

THE EARTH TRANSFORMED

An Untold History

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On the Exploitation of Nature and People (c.1650–c.1750)

For God's sake [capture] it without delay.

William Beckford (1758)

The English engagement with the Caribbean established the principle of conquest and colonisation as a state enterprise. It did not take long for new institutions to be set up to formalise investment overseas. The most important of these was the Royal African Company (RAC), founded in 1660. While this had obvious parallels with the East India Company (EIC) and the Levant Company which had both been founded a few decades earlier, it was not long before the RAC branched out beyond metals and agricultural crops into slavery. Indeed, in 1663, a charter was granted to the RAC by King Charles II for 'the buying and selling, bartering and exchanging of, for, and with any negro slaves, goods, wares and merchandises whatsoever to be vended or found' in West Africa.¹

These developments had a dramatic impact on the ecologies of the Caribbean, the Americas and Africa itself. Shipments of enslaved people rose sharply, rising almost tenfold in the course of the seventeenth century, and reaching over 80,000 per year by the middle of the eighteenth century. By 1680, enslaved people made up around half of Europe's trade with Africa; a century later, in the 1780s – the peak decade for transatlantic slavery when more than 900,000 souls were sent from the coast of Africa – it accounted for over 90 per cent.²

The demand for enslaved people was driven by the vast profits that could be generated from tobacco, cotton, indigo and sugar – all of which required large amounts of labour. Returns on capital were substantial and rapid, with the enslaved paying back the cost of acquisition within eighteen months, 'with god's blessing', as one visitor to the Caribbean put it.³ The incentive to make money drove technological and political change as well. Ships were developed that were fortified and specially designed to discourage uprisings of those being transported across the Atlantic.⁴

Shipowners in England seized the opportunity to invest in building bigger, better and faster vessels – and also a lot more of them. Tonnage of English shipping grew by seven times in just over a hundred years after 1570.⁵ While the Spanish and Portuguese dominated the first century of transatlantic trade, the English and later the British built up a dominant position to become by far the biggest carriers of enslaved people, transporting around 2.5 million in the eighteenth century, around 40 per cent of the total.⁶ The Dutch moved quickly too, quadrupling tonnage between 1500 and 1700 as they too became so involved in the slave trade that some contemporaries contended that they 'managed the whole trade' of the colonies in the western Atlantic, furnishing islands like Barbados 'with Negroes, coppers, stills, and all other things appertaining to the engines for making sugar'.⁷

Advances like these were crucial to the development of merchant shipping fleets, and to the evolution of military forces whose mastery of the seas would later prove the bedrock of imperial power and global empires – most notably the Royal Navy. The demand for seamen far outpaced population growth in England and then Britain as a whole, and helped change perspectives. Once an isolated corner of northern Europe, the British Isles now transformed into a global hub whose population became exposed to peoples, languages, commodities and climates in other corners of the world.⁸

Long-distance trade was part of what is often referred to as a triangular system through which textiles and manufactured goods were shipped from Europe to be exchanged in Africa for enslaved people who were then transported across the Atlantic, before vessels travelled home carrying sugar, tobacco and cotton. Such trade also played an important role in the creation of insurance markets, which in turn relied on the accurate pricing of risk. This in turn was linked to mathematical models

and the careful evaluation of factors ranging from the competence and experience of a ship's captain to the route being sailed to the value of the cargo being transported – whether human or otherwise. This too had long-term consequences for the emergence of financial markets and the creation of centres of commercial power that established cities like London and Amsterdam as economic powerhouses.⁹

Such efficiencies had awful consequences, most notably in driving the price of enslaved people downwards. In just over a decade after 1664, average market prices in the West Indies fell by 25–30 per cent; over the same period, supply more than doubled. In other words, coerced labourers became cheaper and cheaper, which in turn stimulated demand further still.¹⁰ In time, that changed attitudes, hardening the hearts and minds of enslavers, who came to treat fellow humans as though they were simply disposable. It was 'cheaper to work slaves to the utmost', said one planter in the middle of the eighteenth century, 'and by the little fare and hard usage, to wear them out before they become useless and unable to do service; and then to buy new ones to fill up their places'. In one of history's strange twists and turns, John Newton – a notorious trader of West African men, women and children who never said a word in public against slavery – was the author of 'Amazing Grace', a hymn that became closely associated with the civil rights movement in the twentieth century and with those struggling for justice thanks to lyrics that include the euphoric lines 'My chains are gone, / I've been set free. / My God, my Saviour has ransomed me.'¹¹

As one leading scholar has put it, enslaved people were 'systematically worked to death', with the Caribbean best described as a 'slaughterhouse'.¹² The ships that sailed across the Atlantic were designed to maximise profits by cramming as many humans as possible into the smallest amount of space, in horrific conditions with poor ventilation, shocking sanitation and perfect for the spread of disease. On one crossing, 200 captives died as smallpox took hold – with signs of the disease evidently missed before loading, when each individual would or should have been carefully inspected to ensure they were in good health.¹³

From the point of view of the merchant, death at sea was a poor use of capital. In the seventeenth century, it is estimated that 30 per cent of those who left Africa on Spanish ships and 20 per cent of those on

British ones never made it to the other side of the Atlantic. It was not long before these figures began to improve, driven by more rigorous inspections at point of sale and by better care during the crossing – though it would be hard to describe conditions as anything other than inhuman. The British again were pioneers in this regard, bringing mortality rates down to 10 per cent by the second half of the eighteenth century.¹⁴ Captives were typically taken on deck every day to breathe fresh air and made to exercise, with the threat of a lashing from a cat-o'-nine-tails concentrating the minds of those who were reluctant.¹⁵ This allowed the disposal of excrement and the smoking of the quarters with tar, tobacco and sulphur, before they were washed down with vinegar – steps thought to be helpful, but which offered little help against illness.¹⁶ Nevertheless, these steps were an aspect of the efforts made to reduce loss of life, or, to put it more accurately, to improve profitability.

