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"Climate and Curiosity: Human and Nonhuman in the Little Ice Age"

Part 1. The marvelous strange

"This Corne is a marueilous strange plante," Henry Lyte observes in his *Niewe Herball, or historie of plantes* (1578), the first English treatment of the new world crop, maize.[1] Lyte's apparent excitement about the novelty of this commodity, however, is equivocal. Lyte's work is a faithful translation of Rembert Dodoens's *Cruydeboek* (1554), which twenty-five years earlier had included a discussion of maize and its characteristics.[2] Following his source, Lyte calls the plant "Turkie Corne, or Indian Wheat," reflecting the long-held belief that the crop originated in Turkey: "This grayne groweth in Turkie," he claims, "wheras it is vsed in the time of dearth."[3] Maize's curiosity, as Lyte states, lies in its flowering: "nothing resembling any other kinde of grayne: for it bringeth foorth his seede cleane contrarie from the place where as the flowers growe, which is agaynst the nature and kindes of all other plantes."[4] Yet, despite the marvel of this plant that grows against nature, or perhaps because of its unnatural properties, Lyte can find no medicinal use to which it can be put—"There is as yet no certaine experience of the natural vertues of this corne," he admits—and he dimisses its use as food for human consumption. "The bread that is made thereof," he reports, "is drie and harde, hauing very small fatnesse or moysture, wherefore men may easily iudge, that it nourisheth but litle, and is euill of digestion, nothing comparable to the bread made of wheate, as some haue falsly affirmed."[5] If Lyte's exposition of maize appears to be more textual than empirical, he may nonetheless have been familiar with the plant. Maize was known in England by 1562, yet it was not cultivated for human consumption for another two centuries, despite the famine, dearth,

and food shortages that attended the Little Ice Age (LIA).[6] The strangeness that enveloped its reception by the elites—that is, the authors of the botanicals and their readers—works to dismiss the cultivation of maize as a means to alleviate food shortages particularly effecting the poor.

The elite management of maize, in texts and in practice, offers a case study of the ideology undergirding a hierarchy of want and plenty as cultures and classes negotiated the challenges of the LIA. It is a discourse in which the agencies of the human, nonhuman, and more than human are explicit. With other new world plants, maize was subject to extended commentary in European and English herbals, which catalogued and attempted to acclimatize new world plants within old world taxonomies, and in voyagers' accounts of the customs, diet, and climate of the Indigenous people of the Americas. As Amy Tigner points out, this categorizing "was symbolic of how England began to think of itself as a colonial power."[7] As Indigineous American resources and medicinal technologies made their ways into European recipes and early modern kitchens—their reception marked, as Edith Snook has shown, by subsumption and erasure of Indigenous origins and practices—in botanical literature, perceptions of maize and the Indigenous people for whom it was a staple crop were skeptical, disapproving, and uniformly resistant.[8]

This article traces the biases, grounded in race and class, attending the importation of maize into England and its exploitation in New England colonies. Although more critical attention has been given to Europe's impact on the Americas, the acceleration of transatlantic commerce imported a diverse body of new world plants, animals and people into Europe: neobiota which enabled new adaptive and transformative strategies attending Europe's extraction and deployment of new world resources.[9] The literatures surveyed here—English herbals and accounts of settler colonialism—register and promote the transatlantic enterprise that mingled ecosystems, introducing into Europe strange commodities whose strangeness unsettled established notions of the human, nonhuman, and more than human: as Lorraine Daston and Katharine Park state, "bedrock assumptions were shaken and the intensity of wonder was correspondingly seismic."[10]This article argues that "curiosity"—as a mode of thought and as a descriptor aligning goods to a deserving, discriminating class—was deployed to manage the human and nonhuman entities of the LIA, benefiting the elite by providing them with adaptive and transformative strategies and resources. Conversely, this notion deprived less advantaged cultural sectors of the means and resources needed to confront and survive the weather extremes of the LIA and the hazards to life and health associated with them.

In Part 2 of this article, I begin by exploring the reception of maize into England, where its branding as alien matter and its appeal to elite curiosity delayed for centuries its cultivation as a source of sustenance, depriving particularly the poor of the affordances of this response to the food insecurities of the LIA. Part 3 turns to the equally complex colonial engagement with maize and its Indigenous consumers in New England. As Kathryn Yusoff points out, in "the 1610 natal moment" of the Anthropocene, the genocide and dispossession of Indigenous

populations are entangled with the "mixing of previously separate biotas…in new ecological formations and plantation ecologies of the Americas."[11] In this mix, "Indian Corn" measures the uncertainty surrounding Engish encounters with North American plants and people. Subject to the weather extremes of the LIA, English colonists depended upon the availability of maize for their survival. Yet, the consumption of maize, in the old world and the new, troubled the foundational, humoral grounding of English definitions of the human. Finally, Part 4 situates the English experience of maize in the local parish of London's St. Saviour's—now Southwark Cathedral—where Nicholas Stone's monument for William Austin embodies the urbanization of agricultural products in the shift from subsistence farming to market exchange, which kept farmers as well as "the ruling elites, alive."[12] At the same time, the monument sublimates the English resistance to maize in the spiritual metaphors governing Austin's iconographic and poetic program.

Throughout, my discussion is informed by an understanding of anthropogenic climate change, arising from European commercial and colonial enterprises, as contributing to global cooling in the LIA.[13] With the arrival of European colonizers in the Americas, disease, warfare, famine, and enslavement eradicated 90 per cent of the Indigenous population.[14] The abandonment of fire for forest management resulted in the return of plant life and reforestation "of enough cleared land in the Americas that the resulting terrestrial carbon uptake had a detectable impact on both atmospheric CO_2 and global surface air temperatures in the two centuries prior to the Industrial Revolution."[15] As "ecological globalization" advanced, it exacerbated vulnerabilities to weather extremes on both sides of the Atlantic, contributing to the coldest century of the LIA.[16] Consideration of this contributing factor to the LIA is particularly enlightening since its man-made origins and effects register and unfold the cultural and climatic "imaginaries" that worked to situate the European, (male) human as a primary agent in and beneficiary of the global management and movement of nonhuman commodities.[17]

Maize is but one of the many neobiota that entered Europe during the Columbian Exchange, importations that collectively "allowed more people to live off the land. These newly available plants and animals," Simon Lewis and Mark Maslin claim, "led to the single largest improvement in farm productivity since the original agricultural revolution."[18] Yet these benefits were disproportionate and uneven across classes. "While many Europeans lived on a comfortable margin," as Sam White notes, "many barely subsisted at all… the poor suffered more and died sooner than the better-off."[19] The curiosity of new world importations, both animal and vegetable, is one means by which those "on a comfortable margin" defined their right to some commodities while denying them to others and, in doing so, defined themselves as uniquely human.

Part 2. Two nations

The hierarchy of classes in relation to the land and its products carries with it the history of agricultural changes wrought by the Columbian Exchange. Along with the diversification of

planting and increased yields, "subsistence farming" was replaced by a sytem in which wealthy landowners profited from the productivity of tenant farmers.[20] As crops went toward tithes or to the market, tenants were forced into competition for access to land, and were vulnerable to having little or nothing left to live on, particularly in times of dearth. While the weather extremes visited by the LIA threatened the poor, the harnessing of commodities through land ownership ensured the survival of the wealthy. The treatment of maize by botanical writers registers this climatic and cultural shift.

Two primary assumptions defining and surrounding maize are persistently present in early modern herbals. The first is that the grain that bound together Europe as an extended Christian body, despite doctrinal disputes, was wheat, the grain from which the Communion bread was made and thus functioned as a marker of European identity. The valuation of wheat made other grains, such as maize, inferior if not repellent.[21] The second, related assumption was that maize, as food consumed by non-Christian, alien populations, was tainted by barbarous associations that made it both unpalatable and inappropriate for consumption by Europeans. The belief in the porosity of the early modern humoral body, vulnerable to foreign climates and diets, resulted in a reluctance to include maize in the English diet.[22]

Maize was one of the first imports from the new world to enter Europe: Columbus's account of his third voyage in 1498 describes the crop, and the 1525 edition of Oviedo's *Historia general y natural de las Indias* reports that maize from the West Indies was being grown in Madrid.[23] Indeed, along with five correlated global changes, Lewis and Maslin make use of maize pollen deposits "in the European marine sediment off the coast of Italy" to locate the "Orbis Spike" that sets the conditions for the Anthropocene era.[24] While regional cultivation of maize occurred in continental Europe, it was not cultivated as fodder or for human consumption in England, despite its first appearance in the mid-sixteenth century.[25]



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Figure 1. John Gerard, "Frumentum Turcicum," from *The Herball or Generall Historie of Plantes* (London: John Norton, 1597), 76. Creative Commons: CC-PD-mark/PD-old-70-expired.

