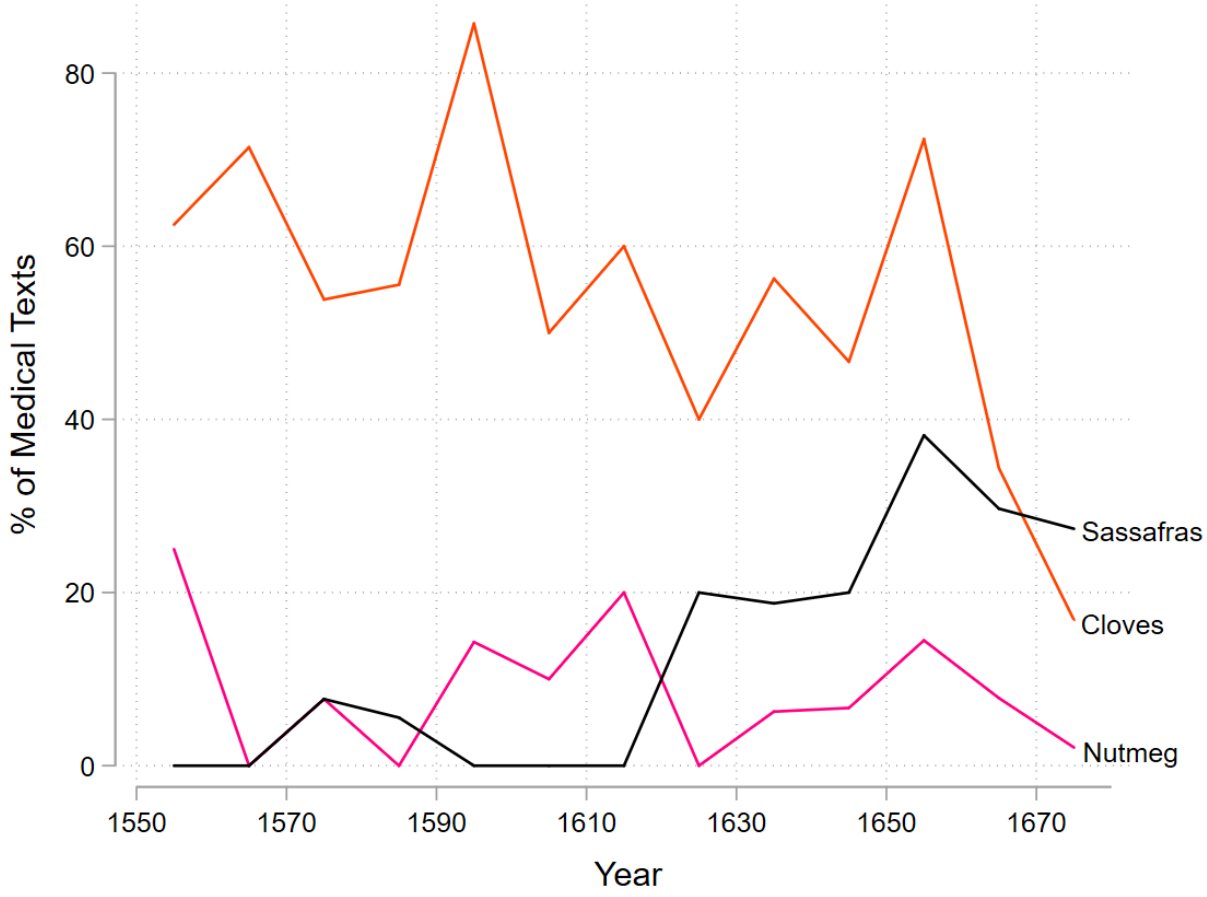

Figure 16. *Prevalence of Sassafras, Cloves and Nutmeg in English Medical Texts, 1550-1680*

How does the use of sassafras compare with drugs from the Old World? In Figure 17, I evaluate the trends in medical discussions of angelica and mastic in relation to sassafras. Mastic was the dominant drug in the sixteenth century, and angelica became referenced on the same scale as mastic in the early seventeenth century. This shifts between Old World drugs indicate that the rise and fall of prominence of drugs was not a case of Old versus New World. The Old World drugs were much more prominent than sassafras until the 1620s, and sassafras overtook angelica and mastic in the 1660s.

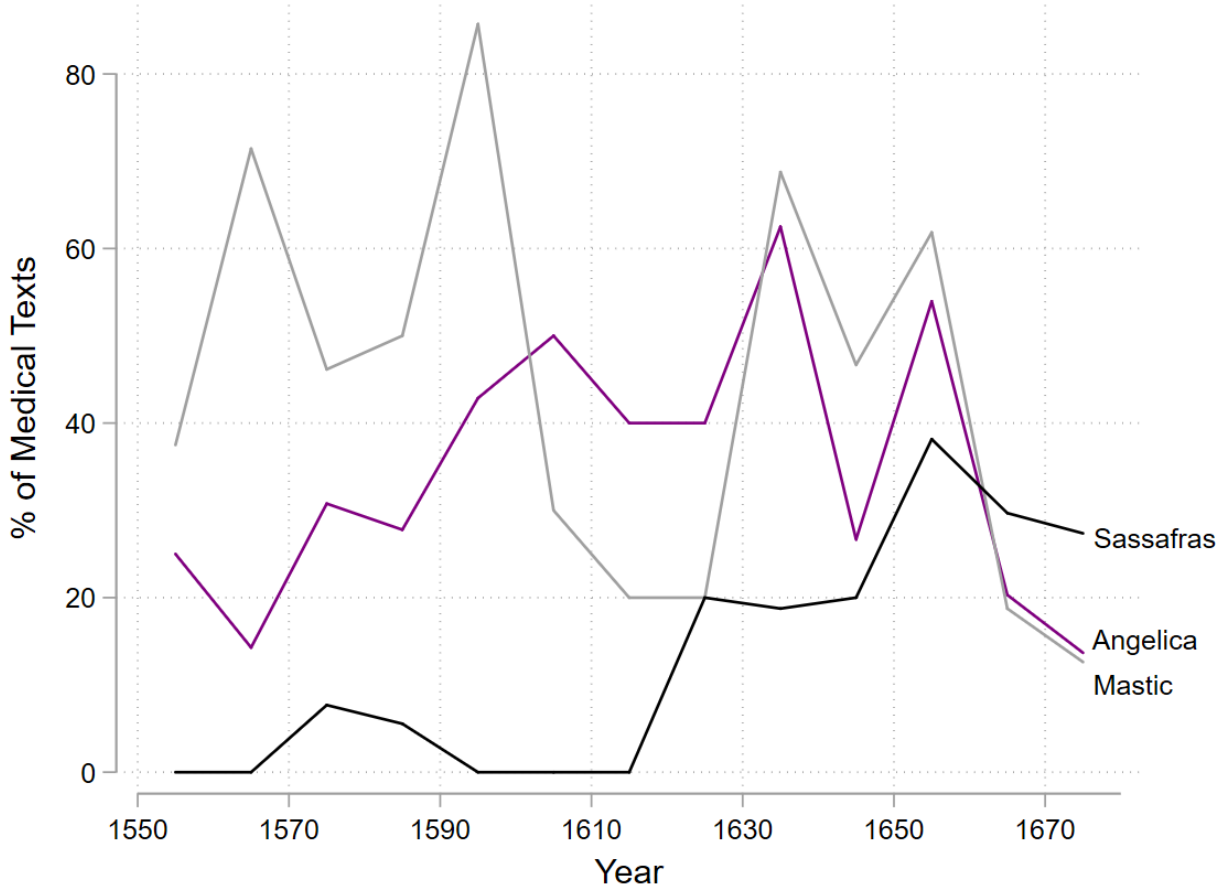

Figure 17. *Prevalence of Sassafras, Angelica and Mastic in English Medical Texts, 1550-1680*

A wide variety of occupations were engaged in writing about sassafras. In the collection, there are texts written by physicians, clergymen, poets, playwrights, natural philosophers, surgeons, apothecaries, midwives, empirics, booksellers, cartographers, schoolmasters, merchants, explorers and general writers. In Figure 18, we can see which occupations wrote about sassafras in printed works between 1580 and 1680. This figure shows change in the proportions of different occupations writing about sassafras between two periods: 1580-1649 and 1650-1680. From the 1650s, there was a large rise in the frequency of references to sassafras in English printed works, as shown in Figure 12. In the 1580-1649 period, relatively few texts were published per year mentioning sassafras in comparison to the 1650-1680 period. Figure 18 therefore allows us to compare the proportions of different occupations who wrote about sassafras before and after sassafras began to be widely discussed.

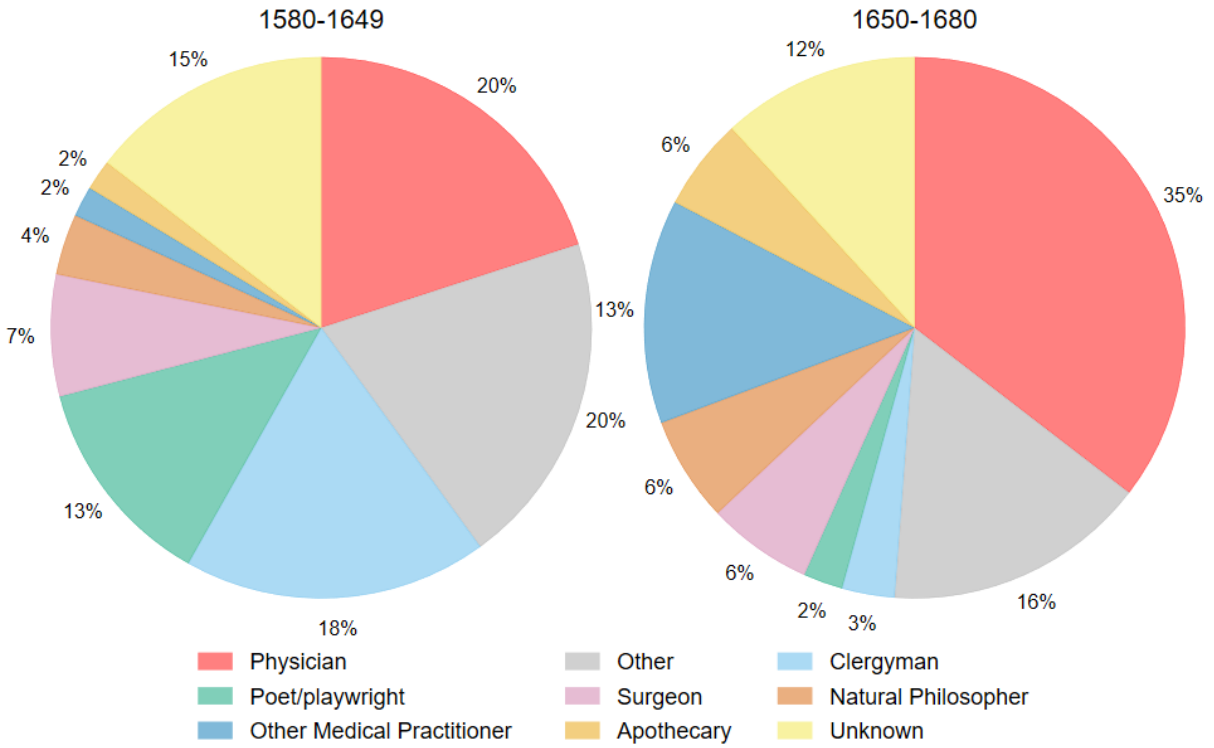

Figure 18. *Writers on Sassafras by Occupation in Two Periods, 1580-1649 and 1650-1680*
Source: Sassafras Text Collection

Between 1580 and 1649, clergymen and physicians were the most prominent writers on sassafras, accounting for 18% and 20% of total printed works respectively. Poets and playwrights were the third largest category in this early period, creating 13% of the texts. The prominence of physicians grew significantly in the 1650-1680 period, when they were responsible for 35% of the texts. Other medical practitioners also wrote a greater proportion post-1650, increasing from 2% to 13%. This reflects the wider trend of unlicensed practitioners gaining a stronger voice in the seventeenth-century medical literature.[8] While the absolute numbers of texts written by poets and playwrights remained stable, they accounted for a smaller percentage of the texts in the latter period, due to an expansion of medical writing on sassafras. The proportions of other occupations, such as surgeons, natural philosophers and apothecaries, remained fairly constant across the two periods. Overall, physicians were the most common producers of works discussing sassafras across the 1580-1680 period, composing 31% of the texts in the collection. In this section, I have addressed the authorship

[8] For a further discussion of the rise of unlicensed practitioners, see Margaret Pelling, *Medical Conflicts in Early Modern London: Patronage, Physicians, and Irregular Practitioners, 1550-1640* (Oxford: Clarendon Press, 2003) and Cook, *The Decline of the Old Medical Regime*. The rise of unlicensed practitioners in the writing of medical texts and manuals is discussed by Elizabeth Lane Furdell, *Publishing and Medicine in Early Modern England* (Rochester: University of Rochester Press, 2002).

of printed works on sassafras and different types of texts it was discussed in. In the next section, I will focus on how sassafras was considered as a commodity in geographical and travel accounts.

Sassafras as a Commodity in Geographical and Travel Accounts

In 1603, a voyage set out from Bristol with the aim of discovering new sassafras groves in northern Virginia. The voyage was sponsored by the chief merchants of the city and other speculators, and the expedition was recounted in Samuel Purchas' *Purchas his Pilgrimage* (1626).[9] After several failed attempts to locate sassafras, the searchers found success near a bay they named after John Whitson, the mayor of Bristol. Large quantities of sassafras were found in the woods near a hill they named after Robert Aldworth, who had helped to finance the expedition. To harvest the precious sassafras, the adventurers set up a small barricade, with a guard to protect the men in the woods. They sent one ship, the *Discover*, back to England laden with sassafras to 'the contentment' of the adventurers. During the heat of the day in the early afternoon, however, the indigenous peoples attacked the Englishmen while they were asleep in the woods during their usual two-hour siesta.

Sassafras was one of the drugs that Edward Williams, William Bullock and John Ferrar promoted as a valuable commodity with potential for exportation in the 1650s, as we saw in Chapter 2. Using the sassafras text collection, we can take a longer view of when sassafras was perceived as a commodity across the late sixteenth and seventeenth centuries. Ten of the texts across this period focus on the promotion of sassafras as a commodity between the dates of 1599 and 1626. It is in this early thirty-year period that sassafras was becoming more familiar to the English experience, crossing the 'exploratory' and 'expansion' phases in which the English writers first encountered sassafras and attempted to commodify it.

In 1590, Thomas Harriot wrote of the potency of sassafras in relation to guaiacum, "It is found by experience to bee farre better and of more uses then the wood which is called Guaiacum, or Lignum vitae."[10] Harriot's report was a promotional piece to encourage the colonisation of Virginia. Sassafras was prevalent in the English colonies in North America, while guaiacum was more common in the Spanish territories. It was clearly a move to market sassafras as the English alternative to guaiacum. Many of the early English texts in this survey make explicit reference to the natural abundance of the sassafras tree in English possessions, its availability to be immediately harvested, and the high profit

[9] Purchas, *Purchas his Pilgrimage*.
[10] Thomas Harriot, *A Briefe and True Report of the New Found Land of Virginia* (London, 1590).

that could be obtained in doing so. For example, the clergyman John Brereton wrote in 1602 that "Sassafras trees. great plentie all the Island over [Virginia], a tree of high price and profit."[11]

By the 1620s, sassafras had become a primary commodity for export alongside tobacco in the British North American colonies. In 1620, the Council for Virginia had called for diversification in export products besides tobacco and sassafras, and for the development of staple commodities by all grantees of land grants and patents.[12] In 1624, a further petition to Parliament was made by the Virginian planter John Bargrave (1571-1625), which criticised the 'abuses' of the colonial government and the lack of economic diversification. Bargrave claimed that the leadership of the colony had failed to establish a viable economy of staple goods and had instead only set the prices of tobacco and sassafras, making a monopoly of the plantation.[13] The English Parliament dismissed all the motions in Bargrave's petition, and he died a year later.

Some answers to these problems were provided by the authors. Purchas argued that the Englishmen could not spare enough of their labourers to harvest the sassafras when most of them were occupied with the establishment of their houses and basic survival necessities like obtaining food and drink. These reasons for the failure to commercialise medicinal drugs at scale from the English colonies in the New World were discussed in Chapter 2, in which the colonial writers agreed with Purchas' assessment.

Fake and Adulterated Sassafras

The value of sassafras as a product can be seen in reports of unscrupulous vendors who attempted to sell fake or adulterated versions of the drug.[14] *A Medicinal Dispensatory*, by the French physician Jean de Renou (1568-c. 1620), was translated into English by the apothecary Richard Tomlinson in 1657, which included sassafras in its section on "adulterate medicaments":

> Sassafras was unknown of old in Europe; which at its first allation was sold dear, and was thereupon much sophisticated. I knew a man that sold the powder of Box-wood and Fennell-

[11] John Brereton, *A Briefe and True Relation of the Discouerie of the North Part of Virginia* (London, 1602).
[12] His Majesty's Council for Virginia, *A Declaration of the State of the Colonie and Affaires in Virginia* (London, 1620), p. 31.
[13] John Bargrave, *To the Honourable, the Commons House of Parliament. The Information of John Bargrave Esquire, Shewing the Seuerall Abuses of the Gouernment of the Plantation in Virginia* (London, 1622), unpaged.
[14] For further discussion of counterfeiting medicaments, see Roy Porter, *Health for Sale: Quackery in England, 1660-1850* (Manchester: Manchester University Press, 1989) and Valentina Pugliano, "Pharmacy, Testing, and the Language of Truth in Renaissance Italy," *Bulletin of the History of Medicine* 91, no. 2 (2017): 233-273.

> seed for the powder of sassafras: but when plenty of the genuine was conveyed, the adulteration ceased.[15]

As we will see later in this chapter, the smell of sassafras was often compared with that of fennel, making it a suitable mimic of sassafras. The potential for fraudulent alternatives masquerading as sassafras was of great concern in the early period of this study, when it was a rare, lucrative medicinal product. Accusations were made against empirics and licensed practitioners alike of preparing 'disguised' remedies: compositions of many other ingredients that might or might not contain a small amount of sassafras. When the scale of the sassafras trade increased in the later seventeenth century, the frequency of counterfeiting decreased.

Monardes provided his readers with a simple colour test to determine whether or not the sassafras was genuine: if urine was combined with the decoction of sassafras, the mixture should turn blue.[16] More detailed instructions for the uncovering of adulterated sassafras oil were provided by the physician Christopher Merret (1614/15-1695) in his 1670 work *A Short View of the Frauds, and Abuses Committed by Apothecaries*.[17] Merret claimed that the apothecaries refused to pay the high prices for the chemists' "right good" preparations of sassafras oil, and that their shops were stocked with "sophisticated" (adulterated) goods. He furthermore asserted that "(t)hese abuses daily increase since the Censors, discouraged by the multitude of Empirics swarming in every Corner, have omitted their wonted searches."[18] The primary chemical oils that were most often subject to forgery were those of cloves, cinnamon and sassafras. Merret provided both the method of adulteration and strategies for uncovering such fraud to "discover these Cheats." He outlined the following ways that fraud was perpetrated: passing off tinctures for oils, mixing tinctures with oil and blending true oils with turpentine or cheap oils "drawn from decayed Oringes, and Limons."[19] To uncover these tricks, for example, he wrote that, "(y)ou may easily discover the Oyl of Turpentine, by setting it on fire, for it yields abundance of ill scented smoak, with very little savour of the Herb, Flour, or Seed, &c. and soon takes fire."[20] Other methods included dropping some oil in water and watching the separation of the true oil from adulterants, heating them in a spoon over a candle and checking their smell, and

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[15] Jean de Renou, *A Medicinal Dispensatory, Containing the Whole Body of Physick Discovering the Natures, Properties, and Vertues of Vegetables, Minerals, & Animals*, translated by Richard Tomlinson (London, 1657), p. 158.
[16] Monardes, *Joyfull Newes.*
[17] Christopher Merret, *A Short View of the Frauds, and Abuses Committed by Apothecaries, as well in Relation to Patients, as Physicians, and of the Only Remedy thereof by Physicians Making their own Medicines* (London, 1670), pp. 9-11.
[18] Ibid, p. 9.
[19] Ibid, p. 11.
[20] Ibid, p. 10.

rubbing them on white paper to see if they left a mark when dried. The concerns over imposter and adulterated sassafras created the necessity for experimentation and the further discovery of its natural properties. The worry about substitution or contamination of this exotic drug was heightened by its long sea travels from the colonies.

Locations of Exotic Drugs: Where was Sassafras From?

Historians considering the trade networks of natural commodities can use customs data and networks of correspondence to reconstruct the movement of exotic drugs. Port Books and Customs Ledgers can give us significant amounts of representative information about the movement of drugs, as we saw in Chapter 1. Due to re-exportation, however, such sources are unreliable ways of finding out where natural products were gathered and harvested. They also cannot inform us about the movement of medicinal plants before they were commodified. Information on encounters with natural substances before, during and after commodification, and their specific sources, can be found in non-commercial exchanges in the form of networks of correspondence, as we will see in Chapter 5. Unfortunately, these exchanges do not inform us about the scale of commerce and are unrepresentative of the wider trade. We cannot therefore draw broad conclusions about the prevalence of these drugs in European markets from these letters.

All the texts in the collection were examined to determine whether any place identifier was attached to the reference of sassafras. By examining large numbers of printed works that refer to plants as coming from certain places, we can gain an understanding of where these natural substances were thought to have come from. When place names were repeated in printed works due to copying earlier work and a lack of first-hand knowledge, they may not necessarily match the places in which the commodities were harvested. There was a 'knowledge gap' between European literate culture and the reality of collecting on the ground.[21] Medical writers in London rarely had first-hand knowledge of the locations in which sassafras grew. Even for Europeans in the Americas, access to the drug was often only possible via the indigenous peoples. Furthermore, colonists and merchants had vested interests in emphasising particular locations as being rich in certain natural commodities, as I discussed in Chapter 2. In Chapter 1, I explored the physical movement of New World drugs through trade. My analysis in this chapter suggests that the movement of commodities and their associated knowledge followed different trajectories on varying timescales.

[21] Grafton, *New Worlds, Ancient Texts*, chapter 4; Markman Ellis, "Tails of Wonder: Constructions of the Kangaroo in Late Eighteenth-century Scientific Discourse," in Margarette Lincoln, ed., *Science and Exploration in the Pacific: European Voyages to the Southern Oceans in the Eighteenth Century* (Woodbridge: Boydell, 1998): 163-182.

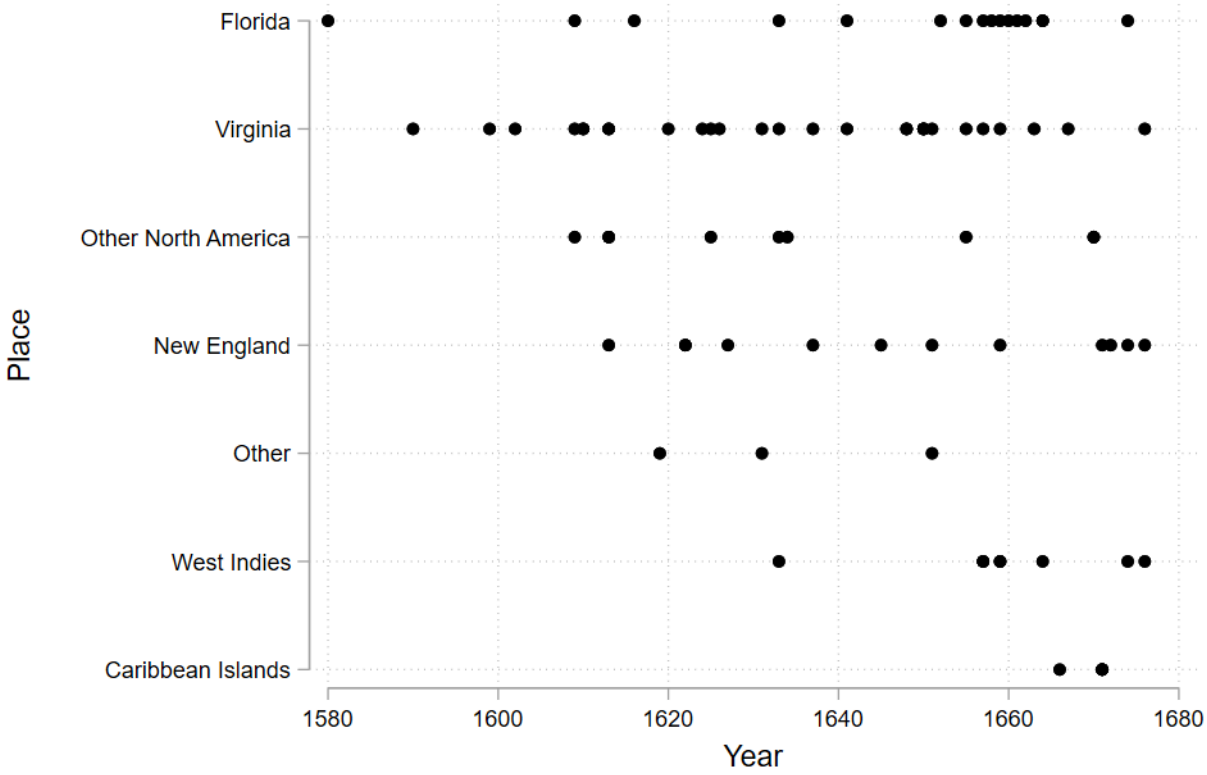

Figure 19. *Places from which Sassafras is Said to Come in English Printed Texts, 1580-1680*[22]

Figure 19 displays the different locations in which sassafras was described as growing. A greater proportion of the earlier printed works included the geographical origins of sassafras: 62.5% in the 1580-1630 period, falling to 28.3% after 1630. We can infer that, as sassafras became more well-known, writers felt it less necessary to describe the places where it grew. The natural philosopher Thomas Hariot (1560-1621) and the clergyman Richard Hakluyt (1552-1616), amongst the first English writers or editors of works on sassafras, both located sassafras in the English plantation of Virginia rather than the Spanish territory of Florida, as Monardes had claimed.[23] Indeed, Virginia was the most commonly-cited location of sassafras across the English-language database used, with 28 references. Florida and New England were the second and third most-frequently mentioned, with 16 and 12 references respectively. The first discussion of New England as a place in which sassafras grew was in a report on the Plymouth colony published in 1622 by the colonist William Bradford

[22] Locations included in 'Other North America': Canada, Newfoundland, Nova Francia, Cape Breton, Norembega, 'New England to Florida', Maine, New Hampshire, Maryland. Location included in 'Other': New Spain, Guiana, America. Locations included in 'Caribbean Islands': Tabago, Barbados, Sante Croix, Lucaies, The Caribby Islands, Olaimi, Tobago.

[23] Thomas Hariot, *A Briefe and True Report of the New Found Land of Virginia* (London, 1599); Richard Hakluyt, *The Principal Navigations*; Monardes, *Joyfull Newes*.

(1590-1657).[24] By the latter half of the seventeenth century, the 'West Indies' was more frequently mentioned. While this designation could either indicate the islands in the Caribbean or the Americas more generally, most of the texts suggested the former meaning.

Many of the texts discussing the location of sassafras revealed its importance as a drug commodity. The surgeon John Woodall (1570–1643) had created exorbitant wealth through the provision of medical supplies for the East India Company and the English armed forces. In 1617, he compiled his handbook on military and domestic surgery, *The Surgions Mate*, which featured sassafras as an essential item in a surgeon's chest. Woodall claimed that the best sassafras roots grew in Virginia in 1617, a statement repeated in the 1655 edition of his text, printed posthumously at the same time as efforts to further promote the commercial trade in Virginian sassafras.[25] By 1666, when John Davies translated Charles de Rochefort's (1605-1683) *The History of the Caribby-Islands* into English, sassafras was a well-known export commodity from the French and English's Caribbean territories as well:

> The Islands Tabago, Barbados, and Sante Croix are accounted to be better furnish'd then any of the rest with several sorts of wood, which experience hath found very useful in Medicine: For they afford Sandal-wood, Guaiacum, and Sasafras, all which are so well known, that we need not in this place make any particular descriptions thereof.[26]

The distribution of locations associated with sassafras shown in Figure 19 follows similar trends to the trade in drugs from England's American colonies discussed in Chapter 1. Virginia was initially the most important colony for the import of drugs in the early seventeenth century, before being displaced by New England and later the island plantations, such as Barbados and Jamaica. The Port Books data indicated that sassafras was imported from Virginia, New England and Barbados. The trade networks correspond with the early modern writers' ideas of the origins of sassafras. Sassafras may have been traded between regions in North America, so the port of departure is not necessarily indicative of where sassafras was harvested. There was also a re-export trade from European ports (including Lisbon and Dublin) to London. We therefore do not know whether the island plantations were producers or re-exporters of sassafras. In 1787, sassafras was described in *The London Medical Journal* as "a native of North America … When propagated, it will also be an article of trade from Jamaica."[27] This suggests that Jamaica was more likely to be a transhipment point rather than a producer itself in the early modern period. It is notable that the majority of English writers located

[24] William Bradford, *A Relation or Journall of the Beginning and Proceedings of the English Plantation Setled at Plimoth in New England* (London: John Bellamie, 1622).
[25] John Woodall, *The Surgeons Mate* (London, 1655), pp. 39-40.
[26] Charles de Rochefort, *The History of the Caribby-Islands* (London, 1666), p. 47.
[27] William Wright, "An Account of the Medicinal Plants growing in Jamaica," *The London Medical Journal* 8, no. 3 (1787), p. 267.

sassafras as growing in English colonies, while the Sevillian Monardes located the plant in Spanish Florida, and French writers located it in French possessions in Canada.

According to Gerard, the suitable environment for sassafras was near the sea in temperate places without much drought or moisture. Many of the texts recount the story of different groups of Europeans - Spanish, English and French - detecting natural groves of sassafras while still at sea, thanks to their sweet aroma. For example, Gerard wrote, "There be mountaines growing full of them, and they cast forth a most sweet smell, so that at the beginning when they [the Spanish] saw them first, they thought they had been trees of Cinnamon."[28] The physician Robert Fludd (1574-1637) also remarked on the ability of navigators to discover land through the experience of sassafras' sweet, odoriferous spirit. He compared sassafras to rosemary, a known aromatic plant that could also be discerned at a distance. Fludd emphasised the strength of sassafras' medicinal qualities in that its vital spirits could travel far, and they emanated "at a proportionated distance more or lesse, according unto the vivacity of the acting Spirit."[29]

Knowing through the Senses and Comparisons with the Familiar

Writers were in a privileged position of knowledge surrounding exotic commodities like sassafras. They acted as the intermediaries and as the mythmakers to the sensual experiences of seeing, touching, smelling and tasting curious preparations of new medicaments. Writers used vivid language citing familiar comparisons to convey this experience to a readership unfamiliar with the first-hand interaction with sassafras. The writers had formed these sensual descriptions either through their own direct experience or through their own reading of other writers' portrayals. In the latter case, layers of each author's perceptions would build up, leading the reader to be further and further removed from the experience of sassafras with each rendition.

Furthermore, the presentation of sassafras was highly reflective of each author's wider motivations for discussing sassafras in print. In many treatises and promotional pamphlets, the sensual depictions of sassafras tended to be overwhelmingly positive. Early modern readers were not naïve; they were fully aware that the descriptions were exaggerated for effect. Despite the over embellishment, information sources on distant flora and fauna were limited, and these entries formed the foundational working knowledge of nature in the New World. Many of Monardes' appraisals of New World drugs put forth in his promotional account were heavily repeated through

[28] Gerard, *The Herball*, p. 1525.
[29] Robert Fludd, *Doctor Fludd's Answer unto Mr Foster* (London, 1631), p. 82.

time. With each repetition, these portrayals gained influence and became the accepted 'truth' after having been verified by so many other authorities.

From the first discussion of sassafras by Monardes, the medical potency of the plant was celebrated. In some cases, Monardes recognised drugs from the Americas as being more powerful than the tried and true remedies from the Old World. For example, he recounted how sassafras had "succeeded in treating dropsy when Pilles of Ruibarbe, and by taking of Dialaca had failed."[30] In the 1590s, Thomas Harriot and Richard Hakluyt both claimed that sassafras was far better than guaiacum, and Hakluyt added that sassafras could also treat many more ailments. By this point, sassafras was not only promoted by English writers as better in curing a specific disease when compared to alternative New World treatments, it also had a broader range of medical applications.[31]

By the end of the sixteenth century, sassafras had reached the highest echelons of praise and fame supported by physicians, natural philosophers and clergymen. If this was not already enough to secure a respected position of sassafras in English medicine, Hakluyt proceeded to share the miraculous encounter of sassafras in curing Frenchmen, as described earlier in this chapter, who regarded the abilities of sassafras to be so great that men would kill each other to be the amongst the first to be healed by it:

> After this medicine [sassafras] was found and proued to be true, there was such strife about it, who should be first to take of it, that they were ready to kill one another … that if all the phisicians of Mountpelier and Louaine had bene there with all the drugs of Alexandria, they would not haue done so much in one yere, as that tree did in sixe dayes.[32]

One aim of these accounts was to accredit New World remedies, to put them on par with the drugs that were already established in the European market. For example, Monardes' claim that sassafras "procureth the same workes and effects as Cinamon doeth" due to their similar colour, sweet smell and taste reoccurred in many texts through time.[33] In 1659, nearly eighty years after the publications of Monardes' work, the naturalist Robert Lovell (c.1630–1690) employed nearly identical language, "[sassafras] smelleth and tasteth as the Cinamon, and produceth the same effects."[34] The same logical inference between virtues perceived by the senses and medicinal effects was still prevalent and persuasive at this time.

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[30] Monardes, *Joyfull Newes*.
[31] Richard Hakluyt, *The Principal Navigations.*
[32] Ibid.
[33] Nicolás Monardes, *Joyfull Newes out of the Newfound World*, p. 48.
[34] Robert Lovell, *Pambotanologia* (Oxford, 1659), pp. 3-4.

Early modern writers believed that the medicinal virtues of sassafras could be perceived through the experience of its sensual properties. Sight, touch, smell and taste all revealed aspects of the medicinal virtues of the plant. Sassafras' smell and taste were described in terms of what was familiar. For example, it was compared to cinnamon or aniseed in its sweetness and fennel in its aromatic taste. The astrologer and medical practitioner Joseph Blagrave (1610–1682) specified the taste of each part of the sassafras plant, corresponding to the relative strength of each part when consumed, its "bark in taste hotter and quicker than the wood or root," leaves "tasting like the root, but more weakly" and it roots "which are most in use, being of more force and efficacy than any other part of the tree, and of a spicy taste."[35]

All of the authors who discussed the ordering of medicinal strength of the parts of sassafras agreed that the root was the most efficacious. Even the dictionary entry for sassafras in 1616 included this information, "The best of the Tree is the roote, next the boughes, then the body, but the principall goodnesse of all resteth in the ryndes."[36] The rationale for this idea was attributed to the roots' tawny colour and sweeter smell than any other part of the tree. Gerard also cited the Spanish preference for using the root over the other parts of the plant. There was a hierarchy between the various parts, and while clearly the root was deemed to be best, the rind was preferred in second place for its strength. The medical reasoning was based on a comparison of sensual qualities and the success of using the root over other portions of the sassafras plant in practice.

Experience was essential in the process of understanding the properties of exotic drugs, especially when hidden virtues needed to be uncovered. Experience, however, was not the only portal available into the knowledge of rare medicinal botanicals; comparisons were often made to the familiar, to what was already known. Yet this was far from a mutually exclusive process. In the texts under study, writers often compared the sensual properties of sassafras with plants known to the English experience.

Medical Understandings

Properties

The physician Gideon Harvey (1636/7–1702) referenced the medicinal properties of sassafras in the context of curing gout. He described sassafras as hot, dry, aromatic, a sudorific, discutient and

[35] Joseph Blagrave, *Blagrave's Supplement* (1674), pp. 199-200.
[36] Bullokar, *An English Expositor*, no page number.

aperitive, and its effect in treating gout as miraculous.[37] Many of the writers agreed with Harvey in recommending sassafras to cure the gout, which was the second most common disease to be treated with the plant. For example, the German physician Daniel Sennert (1572-1637) praised sassafras' "opening, discussive, and attenuating faculty," which was commended for curing gout amongst several other diseases.[38] In 1621, the physician Tobias Venner (1577–1660) combined two New World drugs from Virginia, tobacco and sassafras, in his medical treatise on the medicinal benefits and dangers of consuming tobacco smoke. He viewed tobacco as especially potent in drying out cold ailments, and that when sassafras roots were mixed in with the tobacco, even better results could be achieved, especially in opening obstructions in the body.[39] Nearly all the authors presented a similar assessment to Harvey on how sassafras affected the body.

There was little contestation between the writers regarding the healing virtues of sassafras. Sassafras was primarily understood as a sudorific and as a hot and dry medicament. Some of the astrological texts also identified sassafras as a solar plant, further complementing the hot and dry classification.[40] Thus, sassafras was incorporated into the prevailing models of European medicine with little resistance. For example, in the translation of Jean de Renou's *Dispensatorium Medicum*, he promoted the use of sassafras, dedicating a chapter to its medical uses, and he classified it as a 'exotical calefactive.'[41] The only minor disagreement in the medical literature was whether sassafras was hot and dry in the second degree or the start of the third degree. This disagreement was due to contrasting information being received rather than an intellectual dispute. While most of the plant was determined to be in the second degree, the rinds of its roots were often believed to be more powerful and in the third degree of heat and dryness.

In the early modern period, sudorific medicines were understood as more powerful than diuretics in their purging abilities, due to their hot and tenuous nature. Sudorifics could "penetrate into the farthest parts of the body and cut humours, they attenuate, rarify, and turne into exhalation" and "drive malignant humours to the superficies of the body" as discussed in a text attributed to Daniel Sennert.[42] Across the seventeenth century, sassafras was widely agreed to be one of the principal sudorifics, or medicines that provoked sweats, alongside guaiacum, sarsaparilla and china root.

[37] By 'neuritick,' Harvey referred to the ability to treat 'sinewy diseases,' ones caused by problems with the joints, such as palsies and gouts.
[38] Daniel Sennert, *Two Treatises* (London, 1660), p. 43.
[39] Tobias Venner, *A Briefe and Accurate Treatise Concerning the Taking of the Fume of Tobacco* (London, 1621), unpaged.
[40] Blagrave, *Blagrave's Supplement,* pp. 199-200.
[41] de Renou, *A Medicinal Dispensatory*, p. 287.
[42] Daniel Sennert, *Nine Books of Physick and Chirurgery* (London, 1658), p. 314.

These four medicines were often used in conjunction, as we will see later in this chapter. Sassafras was generally used in all diseases that came of cold, raw, thick and corrupt humours, such as the Pox or diseases of a 'foul nature.' In these "[c]hronical and contumacious diseases," the French physican Lazare Rivière (1589-1655) justified the use of sudorifics to heat, melt, attenuate, and evacuate the humours of deeply fixed diseases, including: "Epilepsies, Palsies, obstinate Catarrhs, Dropsies, Gouts, and any cold affections, and especially the pox, require more powerful Medicaments to eradicate them."[43]

There was little debate over how sassafras should be conceived as working in the body or the properties with which it was imbued. As William Coles explained, the Galenic humoral properties of sassafras could be "manifestly perceived in the decoction," and could be known by anyone from their experience of the drug.[44] In Rivière's chapter on 'sudorifick medicaments' in his *The Universal Body of Physick,* translated into English in 1657, he favoured the use of sassafras, guaiacum, sarsaparilla and china root over the Old World remedies. Rivière explained that he had different recommendations than ancient Physicians because these New World medicines were not known to them. He further claimed that they had excellent occult properties for producing sweats.[45]

Sassafras was adopted into European medicine and ascribed the qualities discussed above at a time of change and debate in medical theories and practices, such as that between the Galenists and the chemists and licensed and unlicensed medical practitioners.

