Ecological Imperialism

The Biological Expansion of Europe, 900–1900
Second Edition

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CAMBRIDGE UNIVERSITY PRESS
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Preface to the new edition

Each generation of scholarly historians has not a universal but at least a common and characteristic way of looking at the past—a paradigm, if you will, but that is too ponderous a word for me. Let's call it a scenario.

The scenario a century ago of historians, nearly all of them Europeans or Euro-Americans, about modern imperialism and the industrial revolution was simple. The Europeans had conquered or at least cowed nearly everyone else in the world because the Europeans were the best people in the world. This phenomenon was especially clear in what I call the Neo-Europes—the United States, Argentina, Australia, and the like—where historians were sure there had never been many indigenous humans and the few survivors were obviously obsolescent.

The industrial revolution had happened first in Europe because everything important started there, as it always
had since—oh—Aristotle. White people were better at machines, administration, and business than other people.

It is easy—even fun—to criticize the historians of the Victorian era, but they did nothing more contemptible than to draw their conclusions from the evidence they had at hand. Native American populations from the Arctic to Tierra del Fuego, along with those of Australian Aborigines and New Zealand Maori, seemed to be plunging to extinction, while European and Neo-European populations were exploding. Their factories were smoking away in Manchester, the Ruhr, and Pittsburgh. Their railroads spanned North America, there were plans for Trans-Siberian and Cape-to-Cairo equivalents, and the sun couldn’t set on the British empire no matter how hard it tried.

Then came the world wars, Gandhi, Lenin and Mao and the Marxist evangelists, innumerable colonial uprisings—and the need for a new historical scenario. That scenario rocketed to notoriety in the trying times of the 1960s and soon achieved the status of “political correctness.” Its theme was that European imperialism had succeeded because of European brutality, superior military technology, and capitalist encroachments. And, oh yes, the industrial revolution was a capitalist scam and an ecological disaster.

We have, guided by this scenario, learned a great deal about our pasts that we had never known or at least consciously acknowledged. I learned that, as one of my T-shirts from Chicago’s Field Museum proclaims, “Columbus didn’t discover America; He invaded it.” I learned that more Africans than Europeans came to the New World in the first three post-Columbian centuries. I learned that the industrial revolution was so unhealthy for most of those it supposedly benefited that for several generations they were literally shorter than their peasant ancestors.

... And so on and so on. For historians the closing decades of the twentieth century were chilly, and we found that the best way to keep warm was to maintain a furious tirade against our society’s and profession’s founding fathers. (No founding mothers, of course.)

But all scenarios, including this one, have weaknesses and omissions. Yes, European imperialists were egomaniacal about themselves, their religions, and their customs, and they had short tempers and long swords, but why were they so much more successful in the Americas and the Pacific than in Asia or Africa? Why, for instance, had Native American resistance been so ineffective?

Yes, the Europeans had joint-stock companies and banks with international connections, but they also had numerous and mutually injurious wars, and the Protestants hated the Catholics and the Catholics hated the Protestants and they both beat up on the Jews. Who would have looked at England under Cromwell or at Germany at the end of the Thirty Years War and predicted their industrializations?

Yes, the Europeans had specific advantages, but other peoples had theirs, too. How is it that the Europeans’ advantages enabled them to soar to world hegemony? And how is it that their advantages led to the industrial revolution while previous imperialist thrusts had never produced such revolutions but only more empires?

We historians have not been sitting on our hands. We’ve been at our computer keyboards day and night and are framing a scenario that answers or at least faces up to those questions, a scenario for the twenty-first century.¹

In 1492 and for at least the next two centuries, and probably three, the societies of humanity’s several

¹ The clearest exposition of the new scenario that I have come across is Kenneth Pomeranz’s The Great Divergence: China, Europe, and the Modern World Economy (Princeton: Princeton University Press, 2000).

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civilizations were each materially incapable of achieving world hegemony. They didn’t have the capital or markets to drive and support a true and permanent industrial revolution. All but a few of their people were engaged in producing the bare necessities—food, fuel, shelter—and if they went off to do something else, stark poverty and famine would follow. There wasn’t sufficient nonfarm population to staff the factories, if they ever did appear.

At least one of the aforesaid societies would have to somehow enormously increase its productivity. That quantum jump would have to be made before the various scientific, technological, agricultural, and industrial revolutions on which our post-quantum-leap world rests. It could only be accomplished by exploiting the ecosystems, mineral resources, and human assets of whole continents outside the lands of the society making the jump.

Western Europe did just that by means of its brutality and guns and, more important, by geographical and ecological luck. The Europeans made the oceans into highways, arrived in America with guns for conquest and with infectious diseases for decimating indigenous populations, and opened whole regions for immigrant settlement and exploitation, i.e., for making the New World into an enormous and varied adjunct to European societies and economies.

Years ago I spent several happy months as a Fulbright Fellow in New Zealand. There I heard the Kiwis’ mildly self-disparaging (and today anachronistic) nickname for their country: “Britain’s off-shore farm.” Europe’s first off-shore farm was the whole New World.

The Europeans arrived there with crops and livestock pre-adapted to American environments. For example, the sugarcane plantations of Brazil and the West Indies became moneymaking machines for the imperial institutions, public and private, and important sources of calories for Europe’s populations. The Europeans returned home with
them, with little in the way of hinterland. They have to
depend on infusions of foreign capital and on the product-
tivity of scientific agriculture, if and when they acquire ex-
pertise in that field. I wish them well.

That, I think, is the new scenario, and I am proud to have
contributed to it. I wonder how long it will suffice.

Acknowledgments

It is impossible to give credit to all the people whose
help in writing this book was indispensable: the legions of
librarians, especially those who labored obscurely at the
business of interlibrary loans, the colleagues who offered
careful criticisms, and – more important and more dif-
cult to remember – those who looked over my shoulder
and made offhand remarks that set me on paths that oth-
erwise I would never have found. I want particularly to
thank the University of Texas Library for amassing such
a magnificent collection of sources and the University of
Texas for being generous in granting me time and funds
for my research. A Fulbright fellowship at the Alexander
Turnbull Library in New Zealand and a year and a half
in New Haven, Connecticut, at the National Humani-
tics Institute and as William B. Cardozo Lecturer at Yale
University were also vital to my work. I also thank The
introduced plants — weeds — in three fields, one that had been undisturbed for two years, another for thirty years, and another for two hundred years. The percentages of weeds, respectively, were 51 percent, 13 percent, and 6 percent. *Weeds thrive on radical change, not stability.* That, in the abstract, is the reason for the triumph of European weeds in the Neo-Europes, concerning which we shall have more to say in Chapter 11 in a general discussion of the success of Old World species overseas.