Among new world transplants, maize in particular had the potential to ameliorate the food insecurities that beset especially the poor in the sixteenth century and after. As Alfred W. Crosby put it:

[M]aize will produce good crops in an extreme variety of climates. Its advantages over equivalent Old World plants is that it will prosper in areas too dry for rice and too wet for wheat […] Its supremely valuable characteristic is its high yield per unit of land which, on average, is roughly double that of wheat [and] has the additional benefit of producing food fast. Few other plants produce so much carbohydrate, sugar, and fat in as short a growing season.[26]

Although not entirely unaware of these characteristics, Lyte's *Niewe herbal* displays the attitudes toward the crop that mitigated its cultivation in England. Itself a translation of Dodoens's mid-century herbal, Lyte's work was in turn translated in 1597 by John Gerard in his *Herball or Generall Historie of Plantes*.[27] Gerard agrees entirely with Lyte's assessment of maize as an inferior and useless grain, but he benefits from increased knowledge about the crop derived from English and European voyages to the Americas, as well as his first-hand experience of growing it in his garden in Holborn.[28] His improved understanding of the plant, and that of his peers, can be traced from Gerard's first publication to a revision published after his death in 1633, "Very much Enlarged and Amended by Thomas Johnson, Citizen and Apothecarye of London."[29] While Lyte is only able to assert that although there are "many sortes" of maize, just one is "in fashion and growing" in England, Gerard identifies and illustrates six varieties (Figure 1), affirming, "the graine is of sundrie colours, sometimes red, and sometimes white, and yellow, as my selfe haue seene in myne owne garden, where it hath come to ripenesse."[30] Gerard's first edition shows his fuller understanding of the development of transatlantic trade when he adds to the Turkish provenance of the grain: "America and the Islands adioyning from the east and west Indies, and Virginia or Norembega, where they vse to sow or set it, and to make bread of it."[31] In the 1633 edition, Johnson's emendations of this passage are subtle but significant: maize was brought into Europe "*not* (as some suppose) out of Asia minor, which is the Turks Dominions; *but* out of America and the Islands adioyning, as out of Florida and Virginia, or Norembega" (my italics).[32] Accordingly, the names of the grain change to reflect its likely origin: in 1597, Gerard states simply, "In English it is called Turky corne and Turky wheate: The inhabitants of America and the Islands adioning, as also the east and west Indies, do call it *Mazium*, and *Maizum*, and *Mais*."[33] By 1633, while the allusion to Turkey lingers in the plant's name, Johnson asserts its novelty: "Turky wheat is called of some *Frumentum Turcicum*, and *Milium Indicum*, as also, *Maizium* and *Maiz*, or *Mays*. It in all probabilitie was vnknowne to the antient both Greeke and Latine Authors." With the benefit of accounts of the English settlements of

Jamestown and Plymouth, he is able to add: "The Inhabitants of America and the Islands adioyning, as also of the East and West Indies, do call it *Mais:* the Virginians, *Pagatowr."*[34]

The assumed origin of maize in Turkey associates the grain with the Muslim world, and thus with Europe's demonized Other. The unified front with which Europe approached this heathenish import is reflected in its translational dexterity: "They do nowe call this grayne Frumentum Turcicum," Lyte writes, "and Frume[n]tum Asiaticum: in Frenche Blé de Turquie, or Blé Sarrazin: in high Douche Turkie Korn: in base Almaigne Torckschcoren: in Englishe Turkish Corne, or Indian wheate."[35] Although the American origins of maize were suggested as early as 1571, it would be another seven decades before John Parkinson's *Theatrum Botanicum* (1640) definitively asserts the crop's origins in the Americas—yet the personification of Asia on his title page shows her with a representative ear of maize.[36] As the possibilities of an American origin increasingly enter into the debate, writers conflate Turks with the Indigenous people of the Americas as unchristian, non-European—possibly nonhuman—purveyors of this suspect plant. Gerard concludes, in a passage unedited by Johnson:

We haue as yet no certaine proofe or experience concerning the vertues of this kinde of Corne; although the barbarous Indians, which know no better, are constrained to make a vertue of necessitie, and thinke it a good food: whereas we may easily iudge, that it nourisheth but little, and is of hard and euill digestion, a more conuenient food for swine than for men.[37]

European explorers and settlers in America were acutely aware of the influences of diet and climate on humoral, porous bodies, both their own and those of the Indigenous people they encountered.[38] Despite Spanish cultivation of maize in South America and the West Indies—José de Acosta's *Historia Natural y Moral de las Indias* (1590) reports that "The Spanyards and the Indians eate this Mays boyled and roasted for daintinesse"—the grain was nonetheless associated with native bestiality and, like cannibalism, suggested the marginal humanity of those who consumed it.[39] Yet, although the belief in humoralism guided understandings of the human body, the American experience increasingly introduced moral and racial promiscuities that complicated global divisions based on Hippocratic humors or religious advantage.[40]Central to the cause of affirming European identity was the comparison between maize and wheat. At the same time that maize was denigrated, wheat, the preferred grain throughout Europe, "was imbued with sacred significance."[41]Catholics maintained that wheat bread and wine were the substances that became the body and blood of Christ in Holy Eucharist; maize was incapable of transubstantiation.[42] Spanish settlers, as Earle describes, were at pains to provide adequate supplies of wheat bread and wine to America to sustain the religious ritual and to ensure their continued health, which they feared would be compromised by the American diet and climate.[43] Protestant colonists and explorers faced a less critical doctrinal dilemma, since bread and wine were symbolic rather than essential to Communion: thus Calvinist minister Jean de Léry records in his *Histoire d'un voyage faict en la terre du Bresil* (1578) that settlers agreed "celebrer la Cène auec les choses plus communes qui seroyent

au lieu de pain & de vin pour la nourriture des hommes du pais ou il seroyent" ("to celebrate the Lord's Supper with the commonest things that took the place of bread and wine in the land where they were").[44]

Uncertain about the effects of maize on their humoral bodies and dispositions—despite having been saved from starvation during the brutal winters of the LIA by "Indian Corn"—English colonists in Plymouth planted their first crop of maize in 1621 and at the same time attempted to grow "English Graine with little success."[45] Positive comments about maize, though few, are issued from the Virginian colony, where colonists were "constrained to make a vertue of necessitie," as Gerard puts it, but nonetheless achieved "two harvests" by rotation of English grains and maize.[46] Edward Waterhouse reports that in Virginia, "the Graine also of our owne Country [is] prospering there very well; but their Maize (being the naturall Graine of VIRGINIA) doth farre exceed in pleasantnesse, strength, fertilitie, and generalitie of vse, the Wheat of *England*."[47] In *An Advice How to Plant Tobacco in England* (1615), the author tells us, "The people of the South-parts of Virginia [say] that God in the creation did first make a woman, then a man, thirdly great maize, or Indian wheat, and fourthly, Tobacco."[48]

The transatlantic rivalry between staple crops implies a cultural relativism that troubled European definitions of the human and the Eurocentrism on which traditional beliefs were grounded. Acosta observes, "to this continent [God] hath given wheate, which is the chiefe nourishment of man; and to the Indians he hath given Mays." His judgment of maize as inferior to wheat is based on pragmatic rather than religious grounds: maize "hath the second place to wheate, for the nourishment of men and beasts."[49] Gerard's *Herball* (1633) likewise embodies the cultural superiority of "English Graine" on the title page: Ceres grasps a generous bundle of wheat in her arms, while behind her back an ear of corn insinuates. An obelisk standing beside it once again recalls the myth of an Asian origin (Figure 2).


THE
HERBALL
OR GENERALL
Historie of
Plantes.
London Printed by

Figure 2. Title page from John Gerard, *The Herball or Generall Historie of Plantes*, expanded by Thomas Johnson (London: Adam Islip, Joice Norton and Richard Whitakers, 1633). Creative Commons: CC-PD-Mark/Author died more than 100 years ago public domain image

A winter crop, wheat was extremely vulnerable to the hard winters of the LIA, and the long period of growth between sowing and harvesting left it vulnerable to erratic weather. Despite the growing diversity of crop cultivation, including barley, beans, and rye beans as grain, and turnips and clover as fodder, England was overly-dependent on wheat both as a source of sustenance and as a product for market and export.[50] The recurring famines of the LIA—affecting various regions of England in 1555–1557, 1594–1597, 1622–1623, 1648–1652, 1690, and 1728—coincided with episodes of weather extremes, including harsh winters, wet summers, drought, and violent storms occurring with increasing frequency in the seventeenth century, occasionally bringing tidal surges inland and contaminating soil and standing harvests.[51]The benefits of maize include a shorter growing season, allowing for rotation with wheat and fodder crops, and having far greater yields and higher nutritional value than traditional grains. These were not realized in England. In Iberia, where widescale maize cultivation was similarly delayed until the eighteenth century, Álvaro Aragón-Ruano has documented the economic and health benefits of maize for farmers and rural communities in the Cantabrian region from the late sixteenth century onward.[52] "The agrarian circumstances of the period between the 1590s and the 1730s," responding to "various subsistence and demographic crises," lead him to conclude that "that a society suffering from serious difficulties is one more adapted to change, more able to become adapted to new productive conditions than one more fortunately placed."[53] While societies slowly were adapting, maize itself was an evolving partner in its diffusion across Europe: this spread, "accompanied by an extreme diversification, and adaptation to the long days and low temperatures of temperate climates has been a key step in maize evolution."[54] Yet maize was not uniformly the solution to Europe's food insecurity: in southwest France, where it was cultivated for consumption as early as 1630, 95 percent of the wheat harvest was exported, leaving only maize for private use. When that crop failed, famine ensued. Rather than solving the subsistence crisis, Appleby concludes, diversified cultivation such as this, driven by the market value of wheat rather than corn, actually increased vulnerability to famine and ill-health among some rural communities.[55]

In England, climate was less of an impediment to the diffusion of maize than attitudes toward the grain. This is especially true since the type of corn described and grown by Gerard and other English herbalists is "Northern Flint," which was "widespread in eastern North America in pre-Columbian times," and which had become the staple crop of North American settlers by 1620.[56] Yet the perceived lack of medicinal or nutritional value in maize, and its denigration as food for Turks and "barbarous Indians," made it unfit for human consumption. Gerard's comment that maize is better suited as food for swine than men seems less a serious promotion of the crop's potential as fodder than a rhetorical gesture casting its human consumers as bestial. Similarly, Lyte's claim that the Turks use maize "in the time of dearth" is not a

recommendation but a curse. Moreover, any attempt to map the views of the herbalists onto actual agrarian practice is vexed by the elite character of the herbals and of their audiences. Lyte's description of maize as "in fashion" in England, and Gerard's experience of maize grown "in myne own garden" associate maize with novelties and curiosities, an association that limited its planting in England to gardens, and particularly to gardens maintained by the gentry and nobility.