Sassafras and the Galenist-Chemist Debate

The first concentrated resistance to the use of sassafras in medical print occurred in the 1650s, with the Galenist-Chemist debates. The Galenic tradition aimed to treat the individual by addressing his or her constitution and restoring the balance of the humours within the body. The chemical approach was to treat the disease with knowledge gathered from experience rather than ancient texts, and they rejected some Galenic practices, such as purging and bloodletting. Medicinal plants from the Americas had been incorporated into the traditional Galenic framework upon their adoption into European medicine. The medical understandings surrounding the properties of sassafras had been formed within the humoral system. The relatively recent arrival of medicaments from the New World, and their absence from classical texts, made them a prime target for the

[43] Lazare Rivière, *The Universal Body of Physick in Five Books* (London, 1657), p. 360.
[44] William Coles, *Adam in Eden* (London, 1657), p. 307.
[45] Lazare Rivière, *The Universal Body of Physick*, p. 360.

chemists' attacks. The chemists' ire was further inflamed by the expense of New World drugs that they viewed the Galenists as privileging over cheaper, local remedies.

As Andrew Wear has stressed, the conflict between the Galenic and chemical physicians was as much of a social issue as an intellectual one. The chemists criticised contemporary medicine for not taking care of the poor.[46] At the same time, colonial projectors of sassafras were advocating an increase in its trade, and the more frequent discussion of sassafras in the medical literature may have supported this endeavour. Even negative press provided publicity and provoked interest in the use of exotic plants as medical treatments.

The Flemish physician Joan Baptista van Helmont (1580-1644) was a leading proponent of 'iatrochemistry.' He rejected the Galenic humoral system, and proposed to study the human body through chemistry, arguing that bodily processes were a result of effervescence, fermentation and putrefaction.[47] Walter Charleton (1619-1707), president of the Royal College of Physicians in 1689 and 1691 and one of the leading iatrochemists in England, was a strong advocate of Helmontian theories. He complained bitterly of attacks on his views by other traditional physicians in the College. In 1650, he translated the section entitled '*Deliramenta Catarrhi*' from van Helmont's *Ortus Medicinae* (1648).[48] Here, van Helmont argued that drugs from the New World were used according to the classical theories, but since these theories were faulty, physicians were merely treating the symptoms and not the disease:

> [Let D]rinks of China, Zarza, [sarsaparilla] Sassafras … and other deceitfull remedies of the same order, be wholly layed aside, which are brought into use by Physicians, that they might not appeare to have received their fees for nothing …. they never release the sick out of their hands: but perpetually oblige them, like purchased Bondslaves … while Physicians remain ignorant of the fundamentals and Causes of the disease.

It is important to emphasise that it was not New World remedies as such that were rejected in Helmontian medicine, but rather the manner of their application. The medical properties of New World drugs, including sassafras, had been interpreted according to Galenic medical theories. For example, the physician George Thomson (1619–1677) dismissed the common Galenic practice of prescribing "Diet-drinks of Guaiacum, Sarzaparilla, Sassafras, out of an intent of drying up

[46] Andrew Wear, *Knowledge & Practice*, Chapter 8.
[47] On the Galenist-Chemist debate in early modern medicine, see Allen G. Debus, *Chemistry and Medical Debate: Van Helmont to Boerhaave* (Canton, MA: Science History Publications, 2001).
[48] *Ortus Medicinae* was a collection of works published posthumously by van Helmont's son from his manuscripts.

superfluous moisture, and imaginary Catarrhs in the Body."[49] He proclaimed that "[t]hese things Helmont hath plainly shewed to be ridiculous."[50] The arrival of American plants had not prompted change in the fundamental theories of medicine. The chemists sought to develop new medical theories and validate them through trials and experimentation. They saw the incorporation of New World drugs into the old medical system as a missed opportunity. In the chemists' view, sassafras might alleviate certain symptoms, but it could not truly cure disease without physicians understanding the fundamental causes of disease formation. The chemists suspected that this was because apothecaries and physicians had a vested interest in having their patients return again and again to manage the symptoms of uncured diseases; a patient who was cured would have no need to pay for subsequent treatment. This argument reflects that of Nicholas Culpeper, who attacked the use of New World plants for their greater expense without providing any greater efficacy.

Sassafras came to be used in chemical preparations, such as "The Compound Liquor of the vitriolised Tartar," a receipt for which was given by the astrologer and medical practitioner Lancelot Coelson (1627–c. 1687). This compound substance worked through 'temperature' and was used for "several infirmities, and to all such persons, where there is need of opening, subtiliating, mundifying, and consolidating, and it worketh by sweat and Urine."[51] The same ideas of sassafras being used as a sudorfic and diuretic, being hot and having properties of opening obstructions are present in this chemical compound, as previously discussed, in the Galenic decoctions based on simples.

The medical practitioner and writer Everard Maynwaringe (1628-c. 1699) observed that "they themselves, which despise Chymical medicines for their novelty do use Rhubarb, Mechoacan, Cassia, Guajacum, Sassafras, Sarsaperilla, Bezoar stone, and many more which were unknown to Hypocrates and Galen."[52] Maynwaringe argued that Galenist medical practitioners could not attack physicians for using chemical remedies because they were new medicaments because Galenists also used new remedies that had not been known to classical writers. The examples he used were four New World drugs – sassafras, mechoacan, guaiacum and sarsaparilla – along with three Asian drugs – rhubarb, cinnamon and bezoar stone. Maynwaringe himself had a commercial interest in promoting new remedies because he sold his own chemical preparations.[53] While the Chemists railed against the Galenist profiteering with exotic drugs, they left themselves open to charges of hypocrisy through their promotion of patent remedies in their own medical texts. This was remarked upon by the

[49] George Thomson, *Galeno-pale, or, A Chymical Trial of the Galenists* (London, 1665) p. 47.
[50] Ibid.
[51] Lancelot Coelson, *Philosophia Maturata* (London, 1668), pp. 135-137.
[52] Everard Maynwaring, *Medicus Absolutus Adespotos the Compleat Physitian* (London, 1668).
[53] Jonathan Barry, "The 'Compleat Physician' and Experimentation in Medicines: Everard Maynwaring (c. 1629–1713) and the Restoration Debate on Medical Practice in London," *Medical History* 62, no. 2 (2018): 155-176.

surgeon Nicolas de Blégny (1652-1722), "the Wood Guaiacum, and the Roots of Sassafras, China, and Sarsaparilla … the Chymists have drawn their Extracts and Quintessences out of them, which they have sold at the price of their weight in Gold."[54]

In order to attract clients who were comfortable with Galenic medicine, the York doctor William Simpson defended complex chemical preparations as similar to the oils that Galenist physicians used: "What are all the Essential Oyls of the Shops, such as of Rosemary, Sage, Wormwood, Cloves, Nutmegs, Cinnamon, Sassafras, Rudium, &c. but Chymical Distillations."[55] He claimed that "One drop or two of which, contain more virtue than is got from a whole handful or more, of the Vegetable infus'd, decocted, or prepared any other ordinary way."[56] We will see later in this chapter that oils became more discussed as a preparation of sassafras from the mid-seventeenth century. Simpson advocated chemical medicine here by claiming that chemical oils were more potent and purer than other preparations like decoctions or infusions, with the inference that chemical preparations would be more effective than other types of medicine. In his book, Simpson advocated for a chemical interpretation of the medicinal qualities of the Scarborough Spa, against the Hull doctor Robert Witty who suggested a more traditional, Galenist understanding of the spa waters. The commercial imperative was important for Simpson; his book aimed to discredit Witty to further his own practice and expand his clientele.[57]

Despite these criticisms by Chemical physicians, the prevailing conceptualisation of sassafras remained grounded in Galenic theory. The medicinal properties of this drug continued to be understood within the humeral framework. While the Chemists expanded the diversity of compound preparations of sassafras, their arguments regarding how sassafras cured disease ultimately had little effect on fundamental medical understandings.[58]

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[54] Nicolas de Blégny, *New and Curious Observations on the Art of Curing the Veneral Disease* (London, 1676), p. 93.
[55] William Simpson, *Hydrologia Chymica, or, The Chymical Anatomy of the Scarbrough* (London, 1669), p. 191.
[56] Ibid.
[57] Noel G. Coley, ""Cures without Care:" "Chymical Physicians" and Mineral Waters in Seventeenth-century English Medicine," *Medical History* 23, no. 2 (1979), p. 200. See also F. N. L. Poynter, "A Seventeenth-Century Medical Controversy: Robert Witty versus William Simpson," in Edgar Ashworth Underwood, ed., *Science, Medicine and History: Essays in Honour of Charles Singer* (Oxford: Oxford University Press, 1953): 72-81.
[58] On the failure of the Chemists' to reform medical theory and practice, see Charles Webster, *The Great Instauration*, Hal Cook, *The Decline of the Old Medical Regime* and Andrew Wear, *Knowledge & Practice*.

Methods of Preparation

> Sassafras, or Ague-Tree.
> [T]he decoction thereof being drunk morning and evening for certain dayes together, which decoction is thus made; take of Sassafras four ounces, steep it four and twenty hours in a Gallon and a half of fair water, then boil it to the consumption of half, and strain it: it may be given in powder from a scruple to two scruples. [59]
>
> Robert Turner (1664)

Through our period of study, sassafras was prepared in an increasingly diverse set of ways. The most common method of preparation, however, remained constant as a decoction. Other preparations included electuaries, powders, pills, salts and oils. Change in preparation reflected the increasing importance of chemical approaches to medicine from the mid-seventeenth century onwards. Sassafras was often mixed with other New World drugs in decoctions for the pox. Sudorific decoctions were commonly composed of guaiacum, sassafras, china root and sarsaparilla. Many drinks for promoting health also included these four drugs together, as I will discuss in more detail later in this chapter.

The earliest, longest-standing and most common preparation of sassafras was in the form of a decoction with thin pieces of sassafras root being steeped in boiled water. Monardes recommended two primary ways of preparing sassafras: a decoction of the roots and a mash of its leaves.[60] The decoction would have treated many diseases, including the pox. The mashed leaves would have been applied directly to external injuries, such as bruises and wounds. Around twenty years later, Richard Hakluyt also discussed the internal and external treatments of sassafras. He recommended that the bark and leaves be made into a decoction rather than the roots.[61] He also suggested that the dregs of the tea should be applied to external wounds rather than mashed leaves. Over time, the directions for preparing the different types of sassafras decoctions became more detailed. For example, in 1633 John Gerard included a colour indicator that the sassafras wood should be steeped until the decoction was the colour of claret wine.[62]

The decoction of sassafras became so famous and widely-consumed that it was developed as a base for the consumption of other medicines. John Hartman's translation and enlargement of the German alchemist Oswald Croll's (1563-1609) *Basilica Chymica* recommended that salt ammoniac should be

[59] Robert Turner, *Botanologia the Brittish Physician* (London, 1664) p. 295.
[60] Monardes, *Joyfull Newes Out of the Newe Founde Worlde*.
[61] Hakluyt, *The Principal Navigations*, p. 227.
[62] Gerard, *The Herball*, p. 1525.

taken in a decoction of sassafras.[63] The translation includes a much-enlarged section on the preparation of salt ammoniac. Croll's original text, published in 1609, did not include any references to sassafras.[64] Another example was the French apothecary Nicaise Le Fèvre (c. 1610-1669), who recommended that modern mumial balsam should be taken in either tincture of sassafras or juniper berries or in a broth.[65]

Sassafras was often a key ingredient in 'diet drinks,' which were drinks prepared for medicinal purposes in the early modern period. Indeed, in the late sixteenth century, the use of New World Drugs, such as sassafras, guaiacum and sarsaparilla, in diet drinks was already referred to as ubiquitous. Some writers expressed that everyone would know both the preparation method of these diet drinks and how to consume them. An example of this can be seen in Richard Surphlet's 1599 translation of the French physician Andre Du Laurens' (1558-1609) *A Discourse of the Preservation of the Sight*. He wrote that, "We shall make them [diet drinks] with Guaiacum, Zarza-perilla [sarsaparilla], the roote China, and Sassafras, the maner of the setting downe of such, as also of the using of them is sufficiently knowne unto every one."[66] This diet drink was being used for "universal evacuation," which provoked sweats and dried up "the superfluous moisture which is within the bowels" while avoiding "all the waterish parts which are conteined in the veines."[67] After a universal purge of sweating, specific purges could be given to afflicted body parts.

The properties of remedies fluctuated across the early modern period just as the causation of disease and classification of disease were also contested and evolving. In this study, the alleged medicinal qualities of sassafras often served the author's agenda by promoting a desirable solution to a current problem. For example, some writers claimed that sassafras had nourishing and strengthening properties, which appears at odds with the purgative properties of sassafras discussed above. The reports of sassafras causing men to 'grow fat' in a colonial environment, where food was periodically scarce, offered writers promoting the colonisation of North America a tool for assuaging the fears of potential settlers. The presented virtues of sassafras were at times more of a reflection of the interests of the writers than its inherent properties.

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[63] Oswald Croll, *Bazilica Chymica, & Praxis Chymiatricae, or, Royal and Practical Chymistry in Three Treatise,* translated by John Hartman (London: John Starkey and Thomas Passinger, 1670).
[64] Ibid.
[65] Nicaise Le Fèvre, *A Compendious Body of Chymistry*, translated by P. D. C. (London, 1662), p. 141.
[66] André Du Laurens, *A Discourse of the Preservation of the Sight*, translated by Richard Surphlet (London, 1599), p. 159.
[67] Ibid.

Sassafras was consumed as a pottage in times of desperation by early colonists, and it became a staple in diet drinks to encourage people to gain weight. Monardes was the first to describe sassafras as restoring health in addition to curing specific diseases. He wrote that, "The use of this water doeth make fatte, and this is certainly knowen, for we have seene many leane and sicke, that have taken it, and have healed of their evils."[68] These claims were repeated throughout the period of study, for example by Hakluyt in 1599, the natural philosopher Francis Bacon (1561-1626) in 1638 and in a text attributed to Daniel Sennert, Nicholas Culpeper and the physician and translator Abdiah Cole (1602-1664) in 1660.[69] The latter text noted that previous authors had found a decoction of sassafras, guaiacum, sarsaparilla and china root to be "no less nourishing than chicken broath," and that patients consuming decoctions of these drugs did gain weight.[70] In order to reconcile this with sassafras' purgative qualities, however, they argued that the mechanism by which bodies grew fat upon sassafras was not due to a "nutritive power" that other writers had attributed to sassafras, guaiacum, sarsaparilla and china root, but rather by an indirect manner by taking away the "cause of leanness," which had "be[en] found by experience, that in the ptisick, Veneral disease, scab [scabies] and other diseases, bodies extenuated, have been restored again."[71]

Sassafras was also claimed to help the memory, quicken the senses and restore natural heat and strength in the body as part of its invigorating properties as a diet drink.[72] It was the first ingredient in the receipt for "The Ale of Health and Strength, by Viscount St. Albans" in the anonymously-authored *The Queens Closet Opened* (1659).[73] Francis Bacon suggested that diet drinks made of sassafras, sarsaparilla, china root and guaiacum could even help to prolong life. He wrote that, "in the declining of Age, such Dyets are good to bee kept once in two yeeres, there by to grow young againe, as the Snake doth by casting his skinne."[74] The search for enhanced longevity was an intellectual puzzle for Bacon, and he viewed sassafras as one of the substances that could aid in its

[68] Monardes, *Joyfull Newes Out of the Newe Founde Worlde*, p. 54.
[69] Hakluyt, *The Principal Navigations*, p. 259; Francis Bacon, *The Historie of Life and Death With Observations Naturall and Experimentall for the Prolonging of Life* (London, 1638), pp. 253-254; Daniel Sennert, Nicholas Culpeper and Abdiah Cole, *Two Treatises*, p. 41.
[70] Ibid, p. 35.
[71] Ibid, pp. 35-36.
[72] William Trigg and Eugenius Philanthropos, *Dr. Trigg's Secrets, Arcana's & Panacea's* (London, 1665), p. 71; Blagrave, *Blagrave's Supplement,* p. 90; Kenelm Digby, *Choice and Experimented Receipts in Physick and Chirurgery* (London, 1675), p. 103.
[73] W. M., *The Queens Closet Opened Incomparable Secrets in Physick, Chyrurgery, Preserving, and Candying &c.* (London, 1659), p. 281.
[74] Francis Bacon, *The Historie of Life and Death*, p. 254.

achievement.[75] Following a regime with diet drinks had a restorative and refreshing effect on the body by removing its blockages and impurities.

The New World was associated as a place of healthfulness, as discussed in Chapter 2, and one aspect of this was the greater longevity of its inhabitants. Baconian science was influential in shaping the early Royal Society's investigation of nature in the New World, which included the assessment of older accounts and the devising of questionnaires to gather and interrogate natural knowledge.[76] For example, John Evelyn considered Walter Raleigh's report of an indigenous Virginian king who lived for over 300 years as plausible.[77] Further corroborating accounts were required, however, for such information to be treated as valid.[78] The Royal Society sent out its own questionnaires regarding the longevity of peoples in Brazil and the Bahamas in the 1660s to collect more data.[79] In Chapter 4, I will discuss the connection between these Society inquiries and the formation of knowledge about New World drugs. By consuming sassafras and other New World drugs in diet drinks, there was a possibility of imbibing the virtues that would maintain health and prolong life.

The Montpellier physician Pierre Morel discussed the celebrity and use of various diet drinks in France, in a work translated into English in 1657.[80] He noted that diet drinks were often composed of three New World drugs and one exotic drug from the East: guaiacum, sassafras, sarsaparilla and china root. When using sassafras in diet drinks, Morel recommended fresh and newly-brought over wood mixed with thin slices of bark. He warned that "the decoction of the Wood Sassafras if kept wil [l]ose his grateful smel."[81] Alternatively, the prescription for sarsaparilla was to take its root, "cut in slices, together with his hairy strings," the prescription for guaiacum was to use its resin and for

[75] For a discussion of Bacon's interest in prolonging longevity, see Guido Giglioni, "The Hidden Life of Matter: Techniques for Prolonging Life in the Writings of Francis Bacon," in Julie Robin Solomon and Catherine Gimelli Martin, eds. *Francis Bacon and the Refiguring of Early Modern Thought: Essays to Commemorate The Advancement of Learning (1605-2005)* (London: Routledge, 2005): 129-145.
[76] John Gascoigne, "The Royal Society, Natural History and the Peoples of the 'New World(s),' 1660-1800," *The British Journal for the History of Science* 42 no. 4 (2009): 539-562; Raymond Phineas Stearns, *Science in the British Colonies of America* (Urbana: University of Illinois Press, 1970), pp. 101-106.
[77] Gascoigne, "The Royal Society," p. 545.
[78] Peter Dear, "Totius in Verba: Rhetoric and Authority in the Early Royal Society," *Isis* 76 no. 2 (1985): 144-161; Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994).
[79] Gascoigne, "The Royal Society," p. 545.
[80] Pierre Morel, *The Expert Doctors Dispensatory*, translated by Anonymous (London: N. Brooke, 1657). Nicholas Culpeper is often credited as the translator of this work, but Poynter has presented evidence that this is a misattribution. F. N. L. Poynter, "Nicholas Culpeper and His Books," *Journal of the History of Medicine and Allied Sciences* 17, no. 1 (1962): 152–167.
[81] Pierre Morel, *The Expert Doctors Dispensatory*, p. 116.

china root to use "the weightiest … not worm eaten or rotten."[82] A common concern in the consumption of exotic drugs in the early modern period was their freshness to ensure their potency.

In the mid-seventeenth century, sassafras oil began to be discussed in the texts. The herbalist and astrologer Nicholas Culpeper's translation in 1649 of the London dispensatory states that sassafras oil should be made like the oil of cinnamon. He refers the reader back to the better-known method of making cinnamon oil for which sassafras should be substituted: "Take of bruised Cinnamon five pound, spring water fifty pints, steep them twenty four hours, then distill them with an Alembick."[83] The distillation of sassafras oil was conducted in the same manner as for other aromatics, including Old World plants, such as lignum rhodium.[84] References to sassafras oil in the medical literature increased throughout the 1660s and 1670s. Sassafras oil required significant amounts of the plant material in order to extract the oil, suggesting that there was increased availability of it in the London market at this time. The production of sassafras oil also coincided with the period in which chemical medicines became more fashionable. The oil was applied externally to the body. Robert Bayfield recounted a case of a gentlewoman afflicted with *tortura oris* (or writhing of the mouth). who had "her neck … often anointed" with the oil of sassafras part of her treatment.[85]

Powdered sassafras was used in diet drinks, electuaries and cordials and became more prevalent in the mid-seventeenth century. In his 1657 *Adam in Eden*, William Coles promoted the use of sassafras powder in diet drinks to treat "all diseases that come of cold raw thin and corrupt humors" like the pox.[86] He also recommended the smell of the root and the wood to "expelleth the corrupt and evill Vapours of the Pestilence."[87] Powdered sassafras was also mixed with honey or syrup to make electuaries. The medical practitioner John Tanner (1636-1715) recommended the electuary of sassafras as a treatment for a variety of diseases in his 1659 *The Hidden Treasures of the Art of Physick*:

> It opens obstructions of the Liver, Spleen, and Kidneys, and is good against cold Rheums and Defluxions, from the Head to the Lungs, Teeth, Eyes; and helps Diseases in those parts, occasioned by such Defluxions: it provoketh the Terms, dryes up the superfluous moisture of

[82] Ibid, p. 127.
[83] Nicholas Culpeper, *A Physicall Directory, or, A Translation of the London Dispensatory Made by the Colledge of Physicians in London* (London, 1649), pp. 319-320.
[84] Moses Charras, *The Royal Pharmacopoeea, Galenical and Chymical* (London, 1678), p. 34.
[85] Robert Bayfield, *Tes Iatrikes Kartos, or, A Treatise de Morborum Capitis Essentiis & Pronosticis* (London, 1663), p. 162.
[86] William Coles, *Adam in Eden,* p. 307.
[87] Ibid, p. 308.

> the Womb, and all raw thin Humours, and breaks Wind. The dose is half a drachm in the morning.[88]

The natural philosopher Robert Boyle (1627-1691) and Nicaise Le Fèvre both included sassafras in their receipts for Sir Walter Raleigh's Cordial.[89] Raleigh himself produced receipts for several different cordials based on his investigations on New World plants while imprisoned in the Tower of London.[90] Boyle discussed in 1663 how the cordial should be prepared with "the Rinds of Sassafras of Virginia."[91] Sassafras was the only ingredient in the cordial for which Boyle specified its place of production. The cordial could be used for "Feavers, Want of Spirits, violent Fluxes, and several other distempers, where Diaphoreticks and Antidotes are proper."[92] Sassafras was prepared as a powder and mixed with a variety of other ingredients to form the cordial. Le Fèvre included sassafras as a required ingredient in his receipt for Sir Walter Raleigh's Cordial, whereas other ingredients could be substituted or were optional. He recommended that both the bark and wood of sassafras should be used based on his experience of distillating it, which worked to ensure sassafras' potency after its long sea travel:

> As for what concerns the Sassafras and its Bark, I am of opinion to put its Wood in also, by reason that the Bark furnishes not sufficiently alone; for I have made the anatomy of this Wood by distillation, and found that the Wood did yield a spirituous Water, and an Oil far more abounding and more excellent then the Bark alone, which has lost upon the Sea that which it had of most subtil and best, in lieu that the rest of the virtue hath preserved, and concentred it self in the Wood.[93]

Near the end of the seventeenth century, sassafras became used in an even more extensive range of preparations. Many texts included a variety of different ways of consuming sassafras. For example, Gideon Harvey recommended sassafras as an ingredient in a decoction, liquor by infusion and a distilled spirit, all of which were involved in the treatment of scurvy in his 1675 treatise on the disease.[94]

Sassafras was prepared in several manners reflecting its appropriation as a cure under both Galenic and chemical theories and as an increasingly ubiquitous substance through the seventeenth century.

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[88] For example, see John Tanner, *The Hidden Treasures of the Art of Physick* (London, 1659), p. 520

[89] Robert Boyle, *Some Considerations Touching the Usefulnesse of Experimental Naturall Philosophy* (Oxford, 1663); Nicaise Le Fèvre*, A Discourse upon Sr Walter Rawleigh's Great Cordial*, translated by Peter Belon (London, 1664).

[90] For Raleigh's receipts, see Walter Raleigh, "Collection of Chemical Receipts," BL Sloane MS 359.

[91] Robert Boyle, *Some Considerations*, p. 317.

[92] Ibid, p. 319

[93] Nicaise Le Fèvre, *A Discourse*, pp. 44-45.

[94] Gideon Harvey, *The Disease of London, or, A New Discovery of the Scorvey* (London, 1675).

The diversity of diseases that sassafras was recommended to treat also expanded as the century progressed, suggesting that it was becoming more familiar and less exotic as a medical drug.

Diseases

In sixteenth- and seventeenth-century print, sassafras was primarily discussed within the Galenic conceptualisation of disease by both medical practitioners and lay people such as playwrights and colonial settlers.[95] The body was viewed as porous and interconnected with its environment, and disease could enter the body as a contagion or develop within the body through malignancy and putrefaction. Galenic disease narratives centred around an imbalance in the humoral system, and the body required an evacuation of this excess to restore health.

While there was a general agreement about these principles amongst lay people and physicians alike, there were also many competing ontologies that varied over time, place and occupation. The cause of each disease was malleable and shaped to fit the experience of those afflicted. The impact of disease was felt beyond the patient, also affecting their family and community. There was a sense of immediacy to the diagnosis of disease, to act and to rectify it. Diseases were most commonly assessed and treated within the home with no external medical practitioner being consulted, as reflected in seventeenth-century letters and diaries.[96]

The diseases that sassafras was used to treat cannot be systematically classified into 'disease categories' across the early modern period. There were fluid definitions of disease that varied across time and place. Medical practitioners often presented several causal explanations for a disease that shifted with societal and environmental factors. Medical texts also included many 'synonyms' in a disease entry, which were identified as separate diseases by other medical practitioners. The boundaries for each disease varied between individual writers, and there were no long-held consensuses reached between them. Even looking at an individual medical treatise reveals many inconsistencies and disagreements about the organisation of disease. While at first glance these complicated explanations of disease causation may appear contradictory, they were not necessarily problematic for early modern readers. For example, some writers who believed that miasma could cause pestilence found the aromatic, sweet smell of sassafras a successful deterrent, while others found it ineffectual in treating the pestilence if it was caused by a divine retribution for human sin.

[95] For a discussion of diseases and symptoms in the early modern period, see Wear. *Knowledge and Practice in English Medicine*, Chapter 3.

[96] Anne Stobart, *Household Medicine in Seventeenth-Century England* (London: Bloomsbury, 2016); Jennifer Stine, "Opening Closets: The Discovery of Household Medicine in Early Modern England," Ph.D. diss. (Stanford University, 1996).

No disease was a distinct entity, but instead shifted its nature and form, disappeared and remerged through the centuries becoming something entirely unrecognisable in the process. An attempt to develop and apply a stable and consistent structure of early modern disease categorisation would be arbitrary and misguided.

Table 8. *Diseases Treated by Sassafras in Medical and Non-medical English Texts, 1580-1680*

Disease name	Medical	Non-medical	Total
The Pox	39	13	52
Dropsy	34	0	34
Obstructions	25	8	33
Agues and Fevers	26	1	27
Gout	19	2	21
Scurvy	12	4	16
Rheumes	13	0	13
Palsy	12	0	12
Windiness	12	0	12
Pestilence	11	1	12
Barrenness	11	0	11
Stone in the Reines	10	1	11
Loathing of Meat	10	1	11
Wounds/Sores	9	2	11
Coughs	10	0	10
Digestion	8	0	8
Epilepsy	8	0	8
King's Evil	8	0	8
Obstinate Catarrhs	7	1	8
Melancholy	7	0	7
Convulsions	6	0	6
Rickets	6	0	6
Shortness of Breath	4	2	6
Green-Sickness	5	0	5
Jaundice	5	0	5
Stinking Breath	5	0	5
The Whites	5	0	5
Ulcers	5	0	5

Source: Sassafras Text Collection

Table 8 shows the diversity of diseases for which sassafras formed part of the treatment. This table includes all diseases which were referred to in at least five texts. A further 47 diseases were mentioned in between one and four texts.[97] Sassafras was most commonly discussed in the

[97] Diseases mentioned in four texts were: asthma, consumptions, cramps or stiches, hypochondriac disease, leprosy and wind-colic. In three texts: apoplexy, cancer, diabetes or pissing evil, fistula, looseness, lame or

treatment of the pox in both medical and non-medical texts. The close association between sassafras and venereal diseases began with Monardes and continued throughout the seventeenth century.[98] I will also consider the prominence of sassafras as a cure for the pox in literary works later in this chapter.

Several diseases specific to women were emphasised in the medical literature on sassafras, including barrenness, green-sickness, the whites and the mother. Sassafras was understood to be particularly effective at heating and drying moist and phlegmatic constitutions and generally helpful for women with excessive moisture, which was perceived to be the underlying cause of many of these diseases. Only one of the diseases was specific to men, when sassafras was recommended as part of the treatment for "venereal impotency" arising "from some defect of the Yard in men" in a translation of Giovanni Benedetto Sinibaldi's *Rare Verities, The Cabinet of Venus Unlocked* (1658).[99] In this text, sassafras was claimed to treat impotence by increasing lust through its heat.

The second most-common disease for which sassafras was used as a treatment was dropsy, although this was only found in medical texts. Obstructions, on the other hand, appeared in both medical and non-medical texts with a relatively high frequency, being the third most common disease in medical texts and the second most common disease in non-medical texts. Aside from the pox and obstructions, the only disease mentioned more than twice in non-medical texts was scurvy. Scurvy was also the sixth most-frequent disease discussed in the sassafras medical texts. Sassafras was also commonly cited in medical texts as part of the treatment for agues and fevers. As noted earlier, the most frequently-used synonym for sassafras was the 'ague tree,' indicating its association with the treatment of this disease.

In Table 9 below, I assess how important sassafras was as a remedy for each disease by the number of times medical works recommended it as a treatment. Sassafras was heavily endorsed as a remedy for the pox. More than one-third of the medical treatises on this disease cited sassafras as a

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cripples, the megrim, phthisis, preserving sight, tumours, weakness of the sinews. In two texts: nephritic, swoonings and the mother. In one text: bruises, bubo's and parotids, chin-cough, congealed blood by a fall, difficult travels of women, enterocele or hernia, For the over-flowing of milk in women's breasts, gangrene, gutta serena or amaurosis, herpes miliar, hysterical, involuntary pissing, measles, pleurisy, poisonous wound from arrows, stings or venomous bites, prevent miscarriages, scabies, small pox, sore eyes, spots and pustules, suffusion, the worms, the burning of the urine, toothache, ulcer of the reins and bladder, urinary constipation, venereal impotency and vulva fallen.

[98] See also Charles Manning and Merrill Moore, "Sassafras and Syphilis," *The New England Quarterly* 9, no. 3 (1936): 473-475 and Magnaghi, "Sassafras and its Role in Early America."

[99] Giovanni Benedetto Sinibaldi, *Rare Verities The Cabinet of Venus Unlocked, and Her Secrets Laid Open.* Translated by Anonymous (London: P. Briggs, 1658), p. 43.

recommended drug. In comparison with Table 8, I discover that dropsy, agues and fevers, and obstructions are no longer in the top three diseases treated by sassafras. This is due to the high frequency of the medical discussions of these diseases in general, rather than the importance of sassafras in particular. Instead, by examining the proportion of sassafras recommendations in the total discussions of each disease, I reveal that sassafras is much more important in the treatment of diseases such as stone in the reines and loathing of meat. However, it is unclear whether this change was due to how often certain diseases were written about or to a change in the recommended uses of sassafras.

Table 9. *The Use of Sassafras in Disease Treatment, 1580 to 1680*

Disease Name	**Medical Texts Referencing this Disease**	**% Medical Texts Recommending Sassafras as a Treatment for this Disease**
The Pox	99	39
Stone in the Reines	35	29
Loathing of Meat	38	26
King's Evil	34	24
Barrenness	57	19
Agues and Fevers	141	18
Dropsy	199	17
Weakness of the Sinews	12	17
Windiness	76	16
The Mother	13	15
Obstinate Catarrhs	50	14
Obstructions	186	13
Rheumes	97	13
Diabetes or Pissing Evil	27	11
Epilepsy	78	10
Coughs	99	10
Gout	193	10
Pestilence	118	9
Palsy	132	9
Hypochondriac Disease	46	9
Rickets	74	8
Scurvy	174	7
Nephritic	29	7
The Megrim	44	7

Source: Sassafras Text Collection

Figure 20. *Top Twelve Diseases that Sassafras is used to Treat by Year, 1580-1680*

Figure 20 displays the distribution over time of references to the top twelve diseases by frequency. Monardes recommended sassafras as part of the treatment for six of these diseases: the pox, dropsy, obstructions, agues and fevers, barrenness and stone in the reines.[100] The pox and obstructions were consistently referred to in the texts throughout the period of study, but the largest density of references occurred between 1650 and 1670. This trend was common across all diseases and was due to the increasing prominence of sassafras in the second half of the seventeenth century.

The expansion of sassafras as a treatment for many of these diseases cannot therefore be seen solely as stemming from its initial introduction into the English medical literature via Monardes. It was in the 1650s that sassafras came to be regularly discussed in English print sources, and the virtues associated with sassafras had developed significantly beyond Monardes' original recommendations. Most of Monardes' suggestions for the use of sassafras took around fifty years to become established with few mentions between 1580 and 1630. Scurvy, rheumes and pestilence were not recommended by Monardes but were cited in the early seventeenth century by other authors. In the 1650s, when sassafras became more frequently discussed in the medical literature,

[100] Monardes, *Joyfull Newes Out of the Newe Founde Worlde*.

gout, windiness and palsy were suggested as diseases that could be treated with sassafras. This expansion connects back to Chapter 2 in which I emphasised how the commercial pressures in Virginia drove stakeholders in the colony to market sassafras as a potent drug.

The Pox

Sassafras was an important treatment for the pox across the late-sixteenth and seventeenth centuries. Monardes wrote that "[i]n the euil of the poxe, it [sassafras] worketh the same effectes that the rest of the waters, of the holy wood [guaiacum], the China, and the Sarcaparillia doeth."[101] As shown in Figure 20 above, texts frequently and continually referenced sassafras as a remedy for the pox. Sassafras clearly played an important role as an early modern cure for the pox alongside sarsaparilla, china root and guaiacum. While guaiacum was ubiquitous in the Spanish possessions in the Americas, sassafras had a more limited range, and was much more common in the British American territories.

The familiarity with sassafras as a treatment for the pox was so well-known by the 1630s that the idea that medical students would need instruction in that use was laughable. The physician Alexander Read (c. 1586-1641) included one such humorous reference in his teaching of surgery. In his *The Chirurgicall Lectures of Tumors and Ulcers* (1635), he wrote:

> As for diaphoreticke medicines, the decoction of Guajacke, Sarsaparilla, Sassafras, and the China roote with Agrimonie, Betony & Coriander, sweet Fennil-seeds, & Annise-seeds carrie away the bell. How effectuall these medicaments are, being judiciously used, not in this griefe only; but in moist ulcers also, and other diseases contagious, I need not to labour to perswade, seeing there are few of this company, who have not often made triall of them.[102]

Read suggested here that his audience of listeners and readers would have known from first-hand experience the effectiveness of sassafras as a treatment for "other diseases contagious," meaning venereal diseases.

In the work *Two Treatises* (1660), the physician and translator Abdiah Cole (fl. 1602–1664) promoted the use of New World drugs over those from the Old World, and a variety of drugs rather than solely relying on guaiacum.[103] In Cole's chapter on the "proper" remedies for the venereal disease, or the

[101] Monardes, *Joyfull Newes Out of the Newe Founde Worlde*.
[102] Alexander Read, *The Chirurgicall Lectures of Tumors and Ulcers* (London, 1635).
[103] Sennert, Culpeper and Cole, *Two Treatises*. The text was also attributed to Daniel Sennert and Nicholas Culpeper, but only Cole was still living when it was published. It appears that the views primarily stem from

pox, he argued that "this disease is occult, and is not known but by its effects, so also the remedies which cure this disease, are not found out by reason, but only by experience."[104] Cole discussed how some may worry that the pock woods would be harmful for those with hot and dry distempers, but how it was more important to "take care of the occult malignity, than of the manifest distemper."[105] He proposed the treatment to take the form of the four 'pock woods': guaiacum, sarsaparilla, sassafras and china root. Cole strongly emphasised that "without the help of these [proper] remedies, no perfect cure can be hoped for by other medicines, under what name soever."[106] Cole advocated for the method to treat the disease rather than the person, and that Master Fernelius had combined "excellent and efficacious" pock woods, "which hitherto never failed any man."[107]

He argued that while "some Physitians would advance and extol the vertues of those medicaments" from the Old World, such as "the decoction of Juniper wood, of the Olive tree, Box, Beech and other trees" could perform the same effects as the decoction of guaiacum, he did not agree.[108] Cole cited the physician Felix Plater (1536-1614) as reasoning that the New World drugs worked by moving the sweat and not by an occult quality; decoctions of other woods that were given in pestilent fevers could thus also be beneficial for the pox.[109] "Yet experience hath long since taught that that is false" and "unless proper remedies be administred, a little while after the disease is seen to grow fresh again, and return more cruel."[110] He defended the decoction of guaiacum, sarsaparilla, china root and sassafras wood as the best method because the majority of physicians preferred it in their treatment over quicksilver, Old World woods or any one sudorific on its own. For those who did not trust New World drugs, Cole advised that they first treat the patient with a standard decoction and then perform an additional treatment of an alternative alexipharmaca or antidote of an opitate, which could be created from various familiar drugs of pennyroyal, French lavender, anise, fennel, cinnamon and several others. Even in his alternative receipts, however, Cole included treatments from the New World with "red opobalsamum brought out of America if it be to be had."[111]

Cole, who cites Sennert and Culpeper as medical authorities in an attempt to draw an audience from both of their followers to listen to his own views.

[104] Ibid.
[105] Ibid.
[106] Ibid, p. 32.
[107] Ibid, p. 33.
[108] Ibid.
[109] Ibid, p. 50.
[110] Ibid, pp. 32-33.
[111] Ibid, p. 49.

Cultural Understandings: Sassafras in Literary Texts

> Lockly spits apace, the rhewme he cals it, …
> At the barre he spits before the Fathers,
> In the Court he spits before the Graces,
> In the Church he spits, thus all prophaning
> With that rude disease, that empty spitting:
> Yet no cost he spares, he sees the Doctors,
> Keepes a strickt diet, precisely useth
> Drinks and bathes drying, yet all prevailes not.
> 'Tis not China (Lockly) Salsa Guacum,
> Nor dry Sassafras can helpe, or ease thee;
> 'Tis no humor hurts, it is thy humor.[112]
>
> Thomas Campion (1602)

In his 1602 *Observations in the Art of English Poesie*, Thomas Campion referred to sassafras in the humorous poem above. Lockly's 'humor' imbalance was in fact a problem with his disposition, revealed through a pun on the word 'humor.' This poem gives us an idea of the contemporary understanding of medical practice that included using drugs, keeping a strict diet and taking baths to dry diseases caused by excess moisture and coldness. Sassafras is presented here alongside china root, sarsaparilla and guaiacum as a drying substance within the Galenic system of humours.[113] Campion suggested that these remedies would have been effective if Lockly had suffered from a somatic disease. The referencing of sassafras by poets and playwrights in the early seventeenth century indicates that the drug was both known to these writers and that they believed readers or playgoers would have understood the reference.

The socio-cultural imaginary of sassafras was constructed in a diverse range of literary works across the seventeenth century but featured most often in the form of drama in which it was closely association with the pox. Through disease representations of the pox, sassafras became imbued with connotations of sexual desire and depravity. Sassafras was presented on the stage as an exotic with a growing mystique around its formidable healing powers. Portraying sassafras in this manner was an effective form of advertising because its potency was trumpeted, while its efficacy was rarely

[112] Campion, *Observations,* p. 20.

[113] The only other discussions of this epigram have been by Paul J. Davis, who misunderstood the meaning of the poem through a partial reading. He believed that the poem was referring to mercury treatment for syphilis, which would cause excessive spitting; he missed the pun on the word 'humor.' Paul J. Davis, "Thomas Campion: Lyrick-Doctor in Physicke," *Journal of the American Medical Association* 208, no. 1 (1969): 115-119. The pun had previously been correctly identified by W. R. B. Prideaux, "The Spitting Nuisance In The Elizabethan Era," *British Medical Journal* 1, no. 2163 (1902): 1515.

challenged. Yet the credibility of sassafras was sometimes diminished by coming from the mouth of the mountebank, who performed on his 'stage upon a stage' invoking the allure of sassafras to sell his wares.