What has all this about weeds to do with European humans in the Neo-Europes, beyond providing latter-day investigators with a model for the success of other exotic organisms — humans, for instance? The simple answer is that the weeds were crucially important to the prosperity of the advancing Europeans and Neo-Europeans. The weeds, like skin transplants placed over broad areas of abraded and burned flesh, aided in healing the raw wounds that the invaders tore in the earth. The exotic plants saved newly cleared topsoil from water and wind erosion and from baking in the sun. And the weeds often became essential feed for exotic livestock, as these in turn were for their masters. The colonizing Europeans who cursed their colonizing plants were wretched ingrates.

*We have a bellyfull of victuals everyday, our cows run about, and come home full of milk, our hogs get fat of themselves in the woods: oh, this is a good country.*

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THE MARINHEIROS TAUGHT their apprentices how to cross the oceans, and the latter did so, taking large numbers of people with them. Then the passengers, landsmen and women, had to make homelands of their new lands. The task was not beyond the range of their capabilities — they could have managed, given enough time — but it was beyond the range of their preferences. They were Europeans, not Americans or Australasians, and would never have adapted voluntarily to the new lands in their pristine condition. The migrant Europeans could reach and even conquer, but not make colonies of settlement of these pieces of alien earth until they became a good deal more like Europe than they were when the marinheiros first saw them. Fortunately for the Europeans, their domesticated and lithely adaptable animals were very effective at initiating that change.

The prospective European colonists were livestock people, as their ancestors had been for millennia. The founders of the Neo-Europes were descendants, culturally and often genetically, of the Indo-Europeans, a west central Eurasian people who spoke the ancestral language of most of the tongues of Europe (English, French, Spanish, Portuguese, German, Russian, etc.), a people who were practicing mixed farming, with heavy emphasis on herding, 4,500 years before Columbus.¹ The Europeans who founded the first transoceanic empires were also mixed farmers and pastoralists (they would have understood the Indo-Europeans’ way of life more readily than our own), and the success of their animals was, generally speaking, their success.

The Europeans brought with them crop plants, which gave them a very important advantage over the Australian Aborigines, none of whom farmed, and who were slow to take it up. But the Amerindians possessed a number of productive, nourishing plants whose value the invaders quickly acknowledged by cultivating themselves. Cassava is one of the staples of Euroamericans in the tropics, especially in Brazil, and maize is a standard food of Euroamericans nearly everywhere, as it was of Australian colonists in the late eighteenth and early nineteenth centuries.² The European advantage over the indigene of their overseas colonies was not so much a matter of crop plants as of domesticated animals.

The Australian Aborigines had only one domesticated animal, the dingo, a knee-high dog of the size the English used for chasing foxes.³ Amerindians also had dogs, plus llamas, alpacas, guinea pigs, and several kinds of fowl, but that was all. For almost every purpose — for food, leather, fiber, or carrying or pulling burdens — the domesticated animals of America and Australia were inferior to those of the Old World. If the Europeans had arrived in the New World and Australasia with twentieth-century technology in hand, but no animals, they would not have made as great a change as they did by arriving with horses, cattle, pigs, goats, sheep, asses, chickens, cats, and so forth. Because these animals are self-replicators, the efficiency and speed with which they can alter environments, even continental environments, are superior to those for any machine we have thus far devised.

Let us begin with what is possibly the “weediest” of all the large domesticated animals, the pig. Pigs convert one-fifth of what they eat into food for human consumption, as compared with one twentieth or less for beef steers. (These statistics pertain to twentieth-century livestock, which are larger than in past centuries, but we can assume that as a matter of proportion, the difference in the food-producing efficiencies of pigs and steers was in the colonial period approximately what it is today.) Pigs, unfortunately for hungry humans, eat concentrated carbohydrates and proteins, foods that are often fit for direct human consumption, which reduces the value of swine to us. Even so, there is no doubt of their importance, espe-
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particularly in the early years of a given colony when there was often an abundance of carbohydrate and protein and few settlers to exploit it.

Swine are omnivorous, and there were more kinds of nourishment available to them in the early colonies across the seas than to any of the species of imported animals that were to be of prime importance economically. They are practically anything of organic origin: nuts of all kinds, windfall fruit, roots, grass, any animal too small to defend itself. They especially fancied peaches in Carolina and Virginia, where “large Orchards are planted of them to feed Hogs with, which when they are satiated of the fleshy Part, crack the Shells and eat the Kernels only.” In New England they learned to root for and thrive on clams: “they will not faile at low water to be with them.” In Sydney, wrote an early visitor, the pigs “are allowed to run in the bush during the day, just giving each a cob of maize to bring it home in the evening... They feed on grasses, herbs, wild roots and native yams, on the margins of rivers and marshy grounds, and also on frogs, lizards, etc. which come their way.”

Pigs did not prosper in the very cold regions of the colonies, for obvious reasons, nor in bare, hot country, because they cannot tolerate strong, direct sunlight and unmitigated heat; they must have easy access to water and cover in the tropics. But in most of the early colonies in the Americas and Australasia there was enough moisture and shade to satisfy pigs, plus an abundance of roots and mast — and soon after the arrival of the whites a great plenty of pigs. The great exceptions to the rule that pigs did magnificently in the early colonies were the grasslands — too bare, too sunny — yet even in the pampa they swarmed along the watercourses.

Healthy sows have large litters, up to ten or more piglets apiece, and with an abundance of food, pigs can increase at the velocity of funds deposited at high compound interest.