The relentless process of improvements had other important knock-on effects. Apart from the technological advances that boosted efficiency and provided greater returns in investment, there was a host of other advances that flowed from the maritime world. These included increasing sophistication of logistics required to provision and supply ships as well as ports and settlements that were often many thousands of kilometres apart and that required first-class administrators and bureaucrats who learned not only from their mistakes but from each other. This in turn helped professionalise the economy and for that matter government apparatus. It is hard to measure exactly what uplift these provided; but it stands to reason that they were extremely important.¹⁷

Those lessons were not shared well in places where personal responsibility was high, accountability low and temptation made irresistible by lack of oversight: in fact, as recent research has shown, the economics of Spanish trans-Pacific trade between Manila and Acapulco from 1570 to 1815 that transported silver as well as cochineal, sweet potato, tobacco and chocolate was compromised by overloading of vessels, endemic corruption of officials and poor decision-making related to bribery of ships' captains. These led to many late departures that took chances with the monsoon winds and ocean currents and dramatically raised the chances of shipwreck. As all the galleons were owned by the crown, losses of vessels such as the *San José* in 1694 which carried a cargo equal to 2 per cent of the Spanish empire's entire GDP had catastrophic consequences for Spain's economy.¹⁸

The relationship between the state and mercantile interests was different in northern Europe, though not completely clear-cut: after all, Queen Elizabeth I herself was an early investor in the slave trade, persuaded by Sir John Hawkins that 'Negroes were very good merchandise in Hispaniola and that store of Negroes might easily be had upon the coast of Guinea' to boost the royal coffers.¹⁹ The overloading of slave ships went hand in hand not only with the search for gain but also with the dehumanisation of those being shipped. In recent years, considerable attention has been paid to questions around race, racism, slavery and the way that humans have sought to justify treatment of those of different skin colour, religious beliefs or sexualities, attention that has helped revolutionise the way we think about these issues.²⁰

At the time, attitudes built on ideas and influences from the classical world, of which Europeans now claimed to be the true heirs. Herodotus, for example, opined that 'soft lands tend to breed soft men', a reference not to political leadership but to geographic bounty: 'it is impossible for one and the same country to produce wonderful crops and good fighting men'.²¹ Being tough meant coming from land that required hard work; places that offered easy lives produced lazy men.

Montesquieu was heavily influenced by what he read, tweaking views that were not only widespread but repeated almost unquestioningly in texts by authors like Pliny, Strabo and Vitruvius. People 'are more vigorous in cold climates', wrote Montesquieu in *L'Esprit des lois* in 1748, exhibiting 'more confidence in oneself' as well as 'more courage' and a better sense of 'one's superiority' than those living in warmer conditions. 'The peoples in hot countries', he went on, were 'like old men': timid. Those living in Asia were 'indolent of mind and incapable of any exertion or effort'.²²

Sweeping statements like this reveal much about finding justifications and explanations for how the cold climate of northern Europe enabled the rise of European global empires. They were also heavily imbued with ideas about race and about the right of European men to dominate other peoples and cultures in distant countries and continents. Those who lived in hot climates, said Montesquieu, were greatly in need of a wise legislator, unlike those who lived in Europe, who were, of course, ideally placed to provide such wisdom to others. Cold air restricts the body's fibres, he wrote, meaning that people lived like 'young, brave men'. In contrast to the lure of luxury experienced by those in other

parts of the world, those from cold countries had 'very little sensibility for pleasure'. Indeed, Muscovites were so tough and so inured to comfort that they needed to be flayed to even feel alive.²³

As Montesquieu realised, elaborate intellectual somersaults were needed to explain the apparently self-evident truth that those in northern climes had superior temperaments, were racially superior and deserved to rule over others. After all, if this had been the case, why was it that northern Europe had been home to barbarian tribes at the time of the Roman empire, and had produced so little by way of culture, scholarship and philosophy in comparison with the Mediterranean region? As always, Montesquieu had the answer: the Germanic tribes 'rose and quit the forests to subvert that great empire'. In the end, in other words, the cold, calm north had won out.²⁴

Montesquieu and others were well aware that others had built empires in hot climates, so again manoeuvred to distinguish between the achievements of those with 'a certain vigour of body and mind' who were capable of making 'long, painful, great and intrepid actions', like Europeans, and those who lived close to or near the equator. Those who inhabited 'hot climates' suffered from cowardice which 'has almost always made them slaves'. Empires that had grown up in Mexico and Peru before the arrival of Columbus were fundamentally inferior, he argued. They were 'despotic', he said – presumably unlike their European counterparts.²⁵

This was nothing compared to how those from Africa were written about, treated and reacted to – which makes for painful and difficult reading. Africans who were sold for shipment across the Atlantic were inspected by buyers as if they were animals rather than humans, even being compared to the purchase of 'black cattle'.²⁶ In the middle of the eighteenth century, one Lord Chancellor used a High Court judgement to confirm his opinion that 'a Negro slave ... is as much property as anything else'.²⁷

Similar views were expressed in the notorious incident of the *Zong*, a ship whose captain had overloaded his vessel and made navigational errors that resulted in water supplies running low. As shortages and sickness took hold, over 130 Africans, many bound and shackled, were thrown overboard to drown. The ship's owners, a syndicate based in Liverpool, went to court to claim on their insurance for losses in a case heard by the Chief Justice, Lord Mansfield – a towering figure in maritime law. Mansfield had ruled that the fate of those who drowned

'was the same as if Horses had been thrown overboard'. This was not a case of murder, in other words, but one of dealing with excess farm animals.²⁸

Those who benefited directly or indirectly from the slave trade thought little about the source of the wealth that built grand country houses, funded great art collections and improved the quality of life in comfortable surroundings at home.²⁹ Britain is a country, wrote one of Lord Mansfield's contemporaries, 'whose grandeur is founded on commerce' – rather than on the blood, sweat, tears and lives of enslaved black men, women and children toiling on sugar and tobacco plantations in the Caribbean and Virginia.³⁰

Others did not so much turn a blind eye as convert reality into fantasy. 'Let an intelligent and educated man compare the deplorable state' of those who had been sold into slavery 'in Africa with the pleasant and easy life which they enjoy in the colonies', one delegate told the French Colonial Assembly. They should be thankful that they were 'sheltered by all the necessities of life, surrounded with an ease unknown in the greater part of the countries of Europe', with access to good healthcare, surrounded by loved ones and 'in peace with their children'. It would be hard to paint a more misleading picture. Rather more accurate were the views of the coerced labourers themselves, who cursed the way that Europeans exploited everything they came into contact with: 'The devil was in the Englishman,' said one enslaved African in Barbados; 'he makes the negro work, he makes the horse work, the ass work, the wood work, the water work and the wind work.'³¹

Some admitted to being moved by the plight, sorrow and despair of those whose lives were spent making money for others, against their will. 'My Heart hath been ready to bleed for those poor Wretches,' admitted one surgeon on a slave ship.³² Others spoke of their sadness at seeing the separation of 'fathers from sons, husbands from wives, brothers from brothers', declaring that it was impossible not to be moved by such scenes: 'what heart, however hard it might be, would not be pierced with piteous feeling to see that company?'³³ It was dreadful to see the 'Barbarity daily exercised on the Bodies of the miserable Negroes; The piercing Cryes and dolefull Lamentations that every Day enters one's Ears both in Town and Country.'³⁴

Such sentiments rarely translated into more prolonged reflection, and were rather the passing thoughts of those briefly moved by a sense

of compassion. It did not take long to become 'cruel and hard-hearted', and some even encouraged their children to become just that when they were young. 'The first Play-Thing put into their hands is commonly a Whip with which they exercise themselves upon a Post, in Imitation of what they daily see perform'd on the naked Bodies of those miserable Creatures, till they are come to an Age that will allow them Strength to do it themselves.'³⁵