Medical conflicts between competing philosophies and groups of practitioners were evident in works of literature. New World drugs, such as sassafras, sarsaparilla and guaiacum, were co-opted into these debates as novel medicines illustrating examples in arguments. In his play *Volpone* (1607), Ben Jonson had the character of a mountebank's assistant playfully mock ancient medical writers as being ignorant of sassafras alongside other New World drugs, tobacco and guaiacum. In this passage, Volpone strives to sell his elixir cure-all by instructing his dwarf assistant Zan Fritada to sing the following song:

> Had old Hippocrates, or Galen,
> (That to their bookes put med'cines all in)
> But knowne this secret, they had never
> (Of which they will bee guilty ever)
> Beene murderers of so much paper,
> Or wasted many a hurtlesse taper:
> No Indian drug had ere beene famed,
> Tabacco, Sassafras not named;
> Ne yet, of Guacum one small stick, Sir,
> Nor Raymund Lullies greate Elixir.
> Ne, had beene knowne the danish Gonswart.
> Or Paracelsus, with his long-sword.[114]

The purpose of the song was to defend the selling of Volpone's elixir against claims that its efficacy was unproven due to its novelty. The ingredients in the song were not included in Volpone's elixir but were examples of effective medical innovations that were not present in the classical texts of Galen and Hippocrates. Three New World drugs were listed in this song alongside Ramon Llull's Elixir, Paracelsus and Danish Gonswart as contributing to medical knowledge. Llull (c. 1232-c. 1315) was a Spanish theologian who was credited with creating an elixir for eternal life. The reference to 'danish Gonswart' is unclear, although Thora Balslet Blatt's research suggests that the most likely possibility is the Danish physician Cornelius Hamsfort (1509-80).[115]

[114] Jonson, *Volpone*, unpaginated.
[115] Thora Balslev Blatt, "Who was Volpone's 'Danish Gonswart'?" *English Studies* 56, no. 5 (1975): 393-395. Another possibility is that the 'danish gonswart' refers to the theologian Wessel Gansfort (1419-1489). See Lucius Hudson Holt, "Notes on Ben Jonson's Volpone," *Modern Language Notes* 20, no. 6 (1905): 164-169.

Just as medical conflicts were subjects of drama and poetry, literary works were used in philosophical debates in medicine. Jonson's passage above mentioning New World drugs was cited in the dispute between proponents of chemical and Galenic medical philosophies. The physician George Castle (1634/5-1673) accused the writer and pamphleteer Marchamont Nedham (1620-1678) of "out-quacking" Volpone.[116] Nedham had advocated for the sweeping away of ancient Galenic and Hippocratic medical theories and their replacement with Paracelsian and Helmontian chemical frameworks in his *Medela Medicinae* (1665).[117] Castle argued for a correction of the errors of Galenism with new discoveries in natural philosophy and anatomy, while retaining its accrued knowledge based on long experience. He attacked Nedham's attempts to "recommend himself to the shrivel'd Sallad-eating Artizans," calling Nedham's book a "most elegant piece of Mountebankry" even more outrageous than Zan Fritada's song.[118]

Sassafras featured in the changing medical landscape between licensed and unlicensed medical practitioners, which was reflected in literary texts. In Massinger's play *The Emperor of the East* (1632), the courtier Paulinus is suffering with gout, and his surgeon is honest about his inability to cure him. An empiric, however, claims "the cure of gout a toy," and the empiric's associate presents him as being able to "grub up your [Paulinus'] goute by the rootes."[119] The empiric describes his elixir as being composed of a wide variety of "most curious, and costly ingredients," and proceeds to give instructions on the preparation and consumption of his treatment: "some few scruples of sassafras and Guacum, so taken every morning and evening, in the space of three dayes, purgeth, clenseth, and dissipateth the inward causes of the virulent tumor."[120] Following this display, the surgeon revealed that this was not a treatment for gout, but rather "For the gonorrhea, or if you will heare it/In a plainer phrase, the pox."[121] The empiric countered that his remedy could cure both gout and the pox, but Paulinus dismissed him, "[h]ence with the rascall/Yet hurt him not, he makes mee smile."[122] The empiric is presented here as an entertainer rather than a credible medical practitioner like the surgeon, who is portrayed as honest, knowledgeable and reliable. The empiric attempts to deceive the Paulinus with costly New World drugs, including sassafras and guaiacum. The audience is invited to laugh at his expense when he asserts that his remedies are worth the outlandish sum of 17,000 crowns and when he is thrown off the stage.

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[116] George Castle, *The Chymical Galenist* (London, 1667), p. 36.
[117] Marchamont Nedham, *Medela Medicinae* (London, 1665).
[118] Castle, *The Chymical Galenist,* p. 36.
[119] Phillip Massinger, *The Emperour of the East, A Tragae-comoedie* (London, 1632), Act 4, Scene 3.
[120] Ibid.
[121] Ibid.
[122] Ibid.

The association between sassafras and venereal diseases was employed for comedic effect in a number of literary works. In *The Wits* (1636) by the poet and playwright William Davenant (1606-1668), the gigolo Sir Morglay Thwack and the henchman Pert hatched a plan to spread fake news to scare the gentry away from London. One dire news item they proposed was the relocation of all the pox sufferers in the Paris suburbs and German camps to Covent Garden, making "Sassafras dearer than Unicornes Horne!"[123] In Ben Jonson's *Cynthia's Revels*, the God Mercury uses the insult, "My love? with a pox to you, goodman sasafras."[124] By using the character Mercury to deliver the line, Jonson added another layer to the joke referring to competition between sassafras and mercury as treatments for the pox.[125] The poet Matthew Stevenson (d. 1684) referred to sassafras as an ingredient in a "rogues Alexipharmacall" to cure the pox in "the worst of men" suggesting a negative moral judgement for its consumption.[126]

In *The Picture* (1630), the dramatist Philip Massinger (1583-1640) also associated sassafras with the pox. The two licentious "wild courtiers" Ubaldo and Ricardo attempted to seduce Sophia, and Ubaldo tried to undermine his rival Ricardo by denouncing him as infected with a variety of venereal diseases:

> Sophia.
> How! is he not holsome?
>
> Ubaldo.
> Holsome? I'll tell you for your good, he is
> A spittle of diseases and indeed
> More lothsome and infections, the tubbe is
> His weekely bath; He hath not dranke this seaven yeare
> Before he came to your house, but compositions
> Of Sassafras, and Guacum, and drie mutton
> His daily portion; name what scratch soever
> Can be got by women and the Surgeons will resolve you
> At this time or at that Ricardo had it.[127]

[123] William D'Avenant, *The Witts A Comedie* (London, 1636).
[124] Ben Jonson, *The Workes of Benjamin Jonson* (London, 1616), p. 248. This play was first performed in 1600 and published in 1616; it is unknown whether this line was in the original production.
[125] For further discussion of this scene in terms of the larger discussion of pomanders and other perfumes, see Holly Dugan, *The Ephemeral History of Perfume: Scent and Sense in Early Modern England* (Baltimore: JHU Press, 2011), pp. 73-74.
[126] Mathew Stevenson, *Occasions Off-spring, or, Poems upon Severall Occasions* (London: John Place, 1645), p. 75.
[127] Phillip Massinger, *The Picture a Tragaecomaedie* (London, 1630), Act 4, Scene 2.

The method of curing venereal disease in this scene reflects the audience's understanding of an effective treatment: the consumption of dry mutton and daily decoctions of sassafras and guaiacum along with weekly baths. This scene also signals an anxiety of not knowing who had venereal disease and the fear of being infected unwittingly. Later, Ricardo adopts a similar strategy of casting aspersions on Ubardo as keeping "a regiment of whores" for which "there's not a nose among 'em," indicating their infection with the pox.[128]

The Irish playwright Richard Head (c. 1637-c. 1686) illustrated a patient's visit to a doctor to cure his venereal disease in his play *The Humours of Dublin* (1663).[129] The physician Bankrupt prescribed sassafras, guaiacum and restringent (astringent) pills:

> Sir, take of each of these as much as will lye on a Groat, in half a Pint of the decoction Guajacum, and Sassaphras, for three mornings together, and 'twill divert the vehement pain in the Scrotum; that done, take of these restringent Pills, three or four, Morning and Evening.[130]

In this later play, the directions for taking sassafras are more specific than in earlier literary sources discussed above, with both the amount of the decoction to consume and the treatment duration specified. The playwright expects his audience to be familiar with such precision from their own experience.

Across the seventeenth century, sassafras and other New World drugs featured prominently in poetry and plays, shifting from lavish things of mystique to the common and familiar. Increasing knowledge and experience of these drugs' consumption was suggested by progressively specific instructions for their preparation and use in the dialogue of plays over time. These medicinal plants from the Americas were proclaimed as especially potent against the pox and other venereal diseases, which was also the primary type of disease treated by medical practitioners with sassafras. Knowledge circulated between genres of texts, in which debates in medical philosophy and status conflicts between groups of medical practitioners were played out on the stage. Likewise, literary works were referenced in polemical medical treatises, their characterisation of empirical practitioners provided rhetorical support for their critics.

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[128] Ibid.
[129] Richard Head, *Hic et Ubique, or, The Humours of Dublin a Comedy* (London, 1663), pp. 52-54.
[130] Ibid, p. 53.

Conclusion

In weaving together diverse aspects of the social, cultural, economic and medical responses to sassafras, I have presented an integrated understanding of the introduction of a New World drug to the early modern English experience. I explored the genres of travel and geographical accounts, medical texts and literary works to uncover how sassafras was understood in early modern England as a commodity, a drug and a cultural marker. These genres were fluid and so was the knowledge that flowed between them. Travel and geographical accounts revealed ideas of plants as medicines, medical texts elaborated the cost of competing drug commodities and literary works displayed humoral understandings of the properties and uses of these medicines.

Sassafras rose to fame in early modern England for both economic and cultural reasons. As I established in Chapters 1 and 2, sassafras was part of a diversified colonial drug economy that expanded in the later half of the seventeenth century. Early modern geographical and travel accounts in my study promoted sassafras as a profitable commodity and located it in an increasing variety of English colonies as England's empire expanded. Medical texts presented sassafras as an efficacious remedy for a growing number of diseases and informed medical practitioners and lay people how to prepare and consume the drug. Literary works highlighted the benefits of using sassafras for curing 'pocky' bodies, which were becoming increasingly common throughout the seventeenth century. As Margaret Healy has noted, the pox held a wide geographical character. Its name was attributed to elsewhere; whether it was Spain, France, Italy or somewhere else, it was inevitably foreign.[131] A foreign disease required a foreign drug to effect its cure. In the case of sassafras, I found that the imperatives of commerce and empire fostered the prominence of another New World remedy for the pox. Anna Winterbottom has also demonstrated that the eventual triumph of sarsaparilla over china root as a treatment for the pox in eighteenth-century England was due to the commercial interests of the British empire, which favoured a commodity from one of its own colonies, Jamaica.[132]

The changing medical landscape across the seventeenth century in terms of debates between medical philosophies, the rising volume of texts authored by unlicensed medical practitioners and the increasing number of colonies from which American drugs were supplied, all influenced how sassafras was represented in early modern English print. Over the course of the century, sassafras

[131] Margaret Healy, *Fictions of Disease in Early Modern England: Bodies, Plagues and Politics* (Basingstoke, Palgrave, 2001), p. 124.
[132] Winterbottom, "Of the China Root."

became more familiar, less exotic, and was incorporated into medical practice in an increasingly diverse range of preparations for an ever-greater number of diseases. The significance of sassafras in the medical corpus accelerated with a shift in scale from the 1650s, which matches the period when the volume and diversity of New World drugs expanded, as shown in Chapter 1. In the next chapter, I will analyse how an avid reader of scientific, medical, geographical, travel and literary genres of print constructed his own knowledge of American *naturalia*.

Chapter 4

Inquiries and Answers:
Constructing Knowledge of New World Drugs

Introduction

How was knowledge of American flora constructed in early modern England? In the first three chapters of the thesis, I demonstrated that the 1650s were a pivotal period for the development of the English trade in American drugs and their reception in print, and that this was a result of political and economic transition. In this chapter, I turn my attention to a decision maker involved in the process of garnering intelligence about the natural productions of the New World in the latter half of the seventeenth century. As drugs from the colonial American market entered English ports, there was an increasing interest in and need for evaluations of their value as both economic commodities and medicines. A few elite figures served as knowledge brokers, who evaluated reports both in government positions and in scholarly societies. These influential knowledge brokers made recommendations for future investment and development of drug commodities. In this chapter, I provide a case study of one of these figures to demonstrate the process of how knowledge was negotiated and how this informed future scholarly inquiry and commercial interest. I focus on the case of Abraham Hill (1633-1721), a figure relatively obscure in the historiography, but one who was responsible and active in the evaluation of medicinal plants from the Americas.

Hill drew on classical and contemporary writers and reported experiences to develop his knowledge of *materia medica* new to England. As a merchant, founding Fellow of the Royal Society and a Commissioner of the Board of Trade and Plantations, Hill occupied a unique position of authority to draw on extant and commissioned sources of information about *naturalia* from the English colonies. By examining his ten volumes of little-studied commonplace books, I have uncovered how Hill investigated nature and negotiated different authorities' knowledge claims to interpret the properties of New World plants.

Hill was well-placed to order inquiries into the extant reports on potential natural commodities from England's colonies in the Americas. Hill acted as a mediator of natural knowledge, consolidating contemporary empirical reports with the vast body of historical knowledge from antiquity. Furthermore, I suggest that, in Hill's view, it was necessary to question traditional forms of authority,

such as the Church and State, not because their knowledge of the New World was incomplete, but only when they did not coincide with the good of the commonwealth. In Hill's many administrative roles, he secured a position of influence and stature, and he became a consulted authority of natural knowledge by the Royal Society, the Archbishop of Canterbury and the Board of Trade. In his role as secretary to the Royal Society, for example, Hill managed the Society's correspondence and was the recipient of contemporary scholarly findings, placing him at the centre of an extensive network of correspondents. He was summoned by these institutions to either confirm or dispute other natural philosophers' claims at committee meetings, especially in matters involving His Majesty's plantations in Virginia and the West Indies.

In this chapter, I consider how Abraham Hill assessed claims of natural knowledge, and how he applied his exacting standards of knowledge production to the project of understanding both the potential dangers and beneficial medicinal uses of American flora. I first introduce Hill's social background, his wider intellectual milieu and the knowledge inquiry services he performed for the Royal Society and the Crown. This provides the background for exploring the process of knowledge negotiation in Hill's own writing, through his avid reading, extensive note-taking and continual editing and reordering of his expansive but little-studied ten volumes of commonplace books comprising over 2,000 pages. I then discuss Hill's questioning of both classical and contemporary authorities and their natural knowledge production methods; even the scholars who most influenced Hill's thinking, such as the philosopher and statesman Francis Bacon (1561-1626), came under his critique. By following the process of Hill's own natural knowledge production, we can see how he evaluated various information sources. These sources ranged from reports on indigenous peoples' knowledge and experience of New World plants to Hill's own observations of experiments.

Abraham Hill, the Royal Society and the Board of Trade

Abraham Hill was described by contemporaries as a 'learned gentleman' and a 'curious naturalist.'[1] He was the eldest son of Agnes Hill (d. 1660) and Richard Hill (d. 1660), a successful English merchant and alderman who had been appointed Treasurer of Sequestrations by the Long Parliament from 1642-1649. Hill first married Anne (d. 1661), daughter of Lord Bulstrode Whitelocke (1605–1675), a prominent statesman and lawyer. Hill had privileged commercial and political connections, and upon

[1] Mr. Pepys wrote on the back of a letter from Abraham Hill to John Evelyn that the letter was from "a learned gentleman, Mr. Hill." Abraham Hill to John Evelyn, 26 February 1697, British Library Add. MS 78684, ff. 43-44. Hill was referred to as a "curious naturalist" in Edward Hasted, *The History and Topographical Survey of the County of Kent: Volume 2* (Canterbury, 1797), p. 352.

his parents' deaths in 1660, he inherited a considerable fortune.[2] Hill's wealth was significant enough that he could afford to largely neglect his foreign mercantile interests for the social and intellectual world of the Royal Society, although he retained his ship *Society* to carry out voyages of inquiry and conduct some trade in luxury goods.[3] Hill left his second wife Elizabeth and the children from his first marriage (Frances and Richard) to reside in rented chambers at Gresham College, where he engaged in discussions of the new or experimental philosophy.

At Gresham College, Hill was a member of the select committee of twelve, who were influential in the formation of the Royal Society in 1660.[4] He became one of the founding fellows of the Royal Society named in King Charles I's charter of 22 April 1663, alongside Robert Boyle (1627–1691) and Christopher Wren (1632-1723). In the same year, as one of Hill's first duties, he sat on the committee for "the making of a cover for the mace from silk sent from Virginia."[5] The mace was (and remains) the Society's symbol of royal endorsement, and the manufacture of its covering cloth would have held significant meaning. This was to be the first of many exchanges with England's colonies in America in which Hill undertook a leading official position. During his sixty-year membership of the Royal Society, Hill served on its elected council from 1663 to 1666 and 1672 to 1721 and also held the positions of treasurer (1663-1666, 1677-1699) and secretary (1673-1675). As a fellow of the Royal Society, Abraham Hill was at the heart of an institution dedicated to promoting knowledge of the natural world through observation and experimentation.

[2] Biographical information is drawn from the following sources: Thomas Astle, "Preface," in Thomas Astle, ed. *Familiar Letters which Passed between Abraham Hill, Esq., and Several Eminent and Ingenious Persons of the Last Century* (London, 1767); John Guillim, *A Display of Heraldrie* (London, 1660); Abraham Hill, *Commonplace books*, Sloane MS 2896, f. 147 (this was written by an unknown hand and included in the back of this commonplace book); Lotte Mulligan, "Hill, Abraham (bap. 1635, d. 1722)," *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004).

[3] Other prominent Royal Society fellows were involved in executing these voyages. Edmond Halley, for example, reported to Abraham Hill about the condition of Hill's ship stating that he would resolve any maintenance issues, such as tarred ropes, with "all diligence" and not let anything "defeat our [Hill and Halley's] business." See Edmond Halley to Abraham Hill, 22 June 1691, in Astle, *Familiar letters*, p. 136.

[4] Thomas Birch, *The History of the Royal Society of London*, Vol. 1 (London, 1757), p. 3.

[5] The Royal Society, "Minutes of a Meeting of the Royal Society: 30 September 1663," JBO/1/150, Royal Society Library: "Mr Hill was desired to get the parcell of coarse silk [from Virginia], to be put into a Stuffe for a Cover to the Mace."

Figure 21. *Portrait of Abraham Hill*
Source: The Royal Society, Image number: RS.9738, Credit: ©The Royal Society
Attributed to John Hayls (1595-1679)

Hill was fully engaged in this intellectual milieu, collaborating on experiments with Robert Hooke, collecting and discussing rare specimens and corresponding with other natural philosophers worldwide. He also consulted his mercantile network to procure *naturalia* or secure other favours for the Royal Society.[6] A few examples of Hill's philosophical activities were: conducting an experiment on the properties of tin and lead; presenting a collection of corals, shells and preserved triangular fish from the Bermudas; and reporting on accounts of strange cases of poisoning in Italy

[6] For example, "Mr Hill presented from Mr. Langerman, a merchant, a spar, or mixture of stone, spar and pyrites." Birch, *The History of the Royal Society of London*, entry for June 24th 1680, p. 43. Additionally, Abraham Hill engaged with the Turkey Company on behalf of Hans Sloane to discuss whether a physician friend of Sloane's could become the Company's physician. Abraham Hill to Hans Sloane, Sloane MS 4036, f. 124.

that were not discernible by smell or taste.[7] Hill's contributions to the Society clearly went beyond those of an administrator; his knowledge and judgement were valued by his peers, who often consulted him. The natural philosopher Robert Hooke (1635-1703) recalled meeting frequently with Hill in coffeehouses and taverns for "Excellent good Discourse" and selected Hill as one of the few he invited to view his letters in his private quarters.[8] Hill also had close relationships with other prominent members of the Royal Society, including John Locke (1632-1704), a fellow member of the Board of Trade, and Sir Hans Sloane (1660–1753), Hill's medical adviser and fellow trustee of the Copley benefaction.[9]

In 1709, Sir Godfrey Copley, a fellow of the Royal Society, bequeathed £100 to Hans Sloane and Abraham Hill to appoint and direct future experiments. The Royal Society council requested that they "cause an exact description of the said Experiments and of their respective design and uses to be made and read to the Said Society and to be Registered in their Books within Six Months after the making them."[10] In order to produce these 'exact descriptions,' Sloane and Hill would have needed to understand all aspects of experiments from the intricate workings of apparatus to the theoretical applications of the experiments' results. The Copley legacy formed the foundations for the Copley Medal instituted in 1736, which is "one of the oldest surviving honorary reward systems not only in the Royal Society but also in European science ... [and] represent[s] the recognition by the Society of the highest scientific distinction."[11] The Society's acknowledgement of Hill's ability to identify promising research was long-standing, and by this time Hill had an established record in this capacity for at least forty years. In 1676, for example, he was chosen to be on a "Committee to consider persons, members of the Royal Society, fit to entertain the Society at their weekly meetings with experiments and discourses upon them."[12] Hill was also involved in the selection of works to be published by the Society on a variety of topics, including natural history and medicine. Two such examples of works supported by Hill for publication were *The Digester, or the Description of an*

[7] Hill also possessed a six-foot telescope that the Society used to make astronomical observations. Birch, *The History of the Royal Society of London*, entry for Monday March 21st 1676/7, "sent home Mr. Hills 6 foot telescope."

[8] Henry W. Robinson and Walter Adams, eds. *The Diary of Robert Hooke MA, MD, FRS, 1672-1680* (Abingdon: Taylor & Francis, 1935), p. 245, and The Royal Society, "Minutes of meeting: 17 December 1679," Council Minutes Original, Volume 1, CMO/1/262, Royal Society Library (henceforth Royal Society Minutes).

[9] For an example of Hill exchanging scholarly advice on publications with John Locke, see Bodleian, MS Locke c.11 f. 208. For an example of Hill's medical consultations in letters with Hans Sloane, see Sloane MS 4046, ff. 183-184.

[10] The Royal Society, "Minutes of meeting: 20 June 1717," Royal Society Minutes Volume 2, CMO/2/272.

[11] M. Yakup Bektas and Maurice Crosland, "The Copley Medal: the Establishment of a Reward System in the Royal Society, 1731-1839," *Notes and Records of the Royal Society of London* 46, no. 1 (1992), p. 43.

[12] The Royal Society, "Minutes of meeting: 6 March 1676," Royal Society Minutes Volume 1, CMO/1/229

Engine for Softening the Bones by the French physician Denis Papin (1647-1713) and a discourse by the writer John Evelyn (1620-1706) concerning the improvements of the earth for vegetation. [13]

Hill's interests in natural history and medicine were diverse, but he was especially interested in distant lands like the Americas, Africa and the East Indies. He encouraged the Royal Society to purchase stock in the East India Company and the Royal African Company, where he later served as Deputy Governor.[14] In regard to Africa, for example, Hill compiled his most pressing questions on Guinea in his "Inquiries For Guiny" (1666). He proposed inquiries regarding the Guinean 'Negroes,' such as whether they had superior eyesight to Europeans which enabled them to spot ships approaching the Guinean coastline, their method of producing palm-wine, how they became infected with worms from their drinking water and "Whether their Arrows, they make, be poisonous? By what tree, and how prepar'd?"[15] After the reading of Hill's inquiries in the 'Committee for Correspondence' (formerly the 'Committee for Foreign Parts'), "[i]t was ordered, that the committee for correspondence consider the drawing up both general and particular heads of inquiries for all parts of the world."[16] Hill's line of questioning was influential in shaping a precedent for regional-based bio-prospecting in the Royal Society in that the committee for correspondence desired choice 'rarities' alongside their completed questionnaires to be brought to England from their contacts in faraway lands.[17] As Michael Hunter has noted, the interests of the Committee for Correspondence reflected the wider endeavour of the Royal Society, where "information might be derived from which knowledge of the workings of nature in different circumstances might be extended and hypotheses thus tested."[18] *Naturalia* acquired from both east and west became subjects of further investigation, and experiments were performed on them to better understand their virtues and vices.

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[13] The Royal Society, "Minutes of meeting: 8 December 1680," Royal Society Minutes, CMO/1/268 and "Minutes of meeting: 17 June 1675," Royal Society Minutes, CMO/1/221.

[14] The Royal Society, Minutes of meeting: 8 February 1682, CMO/1/288, Royal Society Minutes: "Ordered that the £1300 now received by Abraham Hill Esq. Treasurer of the Society from Mr Johnson, be deposited by him in the East India Company." The Royal Society, "Minutes of meeting: 06 December 1682": "Mr Hill's acknowledgement of a trust of 200 pounds stock in the African Company for the use of the Society was put in the chest."

[15] Abraham Hill, "Inquiries for Guiny, the Rivers Niger and Gambra and other Related Natural History," *Philosophical Transactions* 2, no 25 (1666), p. 472.

[16] Thomas Birch, *The History of the Royal Society of London*, pp. 456, 458.

[17] For detailed examinations of European bio-prospecting in the Americas in this period, see Londa L. Schiebinger, *Plants and Empire: Colonial Bioprospecting in the Atlantic World* (Cambridge, MA: Harvard University Press, 2009) and Antonio Barrera-Osorio, *Experiencing Nature: The Spanish American Empire and the Early Scientific Revolution* (Austin, TX: University of Texas Press, 2006).

[18] Michael Hunter, *Establishing the New Science: the Experience of the Early Royal Society* (Woodbridge: Boydell & Brewer Ltd, 1989), p. 94.

The English government did not follow Spain in developing centralised institutions to conduct drug trials and write compendious natural histories inventorying the possessions of the empire in the same vein as the Roman Empire.[19] The Royal Society was, however, granted a charter to "extend not only the boundaries of the Empire, but also the very arts and sciences" and to use experiments to further knowledge of the natural world in expanding the English dominions.[20] In 1666, the Royal Society published its "Inquiries for Virginia and the Bermudas," in which the first three questions were related to medicinal natural substances in these locations. The Society solicited parcels of medicinal earths, inquired into what tinctures and drugs were available, requested full accounts to be provided of several drugs, including wichacan, pocone and musquaspenn, and asked about the medicinal uses of their hot baths.[21] Several accounts were prepared by colonial governors, clergymen, surgeons and delivered to the Royal Society to answer their call for this information. The surgeon Thomas Glover discussed in 1676 how the price of snake root had more than tripled from ten shillings to three pounds sterling a pound, following its fame as a remedy for the plague.[22] He also provided information on a little known plant called dittany or pepper-wort, which he claimed provoked violent sweats and was one of the best remedies for ridding the body of worms. The rector John Clayton (1656/7-1725) discussed how jalap and snake root could treat various illnesses in 1688; later that year, Clayton was elected a Fellow of the Society.[23]

News of the Royal Society's role as both a reservoir of natural knowledge and its application of experimental philosophy to the natural world travelled far. In 1680, a Mr. William London sent a letter from Barbados requesting "the advice and assistance of the Royal Society in writing a history of Barbadoes inc. natural productions, plantations, customs and manners of the people, artificial curiosities, [and] trade."[24] Mr. London stated that his intentions were to expand this project to all of the English plantations in America. The Council met to discuss Mr. London's request and decided to undertake the project. Hill and Hooke were both named as members of the responsible committee. To provide a reference framework and further aid their natural studies, Hill and Hooke proposed that they compile and catalogue a collection of travellers' voyage journals, both those financed by

[19] Barrera-Osorio, *Experiencing Nature;* Paula De Vos, "Natural History and the Pursuit of Empire in Eighteenth-century Spain," *Eighteenth-Century Studies* 40, no. 2 (2007): 209-239.
[20] "First Charter of the Royal Society."
[21] The Royal Society, "Inquiries for Virginia and the Bermudas," *Philosophical Transactions* 2 (1666): 420-421.
[22] Thomas Glover, "An Account of Virginia, its Scituation, Temperature, Productions, Inhabitants, and their Manner of Planting and Ordering Tobacco &c.," *Philosophical Transactions* 11 (1676): 623-636.
[23] John Clayton, "A letter … May 12, 1688. Giving an Account of Several Observables in Virginia, and in his Voyage Thither, More Particularly Concerning the Air," *Philosophical Transactions* 17 (London, 1693): 781-795.
[24] Thomas Birch, *The History of the Royal Society of London*, entry for October 19th 1681, p. 97.

the Society and its Fellows and otherwise, including all those available in both print and manuscript form.[25]

In addition to his roles at the Royal Society, Hill was appointed Deputy Governor of the Royal African Company and Comptroller of the Church of England, both in 1691. These positions attest to Hill's reputation as a diligent administrator and his engagement with elite actors across a range of social institutions. Archbishop John Tillotson, who appointed Hill as Comptroller, was impressed by Hill's knowledge on both religious and other matters, calling him his "instructing philosopher and learned friend."[26]

Hill's engagement with the investigation of overseas *naturalia* went beyond his positions in the Royal Society and the Royal African Company. On June 26th 1696, Hill was present in Whitehall for the first meeting of "His Majesty's Commissioners for promoting the Trade of this Kingdom, and for inspecting and improving His Plantations in America and elsewhere."[27] Others present at the meeting included the Chancellor of the Exchequer, Charles Montagu (1661-1715), the Lord Keeper and lawyer John Somers (1651-1716). Both Montagu and Somers were former presidents of the Royal Society, and they were patrons of authorship and as well as writers themselves. Further down the table was the political philosopher John Locke. All of these men were highly influential, were fellows of the Royal Society and Whig supporters, and together they formed the foundation of the Board of Trade. As Peter Laslett has argued, this group represented "the beginning of the old Board of Trade, the architect and instrument of the disastrous Old Colonial System."[28]

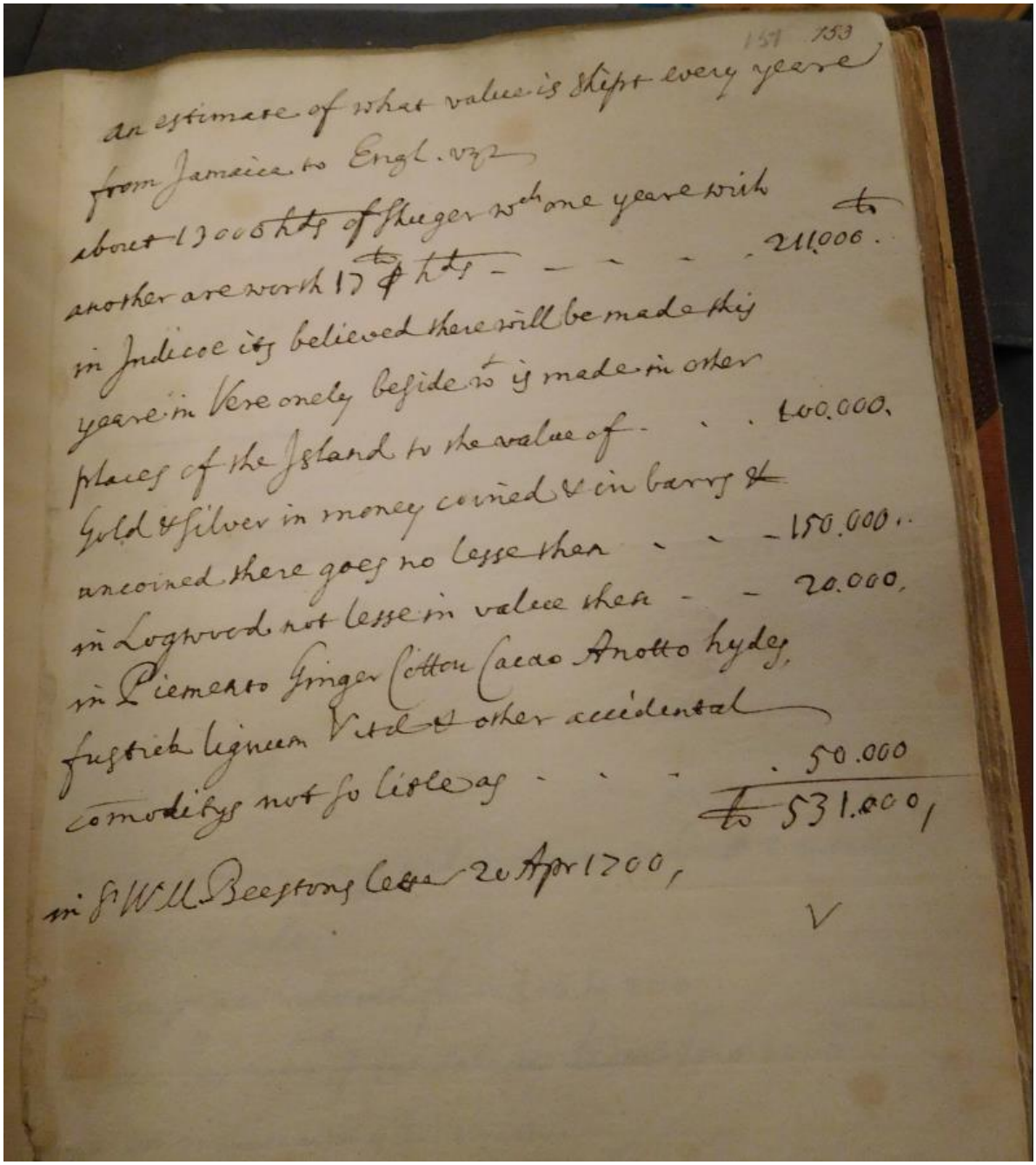
The 'Old Colonial System' was still largely based on Roman imperial policies that drew on the doctrine of Natural Law, although some new influences had been incorporated into the English colonisation projects. Contemporary works, such as Francis Bacon's essay *Of Plantations* (1625) and the philosopher Thomas Hobbes' (1588-1679) characterisation of the colonies as children of a commonwealth in his *Leviathan* (1651), were also cited in theoretical political discussions concerning

[25] Ibid. Entries for March 11, 1679/80 (p. 24) and April 5, 1682 (p. 139).
[26] Thomas Astle, "Preface," in *Familiar Letters.*
[27] "28 January 1698," in *Journal of the House of Commons*, Volume 12, 1697-1699 (London: His Majesty's Stationary Office, 1803), pp. 70-73.
[28] Peter Laslett, "John Locke, the Great Recoinage, and the Origins of the Board of Trade: 1695-1698," *The William and Mary Quarterly* 14, no. 3 (1957): 370-402. Committees like the Board of Trade were not unique to the English case; for parallels with the Spanish case, see Antonio Barrera, "Empire and Knowledge: Reporting from the New World," *Colonial Latin American Review* 15, no. 1: 39-54; for case studies of such similar institutions in other European countries, see Claudia Swan and Londa Schiebinger, ed., *Colonial Botany: Science, Commerce, and Politics in the Early Modern World* (Philadelphia, PA: University of Pennsylvania Press, 2005).

how to manage the English possessions in the New World.[29] Abstract principle and high policy were guiding factors, but the administrative machinery and economic pressures were the ultimate drivers of what materialised and what did not. Some commodities which did materialise were drugs from Jamaica, as shown in Hill's notes from a letter received from Sir William Beeston (1636-1702), governor of Jamaica, shown in Figure 22 and a separate list shown in Figure 23. These lists were preserved in Hill's Board of Trade papers and included many drugs that were exported from Jamaica, such as sarsaparilla, logwood, pimento, ginger, cacao, fustick and guaiacum. These lists also recorded information on their price and quantity. Some of these drug commodities were highlighted in Chapter 1 as being traded in large quantities from Jamaica, including cacao, ginger, guaiacum and sarsaparilla.

As I demonstrated in Chapter 2 with the case of Virginia, and in Chapter 3 with the reception of sassafras, the 1650s were a critical juncture in the political and commercial development of the English American colonies. This was also the time when various formats for a council of trade were proposed, with merchants showing the most initiative in producing concrete plans. While some short-term committees came to fruition between the 1650s and 1670s, none lasted long. The same debates raging about representation and power in colonial American governance were also very alive in England. Should the committee be a small group of experts or a large representative council? Who should the experts be? Who should oversee their selection and appointment, the King or Parliament? Throughout the years of the Interregnum, Restoration, and Glorious Revolution, these questions were revisited and re-evaluated.

[29] Francis Bacon, *The Essayes or Counsels, Civill and Morall* (London, 1625). Thomas Hobbes, *Leviathan, or, The Matter, Form, and Power of a Common-wealth Ecclesiastical and Civil* (London, 1651).



An estimate of what value is Shipt every yeare from Jamaica to Engl.d viz.

about 13000 hds of Sugar w.ch one yeare with another are worth 17 £ hd.s - - - - - 221.000.

in Judicce its believed there will be made this yeare in Vere onely beside's is made in other places of the Island to the value of - - - 100.000.

Gold & Silver in money coined & in barrs & uncoined there goes no lesse then - - - 150.000.

in Logwood not lesse in valuc then - - 20.000.

in Piemento Ginger Cotton Cacao Anotto hyde, fustick ligneum Vitæ & other accidental comodityes not so little as - - - - 50.000

£ 531.000,

in S.r Wm Beestons Case 20 Apr 1700,

V

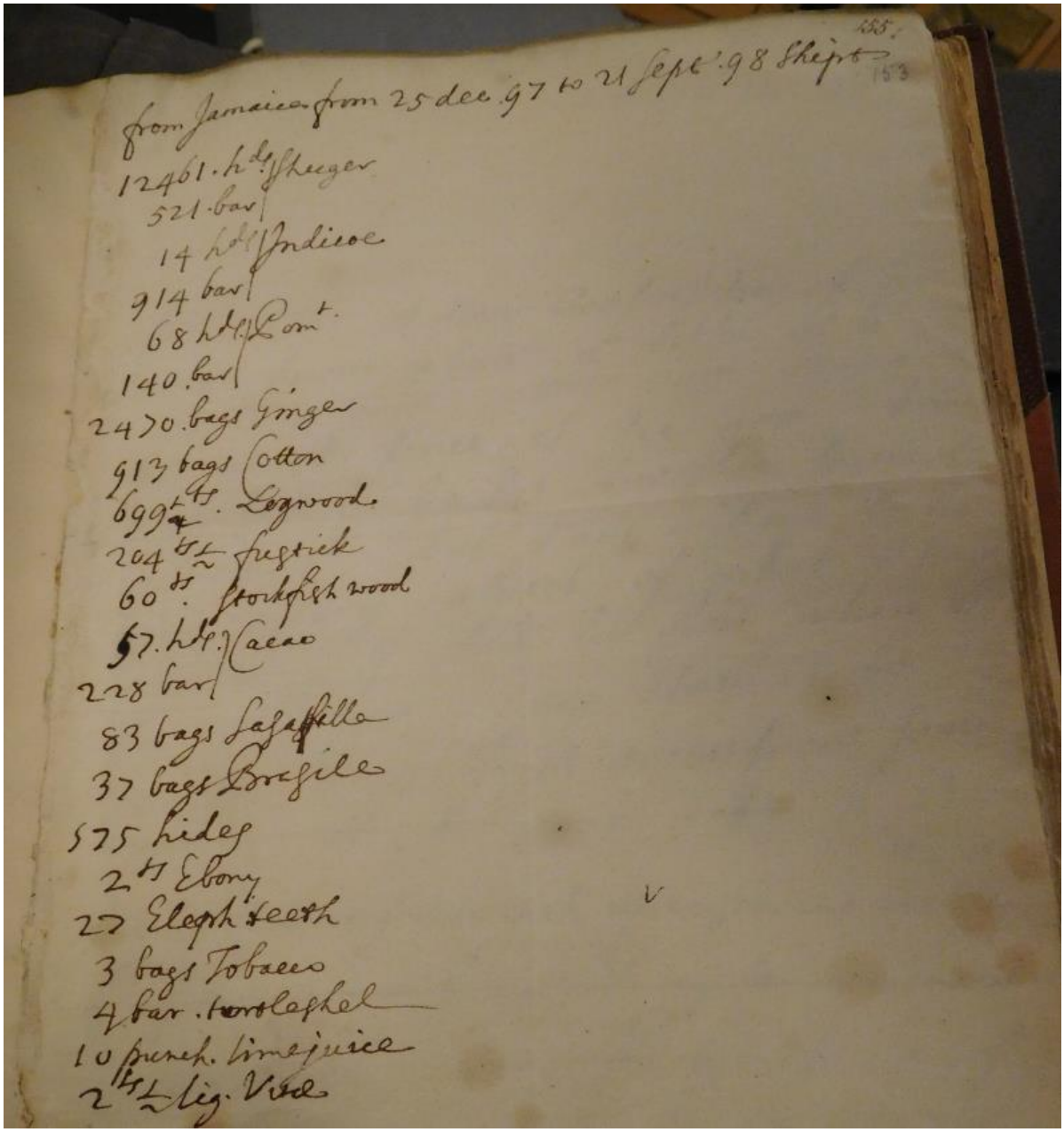


Figure 23. *Abraham Hill's List of Exports from Jamaica in 1697-98*
© British Library Board, Sloane MS 2902, f. 153

The constitutional questions of the Glorious Revolution resulted in a clear need for a separation between policy discussions and advice and the government itself. While proposals were made for a representative assembly, consisting of members from all regions of England and its American colonies, these plans were never properly considered. This dismissal was mainly due to the alliance who proposed them: Tory politicians, Englishmen against Dutch influence and supporters of the Parliament against the Prerogative, who nearly ended King William's reign in 1695. The decisions about colonial trade did not lie with the American colonists or the merchants familiar with their wares, but with the select group of men chosen, including John Locke and Abraham Hill, who would not challenge the Dutch King William or his Tory ministers.