As such, written accounts of the cultivation of maize across Europe almost exclusively refer to its planting in private gardens. When the German herbalist Leonhart Fuchs's *Historia Stirpium* (1542) discusses the arrival of maize in Germany, he reports it "growing in all gardens."[57] The "trend of gardens containing ornamentals and novelties" was international, and maize was "cultivated by physicians and botanists in gardens in Italy, France, Germany and Holland," as well as England.[58] The connection between gardens and *wunderkammern*, as "repositories of the exotic and the curious," is embodied in the activities of John Tradescant and his sons in their garden and cabinet (called "the Ark") in South Lambeth.[59] In 1656, a catalogue of the Ark and its garden lists forty varieties of native American plants, while on display in the cabinet were "Frutus exotici" (Exotic Fruits), many from America. An assortment of relics from North American tribes were also on show, the prize possession being "Pohatan, King of Virginia's habit all embroidered with shells, or Roanoke."[60]

In the gardens of the herbalists and their disciples, plants "Native and Exotick" dwell together—firmly behind the garden wall.[61] This enclosure of maize in private gardens propagates a hierarchy of human engagement with climate, in which new world resources are withheld or dispensed by and for the privileged class, at the expense of the rural and urban poor who are left vulnerable to hostile conditions. This pattern of appropriation applies to a wide variety of new world transplants, among them beans, peppers, potatoes, tomatoes, pumpkins, sweet potatoes, fruits including papayas, pineapples, mulberries, and cranberries, and of course the "drug foods," sugar, tobacco, chocolate, and coffee.[62] The availability of this variety of foods was key to adaptive and transformative practices among the upper classes, well-armed by a diversified diet to withstand the assaults of the LIA. If this diet included maize at all, it would have been merely an occasional curiosity, as Gerard's and Lyte's experiences suggest.

Yet elite works published for an elite audience can tell us little about adaptive practices among the less privileged. John Evelyn's *Kalendarium Hortense* (1666) offers a monthly guide to planting in the garden (which includes beans and potatoes, but not maize), adding instructions for protecting "more *tender, rare, exotic, and costly Shrubs, Plants and Flowers*" from freezing in winter.[63] Evelyn's garden is a private, urban one, and works such as his expose two nations of cultivation, one catering to the refined tastes of the capital, the other a matter of subsistence for the rural poor. As a growing imperial power, England "encompassed diverse environments and peoples," and since "the LIA was spatially heterogeneous, weather that hampered the regional production of resources did not necessarily reduce the supply of resources available to imperial centres."[64] Indeed, the incorporation of exotic botanical and horticultural species

into English gardens was deeply imbricated in the colonial project and "emblematic of the English conception of possessing the expanding world."[65] The arrival of Europeans in America precipitated "the world's first global circuits of trade," including "Triangle trading" which exchanged commodities for slaves.[66] Tigner speaks of England's "horti-colonial endeavor" to point out that the transplantation of horticultural species proceeded via the established routes of the slave trade.[67] We should not be surprised to learn that John Gerard, in his discussion of sugar cane, tells readers of *The Herball* that he learned "the ordering of these reeds when they be newly gathered […] from the mouth of an Indian my seruant."[68]

There was clearly a commercial aspect of this adaptive and compensatory program, although catering to a privileged clientele. Philip Miller's *Catalogus Plantarum* (1730) describes its contents as "A Catalogue of Trees, Shrubs, Plants, and Flowers both Exotic and Domestic which are propagated for Sale in the Gardens Near London."[69] He provides a who's who of horticultural sociability, naming those "Persons, Nobility and Gentry," who "have industriously procured from abroad, Trees, Plants, Flowers and Fruits, not only from our own Plantations in America, but those also of other Parts of Europe, nay, even Asia and Africa."[70] Miller's topography of notable gardens includes that of Henry Compton, Bishop of London, in Fulham; Mary Somerset, Duchess of Beaufort in Chelsea, and William Herbert, Earl of Pembroke at Wilton.[71] The frontispiece of the work depicts a highly cultivated garden with a caption that describes the urban garden as "Exigus spatio, rariis sed fertilis herbis" (A small space, with rare but fertile herbs): a space for an equally rarified, cultivated population.

John Parkinson's *Paradisi in sole, paradisus terrestris* (1629) appears to be unique in its presentation of "A Kitchen Garden […] containing as well all sorts of herbes, as rootes and fruits, that are vsually planted in Gardens, to serue for the vse of the Table whether of the poore or rich of our Countrey."[72] Yet, distinctions between the tastes of the rich and poor are evident throughout Parkinson's work. Of the potato, he says, "The Comfit-makers preserue them, and candy them as diuers other things and so ordered, is very delicate." But "The Potato's of Canada," he adds, "[have] growne to be so common here with vs at London, that euen the most vulgar begin to despise them, whereas when they were first receiued among vs, they were dainties for a Queene."[73]

If horticultural adaptation had reached the citizens of London, the first works to advocate the widespread cultivation of maize for human consumption did not appear until the middle of the eighteenth century. Philip Miller's *Gardener's Dictionary* (1732) echoes earlier herbalists in saying that maize "is seldom propagated in England but as a Curiosity in some curious Gardens," but makes the case for wider adoption of the crop as fodder, becoming "a Piece of Good-husbandry in such Places where Beans will not succeed, as particularly in light sandy Lands (where the Inhabitants are at a great Loss for hearty Fodder for their Cattle)."[74] By his eighth edition in 1768—a century and a half after Parkinson's first mention of the "Table […] of the poore"—Miller writes, "these plants are seldom cultivated in England for use, but in Italy and Germany it is the food of the poor inhabitants; as it is also in many parts of North

America." Miller gives exact instructions for planting in a field, allowing six quarts of seed to an acre of land, "which, if the soil be good, will commonly produce fifty bushels of Corn."[75] Ground into flour,

the poorest sort of people in America, and also in Italy and Germany, make their bread of this flour [and] in times of scarcity of other grain, this would be a better substitute for the poor than Bean flour, or other sorts that have been used in England, and at all times will be found a hearty food for cattle, hogs, and poultry.

Maize may be cultivated, Miller concludes, "to answer both purposes to advantage."[76]

Evidence of cultivation of specific crops can be derived from tithe files, where apportionments of arable land are recorded. However, products grown for private use were not taxed.[77] Many of the benefits which might have been acquired through maize cultivation were clearly sought, as the tithe files indicate, but they were realized by the use of other crops or plants. The reclamation of non-arable lands—as Miller puts it, "light, sandy lands"—especially suited for maize, was managed by planting fodder crops, while the productivity of fallow land was increased by crop rotation.[78] These fodder crops were primarily clover and turnips, according to Overton, and beans, as Miller implies, while crop rotations began to include potatoes for human and animal consumption.[79] However, maize (or Turkie Wheat or Indian Corn) does not appear in tithe surveys—a difficulty exacerbated by the tendency to refer to all grains (wheat, rye, barley, and oats) by the single word "corn." Thus when a parishioner in Anglesey, in lieu of tithes, paid with "a dinner every alternative Sunday for the officiating minister, and a feed of corn for his horse," this may be evidence that maize was in use as fodder, but most likely refers to a more familiar grain.[80] We may be left to conclude that "farmers who cultivated maize did so because they could escape taxes and rents since landlords and 'city folk' wanted nothing to do with it."[81]

The increasing productivity of English agriculture by the mid-eighteenth century in large part may have alleviated the food insecurity of the earlier LIA by the time Miller's advocation of maize was issued. "Compared to France or Central Europe," as White points out, "England's milder Atlantic climate, diversified rural economy, and access to maritime imports undoubtedly helped its grain prices to adjust to long-term climate trends."[82] After 1660, protections of the domestic supply of grain were implemented which ensured Britain's self-sufficiency in grain until the mid-eighteenth century.[83] Poor laws, a unique aspect of the English adaptation to the hardships of the LIA, ensured charity for the poor in their parishes from their implementation in 1601 to their replacement by workhouses in 1834.[84] And although the weather extremes of the LIA would continue for another half-century, "the English escape from famine came early, though as late as 1800–1801 food shortage brought real distress, even if its impact was not demographically marked."[85]While weather extremes continued to cause regional shortfalls throughout the eighteenth century, their failure to result in increased

mortality suggests that adaptive and transformative practices had, at least in part, reduced the vulnerability of the countryside as well as the city.

Yet, it is hard to ignore the denigration of maize by botanists, or the fact that it is less likely to appear as a staple in kitchen gardens than to be grown as a curiosity in gardens of the elite. As a subsistence crop, the negative associations of maize blend poverty with ethnicity and animalism. While private cultivation may have enabled farmers to "trade down" to less desirable grains in times of dearth, the unwavering devotion of the English to wheat seems to have pervaded all classes and meant that these communities would return to planting wheat when times improved.[86] While Miller's recommendation of maize as food for the poor falls on deaf ears (as it appears to have done), his motives in suggesting it are not entirely clear. As the chief gardener of the Chelsea Physic Garden, Miller's career had been devoted to extracting the medicinal "virtues" from plants. Yet there is little indication that the wellbeing of the poor was his primary concern. In the centripetal pull of commodities toward the privileged consumers of London, altruism is easily overcome by self-interest.[87] While the refined taste and religious sensibilities of gentlemen demand wheat, maize will serve the poor, despite the fact that, "this grain seldom agrees with those who have not been accustomed to eat it."[88] If Miller's gesture is less than charitable, it may rather mobilize workers and their crops as commodities ensuring the continued prosperity of the "imperial centre." The legacy of associations of maize with the bestial, the alien, the heathenish infects the crop and, implicitly, its consumers, deflecting this narrative from its authors to those who are degenerated by poverty, protecting and assuring the humanity of the privileged at the expense of the marginally (or non) human.