Ideas of African barbarism also took hold – dispensing with the history of West Africa and its contemporary sophistication. Dutch writers in the seventeenth century had written with admiration of Benin City, for example, describing its 'very broad streets, each about 120 feet wide', and the royal quarters that were 'easily as big as the town of Haarlem and enclosed by a remarkable wall', while the palace of the Oba (ruler) was 'so large that you can feel no End', so vast in fact that walking its length was exhausting.³⁶

These accounts were replaced by representations of Africa as dangerous, barbaric and cruel. If Africans were not sold, wrote the same ship's surgeon who claimed to be upset by the 'Abuse and Death' of enslaved people, other Africans 'will surely starve them to death'.³⁷ Similar views were expressed to a parliamentary committee by Richard Miles, a slave trader who had 'bought some hundreds – some thousands of slaves' and claimed that if he had not done so, many would have been 'sacrificed at the burials of great men'. Another slaver confirmed that buying those who had been enslaved helped save their lives, 'preserving them from being sacrificed, or otherwise put to death'. In such warped logic, the slave trade became one of salvation rather than of suffering and sacrifice.³⁸

It was not just that coerced labour from Africa was all about lining the pockets of merchants, investors and landowners – as in Barbados, which saw land prices multiply by almost twenty times in a few years and went from being a sparsely populated, nondescript island to 'one of the richest Spots on earth under the Sun' following the development of sugar plantations in the mid-seventeenth century.³⁹ The fortunes that were made for white plantation owners were built on the fact that Africans who were shipped across the Atlantic were far more productive, especially in tropical climates, than those who controlled and traded their lives. Nowhere was this clearer than in West Africa itself, a place described by one scholar as a place for most white men 'to get away

from or to die in'.⁴⁰ In the early eighteenth century, the Royal African Company lost half those it sent from Europe to West Africa within a year. Just one out of every ten Englishmen who went to work in this region came home alive before the middle of the nineteenth century.⁴¹ Such was the gamble of trying to strike it rich.

The main cause of such high mortality levels was the disease environment. The lack of innate immunities of European populations stood in sharp contrast to those that had been developed over thousands of years by African populations to cope with malaria, a single-cell parasite that is transmitted to humans by mosquitoes. The two most prevalent strains of the disease are *vivax* malaria, a mild form that is rarely fatal, and *falciparum* malaria, which is far more virulent and deadly, with the latter requiring higher temperatures than the former to become infectious. Classic symptoms include fever, chills and nausea and, in serious cases, impaired consciousness, coma and death. Repeated infection results in deteriorating health, including decreased ability to resist other diseases. Populations in sub-Saharan Africa have developed a vast range of immunities to malaria – including the sickle-cell trait, a blood-cell disorder that can reduce the likelihood of developing cerebral malaria after a *falciparum* infection by 90 per cent. Populations that do not present a high frequency of sickle-cell traits have other forms of innate resistance, including the HbC allele or high levels of antimalarial antibodies.⁴²

Falciparum malaria had established itself in the Caribbean and South America through multiple independent introductions that were linked to the slave trade – attested by genetic and archaeological evidence, with mitochondrial DNA showing a clear link between African and South American haplotypes.⁴³ Settlers from Portugal and Spain may also have brought the disease with them, as malaria was endemic in both countries at the time of the conquest.⁴⁴ Strains may also have entered the New World from Asia and the western Pacific either before Columbus' crossing or as a result of the subsequent creation of trans-Pacific trade – which would help explain the high genetic diversity of *vivax* parasite in the Americas.⁴⁵

However, malaria does not seem to have taken hold in the colonies of North America until the 1680s, when it did so suddenly and with a vengeance. A series of epidemics hit most southern US colonies, with

high mortality in Virginia and South Carolina, where Charleston was particularly badly affected. *Falciparum* malaria then became established, leaving long-term impacts on the white population, such as in Christ Parish in South Carolina, where records show that 86 per cent of the population died before the age of twenty, and more than half before the age of five.⁴⁶

The spread of malarial disease is dependent on three variables, namely the parasite itself, mosquitoes – of which several species prefer to feed on humans rather than on any other vertebrate – and climate, itself closely linked to the habitats of mosquitoes, which require enough water and hot enough temperatures to reproduce, survive and spread. The early 1680s in particular were a time of turbulent and unusual climate conditions, with major El Niño events in 1681 and 1683–4 and again in 1686–8.⁴⁷ The correlation has led some scholars to ask whether these weather anomalies played a significant role in allowing *falciparum* malaria to cross a threshold to establish itself successfully in North America.⁴⁸

The appearance of malaria was to have profound consequences that lasted centuries – plaguing the south of what became the United States long into the twentieth century, reducing life expectancy, impacting productivity and being both an indicator and a motor of poverty in the American south.⁴⁹ As it was, the second half of the seventeenth century saw a wider shift by plantation owners in states like Virginia; they had previously had a preference for indentured English workers who spoke the same language as the owners, had similar customs and were familiar with English agricultural practices. Demand was difficult to satisfy even before the arrival of malaria – at which point those who could choose where to work actively avoided the American south if they could. Combined with this, however, was a dramatically enhanced need for a labour force that resulted from so-called landgrab in the decades after 1650 in which millions more hectares that were ideal for cultivation were seized – further stimulating appetite for the cheapest, most effective workers. Hardening racial prejudice played a role, with some like the Reverend Godwyn Morgan declaring in 1680 that the terms 'Negroe' and 'Slave' had 'by custom grown Homogenous and Convertible'. As if to underline what this meant to him and to many of his contemporaries, he added that 'Negro and Christian, Englishman and Heathen, are by the like corrupt Custom and Partiality made Opposites.'⁵⁰

As far as colonial settlers were concerned, therefore, African manpower was the answer to multiple problems. As malaria kicked in, decimating the existing population, the desire for more coerced labourers rose sharply. Buyers were not keen to buy enslaved people from just anywhere, but had strong preferences for acquiring those from malaria-ridden regions in Africa, whose populations had high levels of resistance to the disease. This resulted in what one scholar has called a 'malaria premium': higher prices for people most likely to survive infection – and therefore prove to be better 'investments'. Captives from the Gold Coast were considered robust, strong and little affected by disease, while those from the Niger Delta were thought to be less hardy.⁵¹

It was not so much disingenuous as disgusting then that the depiction of blackness in general and of enslaved peoples expressly shipped because of their genetic advantages should become associated with inferiority, when the opposite was the case. Those brought across the Atlantic in subhuman conditions and subjected to lives of misery were not only the backbone of fortunes and status for their 'owners', but were doing work that the latter were poorly suited to do themselves. Far from being 'inferior', those put into chains were not only stronger but genetically better suited to the Americas than those who exploited them.