Colonial governance was once again in crisis in the 1690s, with heated constitutional disputes over whether Parliament or the King should create and control the Board of Trade.[30] Perhaps even more alarming was that England's political and economic affairs appeared to be worsening once again in a familiar cycle of colonial distress and the central government's inability to act due to its own chaotic internal administration. Abraham Hill intervened in economic policy debates with his *A Letter about Raising the Value of Coin*, published in 1690.[31] In Hill's design for recoinage, he proposed that clipped coins should be retired from circulation one denomination at a time, the process should be controlled by the Exchequer and the Mint should be reserved for only the King's use.[32] This plan would lead to the capturing of all gains from the recoinage by the King.

England's extended and ever-deepening crises of the balance of payments and the state of coinage forced the government to form the Board of Trade in 1696.[33] The government would need to address these internal issues first before deciding what the proper constitution of a regulating body for trade, which covered both colonial trade and relations.

The selection of Royal Society Fellows to consult on colonial advisery committees was not a new phenomenon. Robert Boyle was involved in the early 1660s, and John Evelyn and John Locke advised on the council led by the Anthony Ashley Cooper, first Earl of Shaftesbury, from 1670-1674.[34] Locke was one of the Carolina proprietors and composed the *Fundamental Constitutions of Carolina* (1669) with Shaftesbury.[35] The theoretical perspective of this early council in the 1670s was that trade was an affair of policy, in which the trade benefits for the entire nation should be its endeavour rather than the private designs of merchants. Peter Laslett asserted that "no private individual living in England in 1695 was in a better position than John Locke to advise that a board of trade should be set up, and to see that his advice was turned into policy, even down to the details of its constitution, functions, and membership."[36] While Locke was no doubt the driving force, we should also analyse a wider group of his contemporaries, including Abraham Hill, who gave Locke critical feedback on his

[30] Charles McLean Andrews, *The Colonial Period of American History* (New Haven: Holt, 1934-38), chapter 9 "The Origin and Work of the Board of Trade."
[31] Abraham Hill, *A Letter about Raising the Value of Coin* (London, 1690).
[32] Hill's plans were more innovative than other proposals for recoinage. His ideas were later incorporated into the first recoinage bill put forward to the Commons in 1695, but they did not manifest in the final bill that was adopted. For a full discussion, see Richard A. Kleer, *Money, Politics and Power: Banking and Public Finance in Wartime England, 1694-96* (Abingdon: Routledge, 2017), pp. 120-122.
[33] R. M. Lees, "Parliament and the Proposal for a Council of Trade, 1695-6," *English Historical Review* 54, no. 213 (1939): 38-66.
[34] Locke was the secretary of this council. Louise Fargo Brown, *The First Earl of Shaftesbury* (New York: American Historical Association, 1933), chapter 9 "Theories and Councils of Trade and Plantations."
[35] Maurice Cranston, *John Locke: A Biography* (Oxford: Oxford University Press, 1957).
[36] Laslett, "John Locke," p. 378.

writings on the issue of recoinage in addition to producing his own publication on the issue as discussed above. While Locke was the front runner in many ways, he did not stand alone in these decisions; other men of the Royal Society also held sway through similar connections and knowledge of political theory and commerce.

The experts chosen to consult on economic and political matters were men involved in promoting rationalism and empiricism. Other natural philosophers, including Isaac Newton (1642-1727), Christopher Wren and John Wallis (1616–1703) were also involved in forming the foundations of the Board of Trade. These men of expert knowledge were employed in government and administration matters, yet here is an area where political history and the history of science rarely converge. The impact of these scientific consultations on political decisions and their influence on political theory are areas seldom discussed by historians, especially in reference to colonial projects.

The English government was faced with the economic dilemma of how to manage its colonial subsidy governments at the same time it was experiencing change in political theory, with the development of the doctrines of self-government and trust. This resulted in a paradox for the political society of early America. Clearly it was not sufficient for these scholars to consider the welfare of colonies like Virginia only as theorists. They needed to construct practical, implementable plans that addressed the colony's constitutional, religious and economic concerns. In Chapter 2, I discussed the concerns of incompetent colonial governance of Virginia in the 1650s and the proposals that were made to improve the situation. It was not until the climax of economic distress in the early 1690s, however, that a body was formed to provide permanent positions to expert advisers.

Hill and the other founding members of the Board of Trade established a political body that would decide on important trade matters. While the American colonies were not created solely by political policy, they could not have been formed without it. These men, Montagu, Somers, Hill and Locke, were responsible for advising the government, providing intelligence and establishing connections with appropriate contacts outside of the political realm with specialist knowledge. The English monarchy and ministers were dependent upon the Board of Trade to have excellent administrative skills and to provide practical information and advice that could be implemented readily to further the Crown's colonial interests.

This was the task set before Abraham Hill. He needed to gather information, interpret it, and assess its potential value for government investment. Chosen members were well-compensated for their service; John Locke was paid £1,000 per annum to consult as an expert adviser.[37] The commissioners of the Board of Trade were deferred to by the Lords Justices and worked closely with the Secretary of State, the greatest permanent government officials in this period. The very fact that Hill was chosen to be a member of a body of colonial advisers demonstrates how valuable his judgement on these matters was perceived to be by high-ranking government ministers.

Hill's extensive private notebooks reveal how he navigated the sheer volume and complexity of information he received in his various committee meetings and from his commissioned reports. We also have examples of the kinds of intelligence that Hill consulted. Amongst his official memoranda as Commissioner for Trade and Plantations are detailed descriptions of imports from the American colonies, including tobacco, sugar, cacao, guaiacum, lime juice, ginger and sarsaparilla. From 25th December 1697 to the 21st September 1698, for example, Hill recorded that 2,470 bags of ginger and 83 bags of sarsaparilla were imported from Jamaica along with a variety of other commodities.[38] In the Commissioners' formal report addressed to William III, the Board of Trade concluded on the basis of this kind of evidence that "Tobacco, Sugar, Cotton, Indigo, and Ginger, [were] the chief Commodities of those Plantations" and that "Trade, to, and from those Colonies deserves the greatest Incouragement, and will be very advantageous."[39] Through my reading of Hill's papers and commonplace books, I examine how a leading adviser to policymakers who was also deeply involved with colonial trade constructed knowledge of American *naturalia*.

Reading Hill's Commonplace Books

Abraham Hill's commonplace books are now stored in the British Library bound in ten quarto-volumes, including one index volume covering the entire set.[40] They are a collection of Hill's private notes on his readings, including direct quotations, compiled summaries from contemporary reports and classical sources and his own reactions and responses to knowledge claims. These responses

[37] Laslett, "John Locke," p. 372.
[38] Abraham Hill, *Commonplace books*, Sloane MS 2902, f. 153.
[39] Ibid, f. 174.
[40] Hill's index is located in Sloane MS 2900. His index can be a useful tool, but it is only partial; for example, there are many more references through the series to 'physician' than he noted in the index and even with some 9,000 entries, some topics are not included.

range from brief rebuttals referencing contrary evidence to more engaged and lengthy criticism.[41] His notes were extensive, reflecting his broad interests and his large collection of books and manuscripts. An example of a page from one of his commonplace books is displayed in Figure 24 in which Hill took reading notes of medical works. Hill was one of the readers of the medical texts evaluated in Chapter 3. He was often amongst the first to order new and updated printed works, attending auctions and organising the Royal Society's library.[42] Due to the scattered nature of discussions, I read the entirety of Hill's commonplace books, and I also examined his philosophical papers, official papers, letters and statements voiced by Hill and recorded in the minutes of Royal Society meetings.

Yeo has argued that copious note-taking in commonplace books by Hill and contemporaries such as John Evelyn and Robert Boyle was a form of memory enhancement, but differed from earlier humanist style in integrating contemporary observations.[43] Hill recognised the importance of keeping exact records, and criticised Francis Bacon for "speaking not from memory only but from the reflection he had in his own mind he did it after a manner fit and suitable to himself."[44] Included in the books are a number of draft indices and a final index, comprising over 9,000 terms produced by Hill, evidence that he tried to present his notes as commonplace books; he also labelled them as such. Originally, they appear to have been private notebooks. In addition to Hill's notes and writings, there are unreferenced calculations, lists of book sales, a catalogue of scientific instruments and running totals, such as the number of plague deaths per year in London.[45]

[41] Examples are his correction of cartographer Richard Blome (1635-1705) "at Bermudas no water but out of wells wch Ebb + flow with the sea." Hill wrote "this is not so. PT [Philosophical Transactions] 30.566," Abraham Hill. *Commonplace books*, Sloane MS 2899, f. 95 (869).

[42] Hill is listed as a subscriber of Moses Pitt's *The English Atlas* (Oxford, 1680), which included a 'much-improved depiction' of the American continent.

[43] Richard Yeo, *Notebooks, English Virtuosi, and Early Modern Science* (Chicago: University of Chicago Press, 2014). See also Ann Blair, "Humanist Methods in Natural Philosophy: the Commonplace Book," *Journal of the History of Ideas* 53, no. 4 (1992): 541-551. Hill himself quoted many sentiments to the effect of "Books may furnish rough materials yet it is only experience & naturall parts can burnish & build up a man." Abraham Hill. *Commonplace books*, Sloane MS 2899, f. (949).

[44] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 256 (947).

[45] Abraham Hill, *Commonplace books*, Sloane MS 2895, f. 142 (494).

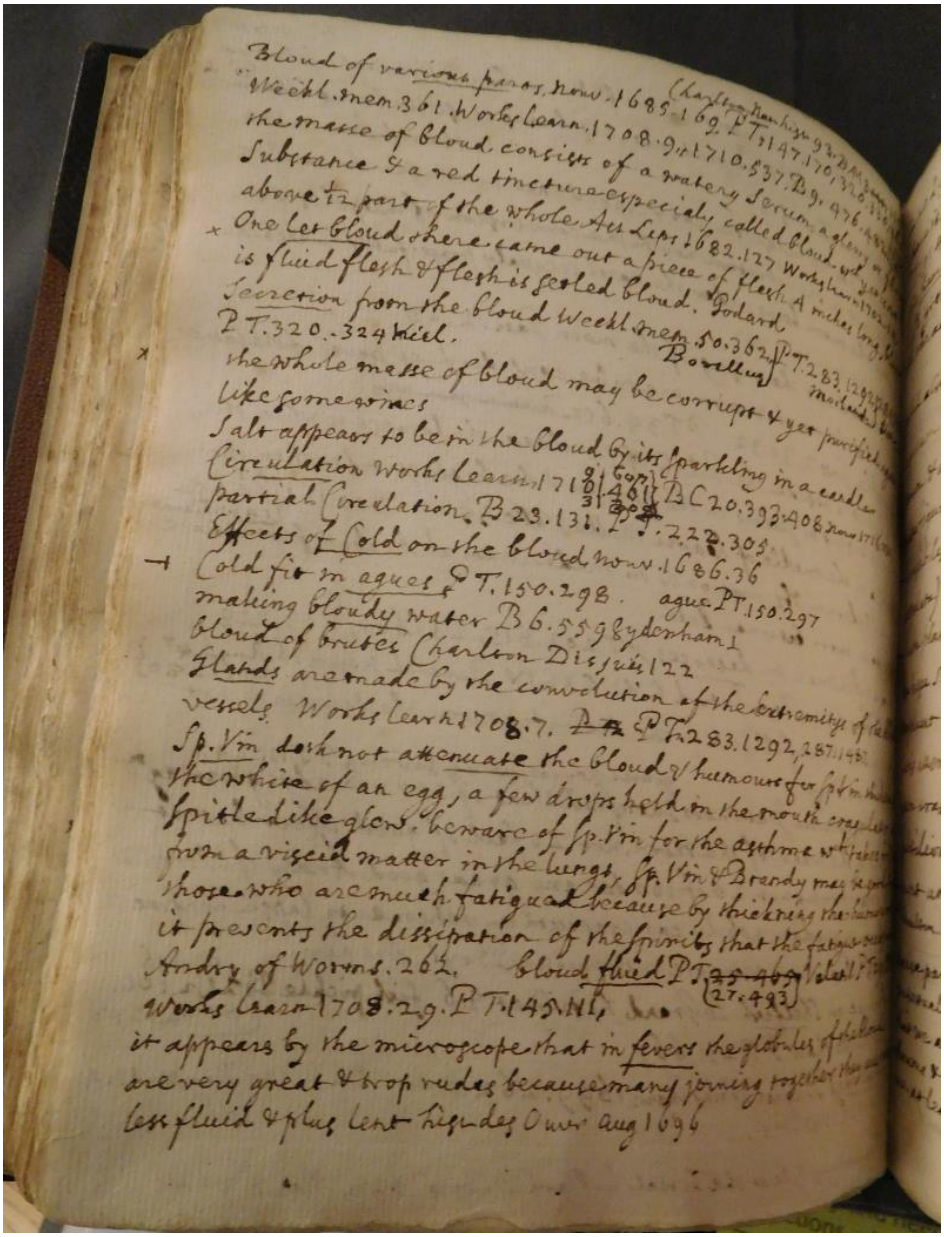


Figure 24. *Example Page from Abraham Hill's Commonplace Books*

The current arrangement of the papers reflects a subsequent hand; Hill's numbering has been struck through and replaced with a new numbering system to account for additional papers being included in the re-bound books. Hill's notebooks differ significantly from the traditional format of commonplace books in lacking commonplace and topical Heads. They are rather disorganised, and the reader can only discern the main topics that Hill was interested in from the content of his notes: divinity, political and ecclesiastical history, moral philosophy, natural history and medicine. He often organised his notes in such a way to guide his reader to a desired conclusion through a logical progression of evidence.

Hill's presentation of English political history, for example, emphasised the importance of both custom and tradition, while making clear the King's responsibility for the welfare of the commonwealth, and set out the reasons for his support for constitutional monarchy.[46] He began with a history of the Magna Carta, focusing on its role in limiting the power of the monarch. 'Divine right,' for example, was not just for the king; "the people have a divine right to be preserved and protected."[47] Hill followed this by citing King James I's speech to parliament in 1609 recognising that even the King himself should have his power constrained, in case he "degenerates into a tyrant."[48] When tyrants manifest, Hill argued, they should be challenged: "Tis no rebellion to take up arms and write of wronged innocence tis just & natural when tyranny sways."[49] Through this line of argumentation, Hill reached the conclusion that "[t]he law of the Common Weal, the very soul of the Politik Body, the parts whereof are by Law animated, held together and let on work in such actions as the common good requireth."[50] By following Hill's sequence of notes on English political history, we can discern the outlines of his political philosophy.

Amongst Hill's philosophical papers, there is a report entitled, "Enquires concerning those several kinds of Things, which are reported to be in Virginia & the Bermudas, not found in England."[51] This report was commissioned by the Governor of Virginia Edward Digges (1621-1675) and was fulfilled by the Royal Society Fellow, politician and merchant Thomas Povey (1613-c. 1705). Povey explicitly categorised natural products as either beneficial or harmful, noted their specific uses and advised whether or not they should be propagated in England. He was impressed by the "considerable minerals, stores & Bitumens, Tinctures [and] drugs" in America.[52] The report was likely used by Hill in his capacity as a Commissioner of the Board of Trade to determine what natural products could become potential commodities. Hill also kept a related account of "Experiments on the Vegetation of Plants, to Examine what mixtures doe promote or hind[er] Evil" amongst his philosophical papers,

[46] Hill's republicanism may have been influenced by his father's demonstrated support for the Parliamentary cause; he was on the Committee for the Safety of the Kingdom, which declared that "the privileges of parliament, and the laws and liberties of the subject, shall be prosecuted with all vigour." William Cobbett and Thomas Cursor Hansard. *The Parliamentary History of England from the Earliest Period to the Year 1803,* Volume 3 (London, 1808). Within this work, see "Parliamentary History, 18 Charles I. 1642, Proceedings relative to," p. 2. Hill's political views can be connected to his motivations for investigating nature for the good of the commonwealth discussed in a later section.
[47] Abraham Hill, *Commonplace books*, Sloane MS 2895, f. 3 (403).
[48] Abraham Hill, *Commonplace books*, Sloane MS 2893, f. 68 (252).
[49] Abraham Hill, *Commonplace books*, Sloane MS 2896, f. 50 (537).
[50] Abraham Hill on Thomas Hooker's *Opinion of Government*, Sloane MS 3828, f. 92.
[51] Thomas Povey, "Enquiries Concerning those Several Kinds of Things, which are Reported to be in Virginia & the Bermudas, not Found in England," Abraham Hill's *Philosophical Papers*, Sloane MS 2903, ff. 112-113.
[52] Ibid.

which he may have consulted in making his decisions about the properties of new plants.[53] He assessed several New World drugs, including American aloes, ipecacuanha, guinea grain (grains of paradise) and cinchona. In his notes on these medicinal plants, he kept references to their deliberation in printed texts, in letters he had received and his own commentary regarding their trade, propagation and medicinal virtues.

The development of Hill's knowledge of nature can be observed through reading his commonplace books, in which he negotiated competing knowledge claims. In Chapter 3, I analysed printed texts, which were carefully designed and prepared to disseminate a particular message to a large audience. In this chapter, I will consider the process by which Hill investigated and understood nature through personal notes, which were not published for the populace to read.

The Investigation of Nature

Hill was obsessed with truth and knowledge, and was dissatisfied with reports of the Americas from previous "uninstructed" sources, arguing that "Both to the arts & virtue there is necessary a concours of nature instruction & practice, Nature without discipline is blind."[54] Hill directed travellers with exacting demands concerning the manner in which they should make and record their observations, emphasising that "the work of a naturalist ... is not sensation as in brutes."[55] In Chapter 5, I will consider the collecting practices of James Petiver and their relationship with his apothecary practice. His network of correspondents in the Americas furnished Petiver with medicinal plant specimens and knowledge of their virtues.

For Hill, the manner in which knowledge was derived was crucial to its validity, and in his view, the senses on their own could only provide a basic, primal understanding at best. Instead, Hill posited, "to understand nature & imitate her, the eye & hand, Knowledge & practice, proceeding together, mutually give advantage."[56] Hill's knowledge of nature was complex and multi-faceted, drawing on experience, both contemporary and historical, and reason supported by demonstration. This view

[53] Abraham Hill, *Philosophical Papers*, Sloane MS 2903.
[54] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 264 (954). In parentheses are Hill's original folio numbers, which I am including to assist with use of the index. Some papers added later after Hill's original compilation are referenced by a single number.
[55] Ibid, f. 258 (949). This guidance was written in his commonplace book as instructions for naturalists, and he sent questionnaires with merchants and explorers who visited to the Americas, so it appears likely that he included some version of these instructions to those he surveyed.
[56] Ibid. These quotes may have been based on Hill's reading, but they nevertheless summarise his ideas (see the discussion of reading Hill's commonplace books above). They are strongly congruent with the majority of other passages in Hill's commonplace books.

was not, however, unique to Hill and was shared by many contemporary fellows of the Royal Society.

Hill defined the law of nature as the "endeavour [for] the common good of all rationals (God & man)."[57] For Hill and many of his contemporaries, religion was the most important lens through which nature could be viewed, for they believed that knowledge of nature could not be obtained without God's guidance since all nature derived from God. Man was endowed with reason and rationality, and these faculties should also be used to understand nature and to determine what was useful and what was not, as seen in Hill's reasoning about the uses of New World plants. Ultimately, Hill concluded, "[r]eason (with the assistance of God's grace) is all we have or can have."[58] The plants found in the Americas may have been new to the English, but they had been created by God, who gave man the abilities to understand them through "rational investigations."[59]

A primary method of the exploration of nature was through experience, both contemporary and historical. For Hill, the division was not between traditional scholasticism and the new experimental philosophy; history was a form of experience and could be held to the same exacting standards of rational inquiry. The influence of Bacon's natural and experimental histories is evident in Hill's attempts to create order and to interpret nature in the New World.[60] As Hill wrote, "History is but a true diligent & prudent demonstration of virtue & vice, history wch by expounding actions past teaches to regulate the future & furnishes us with wisdom at the cost of other mens experience."[61] While Hill acknowledged classical authors as potential sources of knowledge, he counselled against uncritical acceptance of them. He emphasised Bacon's warning of compounding errors through unquestioned recitation: "the Errors of antiquity are so much the worse in that they are roots of error."[62] Furthermore, Hill recognised that his contemporaries would be considered classical authors

[57] Abraham Hill. *Commonplace books*, Sloane MS 2892, f. 11 (106).
[58] Abraham Hill, *Commonplace books*, Sloane MS 2894, f. 33 (325).
[59] Several studies have discussed how early modern English viewed the study of natural history to be part of their Christian duty; to understand God's creation meant becoming closer to God through a deeper knowledge of him. An example of this was the idea that, after the fall of Adam, nature was not poisoned but instead scattered, and God wanted them to use his signs and their reasoning to put the pieces back together as they were complete in Adam's day. See, for example, John Prest, *The Garden of Eden: The Botanic Garden and the Re-Creation of Paradise* (New Haven, CT: Yale University Press, 1981) and Carolyn Merchant, *Reinventing Eden: The Fate of Nature in Western Culture* (London: Routledge, 2003).
[60] Richard Serjeantson, "Francis Bacon and the 'Interpretation of Nature' in the Late Renaissance," *Isis* 105, no. 4 (2014): 681-705. Peter Anstey, "Francis Bacon and the Classification of Natural History," *Early Science and Medicine* 17, no. 1-2 (2012): 11-31. Paula Findlen, "Francis Bacon and the Reform of Natural History in the Seventeenth Century," in Donald R. Kelley, ed., *History and the Disciplines: The Reclassification of Knowledge in Early Modern Europe* (Rochester: University of Rochester Press, 1997): 239-260.
[61] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 260 (951).
[62] Ibid, f. 259 (950).

by future readers and would likewise become the subject of critical review. These future readers included the descendants of the indigenous peoples of the American colonies: "When the people of America shal in time to come have the same temper & disposition wch we now enjoy, they will suspect the undoubted storys of their ancestors writ by us of this time as we doe ancient stories."[63]

An important matter for Hill was the relative authority of classical scholars to assert natural knowledge claims. Foremost, he attempted to establish these authors' authority, despite their lack of Christian belief. For example, Hill presented Plato as ascribing important matters to a singular God and lesser matters to the pantheon: Plato "prefined the name of God to his more serious & remarkable epistles but of Gods in the plural to the more trivial."[64] By portraying Plato as a proto-monotheist, Hill attempted to improve his credibility, and he clearly supported arguments against scholasticism. One way he established the relative authority of classical authors was to compare how they themselves allocated authority: "Hippocrates imitated Plato in many things. Galen in all, he cites him often, Aristotle never."[65] Hill applied Galenic and Hippocratic teachings to explain the properties of New World plants: "chocolate proves to most tender constitutions perfeit physick ... for they take it all the year in Indie yet as that place is very hot so tis very moyst to the earthy parts."[66] While Hill paid due reverence to classical authorities, he recognised that even they acknowledged that first-hand experience and experimentation were necessary to accredit and advance natural knowledge.[67] For example, he referred to experimentation as what "Aristotle called true Science" and cited Plato advocating that "experience hath taught in every part & Science."[68]

One source of contemporary experience to which Hill paid significant attention was travellers to the American colonies. In comparing explorers with direct experience to logicians who focused on established texts, Hill argued that "[a] reader is like one feasted with dishes fitted for another mans stomach, but a traveller with his eye & eare takes only such observations as he most affects & so can

[63] Abraham Hill, *Commonplace books*, Sloane MS 2897, f. 11 (611).
[64] Abraham Hill, *Commonplace books*, Sloane MS 2892, f. 89 (160).
[65] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 271 (960).
[66] Abraham Hill, *Commonplace books*, Sloane MS 2891, f. 66 (844). Hill also referred to humeral theory in his own medical treatment; writing to his physician Hans Sloane, "I have much phlegme still coming away." Abraham Hill to Hans Sloane, 23rd January 1721, Sloane MS 4059, f. 171. The application of classical theories to New World plants in the early modern period has been explored in several studies, including Clifford M. Foust, *Rhubarb: The Wondrous Drug* (Princeton: Princeton University Press, 1992) and J. Worth Estes, "The European Reception of the First Drugs from the New World," *Pharmacy in History* 37, no. 1 (1995): 3-23.
[67] While Hill valued classical authors' contributions to the knowledge of nature, he readily cited corrections to their work based on more recent empirical observations, for example he wrote that "[m]uch of the ancient Astrology did depend from the stations & retrogressions & direct motions of the planets, but according to Copernicus all these things are but in appearance not real so there can be no effect of them." Abraham Hill, *Commonplace books*, Sloane MS 2895, f. 190 (455).
[68] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. (951) and f. 222 (967).

best digest."[69] Here, Hill demonstrated the limitations of both empiricism and scholasticism as methods of investigation. He attempted to improve the quality of the knowledge accumulated by travellers who visited the English colonies in America by providing instructions on how to gather information about all aspects of nature in these lands. While Hill valued reports that he had heard from "several credible persons," he stressed the importance of recording experiences because "[u]nwritten things are easily changed, when 2 men relate the same story, it will seldome be the same way."[70] Memory could be fallible, but the written word was unchanging, and so could preserve experience.[71]

The other first-hand experience of New World plants came from the indigenous people of the Americas. Contemporaries of Hill noted a number of problems with treating these peoples as credible sources, including their lack of Christianity and what were perceived as 'barbaric' customs, such as human sacrifice.[72] One way in which Hill attempted to establish indigenous peoples as a more credible source was to assert that they were Christians even before the arrival of the Spanish (and even if they did not know it themselves). He suggested that angels may have assisted the travel of the apostle St. Thomas to the Americas, and noted that:

> Many authors have confirmed Memory of St. Thomas at Bresil in their ballads left them by their ancestors the Americans have prophesys of the coming of our men into their country these they sing with mourning. Christianity has bin planted in America.[73]

Furthermore, he defended their reported practice of human sacrifice by reflecting at length on the Christian God's demands for sacrifice in the Bible, for example from Abraham, and sacrifices conducted by the pagan Greeks.[74] Hill emphasised that many religions' God or Gods had demanded human sacrifice for their appeasement throughout history. The reason he may have wanted to

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[69] Ibid, f. 258 (949).

[70] Abraham Hill, *Commonplace books*, Sloane MS 2895, f. 78. Here credibility was a function of both who made the claims and the verification of these claims by others of a respected standing. The issue of credible testimony has been aptly discussed in the historiography. For example, see Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-century England* (Chicago: University of Chicago Press, 1994) and Steven Shapin, "The House of Experiment in Seventeenth-century England," *Isis* 79, no. 3 (1988): 373-404. Abraham Hill, *Commonplace books*, Sloane MS 2893, f. 2 (202).

[71] This constancy may have been a reason for Hill to keep his extensive commonplace books that recorded both the ideas of other scholars and his reactions to them.

[72] Despite this, European explorers used the knowledge of indigenous peoples in conducting their assessments of previously unknown plant specimens. See Schiebinger, *Plants and Empire* and Marcy Norton, *Sacred Gifts, Profane Pleasures: A History of Tobacco and Chocolate in the Atlantic World* (Ithaca, NY: Cornell University Press, 2008), chapter 5.

[73] Abraham Hill, *Commonplace books*, Sloane MS 2891, f. 100 (56).

[74] Ibid, f. 165 (89). The ancient Greeks were thought to have engaged in human sacrifice during Hill's time due to the many references to it in mythological writings, but modern studies have cast doubt on whether this practice occurred, for example Dennis Hughes, *Human Sacrifice in Ancient Greece* (London: Routledge, 1991).

defend the indigenous people in this way was because he valued their first-hand experience and knowledge of *naturalia*. There are many references to the use of medicinal plants by indigenous peoples in the Americas throughout Hill's commonplace books. For example, he noted from Dr Henry Stubbs' *The Indian Nectar; or, A Discourse Concerning Chocolata* (1660) that "in acute diseases, to allay heat & fever & in hot distemper of the liver they [the indigenous peoples] give the cacao nut pounded & dissolved in water without any other mixture."[75] Hill also recorded an indigenous receipt for chocolate, commenting that it could not break the fast because it was only a drink like wine.[76] Here, Hill reflected on indigenous knowledge of a New World drug being adopted within a European religious framework. He was referring to a debate between Catholic theologians over whether chocolate should be classified as a food or a drink; if chocolate was a food, then it would not be permissible for consumption during fasting.[77] The indigenous peoples could thus be a source of knowledge about which American specimens were nourishing or harmful for health for European writers. Nevertheless, this information was dependent upon the classification of their properties by European religious authorities for certain manners of their consumption.

The Importance of Credibility and Authority

Mediating between different authorities was an important preoccupation for Hill. He argued that authorities should refrain from making knowledge claims outside their area of expertise, for example:

> The magistrate ... may forbid a physician to use some dangerous medicine on his subjects & may punish him when he wilfully kills any of them by may not on that pretence appoint him & what & how & when to whome he shal administer & so become Physician himself alone.[78]

In this passage, both the physician and the magistrate had distinct realms of authority that should be respected. This scenario of power boundaries often occurred in the interpretation and use of American botanicals as potential medicines in that these new remedies did not have longstanding traditional uses for the English and could therefore be viewed as dangerous, thus requiring both magistrate and physician to settle disputes over their intended use. In another example of mediating authority, Hill asserted that only naturalists and physicians could verify whether baptismal waters

[75] Abraham Hill, *Commonplace books*, Sloane MS 2891, f. 124 (892). For a discussion about the debates around chocolate as both food and medicine, see Ken Albala, "The Use and Abuse of Chocolate in 17th Century Medical Theory," *Food and Foodways*, 15 no. 1-2 (2007): 53-74.
[76] Abraham Hill, *Commonplace books*, Sloane MS 2894, f. 17 (314).
[77] Beth Marie Forrest and April L. Najjaj, "Is Sipping Sin Breaking Fast? The Catholic Chocolate Controversy and the Changing World of Early Modern Spain," *Food and Foodways* 15, no. 1-2 (2007): 31-52.
[78] Abraham Hill, *Commonplace books*, Sloane MS 2892, f. 14.

were pure natural waters which were essential for the sanctity of the rite.[79] Popes and bishops could not verify the purity of water themselves because, even though they performed the sacrament, the natural properties of water were not within their realm of expertise. Hill's focus on the bounds of occupational authority was related to his stressing of the importance of credibility in knowledge claims.

Even authorities established as credible were not merely accepted by Hill but were critically questioned. Hill particularly respected the views of Francis Bacon, the French philosopher René Descartes (1596-1650) and the Italian polymath Galileo Galilei (1564-1642), whom he referred to as the "great wits of the last Age, who seem to offer something more solid and substantial."[80] Even so, the methods and ideas of these 'great wits' could have fundamental flaws, such as lacking diligence and promoting ungrounded theorising. In Hill's opinion, for example, Bacon engaged in poor scholarly practice by not accurately reporting other people's ideas and observations but instead embellishing them.[81] Hill also criticised Descartes for employing circular logic:

> Of Descartes first principles of reasoning after he had doubted of everything seems too circular to be built on, for he is proving the being of a God from one truth of our facultys & the truth of our facultys from the being of a God.[82]

Hill was sceptical of grand theoretical claims not based on empirical data, which he saw as dilettantes "amusing themselves in the Labyrinth of Speculations & Chaos of Ideas."[83] Instead, he preferred careful, diligent study, employing the German Jesuit polymath Athanasius Kircher's (1602-1680) three approaches to demonstrating natural knowledge: mathematical/logical, physical/experimental and moral/faith.[84] These three methods of investigation could be used to satisfy "[t]he desire of knowledge wch nature hath planted in man," but Hill also argued that this desire "doth generally need regulation."[85] He referred to three situations by which to regulate enquiries: "suspicion requires further enquiry, probability admits further enquiry, [and] infallible

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[79] Abraham Hill, *Commonplace books*, Sloane MS 2891, f. 42 (25).
[80] Abraham Hill, "Some Account of the Life of Isaac Barrow."
[81] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 256 (947). Hill was also scandalised by Bacon's wearing of a hat in church while the Psalms were sung.
[82] Ibid, f. 215 (940).
[83] Ibid, f. 265 (955). Interestingly, Hill has been accused of the same vice in his entry in the Oxford Dictionary of National Biography. Mulligan, "Hill, Abraham (bap. 1635, d. 1722)."
[84] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. (951).
[85] Ibid, f. 254 (945). Hill was writing at a time when the perception of curiosity was undergoing a shift from vice to virtue, as noted by Peter Harrison, "Curiosity, Forbidden Knowledge, and the Reformation of Natural Philosophy in Early Modern England," *Isis* 92, no. 2 (2001).

authority or demonstration forbids further enquiry."[86] Here again, Hill emphasised the importance of authority and experience in establishing credible natural knowledge.

Hill's judgement and accumulation of knowledge was respected by contemporary scholars, who solicited his corrections of their work. For example, he provided John Evelyn with corrections on his book *Numismata* (1697), and Evelyn cited Hill as a contributor to this work.[87] Hill also sought further comments on Evelyn's work from his network of scholarly friends, including the diplomat and government official Sir Robert Southwell (1635-1702). Hill also reassured John Locke that he was satisfied with his work: "Upon the publishing your last book ... had I any objections to make you should have bin sure to have heard of them."[88] When Hill did have objections, he was not quiet about them; he challenged Harvey's discovery of the circulation of blood as unoriginal, noting it both in his commonplace books and at a Royal Society meeting.[89] Through this activity, Hill was not only viewed as a scholarly mediator, but also added further knowledge to his network at the same time.

Natural Knowledge for the Commonwealth

Hill's knowledge of nature was framed within his political philosophy, which had the promotion of the public good as its guiding principle. He highlighted the deist author Matthew Tindal's (1657-1733) argument that "None can have a right inconsistent with the public good wch is [the] only fundamental law of all Societys."[90] For Hill, enquiries into the natural world needed to benefit the English people as a collective, a view consistent with his ideas about the proper use of political power. Nevertheless, Hill was a man of commerce and was tasked with identifiying profitable commodities. Thus, he focused on colonial plants with medicinal and nourishing qualities that could be both procured and promoted. Hill learned about the efficacy of American plants through both first-hand accounts of explorers and scholarly inquiries, and he believed that this knowledge would benefit the English people. As Hill summarised, "[t]he good of the civil society wherein we live true &

[86] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 254 (945).
[87] John Evelyn, *Numismata, a discourse of medals, ancient and modern* (London, 1697). Abraham Hill to John Evelyn, 26th February 1697, Add MS 78684, ff. 43-44.
[88] Abraham Hill to John Locke, 4 May 1699, MS Locke c. 11, f. 208, Bodleian Libraries, University of Oxford.
[89] "Harvy learnt the circulation of the blood from Aquapendense, he from f. Paul who did not publish it himself for feare of the Inquisition." He also gives page numbers in the relevant publications to prove his point. Abraham Hill, *Commonplace books*, Sloane MS 2895, f. 146 (498). Hill's objections are also recorded in the minutes of a Royal Society meeting on April 7th 1686. Birch, "The History of the Royal Society of London," entry for April 7th 1686, p. 471.
[90] Abraham Hill, *Commonplace books*, Sloane MS 2897, f. 2 (602). Matthew Tindal, *An Essay Concerning Obedience to the Supreme Powers* (London, 1694), p. 19.

rational conclusions drawn from knowledge & experience (of ourselves or others) concerning the natural efficacy of things."[91]

Hill's notes from the explorer William Dampier's (1651-1715) *A New Voyage Round the World* (1697) consisted of descriptions of the extraordinary nourishing qualities of maize: "8 or 10 spoonfuls a man of boiled Maiz once a day" were reported to be all that was needed to satisfy a man's thirst.[92] Additionally, what he found most note-worthy from the author Richard Ligon's (c. 1585-1662) *A True & Exact History of the Island of Barbados* (1657) was the success of a diet consisting solely of plantains to satisfy hunger.[93] The sustainability of the labour force in the English colonies was a long-standing concern for projectors, government officials and colonists themselves. If labourers could be maintained on limited amounts of local foodstuffs, then productivity would improve and starvation would be less of a fear. The shortage of food was a continual problem in the American colonies across the seventeenth century. In Chapter 3, I noted how unappetising sassafras' leaves were eaten as a pottage in times of desperation. In Chapter 2, I discussed the tribulations of the Virginia colony and how starvation was one of the main reasons for the inability to establish a sustainable economy.

Not all New World plants possessed beneficial qualities, however, and some had a mixture of both positive and negative traits. Hill noted that tobacco oil killed many animals and that the consumption of tobacco "makes the head a drain wch being so neer the brain (a principal part) may be of dangerous consequence."[94] Hill carefully observed the negative effects of tobacco and made comparisons to opium, a well-known drug at the time, in that they both produced "a narcotic sulphur and acid salt" that bound to "nervous fibres ... so passages are stopt."[95] In Chapter 3, writers in the print survey also commonly compared the unknown with the familiar as a way of understanding the virtues of sassafras. The medical status of tobacco was a conflicted one with reservations and cautions made by medical practitioners. Yet it was still valued for some medicinal purposes at the turn of the eighteenth century. In Chapter 5, I will show that James Petiver occasionally included tobacco in his medical receipts.

In Hill's official role as a Commissioner for the Board of Trade and Plantations, he identified the chief plant commodities that could be easily cultivated in the American colonies and/or in England. He

[91] Abraham Hill, *Commonplace books*, Sloane MS 2892, f. 12 (106).
[92] Ibid, f. 52 (836).
[93] Ibid, f. 65 (843).
[94] Ibid, f. 106 (887). Hill noted that snails, however, were immune to tobacco oil's mortal effects.
[95] Ibid. For discussions of the perception of tobacco in early modern Europe, see Norton, *Sacred Gifts, Profane Pleasures* and Jason Hughes, *Learning to Smoke: Tobacco Use in the West* (Chicago, IL: Chicago University Press, 2003), chapters 1-2.

remarked upon the particularly rapid growth rates of tobacco and aloe in the American climate.[96] He also investigated methods of transplantation of *naturalia* from Virginia and Bermuda to England and learned from travel accounts of pineapple, ginger and cocoa being transplanted between the West and East Indies.[97] The issue of transplantation between the American colonies and England was more complex than the physical preservation and transportation of plants. The Hippocratic treatise *Airs, Waters, Places* also emphasised the relationship between health, location and the climate. Thus the original location of medicinal plants was important in understanding their suitability for the English constitution.[98] As I presented in the Introduction, there was controversy regarding whether plants in the American plantations became 'English plants' by virtue of English colonial rule and settlement and were thus suitable for consumption by the English. Hill was particularly interested in the properties of waters in the New World. He advised that water in the West Indies, when combined with a salt meat diet, would lead to the bloody flux.[99] West Indian water could, however, also cure wounds made by poisoned arrows.[100] Hill noted accounts of "Indians drink[ing] out of a pond rather then running water," and he compared reports of the different qualities of water in the Cayman Islands and Jamaica: brackish in both, but wholesome in the Cayman Islands.[101] Knowledge of the nature of water in different geographical regions was vital for either accepting or rejecting the plant life that grew in those regions for English consumption, and this information was critical for protecting the Commonwealth.