Part 3: Rarities never before seen

When the Plymouth settlers arrived in North America in 1620, they were met not with the temperate climate and plentiful fare they anticipated in the new world, but bitter cold and imminent starvation; not with feast but with famine. Although the settlers would turn to maize out of necessity, here, too, "Indian corn" would be imbued with racialized associations and subject to resource appropriation by the privileged. They planted their first crop of maize in 1621 with the help of an English-speaking Indigenous person, Tisquantum, whom they called Squanto, "the onely natiue of Patuxat, where we now inhabite."[89] William Bradford's *Relation* (1622) of Plymouth's founding tells us that Tisquantum "was one of the twentie Captiues that by Hunt were carried away, and had beene in England & dwelt in Cornehill with master Iohn Slanie a Marchant, and could speake a little English."[90] Thomas Hunt had accompanied John Smith to Massachusetts in 1614, and after Smith's return to England, Hunt captured twenty villagers of Patuxat, selling most of them as slaves in Spain before Tisquantum "got away for England."[91] When he returned to New England in the service of English explorers in 1619, an epidemic had killed all the remaining members of his tribe. At Tisquantum's death in September 1622, Bradford provided one of the few epitaphs for the 60 million Amerindians who perished in the first century of European settlement:

Squanto fell sick of an Indean feavor, bleeding much at the nose (which the Indeans take for a simptome of death), and within a few days dyed ther; desiring the Gov[enor] to pray for him, that he might goe to the Englishmens God in heaven, and bequeathed sundrie of his things to sundry of his English freinds, as remembrances of his love; of whom they had a great loss.[92]

In many respects, Tisquantum represented to the English the model Native. His service in England had exposed him to a civilized people who taught him the English tongue and the tenets of Christianity. His deathbed performance—encouraging prayers from attendants, bequeathing gifts to friends, and expressing the hope that he will "goe to the Englishmens God in heaven"—was worthy of any reformed English man or woman. Tisquantum's friendship with the English is the stuff of the Thanksgiving myth. Never mind that "Squanto" is not actually his name; that God remains the English god, one perhaps among many; that his entire village had been extinguished; or that he had been enslaved. His life story is a parable of the European encounter with the Indigenous people of America; one that proceeded entirely on their own terms and for their own benefit. If herbalists, as we have seen, make use of maize and its consumption to discriminate between human, less human, and nonhuman agents—a strategy to adapt to and rise above the challenges posed by the LIA—colonizers, too, advance themselves as singularly true humans, and therefore rightful proprietors of the new world and its resources. Bradford's "Of Plimoth Plantation" (1620) recounts episodes in which colonists, "not yet well acquainted with the mannor of Indean corne," to relieve their hunger "fell to plaine stealing [of corn], both night and day from the Indeans."[93]

Two intertwined aspects of Tisquantum's story emerge from and contribute to the global ecology in which anthropogenic climate change exacerbated the weather extremes of the LIA. In America, the genocide of the Amerindians profoundly altered the landscape and ecosystem, contributing to global cooling.[94] As late-comers to colonization, the Plymouth settlers suffered bitterly cold winters and violent weather extremes, in part due to the relative harshness of the continental climate, and in part the legacy of Spanish colonial enterprises that had been decimating the population of South America for more than a century. The second aspect of Tisquantum's story, deeply imbricated with the first, is slavery, both the ongoing capture of the Indigenous populations of the Americas and their enslavement in both old and new worlds, and the enslavement of Africans transported to the new world.[95] In the face of dwindling native populations in the Americas, the cultivation of the "drug foods" in high demand in Europe—chiefly coffee, sugar, and tobacco—required ever-growing numbers of workers to meet supply.[96] Conversely, as many as 650,000 Indigenous Americans were "enslaved and forced to relocate to foreign lands" in the sixteenth century; a demographic loss that represents a deferred, if certain, contribution to "The Great Dying" of America's Indigenous population.[97]

By the time of Tisquantum's arrival in England, Indigenous people of the Americas had become familiar figures in Europe, both through direct encounters with those captured or displayed, or through the accounts of voyages that were richly illustrated (if after the fact), or through prints

and decorative arts.[98] Yet, these Indigenous people were never familiar: they were consistently perceived as curious commodities, like the "marueilous strange plante," maize; creatures of difference who appeared only marginally human, if at all. Curiosity surrounds accounts of new world voyages as well as its commodities, both human and nonhuman, and novelties witnessed in Europe are called upon to corroborate wondrous tales of a world beyond. Translating André Thevet's *New found worlde, or Antarctie* (1568), Thomas Hacket includes an "Admonition to the Reader" meant to entice and appease:

Doubt not gentle Reader, but that the description of this present historie wil make thee to wonder, as wel bicase of the varietie of things that herein thou mayst Reade, as also of many others whiche at the first wil seme unto thee rather monstrous than naturall…But if thou herein stande in doubt, then those that have travelled thether, and those *Indians* that were brought from hence, can affirme al things herein contayned to be true.[99]

Like the trend of curious gardens filled with exotics and rarities, the vogue of the Native in the sixteenth century diverted European attention from the suffering of humans to the novelty of the unnatural creatures passing before their eyes. Between 1502 and 1588, 268 separate depictions of Indigenous Americans were published across Europe; 70 fêtes, entries, masques and pageants featured Indigenous people between 1492 and 1700.[100] Throughout the sixteenth century, the figure at the center of this swirl of images was the Tupinambá warrior, one of the Tupi people indigenous to Brazil (Figure 3).[101] The Tupi's appearance and customs—specifically, the lurid tales of cannibalism that pervaded both narrative and visual depictions—struck the European imagination as the height of curiosity and exoticism.[102] The curiosity of maize has another face; one painted with strangeness, masking colonial oppression, enslavement, and genocide.



96.

Figure 3. British Museum, BM Record P_SL-5270-10, John White, Watercolor of Tupi Dancers. Creative Commons: CC BY-NC-SA 4.0.

Across colonial America, Indigenous people were viewed as "savages," weak in constitution and intelligence, unable to withstand the onslaught of disease or to make productive use of the land. Colonists, by contrast, were armed with the belief that their labors would improve the land and climate, making it more accommodated to their humors, warmer and more temperate, and therefore more receptive of English crops.[103] "Nature cannot reach its full potential without human care," as Karen Kupperman summarizes this line of thinking; "it may even degenerate without it."[104] Needless to say, settlers considered the Indigenous peoples' less than human occupation of the country to have led to the degeneration of nature. In English plantations, epidemics were seen as "miraculous plagues," proving and justifying settlers' natural right to seize lands on which Indigenous residents could not thrive.[105] Moreover, colonial settlers, in both North and South America, were systemically incapable of perceiving the patterns of pre-Columbian cultivation everywhere visible in the landscape, unable to comprehend that "pre-Columbian America was a humanized landscape."[106] Settlers would have been greeted by a variegated landscape of meadows, grasslands, forests in various states of regrowth, and wide evidence of agricultural practice; all anthropogenic, many abandoned.[107] The main technology that resulted in "the mosaic quality of New England ecosystem" was burning.[108] Colonial accounts such as William Wood's frequently mention selective burning of forests and underbrush by Indigenous people, noting the abandonment of some forests and subsequent reforestation: "In some places where the Indians dyed of the Plague some foureteene yeares agoe, is much underwood because it hath not beene burned," making it "unusefull and troublesome to travell thorow."[109]Writing in 1634, Wood refers to the epidemic that coincided with the first arrival of the colonists at Plymouth—one in a series that would ultimately kill most of the Indigenous population.

Relying on the Ptolemaic division of the globe into seven "climates" (that is, latitudes), New England settlers assumed that lands sharing the same climate as England would align with and support their humoral dispositions.[110] However, the continental climate of North America was much colder and more "prone to extremes" than England's oceanic climate: as a result, winters were colder than colonists had anticipated, and weather extremes were frequent and violent.[111] In the depths of the LIA, made deeper by the effects of The Great Dying, the first stage of English plantation occurred "at an inauspicious period for the founding of colonies."[112] John Winthrop's *Journal* offers a detailed account of the weather extremes assaulting the Massachusetts Bay Colony from 1630 to 1649. Colonists endured harsh winters annually, with rivers and the bay freezing in 1630/1, 1634/5, 1637/8, and in the 'great frost' of 1641/2:

The frost was so great and continual this winter, that all the bay was frozen over, so much and so long, as the like, by the Indians' relation, had not been these 40 years, and it continued from the 18th of this month to the 21st of the 12th month [March] so as horses and carts went over

in many places where ships have sailed […] To the southward also the frost was as great and the snow as deep, and at Virginia itself the great bay was much of it frozen over, and all their great rivers, so as they lost much cattle for want of hay, and most of their swine.[113]

Wet, cold summers caused corn to spoil in the fields: in 1634, "men were forced to plant their corn two or three times, for it rotted in the ground," and again in 1642, "much Indian corn never ripened" and "people who fed upon that corn were extraordinarily infected with worms in their bodies all the year following."[114] In 1645, "corn was very scarce all over the country, so as [many families] were forced to live of clams, muscles, cataos, dry fish, etc."[115] In May of 1648, Winthrop writes, "This year corn was very scarce, and so it was in all countries of Europe."[116] Although Winthrop blames scarcity in the colony on "our transporting much to the West Indies, and the Portugal and Spanish Islands," a drought in the summer of 1647 was so severe "as their potatoes and corn, etc., were burnt up."[117] In 1638 alone, the colony was visited by hard winter which froze rivers and the bay, a cold spring, an earthquake, "a hiracano," a drought, and "a great tempest."[118]

New England colonists, according to Winthrop, viewed triumphs over these adversities as divine interventions, affirming their sovereignty over the land. Climatic disasters were often averted through the power of prayer, fasting and "humiliations": during the drought in 1640, a "day of humiliation" resulted in "such store of rain, and so seasonably, as the corn revived and gave hope of a very plentiful harvest."[119] Morton's *New-England's Memoriall* recalls that upon seeing "so sweet and gentle showers" reviving the colonists' corn, the Indigenous people were astonished and confessed "that the English mans God is a good God, for he hath heard you, and sent you Rain, and that without Storms, and Tempests, and Thunder, which usually we have with our Rain, which breaks down our Corn; but your stands whole and good still."[120]