In a further surreal twist, states set about codifying the deprivation of rights of fellow human beings – both to justify the principles of enslavement and racism and to enshrine these ideas in law. Slave codes began to be passed by one state after another that formalised the status of slavery as a lifelong condition, as having a racial basis and as being an inherited condition, with coerced labourers being defined as the property of their 'owner': 'buying' another human meant controlling and benefiting from the fruits not only of their labour but that of their descendants too.⁵²

This was first set in law in Virginia in 1662 whereby the legal status of 'all children born in this country shall be held in bond or free only according to the condition of the mother'. This was known as *partus sequitur ventrem* – or 'the offspring follows the womb', which among other things meant that the children of women who had been raped by owners of coerced labourers or other white men were condemned to lives of servitude, thus concealing the acts of sexual violence that had led to their conception.⁵³

Controlling fertility became an important part of the lives of enslaved women, and in due course led to advances in the development of herbal

remedies by black women to control the spacing of childbirth, to act as contraception and to track stages of pregnancy.⁵⁴ This was itself partly a response to the fact that an estimated 54 per cent of pregnancies among enslaved women resulted in stillbirths, infant mortality and early childhood mortality.⁵⁵ Appalling experiments on women of African descent in the first half of the nineteenth century, almost all without consent, proved foundational for modern gynaecology, obstetrics and healthcare for women – debts that are likewise little known and even less acknowledged.⁵⁶ This does not mean that the benefits have been shared equally: today in the United States the disparity between deaths of infants born to white and black mothers is actually greater than it was in the first half of the nineteenth century, while pregnancy-related mortality is three to four times higher among black women than among white women.⁵⁷

Then there is the Mason–Dixon line which is often seen as marking the boundary between southern slave states and northern free states. This was not only a political and commercial frontier but an epidemiological one too, with *falciparum* malaria flourishing to the south – precisely where slavery was not only prevalent and defended as a principle, but eventually a fundamental cause of civil war in the United States in the 1860s.⁵⁸ The role that climatic factors had in creating the rich soils of the American south has already been noted in this book, along with the role these play in shaping US presidential elections. However, this can be developed further, with recent research suggesting that the counties with large populations of enslaved people at the time of the abolition of slavery in the 1860s are more likely today not only to vote Republican, but to oppose affirmative action and express racial resentment and sentiments towards black people.⁵⁹

The major expansion of the exploitation of human labour deepened the ecological transformation of large swathes of land in the New World which diverted the benefits to those in the Old, much of it delivered by the manpower and lives of those who had been transported from Africa. This included the importation of coffee, tea and chocolate, of silver and raw materials that were hacked out of the ground and from the sides of mountains, and of cod from Newfoundland that found its way on to European tables by the boatload.⁶⁰ The benefits were manifold. For example, indigo production soared in the 1740s, rising from just over 2,200 kilos in 1746 to more than 62,000 just twelve months later.

Such jumps owed much to the consolidation of estates that allowed efficiencies of scale, but they owed more to the huge increases in the size of the coerced labour force working the land, such as in Jamaica where numbers almost doubled between 1740 and 1774 – a figure that excludes many tens of thousands who arrived on the island but did not survive. The sheer numbers of enslaved people being transported across the Atlantic, combined with good climatic and economic conditions, meant that prices fell – driving a permanent cycle of demand for coerced labour, and rising production.⁶¹

So valuable did this trade become that it was a key part in the struggle for the mastery of Europe, as well as in the creation of and competition between fledgling global empires. Naval victories by the British against the French in West Africa and the Caribbean not only sapped the finances of the latter, but made it more difficult to fund efforts against the former either locally or elsewhere. During the Seven Years' War of 1756–63, the conquest of the West Indies loomed large. One plan involved the British swapping control of Guadeloupe, which they had taken from the French, for France's territories in Canada, so great was Canada's perceived strategic value. This was preposterous, William Burke wrote in riposte to discussions in Parliament. Canada, he told MPs, 'produced no Commodity except Furs and Skins', and offered 'little Returns to make the English merchant'.⁶² Guadeloupe, in contrast, produced sugar, cotton, tobacco and more besides that was worth about forty times the wealth of the trade of Canada each year.⁶³ Despite these entreaties, the French managed to get back Guadeloupe as well as Martinique and St Lucia – but at the price of all its possessions in North America, except for the territory of Louisiana west of the Mississippi river.

The preoccupation with controlling resources was intense. 'The negroes and stock' of Martinique, an island controlled by the French, 'are worth above four millions sterling', William Beckford had told the prime minister, William Pitt the Elder, in 1758. 'For God's sake', he said, capture it 'without delay'.⁶⁴ A prominent enslaver, Beckford had his own interests to promote – a pursuit made easier by the fact that he had the ear of the Prime Minister, who took to saying that Beckford 'had done more to support government than any minister in England', thereby surprising other parliamentarians who viewed him 'as a wild, incoherent, superficial buffoon'.⁶⁵ Beckford was motivated, above all,

by concerns that were shared by many involved in the sugar industry – namely, that taxes would be levied to help support British war efforts at a time when ‘the low price of sugar, high freights, high insurance, and hoops and staves’ threatened to eat into their profits. Pitt obliged, overruling his own Chancellor of the Exchequer to abandon a special tax on sugar, earning the goodwill and support not only of Beckford but of many others in the colonies. It paid to have friends in high places.⁶⁶

The volumes of sugar being imported back to Europe naturally brought prices down rapidly, enabling consumption by an increasing share of society; this in turn encouraged people to earn more money that could be spent on luxuries that were previously unavailable, unaffordable or both. This was a core part of an ‘industrious revolution’ that drove a rise in productivity and an increase in levels of income.⁶⁷ Some scholars have linked this to a further set of other social responses, such as growing interest and investment in new ideas, that stemmed in part from rising wages and the gains that could be obtained from innovation and technology.⁶⁸

As such, the increase in goods, materials and foods being drawn back to Europe from the Americas in general was important from the perspective not just of ecological dividends being recirculated from one part of the world to another, but of powering a much wider division between what are often referred to today as the global north and the global south. Those in Europe did not just advance because they were able to dominate other parts of the world, or even because they could adapt ecosystems for their own benefit and reap the rewards; those rewards themselves brought further gains that themselves proved crucial. What mattered most was not so much the quantities of goods brought back to Europe as the range and novelty of what became available during the Age of Discovery. Elites secured the bulk of the profits available from transatlantic trade, although these were not always substantial. What made a difference, then, were the gains from variety, as life became sweeter and more stimulating and, furthermore, became available to rich and poor alike.⁶⁹

The case of sugar again proves instructive. In 1700 England imported around 10,000 metric tons; a century later, this had risen to 150,000 tons. On a per capita basis, consumption of sugar in England increased twentyfold between 1663 and 1775.⁷⁰ Apart from having the obvious effect of dramatically increasing the availability of what had previously

been a luxury product, this consumption of sugar also provided a calorie boost for the growing working class in Europe. It has been argued that the increase in sugar imports between 1600 and 1850 increased English welfare and living standards by an astonishing 8 per cent.⁷¹