[96] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 107 (880) and f. 98 (872).
[97] Ibid, f. 18 (812). For a discussion of attempted transplantation from America to England, see Joan Thirsk, "New Crops and their Diffusion: Tobacco-growing in Seventeenth-century England," in Christopher W. Chalklin and Michael Ashley Havinden, eds., *Rural Change and Urban Growth, 1500-1800: Essays in English Regional History in Honour of W. G. Hoskins* (London: Longman, 1974).
[98] For a discussion of the importance of the environment in the understanding of medicine in English colonies, see Andrew Wear, "Place, Health, and Disease: The Airs, Waters, Places Tradition in Early Modern England and North America," *Journal of Medieval and Early Modern Studies* 38, no. 3 (2008).
[99] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 72 (850).
[100] Ibid, f. 113 (883).
[101] Ibid, f. 117 (886).

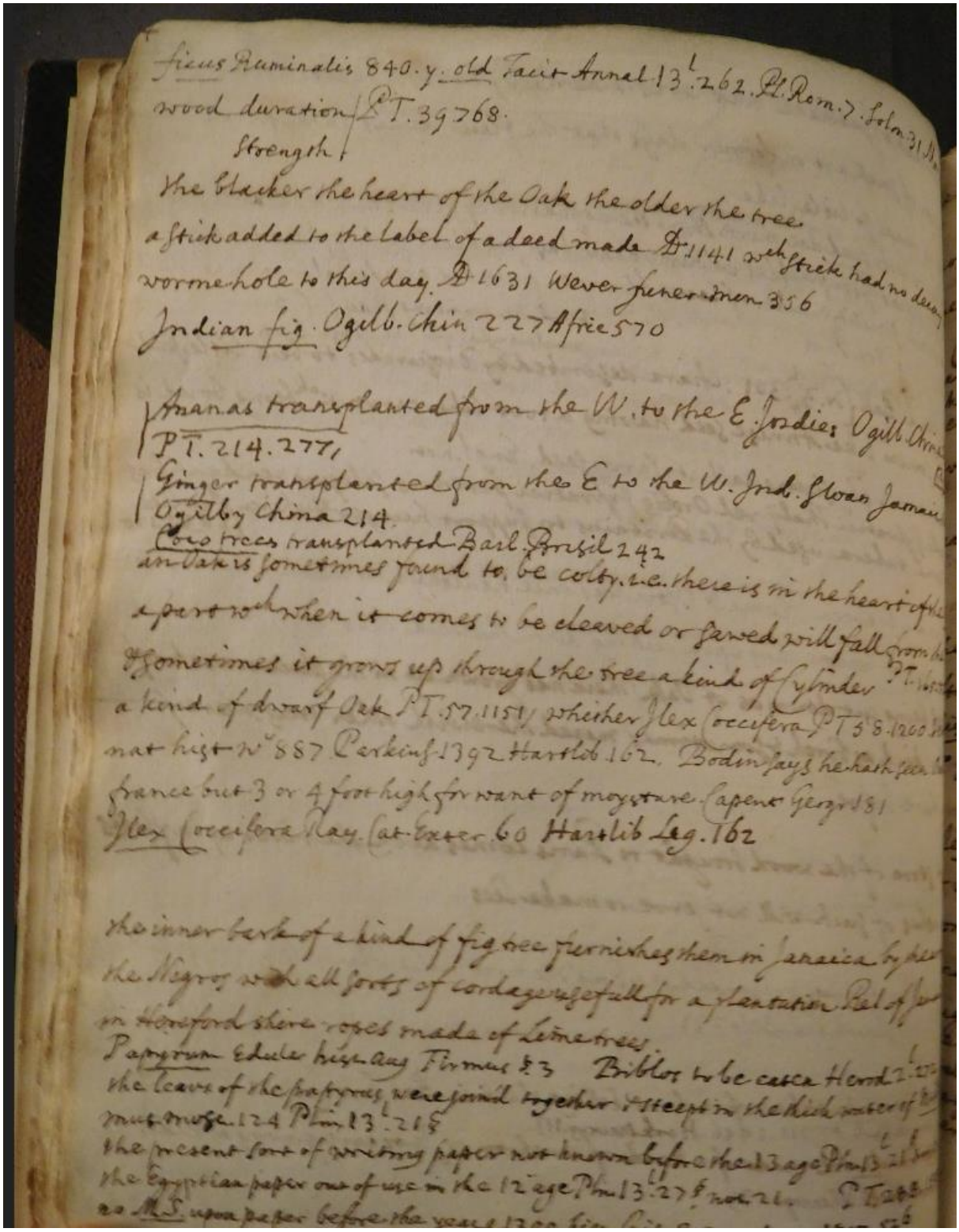

Figure 25. *Hill's Notes on the Transplantation of Exotic* Naturalia

Hill's investigations of natural things went beyond practical matters to intellectual curiosity, especially concerning the great variety of new American *naturalia*. He expressed that, "[w]hen the knowledge of natural things doth because of their variety gratify our curiosity we have then but the pleasure of scratching where it itches & the pleasure so taken hinders the endeavour after a cure."[102] Hill also recognised the study of nature as a divine command: "God hath not given a power only but a comand also of improving whatsoever that be truly decent & becoming his publick service."[103] For Hill, understanding these New World *naturalia* led to an improved knowledge of God's works and also contributed to the "common good & happiness of mankind."[104]

Conclusion

In this chapter, I have evaluated how a decision maker assessed the potential value of American plants as drug products for the English market. I chose the case of Abraham Hill, who was tasked by the English government to advise on colonial trade matters and identify commodities for investment and development. Hill had a mercantile background and a knowledge of economics, which was complemented by his interest in natural philosophy, including the medicinal properties of plants. In his role as a Fellow of the Royal Society, Hill was also active in discussions about which natural substances would make effective medicines.

Through the analysis of Abraham Hill's extensive but little-studied private notebooks, I have explored how he attempted to understand *materia medica* from the New World. The private nature of the notebooks permits a window into the stages of Hill's thought process, rather than the edited results presented for a particular audience in printed works, such as those examined in Chapter 3. Hill drew on the thought of both classical authors and his contemporaries to develop knowledge claims about the nature of American flora new to the English. He used these intellectual frameworks to assimilate knowledge procured from the first-hand experience of indigenous peoples and European travellers. Hill had privileged access to a wide variety of theoretical and empirical, classical and contemporary sources. In his painstaking reading and notetaking (generating more than 2,000 pages), he carefully evaluated natural knowledge claims according to his exacting standards of prudent study in his endeavour of identifying lucrative American drug commodities.

[102] Abraham Hill, *Commonplace books*, Sloane MS 2899, f. 256 (947).
[103] Abraham Hill, *Commonplace books*, Sloane MS 2892, f. 12 (106).
[104] Ibid.

Another contribution of this chapter is to underscore Hill's importance in the intellectual life of seventeenth- and early-eighteenth-century London. Some historians have prematurely dismissed Hill's contributions to the advancement of natural knowledge in this period, because of his limited publication record. For example, Robert Maddison wrote that Hill's "claim to remembrance is founded not on contributions to the advancement of knowledge (for he made none), but on his services to the Royal Society and to the Board of Trade, where his administrative and business abilities were exercised."[105] While it is true that Hill did not produce any significant published work beyond his proposals for the recoinage, he was nevertheless influential in mediating knowledge and acting as a node in the intellectual network of his time. Hill was in a position to both enquire and answer, and he connected different spheres of society including merchants, religious officials, politicians, members of the Royal Society and other scholars.

In the next chapter, I will assess how these American medicinal plants shifted from objects of scientific investigation to consumption by the populace.

[105] Robert E. W. Maddison, "Abraham Hill, FRS (1635-1722)," *Notes and Records of the Royal Society of London* 15, no. 1 (1960), p. 173. Recently, historians have begun to reassess Hill in a more positive light, for example Richard Yeo, *Notebooks,* and William Poole, "Two Early Readers of Milton: John Beale and Abraham Hill," *Milton Quarterly* 38, no. 2 (2004): 76-99.

Chapter 5

Consuming New World Drugs: Prescriptions in James Petiver's Apothecary Practice

Introduction

As I explored in earlier chapters, imports of American drugs into London increased significantly in the second half of the seventeenth century. This drug import boom was part of a wider trend in the growth of colonial trade and was further fuelled by the English acquisition of new drug-producing territories, such as Jamaica. There was also a substantial rise in the medical consumption of drugs across the seventeenth century. In this chapter, I examine how American drugs, such as sassafras, guaiacum and sarsaparilla, were received in early modern English medicine. Specifically, I demonstrate how a medical practitioner in late-seventeenth and early-eighteenth century London used these drugs in his retail trade and institutional care. By studying how American drugs were dispensed to patients, I discover how this import boom translated into medical consumption.

James Petiver (1665-1718) was an apothecary, collector and Fellow of the Royal Society. [1] Petiver is an especially useful case study because of his large correspondence network in the Americas. He kept extensive accounts of his prescriptions, both in his private practice and in his public role as apothecary to the Charterhouse charitable school and hospital. These records reflect Petiver's medical treatment of pensioners and schoolboys in an institutionalised setting and a wider variety of men, women and children who were his private clients. In this chapter, I analyse Petiver's medical manuscripts, which include daily prescription records, collections of medical receipts and administrative papers. I provide some preliminary answers to the following questions: What drugs did Petiver dispense to his clients, and what proportion were New World drugs? How many men, women and children did he treat each day with New World drugs? How did his use of New World drugs differ between his private practice and his work for the Charterhouse?

By the turn of the eighteenth century, American drugs such as Virginia snakeroot, guaiacum and jalap were readily accessible and dispensed to patients of all social classes in London. I find that

[1] For biographical information about Petiver, see Raymond P. Stearns, "James Petiver, Seventeenth-Century Promoter of Natural Science," *Proceedings of the American Antiquarian Society* 62, no. 2 (1952): 243-365 and D. E. Allen, "James Petiver (c. 1665–1718), botanist and entomologist," *Oxford Dictionary of National Biography* (Oxford, Oxford University Press 2004).

Petiver treated one-third of his private patients and one-fifth of his institutional patients with American drugs. Men, women and children regularly consumed American drugs, although his retail clients were able to access a greater variety of these drugs.

Recent scholarship has considered sources including physicians' casebooks, domestic receipt collections, pharmacopeias and probate inventories to further our understanding of medical practice in the early modern period.[2] This chapter contributes to this literature by exploring the interactions between patients and apothecaries. For example, I show how often different medicines were prescribed in what quantities to various kinds of people (men and women, children and adults, private or institutional patients). I discover useful information about the practice of apothecaries, such as how many patients they saw each day, how many prescriptions they filled, what they sold and in what quantities.

Petiver's voluminous medical manuscripts are amongst the most complete surviving records of an early modern English apothecary. The British Library holds six volumes of Petiver's prescriptions in his private practice, five volumes of his medical receipts, two volumes of a catalogue of diseases and their remedies and one volume of administrative records and prescriptions related to Petiver's position at the Charterhouse charity.[3] His private practice prescription books alone comprise 1,454 folios, spanning twenty-three consecutive years and include over 50,000 individual prescriptions. Amongst the volumes of Petiver's correspondence, there are numerous letters from his patients, seeking his advice on their treatment and requesting medications.[4]

Petiver's apothecary journals and correspondence demonstrate how his professional medical practice was intertwined with his botanical collecting activities and engagement in scholarly networks. Some of Petiver's customers were also part of his intellectual milieu and received medical drugs in exchange for furnishing Petiver with specimens and knowledge. Many of Petiver's contacts were involved in these natural philosophical pursuits and some were high-ranking individuals. For

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[2] On physicians' care of patients, see Lauren Kassell, *Medicine and Magic in Elizabethan London: Simon Forman: Astrologer, Alchemist, and Physician* (Oxford: Oxford University Press, 2005); Martin Dinges, Kay Peter Jankrift, Sabine Schlegelmilch and Michael Stolberg, eds., *Medical Practice, 1600-1900: Physicians and Their Patients* (Leiden: Brill, 2015); Michael Stolberg. "A Sixteenth-century Physician and His Patients: The Practice Journal of Hiob Finzel, 1565–1589," *Social History of Medicine* 32, no. 2 (2019): 221–240.

[3] All these manuscripts are available in the Sloane Collection at the British Library. James Petiver, "Medical journal: 1687-1710," Sloane MS 3220-3226; James Petiver, "Collection of medical receipts," Sloane MS 2336, 2338, 2340, 2344, 2346; James Petiver, "Catalogue of diseases with their remedies," Sloane MS 2364, 2366; James Petiver, "Observationes ex praescriptionibus medicorum Anglicorum," Sloane MS 2314; James Petiver, "Medical rules relating to the Charter-House," Sloane MS 3219. Further references in this chapter will be to the Sloane MS number.

[4] James Petiver, "Miscellaneous Correspondence," Sloane MSS 4062 – 4067.

example, Joseph Blake (1663 - 1700), the governor of Carolina, was one of Petiver's patients during his short life.[5]

In this chapter, I also consider Petiver's professional identity as an apothecary.[6] Through Petiver's work as a naturalist and apothecary, I reveal aspects of the movement and consumption of medicinal drugs and their associated knowledge. Petiver's collecting activities and correspondence network have been the subject of a number of recent academic studies. Kathleen Murphy has shown how Petiver's collection reflected the movements of his correspondents in slave trading networks, who contributed to his collections.[7] James Delbourgo has used Petiver's lists of specimen suppliers to show how Petiver "advertise(d) his status as a global specimen broker in the Republic of Letters."[8] Sebestian Kroupa has illustrated how the correspondence and specimen exchange between Petiver and the Jesuit pharmacist Georg Joseph Kamel (1661-1706) was shaped by commercial and imperial circulations.[9] These studies have documented Petiver's role as a collector and naturalist.

By examining Petiver's medical manuscripts, I show how New World drugs were used in the medical practice of an apothecary in early modern London. The reason for choosing an apothecary's prescriptions is that I can follow how medicinal plants were processed into consumable drugs. An alternative way for exploring the therapeutic preparations of plants is through domestic receipt books and life writing on household medicine.[10]

I chose Petiver as a case study due to the richness of his surviving manuscripts. Several other apothecary records have also been preserved, but are more partial, run for shorter durations and are often anonymous. A notebook of prescriptions by the seventeenth-century Oxford apothecary Jeremiah Webbe has been analysed by Wendy Churchill and James Alsop, but this source only runs for a single year.[11] Notebooks from a Cambridge apothecary for 1619-1622 and 1626-1628 are also

[5] An example of their medical correspondence can be found in Sloane MS 3333, especially the letters in ff. 7-8.
[6] For a discussion of Petiver's professional identity as an apothecary, see also Juanita Gordon Lloyd Burnby, "A Study of the English Apothecary from 1660–1760," Ph.D. diss. (University College London, 1979).
[7] Kathleen S. Murphy, "Collecting Slave Traders: James Petiver, Natural History, and the British Slave Trade," *William & Mary Quarterly* 70, no. 4 (2013): 637-670.
[8] James Delbourgo, "Listing People," *Isis* 103, no. 4 (2012): 735-742.
[9] Sebastian Kroupa, "*Ex Epistulis Philippinensibus*: Georg Joseph Kamel SJ (1661-1706) and His Correspondence Network," *Centaurus* 57, no. 4 (2015): 229-259.
[10] Anne Stobart, *Household Medicine in Seventeenth-Century England* (London: Bloomsbury, 2016); Elaine Leong, "Making Medicines in the Early Modern Household," *Bulletin of the History of Medicine* (2008): 145-168.
[11] British Library Sloane MS 564. Wendy D. Churchill and J. D. Alsop, "The Prescribing Physicians and Sick Scholars of Oxford: Jeremiah Webbe's Apothecarial Notebook, 1653-54," *Vesalius: The Official Journal of the International Society for the History of Medicine* 7, no. 2 (2001): 73-77.

held by the British Library, but the author of these prescriptions is unknown.[12] Later anonymous notebooks written by apothecaries practising in Cheshire and Hampshire are available for 1753-1756 and 1774-1780.[13] These manuscripts are useful supplements for comparison to Petiver's practice, but they are too limited to form a case study on their own.

Petiver treated large numbers of patients from all social backgrounds from his shop in Aldersgate and at the Charterhouse school and hospital over his thirty-three-year career as an apothecary. He kept systematic daily records of his interactions with patients, his medical receipts and letters from his patients describing their experiences of illness and recovery. Petiver is not necessarily representative of other apothecaries in London at the turn of the eighteenth century. Few apothecaries could match Petiver's large global network of correspondents, held influential administrative roles at the Society of Apothecaries, were fellows of the Royal Society or had such influential patrons. Petiver did, however, serve a standard apprenticeship, kept a retail presence for his entire career and trained several apprentices. His apothecary practice makes for a useful case study because Petiver spanned the world of elite gentlemanly learning discussed in Chapter 4, where knowledge experts became entangled in government colonisation programmes, and the world of urban trade which was the point of consumption for many of the drugs.

I begin my study of Petiver's medical practice by reconstructing his career as an apothecary. I explore the connections between Petiver's natural history collecting and medical practice. I examine the representation of New World drugs in Petiver's receipt books. I discuss how to read Petiver's prescriptions. Lastly, I analyse the prescription lists to understand the consumption practices of American drugs by Petiver's customers.

Petiver's Apothecary Career

Following an eight-year apprenticeship under Charles Feltham, James Petiver was made a freeman of the Society of Apothecaries in 1685.[14] Soon after, he opened his apothecary shop in Aldersgate at the sign of the White Cross next to the Sun Tavern, which was the address to which letters were sent, as shown in Figure 26. It was from this shop that Petiver saw his private patients and engaged

[12] British Library Sloane MS 1112, ff. 1-34.
[13] Bodleian Library MSS. Eng. misc. c. 266-7. Wellcome Library MS.3974.
[14] Petiver was apprenticed to Charles Feltham, apothecary to St Bart's Hospital on June 5th, 1677. He was the second apprentice bound to Feltham (*Society of Apothecaries Court Book*, 1 Sept., 1651 – 6 April, 1680, f. 221, Society of Apothecaries Library). Petiver was made a freeman of the Society of Apothecaries on October 6th, 1685 (*Society of Apothecaries Court Book*, May, 1680 – February 1694, f. 183).

in extensive correspondence with merchants, physicians, planters, ship captains and others, who procured for him the botanical information and specimens of plants from around the world. During Petiver's career, he trained his apprentices to mind his shop while he was involved in scholarly debate at the Royal Society and collecting plants at Hampstead Heath.[15] Petiver was sufficiently successful in his apothecary practice to maintain a retail space in central London for around thirty years.[16]

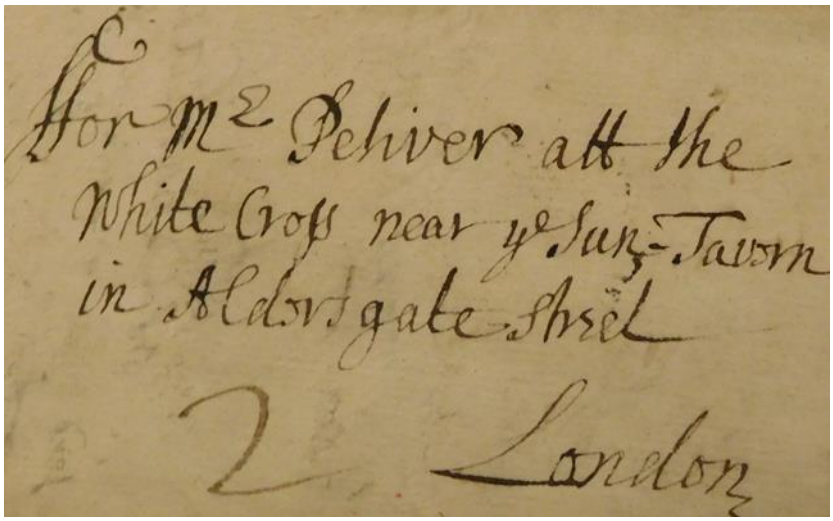

Figure 26. *Addressed Letter to Petiver*
Source: © British Library Board, Sloane MS 4077, f. 77

In addition to his private practice, Petiver was a wholesale drug supplier to St Bartholomew's Hospital. He also became apothecary to the Charterhouse school and hospital in 1700, a position he held until his death in 1718. His work with St Bartholomew's was likely arranged by Feltham, who was apothecary to the charity during Petiver's apprenticeship. In support of his application for the prestigious role at the Charterhouse, Petiver received a recommendation from the Royal College of Physicians: "Mr. J. P. is a skillfull Apothecary not of a common character, having acquired an extraordinary knowledge of Botany & many other parts of Natural Phylosophy, most usefull qualifications for his profession."[17] This recommendation was organised by Petiver's friend and Fellow of the Royal College of Physicians, Hans Sloane, who also sponsored Petiver's membership of the Royal Society. Thus, Petiver made use of his network of contacts to secure important and lucrative contracts and positions in his medical career.

[15] Petiver's apprentices included William Bennett, a family relation, and Charles Bernard. Sloane MS 4064.
[16] Upon Petiver's death in 1718, his shop inventory was bequeathed to his sister. "Will of James Petiver, Doctor in Physic of Saint Botolph within Aldersgate, Middlesex," The National Archives, Kew, PROB 11/563/273.
[17] Sloane MS 4063, f. 29.

Petiver received a salary for his work at the Charterhouse in addition to payment for the medicines he supplied. His contract was renewed every two years, his work was audited and his prices were checked by the Society of Apothecaries who confirmed that they were "moderate and reasonable."[18] In his Charterhouse records, Petiver claimed that his prices were lower than for his private patients and those charged by other apothecaries, and that any extra costs endured by the Charterhouse for drug purchases were due to dangerous fevers and other disease outbreaks that were beyond his control.[19]

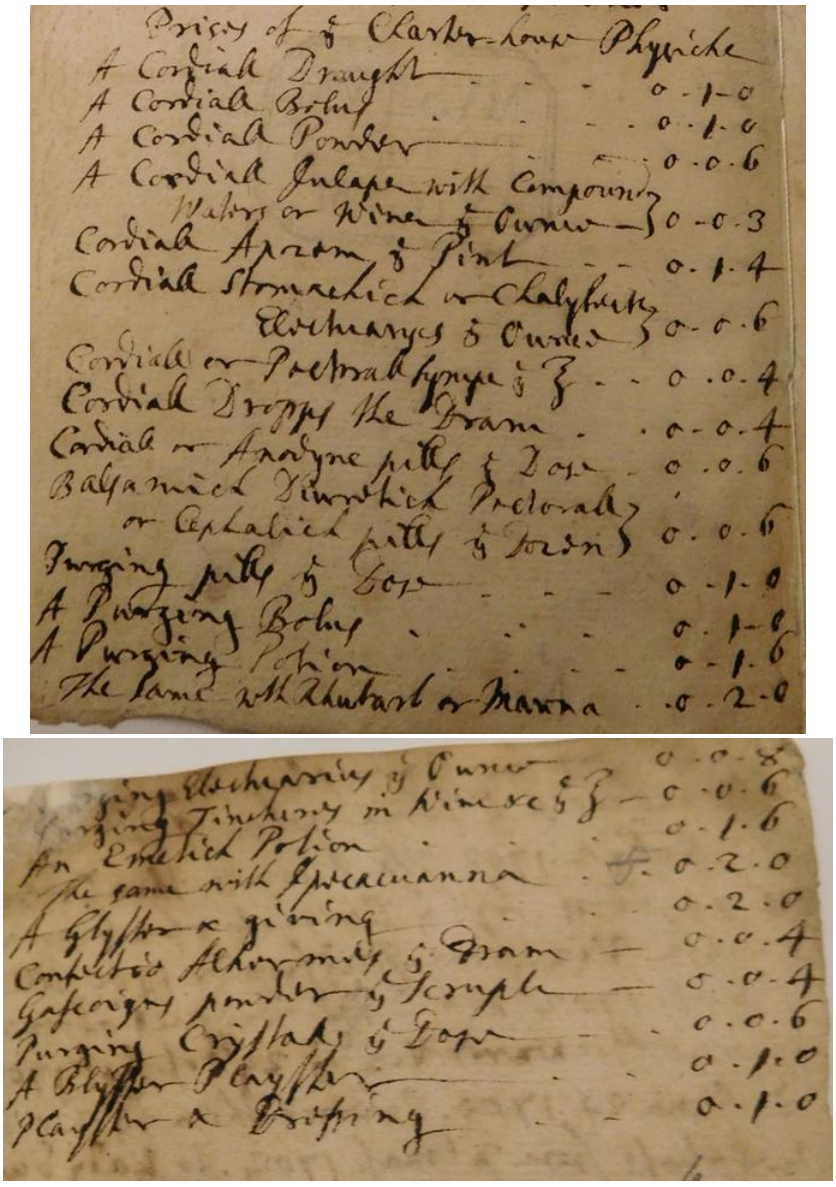

Figure 27. *Drug List for Petiver's Charterhouse Practice*
Source: © British Library Board, Sloane MS 3219

[18] James Petiver, "Medical rules relating to the Charter-House: 1703-1714, and Papers relative to the Charterhouse," Sloane MS 3219. This volume contains manuscript administrative records related to Petiver's work at the Charterhouse.
[19] Ibid.

At the Charterhouse, Petiver dispensed drugs to the scholars of the school and pensioners of the hospital, as well as occasionally to servants of the charity.[20] Many Charterhouse patients received treatments for ongoing ailments: 38% of the orders recorded in Petiver's medical journals were repeat prescriptions. A 1709 price list in Petiver's manuscripts (shown in Figure 27) provides an example of how much Petiver charged the Charterhouse for various drugs.[21] This price list shows that exotic New World drugs were available even to the poor pensioners and schoolboys of the charity. Petiver charged 2s for an emetic potion containing ipecacuanha.[22] This was more expensive than a regular emetic potion without ipecacuanha, which was priced at 1s 6d.[23] The inclusion of both kinds of emetic potion in the price list indicates that both were available to Petiver's patients at the Charterhouse. The premium version of the potion, containing ipecacuanha, may have been used as a more powerful remedy for serious medical cases. Indeed, the ipecacuanha potion was the joint-most expensive drug provided by Petiver. At a price of 2s, a dose cost the same amount as the average daily wage of a building labourer in London in 1700.[24]

Figure 28 shows William Morgan's map of London from 1682, engraved just three years before Petiver established his private practice. The black square indicates Petiver's main areas of apothecary activity, which were all north of the Thames and close to the centre of the city. I have highlighted the locations of Petiver's shop, the Charterhouse, St Bartholomew's Hospital and the Hall of the Society of Apothecaries in an enlarged section of the map, displayed in Figure 29. Petiver's shop was in a prime location at the intersection of three main streets: Goswell Street, Aldersgate Street and Barbican. It was also close to the Charterhouse and St Bartholomew's Hospital, both of which Petiver would often have visited regularly to discharge his duties. The Apothecaries' Hall was further away, but still within walking distance. Petiver sat on several committees in the Society of Apothecaries, which met at this location, and he would likely have travelled to the Hall regularly. He was particularly involved in the management of the Chelsea Physic Garden, far away from his centre of activities and beyond the boundaries of the map, where he was Demonstrator from 1706 until his death in 1718.

[20] In most cases, Petiver does not record whether patients are scholars or pensioners. Employees of the charity were also treated by Petiver. For example, 'The Butler' was recorded as receiving medicines.
[21] Sloane MS 3219.
[22] Ibid.
[23] Ibid.
[24] The average daily wage was 22d. Robert C. Allen, "The Great Divergence in European Wages and Prices from the Middle Ages to the First World War," *Explorations in Economic History* 38, no. 4 (2001): 411-447.

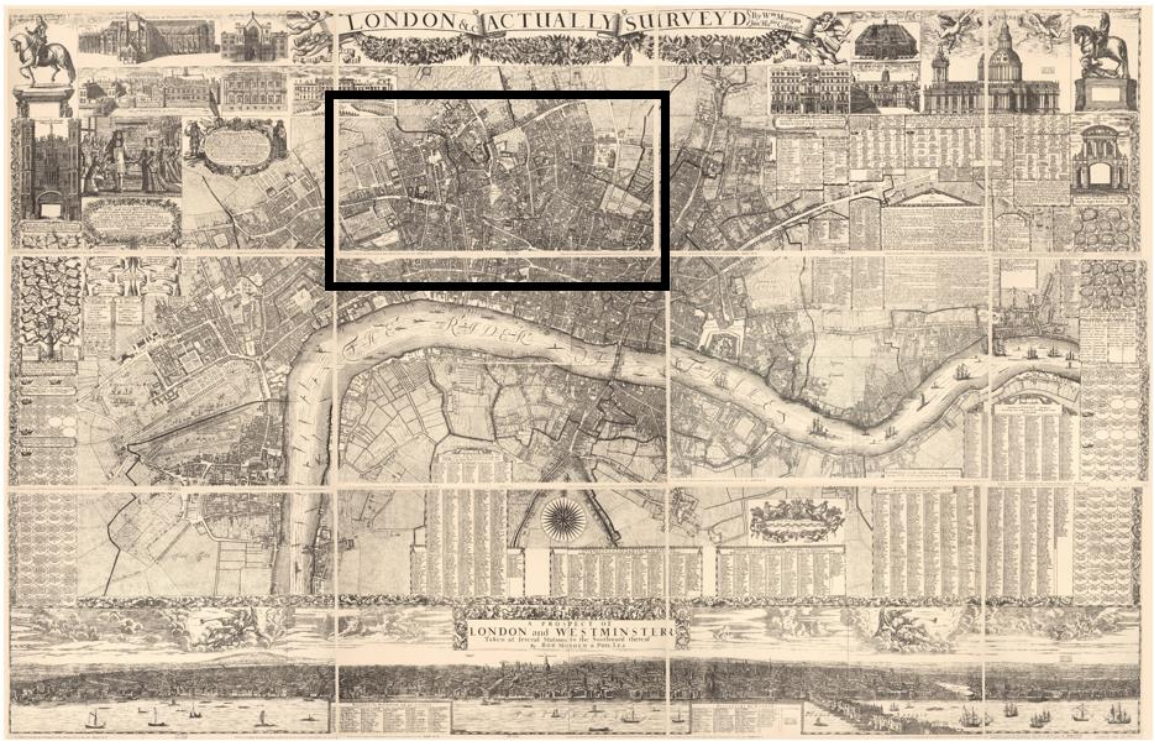

Figure 28. *Petiver's London, 1683*
William Morgan, "London &c. actually surveyed," (London, 1682) U.S. Library of Congress Map Collections, G5754.L7 1682.M6 1904

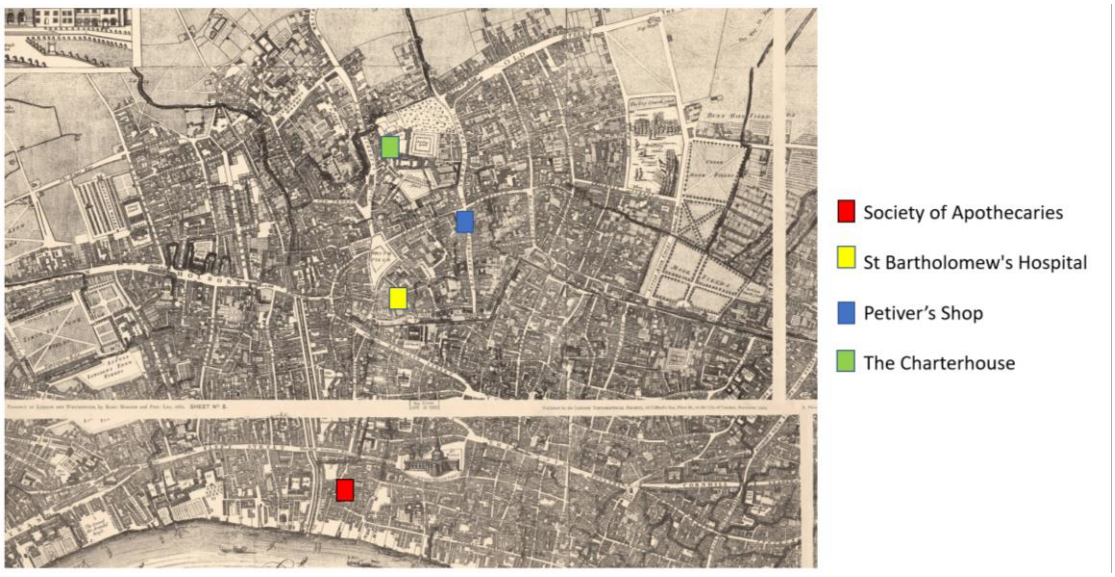

Figure 29. *Petiver's Medical Spaces, 1683*
Author's adaptation of William Morgan, "London &c. actually surveyed," (London, 1682) U.S. Library of Congress Map Collections, G5754.L7 1682.M6 1904

Figure 30 is a map of Aldersgate ward from 1720, two years after Petiver's death. The locations of the Sun Tavern and Long Lane are shown on the map. Letters to Petiver were often addressed to his shop "close to Long Lane" or "next to the Sun Tavern" on Aldersgate Street, so Petiver's shop was

likely to have been in one of the two buildings on either side of the Sun Tavern, which is highlighted on the map.

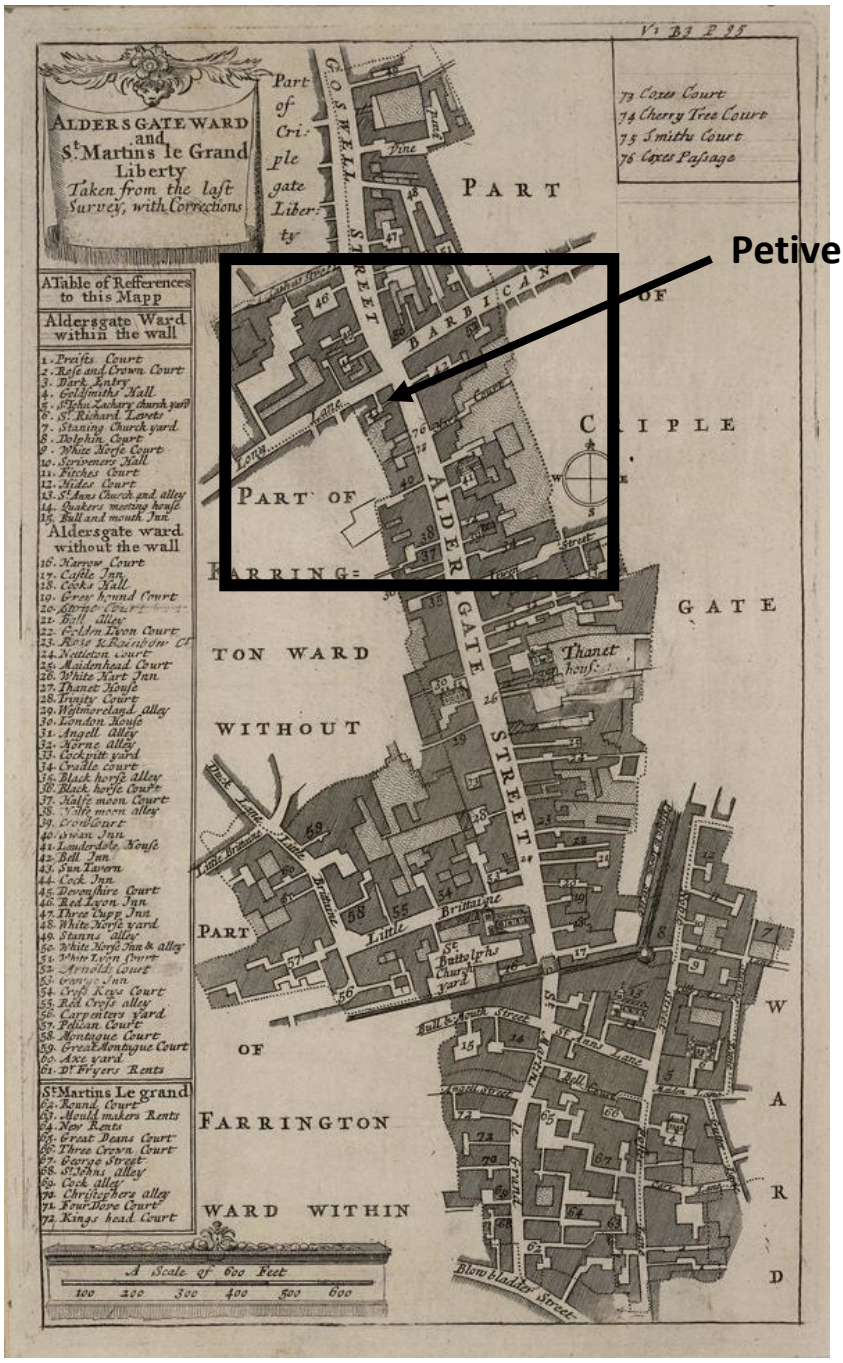

Figure 30. *Plan of Aldersgate, 1720*

Richard Blome, "Aldersgate Ward and St. Martins le Grand Liberty taken from the Last Survey, with Corrections (1720)," British Library Cartographic Items, Maps Crace Port. 8.1.(1.).

Figure 31. *Location of Petiver's Shop*
Author's adaptation of Richard Blome, "Aldersgate Ward and St. Martins le Grand Liberty taken from the Last Survey, with Corrections (1720)," British Library Cartographic Items, Maps Crace Port. 8.1.(1.).

Petiver dispensed most of his medicines individually, either in his shop or at the Charterhouse. His prescription lists suggest that he had many repeat customers who returned on a regular basis. He also provided larger orders to ships' captains and surgeons as medical supplies for voyages, and he sent prescriptions by courier to other parts of England and by ship to America.[25] For example, Petiver received letters from Joseph Bentham in Stevenage asking for a repeat prescription for his daughter: "yr Little Patient my youngest daughter here, begin's to look Pale, & seem's to Want yr Assistance again, she has held up a long while, Pray send her ye same Quantity of Things, she had from you at first, & wth them yr Directions for we have lost yr First."[26] In another letter, Bentham requested two ounces of gentian root and zedoary, an ounce of Spirit of Hartshorn and half a dozen Seville oranges and lemons.[27] These orders were sent through a courier named Richard Reeves, who operated a biweekly service from London to Stevenage. Bentham received these orders on credit and settled his account with Petiver when he next travelled to London.

[25] The provision of large orders to ships' captains is described by Murphy, "Collecting Slave Traders."
[26] Joseph Bentham to James Petiver, 27th January 1707, Sloane MS 4077, f. 74.
[27] Joseph Bentham to James Petiver, 13th October unknown year, Sloane MS 4077, f. 77.

In addition to commercial exchanges, Petiver operated a charitable practice from his shop on Tuesday and Saturday mornings. He recorded that "until 10 of ye Clock I give ye Poor yt first come themselves to me medicines for nothing."[28] While we have multiple mentions of this charity in his manuscripts, we do not have any details about how many people Petiver treated on a pro bono basis. He did not make any identifiable distinction in his prescription books between paying customers and individual charity clients; he may either have recorded them both in the same manner or not recorded charity cases at all.[29] He did mention family members in his prescription books: his mother, uncle and brother-in-law were all recorded as receiving medicines.

Medicine and Collecting

Petiver saw his collecting activities and his apothecary practice as closely related, and he argued for the application of botanical knowledge to improve the practice of medicine. Petiver wrote to his fellow apothecary Patrick Blair that "Perhaps many Plants which grow in such abundant plenty with us to be of more Vertue or Use than we have hitherto found out or conceived, and are not yet reckoned amongst our Materia Medica."[30] Investigating the medicinal qualities of both well-known plants and new plants from overseas would lead to advances in medicine. As he wrote in *Philosophical Transactions*, "Needless to tell you that many Advantages that would accrue to the Art or Mystery of Physick, if the Vertues of all Simples were more nicely inquired into, or better known."[31]

Petiver was himself involved in developing theories about the medical uses of plants. The apothecary Samuel Dale (1659-1739) consulted Petiver on the virtues of American plants, including Mexican lignum aloes, as part of a supplement to his book *Pharmacologia* (1693) in which he classified many New World drugs following the schema of the naturalist John Ray (1627-1705).[32] For example, cortex winteranus was classified as an 'umbilicated fruit' and sassafras and canella abla as a 'calyculated fruits.' These plants were no longer categorised by their origin but by their botanical features alongside plants from other regions of the world in a natural system of classification. Dale implored Petiver to assist him in "supplying the defects" of the *Pharmacologia*, "I know you would much enlighten me therein, and do not doubt but you have received many things relateing to the

[28] Sloane MS 4064, f. 6.
[29] Little is known about the charitable practices of individual medical practitioners outside institutions in early modern England, likely due to the dearth of extant records of this activity.
[30] James Petiver to Patrick Blair, 6th January 1710, BL Sloane MS 3337, ff. 68-9.
[31] James Petiver, "A Catalogue of Some Guinea-Plants, with Their Native Names and Virtues," *Philosophical Transactions* 19 (1697), p. 677.
[32] Samuel Dale, *Pharmacologia* (London, 1693). Samuel Dale to James Petiver, October 20, 1704, Sloane MS 3321, f. 164.

materia medica of which I have given but an Imperfect account."[33] Petiver's expertise was well-regarded on account of his combination of being at the centre of a global network of correspondents providing information and specimens and his use of these medical products in his apothecary practice.