Within a few years of Españaola’s discovery, the number running wild was “infinios,” and “all the mountains swarmed with them.” They spread to the other Greater Antilles and to the mainland in the 1490s, where they continued to multiply rapidly. They followed in the footsteps of Francisco Pizarro (who allegedly began life as a swineherd) and were soon doubling and redoubling their numbers in the area of the conquered Incan empire. Their rate of increase on the mainland was probably lower than in the West Indies because of the former’s carnivores, but pigs soon increased to many, many thousands on the continents — infinios again. Every last one of these swarms of pigs, said the saintly Las Casas, were descendants of the eight pigs that Columbus had bought for seventy maravedis each in the Canaries and brought to Españaola in 1493.

The swinish multitudes rooting through the swamps, jungles, and savannas of Brazil by the end of the sixteenth century presumably had other origins, as did the pigs of Port Royal, Nova Scotia, France’s first successful American colony, where they multiplied and often slept out-of-doors in the winter of 1666–67. Some of those in early Virginia could have been descendants of the Columbian eight, picked up in the West Indies on those voyages that took the English colonists across the Atlantic in the trade-wind belt. Whatever their origin, they thrived in Virginia, and circa 1700 did “swarm like Vermin upon the Earth, and are often accounted such, insomuch that when an Inventory of any considerable Man’s Estate is taken by the Executors, the Hogs are left out, and not listed in the Appraisement. The Hogs run where they list and find their own Support in the Woods without any Care of the Owners.”

Pigs were the favorite choice of explorers, pirates, whalers, and sealers for “seeding” remote islands to assure a supply of meat on the hoof for the next set of transient Europeans or Neo-Europeans to come along. As a result, pigs were already running wild on islands in the Río de la
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Plata, on Barbados and Bermuda, on Sable Island off Nova Scotia, on the Channel Islands off California, and on islands in the Bass Strait between Tasmania and the mainland when mention of those patches of land first appears in the written record. 14

In Australia, pigs swept inland from Sydney, keeping pace with or trotting along in advance of the frontier. They were almost as much a part of the usual station (ranch) as the sheep, scavenging the environs for kilometers around. On the more sloppily run establishments they might be seen no more often than once a month. Many, of course, were not domesticated even to that extent. 15 In the twentieth century, the wild pigs of Australia, though thousands have been shot, poisoned, and electrocuted, have a range that includes most of the eastern third of the continent. 16

After a few generations, feral pigs revert to a type very different from what we are accustomed to seeing in the barnyard. Long-legged and long-snouted, slab-sided, narrow-backed, fast and vicious, and equipped with long, sharp tusks, they earned the same name in both North America and Australia: razorback. 17 The razorback is a bad-tempered beast, especially the boars, an Argentinian example of which nearly robbed us of Green Mansions and several good books on the pampa by almost unhorsing the young William H. Hudson, after which the animal almost certainly would have sabered and eaten the prospective author. 18

Today, wild pigs, except in a few remaining frontier areas, are at best game animals and at worst a nuisance and danger, but from the Antilles in the 1490s to Queensland in the late nineteenth century they were a very important source of food. They provided for themselves—completely, if given the opportunity—and their meat was flavorful, nourishing and free. The first generations of European settlers in most of the colonies in America and Australasia ate pork more often than any other flesh.

CATTLE have, from the human point of view, at least two advantages over pigs: They are equipped with more efficient thermoregulating systems and are more tolerant of heat and direct sunlight; they specialize in turning cellulose—grass, leaves, sprouts—that humans cannot digest into meat, milk, fiber, and leather, in addition to serving as draft animals. These characteristics, added to the natural self-reliance of cattle, make them a species as good at taking care of themselves in open grassland as pigs are in forest and jungle. The cattle that Columbus carried from the Canaries to Española in 1493 certainly had that capability, as did their descendants who were living as breeding herds in the West Indies by about 1512, in Mexico in the 1520s, in the Inca region in the 1530s, and in Florida in 1565. By the end of the century they were in New Mexico, and in 1769 they arrived in Alta California. 19 Their story is not one of uniform success everywhere. In steamy Brazil and the Colombian and Venezuelan llanos, Iberian cattle took generations to adapt; but in the higher country they exploded in numbers, dropping calves at what the colonists thought amazing rates. At the end of the sixteenth century, the cattle herds in northern Mexico may have been doubling every fifteen years or so, and one French visitor wrote his king of the “great, level plains, stretching endlessly and everywhere covered with an infinite number of cattle.” 20 They were completely naturalized, as permanent a part of the fauna as the deer and coyotes, and still advancing north. A century and three quarters later, Friar Juan Agustín de Morfi, traveling through that part of Mexico called Texas, saw “amazing” numbers of wild cattle. 21

What happened to cattle on the pampa was even more amazing. The first European settlement at Buenos Aires failed, but the Spanish tried again, successfully, in 1580. By that date, European quadrupeds, descendants of the first settlement’s strays or of feral animals that drifted in from other European outposts, were already present in large
numbers: The origins of the feral herds cast of the Río de la Plata in what is now Uruguay and Río Grande do Sul are also obscure. The Spanish or the Portuguese or the Jesuits may have introduced livestock first, and all three groups brought in cattle and horses eventually. The first solid date we have is 1638, when Jesuits abandoned a mission in the area, leaving 5,000 head of cattle behind. We can be sure the freed animals propagated at high rates, as did all the herds of the pampa. In 1619, the governor of Buenos Aires reported that 80,000 cattle per year could be harvested for their hides without decreasing the wild herds. The trustworthy Félix de Azara, who told us about weeds in the pampa in the last chapter, estimated the number of cattle in that grassland between 26°S and 41°S circa 1700 at 48 million, feral cattle in numbers comparable to those of buffalo on the Great Plains in their heyday.

The cattle on the pampa were never properly counted until late in their history, and so a caveat should accompany Azara’s estimate: 48 million, plus or minus how many? A quarter, even a half? The bovine multitudes inspired not statistics, but awe. William Hudson, in his autobiography, remembered plantations and orchards in mid-nineteenth-century Argentina with walls built entirely of cows’ skulls, seven, eight, or nine deep, placed evenly like stones, with the horns projecting. Hundreds of thousands of skulls had been used thus, and some of the old, very long walls, crowned with green grass and with creepers and wild flowers growing from the cavities of the bones, had a strangely picturesque but somewhat uncanny appearance.