Sugar availability was significant in other ways too. For example, the innovation of adding sweetener to hot drinks such as coffee and tea produced not so much a spike in demand from China as a tsunami, as consumption rose by 400 times in the course of the eighteenth century. This in turn galvanised the East India Company and others to invest in direct trade with East Asia, and in time to begin production of tea in India. The ecological transplantation of natural commodities to new locations was paralleled by that of coffee, native to Ethiopia and Yemen, which was then introduced to plantations in Java in South-East Asia and Surinam in South America by the Dutch soon after 1700, to Martinique and Saint-Domingue in the Caribbean by the French and to Jamaica by the English – by 1800 Jamaica was producing a third of the world’s coffee.⁷²

In some cases, there were unexpected side-effects of the transplantation of plants and the opening up of new markets. High taxes on tea and tobacco imports to Britain produced a thriving smuggling industry, with some estimates suggesting that between 50 and 90 per cent of all the latter were brought into the country surreptitiously.⁷³ While difficult to measure accurately, it stands to reason that there were gains arising from the improved navigational skills of sailors who had to sneak in to unwatched bays and from a new industry whose job it was to stay one step ahead of government tax authorities – perhaps coincidentally an area where Britain has long led the world: even in 2021, British tax havens in the Cayman Islands, Bermuda and the British Virgin Islands are ranked as the three top enablers of corporate tax abuse on the planet.⁷⁴ Engagement with the New World led to new possibilities and new tastes – and demanded new ways of doing things that had long-lasting consequences.

Near insatiable demand for tea which rose dramatically in the course of the nineteenth century, meanwhile, led to the production of opium in Bengal which was typically sold at auction in Calcutta in exchange for tea sold in Canton (Guangzhou) in order to avoid bans imposed by Qing dynasty emperors.⁷⁵ Trade eventually became so important to the British Exchequer that the government used military force to

gain favourable trading terms, control of China's customs system, access to ports such as Shanghai and even direct sovereignty over Hong Kong – part of what has later become known in China as the 'Century of Humiliation', and a fundamental part of contemporary conceptualisations of world affairs in Beijing and beyond.⁷⁶ Again, it is hard to overstate the impact of new global connections, of new patterns in supply of and demand for commodities and of the attractions of a financial world that enabled merchant capital not only to reshape ecologies but to transform global politics.

As with sugar, increasing availability meant lower prices and greater affordability. The impact on social interaction was profound. There is 'no bourgeois household where you are not offered coffee', wrote one Parisian in the eighteenth century, 'no shopkeeper, no cook, no chambermaid who does not breakfast on coffee with milk in the morning. In public markets and in certain streets and alleys in the capital, women have set themselves up selling what they call *café au lait* to the populace.'⁷⁷

These interactions were not just about improvements to the quality of life, but were important to the exchange of ideas, to innovation and to collaboration. It was no coincidence, for example, that tea and coffee houses played key roles in the development of the stock exchange, of the insurance industry and of political debate and in the dissemination of print media during the Age of Enlightenment – a term that suggests a time of exceptional brilliance in Europe without acknowledging the debts that were owed to the planters, pickers and diggers who were an essential part of the story.⁷⁸

Sugar, coffee and tea were just some of the commodities that characterised a time of intensive and deepening global exchange; attention could also be paid to individual goods like tobacco, timber or furs that played a role individually and collectively in the acceleration of pre-industrial capitalism, which was centred on geographic, ecological and environmental inequality and exploitation.⁷⁹ Commodities could see explosive growth in production, as was true of cotton, with exports from the United States to Great Britain rising ninety-three times between 1791 and 1800 and then rising another seven times before 1820.⁸⁰ This owed much to the development of the Whitney gin, a device that separated cotton fibres from their seeds, and the huge

British demand in terms of domestic consumption and for export, not to mention the almost doubling in size of the United States after the Louisiana Purchase, which was followed in 1845 by the annexation of Texas. The annexation delivered land that not only could be turned over to cotton but was ideally suited to be offered as rewards to political allies and to become part of what one eminent scholar has called the 'military-cotton complex'.⁸¹ As with the other phases of the expansion across the Atlantic, the impetus of mercantile interests and landowners, combined with a targeted and relentless search for a return on capital, proved not so much crucial as the driving force.⁸²

Often, there were steep environmental prices to pay. Overwork of the land damaged soils, caused a decline in fertility and resulted in erosion. Even by the start of the eighteenth century, some were commenting that fields had turned into 'barren, rocky gullies, runaway land, waste land ... much worn out and not so fertile as it was.' According to one clergyman in Barbados in the 1730s, 'the face of the earth appeared, as it were, a dry crust, burnt up and gaping', while a contemporary noted that 'excessive drought, the number of people running off, and the miserable condition and poverty' of an island that had been the source of colossal fortunes only a century before now meant that famine and disaster seemed inevitable.⁸³ According to Eric Williams, one of the Caribbean's most influential historians, the ecological degradation was a blessing in disguise, helping to reduce profitability and therefore easing the way to the abolition of slavery. Commercial realities rather than compassionate sensibilities were what made the difference.⁸⁴

Plantation agriculture in the Caribbean opened up other environmental hazards too. These included destructive landslides that were dangerous to workers and damaging to ecosystems. Rampant deforestation did not only have implications for soil run-off but magnified the threat posed by hurricanes because of the removal of trees that served as natural protection for animal and plant life alike.⁸⁵ Colonial legacies of ecological intervention remain an important factor in climate and biotic vulnerability to this day, to judge from some studies.⁸⁶

The secret to the rise of Europe – and especially of northern Europe – was the ability to access, develop and control millions of 'ghost acres' of land that were either blessed with natural resources or that could be repurposed to produce crops and goods that were necessary and

desirable thousands of kilometres away. This had the twin effect of diverting calories, energy and raw materials to Europe and so supporting economic and demographic growth that would otherwise have not been possible, and also of liberating land for other uses.⁸⁷

Much of this was poorly understood and taken for granted, with buyers and sellers knowing and caring little about where goods, products, components or resources came from. A good example comes from hat fashion in Europe in the second half of the seventeenth century. King James I is sometimes given credit for starting the craze when he ordered twenty beaver hats when he became king of England in 1603. Sweden's successes in the Thirty Years' War influenced the popularity of tall 'cavalier's hats', with hat styles then influenced by the latest French fashions. This led to surging demands for beaver fur, which has the ability to hold its shape through felting, and for vicuña, an alternative from the Andes. In short order, this led to beaver populations in most parts of Europe being all but hunted to extinction, and to commodity frontiers being expanded elsewhere, most notably in what is now Canada and Peru. Tens of millions of beaver pelts were imported to Europe from North America, with England alone re-exporting more than twenty million between 1700–1770.⁸⁸