In another letter published in *Philosophical Transactions*, Petiver followed Ray in arguing that herbs of the same botanical class would have similar medicinal properties and could therefore treat related illnesses. He supported this claim with examples of plants that he had received through his collecting networks and used in his apothecary practice, "No less Noble Herbs of this Family, that I have lately received both from the East and West-Indies; which I have also Experienc'd in some Cases with very good success."[34] In a series of published letters, Petiver flagged the medicinal virtues of exotic drugs, their origins and his directions for use, arguing that "Concon, Pounded and Mixt with Oyl, killeth the Worms in the Legs, by anointing with it," and "Caggow, Boyl'd in Water, and wash the teeth, is good for the Tooth-ach."[35] In a description of the Chelsea Physick Garden, he noted the medicinal virtues for exotic plants under sections on "Asiatick and Oriental Plants," "Canary Plants," "Plants from the Cape of Good Hope" and "American Plants."[36]

In these publications, Petiver tried to prove himself to the Royal Society as a source of medical as well as botanical knowledge: "this Plant being altogether new, I design its Description and Figure … It being my great Ambition to approve myself."[37] It appears that Petiver's knowledge of plants and their medicinal qualities acquired through his collecting activities and apothecary practice were recognised by the Royal Society. He was later chosen to "give his Thoughts and Discoveries" on an account of plants and drugs presented by the East India Company.[38] Petiver was pronounced to be the "fittest person" for this task because he had seen them in other collections, raised from seeds or described in books.[39]

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[33] Samuel Dale to James Petiver, October 23, 1700. Sloane MS 3321, f. 57. Dale grew frustrated with Petiver's slow responses to his requests, writing "[i]t is many months since you promised to give me your thoughts" and "[i]f you think it proper please to give yourself the trouble of putting it." Samuel Dale to James Petiver, October 20, 1704, Sloane MS 3321, f. 164.

[34] James Petiver, "Some Attempts Made to Prove That Herbs of the Same Make or Class for the Generallity, have the Like Vertue and Tendency to Work the Same Effects," *Philosophical Transactions* 21 (1699), p. 292.

[35] James Petiver, "A Catalogue of Some Guinea-Plants," p. 682.

[36] James Petiver, "Some Farther Account of Divers Rare Plants, Lately Observed in Several Curious Gardens about London, and Particularly in the Company of Apothecaries Physick-Garden at Chelsey," *Philosophical Transactions* 27 (1710): 416-426.

[37] James Petiver, "A Catalogue of Some Guinea-Plants," p. 686.

[38] James Petiver, "An Account of Part of a Collection of Curious Plants and Drugs, Lately Given to the Royal Society by the East India Company," *Philosophical Transactions* 22 (1700), p. 579.

[39] Ibid.

Petiver's manuscripts reveal that he actively monitored the latest medicinal plant collections and their adoption into medical practice. He compiled a list of seventeen of "Pomets Druggs wch I want" referring to the French druggist Pierre Pomet's (1658 - 1699) *Histoire Générale des Drogues* (1694).[40] Petiver's list, shown in *Figure 32*, included drugs from different regions of the world: "Pignons de Barbarie" (North African pine nuts) and "Graine d'Avignon" (a type of buckthorn found in the south of France). The book and page number references given by Petiver match the 1694 edition of Pomet's work. These references would allow Petiver to consult the entries again. Several of the drugs on this list were described by Pomet as coming from the Americas, including "Bois de Corail" (coralwood), "Bois d' Inde" (logwood), "Kinquina" (cinchona) and "Baume nouveau" (a balsam from Saint-Dominigue). About one-quarter of the drugs desired by Petiver were noted to be from the New World in Pomet's book, demonstrating their importance to Petiver. While Petiver's correspondence network was global, the majority of his correspondents travelled along English trade routes or were based in English colonies. Drugs which grew in French possessions were less accessible to Petiver, and French New World specimens were not necessarily readily available to him.

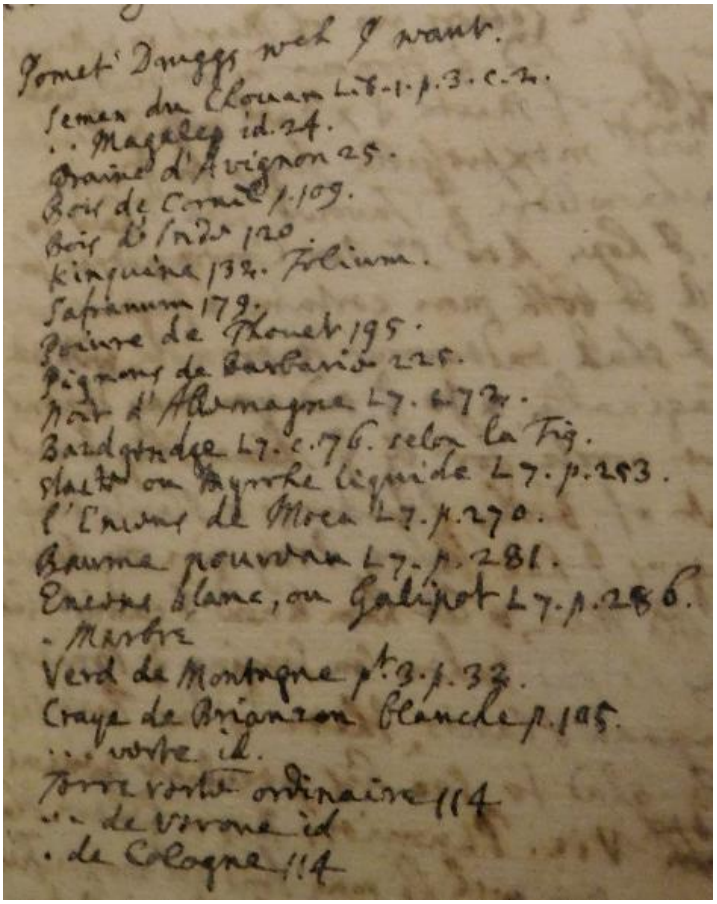

Figure 32. *Petiver's List of Pomet's Drugs*
Source: © British Library Board, Sloane MS 3339, f. 11

[40] Sloane MS 3339, f. 11. Pierre Pomet, *Histoire Générale des Drogues* (Paris, 1694).

Petiver created his own collection of natural rarities which contained many medicinal plant specimens. He published an inventory of his natural history collection in his *Musei Petiveriani* (1695–1703). Petiver had obtained several New World drug specimens for his collection, including sassafras and Balsam Tree from St Helena. He tracked when each plant was commodified into a drug product that was sold commercially. In the *Musei Petiveriani*, he signalled which plants were "of Medicinal Use in the Shops" with the mark "Offic."[41] He also published a list of drugs that were "not at all, or but imperfectly known" and that he:

> most earnestly desired, that all Practitioners in Physick, or other Curious Persons, who Travel into those Parts, from whence these Drugs are brought, would be pleased to procure me what Account they can learn of them, with Samples of their Leaves, Flowers and Fruit.[42]

He divided these up between the East Indies and West Indies. He indicated that some were completely unknown, for which "Samples of their Leaves, Flowers and Fruit, are most particularly desired." Others were somewhat known, "Branches of [which] will be very acceptable."[43] He was particularly interested in obtaining samples of those he judged "altogether unknown."[44] West Indian drugs falling into this category were Peruvian balsam, cascarilla, cinchona, old fustic, caranna, copal, acacia, logwood and tramboon cassia. In Petiver's 'better known' category were copaiva, balsam of Tolu, contrayerva, tobacco, ebony wood, gum anime, gum elemni, brazilwood, mechoacan, red sandalwood, sarsaparilla, American storax, tacamahac and vanilla. Knowledge about these plants was continually being updated, revised and normalised.

Petiver routinely acquired information about the trade and commerce of medicinal plants as well as their healing virtues. He received letters about the natural productions and trade, flora and fauna and political and economic history in Barbados from the seaman Captain Walduck (fl. 1710-1715), alongside specimens of plants, lizards, worms, crabs and spiders.[45] Petiver's collecting networks were intertwined with his customers, and many of his correspondents and collectors were medical practitioners themselves. Kathleen Murphy has identified ship's surgeons and colonial medical practitioners as the two largest groups in Petiver's network of correspondents in the Atlantic world.[46] Medical and collecting matters were often discussed in the same letter. For example, John Bannister apologised for not sending sassafras berries to Petiver, because he had a "fit of sickness

[41] James Petiver, *Musei Petiveriani* (London, 1695–1703).
[42] Ibid, unpaginated.
[43] Ibid.
[44] Ibid.
[45] Sloane MS 2302
[46] Murphy, "Collecting Slave Traders."

just at their time of ripening."[47] In another example, Ja Ingerson reported that "I have had two fitts of ye. goute since I came here which occasioned me to make use of some of yor. Medicens" in the same letter that he mentioned "The Bearer has got such a stock of Plants &c yt. he will furnish yu. wth. what varietties ys place chiefly affords."[48]

Petiver also dispensed drugs in exchange for knowledge and collectibles. For example, Joseph Lord, also in South Carolina, asked for eighteen different drugs – including black hellebore, mastic and rhubarb – to be sent to him in exchange for mosses, stones, fossils and berries he had collected for Petiver.[49] Petiver's agent Robert Ellis, based in Charleston, requested a pot of Lucatellus Balsam and "something that will disperse Wind … with Directions how to use ye same."[50] In exchange, Ellis reported having "delivered some of your Bookes out to Severall Gentlemen of my acquaintance, to fill for me."[51] These included Captain Nerne "who lives up to ye South Ward amongst ye Indians" and would fill out a book with the indigenous names and uses of various plants, and Mr Bohun who "knows very well, who Trades with another Nation of Indians."[52] Mr Bohun asked for ten one-pound pots of Lucatellus Balsam for providing this service. Petiver acquired a large collection of plant material from around the world, especially from the Americas. He was a major contributor to Sloane's collection of vegetable substances, almost 50% of which originated in the Americas.[53]

New World Drugs in Petiver's Receipts

Amongst Petiver's medical manuscripts are nine volumes of medical receipts. The majority of these volumes are rough notebooks, comprising unorganised reading notes from medical treatises (such as William Salmon's *Seplasium The compleat English physician* (1693)), interspersed with receipts for various medical remedies.[54] Petiver also kept more formal receipt books, one structured by type of preparation and one organised by the type of disease to be cured.[55] The organised nature of these volumes indicate that they were used as a reference guide by Petiver or his apprentices when preparing the medicines that were dispensed to customers. Indeed, the same pre-prepared medicines written in Petiver's prescription books are found in the organised receipt books. These

[47] John Bannister to James Petiver, April 19th 1699, Sloane MS 3321, f. 1.
[48] Ja Ingerson to James Petiver, Sloane MS 4066, f. 389.
[49] Joseph Lord to James Petiver, 3rd May 1704, Sloane MS 4064, f. 4. Lord asked for specific quantities of each of the drugs, for example three ounces of black hellebore, and he also requested a set of collecting books.
[50] Robert Ellis to James Petiver, 24th August, year unknown, Sloane MS 4064, f. 290.
[51] Ibid.
[52] Ibid.
[53] Victoria Pickering, "Putting Nature in a Box: Hans Sloane's 'Vegetable Substances' Collection," Ph.D. diss. (Queen Mary, University of London, 2016), p. 70.
[54] James Petiver, "Collection of medical receipts," Sloane MS 2336.
[55] James Petiver, "Collection of medical receipts," Sloane MSS 2338, 2340.

books are therefore a useful source for understanding which New World drugs were used in early modern English apothecary practice.

Table 10. *New World Drugs in Petiver's Receipts*

Type of preparation	Number of receipts	Number of receipts containing New World drugs	Percentage of receipts containing New World drugs (%)
Waters	54	4	7.4
Pills	47	10	21.3
Powders	27	2	7.4
Decoctions	20	3	15
Liniments	18	0	0
Electuaries	13	1	7.7
Syrups	11	1	9.1
Spirits or Wines	10	1	10
Plasters	9	0	0
Troches	9	1	11.1
Tinctures	6	0	0
Liquors	6	0	0
Infusions	4	0	0
Extracts	4	1	25
Others[56]	14	1	7.1
Total	**252**	**25**	**9.9**

Source: Petiver Receipt Database

Table 10 presents the number of receipts in the different sections of Petiver's organised receipt book and the proportion which contained New World drugs. There were 252 receipts in total, of which 24 contained American drugs. There was significant variation in the number of American drugs in different types of preparation: 21% of Petiver's pill receipts contained American drugs compared to 7% of waters and powders. These receipts did not only contain American plants; they were mixed with various other drugs. For example, Petiver's receipt for Aqua Alexiteria included contrayerva, Virginia snakeroot and Lipori Jamaica alongside angelica, mint, cardamom and bace juniper.[57] This mixing of drugs suggests that American drugs were treated in a similar manner to other drugs, both English and exotic. It was the specific properties of American plants, understood in accordance with existing medical theories, which were sought for use in different medical

[56] Other types of preparation included salts (3 recipes), cataplasms (2), gargles (2), elixirs (1), balsams (1), emulsions (1), confections (1), pickles (1), fotus (poultice) (1) and vinegars (1). The American drug was in the sole pickle recipe (for treating measles), which contained pimento.
[57] Sloane MS 2336.

preparations. This finding accords with what we saw in Chapter 3 with sassafras; the drugs' origin in America was less important than its humoral properties of being hot and dry in the second degree.

Petiver's receipts for certain preparations differed significantly from others published by his contemporaires. For example, his Chalybeate Electuary contained sassafras, jalap, mechoacan and sarsaparilla. Four seventeenth-century pharmacopoeias and medical manuals also include receipts for a Chalybeate Electuary, and the six receipts shown in Table 11 give an indication of the receipts that Petiver could have accessed during his lifetime. These published receipts varied substantially in their ingredients; such variation was made possible by the lack of an authorised receipt in the Royal College of Physicians' London pharmacopeia. This is an example of the greater freedom and creativity that was possible in the design of receipts for unofficial remedies. Petiver's receipt was unique amongst published receipts in containing American drugs, and he referred to it as his 'Proprietary Chalybeate Elixir' in his prescription books. By labelling it 'proprietary,' Petiver indicated that this medicine was his own concoction and that it was only available from him.[58] Other proprietary medicines of the time, including Stoughton's Bitters and Daffy's Elixir, also included ingredients from the New World. There were many receipts for Daffy's Elixir, but the most common included guaiacum wood.[59] Stoughton's Bitters, which received a royal patent in 1712, included Virginia snakeroot and guinea pepper.[60]

[58] For discussions of the development and sale of proprietary medicines in early modern England, see Roy Porter, *Health for Sale: Quackery in England, 1660-1850* (Manchester: Manchester University Press, 1989) and John Styles, "Product Innovation in Early Modern London," *Past & Present* 168 (2000): 124-169.
[59] See David Boyd Haycock and Patrick Wallis, "Quackery and Commerce in Seventeenth-century London: the Proprietary Medicine Business of Anthony Daffy," *Medical History: Supplement* 25 (2005): p. 31.
[60] Richard Barnett, "Bitter Medicine: Gout and the Birth of the Cocktail," *The Lancet* 379, no. 9824 (2012): 1384-1385.

Table 11. *Receipts for Chalybeate Electuary in Early Modern Texts and Petiver's Receipt Book*

Richard Bunworth, *The Doctresse* (1656)[1]	**Richard Bunworth, *The Doctresse* (1656)[2]**	**Richard Bunworth, *The Doctresse* (1656)[3]**	**George Bate and William Salmon, *Pharmacopoeia Bateana* (1694)[4]**	**Richard Morton, *Phthisiologia* (1694)[5]**	**Nicolas Lémery, *Pharmacopoeia Lemeriana* (1700)[6]**	**James Petiver, manuscript receipt book[7]**
Chalybeate Electuary for hot Constitutions	Chalybeate Electuary for cold Constitutions	Third Electuary for moderate Constitutions	Electuarium Chalybeatum, Electuary of Mars	Chalybeate Electuary	Chalybeat Electuary	Electuary/Elixir Chalybeate
Conserve of Berberies, 3 ounces Conserve of Wood Sorrel, 2 ounces Prepared Steele, 1 ounce Red Coral Prepared, 1 dram Cream of Tartar, 1 dram Oyle of Vitriol, 20 drops Syrupe of Lemons, as much as is sufficient	Conserve of Scurvygrass, 4 ounces Tartarum Vitriolatum, 1 dram Salt of Steele, 1 dram Species Diagalanga, 1 dram Syrupe of Coral, as much as is sufficient	Conserve of Scurvigrass, 3 ounces Conserve of Berberies, 2 ounces Red Coral prepared, 1 dram Prepared Steele, 6 drams Syrupe of Wood Sorrel, an ounce Oyle of Sulphur, thirty drops	Mars prepared, 1 ounce Mars purified, ½ ounce Pulp of Currants, 7 ounces Oil of Cinnamon or Cloves, 40 drops	Filings of Steel prepared, 2 drams Saffron, 1 scruple Mace, 1 scruple Conserve of Hipps, 1½ ounces Conserve of the Flowers of Succory, 1½ ounces Syrup of Citron-peel, a sufficient quantity	Extract of Mars, half a pound Cinnamon, 6 drams Nutmegs, 6 drams Best Rhubarb, ½ ounce Clarify'd Honey, 1 pound Sugar, 1 pound	Mars prepared, 1 ounce Sassafras, 6 ounces Radix Jalap, 2 ounces Mechoacan, ½ dram Sarsaparilla, 1 dram

[1] Richard Bunworth, *The Doctresse* (London, 1656), p. 15-16.
[2] Ibid, p. 16.
[3] Ibid.
[4] George Bate and William Salmon, *Pharmacopoeia Bateana, or, Bate's Dispensatory* (London, 1694), p. 833.
[5] Richard Morton, *Phthisiologia, or, A Treatise of Consumptions* (London, 1694), p. 326
[6] Nicolas Lémery, *Pharmacopoeia Lemeriana Lemery's Universal Pharmacopoeia* (London, 1700), p. 105.
[7] BL Sloane MS 2340, f. 21.

Table 12. *Number of Occurrences of New World Drugs in Petiver's Receipt Books*

Drug name	Occurrences in organised receipt book	Occurrences in ad hoc receipts	Occurrences as simple remedies	Total number of occurrences	Imports into England in 1685, lb	Annual Imports into England, 1699-1701, lb
Guaiacum	11	0	0	11	40,096	521,161
Sassafras	5	1	1	7	1,736	10,605
Jalap	5	1	1	7	0	7,042
Contrayerva	5	0	0	5	148	26
Sarsaparilla	5	0	0	5	16,737	11,020
Virginia snakeroot	3	0	1	4	360	91
Cortex Winteranus	2	1	0	3	237	5496
Mechoacan	2	0	0	2	408	7
Lipori Jamaica[1]	1	0	0	1	n/a	n/a
Tobacco (nicotiana)	1	0	0	1	0	10,746,453
Pimento	1	0	0	1	0	2
Cinchona	0	0	1	1	2,768	2,045
Carscarilla	0	0	0	0	8,156	1,033
Cocoa	0	0	0	0	13,828	78,314

Source: Petiver Receipt Database

Table 12 displays the number of times New World drugs were listed as an ingredient, both in Petiver's organised receipt book and in other ad hoc receipts included amongst his medical notes. Guaiacum or lignum vitae was the most commonly-used American drug, followed by contrayerva, sassafras, jalap and sarsaparilla. The two right-hand columns display the total imports into England by weight of the same drugs in 1685 and 1699-1701, using the customs data explored in Chapter 1. Leaving aside tobacco, the most commonly-imported drug was guaiacum, which was the drug that also appeared most frequently in Petiver's receipts. Sassafras, sarsaparilla and jalap were regularly imported into England at the turn of the seventeenth century, and each appears five times in Petiver's receipts. Contrayerva occurred more often in receipts than we would expect, given its relatively smaller level of imports, while cortex winteranus is included in fewer receipts. One primarily medicinal New World drug which was regularly imported are not mentioned in any of Petiver's receipts: cascarilla. Tobacco was imported in the largest quantities but is only once mentioned in Petiver's receipts, suggesting that most was consumed for recreational rather than

[1] It is unclear what this term referred to, but the place signifier of 'Jamaica' suggests that it came from the Caribbean.

medicinal purposes.[2] Cocoa was also imported in significant quantities but does not appear in Petiver's medical manuscripts. While medicinal uses for cocoa were discussed in medical texts of the time, it does not appear to have been regularly used by Petiver in medical preparations. These analyses show that in order to understand New World drug consumption, we need to bring together evidence from a variety of sources, including trade data and data on apothecaries' prescriptions.

In addition to his receipt book, Petiver also kept a volume in which he recorded the different cures available for various diseases, dividing them into 'compounds' and 'simples.' Compound remedies were drugs using multiple ingredients, while simples were composed of a single ingredient. The New World simples that were mentioned were Jesuits Bark and jalap for gout, and sassafras for the ague. As discussed in Chapter 3, sassafras was noted for its treatment of the ague, and it was named the 'ague tree' by some writers. Here we have evidence that this knowledge was used by apothecaries in their medical practice. Petiver's manuscripts also suggest that not all of the medical knowledge commonly found in printed books of the early modern period was necessarily reflected in practice. Sassafras and guaiacum were often suggested as cures for venereal diseases in printed medical texts. In Petiver's list of simples to cure gonorrhea, however, no New World drugs were mentioned.

Petiver's receipts are a useful source for understanding which American drugs were used in different preparations by practising apothecaries in the early modern period. Nevertheless, to understand which drugs were given to patients, we need to investigate Petiver's prescribing practice because some receipts were likely to have been prepared more often than others. Furthermore, Petiver prescribed simples and freshly-mixed preparations alongside pre-prepared medicines made according to these receipts, as we shall see in the next section.

Reading Petiver's Prescription Lists

One reason why apothecary prescription lists may have yet to be systematically analysed is the time-consuming process of decoding and understanding both the handwriting and the abbreviations used by apothecaries. Figure 33 and Figure 34 give examples of prescription lists from Petiver's Charterhouse and private practices respectively. Both were recorded in the same manner, as will be discussed below. His later prescription lists include a greater number of abbreviations and more compact handwriting.

[2] Jordan Goodman, *Tobacco in History: The Cultures of Dependence* (London, Routledge, 1994), Chapter 4.

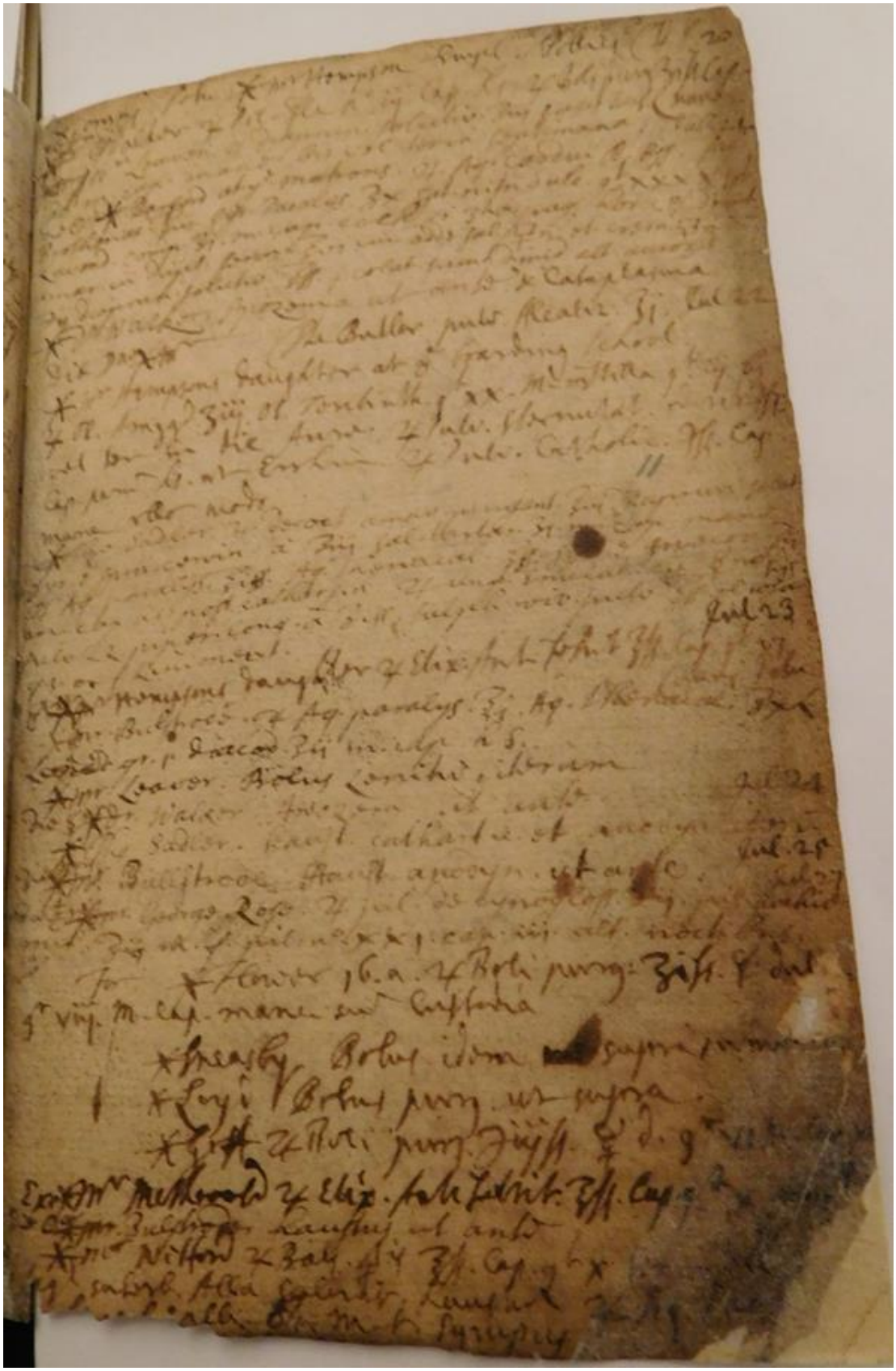

Figure 33. *Example of a Page from Petiver's Prescription Books (Charterhouse Practice)*
Source: © British Library Board, Sloane MS 3219.

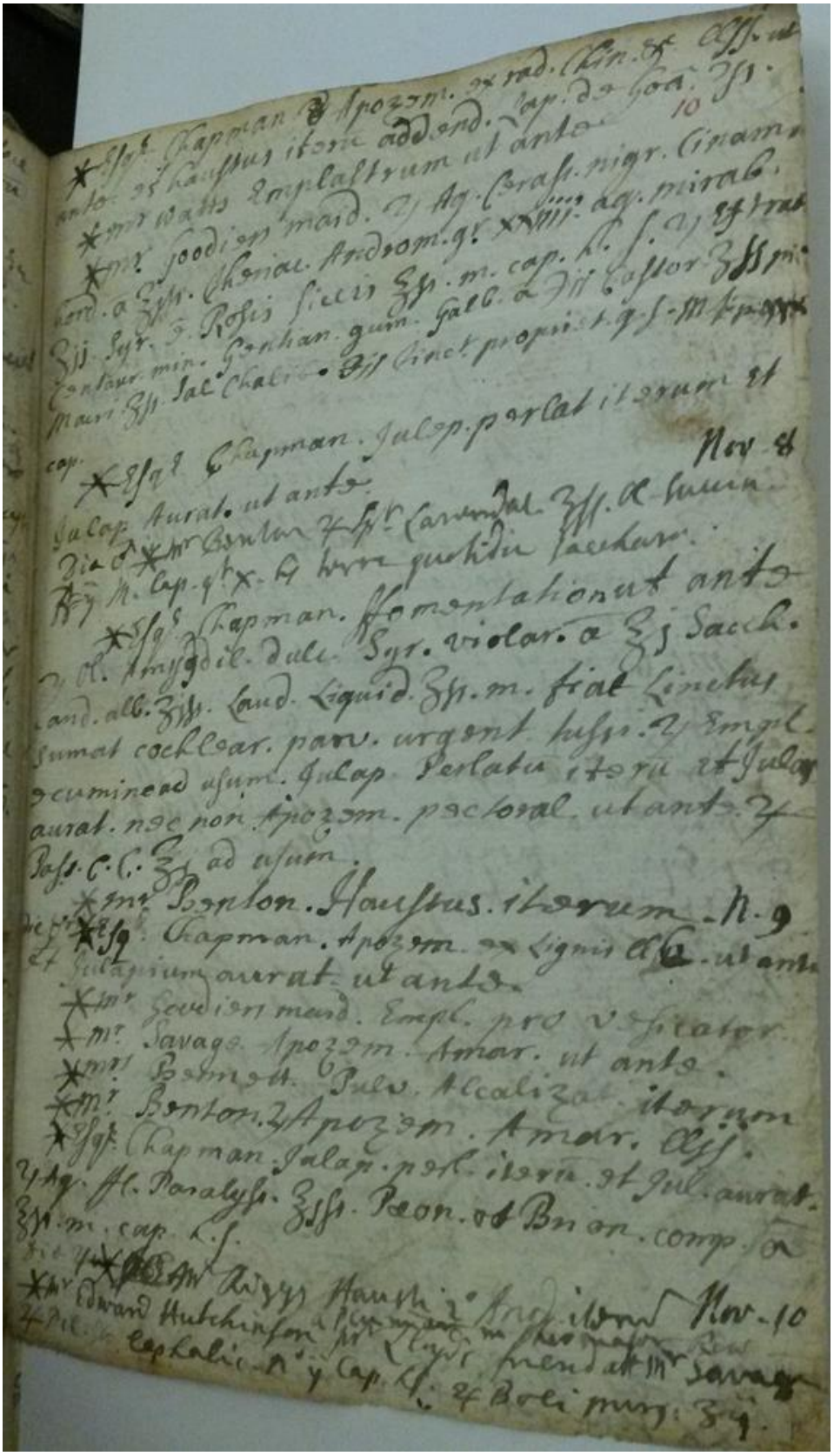

Figure 34. *Example of a Page from Petiver's Prescription Books (Private Practice)*
Source: © British Library Board, Sloane MS 3223.

Petiver appears to have been very conscientious in his record-keeping. He followed traditions borrowed from scholarly note-taking and mercantile account keeping, in a similar manner to contemporary physicians' casebooks.[3] He noted a range of interactions from complicated orders involving multiple prescriptions for different family members to very brief interactions such as supplying his mother with a plaster. We cannot know whether Petiver recorded every transaction, but the range, detail and consistency of the records suggests that he inscribed the vast majority of his dispensing practice.

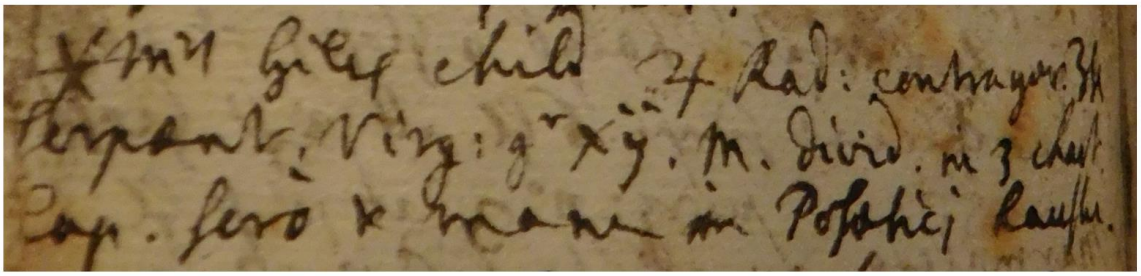

Figure 35. *Example of a Prescription in James Petiver's Prescription Lists*
Source: © British Library Board, Sloane MS 3221.

Figure 35 shows an example of a prescription given by Petiver to Mrs Giles' child. This prescription reads "Mrs Giles child Rx Rad. Contrayer. ℥ss Serpent. Virg: gr xij. M. divid in 3 chart Cap. Sero x mane Postci haustus." As with all of Petiver's prescriptions, the prescription is in a mixture of English and Latin with many abbreviations. Usefully for our analysis, however, all the prescriptions were recorded in a standardised format. Each transaction was denoted by a star mark, followed by the name of the patient; in this case, "Mrs Giles child." Most patients were named directly, but sometimes patients were referred to only as someone's "child," "son," "daughter," "servant," or "friend." In these cases, it is likely that the named person was the purchaser of the prescription, so we can infer that Mrs Giles obtained this prescription for her child. For some customers, their location was also recorded; for example, prescriptions were provided for "Mrs Edwards at Charing Cross" and "Mr Marriott at Mr John Durmany in Yalip Court." Some customers placed many orders with Petiver. For example, seven separate orders were made up for "Madam Pledwell" in September and October 1698.

Within each order, individual prescriptions were denoted by a 'Rx' symbol, as we can see after the word "child." There were two types of prescription: a prepared medicine and a mixed medicine.

[3] Lauren Kassell, "Casebooks in Early Modern England: Medicine, Astrology, and Written Records," *Bulletin of the History of Medicine* 88, no. 4 (2014): 595-625; Volker Hess and J. Andrew Mendelsohn, "Case and Series: Medical Knowledge and Paper Technology, 1600–1900," *History of Science* 48, no. 3-4 (2010): 287-314.

Prepared medicines were pills, potions or elixirs that Petiver had mixed earlier or were simples which had been ready-prepared or bought wholesale in a consumable form. They were recorded as single-item prescriptions, with the name of the medicine followed by a quantity, volume or weight. Mixed medicines were prepared as the customer waited (or may have been ordered in advance). The individual components of the mixture and their amount were recorded in the prescription lists, followed by the letter "M" to denote a mixture. Our example is a mixed medicine: half a dram (ℨss) of contrayerva root (Rad. Contrayer.) and 12 grains (gr xij) of Virginia snakeroot (Serpent. Virg) were mixed together and divided into three powders (M. divid in 3 chart).

Each prescription ends with instructions on how much of the medicine should be taken at what time. These instructions are introduced by the term "cap.," an abbreviation of *capiat* or "let him take." In our example, Mrs Giles is advised to give her child the prepared powder in a draught (*haustus*) late in the morning (*sero x mane*) after food (*postci*, an abbreviation of *post cibum*). The instructions varied according to the different drugs prescribed. The most common instructions gave times of day, such as at night or in the morning. Some patients were told to take the medicine when required, or when they felt pain or suffered from spasms.

We can now put the different parts of the example prescription together to create an unabbreviated English translation:

> Mrs Giles' child had a prescription made up for half a dram of contrayerva root and 12 grains of Virginia snakeroot mixed and divided into 3 powders. The child was to take a powder in a draught late in the morning after food.

Petiver recorded his prescriptions continuously and noted a new day by writing "Dia" on the left-hand side of the page and recording the date on the right-hand side. The majority of the entries were prescriptions in the format shown in the example above. In some cases, a patient was given a repeat prescription, in which case Petiver recorded their name, the type of preparation (such as draught or powder) and "iterum" (again) or "ut ante" (as before). In these cases, he did not write out the full prescription. This points us to one purpose of the prescription lists: Petiver could refer to previous prescriptions that he had provided for his various patients. Another reason for keeping extensive records, at least those related to his work at the Charterhouse, was that his work was audited by the charity.[4]

[4] A copy of an audit report into Petiver's Charterhouse practice is recorded in Sloane MS 3219. These audits may have been used by the administration of the charity to decide whether to renew Petiver's appointment as apothecary to the Charterhouse. The audit was positive about Petiver's practice, and his contract was renewed repeatedly until his death.

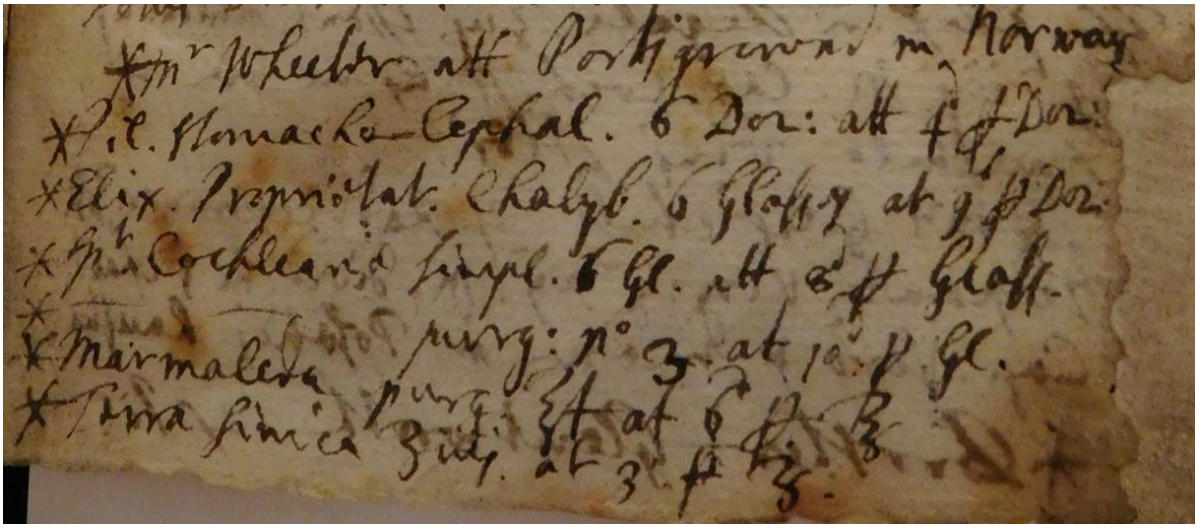

Figure 36. *Example of a Large Order in Petiver's Prescription Books*
Source: © British Library Board, Sloane MS 3221.

Certain types of entries were recorded in a different manner: non-prescription items and large orders. These were the exception and made up less than 1% of the entries. An example of a non-prescription item was a "large box with partitions" sold to "Mr Daniell Surgeon" in October 1698.[5] For large orders, Petiver did not include directions on how to take the medicines, but instead recorded the price. Figure 36 gives an example of Petiver providing Mr Wheeler at "Portiground" in Norway with a large order including six doses of stomachocephalic pills at 4d each, six glasses of Proprietary Chalybeate Elixir at 9d each, nine glasses of Spirit of Cochlear (six simple at 8d each and three purgative at 10d each), ten ounces of Marmaleda Purgative at 6d an ounce and 4 drams of Terra Sinica at 3d a dram.[6] The recording of the price of these drugs, a practice which was unique to large orders, suggests that they differed from Petiver's usual prices. Petiver may have offered discounts on his usual prices for such larger orders. In this example, Petiver sold large quantities of his proprietary medicine, which included sassafras, jalap, mechoacan and sarsaparilla. This demonstrates that Petiver's proprietary remedies were in demand and highlights the importance of the global trade in New World drugs for his medical practice. Petiver would have purchased the ingredients for his proprietary medicine from merchants trading with the Americas, manufactured his medicinal preparation in London and then sold it to a customer based in Norway.

In his private practice, Petiver recorded prescriptions in much the same manner as in his Charterhouse practice. In the Charterhouse prescription lists, some of the prescriptions were written to physicians. In these cases, the physicians may have administered the medicine to their own patients, and we do not know the identity of the patient who would have taken the medicine. Most

[5] Sloane MS 3223.
[6] "Portiground" likely referred to Porsgrund, a Norwegian port town.

of the entries appear to be for scholars and pensioners, although in most cases we cannot differentiate between them. A small number of entries were for staff of the Charterhouse, indicated by their job title. For example, Petiver provided prescriptions for the butler.