The miracles demonstrated through climate and crops, favoring the colonists and cursing the "Indians [with] Storms and Tempests, and Thunder," register English efforts to convert Indigenous people to Christianity. The missionary project, however, met with less than success. As Laura Stevens puts it, "By the second half of the eighteenth century British missionary writings exhibited a preoccupation with what had become a necessary task: explaining the failure of most efforts to convert Indians." While any number of parties were blamed in this thwarted attempt, "Above all, these writings blamed Indians for refusing the blessings of Protestant Christianity."[121] The unregenerate paganism of the natives had humoral aspects and implications as well: Indigenous people's "dietary preferences revealed an underlying bestiality, all the more so given that Amerindians persisted in eating such foods after they had been introduced to the superior European diet."[122]

Morton relates an episode shortly after the Plymouth settlers' arrival in New England that illustrates their first impressions of the land and its inhabitants, and the centrality of maize to their nascent colonial enterprise:

The next morning they followed the Indians tracts, but could not finde them nor their dwellings, but at length lighted on a good quantity of clear ground near to a Pond of fresh water, where formerly the Indians had planted Indian Corn, at which place they saw sundry of their graves; and proceeding further, they found new Stubble where Indian Corn had been planted the same year; also they found where lately an house had been, where some Planks and a great Kettle was remaining, and heaps of sand newly paddled with their hands, which they digged up, and found in them divers fair Indian Baskets filled with Corn, some whereof was in Ears fair and good of divers colours, which seemed to them a very goodly sight, having seen none before: Of which Rarities they took some to carry to their friends on Shipboard, like as the *Israelites* Spies brought from *Eshcol* some of the good fruits of the Land.[123]

An abandoned homestead, dotted with graves, and rarities unearthed (and stolen), framed by the providential discovery of the promised land—it is a narrative that bespeaks the appropriation of new world resources by the English, the erasure of Indigenous people, and the rationale supporting this colonial enterprise. It echoes, too, the cult of curiosity surrounding the reception of the New World and its Indigenous people throughout Europe; a movement which the Plymouth settlers would have witnessed if not shared.

While the colonists' ignorance of maize signals its lack of cultivation in England, Morton's use of the term "rarity," the preferred classification of the grain in England, registers the exclusive agenda of herbalists and their privileged clientele, and—although in a different climate—reaffirms the hierarchy of the human and the nonhuman that enabled the privileged to adapt, survive, and even prosper during the tumultuous period of the LIA. For the New England settlers, privilege rested on their religious belief, their education, and their assumed mastery over the land and its inhabitants, both human and nonhuman. Although the corn is stolen from the Indigenous people, they are, in any case, absent, unknown—probably dead—and undeserving of such a "Raritie."

Part 4. God's husbandry



Figure 4. Nicholas Stone, Monument for William Austin, Southwark Cathedral (1633). Creative Commons: CC-Zero, attrib. Poliphilo.

Nicholas Stone's monument for William Austin, erected in Southwark Cathedral in 1633 (Figure 4), draws on and condenses the representational and ideological machinations of the curious, deployed to manage resources—human and nonhuman—in England and New England amid the hardships of the LIA. The memorial gives shape to the agrarian and devotional metaphors and practices informing the reception of and resistance to maize in England, and sublimates the discursive strategies at play in the denigration of maize and its consumers. Austin, born the son of a dyer in Southwark, rose to become a barrister in Lincoln's Inn and a minor author, whose devotional works were published posthumously by his widow.[124] From 1608 to 1611, Austin assisted in distributions of support to the poor of Paris Garden, Southwark, in accordance with the Poor Laws, and in 1610 he served as one of the overseers of the poor. His annual account gives us a snapshot of how charity in the parish was managed.[125]

Their receipts

Of the ouerseers Of the pore Of the burrough Of Southwarke

By weeke	15[d] a 3 i 3
at the church dores on Sondaies and Thursdays	3 9 3
at the comunion table	0 i9 7
of the inhabitants	17 16 5
…	
from the Play house	4 6 8
…	
received in legacies	7 0 0

Both Austin and his mother, Lady Joyce Clarke, remembered the poor of Southwark with legacies in their wills.[126] The rural poor are acknowledged—at once exploited and beatified—in the figures of two female farm workers, the "Reapers," on Austin's monument.

Austin commissioned the monument after his mother's death in 1626, and he was eventually buried with her and his first wife, Anna, beneath the monument. The memorial program adapts a metaphor from 1 Corinthians 3:9, "For we are the labourers, ye are God's husbandry." Although the verse marks a division between the human workers, Paul and the Apostles, and the land worked (the church at Corinth), Austin's monument collapses this distinction between human and nonhuman, eliding human agency by including only the latter portion of the verse, "Vos estis Dei agriculture" ("You are God's husbandry"), inscribed on the pediment. An angel, the Allegory of Agriculture (who once held a sickle, now lost), stands on the rock of Christ, from which a stream flows, irrigating the field of wheat in the foreground.[127] Another emblem is woven through the wheat, further associating the death and rebirth of the human with those of crops: "It is not quickened unless it dies." Below a second inscription further extends the agricultural image: "He hath sown, fostered and washed us. He gathers us together and will renew us." On either side of this inscription, two exhausted female laborers rest, one with a rake and the other with a pitchfork and scythe. Beneath one is the word "Congregabunt," "They shall gather," and beneath the other the word "Messores" ("reapers"). Below them, the epitaph is inscribed on a winnowing fan, and a shovel bearing Austin's coat of arms completes the scheme.

Like most funeral monuments of the period, Austin's is an elite production, but set within the communal space of the church. While the message may be lost on parishioners who lack an understanding of Latin, the visual elements of the memorial, while curious in their precise setting in Austin's lifetime, evoke scriptural metaphors familiar to members of all classes. An urban sculpture, the monument exploits the countryside and agrarian technologies and innovations emerging in the early seventeenth century. In an increasingly diversified ecology, largely enabled by the importation of new world plants, crop rotations and water management increased productivity, while some new plants (maize, for instance) required hoeing rather than ploughing to manage weeds. [128] As such, a larger workforce was needed. Austin's female farmers may reflect the reality of women and children working in the fields (and almost certainly in gardens).[129] Yet, Austin's monument develops these practices in a more than human space, reimagining the tools of the harvest as figures not of Austin's own labor, but of God's. The two lovely female workers on the monument, wearing broad-brimmed straw hats against the sun—here the "Sol Justitiae" ("The Sun of Righteousness") surmounting the monument—are the only human figures present, displacing the expected effigies of Austin's mother, wife, and Austin himself. Their identification as angelic reapers invokes the Second Coming as a harvest, reworking ecology as eschatology. They are both exhausted farmers and farmers of men, blurring the boundaries between the human and more than human.[130] Indeed, the monument's middle register, where traditionally recumbent effigies of the deceased appear, is occupied instead by a field of wheat.

Imagining the human as God's crop, not the farmer but the farmed, casts God as a discriminating husbandman, one who separates the wheat from the chaff. He is also a divine feeder, whose sustenance is the human field, an orthodox, sanctified field of wheat. If death eats the body, the resurrection will sow the crop anew, regenerate the field. The notion of the human body as crop assumes that the humoral, porous human and the nonhuman are fluid entities; mutual, if not transubstantial, sharers in the seasonal process of spiritual sowing and reaping.

In the years between his wife's death in 1622 (after her tenth childbirth, the inscription tells us) and Austin's own, eleven years later, two years of failed harvests resulted in famine in northern England; "an extreme & vehement storm" struck Devon and floodwaters destroyed 53 houses there; "a whirl wind" was visited on the Thames; a wet spring and summer in 1629 caused failed harvests and food shortages; and another wet autumn and winter in 1633 resulted in "major harvest failures."[131] In New England, settlers of the Plymouth colony passed through the first "inauspicious" decade, beset by frozen waterways, failed harvests, violent winds, fatal bouts of scurvy, and "great winds" that repeatedly "cast to sea" vessels large and small.[132] In Austin's monument, the untamed climate of the LIA is suspended between death and resurrection. "Anna [his] spouse," the inscription reads, "most bright and fair, is first sown. She is covered in this earth, unto the day and the hope of blossoming forth again […] Sown in corruption, raised in incorruption (as it is written), she hath made a propitious sowing." "Lady Joyce Clarke," the script continues, "here awaits the change of springing up once more to life in Christ in due season." In the transformation from human to crop, the grave becomes the fertile soil in which these seeds are safely planted. Between now and the harvest to come, humans and their likenesses dissolve as the collective body of Christians becomes a vibrant field of wheat—not maize—joined in the communion the field represents. Discrimination, distinction, and differences lie elsewhere. Finally, Austin himself—a wealthy householder whose gardens and cupboards are replete—furnishes the table of God. He was "at Table, a Feast in himself."

Curiosity was a convenient category with which to confront and manage difference, whether human, nonhuman, or the more than human twists and turns of weather extremes in the LIA. It was a useful technology in the transplantation of maize into the gardens of the privileged, one with which to distinguish between the human and less than human in narratives created by the privileged few. Following the reception of maize in the hands of English herbalists and New England colonists reveals a transatlantic culture in which rights to possession and dispossession based on race and class—the notional purchase ensuring access to plenty for the privleged and want for the poor in England, and enabling "the Great Dying" in the Americas—are thoroughly imbricated with the Columbian Exchange and its contribution to the weather extremes assaulting both sides of the Atlantic. Simultaneously degraded as barbarous and coveted as a curiosity, maize suggests the ambivalence with which the old world confronted the new world, its new resources, and its new facsimiles of the human. Yet when the novelty wears off—when the poor are encouraged to "trade down" to maize, or when the curious Native becomes a familiar slave—the obverse of curiosity is abjection.

Notes

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[1] Henry Lyte, *A Niewe herball, or historie of plantes* (London: Gerard Dewes, 1578), 463.

[2] Rembert Dodoens, *Cruydeboeke* (Antwerp: J. van der Loe, 1554), ff. 396–7.

[3] Lyte, 464.

[4] Lyte, 463.