Other components for these hats – such as mastic gum that was used as a stiffening agent and ostrich feathers for decoration – led to surging pressures on plant and animal life in West Africa, Sudan and the Levant where these items were in seemingly inexhaustible supply. All were parts of a process that has been termed 'Invisible Globalization' – that is to say, the centralisation of resources and the expansion of supply chains alongside patterns of overconsumption and depletion. All went unnoticed by consumers.⁸⁹

This was true of no end of other commodities, goods and products. Animals were hunted to the edge of extinction and sometimes beyond. Demand for ivory piano keys and billiard balls in the nineteenth century in the drawing rooms of the burgeoning middle classes in Europe and North America decimated African elephants; beavers were trapped in vast numbers not only for their fur but for the castoreum that could be extracted from their anal scent glands and was used in popular treatments for fever, headaches, spasms, epilepsy and mental illness. Demand for products from whaling, including whalebone and oil made from blubber that was boiled down and used in street lighting,

in miners' lamps and in lubricants for guns, watches, sewing machines and typewriters, led to the collapse of whale populations in the Atlantic and the opening up of new whaling stations as far away as the Falklands and the Pacific in the search for new supplies.⁹⁰

Rubber booms saw another surge in the plantation agricultural economy and the intensification of monoculture; demand was spurred both by the growing use of this material and by the development of vulcanisation which stabilises rubber and allows it to be used across a much wider range of temperatures. The booms were concentrated in the Amazon forests of Brazil, where latex was collected from rubber trees, until Sir Henry Wickham smuggled tens of thousands of seeds back to Kew Gardens in London. These were then transplanted to South and South-East Asia, where they were used to establish rubber plantations that not only became central to local, regional and global economies, but led to mass migration through the familiar practice of indentured labour.⁹¹

Developments such as these fuelled the Great Divergence – the shift by which the western world caught up with, overtook and dominated vast parts of the world. To most Europeans, this was a story of entitlement as much as one of enlightenment, a natural outcome of inherent sophistication and progress which those living in other parts of the world could not and never would match, a result even of racial superiority. Underpinning all these ideas, however, were the cold realities of resource exploitation, of the creation and improvement of supply chains and of turning blind eyes to abuses, of not asking too many questions about who lost while others gained.

Such questions were hardly new. After all, many societies had experienced problems of over-consumption, exhaustion of natural resources or strains on ecosystems that were excessive and unsustainable. Centralised states had at their roots the principle of drawing in resources of all kinds – whether minerals or metals, animals or foodstuffs, tax revenues or human labour – from the periphery to the core. What was different in the centuries that followed Columbus, however, was the global scale on which these cycles operated. Exploitation of landscapes no longer just meant pushing geographic frontiers beyond existing territories, it meant an expansion across oceans and continents.

This in turn was enabled by advances that are easy to dismiss as dull or to overlook altogether, in matters like the logistics of shipping,

including docking facilities that enabled rapid turnaround of vessels and the efficient onward distribution of goods; or like the calculation of pricing when purchasing goods at source, which in turn owed much to information gathering and analysis, taking in factors such as the size of harvest, the value of commodities or weather factors.

Calculations like these were extensive and constant, and not just for Europeans involved with trade of all kinds. For example, traders in Angola deliberately restricted the number of captives in the market place at any one time in order to drive prices up. Then there was disease, illness and malnutrition that also led to extensive loss of life: an estimated 6 million enslaved men, women and children who never even made it on to a ship, let alone across the ocean, lost their lives as a result of the transatlantic slave trade.⁹²

Trading seasons for trafficking captives from Africa to the New World meanwhile were dictated by rainfall: it was difficult for merchants to move heavy cargoes during downpours that directly affected the ability to reach coastal ports from the interior. Navigational dangers increased during the tropical rainy seasons in Africa, the Guianas and north-east Brazil, while estuarial sandbars off the coast of West Africa and reefs off that of the Americas posed additional risks that rose and fell depending on season and on seasonal variations.

This was not the full extent of the relationship between slavery and climatic conditions. In fact, Atlantic rainfall in Africa not only impacted harvests, but shaped the distribution of crops, determined growing seasons and directed the farming calendar. This was important, of course, in its own right for domestic agricultural production, but it was significant too for the wider trade in terms of selling cash crops to Europe and for buying foodstuffs for enslaved Africans. As such, there were optimal times for sellers to seek to profit, with exports highest in September–October, immediately after the yam harvest, and lowest during yam planting in May–June. These rhythms suited merchants, as they also fitted around supply constraints in Atlantic Africa and allowed provisioning before the ocean crossing. As one agent of the Royal African Company put it, the ‘best time for Negroes to arrive is between December & June, being a healthy time & affording plenty of provisions, and ye rest of ye Year being ye reverse’. Such realities underpinned the transatlantic slave trade.⁹³

The role of climatic and weather conditions was closely linked in other ways too. For example, higher temperatures had an impact on rainfall levels and on agricultural production. Rises of just 1 °C resulted in measurable and significant reductions in exports of coerced labour – a phenomenon best explained by the rising costs of enslavement since provisions needed to be obtained for those who had been enslaved and for those who enslaved them. These trends were particularly marked in drier regions which were more sensitive to changes in temperature and rainfall and where agricultural productivity varied accordingly. Furthermore, warmer conditions resulted in higher mortality levels, both as a result of an increased disease burden and because of food scarcities, with again the results being most striking in regions that were least ecologically resilient and those where pathogens flourished most easily.⁹⁴

As with the sources of goods that made life in Europe more interesting, more exciting and more varied, these rhythms were difficult to identify or even to see. In some ways, this is not a surprise, for invisibility characterised the way that history itself was written. The arrival of the pilgrims aboard the *Mayflower* in Plymouth Bay in 1620, for example, was seen for centuries as a seminal moment in the telling of the origins of the United States, while the landing of the *White Lion*, the first known arrival of indentured Africans at Old Point Comfort in Hampton, Virginia, a year earlier was relegated to footnotes, or not mentioned at all. The foundation of many of the most illustrious seats of learning in the United States, including Princeton, Yale, Georgetown and Harvard, owed much to the profits of slavery and in the case of University of Virginia to coerced labour itself.⁹⁵ US politics likewise owe much to the fruits of slavery, with more than 1,700 members of Congress between 1789 and the 1920s ‘owning’ or having once ‘owned’ other human beings.⁹⁶

Not everyone was blind to the new world that was being opened up by long-distance trade. ‘I never more will drink Sugar in my Tea,’ wrote Aaron Thomas, ship’s purser who saw for himself the backbreaking way sugar was made and the conditions it was made in; ‘it is nothing but Negroe’s blood’.⁹⁷ Others too were clear-sighted about just how important the exploitation of humans and nature was. ‘If the negro trade was lost,’ one businessman of the mid-eighteenth century

observed, 'the Colonies must be lost.'⁹⁸ There was a choice to be made, in other words: wealth and glory; or compassion and fewer rewards.