The standard format in which Petiver recorded his prescriptions makes them useful for exploring apothecary practice in early modern England and how New World drugs were incorporated into medicine at this time. I created a database of Petiver's prescriptions from two sample periods of Petiver's private practice (June-July 1693 and September-October 1698) and a sample period of his Charterhouse practice (July-September 1700). I recorded detailed data on 100 of Petiver's transactions in his private practice at three nested levels: the customer level, the prescription level and the drug level. At the customer level, I noted the name of the patient and any available demographic information: their sex, their status (e.g. child, servant, or friend) and their location (if given). I noted the number of prescriptions in each order, the number of drugs given and whether they were repeat orders. At the prescription level, I recorded which medicines were prescribed, whether the prescriptions were ready-mixed or pre-prepared, and the directions for taking the prescription. At the drug level, I recorded the drug name, the quantity used and whether it was prescribed as a simple, a pre-prepared medicine or as part of a mix with other drugs. By analysing these three nested levels of data, we can explore what kinds of drugs Petiver provided, in what quantity he provided them, and the proportions of men, women and children who would take them. In addition, I recorded the New World drugs dispensed to a wider set of 260 private customers and Charterhouse patients. I recorded data at the customer level and details of any New World drugs that were dispensed, either as simples or as components of pre-prepared medicines.

One important caveat to this analysis is that we do not know how representative the sample periods used in this analysis are of Petiver's prescriptions over his entire career. Based on the number of orders on each page and in the surviving manuscripts, there are likely to be more than 40,000 orders in total that could be analysed in a continuous series from 1687 until 1710. A complete survey of all these prescriptions was impractical due to the very substantial amount of time such an undertaking would require. Instead, I analysed sample periods which together comprise a small fraction of the total number of prescriptions. By choosing two sample periods from his private practice and one from his Charterhouse practice, I decrease the likelihood that any findings are particular to a certain time and place. Nevertheless, further investigation of a larger number of Petiver's prescriptions would be a worthwhile endeavour.

Some prescriptions of New World drugs are simple to record. In the example prescription displayed above, two such drugs are noted directly: Virginia snakeroot and contrayerva. As discussed above, however, many of the prescription orders that Petiver provided were pre-prepared medicines. Some examples of these are aqua alexiteria and stomachocephalic pills. The ingredients for these are not listed in the prescription, so to discover which of these medicines contained New World drugs, I cross-referenced Petiver's medical journal with his books of receipts described above. For each unique pre-prepared medicine, I noted whether and which New World drugs were included in the receipt. This methodological approach, however, cannot exclude the possibility that Petiver may have used substitutes when a certain drug was unavailable.

For the majority of the simple and compound entries in Petiver's prescription books, it is fairly straightforward to discover whether an American drug was included by cross-referencing the entries with his receipt books. There were a small number of unspecific entries for repeat prescriptions at the beginning of volumes for which the original prescription is not included in the sample. For example, Mrs Edwards' daughter was dispensed a repeat prescription for an anodyne and a powder on 30th September 1698, but the specific type of anodyne and powder are likely specified in a prescription not included in the dataset.

New World Drugs in Petiver's Prescriptions

One-third of Petiver's private patients and one-fifth of his institutional patients received New World drugs as part of their medical treatment (30% and 20%). This data reveals that New World drugs formed an important component of medical care in both retail trade and institutional provision. Petiver treated an average of six people per day in his private practice (consistent across both sample periods) and three people per day at the Charterhouse. New World drugs were thus prescribed twice a day on average in Petiver's private practice and every other day in his institutional practice. By the turn of the eighteenth century, therefore, New World drugs were commonplace in medical practice. In reference to Petiver's medical collecting, I discussed how Petiver was still seeking many 'altogether unknown' drugs from the Americas, suggesting that there were still more beneficial medicines to adopt into English medical practice. It appears likely that the positive experience with New World drugs inspired Petiver to search for more of them.

In order to understand the significance of Petiver's dispensing of New World drugs, I first describe the general contours of his practice as revealed in his prescription books. Figure 37 and Figure 38 display the number of drugs per transaction in Petiver's private and Charterhouse practices. In both

practices, most patients received one drug per transaction. The range was greater for his retail practice (from 1 to 15 drugs) than for his institutional practice (from 1 to 10 drugs). This difference could reflect the more substantial buying power of the private patient and the greater availability of drugs that they could access from Petiver's shop.

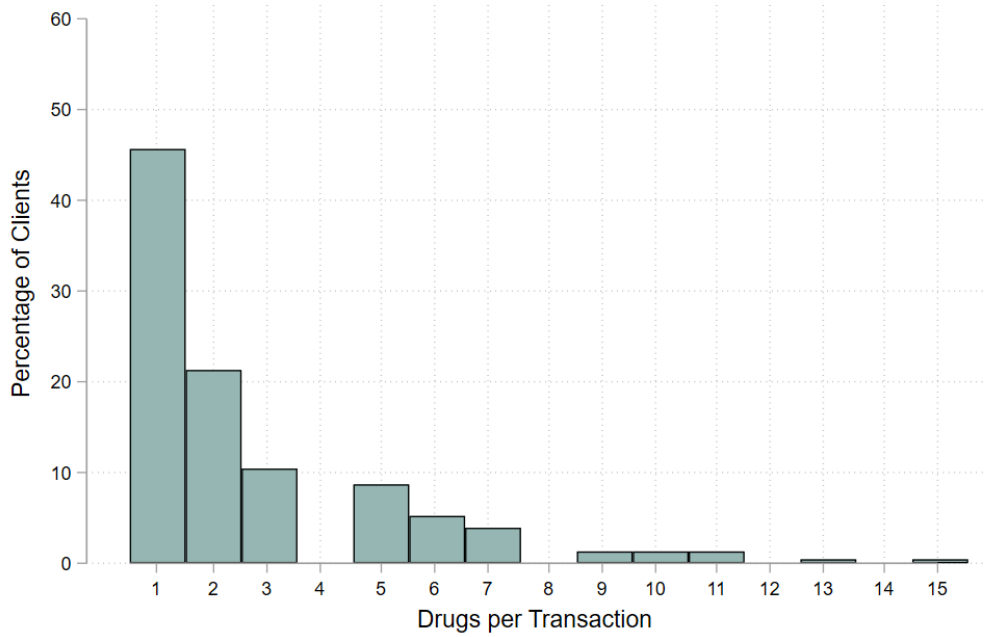

Figure 37. *Drugs Dispensed per Transaction (Retail Practice)*
Source: Petiver Prescription Database

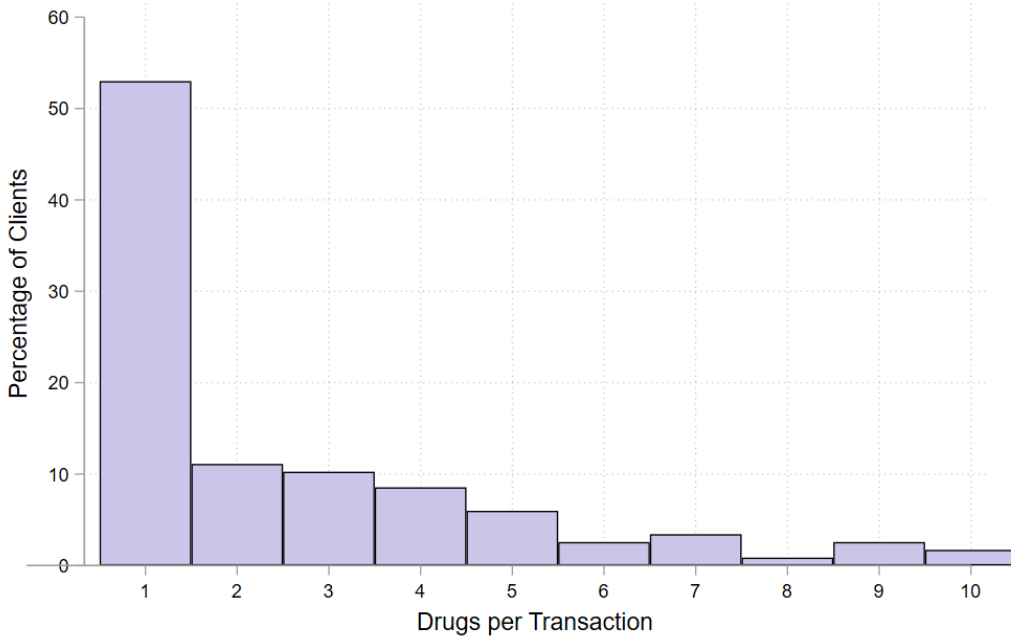

Figure 38. *Drugs Dispensed per Transaction (Institutional Practice)*
Source: Petiver Prescription Database

The sex of Petiver's private customers is shown in Figure 39. Women comprised 45% of his customers, with the rest being men. The purchase of drugs from apothecaries like Petiver was not exclusive to one sex. In his Charterhouse practice, by contrast, Petiver's clients were almost all male apart from a few women who were associated with the charity. All of the scholars and pensioners were male.

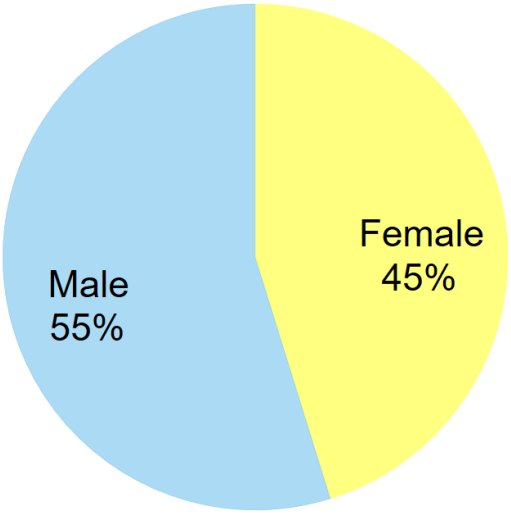

Figure 39. *Petiver's Customers (by sex)*
Source: Petiver Prescription Database

The purchasers of Petiver's drugs were not always the patients themselves. In a prescription referenced earlier in this chapter displayed in Figure 35, Mrs Giles was the customer, and her child was the patient. Figure 40 shows that Petiver's drugs were consumed slightly more often by male patients (45%) than by female patients (39%). For 16% of patients, their sex is not known: 13% were referred to as children, and 3% were described as friends.

Figure 40 also presents a comparison of who consumed Petiver's drugs between all his prescriptions in our data set and the prescriptions specifically containing New World drugs. There is no significant difference between Petiver's general prescriptions and those including American medicaments. There was no distinction in Petiver's dispensing practice based on sex or age (male/female; child/adult). This finding indicates that New drugs were fully integrated into medical care by the turn of the eighteenth century.

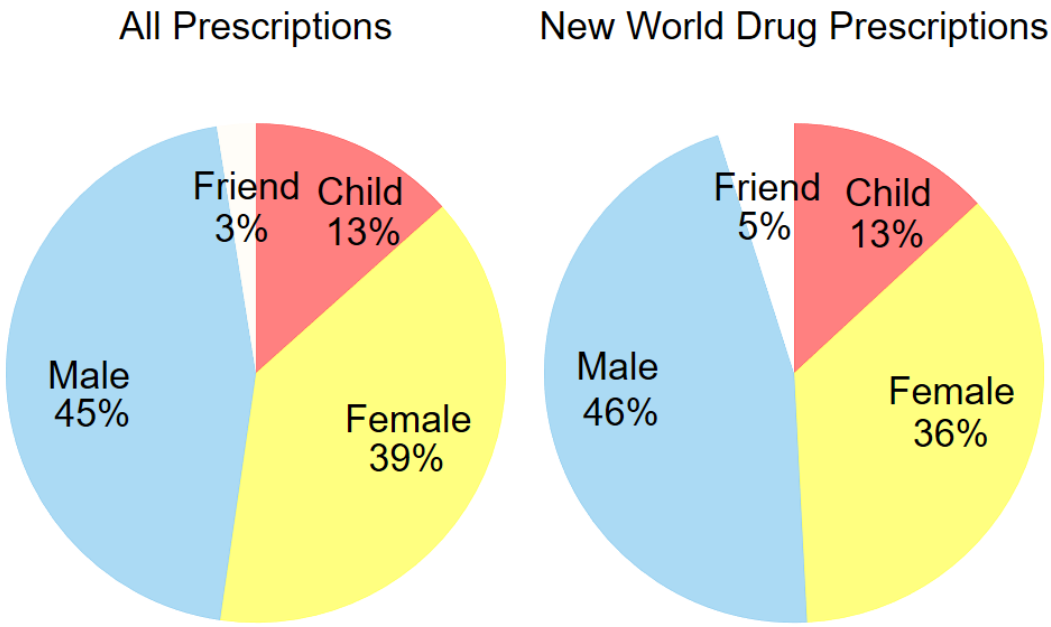

Figure 40. *Patients who Consumed Petiver's Drugs by Sex and Age*
Source: Petiver Prescription Database

The majority of prescriptions (71%) were consumed by the customers directly, as shown in

Table *13*. Other prescriptions were filled on behalf of customers' friends and family. Almost a quarter (23%) of the prescriptions were purchased for children. Smaller proportions were obtained for servants (3%), friends (2%) and wives (1%). When comparing all of the prescriptions in my dataset with only those including New World drugs, I again observe that there is little discernible difference, a result which supports my earlier finding, and confirms that both customers and patients were equally likely to receive New World or Old World drugs.

Table 13. *Patients who Consumed Petiver's Drugs by Relation to Customer*

Prescriptions for…	**Percentage of prescriptions**	**Percentage of New World drug prescriptions**
Self	71%	62%
Child	23%	23%
Servant	3%	5%
Friend	2%	5%
Wife	1%	5%

Source: Petiver Prescription Database

In Table 14 below, I present the most common drugs dispensed to Petiver's retail customers, based on a sample of 100 prescriptions in 1698. Whether or not they included ingredients from the Americas was determined by cross-referencing Petiver's prescriptions with his medical receipts. Four readily-prescribed medicines contained New World ingredients. Bolus Purgative (a large purging pill), the third most commonly prescribed drug by Petiver, contained gum guaiacum. Aqua Alexiteria, Petiver's fourth most commonly prescribed drug, was a drink to treat "the Plague, Measles Small-pox, and all manner of malign and pestilential Fevers, the Bitings of Serpents, mad Dogs, and other venomous Creatures."[7] This remedy included several drugs from the Americas in its ingredients for preparation: contrayerva, Virginia snakeroot and lipori Jamaica. Elixir antiscorbutica (a drink to treat scurvy) was the sixth most-commonly prescribed drug, and it contained jalap in Petiver's receipt. Balsam of Brasil was a simple from the Americas and was the only New World simple commonly prescribed by Petiver. A wide variety of drugs were dispensed to his private clients, and many of these medicaments were also prescribed once or twice in the sample period. In total, 83 different drugs were dispensed by Petiver in the detailed sample of 100 prescriptions.[8] New World drugs made up 9% of the number of drugs, but accounted for more than 15% of the total drugs dispensed. This finding emphasises that counting drugs is a poor measure of drug consumption and that it is necessary to investigate the use of New World drugs in prescribing practice, as I discussed in the Introduction.

[7] Bate and Salmon, *Pharmacopoeia Bateana*, pp. 32-33.

[8] The different drugs that Petiver prescribed were: aqua alexiteria, pulvarum alcalizat, syrup althaea, aqua amaraci, tincture anticholica, elixir antiscorbutic, aqua alexipharmica, aqua castitatis alex, aqua epidemica, aqua puleggi, aqua solis, pill asafoetedia, emplastrum astringent, balsam fomentation, balsam brasil, aqua hordeuta, apozem amar, aqua cevasor nigrum chamomile, piper nigrum, borax, calomel, spirit cardiacus, carminative, semen carui, medicine cathartic, pulvarum catholic, pulvarum catholic purgante, chalybs aceto praeparatus, spirit chamaepitys, ol chamomile, aqua chamomile, spirit chamomile, cinnamon, aqua cinnamon, aqua cinnamon fort, pill cochiae major, crocus mettalorum, elixir daffy, spirit cornu cervi, diacodium, electuary caryophyll, elixir volatile lavender, pulvarum emmenagogue, pulvarum emula, extract rudii, emplastrum galbani, haustus hypnoticus, haustus purgante, aqua hyssopi, jalap, juniper, electuary juniperinum, laudanum, bacae lauri, ol lini, balsam lucatelli, marmalade purgante, emplastrum melilote, mixtura pectoral, semen sinapis, ol nutmeg, auripigmentum, syrup paeony, ol pectoral, aqua plantaginis, pulvis sternutatorius, bolus purgative, radix pyrethrum, rosa solis, aqua rosa solis cinnamon, senna, spermaceti, spirit coral nigrum, spirit sulfur, spirit vitrioli, pill stomach cephalic, ol amygdalus dulcis, laudanum sydenham, syrup aether, syrup de meconio, spina cervina, spirit rhubarb, and ol tonic.

Table 14. *Most Commonly Dispensed Drugs in Petiver's Retail Practice*

Drug Name Verbatim	Includes New World drugs?	Times Used
Diacodium (Syrup of Poppies)	No	13
Pill Stomach Cephalic (stomachocephalic pill)	No	10
Bolus Purgative	Yes	7
Aqua Alexiteria	Yes	6
Laudanum	No	6
Elixir Antiscorbutica	Yes	5
Aqua Epidemica (Plague Water)	No	5
Bitter Apozem	No	5
Pulv Catholic	No	5
Elixir Volatile Lavender	No	5
Pulv Purgative	No	5
Pulv Alcalizat (Alkaline Powder)	No	4
Marmelade purgative	No	4
Emplastrum Melilot	No	4
Spirit of Chamomile	No	4
Balsam of Brasil	Yes	3
Rosa Solis	No	3
Tinctura Anticolica	No	3

Source: Petiver Prescription Database

In Table 15, I compare Petiver's prescribing practices of New World drugs between retail and institutional settings. The data for this table is based on a sample of 360 transactions from 1693, 1698 and 1700. The two most commonly-prescribed drugs were the same in both settings: bolus purgative and elixir antiscorbutica. The bolus purgative was heavily prescribed because it was a general use purgative that Petiver used for a wide variety of diseases. The frequent use of elixir antiscorbutica suggests that Petiver treated many patients afflicted with scurvy. The only other drug that was prescribed in both private and institutional practice was aqua alexiteria, likely due to its use in the treatment of fevers. These diseases affected people from all social classes. This finding provides further evidence that children and elderly and disabled pensioners were able to access exotic drugs in their medical care at the turn of the eighteenth century.

Petiver's private clients, however, had access to a much wider variety of New World medicaments. Twelve additional New World simples or medicines including New World ingredients were only prescribed in his retail trade. He made use of a greater variety of preparations of Virginia snakeroot than of any other simple, dispensing this New World drug as a simple, a powder, a water and a spirit, and as an ingredient in his aqua alexipharmica and aqua alexiteria. This wide range of uses indicates

that Virginia snakeroot was a staple of Petiver's medical practice. I provide further evidence for the importance of this drug in Table 16. Virginia snakeroot was the most common ingredient from the New World receipts that Petiver dispensed to his private clients. As its name suggests, this drug was associated with Virginia, which demonstrates the successful promotion of a diverse range of drug exports from this colony that resulted from aspirations for economic development discussed in Chapter 2.

Table 15. *New World Drugs Dispensed by Petiver, and their Common Uses*

Drug Name	**Common uses**	**Times dispensed: Private Practice n = 243**	**Times dispensed: Charterhouse n = 117**	**Time dispensed: Total n = 360**
Bolus Purgative	Purging	18	11	29
Elixir Antiscorbutica	Scurvy	14	4	18
Aqua Alexiteria	Plague, measles, smallpox, venomous bites	10	1	11
Serpent Virginia	Venomous bites, plague	8	0	8
Balsam of Brasil	Wounds, hysteric	4	0	4
Pill Purgante	Purging	3	0	3
Radix Contrayerva	Plague, fevers	3	0	3
Aqua Serpent Virginia	Venomous bites, plague	2	0	2
Chalybeate Elixir	Provoke the menses, hypochondriacal diseases	2	0	2
Pulv Serpent Virginia	Venomous bites, plague	2	0	2
Guaiacum	The pox	0	2	2
Spirit Serpent Virginia	Venomous bites, plague	1	0	1
Spirit Cardiacus	Plague, swoonings	1	0	1
Jalap	Purging, dropsy	1	0	1
Aqua Alexipharmica	Resist poison	1	0	1
Daffy's Elixir	Cure-all	1	0	1

Source: Petiver Prescription Database

In Table 16, I report how often New World medicaments were dispensed as either simples or compound medicines. Guaiacum was the most frequently-dispensed American drug, both overall and in his Charterhouse practice. This perhaps reflects the greater supply of guaiacum available in

the market, as it was the most imported New World drug into England (as shown in Chapter 1). I find more supporting evidence that a wider variety of New World drugs was available to Petiver's private clientele, in comparison to his patients at the Charterhouse. Balsam of Brasil, sassafras, mechoacan, sarsaparilla and cortex winteranus were only dispensed in Petiver's retail trade. This finding suggests that these drugs were more exclusive.

Table 16. *New World Ingredients in Medicines Dispensed by Petiver*

Ingredient Name Verbatim	**Times dispensed: Private Practice**	**Times dispensed: Charterhouse**	**Time dispensed: Total**
Guaiacum	22	13	35
Virginia Snakeroot	24	1	25
Jalap	17	4	21
Contrayerva	14	1	15
Lipori Jamaica	10	1	11
Balsam of Brasil	4	0	4
Sassafras	2	0	2
Mechoacan	2	0	2
Sarsaparilla	2	0	2
Cortex winteranus	1	0	1

Source: Petiver Prescription Database

Conclusion

By analysing Petiver's apothecary practice, I have been able to document a case of the retailing and consumption of New World drugs in London at the turn of the eighteenth century. A significant proportion of Petiver's patients consumed these drugs, with nearly one-third of Petiver's private clientele and one-fifth of his institutional charges receiving drugs with American ingredients. Petiver's medical manuscripts also provided information about how drugs circulated between the Americas and England. Petiver dispensed American drugs to his customers, dispatched Old World remedies to his correspondents in Carolina and received information and specimens to study and integrate into his medical practice. Petiver's profession as an apothecary and drug supplier gave him first-hand experience with a wide range of medical drugs and the network and financial resources to engage in natural history collecting.

In Chapter 1, I identified a wide variety of New World drugs that were imported in England at the turn of the eighteenth century, but only a few of these drugs were traded in large quantities. In this chapter, I have discovered that New World drugs formed a regular part of medical practice, but that only a few were available across all social classes. The supply and demand for New World drugs thus

correlated well together, giving us strong evidence for the adoption of New World medicaments in early modern English healing practices. In Chapter 2, I evaluated project schemes in colonial Virginia for promoting the diversification of the drug economy. In this chapter, I found that Virginia snakeroot became a commonly-used drug in medical practice at the turn of the eighteenth century.

In Chapter 3, I offered a one-hundred-year longitudinal analysis of a New World drug – sassafras - and revealed how it was understood by medical writers. In this chapter, I have uncovered the uses of sassafras and a wide variety of New World drugs in the treatment of patients by an apothecary. In Chapter 4, I analysed a contemporary Royal Society Fellow of Petiver's: Abraham Hill. Both Petiver and Hill were involved in acquiring and distributing knowledge as nodes in a network of discovery. Hill's commonplace books allowed me to assess how a merchant and government official sought to understand New World plants, their medicinal properties and their commercial value. Petiver's medical manuscripts permitted me to evaluate how a medical practitioner viewed these issues and how he implemented them in his professional practice.

This analysis comes from the practice of a single apothecary, and one who was interested in exotic plants and in regular contact with naturalists and collectors in the Americas. We must be careful, therefore, to recognise the limitations of how representative Petiver's medical practice was compared to contemporary apothecaries. The patient experience of medical drug consumption would have varied spatially, temporally and with respect to their interaction with different types of medical practitioners. Nevertheless, this chapter has allowed us to get closer to the patient experience of consuming drugs from the New World, both on the retail market and in the institutional environment of the Charterhouse.

Conclusion

In this thesis, I have investigated the reception of New World drugs in early modern England. I argued that commercial and political imperatives drove the production, trade and consumption of New World medicines. These new botanicals held significance for the early modern English in philosophical, religious, medical and economic terms. By the seventeenth century, the English were not only learning from second-hand Spanish accounts but were exploring the New World for themselves from Newfoundland to Guiana. A new empirical philosophy was being promoted by gentlemen scholars, who argued for the inclusion of natural history observations via the senses and experiments in medicine. This new approach contrasted with an older, more theory-based, philosophy based on classical scholarly texts, in which New World drugs were absent. In religious terms, the rhetoric of accounts from afar promoted an ideal nature unknown to ancient philosophers, which stirred a sense of discovery steeped in the Christian duty to understand God's creation. These plants were contentious in medical practice. Their proponents made claims about their almost miraculous effects, while suspicions were held by others about their unknown virtues and what the plants' origin from a foreign place might mean for the constitutions of the English people. In economic terms, a profitable trade in New World botanicals grew across the seventeenth and eighteenth centuries and contributed to the economic development of England's early empire.

My thesis answered the question of how New World drugs were received and understood in the early English empire. I explored the period from the first English encounters of American flora in the sixteenth century to when these medicinal plants became an important staple of English medical practice at the turn of the eighteenth century. Cycles of expansion and contraction in the colonial economy were reflected in the fluctuating supply of drugs from the English plantations, as I documented in Chapters 1 and 2. Failure to create robust colonial governance institutions or invest sufficiently in the colonies resulted in the abandonment of merchant ventures, for example the dissolution of the Virginia Company in 1624. The collapse of commercial cycles forced political action, and political upheaval permitted opportunities for economic reassessment. The confluence of a change in government and an economic crisis in the 1650s led to a radical restructuring of the colonial political economy. The Navigation Acts sought to control the lucrative transatlantic trade between England and its American plantations. Oliver Cromwell's Western Design aimed to expand England's territorial possessions in the Caribbean at the expense of the Spanish, which culminated in the English acquisition of Jamaica in 1655, a colony which became a major drug supplier for England. While the English government did not lead the inquiry into New World drugs, state-chartered

institutions like the Royal Society did encourage knowledge-gathering initiatives and promoted the collection of specimens and information that could improve the economy of the colonies and the metropolis, as I demonstrated in Chapter 4. Scientific and mercantile interests intertwined and fostered each other, as I revealed in my analysis of Abraham Hill's role in constructing knowledge of American *naturalia*.

The first English commercial development of New World drugs occurred at the turn of the seventeenth century as part of the English imperial project in the Americas. The process of drug adoption was not linear, but instead involved successive waves of projecting, trading, and retailing of drugs across the seventeenth century. The demand for New World drugs in the English market was created by merchants and colonial projectors, who promoted the medicinal virtues of these drugs. Demand for these drugs was further fuelled by the advocacy of medical writers endorsing their use in healing practice as illustrated in Chapter 3. As medical practitioners became more familiar with these drugs, they prescribed them more often. The development of the market was stimulated through a self-catalysing process, whereby the supply escalated in response to further demand. In Chapter 5, I discovered that by the end of the seventeenth century, New World drugs were prevalent in the English medical marketplace. In James Petiver's apothecary practice, these American drugs were dispensed to over 30% of his retail clients and 20% of his institutional patients.

The commodification of New World drugs was well-established before significant scientific enquiries into their properties were conducted in early modern England. Comparing my findings in Chapters 1 and 3 reveals that guaiacum, sarsaparilla, sassafras and mechoacan were regularly imported into England before they were prevalently discussed in the medical literature. In the latter seventeenth century, Abraham Hill proposed the systematic study of flora in the New World and other regions, as I highlighted in Chapter 4. Following solicitation from colonial governors, Hill designed standardised questionnaires with Robert Hooke to be distributed amongst correspondents in the Americas who could collect information on the virtues of plants. At the turn of the eighteenth century, James Petiver was actively prescribing cinchona even while he described it as 'altogether unknown' in his *Musei Petiverani*, as I uncovered in Chapter 5. Petiver considered contrayerva, mechoacan and sarsaparilla as 'better known' but still requiring further study even though he often dispensed these drugs in his apothecary practice. In Chapter 1, I presented evidence that these drugs had been imported and used in England for more than one hundred years when Petiver advocated for the greater investigation of their medical properties. Perhaps most striking is that he desired a tobacco

plant to be collected for the purposes of scientific inquiry when it was an established commodity of leisure in England by this time.

How did the early modern English understand the healing virtues of New World medicinal plants? While American plants were unknown in classical sources, such as the treatises of Aristotle, Theophrastus, Galen and Dioscorides, or in the Bible, they were assigned properties in the traditional humoral framework. In Chapter 3, I explored how both Galenists and Chemists used New World drugs in their healing practices while mocking each other for not having a true knowledge of the medicinal virtues of these plants. This conflict was part of a wider debate about the appropriate preparation of medicine and its operation within the body. New World drugs were merely an example used to illustrate the arguments of competing medical practitioners, and these drugs became co-opted into their power struggles.

In Chapter 3, I conducted a unique longitudinal analysis of one hundred years of references to sassafras in English printed sources assessed the reception of this drug in different types of texts – medical, literary and travel accounts – and how this varied over time. Future research could employ this approach to compare the case study of sassafras with other New World drugs, with other exotic drugs, and with drugs that had a longer history in the English medical corpus. More broadly, this method could be utilised to analyse continuity and change in the conceptions of other commodities in early modern English print.

Rhetoric in books and promotional pamphlets often portrayed the American colonies as lands of new beginnings and opportunities. In Chapter 2, I identified an espoused potential to create a utopian society sustained by natural wonders, which could deliver economic prosperity and heal all hurts: spiritual, political and medical. Opposition to New World drugs came from those who worried about the high price of and limited access to exotic medicines, which made them difficult to obtain especially for the poor, as I discussed in the Introduction and Chapter 3. While some writers argued that only English herbs were suitable for English bodies, this argument referred to all exotic drugs not just those from the Americas. The contentious nature of New World drugs had little to do with their place of origin but was more of a reflection of their price and accessibility.

How does the reception of New World drugs in early modern England compare with other early modern European cases? In the Spanish case, centralised state institutions were primarily responsible for investigating naturalia in the Americas. Queen Isabella founded the Casa de

Contratación in 1503 to control trade and to monitor the scientific investigation of commodities from the New World. Under state direction, drug trials were performed, and natural histories were compiled on *naturalia* to inventory and catalogue Spain's imperial possessions. In the English case, state-led efforts were relatively modest. Throughout this thesis, I have explored how collective groups of merchants, colonists and projectors played the central role in developing knowledge of American flora. In this regard, the English experience more closely paralleled that of the Netherlands, where trade and commerce inspired the blossoming of scientific investigation.

To conclude, this thesis has offered a wide-ranging analysis of the reception of New World drugs in England's early empire. I investigated the transatlantic trade of new botanicals; the political and economic drivers of drug commodification; the treatment of American drugs in printed texts; philosophical investigations of New World drugs; and their use in retail and institutional medical practice. I evaluated a wide array of sources from quantitative analyses of prescription lists and customs records to close qualitative examinations of commonplace books and colonial reports. I discovered that American drugs were in regular, everyday use in medical treatment in England by the turn of the eighteenth century. The adoption of these drugs in early modern England was driven by political and commercial imperatives. Religious discourse was used as a propaganda tool that indirectly promoted the commodification and trade of New World drugs. The global circulation of these medicinal substances contributed to wealth and development of England's colonial empire, and how they were represented and perceived shifted with political boundaries and whether or not they should be experienced as foreign or naturalised.

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Appendix: Sassafras Texts Collection

Author	Title	Year
Monardes, Nicolás	Joyfull newes out of the newfound world wherein are declared the rare and singular vertues of diuers and sundrie herbs, trees, oyles, plants, [and] stones, with their applications, aswell to the vse of phisicke, as chirurgery: which being wel applied, bring such present remedy for all diseases, as may seeme altogether incredible: notwithstanding by practize found out, to be true. Also the portrature of the sayde herbes, very aptly described.	1577
Hariot, Thomas	A briefe and true report of the new found land of Virginia of the commodities and of the nature and manners of the naturall inhabitants. Discouered by the English colony there seated by Sir Richard Greinuile Knight in the eere 1585. Which remained under the gouernement of twelue monethes, at the speciall charge and direction of the Honourable Sir Walter Raleigh Knight lord Warden of the stanneries who therein hath beene fauoured and authorised by her Maiestie: and her letters patents.	1590
Du Laurens, André	A discourse of the preseruation of the sight: of melancholike diseases; of rheumes, and of old age.	1599
Hakluyt, Richard	The principal nauigations, voyages, traffiques and discoueries of the English nation made by sea or ouer-land, to the remote and farthest distant quarters of the earth, at any time within the compasse of these 1600 yeres: deuided into three severall volumes, according to the positions of the regions, whereunto they were directed.	1599
Brereton, John	A briefe and true relation of the discouerie of the north part of Virginia being a most pleasant, fruitfull and commodious soile: made this present yeere 1602, by Captaine Bartholomew Gosnold, Captaine Bartholowmew [sic] Gilbert, and diuers other gentlemen their associats, by the permission of the honourable knight, Sir Walter Ralegh, &c.	1602
Campion, Thomas	Obseruations in the art of English poesie ... Wherein it is demonstratiuely prooued, and by example confirmed, that the English to long will receiue eight seuerall kinds of numbers, proper to it selfe, which are all in this booke set forth, and were never before this time by any man attempted.	1602
Clowes, William	A right frutefull and approoued treatise, for the artificiall cure of that malady called in Latin Struma, and in English, the evill, cured by kinges and queenes of England Very necessary for all young practizers of chyrurgery.	1602
Jonson, Ben	Ben: Jonson his Volpone or The foxe.	1607
Johnson, Robert	Nova Britannia offering most excellent fruites by planting in Virginia: exciting all such as be well affected to further the same.	1609
Lescarbot, Marc	Noua Francia: or The description of that part of New France, which is one continent with Virginia Described in the three late voyages and plantation made by Monsieur de Monts, Monsieur du Pont-Graué, and Monsieur de Poutrincourt, into the countries called by the Frenchmen La Cadie, lying to the southwest of Cape Breton. Together with an excellent seuerall treatie of all the commodities of the said countries, and maners of the naturall inhabitants of the same.	1609

Crashaw, William	A sermon preached in London before the right honorable the Lord Lavvarre, Lord Gouernour and Captaine Generall of Virginea, and others of his Majesties Counsell for that kingdome, and the rest of the aduenturers in that plantation At the said Lord Generall his leaue taking of England his natiue countrey, and departure for Virginea, Febr. 21. 1609.	1610
Folkingham, W.	Feudigraphia The synopsis or epitome of surueying methodized. Anatomizing the whole corps of the facultie; viz. The materiall, mathematicall, mechanicall and legall parts, intimating all the incidents to fees and possessions, and whatsoeuer may be comprized vnder their matter, forme, proprietie, and valuation. Very pertinent to be perused of all those, whom the right, reuenewe, estimation, farming, occupation, manurance, subduing, preparing and imploying of arable, medow, pasture, and all other plots doe concerne. And no lesse remarkable for all under-takers in the plantation of Ireland or Virginia.	1610
Rich, Richard	Newes from Virginia The lost flocke triumphant. With the happy arrivall of that famous and worthy knight Sr. Thomas Gates: and the well reputed & valiant captaine Mr. Christopher Newporte, and others, into England. With the maner of their distresse in the Iland of Deuils (otherwise called Bermoothawes) where they remayned 42. weekes, & builded two pynaces, in which they returned into Virginia.	1610
Guillemeau, Jacques	Child-birth or, The happy deliuerie of women Wherein is set downe the gouernment of women. In the time of their breeding childe: of their trauaile, both naturall, and contrary to nature: and of their lying in. Together with the diseases, which happen to women in those times, and the meanes to helpe them. To which is added, a treatise of the diseases of infants, and young children: with the cure of them.	1612
Purchas, Samuel	Purchas his pilgrimage. Or Relations of the vvorld and the religions obserued in all ages and places discouered, from the Creation unto this present In foure partes. This first containeth a theologicall and geographicall historie of Asia, Africa, and America, with the ilands adjacent. Declaring the ancient religions before the Floud ... With briefe descriptions of the countries, nations, states, discoueries, private and publike customes, and the most remarkable rarities of nature, or humane industrie, in the same.	1613
Whitaker, Alexander	Good newes from Virginia Sent to the Counsell and Company of Virginia, resident in England. From Alexander Whitaker, the minister of Henrico in Virginia. Wherein also is a narration of the present state of that countrey, and our colonies there. Perused and published by direction from that Counsell. And a preface prefixed of some matters touching that plantation, very requisite to be made knowne.	1613
J. B. (John Bullokar)	An English expositor teaching the interpretation of the hardest words vsed in our language. With sundry explications, descriptions, and discourses.	1616
Jonson, Ben	The workes of Beniamin Jonson.	1616
J. T.	The hunting of the pox a pleasant discourse betweene the authour, and pild-garlicke: wherein is declared the nature of the dissease, how it came, and how it may bee cured.	1619
Counseil for Virginia	A declaration of the state of the colonie and affaires in Virginia with the names of the aduenturors, and summes aduentured in that action.	1620

Burton, Robert	The anatomy of melancholy what it is. With all the kindes, causes, symptomes, prognostickes, and seuerall cures of it. In three maine partitions with their seuerall sections, members, and subsections. Philosophically, medicinally, historically, opened and cut up.	1621
J. B. (John Bullokar)	An Englis[h] expositor[:] teaching the in[ter]pretation of the harde[st] words [vsed] in our language. With sundry [ex]plicat[ions, de]scriptions [, and d]iscourses.	1621
Venner, Tobias	A briefe and accurate treatise, concerning, the taking of the fume of tobacco vvhich very many, in these dayes, doe too too licentiously use. In which, the immoderate, irregular, and unseasonable vse thereof is reprehended, and the true nature and best manner of using it, perspicuously demonstrated.	1621
Bradford, William	A relation or journall of the beginning and proceedings of the English plantation setled at Plimoth in New England, by certaine English aduenturers both merchants and others with their difficult passage, their safe ariuall, their joyfull building of, and comfortable planting themselues in the now well defended towne of New Plimoth.	1622
Council for New England	A briefe relation of the discouery and plantation of New England and of sundry accidents therein occurring, from the yeere of our Lord M.DC.VII. to this present M.DC.XXII. Together with the state thereof as now it standeth; the generall forme of gouernment intended; and the diuision of the whole territorie into counties, baronries, &c.	1622
Bargrave, John	To the honourable, the Commons House of Parliament. The information of Iohn Bargraue esquire, shewing the seuerall abuses of the gouernment of the plantation in Virginia. against Sir Thomas Smith knight. Alderman Iohnson & alias.	1624
Gordon, Robert, Sir	Encouragements. For such as shall have intention to bee under-takers in the new plantation of Cape Briton, now New Galloway in America.	1625
Purchas, Samuel	Purchas his pilgrimes In fiue bookes. The first, contayning the voyages and peregrinations made by ancient kings, patriarkes, apostles, philosophers, and others, to and thorow the remoter parts of the knowne world: enquiries also of languages and religions, especially of the moderne diuersified professions of Christianitie. The second, a description of all the circum-nauigations of the globe. The third, nauigations and voyages of English-men, alongst the coasts of Africa ... The fourth, English voyages beyond the East Indies, to the ilands of Japan, China, Cauchinchina, the Philippinae with others ... The fifth, nauigations, voyages, traffiques, discoueries, of the English nation in the easterne parts of the world.	1625
Purchas, Samuel	Purchas his pilgrimage. Or Relations of the vvorld and the religions obserued in all ages and places discouered, from the Creation unto this present Contayning a theologicall and geographicall historie of Asia, Africa, and America, with the ilands adiacent. Declaring the ancient religions before the Floud ... The fourth edition, much enlarged with additions, and illustrated with mappes through the whole worke; and three whole treatises annexed, one of Russia and other northeasterne regions by Sr. Ierome Horsey; the second of the Gulfe of Bengala by Master William Methold; the third of the Saracenicall empire, translated out of Arabike by T. Erpenius.	1626