[5] Lyte, 464. Amy L. Tigner, *Literature and the Renaissance Garden from Elizabeth I to Charles II: England's Paradise*(Aldershot: Ashgate, 2012), 173–74, notes that herbals display a division between "the importation of plant derivatives for medical use, which emerges as one of the primary arguments for commerce," and their importation for decorative uses.

[6] Warwick Bray, "Crop Plants and Cannibals: Early European Impressions of the New World," in *The Meeting of Two Worlds: Europe and the Americas, 1492–1650*, edited by Warwick Bray. *Proceedings of the British Academy* 81 (Oxford: Oxford University Press and the British Academy, 1994), 289–326, 291. John J. Finan, "Maize in the Great Herbals," *Annals of the Missouri Botanical Garden*, 35, no. 2 (May 1948), 150, speculates that Vikings may have brought maize into Europe, but Conway Zirkle, "How Maize Got Into Europe," *Journal of Heredity* 43, no. 3 (May 1952): 116, points out multiple possible routes before 1562: "John Cabot explored the eastern coast in 1497; In 1524 or 1525 Gomez sailed along this coast from Labrador to North Carolina; in 1526 Ayllon made an abortive settlement in the Chesapeake Bay; in 1524 Verrazano explored the bays and harbors from Cape Hatteras to Nova Scotia; and in the years 1534 and 1535 Cartier explored the land along the St. Lawrence River and attempted to found a colony there."

[7] Tigner, 17.

[8] On Indigenous ingredients in recipes, see Edith Snook, "English Women's Writing and Indigenous Medical Knowledge in the Early Modern Atlantic World," in *A History of Early Modern Women's Writing*, edited by Patricia Phillippy (Cambridge: Cambridge University Press, 2018), 382–97; and Edith Snook, "A New Source of Happiness to Man? Maple Sugaring and Settler Colonialism in the Early Modern British Atlantic," in *In the Kitchen, 1550–1800: Reading English Cooking at Home and Abroad*, edited by Madeline Bassnett and Hilary Nunn (Amsterdam: Amsterdam University Press, 2022), 265–86.

[9] See Simon L. Lewis and Mark A. Maslin, *The Human Planet: How We Created the Anthropocene* (New Haven: Yale University Press, 2022), 168 and 189.

[10] Lorraine Daston and Katharine Park, *Wonder and the Order of Nature 1150–1750* (New York: Zone Books 1998),266–67. The authors' description of the effects of "the marvelous" is especially apt in the context of Europe's reception of new world wonders.

[11] Kathryn Yusoff, *A Billion Black Anthropocenes or None* (Minneapolis; University of Minnesota Press, 2019), 31–32. ; Simon L. Lewis and Mark A. Maslin, "Defining the Anthropocene," *Nature* 519 (2015): 171–80,174, name

the dip in atmospheric CO_2 the "Orbis Spike," and locate it in 1610. See also Lewis and Maslin, *Human Planet*, 299–332.

[12] Lewis and Maslin, *The Human Planet*, 149.

[13] See Lewis and Maslin, *Human Planet*, 229–332;. Lewis and Maslin, "Defining the Anthropocene"; and Alexander Koch et al., "Earth system impacts of the European arrival and Great Dying in the Americas after 1492," *Quaternary Science Reviews* 207 (2019): 13–36.

[14] Koch et al., 17–20.

[15] Koch et al., 30.

[16] Steven Mentz, *Shipwreck Modernity: Ecologies of Globalization, 1550–1719* (Minneapolis: University of Minnesota Press, 2015), xxvii. Sam White, *A Cold Welcome: The Little Ice Age and Europe's Encounter with North America* (Cambridge: Harvard University Press, 2017) describes the effects of this frigid period on North American colonial struggles, specifically attributing this episode to a cluster of volcanic eruptions culminating in 1600: see 74–87 and 252. See also White, "Real Little Ice Age," 348–50 for three useful definitions of the LIA and their implications for the spectrum of responses to weather extremes.

[17] Mike Hulme, *Climate Change* (London: Routledge, 2021), 225–49. See also Lewis and Maslin, *Human Planet*, 35, who observe that that early modern views of human influence on the environment, including climate, were guided by the religious aim of "separating *Homo sapiens* from other animals and placing humans at the apex of life on Earth."

[18] Lewis and Maslin, *Human Planet*, 189.

[19] White, *A Cold Welcome*, 74. White, observing nuances in the LIA, notes that the population of Europe rose from 1450, "grinding to a halt" in the "general crisis" of the mid-1600s (73).

[20] Lewis and Maslin, *Human Planet*, 189.

[21] See Stanley Brandes, "Maize as a Culinary Mystery," *Ethnology* 31, no. 4 (October 1992): 331–37.

[22] Mary Floyd-Wilson and Garrett A. Sullivan, Jr., editors, "Introduction: Inhabiting the Body, Inhabiting the World," in *Embodiment and Environment in Early Modern England* (London: Palgrave-Macmillan, 2007), 1–13; and Gail Kern Paster, *Humoring the Body: Emotions and the Shakespearean Stage*, 2nd edition (Chicago: University of Chicago Press, 2004). And see Rebecca Earle, *The Body of the Conquistador: Food, Race and Colonial Experience in Spanish America, 1492–1700* (Cambridge: Cambridge University Press, 2014), for this issue in Spanish exploration and colonization.

[23] See Finan, "Maize in the Great Herbals," 149–91, 150 and 157; and Gonzolo Fernández de Oviedo, *Ovedio de la natural hystoria de las Indias* (Toledo: Remon de Petrus, 1526).

[24] Lewis and Maslin, *Human Planet*, 315.

[25] J. Gouesnard et al., "Classification of French maize populations based on morphological traits," *argonomie* 17 (1997): 491–98, 492; and Rudy J. Favretti, and Gordon P. DeWolf, Jr., "Colonial Garden Plants," *Arnoldia* 31, 4

(1971): 172–255, 206. While strains of the crop imported into Spain were of West Indian origin, English maize, as described by the herbalists, was imported from North America. And see Álvaro Aragón-Ruano, "The Diffusion of Maize in the Cantabrian Region and its economic and demographic consequences during the Ancient Regime," *Rural History*, 32 (2021): 23–40 on regional maize cultivation in Italy.

[26] See Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, CT: Greenwood Press, 1972), 171. Crosby's view of colonization and trade has been challenged as overlooking the genocide of Indigenous people of the Americas. See Alfred W. Crosby, "Reassessing 1492," *American Quarterly* 41, no. 4 (December 1989): 661–669 at 666 for Crosby's reconsideration of "exchange" as "Encounter"; and see Yusoff, *A Billion Black Anthropocenes*; and Mentz, *Shipwreck Modernity*, xxxiv.

[27] Lyte, *A Niewe herball*, 464.

[28] John Gerard, *The Herball, or The Generall Historie of Plantes* (London: John Norton, 1597), 77–78.

[29] John Gerard, *The Herball, or The Generall Historie of Plantes. Very much Enlarged and Amended by Thomas Johnson, Citizen and Apothecarye of London* (London: Adam Islip, Joice Norton and Richard Whitakers, 1633), title page.

[30] Lyte, *Niewe herball*, 463; and Gerard, *The Herball* (1597), 74.

[31] Gerard, *The Herball* (1597), 77.

[32] Gerard, *The Herball* (1633), 83. Although having a clearer understanding of North American geography, Johnson still considered the mythical colony of Norumbega to exist. See Kirsten A. Seaver, "Norumbega and 'Harmonia Mundi' in Sixteenth-Century Cartography," *Imago Mundi*, 50 (1998): 34–58; and White, *A Cold Welcome*, 135–37.

[33] Gerard, *The Herball* (1597), 77.

[34] Gerard, *The Herball* (1633), 83. Thomas Hariot, *Brief and true report of the new found land of Virginia* (London: R. Robinson, 1588) C1^{r}, describes "*Pagatowr*, a kind of graine so called by the inhabitants; the same in the West Indies called *Mayze*; English men call it *Guinney wheat* or *Turkie wheat*."

[35] Lyte, *A Niewe herball*, 463.

[36] Pietro Andrea Mattioli, *Compendium de Plantis omnibus, unà cum earum iconibus* (Venice: Vincenzo Valrisi, 1571), 164-165; page?; and John Parkinson, *Theatrum Botanicum* (London: Tho. Cotes, 1640).

[37] Gerard, *The Herball* (1597), 77.

[38] See Rebecca Earle, *The Body of the Conquistador: Food, Race and Colonial Experience in Spanish America, 1492–1700* (Cambridge: Cambridge University Press, 2014), 164–165.

[39] José de Acosta, *Naturall and Morall Historie of the East and West Indies*, translated by E. G. (London: Valentine Simms for Edward Blount and William Aspey, 1604), 256.

[40] Earle, *Body of the Conquistador*, is the most thorough treatment of humoralism in the context of colonialism; and see also Martha L Finch, "'Civilized' Bodies and 'Savage' Environment in Early New Plymouth," in *A Centre of Wonders: The Body in Early America*, edited by Janet Moore Lindman and Michelle Lise Tarter (Ithaca: Cornell University Press, 2001), 43–57.

[41] Brandes, "Maize as a Culinary Mystery," 334.

[42] Earle, *Body of the Conquistador*, 148–55.

[43] Earle, 84–117.

[44] Jean de Léry, *Histoire d'un voyage faict en la terre du Bresil* (La Rochelle: Antoine Chuppin, 1578), 90; and Jean de Léry, *History of a Voyage to the Land of Brazil*, edited and translated by Janet Whatley (Berkeley: University of California Pres, 1992), Ch. 6, 49. See also Andrea Frisch, "In a Sacramental Mode: Jean de Léry's Calvinist Ethnography," *Representations* 77, no. 1 (Winter 2002): 82–106.

[45] Nathaniel Morton, *New-England's Memoriall* (Cambridge, MA: S. G. and M. J., 1669), 30. See also Kate Luce Mulry, "Climate and Reproduction in the Early English Atlantic," *Early Modern Women: An Interdisciplinary Journal* 18, no. 1 (Fall 2023): 118–32, 128–29.