Daniel Defoe, later to find fame as author of *Robinson Crusoe*, set out the equation in similar terms. 'No African trade, no negroes,' he argued; then 'no negroes, no sugars, gingers, indicoes etc; no sugar etc no islands, no islands, no continent, no continent, no trade.'⁹⁹ He could have added 'no empire, no rise of the west'. Defoe was no critic of the slave trade, in fact quite the opposite, this comment coming not from a critique but from an impassioned defence of the importance of British commerce: the slave trade was vital to trade in general; in Defoe's eyes, that justified the violence done to African men and women.¹⁰⁰ Some, like the Quakers, took increasingly principled stands, with Joseph Woods in 1784 questioning whether it was 'better a thousand poor unoffending people should be degraded and destroyed [than] the inhabitants of Europe should pay a higher price for their rum, rice and sugar?' Those who buy any such goods, observed a contemporary, 'become partaker in the guilt of it'.¹⁰¹

Few took such principled views, preferring to look the other way – or to benefit directly from trade. The 'discovery' of the Americas was of course nothing of the sort; indeed, despite his place in historical narratives, Columbus was not even the first European to cross the Atlantic. And yet the new arrivals reshaped and renamed the world they now stepped into and that they regarded as theirs by right. New names reflecting the triumph of Europe were layered over those of indigenous peoples. Continents, countries and states came to bear the names of their conquerors and new masters, from America to Colombia, named for Amerigo Vespucci and Columbus, from Pennsylvania, named after William Penn, to Venezuela – literally 'Little Venice', because the houses that local populations lived in on stilts surrounded by water reminded the Spanish of the Italian city.

Yet the idea that the Europeans embarked on an Age of Discovery, a golden age that is associated with a sense of curiosity and exploration, of adventure and search for knowledge obscures the fact that the driving force behind the expansion of horizons was merchant capital and the thirst for financial rewards. There were scholars, certainly, whose minds were inspired and opened by new possibilities; but, as in any day and age, scientific research has always been closely linked to the availability

of resources, of funds and of time that allows the flapping of intellectual wings in place of the planting and harvesting of crops.

This model shaped the world of today in the Americas as well as in Africa. For example, regions in the Americas that were well suited to cash crops that required intensive farming and benefited from large pools of labour became places with high levels of inequality and limited distribution of rights among the population. Locations better suited to less intensive forms of agricultural production on the other hand – regions that favoured the growing of wheat, for example – proved to be more egalitarian, with better distribution of rights among the population. The short explanation for this is that crops that required lower labour input produced smaller profits and therefore meant there was less to fight over, and more reason to co-operate. This is one of the reasons why it is possible to identify a strong relationship between a country's socio-economic development and its distance from the equator.¹⁰²

What mattered, of course, was the combination of temperature, rainfall and soil quality that in turn together determines where particular crops could – and could not – be grown. But the disease environments of tropical locations were of key importance too. In an alternative reality where African sailors had crossed the Atlantic first and taken advantage of conditions the way that the Europeans managed to do, the last 500 years of the world's history would have been very different indeed.

Whether this different scenario would have meant no transatlantic slavery, however, is another matter. For one thing, the ability of Europeans to ship millions of people across the ocean owed much to the existence of established markets for enslaved people in Africa that they could tap into easily and quickly – even if the insatiable appetites became overwhelming almost immediately. By 1516, some African leaders were already demanding a stop to the enslavement of local populations, begging for it even, for it was already clear that it brought negative and damaging results locally. African slavery was not only a transatlantic issue. Around two million of the estimated seven million people enslaved or sold by the Ottomans came from sub-Saharan Africa. Some caravans are attested to have conveyed thousands of captives, while other records suggest annual sales to port cities in the Red Sea of as many as 10,000 people per year.¹⁰³

Over the long term, the impacts of slavery on Africa were catastrophic. By 1800, the population of the continent was half of what

it would have been had the slave trade not existed.¹⁰⁴ That of course meant that manpower that would and could have been involved either in ecological transformations of Africa or in other productive activities was deployed elsewhere and for the benefit of others.¹⁰⁵ Indeed, even the end of the slave trade did not immediately result in more positive outcomes; in some parts of Africa, for example, prisoners of war had previously been sold into captivity. With this option closed off, many were put to death.¹⁰⁶

But there were more profound effects that changed social and political development in many parts of the continent too. Supplying captives to traders on the coast demanded constant raiding to secure near endless numbers of captives – which created a vicious and circular world of enslaving or being enslaved. That in itself had other consequences, not least demand for weapons and above all guns – areas in which Europeans had an advantage by the time of enhanced contact with Africa, an advantage maintained and furthered in part thanks to the sheer number of conflicts in Europe and between Europeans that incentivised the development of improvements in reliability of firearms.¹⁰⁷ The demand for guns, itself in part a function of the need both to defend against raiding and to use in raids, became a motor of intensification of the slave trade in its own right, as well as propelling the emergence of highly centralised states dominated by military elites such as Oyo, Dahomey and Asante, each of whose fortunes were closely connected to the European expansion.¹⁰⁸

While some of these states consolidated, others splintered, with the Jolof confederation splitting into a series of smaller kingdoms under the pressures and demands of slave traders that were so great that some rulers in West Africa complained that it was not only prisoners of war, members of minorities and those of low status who were being sold and shipped across the seas, but high-ranking figures and even members of royal families.¹⁰⁹

In this age of mounting violence and insecurity, it was perhaps not surprising that ties between villages weakened, communities became introverted and levels of trust plummeted dramatically.¹¹⁰ Societies atomised and disintegrated, leading to fragmentation that encouraged differentiation along ethnic and other grounds. Research has suggested that these breakdowns developed into long-term issues which are still prevalent today in many parts of West Africa, and explain low levels

of co-operation, low levels of trust and poor economic performance. Regions that provided large numbers of captives to be shipped across the Atlantic are worse off now thanks to the historical effects of slavery. In other words, it is not just that peoples and places in Africa paid a heavy price centuries ago; they continue to do so to this day.¹¹¹

Slave raiding had a significant impact on age and gender balances, with demand being heavily skewed in favour of securing male captives of working age whose labour was most valuable across the Atlantic. The instructions given to Cesar Lawson, a slave-ship captain, by a member of the merchant consortium in Liverpool were typical. The vessel under Lawson's command was 'allowed to carry 400 Negroes, and we request that they be all males, if possible to get them, at any rate buy as few females as in your power'. It was important, Lawson was told, to 'be very particular, select those that are well formed and strong; and do not buy any above 24 years of Age'. The captain's patrons further instructed him to keep the ship 'very clean' and to maintain discipline on board. Lawson was also told to ensure that no officers or crew 'abuse or insult them in any respect'. In the world of slavery, this passed for a rare expression of kindness.¹¹²