The majority of the cattle of the Americas from the sixteenth to the nineteenth century were probably feral. As with the pigs, their environment rendered them fast, lean, and mean—the kind of cattle that meat packers describe as “eight pounds of hamburger on eight hundred pounds of bone and horn”—animals that when fully grown could take on nearly any challenge. In the viceroyalty of Río de la Plata, according to Father Martin Dobrizhoffer, the cows could not be milked unless their feet were tied and their calves were present, and the cows and bulls alike moved “with a sort of ferocious arrogance,” holding their heads high like stags, which they almost equaled in speed. When Anglo settlers began moving into Texas in the 1820s, they found these cattle more difficult to catch and more dangerous to handle than mustangs.

The cattle that came to French and British North America were not so agile, so fearsomely equipped with long horns, nor so vicious when accosted as the Iberian cattle, but they, too, were a hardy lot. A cattle frontier preceded the European farmers as they moved west from the Atlantic, even though forests were thick and broad expanses of meadow uncommon. Not until the Neo-Europeans moved onto the vast grasslands of middle North America in the nineteenth century were the numbers of their cattle comparable to the herds of colonial Ibero-America, but there were enough of them in the eighteenth century to impress Europeans who had never visited the southern steppes. Shortly after 1700, John Lawson remarked that the stocks of cattle in Carolina were “incredible, being from one to two thousand Head in one Man’s possession.”

Some of the English cattle were feral, some tame, and all of them hardy. Within thirty years of the founding of Maryland, the settlers were complaining that their stocks of cattle were being “molested by reason of several heard of Wilde Cattle resorting amongst their tame.” Two human generations later, cattle on the South Carolina and Georgia frontier were migrating west “under the auspices of cowpen keepers, which move (like unto the antient patriarch or the modern Bedowin in Arabia) from forest to forest as the grass wears out or the planters approach.” We, of course, can make an educated guess as to what replaced the worn-out native grasses.
To maintain a measure of control over these frontier cattle and the other semidomesticated animals that roamed the woods from Nova Scotia to the lower Mississippi, one easily obtained item was needed: salt. A stockman would locate his herd by listening for the bell hung round the neck of the herd leader and then approach with a cake of salt in his outstretched hand. While the animals licked the salt, he could harness or yoke or select for slaughtering those he wanted.31

These herds of only semidomesticated animals wandering in the forests and canebrakes had no easy time of it. The full trough, the warm barn, the attentive herdsman were unknown to them. Their weakest went to feed the cougars and wolves, died foundering up to their withers in bogs, froze in blizzards, “pined and starved.” But the survivors made up the losses and more in the months of warmth and lush forage, and continued to mosey farther into the North American wilderness.32

In the nineteenth century, Australia established itself as one of the chief wool and mutton producers in the world; but nature did not foreordain that sheep should dominate in the antipodes. The mechanization of Europe’s textile industry did that, and without that influence, feral cattle might have taken over as thoroughly as they did, for instance, in Texas.

The colonizing First Fleet arrived in Australian waters in 1788 with a discomforting number of livestock on board, obtained at Cape Town, South Africa. The master’s mate on the Sirius declared that the ship looked like a livery stable. Among the animals were two bulls and six cows. Within the first few months at Sydney, these eight animals strayed off or, some said, were driven off by a surly convict named Edward Corbett.33 The settlers assumed that the Aborigines had killed them. When spotted next, seven years later, the cattle numbered sixty-one head and they were grazing in an area soon called Cowpastures. The governor, John Hunter, went out to see them, and he and his party were “attacked most furiously by a large and very fierce Bull, which rendered it necessary for our own Safety, to fire at him. Such was his Violence and Strength, that six Balls were fired through, before any Person dared approach him.”34

The governor, who may have been familiar with the story of feral livestock on the pampa, decided to leave the cattle alone so that “they may become hereafter a very great Advantage and Resource to this Colony.” By 1804, the feral herds (“mobs,” to be properly Australian) numbered 3,000 to 5,000 head. The Australians in time would become fine livestock handlers, but they were not yet, and the best they could do with these fierce African animals was to shoot some and salt them down, and capture a few of the calves. The rest confounded those who pursued them by “running up and down the mountains like goats.” The herds had become a nuisance and worse, providing a source of food for escaped convicts living in the wild – the famous and infamous “bushrangers.” Furthermore, the wild cattle were occupying, and were unshakably resolved to continue occupying, some of the very best land between the sea and the Blue Mountains.35 The government, convinced that humans, not cattle, had been ordained to be the dominant species in New South Wales, reversed its policy toward the wild cattle and in 1824 ordered the last wild descendants of the strays of 1788 destroyed.36