[46] Karen Ordahl Kupperman, "The Puzzle of the American Climate in the Early Colonial Period," *The American Historical Review* 87, no. 5 (December 1982): 1262–89, 1270.

[47] Edward Waterhouse, *A Declaration of the State of The Colony and affaires in Virginia* (London: G. Eld for R. Mylbourne, 1622), 4.

[48] C. T., *An Advice How to Plant Tobacco in England* (London: Nicholas Oakes, 1615), C1^{r}.

[49] Acosta, *Naturall and Morall Historie*, 257.

[50] See Mark Overton, "Weather and Agricultural Change in England, 1660-1739," *Agricultural History* 63, no. 2 (Spring 1989): 77–88; and Andrew B. Appleby, "Grain Prices and Subsistence Crises in England and France, 1590-1740," *The Journal of Economic History* 39, no. 4 (December 1979): 865–87.

[51] See Richard Hoyle, "Britain," in *Famine in European History*, edited by Guido Alfani and Cormac Ó Gráda, (Cambridge: Cambridge University Press, 2017), 141–65; and Andrew B. Appleby, "Epidemics and Famine in the Little Ice Age," *The Journal of Interdisciplinary History* 10, no. 4 (Spring 1980): 643–63. Famines are often calculated by correspondence with high grain prices; however, Hoyle, "Britain," 142, points out that price data can indicate periods of "dearth" but not famine. See also Overton, "Weather," 81–82, who demonstrates that "correlations are much higher between [crop] yields and the weather variables than they are between prices and the weather variables." A wet year followed by drought, "reputed to be responsible for a six-fold increase in the quarterly price of wheat, occurred in 1555–1556; a thunderstorm (possibly a tornado) damaged and uprooted standing crops in Nottinghamshire in 1558; 1594 had a wet and unseasonable summer, with extensive flooding of fields and loss or spoiling of crops" across England. This was followed by a cold winter in 1594–1595; inclement weather in Northern England, with loss of crops in spring and summer of 1622; a "Great Frost" in winter 1683; followed by a severe drought in 1685. All from "Weatherweb.net." See also Madeline Bassnett (project director), *Weather Extremes in England's Little Ice Age 1500–1700*, https://weather-extremes-in-englands-little-ice-age-westernu.hub.arcgis.com.

[52] Aragón-Ruano, "Diffusion of Maize."

[53] Aragón-Ruano, 28.

[54] Maud Irène Tenaillon and Alain Charcosset, "A European Perspective on Maize History," *Comptes Rendus Biologies* 334 (2011): 221–28, 221.

[55] Appleby, "Grain Prices," 885. A diet wholly dependent on maize can result in pellagra, a deficiency disease which can lead to diarrhea, dermatitis, dementia, and death. See Brandes, "Maize," 332. S. H. Katz, "Biocultural Evolution of Cuisine: The Hopi Blue Corn Tradition," in *Handbook of the Psychophysiology of Human Eating*, edited by Richard Shepherd (New York: John Wiley and Sons, 1989), 115–40, has shown that the nixtamalization process which protected Amerindians from pellagra (boiling maize in ashes before consuming) was not transmitted to Europe. Early modern opinion was that the disease was a result of "poverty and biological transmission" (Brandes, "Maize," 332).

[56] Finan, "Maize in the Great Herbals," 182–83.

[57] Leonhart Fuchs, *Historia Stirpium* (Basel: Vitus Rudolph Speckle, 1542), page?; and see Finan, "Maize in the Great Herbals," 157.

[58] Jonathan D. Sauer, "Changing Perception and Exploitation of New World Plants in Europe, 1492–1800," in *First Images of America: The Impact of the New World on the Old*, edited by Fredi Chiapelli, 2 vols. (Berkeley: University of California Press, 1976), 2:813–32, 820.

[59] See Bray, "Crop Plants and Cannibals," 304–305, on the comparison between colonial gardens and Cabinets of Curiosity; and see Daston and Park, *Wonder*, 228, on the "wonder-inducing variety" of *wunderkammern*.

[60] John Tradescant, *Musæum Tradescantianum: or, A collection of rarities. Preserved at South-Lambeth neer London by John Tradescant* (London: John Grismond, 1656), 29–31 and 45. The 1656 catalogue reprints Tradescant's *Catalogus Plantarum in Horto* (1634), so it is likely that the catalogue is partial. John Tradescant the younger traveled to Virginia three times (in 1637, 1642, and 1654) to collect specimens of native plants as well as many of the artifacts listed in the Ark. Both Tradescants were gardeners to nobility and royalty, including Robert Cecil and Henrietta Maria. See Tigner, *Literature and the Renaissance Garden*, 169–73; and Prudence Leith-Ross, *The John Tradescants: Gardeners to the Rose and Lily Queen* (London: Peter Owen Publishers, 1984).

[61] Derham, "A History," 470.

[62] Lewis and Maslin, *Human Planet*, 172.

[63] John Evelyn, *Kalendarium Hortense* (London: Jo. Martyn and Ja. Allestry, 1666), 18 and 110.

[64] See Dagomar DeGroot, et al., "Towards a Rigorous Understanding of Societal Responses to Climate Change," *Nature*, 591 (March 2021): 539–50, 545. Hoyle, "Britain," 144, notes a geographical pattern of growth and distribution during four famine episodes from 1585 to 1650 in which products grown in the northwest fed the capital with significant regional shortfalls at their origins.

[65] Tigner, *Literature and the Renaissance Garden*, 160.

[66] Lewis and Maslin, *Human Planet*, 161.

[67] Tigner, *Literature and the Renaissance Garden*, 159 and 167.

[68] Gerard, *The Herball* (1597), 35.

[69] Philip Miller, *Catalogus Plantarum* (London: Society of Gardeners, 1730), title page.

[70] Miller, *Catalogus Plantarum*, vi.

[71] On Mary Somerset, Duchess of Beaufort's gardens at Chelsea and Badminton, see Jennifer Munroe, "'My innocent diversion of gardening': Mary Somerset's plants," *Renaissance Studies*, 25, no. 1 (February 2011): 111–23.

[72] John Parkinson, *Paradisi in sole paradisus terrestris. or A garden of all sorts of pleasant flowers which our English ayre will permitt to be noursed vp* (London: Humfrey Lownes and Robert Young, 1629), 487.

[73] Parkinson, *Paradisi in sole*, 318. See also Earle, "Promoting Potatoes," 150.

[74] Philip Miller, *The Gardener's Dictionary* (Dublin: S. Powell, 1732), Nnnn2^{r-v}.

[75] If Miller's calculation is correct, an acre of corn yields 50 bushels while wheat yielded 18 bushels an acre, a yield that did not increase throughout the seventeenth century. See Mark Overton, "Re-establishing the English Agricultural Revolution," *The Agricultural History Review* 44, no. 1 (1996): 1–20, 4.

[76] Miller, *The Gardener's Dictionary*, 8th edition (1768), 15D^{r-v}. Miller distinguishes between three types of maize, grown in the West Indies, in Spain and Portugal, and in North America, the latter of which "ripens its grains perfectly well in England." The first two types "are planted in a garden for curiosity" (15D1^{r}). In 1796, Charles Varlo published an essay, "On Indian-Corn, its Perfection and How to Raise it," which was based on his tour of America a decade earlier. See Charles Varlo, *The Floating Ideas of Nature*, 2 vols. (London: Charles Varlo, 1796), 1:292–300.

[77] See Aragón-Ruano, "Diffusion," 25; Rebecca Earle, "Promoting Potatoes in Eighteenth-Century Europe," *Eighteenth-Century Studies* 51, no. 2 (2018): 147–62, 149; and W.H. McNeill, "American Food Crops in the Old World," in *Seeds of Change*, edited by H. J. Viola and C. Margolis (Washington: Smithsonian Insititute Press, 1991), 43–59, 51.

[78] Overton, "Re-establishing," 9.

[79] Overton, "Re-establishing," 9; see also Joan Thirsk "Patterns of Agriculture in Seventeenth Century England," *Publications of the Colonial Society of Massachusetts 63: Seventeenth Century New England* (Charlottesville, VA: University Press of Virginia, 1984), 39–54, 43–45.

[80] Roger J. P. Kain and Hugh C. Prince, *The Tithe Surveys of England and Wales* (Cambridge: Cambridge University Press, 1985), 16.

[81] McNeill, "American Food Crops," 51.

[82] White, "Real Little Ice Age," 333.

[83] Hoyle, "Britain," 156.

[84] Marjorie Keniston McIntosh, *Poor Relief in England, 1350–1600* (Cambridge: Cambridge University Press, 2011), 273–93.

[85] Hoyle, "Britain," 141.

[86] Hoyle, "Britain," 159.

[87] See Earle, "Promoting Potatoes," for the argument that the late-eighteenth century European advocation of potatoes as food for the poor signalled a new view of the political relationship between a vital population and state power.

[88] Miller, *Gardener's Dictionary* (1768), 15D1^{v}.

[89] Morton, *New-England's Memoriall*, 30; and William Bradford, *A Relation or Journall of the beginning and proceedings of the English Plantation setled in Plimouth in New England* (London: J. Dawson for John Bellamie, 1622), 35. For discussion, see Finch, "Civilized Bodies," 45. Tisquantum was a member of the Wampanoag Patuxet tribe.

[90] Bradford, 35.

[91] William Bradford, "Of Plimouth plantation," (Bradford Manuscript), State Library of Massachusetts, MS 198, fol. 58.

[92] Bradford, fol. 92.

[93] Bradford, fols. 90 and 93.

[94] See White, *A Cold Welcome*, for an incisive discussion of how the weather extremes of the LIA threatened the colonial project in North America.