Investigation of the impact of gender both in locations where enslaved people were taken from and in those they were exported to is complicated by the fact that the proportion of women and children taken across the Atlantic varied greatly by region and changed over time. Price differentials between men and women generally were much smaller in the Americas than in Africa, partly because planters soon recognised that enslaved African women had a high work rate.¹¹³ In fact, on some estates, women made up the majority of field hands. Gender shaped work roles beyond the fields too, with men being used as mechanics, blacksmiths, carpenters, coopers, masons and so on, while women were made to cook, nurse and act as midwives – jobs that brought less prestige and fewer material rewards than the men's, which in turn affected models and expectations both within slave populations and beyond.¹¹⁴

Rape and sexual fantasies were particularly virulent among enslavers and white settlers, with some scholars arguing that ideas about abuse and the use of violence became more prominent, not less so, over time.¹¹⁵ Women who chose to acquiesce, either in the hope of material rewards or to self-convince that they had choices that did not exist in reality, had little chance of seeing their offspring being freed, although again patterns were different in different locations with manumission of

sexual partners and children more common in the Spanish West Indies than in most other regions.¹¹⁶

There was, of course, considerable variation in the ways that enslaved people were treated, dependent not only on the personality of the 'owner' but on the size of plantation, its location and what work a coerced labourer was made to do: those working in enslaver homes typically benefited from better food, clothing and housing than those forced to work in the fields, and endured less exposure to disease, heat exhaustion, frostbite, snakebite and more. Hierarchies were created among enslaved social groups, in other words, based on proximity to those who exploited unfree labour.¹¹⁷

The effects of the slave trade in Africa were also significant. For example, scholars have noted that the prevalence of polygyny (men having more than one wife) is strikingly high today in regions that were sources of large numbers of enslaved men, such as Guinea, Togo and Benin – where the numbers with multiple wives are three times higher than in countries in East Africa. This has been linked to skewed sex ratios caused by the strong preference for male coerced labour in the Caribbean and Brazil, the main destinations for the exports of human captives, mirrored by the demand for enslaved women from East Africa who were sold into slavery as household staff and concubines in the Middle East and India.¹¹⁸

There is evidence to suggest that these patterns were reduced in districts that received intensive Christian missions during the later colonial period.¹¹⁹ This is important, as models show that the banning of polygyny reduces fertility, increases savings, produces significant uplifts in GDP per capita and reduces gender inequality – raising separate questions about the impact of slavery and the period that followed its abolition in the early nineteenth century.¹²⁰ In regions where polygyny persists, on the other hand, incidences of HIV infection rates, violence and child mortality rates are high.¹²¹ However, there are more progressive outcomes too, including higher levels of women's participation in the labour force, an increased likelihood that women will vote and broader-minded views about women as political leaders.¹²²

Such then were the profound and many impacts that resulted from the 'discovery' of the Americas that followed Columbus' crossing of the Atlantic in 1492. Global ecosystems were knitted together through transformations of landscapes, the emergence of new tastes driven by widening demand that were in turn propelled by consumption patterns

and spending power, above all in coastal regions of western and northern Europe. All this came at the expense of indigenous populations in the Americas and of the millions shipped from Africa who ironically were better suited and more resilient in climate and disease environments than the Europeans who dominated, controlled and 'owned' them.

The sense of entitlement extended even further. The philosopher John Locke, for example, writing in the late seventeenth century, proposed that every person had an equal right to use natural resources, as these were provided by the 'spontaneous hand of nature'. If, however, one worked the land oneself, that land should become one's property. For Locke, human intervention changed the status of land itself from 'the common state of nature' to something that 'excludes the common right of other men'. Labour, in other words, was the foundation of private property.¹²³

Ideas like this naturally had resonance as European settlers fanned out around the world, especially when they moved into lands that had not been cultivated or were lived on by nomadic and tribal peoples. As the Reverend Samuel Stoddard, a Puritan minister in Boston, put it in 1722, it was entirely reasonable to take land from the indigenous peoples as they 'made no use of it, but for hunting'. In this particular case, the local population had at least been paid a nominal sum for some of their land; they were lucky, said Stoddard, given that the land had no value in their hands. For the settlers, however, it would be rendered valuable after 'our improvements' had been made to it.¹²⁴

It was a similar story in other parts of the world, where Dutch, British and other jurists and philosophers relied heavily on humanist ideas that private property related only to land that an owner cultivated and transformed. Anything else was *terra nullius* – virgin land that could be claimed and taken over.¹²⁵ One good example comes from Assam in India, where British authorities declared that land that was not planted with cash crops was deemed to be 'waste land'. This meant that it was deemed unowned and capable of being claimed or given out as a grant to settlers, usually for free.¹²⁶ Another example can be found in legislation in the United States, such as the Homestead Act (1862), which entitled any adult citizen or intended citizen to claim 160 acres of surveyed government land as long as they improved and 'cultivated' it, and allowed land to be taken from indigenous peoples if it was deemed suitable for agriculture or grazing – by newcomers.¹²⁷

The story is not just one of human exploitation of nature, nor even one of humans' exploitation of each other. Insects played a role in shaping social, economic and political change, as did pathogens, precipitation patterns and soil conditions not only in the New World but beyond. One thing, however, was clear: the intensification of exchange had dramatic consequences. It seemed inevitable, therefore, that the emergence and development of new technologies was likely to produce a familiar pattern of exploitation of all kinds, of inequality and of unsustainability. The question was who would do well, and who would pay the price.

17

The Little Ice Age (c.1550–c.1800)

There was great scarcity in the cities and villages of India ... men took to eating one another.

Abū al-Faḡl, *Ain-I Akbari* (late sixteenth century)

In April 1939, a committee on glaciers at the American Geophysical Union delivered a report which stated that glaciers had advanced over the course of the previous century by a 'far greater extent and volume' than they had done in the past, and suggested that 'We are living in an epoch of renewed but moderate glaciation – a "little ice age".'¹ Although the committee took the long view of the duration of this epoch, suggesting a time frame of 'about 4,000 years' for global cooling, the idea of the Little Ice Age caught the imagination of historians, who typically use the label to refer to the period from the sixteenth to the nineteenth century.²

While the problems of trying to identify even vague start and finish points given the vast range of global, regional and local variations are obvious, many scholars have argued that it is possible to paint a broad picture of changing climatic conditions that spanned several centuries, which is attested by tree-ring data, morphostratigraphic evidence and glacier evidence.³ Three periods of low solar activity are often noted as being key factors in climatic changes in this period – namely the Spörer Minimum (1420–1550), the Maunder Minimum (1645–1715) and the Dalton Minimum (1790–1830).⁴ The Little Ice Age is said