In the second decade of the new century, the Australians found a way through the Blue Mountains into the grasslands beyond and passed through with their livestock; there, according to all appearances, cattle increased faster in proportion to their original number than either sheep or horses.37 Most of these cattle were now of European rather than South African ancestry, but that did not mean docile animals. The calves were as wild as deer and nearly as fast, and many – “Kangaroos, as we term them” – could leap a
two-meter fence. By 1820, the number of cattle in the tame herds of New South Wales was 54,103; ten years later it was 371,699. In another human generation, Australia would have millions. No one knew the number of the feral cattle, some of which preceded the frontiersmen and women, some even the explorers. In 1836, Thomas L. Mitchell, trekking through the wilderness near the Murrumbidgee River, came upon cattle trails around the water holes so wide and hard-packed that they resembled roads, "and at length the welcome sight of the cattle themselves delighted our longing eyes, not to mention our stomachs." The animals were so unused to people that "we were soon surrounded by a staring herd of at least 800 head of wild animals." Even the so-called tame cattle on the frontier saw so few humans – most cattle stations consisted of no more than two or three stockmen and a "hut-keeper" – that one wonders to what extent the animals realized that men were their masters. The bulls were especially imperious. They stayed with the herds most of the time, but drifted off to spend the winters in solitude, returning in the spring to battle for females. One of the memorable sounds of the Australian frontier was the returning bull's challenging bellow, "now sullen and deep, then rising into a shrill scream, clear as a bugle... awakening the echoes for miles around, through the deep glens, and pathless solitudes." Horses died out in the Americas some 8,000 to 10,000 years ago, and returned again only when Columbus carried several to Españaola in 1493. The Iberians, initially a minority wherever they went in the New World, found horses effective, indeed an absolute necessity, in fighting the Amerindians, and so they brought the animals with them everywhere. The horses propagated rapidly in most of the colonies – not with the wild abandon of pigs, perhaps, but rapidly. Even in coastal Brazil, where the climate is too hot to be ideal for horses, there were plenty of them by the end of the sixteenth century, and the settlers were shipping them to Angola. Given the same latitudes and climates, horses died in Africa and bred in America. In northern Mexico, horses thrived and went wild in multitudes. In 1777, Friar Morfi found feral mesteños (the Mexican word for horses of the northern plains, which North Americans corrupted into "mustangs") beyond counting near El Paso, Texas. The horses, wild, of course, were so plentiful that the plain was crisscrossed with their paths, so many paths that this empty land seemed "the most populous country in the world." They had eaten and worn away the grass from large expanses, which immigrant plants were moving in to occupy. Around the water hole at San Lorenzo he found a great abundance of the plant called erva de gato in Spain and stonecrop in England, "which gladdened the landscape with its greeness." It may have been one or more of the European species of the genus *Sedum*, highly valued today as ground cover, that have spread widely since the marinheiros learned to read the oceanic winds. The story of the mustang in North America, of its spread north across the Great Plains into Canada before the end of the eighteenth century, is well known, and we shall not repeat it here. That migration was largely the work of Amerindian raiders and traders, but it was the Spaniards who drove the first horses into Alta California in the 1770s. There the animals took up the ways of their ancient ancestors of the mid-Asian steppes. When the gold rush began in 1849, there were so many wild horses that ate so much of the grass that livestockmen with an eye for the profit that other stock could make out of the same grass drove the horses off the cliffs at Santa Barbara by the thousands. Some of the ancestors of the horses of the Atlantic seaboard colonies were of Mexican origin, brought eastward by traders from the midcontinental grasslands, but
most came directly from Britain and France, arriving in Virginia as early as 1620, in Massachusetts in 1629, and in New France in 1665. John Josselyn found plenty of horses in seventeenth-century Massachusetts, "and here and there a good one." Their owners let most of them scavenge the wilderness for their own feed in wintertime, though the practice, he said, brought the animals "very low in flesh till the spring, and so crested, that their crests never rise again." He was from Europe, where horses were very expensive, and worth taking good care of. In North America they were relatively cheap and wandered free, often with little more evidence of their connection with humanity than a collar with a hack at the bottom to catch on fences as they tried to leap over them to get at the crops. Hogs, incidentally, were collared with triangular yokes so that they would not push through fences. Fences were not for keeping livestock penned in, but for keeping livestock out.

Having hardy mounts for no more than the effort of catching them was a boon for the frontiersman, but there were so many of them in some places than they actually became a nuisance. (How unthinkable in Great Britain on both counts.) By the end of the seventeenth century, feral horses were pests in Virginia and Maryland. Runy stallions made so much trouble by impregnating valuable mares that statutes were passed requiring their penning or gelding. In Pennsylvania, anyone finding a stallion under thirteen hands running free had the legal right to geld him on the spot.

Thousands of feral horses are still with us in the western parts of North America, where there is still a lot of open country. Despite drought and blizzard, epizootics, the gluttonous pet-food industry, and periodic cullings by men looking for free mounts, in 1959 mustangs were still roaming a dozen or so western states and two Canadian provinces.

As mentioned earlier in reference to cattle, the first European settlements on the pampa did not succeed, but large herds of feral horses were grazing there when the Spanish returned to Buenos Aires in 1580. They were increasing at what was perhaps an unprecedented rate for large herds, and at the opening of the next century there were wild horses in Tucumán "in such numbers that they cover the face of the earth and when they cross the road it is necessary for travellers to wait and let them pass, for a whole day or more, so as not to let them carry off tame stock with them." The grasslands around Buenos Aires were overrun with "escaped mares and horses in such numbers that they go anywhere they look like woods from a distance." Such reports trigger skepticism, but are probably accurate. The pampa, east and west of the Río de la Plata, was a paradise for horses; even in the nineteenth century, after many of the advantages the animals enjoyed initially had dissipated, herds set apart as sources of cavalry mounts and protected from human harvesting increased at a rate of one-third per year.

The Jesuit, Thomas Falkner, found the number of horses on the pampa in the eighteenth century to be "prodigious," and the going price of a two- or three-year-old colt was half a dollar. Sometimes, he wrote, the pampa was empty, the feral horses over the horizons, and other times they were on all sides.

They go from place to place, against the current of the winds; and in an inland expedition which I made in 1744, being in these plains for the space of three weeks; they were in such vast numbers, that, during a fortnight, they continually surrounded me. Sometimes they passed by me, in thick troops, on full speed, for two and three hours together; during which time, it was with great difficulty that I and the four Indians, who accompanied me on this occasion, preserved ourselves from being run over and trampled to pieces by them.

Horses in such profusion, tame or feral, existed nowhere else on earth. Their abundance shaped the societies.
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of the pampa more firmly and more permanently than the discovery of gold would have. The metal would not have lasted long. The enormous herds of wild horses, the indispensable element of gaucho culture, lasted for two and a half centuries.

Seven horses came to Australia in 1788 with the First Fleet. The governor reported next winter that “the horses do very well,” but that was not true, or not for long, at least. Only two of them survived the first years, and not until good South African mares arrived in 1795 did the number of horses really begin to increase. In 1810 there were 1,134, a decade later four times as many, and the settlers were even starting to export a few. Many were already roaming free. In Australia they were known not as mustangs but as brumbies. The word may be derived from the Aboriginal term “baroomby,” meaning wild, or from Baramba, the name of a creek in Queensland, or from the name of James Brumby, who came to New South Wales about 1794 as a private, settled on a hundred acres where he grazed stock, and then went off on an expedition to Tasmania in 1804. Before leaving, the story goes, he mustered (rounded up) his animals, but missed a few horses, and they strayed off to found dynasties of brumbies.