[95] See Michael L. Fickes, "'They Could Not Endure That Yoke': The Captivity of Pequot Women and Children after the War of 1637," *The New England Quarterly* 73, no. 1 (March 2000): 58-81; and Julie A. Fisher, "'Teâgun kuttiemaûnch: What Food Shall I Prepare for You?': Exchanges in Early New England Kitchens" in Madeline Bassnett. and Hillary M. Nunn, eds., *In the Kitchen, 1550–1800: Reading English Cooking at Home and Abroad* (Amsterdam: Amsterdam University Press, 2022), 243–263, 252–54 on Indigenous servants in North American colonial households.

[96] See Nathan Nunn and Nancy Qian, "The Columbian Exchange: A History of Disease, Food and Ideas," *Journal of Economic Perspectives* 24, no. 2 (Spring 2010): 163–88,18; and Lewis and Maslin, *Human Planet*, 156 and 172.

[97] Nancy E. van Duesen, *Global Indios: The Indigenous Struggle for Justice in Sixteenth-Century Spain* (Durham: Duke University Press, 2015), 2. Van Duesen's interest is in the "inter-American and transatlantic Iberian worlds;" and Caroline Dodds Pennock, *On Savage Shores: How Indigenous Americans*

Discovered Europe (London: W&N Publishers, 2023), 47. Andrés Reséndez, *The Other Slavery: The Uncovered Story of Indian Enslavement in America* (New York: Houghton Mifflin Harcourt, 2016), 324, states that between 1 and 2 million Indigenous people of the Americas were enslaved before 1600. Koch et al., "Earth system impacts," describe the genocide of the Indigenous people as "The Great Dying."

[98] Bray, "Crop Plants and Cannibals," 289. Bray points out that Vespucci's *Mundus novus* (1503) "was translated into every European language but English and framed the European image of the Americas" (315). See Amerigo Vespucci, *Mundus novus: Letter to Lorenzo Pietro di Medici*, translated by George Tyler Northrop (Princeton: Princeton University Press, 1916). See also Jesus Carillio Castillo, "The Eyes of the New Pliny: The Use of Images in Gonzalo Fernández de Oviedo's *Historia general y natural de las Indias*," *Studies in the History of Art* 69 (2008): 108–25; and Joan-Pau Rubiés, "Text, Image and the Perception of Savages in Early Modern Europe: What We Can Learn from White and Hariot," in *European Visions, American Voices*, edited by Kim Sloan, British Museum Research Publication, 172 (2009): 120–30. Fernández de Oviedo, who spent years in Brazil, is one of the few explorers who published first-hand images of the new world. See Fernández de Oviedo, *Oviedo dela natural hystoria delas Indias*; and Daymond Turner, "Forgotten Treasure from the Indies: The Illustrations and Drawings of Fernández de Oviedo," *Huntington Library Quarterly* 48, no. 1 (Winter 1985): 1–46.

[99] André Thevet, *The New found worlde, or Antarctie*, translated by Thomas Hacket (London: Henrie Bynneman for Thomas Hacket, 1568), aiv^{r}. This is Thevet's address to the reader: see André Thevet, *Les Singularitez de la France Antartique, Autremeent nomee Amerique, & plusiers Terres & Iles Decouvertes de noste temps* (Angers: Christopher Plantin, 1558), n.p. See Acosta, *Naturall and Morall Historie*, A3^{v}–A4^{r} for a similar claim to novelty. Jean de Léry, *Histoire d'un voyage faict en la terre du Bresil* (1578), criticizes the Catholic Thevet for exaggerating and misrepresenting his subject. Léry's text was received favorably by Ralegh's circle (which included Hariot, Haklyut and John White) and the Huguenot community in London facilitated its circulation. See Rubiés, "Text, Image and the Perception," 121.

[100] William C. Sturtevant, "First Visual Images of Native America," in *First Images of America: The Impact of the New World on the Old*, edited by Fredi Chiapelli, 2 vols. (Berkeley: University of California Press, 1976), 1:417–55, 44; and Suzanne Boorsch, "America in Festival Presentations," in *First Images of America: The Impact of the New World on the Old*, edited by Fredi Chiapelli, 2 vols. (Berkeley: University of California Press, 1976), 1:503–15, 503.

[101] See British Museum Record P_SL-5270-10, John White, Watercolor of Tupi dancers, 1585–1593; and see Rubiés, 'Text, Image and the Perception," 121 and 129–30n11. On White, see Paul Hulton, *America 1585: The Complete Drawings of John White* (Durham and London: University of North Carolina Press and British Museum Publications, 1984).

[102] See Pennock, *On Savage Shores*, 204–38 on the association of the Tupi with spectacles and curiosities.

[103] See Anya Silberstein, *A Temperate Empire: Making Climate Change in Early America* (Oxford: Oxford University Press, 2009).

[104] Kupperman, "Puzzle," 1287.

[105] TNA CO 1/6, 64, John Winthrop, "General Observations for the Plantation of New England," (1629)_2^{r}. For discussion, see Cristobal Silva, *Miraculous Plagues: An Epidemiology of Early New England Narratives* (Oxford: Oxford University Press, 2011).

[106] Denevan, "Pristine Myth," 369.

[107] Koch et al., 20.

[108] William Cronon, *Changes in the land: Indians, colonists, and the ecology of New England* (New York: Hill and Wang, 1983), 51; quoted in Denevan, "Pristine Myth," 371.

[109] William Wood, *New Englands prospect· A true, lively, and experimentall description of that part of America, commonly called New England* (London: Thomas Coates for John Bellamie, 1634), 15.

[110] Kupperman, "Puzzle," 1262–63; and White, *A Cold Welcome*, 9–19.

[111] Kupperman, 1262–63 and 1266.

[112] Kupperman, 1264. And see White, *A Cold Welcome*, which expands this thesis by examining English, French and Spanish attempts to colonize North America.

[113] John Winthrop, *The Journal of John Winthrop, 1630–1649*, edited by Richard S. Dunn, James Savage and Laetitia Yeandle (Cambridge, MA: Harvard University Press, 1996), 384.

[114] Winthrop, 257 and 368.

[115] Winthrop, 423–24.

[116] Winthrop, 708.

[117] Winthrop, 708. An embargo on the export of grains was enacted in the Massachussets Bay Colony as a result of this scarcity. The fact that colonists were exporting "corn" to Spanish and Portuguese holdings in the West Indies suggests the successful cultivation of grains other than maize, specifically wheat, in New England despite early failures. Winthrop, 414, indicates this when he states that crops of "corn and hay" were spoiled by heavy rain, but adds, "though indeed it proved a blessing to us, for it being with warm easterly winds, it brought the Indian corn to maturity, which other-wise would not have been ripe." John Winthrop the Younger confirms this in a lecture to London's Royal Society in 1662: see Fulmer Mood, "John Winthrop, Jr., on Indian Corn," *The New England Quarterly* 10, no. 1 (March 1937): 121–133, 128. See Karen Ordahl Kupperman, "Climate and Mastery of the Wilderness in Seventeenth-Century New England," *Publications of the Colonial Society of Massachusetts 63: Seventeenth-Century New England* (Charlottesville, VA: University Press of Virginia, 1984), 3–37 for a discussion of crop diversification in the New England colonies.

[118] See Winthrop, *Journal*, 247–82.

[119] Winthrop, 297.

[120] Morton, *New-England's Memoriall*, 38.

[121] Laura M. Stevens, *The Poor Indians: British Missionaries, Native Americans, and Colonial Sensibility*

(Philadelphia: University of Pennsylvania Press, 2004), 195–96.

[122] Earle, *Body of the Conquistador*, 119.

[123] Morton, *New-England's Memoriall*, 15–16.

[124] William Austin, *Devotionis Augustinianae Flamma* (London: John Legat and R. Badger for Richard Meighen and John Legat, 1637). See Graham Parry, "The Devotional Flames of William Austin," *Early Modern Literary Studies* Special Issue 7 (May 2001): 6.1–30 for an account of Austin's life and his writings.

[125] BL Add. MS 34.110, "The Accounts of the Overseers of the Poor of Paris Garden (1608–1671)," esp. ff. 8^{r}–8^{v}. The manuscript is transcribed in Philip Norman, editor, *The Accounts of the Overseers of the Poor of Paris Garden, Southwark*(London: Roworth & Co. Ltd., 1901), esp. 27.

[126] TNA PROB 11/165/107, Will of William Austin of Saint Saviours Southwark, Surrey, February 6, 1634; and TNA PROB 11/150/463, Will of Dame Joyce Clerke or Clarke, Widow of Saint Saviour Southwark, Surrey, December 1, 1626.

[127] William Thompson, *Southwark Cathedral: The History and Antiquities of the Cathedral Church of St. Saviour (St. Marie Overie)*, 2nd edition (London: Ash and Co., 1904), 186. Translations of the Latin inscriptions are from this text.

[128] McNeill, "American Food Crops," 46. Miller, *The Gardener's Dictionary* (1768), 15D1^{v}, recommends "horse hoeing husbandry" for maize, which would depend on the cultivation of more and improved fodder.

[129] See Thirsk, "Patterns," 52. Rebecca Bushnell, *Green Desire: Imagining Early Modern English Gardens* (Ithaca, NY: Cornell University Press, 2003), 18, notes that Hampton Court gardening records for 1696 list "men and women 'weeders' and 'diggers.'" See also Moesswilde, "To Keep All the Year,'" 104, who states that "in the summer of 1792 fourteen 'sundry women' spent as many as thirty-five days 'filling the water drains' with stones to support drainage in newly improved fields."

[130] In another version of this scheme by Stone, on the monument for Edward Pinchon in Writtle, Essex, the two reapers are given wings. Pinchon died in 1625 and Stone notes that he "set up" the monument in 1629: see Walter Lewis Spiers, *The Note-Book and Account Book of Nicholas Stone*, Walpole Society 7 (1918–1919), 56. Austin may have commissioned the Southwark monument shortly after his mother's death in 1626, so it is uncertain which is the primary version and which the copy.

[131] Weatherweb.net, "Weather in History, 1600–1649"; and Bassnett (project director), *Weather Extremes*.

[132] See Winthrop, *Journal*; and Kupperman, "Puzzle."