Council for New England	An historicall discoverie and relation of the English plantations, in New England Containing their aventurous passages, their happie arivall and comfortable planting, manifesting the goodnesse of God in their preservations from many apparent dangers. With a relation of such religious and ciuill lawes, and customs as are in practise amongst the indians, with their natures and habits. As also a naration of the ayre, earth, water, fish, and fowles of that countrie. continued from the first beginning, in the yeare of our Lord 1607.	1627
Bonham, Thomas	The chyrugians closet: or, an antidotarie chyrurgicall Furnished with varietie and choyce of: apophlegms, balmes, baths, caps, cataplasmes, causticks, cerots, clysters, collyries, decoctions, diets, and wound-drinks, desensatiues, dentifrices, electuaries, embrocations, epithemes, errhines, foments, fumes, gargarismes, iniections, liniments, lotions, oyles, pessaries, pils, playsters, potions, powders, quilts, suppositaries, synapismes, trochisces, vnguents, and waters.	1630
Massinger, Philip	The picture a tragaecomaedie: as it was often presented with good allowance, at the Globe, and Blackefriers play-houses, by the Kings Maiesties seruants.	1630
Fludd, Robert	Doctor Fludds answer unto Mr Foster or, The squeesing of Parson Fosters sponge, ordained by him for the wiping away of the weapon-salue Wherein the sponge-bearers immodest carriage and behauiour towards his bretheren is detected.	1631
Massinger, Philip	The Emperour of the East A tragae-comoedie. The scaene Constantinople. As it hath bene diuers times acted, at the Black-friers, and Globe play-houses, by the Kings Maiesties Servants.	1632
Gerard, John	The herball or Generall historie of plantes. Gathered by Iohn Gerarde of London Master in Chirurgerie very much enlarged and amended by Thomas Iohnson citizen and apothecarye of London.	1633
Hart, James	Klinike, or The diet of the diseased· Divided into three bookes. Wherein is set downe at length the whole matter and nature of diet for those in health, but especially for the sicke; the aire, and other elements; meat and drinke, with divers other things; various controversies concerning this subject are discussed: besides many pleasant practicall and historicall relations, both of the authours owne and other mens, &c. as by the argument of each booke, the contents of the chapters, and a large table, may easily appeare. Colellected as well out of the writings of ancient philosophers, Greeke, Latine, and Arabian, and other moderne writers; as out of divers other authours.	1633
White, Andrew	A relation of the successefull beginnings of the Lord Baltemore's plantation in Mary-land Being an extract of certaine letters written from thence, by some of the aduenturers, to their friends in England. To which is added, the conditions of plantation propounded by his Lordship for the second voyage intended this present yeere, 1634.	1634
Read, Alexander	The chirurgicall lectures of tumors and vlcers Delivered on Tusedayes appointed for these exercises, and keeping of their courts in the Chirurgeans Hall these three yeeres last past, viz. 1632, 1633, and 1634.	1635
D'Avenant, William, Sir	The witts A comedie, presented at the private house in Blacke Fryers, by his Majesties servants.	1636
Sadler, John	The sicke vvomans private looking-glasse wherein methodically are handled all uterine affects, or diseases arising from the wombe; enabling women to informe the physician about the cause of their griefe.	1636

Morton, Thomas	New English Canaan, or New Canaan containing an abstract of New England, composed in three bookes : the first booke setting forth the originall of the natives, their manners and customes, together with their tractable nature and love towards the English: the second booke setting forth the naturall indowments of the countrie, and what staple commodities it yeeldeth: the third booke setting forth what people are planted there, their prosperity, what remarkable accidents have happened since the first planting of it, together with their tenents, and practise of their church.	1637
Bacon, Francis	The historie of life and death With observations naturall and experimentall for the prolonging of life.	1638
Company of Distillers of London	The distiller of London Compiled and set forth by the speciall licence and command of the Kings most excellent Majesty: for the sole use of the Company of Distillers of London. And by them to bee duly observed and practized.	1639
Guybert, Philbert	The charitable physitian with the Charitable apothecary.	1639
Wood, Owen	An alphabetical book of physicall secrets for all those diseases that are most predominant and dangerous (curable by art) in the body of man. Collected for the benefit, most especially of house-holders in the country, who are either farre remote, or else not able to entertaine a learned physician: as likewise for the help of such ladies and gentlewomen, who of charity labour to doe good. Whereunto is annexed a small treatise of the judgement of vrines.	1639
Parkinson, John	Theatrum botanicum: The theater of plants. Or, An herball of a large extent containing therein a more ample and exact history and declaration of the physicall herbs and plants that are in other authours, encreased by the accesse of many hundreds of new, rare, and strange plants from all the parts of the world, with sundry gummes, and other physicall materials, than hath beene hitherto published by any before; and a most large demonstration of their natures and vertues. Shevving vvithall the many errors, differences, and oversights of sundry authors that have formerly written of them; and a certaine confidence, or most probable conjecture of the true and genuine herbes and plants. Distributed into sundry classes or tribes, for the more easie knowledge of the many herbes of one nature and property, with the chiefe notes of Dr. Lobel, Dr. Bonham, and others inserted therein.	1640
Evelyn, Robert	A direction for adventurers with small stock to get two for one, and good land freely and for gentlemen and all servants, labourers, and artificers to live plentifully: and the true description of the healthiest, pleasantest, and richest plantation of new Albion in North Virginia proved by thirteen witnesses.	1641
J. B. (John Bullokar)	An English expositor teaching the interpretation of the hardest words used in our language: with sundry explications, descriptions and discourses.	1641
Fabricius Hildanus, Wilhelm	Gulielm, Fabricius Hildamus, his experiments in chyrurgerie concerning combustions or burnings made with gun powder, iron shot, hot-water, lightning, or any other fiery matter whatsoever: in which is excellently described the differences, signs, prognostication and cures, of all accidents and burning themselves.	1642
Anonymous	A treatise of New England.	1645

Stevenson, Matthew	Occasions off-spring, or, Poems upon severall occasions.	1645
Cooke, James	Mellificium chirurgie, or, The marrow of many good authours wherein is briefly handled the art of chyrurgery in its foure parts, with all the severall diseases unto them belonging, their definitions, causes, signes, prognosticks, and cures, both generall and particular : as also an appendix wherein is methodically set down the cure of th[o]se affects usually happening at sea and in campe, with others necessary to be known, and lastly an addition of severall magistrall receipts approved and heretofore kept secret.	1648
Ferrar, John	A perfect description of Virginia: being, a full and true relation of the present state of the plantation, their health, peace, and plenty: the number of people, with their abundance of cattell, fowl, fish, &c. with severall sorts of rich and good commodities, which may there be had, either naturally, or by art and labour.	1648
Plantagenet, Beauchamp	A description of the province of New Albion and a direction for adventurers with small stock to get two for one, and good land freely, and for gentlemen, and all servants, labourers, and artificers to live plentifully: and a former description re-printed of the healthiest, pleasantest, and richest plantation of New Albion in north Virginia, proved by thirteen witnesses.	1648
Royal College of Physicians of London	A physicall directory, or, A translation of the London dispensatory made by the Colledge of Physicians in London.	1649
England and Wales	An Act for the redemption of captives.	1650
Ferrar, Virginia	The Wonderful and Admirable Vertue of the Sassafras-Tree in Virginia.	1650
Helmont, Jean Baptiste van	Deliramenta catarrhi: or, The incongruities, impossibilities, and absurdities couched under the vulgar opinion of defluxions.	1650
Williams, Edward	Virginia, more especially the south part thereof, richly and truly valued viz. the fertile Carolana, and no lesse excellent Isle of Roanoak, of latitude from 31 to 37 degr. relating the meanes of raysing infinite profits to the adventurers and planters.	1650
Williams, Edward	Virgo triumphans, or, Virginia in generall, but the south part therof in particular including the fertile Carolana, and the no lesse excellent island of Roanoak, richly and experimentally valued: humbly presented as the auspice of a beginning yeare, to the Parliament of England, and councell of state.	1650
Brugis, Thomas	Vade mecum or, a companion for a chyrurgion: fitted for times of peace or war. Compendiously shewing the yong artist the use of every severall instrument belonging to a chyrurgion; and the vertues and qualities of all such medicines as are needfull and necessary, with the maner of compounding them, according to the most approved authors. As also the perfect cure of green wounds, either incised or contused, ulcers, fistulaes, fractures, and dislocations. To which is added the maner of making reports before a judge of assize, of any one that hath come to an untimely end.	1651
Elkes, Richard	Approved medicines of little cost, to preserve health and also to cure those that are sick provided for the souldiers knap-sack and the country mans closet.	1651

Glauber, Johann Rudolf	A description of new philosophical furnaces, or A new art of distilling, divided into five parts. Whereunto is added a description of the tincture of gold, or the true aurum potabile; also, the first part of the mineral work. Set forth and published for the sakes of them that are studious of the truth.	1651
Glisson, Francis	A treatise of the rickets being a diseas common to children.	1651
Hartlib, Samuel	Samuel Hartlib his legacie: or An enlargement of the Discourse of husbandry used in Brabant and Flaunders; wherein are bequeathed to the Common-wealth of England more outlandish and domestick experiments and secrets in reference to universall husbandry. Entered according to the late Act concerning printing. Discours of husbandrie used in Brabant and Flanders. Discours of husbandrie used in Brabant and Flanders.	1651
L'Estrange, Hamon	Americans no Iewes, or improbabilities that the Americans are of that race.	1651
Read, Alexander	Most excellent and approved medicines & remedies for most diseases and maladies incident to man's body, lately compiled and extracted out of the originals of the most famous and best experienced physicians both in England and other countries.	1651
Record, Robert	The urinal of physick By Robert Record Doctor of physick. Whereunto is added an ingenious treatise concerning physicians, apothecaries, and chyrurgians, set forth by a Dr. in Queen Elizabeths dayes. With a translation of Papius Ahalsossa concerning apothecaries confecting their medicines; worthy perusing and following.	1651
Heylyn, Peter	Cosmographie in four bookes: containing the chorographie and historie of the whole vvorld, and all the principall kingdomes, provinces, seas and isles thereof.	1652
Howell, James	A Hermeticall banquet, drest by a spagiricall cook for the better preservation of the microcosme.	1652
Pemell, Robert	Tractatus de simplicium medicamentorum facultatibus. A treatise of the nature and qualities of such simples as are most frequently used in medicines, both purging, and others. Methodically handled, for the benefit of those that understand not the Latine tongue. To which is added: many compound medicines for most diseases incident to mankinde: as also two alphabeticall tables, very necessary for the reader. Together with, the explanation of all hard words or termes of art, whereby the vulgar may the better understand it.	1652
French, John	The art of distillation, or, A treatise of the choicest spagiricall preparations performed by way of distillation together with the description of the chiefest furnaces & vessels used by ancient and moderne chymists: also, A discourse of divers spagiricall experiments and curiosities, and the anatomy of gold and silver with the chiefest preparations and curiosities thereof, together with their vertues.	1653
Heyden, Hermann van der	Speedy help for rich and poor or, certain physicall discourses touching the vertue of whey, in the cure of the griping flux of the belly, and of the dysentery. Of cold water, in the cure of the gout, and green-wounds. Of wine-vineger, in the preservation from, and cure of the plague, and other pestilential diseases: as also in the prevention of the hydrophobia, or dread of water, caused by the biting of a mad dog.	1653

Royal College of Physicians of London	Pharmacopoeia Londinensis, or, The London dispensatory further adorned by the studies and collections of the Fellows, now living of the said colledg.	1653
Bayfield, Robert	Enchiridion medicum: containing the causes, signs, and cures of all those diseases, that do chiefly affect the body of man: divided into three books. With alphabetical tables of such matters as are therein contained. Whereunto is added a treatise, De facultatibus medicamentorum compositorum, & dosibus.	1655
Cooke, James	Supplementum chirurgiae or The supplement to the marrow of chyrurgerie. Wherein is contained fevers, simple and componnd [sic], pestilential, and not, rickets, small pox and measles, with their definitions, causes, signes, prognosticks, and cures, both general, and particular. As also the military chest, containing all necessary medicaments, fit for sea, or land-service, whether simples, or compounds, such as purge, and those that do not; with their several vertues, doses, note of goodness, &c as also instruments. Amongst which are many approved receipts for several diseases.	1655
Hartlib, Samuel	Samuel Hartlib, his legacy of husbandry wherein are bequeathed to the common-wealth of England, not onely Braband and Flanders, but also many more outlandish and domestick experiments and secrets (of Gabriel Plats and others) never heretofore divulged in reference to universal husbandry: with a table shewing the general contents or sections of the several augmentations and enriching enlargements in this third edition.	1655
Moffett, Thomas	Healths improvement: or, Rules comprizing and discovering the nature, method, and manner of preparing all sorts of food used in this nation	1655
N. N.	America: or An exact description of the West-Indies: more especially of those provinces which are under the dominion of the King of Spain.	1655
Philiatros	Natura exenterata: or Nature unbowelled by the most exquisite anatomizers of her. Wherein are contained, her choicest secrets digested into receipts, fitted for the cure of all sorts of infirmities, whether internal or external, acute or chronical, that are incident to the body of man.	1655
Rivière, Lazare	The practice of physick in seventeen several books wherein is plainly set forth the nature, cause, differences, and several sorts of signs : together with the cure of all diseases in the body of man.	1655
Woodall, John	The surgeons mate or Military & domestique surgery Discouering faithfully & plainly ye method and order of ye surgeons chest, ye uses of the instruments, the vertues and operations of ye medicines, with ye exact cures of wounds made by gunshott, and otherwise as namely: wounds, apos fumes, ulcers, fistula's, fractures, dislocations, with ye most easie & safest wayes of amputation or dismembring. The cures of the scuruey, of ye fluxes of ye belly, of ye collicke and iliaca passio, of tenasmus and exitus ani, and of the calenture, with A treatise of ye cure of ye plague. Published for the service of his Ma. tie and of the com:wealth.	1655
A. M.	Queen Elizabeths closset of physical secrets, with certain approved medicines taken out of a manuscript found at the dessolution of one of our English abbies and supplied with the child-bearers cabinet, and preservative against the plague and small pox. Collected by the elaborate paines of four famons physitians, and presented to Queen Elizabeths own hands.	1656

Bunworth, Richard	The doctresse: a plain and easie method, of curing those diseases which are peculiar to women. Whereunto are annexed physicall paradoxes, or a new discovery of the aeconomy of nature in mans body.	1656
Chamberlayne, Thomas	The compleat midwifes practice, in the most weighty and high concernments of the birth of man. Containing perfect rules for midwifes and nurses, as also for women in their conception, bearing, and nursing of children: from the experience not onely of our English, but also the most accomplisht and absolute practicers among the French, Spanish, Italian, and other nations.	1656
unknown	The skilful physician containing directions for the preservation of a healthful condition, and approved remedies for all diseases and infirmities (outward or inward) incident to the body of man ... whereunto is added experimented instructions for the compounding of perfumes, also for the chusing and ordering of all kinds of wines, both in preserving the sound, and rectifying those that are prick'd : never before imparted to publick view.	1656
Clarke, Samuel	A geographicall description of all the countries in the known vvorld as also of the greatest and famousest cities and fabricks which have been, or are now remaining : together with the greatest rivers, the strangest fountains, the various minerals, stones, trees ... which are to be found in every country : unto which is added, a description of the rarest beasts, fowls ... which are least known amongst us.	1657
Coles, William	Adam in Eden, or, Natures paradise the history of plants, fruits, herbs and flowers with their several names ... the places where they grow, their descriptions and kinds, their times of flourishing and decreasing as also their several signatures, anatomical appropriations and particular physical vertues together with necessary observations on the seasons of planting and gathering of our English simples with directions how to preserve them in their compositions or otherwise.	1657
Jonstonus, Joannes	An history of the constancy of nature wherein by comparing the latter age with the former, it is maintained that the world doth not decay universally in respect of it self, or the heavens, elements, mixt bodies, meteors, minerals, plants, animals, nor man in his age, stature, strength, or faculties of his minde, as relating to all arts and science.	1657
Jonstonus, Joannes	The idea of practical physick in twelve books.	1657
Morel, Pierre	The expert doctors dispensatory. The whole art of physick restored to practice. The apothecaries shop, and chyrurgions closet open'd; wherein all safe and honest practices are maintained, and dangerous mistakes discovered; and what out of subtilty for their own profits they have indeavoured to reserve to themselves, now at last impartially divulged and made common.	1657
Renou, Jean de	A medicinal dispensatory, containing the vvhole body of physick discovering the natures, properties, and vertues of vegetables, minerals, & animals: the manner of compounding medicaments, and the way to administer them. Methodically digested in five books of philosophical and pharmaceutical institutions; three books of physical materials galenical and chymical. Together with a most perfect and absolute pharmacopoea or apothecaries shop. Accommodated with three useful tables.	1657
Rivière, Lazare	The universal body of physick in five books; comprehending the several treatises of nature, of diseases and their causes, of symptomes, of the preservation of health, and of cures.	1657
Sadler, John	Enchiridion medicum: an enchiridion of the art of physick. Methodically prescribing remedies in such an order, that it may be	1657

	accounted to the sick-man a sanctuary, and to the studious a library: containing a salubrious remedy for every malady incident to the body of man.	
Collins, Thomas	Choice and rare experiments in physick and chirurgery, or, A discovery of most approved medicines for the curing of most diseases incident to the body of men, women, and of children together with an antidotary of experiments never before published.	1658
Phillips, Edward	The new world of English words, or, A general dictionary containing the interpretations of such hard words as are derived from other languages ... together with all those terms that relate to the arts and sciences ... : to which are added the significations of proper names, mythology, and poetical fictions, historical relations, geographical descriptions of most countries and cities of the world.	1658
Rattray, Sylvester	Aditus novus ad occultas sympathiae et antipathiae causas inveniendas per principia philosophiae naturalis, ex fermentorum artificiosâ anatomia hausta, patefactus.	1658
Sennert, Daniel	Nine books of physick and chirurgery written by that great and learned physitian, Dr Sennertus. The first five being his Institutions of the whole body of physick: the other four of fevers and agues: with their differences, signs, and cures.	1658
Sinibaldi, Giovanni Benedetto	Rare verities. The cabinet of Venus unlocked, and her secrets laid open. : Being a translation of part of Sinibaldus, his Geneanthropeia, and a collection of some things out of other Latin authors, never before in English.	1658
C. B.	A Short method of physick shewing the cure of fourty-five severall diseases which are the generall and most inclined to men and womens bodyes / collected out of severall authors and experienced beyond the seas and also in England.	1659
Fioravanti, Leonardo	An exact collection of the choicest and more rare experiments and secrets in physick and chyrurgery (both cymick and Galenick) viz. of Leonard Phioravant, Knight and doctour in physick and chyrurgery, his Rational secrets and chyrurgery &c. : whereunto is annexed Paracelsus's One hundred and fourteen experiments : with certain excellent works of G.B. `a ortu Aquitano ; also Isaac Holandus, his secrets concerning his vegetal and animal work : with Quercetanus his Spagyrick antidotary for gun-shot : also certain collections out of some manuscripts of Dr. Edwards and other physitians of note.	1659
Hartlib, Samuel	The compleat husband-man: or, A discourse of the whole art of husbandry; both forraign and domestick. Wherein many rare and most hidden secrets, and experiments are laid open to the view of all, for the enriching of these nations. Unto which is added A particular discourse of the naturall history and hubandry [sic] of Ireland.	1659
Lovell, Robert	Pambotanologia. Sive Enchiridion botanicum. Or A compleat herball containing the summe of what hath hitherto been published either by ancient or moderne authors both Galenicall and chymicall, touching trees, shrubs, plants, fruits, flowers, &c. In an alphabeticall order: wherein all that are not in the physick garden in Oxford are noted with asterisks. Shewing their place, time, names, kindes, temperature, vertues, use, dose, danger and antidotes. Together with an [brace] introduction to herbarisme, &c. appendix of exoticks. Universall index of plants: shewing what grow wild in England.	1659
Tanner, John	The hidden treasures of the art of physick; fully discovered: in four books.	1659

W. M.	The Queens closet opened incomparable secrets in physick, chyrurgery, preserving, and candying &c. which were presented unto the queen / by the most experienced persons of the times, many whereof were had in esteem when she pleased to descend to private recreations.	1659
Sennert, Daniel	Two treatises The first, of the venereal pocks: Wherein is shewed, I. The name and original of this disease. II. Histories thereof. III. The nature thereof. IV. Its causes. V. Its differences. VI. Several sorts of signs thereof. VII. Several waies of the cure thereof. VIII. How to cure such diseases, as are wont to accompany the whores pocks. The second treatise of the gout, 1. Of the nature of the gout. 2. Of the causes thereof. 3. Of the signs thereof. 4. Of the cure thereof. 5. Of the hip gout or sciatica. 6. The way to prevent the gout written in Latin and English.	1660
Blount, Thomas	Glossographia, or, A dictionary interpreting all such hard words of whatsoever language now used in our refined English tongue with etymologies, definitions and historical observations on the same : also the terms of divinity, law, physick, mathematicks and other arts and sciences explicated.	1661
Bunworth, Richard	A new discovery of the French disease and running of the reins their causes, signs, with plain and easie direction of perfect curing the same.	1662
Faber, Albert Otto	Alberti Ottonis Fabri medici regii exer. Suec. Paradoxon de morbo Gallico libr. II, or, A paradox concerning the shameful disease for a warning to all against deceitful cures.	1662
Le Fèvre, Nicaise	A compendious body of chymistry, which will serve as a guide and introduction both for understanding the authors which have treated of the theory of this science in general and for making the way plain and easie to perform, according to art and method, all operations, which teach the practise of this art, upon animals, vegetables, and minerals, without losing any of the essential vertues contained in them.	1662
Stubbe, Henry	The Indian nectar, or, A discourse concerning chocolata the nature of cacao-nut and the other ingredients of that composition is examined and stated according to the judgment and experience of the Indian and Spanish writers ... its effects as to its alimental and venereal quality as well as medicinal (especially in hypochondrial melancholy) are fully debated : together with a spagyrical analysis of the cacao-nut, performed by that excellent chymist Monsieur le Febure, chymist to His Majesty.	1662
Bayfield, Robert	Tes iatrikes kartos, or, A treatise de morborum capitis essentiis & pronosticis adorned with above three hundred choice and rare observations.	1663
Boyle, Robert	Some considerations touching the usefulnesse of experimental naturall philosophy propos'd in familiar discourses to a friend, by way of invitation to the study of it.	1663
Harvey, Gideon	Archelogia philosophica nova, or, New principles of philosophy containing philosophy in general, metaphysicks or ontology, dynamilogy or a discourse of power, religio philosophi or natural theology, physicks or natural philosophy.	1663
Head, Richard	Hic et ubique, or, The humors of Dublin a comedy, acted privately, with general applause.	1663
Sennert, Daniel	The Art of chirurgery explained in six parts part I. Of tumors, in forty six chapters, part II. Of ulcers, in nineteen chapters, part III. Of the skin, hair and nails, in two sections and nineteen chapters, part IV. Of wounds, in twenty four chapters, part V, Of fractures, in twenty two chapters, Part VI. Of luxations, in thirteen chapters : being the whole Fifth book of practical physick	1663

Southland, Thomas	Love a la mode a comedy.	1663
Drage, William	A physical nosonomy, or, A new and true description of the law of God (called nature) in the body of man confuting by many and undeniable experiences of many men, the rules and methods concerning sicknesses or changes in mans body, delivered by the ancient physicians and moderns that followed them.	1664
Helmont, Jean Baptiste van	Van Helmont's works containing his most excellent philosophy, physick, chirurgery, anatomy: wherein the philosophy of the schools is examined, their errors refuted, and the whole body of physick reformed and rectified: being a new rise and progresse of philosophy and medicine, for the cure of diseases, and lengthening of life.	1664
Le Fèvre, Nicaise	A discourse upon Sr Walter Rawleigh's great cordial.	1664
Philipot, Thomas	The original and growth of the Spanish monarchy united with the House of Austria extracted from those chronicles, annals, registers, and genealogies that yeild [sic] any faithful representation how the houses of Castile, Aragon and Burgundy became knit and combin'd.	1664
Platter, Felix	Platerus golden practice of physick fully and plainly discovering, I. All the kinds. II. The several causes of every disease. III. Their most proper cures, in respect to the kinds, and several causes, from whence they come. After a new, easie, and plain method; of knowing, foretelling, preventing, and curing, all diseases incident to the body of man. Full of proper observations and remedies: both of ancient and modern physitians. In three books, and five tomes, or parts. Being the fruits of one and thirty years travel: and fifty years practice of physick.	1664
Turner, Robert	Botanologia the Brittish physician, or, the nature and vertues of English plants, exactly describing such plants as grow naturally in our land, with their several names Greek, Latine, or English, natures, places where they grow ... : by means whereof people may gather their own physick under every hedge ... : with two exact tables, the one of the English and Latine names of the plants, the other of the diseases and names of each plant appropriated to the diseases, with their cures.	1664
Wilson, John	The cheats a comedy.	1664
Thomson, George	Galeno-pale, or, A chymical trial of the Galenists, that their dross in physick may be discovered with the grand abuses and disrepute they have brought upon the whole art of physick and chirurgery.	1665
Trigg, William and Eugenius Philanthropos	Dr. Trigg's secrets, arcana's & panacea's approved by his long admired experience and practice, whereby he wrought such wonderfull cures. With his most experienced secrets particularly appropriated to womens distempers. Now after his death to fulfill his request published as a legacy to his patients.	1665
Bunworth, Richard	A new discovery of the French disease and running of the reins their causes, signs, with plain and easie direction of perfect curing the same.	1666

de Rochefort, Charles	The history of the Caribby-islands, viz, Barbados, St Christophers, St Vincents, Martinico, Dominico, Barbouthos, Monserrat, Mevis, Antego, &c in all XXVIII in two books: the first containing the natural, the second, the moral history of those islands : illustrated with several pieces of sculpture representing the most considerable rarities therein described : with a Caribbian vocabulary.	1666
Sudell, Nicholas	Mulierum amicus: or, The womans friend plainly discovering all those diseases that are incident to that sex only, and advising them to cure, either 1. By those receipts prescribed. Or, 2. By certain secret arcanums and specifical medicines.	1666
Castle, George	The chymical Galenist a treatise, wherein the practise of the ancients is reconcild to the new discoveries in the theory of physick, shewing that many of their rules, methods, and medicins, are useful for.	1667
Croke, Charles	Fortune's uncertainty, or, Youth's unconstancy wherein is contained a true and impartial account of what hapned in the space of a few years to the author, whom you will know in this ensuing discourse by the name of Rodolphvs.	1667
Coelson, Lancelot	Philosophia maturata an exact piece of philosophy containing the practick and operative part thereof in gaining the philosophers stone: with the wayes how to make the mineral stone and the calcinations of mettals: whereunto is added a work compiled by St. Dunstan concerning the philosophers stone: and the experiments of Rumelius and preparations of Angelo Sala, all most famous chymists in their time.	1668
Maynwaringe, Everard	Medicus absolutus adespotos the compleat physitian, qualified and dignified: the rise and progress of physick, historically, chronologically, and philosophically illustrated: physitians of different sects and judgements, charactered and distinguished : the abuse of medicines, imposture of empericks, and illegal practisers detected : cautioning the diseased in the use of medicines, and informing them in the choice of a good physitian.	1668
Wilkins, John	An essay towards a real character, and a philosophical language.	1668
Digby, Kenelm, Sir	The closet of the eminently learned Sir Kenelme Digbie Kt. opened whereby is discovered several ways for making of metheglin, sider, cherry-wine, &c.: together with excellent directions for cookery, as also for preserving, conserving, candying, &c.	1669
Simpson, William	Hydrologia chymica, or, The chymical anatomy of the Scarbrough, and other spaws in York-Shire wherein are interspersed some animadversions upon Dr. Wittie's lately published treatise of the Scarbrough-spaw : also a short description of the spaws at Malton and Knarsbrough : and a discourse concerning the original of hot springs and other fountains : with the causes and cures of most of the stubbornest diseases ... : also a vindication of chymical physick ... : lastly is subjoyned an appendix of the original of springs.	1669
Anonymous	An Account of the causes of some particular rebellious distempers viz. the scurvey, cancers in women's breasts, &c. vapours, and melancholy, &c. weaknesses in women, &c. gout, fistula in ano, dropsy, agues, &c.: together with the vertues and uses of a select number of chymical medicines studiously prepar'd for their cure and adapted to the constitutions and temperaments of all ages and both sexes.	1670

Croll, Oswald	Bazilica chymica, & Praxis chymiatricae, or, Royal and practical chymistry in three treatises : wherein all those excellent medicines and chymical preparations are fully discovered, from whence all our modern chymists have drawn their choicest remedies : being a translation of Oswald Crollius, his Royal chymistry, augmented and inlarged by John Hartman : to which is added his Treatise of signatures of internal things, or, A true and lively anatomy of the greater and lesser world : as also, The practice of chymistry of John Hartman, M.D., augmented and inlarged by his son.	1670
Dyer, William	To the Kings most excellent Majesty. The humble petition of William Dyre.	1670
Harvey, Gideon	Little Venus unmask'd, or, A perfect discovery of the French pox comprising the opinions of most ancient and modern physicians, with the author's judgement and observations upon the rise, nature, subject, causes, kinds, signs, and prognosticks of the said disease: together, with several nice questions, and twelve different ways and methods of curing that disease, and the running of the reins.	1670
Merret, Christopher	A short view of the fravds, and abvses committed by apothecaries, as well in relation to patients, as physicians, and of the only remedy thereof by physicians making their own medicines.	1670
Ogilby, John	America : being the latest, and most accurate description of the new world containing the original of the inhabitants, and the remarkable voyages thither, the conquest of the vast empires of Mexico and Peru and other large provinces and territories : with the several European plantations in those parts : also their cities, fortresses, towns, temples, mountains, and rivers : their habits, customs, manners, and religions, their plants, beasts, birds, and serpents : with an appendix containing, besides several other considerable additions, a brief survey of what hath been discover'd of the unknown south-land and the arctick region.	1671
Sharp, Jane, Mrs.	THE MIDWIVES BOOK. Or the whole ART of MIDWIFRY DISCOVERED. Directing Childbearing Women how to behave themselvesIn their Conception, Breeding, Bearing, and Nursing of CHILDREN.	1671
Stubbe, Henry	A reply unto the letter written to Mr. Henry Stubbe in defense of The history of the Royal Society whereunto is added a Preface against Ecebolius Glanville, and an answer to the letter of Dr. Henry More, containing a reply to the untruthes he hath publish'd, and a censure of the cabbalo-pythagorical philosophy, by him promoted.	1671
Josselyn, John	New-Englands rarities discovered in birds, beasts, fishes, serpents, and plants of that country: together with the physical and chyrurgical remedies wherewith the natives constantly use to cure their distempers, wounds, and sores: also a perfect description of an Indian squa ... with a poem not improperly conferr'd upon her: lastly, a chronological table of the most remarkable passages in that country amongst the English.	1672
Talbor, Robert, Sir	Pyretologia, a rational account of the cause & cure of agues with their signes diagnostick & prognostick. Also some specifick medicines prescribed for the cure of all sorts of agues; with an account of a successful method of the authors for the cure of the most tedious and dangerous quartans. Likewise some observations of cures performed by the aforesaid method. Whereunto is added a short account of the cause and cure of feavers, and the griping in the guts, agreeable to nature's rules and method of healing.	1672
Wiseman, Richard	A treatise of wounds by Richard Wiseman.	1672

Anonymous	"An Accompt of Two Books" Philosophical Transactions 8, 5197-6006.	1673
Burnet, Thomas	Thesaurus medicinae practicae expraestantissimorum tum veterum tum recentiorum medicorum observationibus, consultationibus, consiliis & epistolis: summa diligentia collectus ordineq, alphabetico dispositus.	1673
A. B.	The sick-mans rare jewel wherein is discovered a speedy way how every man may recover lost health, and prolong life, how he may know what disease he hath, and how he himself may apply proper remedies to every disease, with the description, definition, signs and syptoms of those diseases. (Viz.) The scurvy, leues venerea, gonorrhea, dropsies, catarrhs, chollick, gouts, madness, frensies of all sorts, fever, jaundise, consumptions, ptisick, swoundings, histerick passions, pleurisies, cachexia's, worms, vapours, hypochondriack melancholly, stone, strangury, with the whole troop of diseases most afflicting the bodies of men, women and children; with a supply of suitable medicines; ... a piece profitable for every person and family, and all that travel by sea or land.	1674
Blagrave, Joseph	Blagrave's supplement or enlargement to Mr. Nich. Culpeppers English physitian containing a description of the form, names, place, time, coelestial government, and virtues, all such medicinal plants as grow in England, and are omitted in his book, called, The English-physitian, and supplying the additional virtues of such plants wherein he is defective : also the description, kinds, names, place, time, nature, planetary regiment, temperature, and physical virtues of all such trees, herbs, roots, flowers, fruits, excrescencies of plants, gums, ceres, and condensate juices, as are found in any part of the world, and brought to be sold in our druggist and apothecaries shops, with their dangers and corrections.	1674
Josselyn, John	An account of two voyages to New-England wherein you have the setting out of a ship, with the charges, the prices of all necessaries for furnishing a planter and his family at his first coming, a description of the countrey, natives, and creatures, with their merchantil and physical use, the government of the countrey as it is now possessed by the English, &c., a large chronological table of the most remarkable passages, from the first dicovering of the continent of America, to the year 1673	1674
Scultetus, Johannes	The Chyrurgeons store-house furnished with forty-three tables cut in brass, in which are all sorts of instruments ... useful to the performance of all manual operations ... together with a hundred choise observations of famous cures performed: with three indexes 1. of the instruments, 2. of cures performed, and 3. of things remarkable.	1674
Anonymous	Every woman her own midwife, or, A Compleat cabinet opened for child-bearing women furnished with directions to prevent miscarriages during the time of breeding, and other casualties which usually attend women in child-bed: to which is annexed cures for all sorts of diseases incident to the bodies of men, women and children.	1675
Digby, Kenelm, Sir	Choice and experimented receipts in physick and chirurgery as also cordial and distilled waters and spirits, perfumes, and other curiosities.	1675
Harvey, Gideon	The disease of London, or, A new discovery of the scorvey comprising the nature, manifold differences, various causes, signs, prognostics, chronology, and several methods of curing the said disease by remedies, galenical and chymical : together with anatomical observations, and discourses on convulsions, palsies, apoplexies, rheumatisms, gouts, malignant fevors, and small pox, with their methods of cure and remedies : likewise, particular observations on most of the fore-mentioned diseases.	1675

Le Boë, Frans de	Of childrens diseases given in a familiar style for weaker capacities. With an apparatus or introduction explaining the authors principles: as also a treatise of the rickets.	1675
Le Boë, Frans de	A new idea of the practice of physic written by that famous Franciscus De Le Boe ... the first book, of the diseases either constituting, producing, or following the natural functions of man not in health: wherein is containd ... a vindication of the spleen and mother.	1675
Thomson, George	Ortho-methodoz itro-chymike: or the direct method of curing chymically.	1675
Woolley, Hannah	The Accomplish'd lady's delight in preserving, physick, beautifying, and cookery.	1675
Blégny, Monsieur de	New and curious observations on the art of curing the veneral disease and the accidents that it produces in all its degrees explicatd by natural and mechanical principles with the motions, actions, and effects of mercury and its other remedies: wherein are discovered on the same subject the errours of some authors.	1676
Culpeper, Nicholas	Culpeper's Directory for midwives: or, A guide for women The second part. Discovering, 1. The diseases in the privities of women. 2. The diseases of the privy part. 3. The diseases of the womb. 4. The symptomes of the womb. 5. The symptomes in the terms. 6. The symptomes that befal all virgins and women in their womb, after they are ripe of age.7. The symptomes which are in conception. 8. The government of women with child. 9. The symptomes that happen in child-bearing. 10. The government of women in child-bed, and the diseases that come after travel. 11. The diseases of the breasts. 12. The symptomes of the breasts. 13. The diet and government of infants. 14. The diseases and symptomes in children.	1676
Glover, Richard	"An Account of Virginia, Its Scituation, Temperature, Productions, Inhabitants, and their Manner of Planting and Ordering Tobacco, etc. Communicated by Mr. Thomas Glover, An Ingenious Chirurgion that Hath Lived Some Years in That Country," Philosophical Transactions 11:623-636.	1676
Moellenbrock, Valentin Andreas	Cochlearia curiosa: or The curiosities of scurvygrass. Being an exact scrutiny and careful description of the nature and medicinal vertue of scurvygrass. In which is exhibited to publick use the most and best preparations of medicines, both Galenical and chymical; either for internal or external use, in which that plant, or any part thereof is imployed.	1676
Speed, John	An epitome of Mr. John Speed's theatre of the empire of Great Britain And of his prospect of the most famous parts of the world. In this new edition are added, the despciptions of His Majesties dominions abroad, viz. New England, New York, Carolina, Florida, Virginia, Maryland, Jamaica, Barbados, as also the empire of the great Mogol, with the rest of the East-Indies, the empire of Russia, with their respective descriptions.	1676
Wiseman, Richard	Severall chirurgicall treatises.	1676

Coles, Elisha	An English dictionary explaining the difficult terms that are used in divinity, husbandry, physick, phylosophy, law, navigation, mathematicks, and other arts and sciences , containing many thousands of hard words, and proper names of places, more than are in any other English dictionary or expositor : together with the etymological derivation of them from their proper fountains, whether Hebrew, Greek, Latin, French, or any other language : in a method more comprehensive than any that is extant.	1677
Glaser, Christophe	The compleat chymist, or, A new treatise of chymistry teaching by a short and easy method all its most necessary preparations.	1677
J. S.	A short compendium of chirurgery containing its grounds & principles : more particularly treating of imposthumes, wounds, ulcers, fractures & dislocations : also a discourse of the generation and birth of man, very necessary to be understood by all midwives and child-bearing women : with the several methods of curing the French pox, the cure of baldness, inflammation of the eyes, and toothach, and an account of blood-letting, cup-setting, and blooding with leeches.	1678
Browne, John	A compleat discourse of wounds, both in general and particular whereunto are added the severall fractures of the skull, with their variety of figures: as also a treatise of gunshot-wounds in general, collected and reduced into a new method.	1678
Browne, John	A compleat treatise of preternatural tumours both general and particular as they appear in the human body from head to foot: to which also are added many excellent and modern historical observations concluding most chapters in the whole discourse.	1678
Charas, Moyse	The royal pharmacopoeea, galenical and chymical according to the practice of the most eminent and learned physitians of France: and publish'd with their several approbations.	1678
Harvey, Gideon	The family-physician, and the house-apothecary containing I. Medicines against all such diseases people usually advise with apothecaries to be cured of, II. Instructions, whereby to prepare at your own houses all kinds of necessary medicines that are prepared by apothecaries, or prescribed by physicians, III. The exact prices of all drugs, herbs, seeds, simple and compound medicines, as they are sold at the druggists, or may be sold by the apothecaries, IV. That it's plainly made to appear, that in preparing medicines thus at your own houses, that it's not onely a far safer way, but you shall also save nineteen shillings in twenty, comparing it with the extravagant rates of many apothecaries.	1678
Harvey, Gideon	Casus medico-chirurgicus, or, A most memorable case, of a noble-man deceased wherein is shewed His Lordship's wound, the various diseases survening, how his physicians and surgeons treated him, how treated by the author after my Lord was given over by all his physicians, with all their opinions and remedies : moreover, the art of curing the most dangerous of wounds, by the first intention, with the description of the remedies.	1678
Bacon, Francis	Baconiana, or, Certain genuine remains of Sr. Francis Bacon, Baron of Verulam, and Viscount of St. Albans in arguments civil and moral, natural, medical, theological, and bibliographical.	1679
Hall, John	Select observations on English bodies of eminent persons in desperate diseases.	1679
Jones, William	Work for a cooper being an answer to a libel, written by Thomas Wynne the cooper, the ale-man, the quack, and the speaking-Quaker: with a brief account how that dissembling people differ at this day from what at first they were.	1679

Maynwaringe, Everard	The frequent, but unsuspected progress of pains, inflammations, tumors, apostems, ulcers, cancers, gangrenes, and mortifications internal therein shewing the secret causes and course of many lingering and acute mortal diseases, rarely discerned: with a tract of fontanels or issues and setons.	1679
Willis, Thomas	Pharmaceutice rationalis: or, An exercitation of the operations of medicines in humane bodies. Shewing the signs, causes, and cures of most distempers incident thereunto. : In two parts. : As also a treatise of the scurvy and the several sorts thereof, with their symptoms, causes, and cure.	1679
Lomax, Nathaniel	Delaun reviv'd, vix. A plain and short discourse of that famous doctor's pills, their use and virtues With choice receipts for the cure of the scurvy, dropsy, jaundies, venereal and other diseases. Before I speak to this famous medicine, I will declare who Delaun was; then, the price of his pill and how to take it, and of its several virtues in order, in such plain words, as to the weakest capacity may understand: and I intreat those who hope for help hereby, would throughly read this short book, and observe my directions for their own good and the authors's credit.	1680
unknown	THE Royal Charter OF Confirmation Granted by KING Charles II. To the CITY of LONDON.	1680