Brumbies once ran by the tens and scores of thousands in the interior of Australia, and in 1966 there were still 8,000 to 10,000 of them living in Western Australia, “by spur and bridle undefiled.” They are not lovely animals; 150 years ago they were so narrow in the chest and shoulders that saddles intended for them had to be made narrower than those for European horses, and in 1972 an expert on brumbies declared that “they have a great bloody head like a bucket.” But they are amazingly durable and need no more feed than what they can find for themselves, summer or winter. They make excellent horses for working stock, intelligent and able to “turn on a cabbage-leaf.”

As elsewhere, horses thrived so famously in Australia that the Neo-Europeans forgot what a miracle it was to have mounts for next to nothing, and cursed the excess of their own good fortune. The brumbies were pests, sweeping past and carrying tame horses off with them, “leaving their owner to chew the cud of mortification.” Worst of all, they drank and ate water and grass needed for profitable animals: sheep, cattle, and obedient horses. Many were killed for their skins — so many that in 1869, horse hides brought only four shillings each in Sydney. Some Australians simply fenced off the water holes in dry times and got rid of the animals that way. Other settlers, not willing to wait for thirst to work, devised methods of getting rid of the brumbies so that they would run a long way before dying, thus preventing noisome accumulation of dead horses at, a single point. In the 1930s, when bounties were offered for horse ears, two men shot 4,000 in one year on the Innaminka. A little later, one man shot 400 horses in a single night.

So much for domesticated quadrupeds gone wild. There is no value in belaboring the point that they adapted marvellously well to the Neo-Europes, and vice versa. We could go on at length about goats, dogs, cats, even camels, and go on further to point out that domesticated birds — chickens, for instance — prospered in the Neo-Europes, but the point has already been made: Old World livestock prospered in the Neo-Europes. In fact, they did amazingly better in the Neo-Europes than in their homelands — a paradox. Let us examine the story of what might be described as the Neo-Europes’ only domesticated insect, the honeybee. If this Old World insect did as well in the Neo-Europes as did pigs, cattle, and horses, then the forces behind the success of Old World immigrants must have been pervasive indeed.
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There are many kinds of bees and other insects producing honey all round the world, but the one insect that combines high production of honey with being amenable to human manipulation is the honeybee, a native of the Mediterranean area and the Middle East. There humans collected honey (and wax, for many peoples more important than the sweet product) long before written history began, and there Samson created one of the Old Testament's most striking images when he found "bees and honey in the carcass of a lion."765

In the fifteenth and sixteenth centuries, the sailors of western Europe became *marinheiros*, with many and diverse results, among them enormous expansions in the ranges and numbers of honeybees. These bees may have been in the islands of the Mediterranean Atlantic before the arrival of the Europeans, but if so, then not in all the islands. If they had been in Tenerife before Our Lady of Candelaria, then why would she have been obliged to produce wax for her candles by miracles? It appears that they arrived late in Latin America, and in many cases came from North America, not from Europe. In tropical America, the indigenes were collecting honey from bees long before Cortés and continued to do so; and for long after Cortés sugar was plentiful and cheap in Latin America. Both factors tended to discourage the importation of honeybees. Today Argentina is one of the world's top producers of honey, but that is a relatively recent development. In contrast, honey was an essential sweetener in North America, and the honeybee arrived early.62

The first honeybees brought to North America arrived in Virginia in the early 1620s, where honey became a common food in the seventeenth century. In Massachusetts, bees came ashore no later than the 1640s, and by 1663 they were thriving "exceedingly," according to John Josselyn. The immigrant insects did as well or better than the Europeans themselves in seventeenth-century British America.64

To an extent, their advance was due to human intervention, humans with hives on their rafts and wagons moving into Indian territory, but in most cases the avant-garde of these Old World insects moved west independently. They were naturalized in the seaboard colonies in the seventeenth century and widespread there by 1800,44 but the Appalachians were a real barrier for them. Some were carried across by people, and some reputedly blown across by a hurricane. They did get across and then seem to have spread even more rapidly in the Mississippi basin than they had east of the Appalachians. In the campaign that climaxd with the battle of Tippecanoe in 1811, the advancing United States forces found many beehives in hollow trees in the Indiana wilderness, and one man recorded that he and his friends found three bee trees in an hour.65 The first honeybees west of the Mississippi are supposed to have settled in Mme. Chouteau's garden in St. Louis in 1792.66

One of the favorite recreations of rural North Americans was to seek out and steal the honey from the hives of wild bees. A whole system of techniques grew up: how to find foraging worker bees, how to follow their bee line back to the bee tree while cracking shins and falling into creeks, and how to smoke out the bees and chop down the tree--all without being stung any more than was absolutely necessary. Then came the reward, as witnessed by Washington Irving on the Oklahoma frontier in the 1830s. The unbroken honeycombs were placed in kettles to take back to camp or settlement, and those which had been shivered in the fall were devoured upon the spot. Every stark bee-hunter was to be seen with a rich morsel in his hand, dripping about his fingers, and disappearing as rapidly as a cream-tart before the holiday appetite of a schoolboy.67

Honey was a blessing to the North American indigenes, who had previously had only maple sugar for a strong sweetener, but the "English fly" was for them a dismal
portent of the approach of the white frontiers. St. Jean de Crévecoeur wrote that “as they discover the bees, the news of this event, passing from mouth to mouth, spreads sadness and consternation in all minds.”

Australia has small stingless bees, which the Aborigines valued for their very sweet product, but it was as innocent of true honeybees as America. These arrived in Sydney on 9 March 1822 on the ship Isabella, along with 200 convicts.⁶⁹ Once established in New South Wales, the bees propagated and swarmed with the same vigor as in America. They were introduced in Tasmania in 1832 or shortly before, and the first hive there swarmed either twelve or sixteen times the first summer ashore, according to which account one accepts.⁷⁰ It seems that several of the eucalypti, native to Australia, are among the best of all honey sources in the world.⁷¹ When Anthony Trollope visited Australia in the early 1870s, he found the alien bee much more plentiful than the native, and honey to be “a customary delicacy with all the settlers.”⁷² A hundred years later, Australia is one of the world’s largest producers and exporters of honey.⁷³

The creatures we have discussed thus far went to the colonies because the colonists wanted them, but others crossed the seas of Pangaea without invitation. These varmints pose a very interesting set of animals for us, because whereas it can be argued that the barnyard organisms succeeded overseas because the Europeans worked for their success (not necessarily true, but let us accept that argument for the moment), no one would argue that rats, for instance, succeeded because the settlers wanted them for neighbors. On the contrary, Neo-Europeans have made gargantuan efforts to exterminate them. If they have thrived in the Neo-Europees, then the forces encouraging the success of Old World creatures in the colonies must be truly powerful.

The common rat of Europe is really two rats: the black and the brown, the former smaller and the better climber, and the latter larger, fiercer, and a better burrower. The rat mentioned in colonial sources is probably the former (often called the ship rat) most of the time, but the chronicles speak only of “rat.” Either animal or both will do for our purposes, so we shall use the single word for both. To make matters more confusing, the colonial Spanish often used the same word for mice and rats.

Rats shipped as stowaways with the Iberians everywhere they went in America, but the accounts of the conquistadores omit mention of them. We do, however, know a little about their early years on the Pacific coast of South America, thanks (as with weeds) to Bernabé Cobo and Garcilaso de la Vega. There were several indigenous species of rodents in Peru and Chile, but none equal to the immigrant rats in adapting to the ways of European civilization. It was the latter, in all likelihood, that were the protagonists in the three plagues of rats (and of mice, too) that swept Peru between the arrival of Pizarro and 1572. “They bred in infinite numbers,” said Garcilaso de la Vega, “overran the land, and destroyed the crops and standing plants, such as fruit trees, by gnawing the bark from the ground to the shoots.” Afterward they remained in such numbers on the coast “that no cat dare look them in the face.”⁷⁴ Rats and/or mice (possibly indigenous, probably imported) afflicted Buenos Aires almost from its first beginnings as a viable settlement, swarming among the grapevines and the wheat. The colonists called upon Saint Simon and Saint Jude for divine intervention and sang masses pleading for mercy. Two hundred years later, at the beginning of the nineteenth century, the rats were so numerous that at night people stumbled over them in the streets: “Every house swarms with them, and granaries are dreadfully taxed. Indeed, the increase in that species seems to have kept pace with the cattle in those regions.”⁷⁵

Immigrant rats almost extinguished Jamestown, Virginia. In 1609, when the colony was barely two years old,
the settlers found that their stores of food had been consumed by “the many thousands of rats” from the English ships. The settlers were reduced to dependence on their own meager skills as hunters, fishermen, and farmers for nourishment, and to dependence on Amerindian generosity. At about the same time, the French at Port Royal, Nova Scotia, were also doing battle with multitudes of rats that they, too, must have inadvertently introduced. The Amerindians nearby were victims as well, beset with this entirely new kind of four-legged varmint that had come “to eat or suck their fish oils.”

The story was much the same in the early days of Sydney. In 1790, rats (conceivably native marsupials, but almost certainly rodents the settlers had brought with them) overran the food stores and the gardens as well. The governor estimated that they were the cause of the loss of “more than 12,000 weight” of flour and rice. And the rats continued to arrive. Early in the nineteenth century, a Tasmanian newspaper grimly announced that “the number of rats leaving the convict ship now tied up in the Bay has to be seen to be believed.” Today, Old World rats infest Australia’s ports and waterways and have even left the immediate vicinity of humanity to go wild in the bush, reverting to a way of life they have practiced little in thousands of years.

Neo-Europeans did not purposely introduce rats, and they have spent millions and millions of pounds, dollars, pesos, and other currencies to halt their spread—usually in vain. The same is true for several other varmints in the Neo-Europes—rabbits, for instance. This seems to indicate that the humans were seldom masters of the biological changes they triggered in the Neo-Europes. They benefited from the great majority of these changes, but benefit or not, their role often was less a matter of judgment and choice than of being downstream of a bursting dam.

Were there animals from the Neo-Europes that swarmed over Europe and the Old World? Was the exchange anything like even? The answer, which the reader must be expecting by this time, is no. The American turkey did go to the Old World, but it did not go wild there and has not swarmed like locusts over the face of Africa or Eurasia. In much of Great Britain the relatively large and aggressive North American gray squirrel has replaced the Old World red squirrel, decimated early in this century by an unknown epidemic disease. And the American muskrat, first released in Bohemia in 1905, has spread widely since, helped along by other ill-advised introductions. By 1960 its range extended from Finland and Germany to the headwaters of several of the tributaries of the Ob River far to the east. Still and all, nothing has happened in the Old World approaching the deluge of Old World domesticated animals gone feral in the Neo-Europes. The exchange of animals, tame or feral or wild, between the Old World and New World has been as one-sided as the exchange of weeds, and Australasia seems to have contributed nothing of importance to Europe in this category. As with weeds, the reasons why will be discussed in Chapter 11.

There is an old American folksong of the frontier in which a certain Sweet Betsy from Pike County, Missouri, crosses the mountains, presumably the Rockies or Sierras, “with her lover, Ike, with two yoke of oxen, a large yellow dog, a tall shanghai rooster, and one spotted hog.” Betsy was heir to a very old tradition of mixed farming, and whereas it must be pointed out that her oxen were castrated and the other animals without mates, Betsy's party was not the only one to cross the mountains; wagon trains had bulls and cows, plus hens and dogs and pigs of genders opposite to those of her animals. (Betsy herself had the foresight to
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bring Ike.) Rapid propagation of the colonizing species would be the rule on the far side of the mountains. Betsy came not as an individual immigrant but as part of a grunting, lowing, neighing, crowing, chirping, snarling, buzzing, self-replicating and world-altering avalanche.

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Ills

THE COLONY OF A CIVILIZED NATION which takes possession, either of waste country, or of one so thinly inhabited, that the natives easily give place to the new settlers, advances more rapidly to wealth and greatness than any other human society.

Conclusion

In the last chapter I made use of a metaphor to describe the roles of the first arrivals in the Americas and Australasia, the indigenes, and of the second to arrive, the Europeans and Africans. I suggested that the Amerindians, Aborigines, and Maori were shock troops - marines - seizing beachheads and clearing the way for the second wave. They chiefly came on foot: the Amerindians entirely so, in all probability; the Aborigines on foot, with a few spells of paddling between Indonesian islands; the Maori only by seacraft. It might be helpful to elaborate on the metaphor (metaphor, please, not theorem), dividing the second wave into a pair of successive waves. We might think of the earlier of the pair to arrive in the Neo-Europes (consisting of those who came chiefly in the age of sail) as the army, landing with its heavy equipment, extensive support units, and greater numbers to take over from the marines. The members of this army came with weapons, fought many battles, and spent much or all of their lives under stern discipline. It is well known that the first Afro-Americans were slaves, but it is not so widely realized that half to two-thirds of the whites to migrate to North America before the American Revolution were indentured servants who had contracted away their freedom for up to seven years in return for passage to the New World. Until 1830, the majority of migrants to Australia were convicts, which leaves New Zealand alone to be founded by free laborers. ¹

The next great batch of Old World peoples, almost all of them Europeans, to come to the Neo-Europes crossed the oceans chiefly by steamship. I think of them collectively as the civilian wave, because they harvested the benefits of the prior invasions, rather than launching invasions themselves. They came without weapons and without much in the way of institutional organization above the kinship level. They came, with very few exceptions, as free and independent individuals.

INTERLINK'D FOOD-YIELDING LANDS!
Land of coal and iron! land of gold! land of cotton, sugar, rice!
Land of wheat, beef, pork! land of wood and hemp! land of the apple and the grape!
Land of the pastoral plains, the grass-fields of the world! land of those sweet-air'd interminable plateaus!
Land of the herd, the garden, the healthy house of adobe!
—Walt Whitman, "Starting from Paumanok"
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They came in the greatest numbers: Over 50 million crossed the oceans to the Neo-Europe between 1820 and 1930.1

These 50 million came because they were pushed from behind – the population of Europe was growing, but the supply of cultivable land was not – and because in the middle of the nineteenth century the application of steam power to oceanic travel made the passage overseas safer and cheaper than ever before. But there was also the matter of the pull, of the conviction held by these people that their lot would be better in the alien lands beyond the seas of Pangaea than at home.

In the middle of the eighteenth century, white Australia and New Zealand were still in the future, but it was obvious that Europeans, their agriculture, and their plants and animals were doing very well in North America. The strongest possible proof of colonial success was the extraordinarily high rate of natural increase of Old World peoples in North America. Early in the 1750s, Benjamin Franklin proudly recorded that there were about a million Britons in North America, although a mere 80,000 had emigrated from Europe. At the end of the century, Thomas Malthus, seeking evidence of how fast humans might increase under optimal conditions, looked to the northern colonies of British North America, where the two great checks, “misery and vice,” did not seem to be operating. In New Jersey, for instance, “the proportion of births to deaths on an average of seven years ending in 1743, was as 300 to 100. In France and England, taking the highest proportion, it is 117 to 100.”2 In the southern colonies from Virginia to Georgia, intermediate between the cool salubrity of New England and the middle colonies and the hot, wet insalubrity of the West Indies, the statistics were not as encouraging, but all in all British North America was a dazzling success.

The Iberian pampa was not a failure at the end of the eighteenth century, but no one could call it much of a

success. The population was small and growing very slowly. In 1790, Alejandro Malaspina, an Italian navigator sailed for Spain, exasperated by the paradox of a society somehow managing to stagnate in the midst of prodigal natural wealth, blamed the people for their plight: They were without morality or discipline.3 If they were, it was because the pampa was still largely untamed. The city of Buenos Aires, although a century older than Philadelphia, was closer to the frontier than the capital of Pennsylvania was. The vast numbers of cattle and horses on the pampa had sustained the hostile Amerindians and tempted many of the local subjects of the kings of Spain and Portugal to retrogress to a life of hunting and gathering on horseback. The gaucho was more like an Australian bushranger than an Australian shepherd. The gift of the European herds, ironically, discouraged the growth of European families and civilization. The overwhelming success of the livestock and forage plants of the portmanteau biota had stymied its human component. In addition, the policy of imperial Spain over many decades had been such as to subordinate the pampa to other parts of the empire and leave it an economic, social and intellectual backwater, reinforcing its biotic oddity.4 But it was clear to Malaspina, and to anyone with half an eye, that there was no necessity for European society on the pampa to be retarded forever. Millions of thriving European animals and plants indicated that this was a land destined to become at least as European as North America.

The success of European ecological imperialism in the Americas was so great that Europeans began to take for granted that similar triumphs would follow wherever the climate and disease environment were not outright hostile. Captain Cook, after a short stay in New Zealand, predicted a bright future for European colonists there. When Joseph Banks, one of the scientists who sailed with him, was asked by a Parliamentary committee for his opinion of Australia
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as a site for a colony, he answered that settlers in New South Wales "would necessarily increase." As for what good they might do the mother country, why, they would be a market for manufactured goods; and Australia, larger than all of Europe, was certain to "furnish Matter of advantageous Return." Necessarily? This was arrogance! Matter of advantageous return? What would that be? He was, of course, perfectly right in his simplminded optimism.

The migrants from Europe, who were to validate the prophecies of Cook and Banks and the like, were, omitting such ephemera as gold rushes, drawn to the lands overseas in accordance with three factors. The lands had to have temperate climates; the migrants wanted to go where they could be more comfortably European in life style than at home, not less. Second, to attract Europeans in great numbers, a country had to produce or show a clear potentiality for producing commodities in demand back home in Europe — beef, wheat, wool, hides, coffee — and its resident population had to be too small to supply that demand. And so it was that so many Europeans in the nineteenth century poured into cornucopian North America, into Australasia, and into southern Brazil, particularly São Paulo, where coffee plantations were springing up, and also into the cool agricultural and pastoral provinces farther south. They poured in multitudes onto the pampa of Rio Grande do Sul, Uruguay, and Argentina, bleaching out whatever Amerindian and African traces that might have existed. Mountainous Chile — "perhaps the worst constructed and worst located nation on this planet," said Ezequiel Martínez Estrada, "it is like a plant that sprouts between two stones" — produced few things in quantity or cheaply that Europe wanted, and in 1907 only 5 percent of her people were foreign-born, as compared with more than 25 percent on the pampa. 

The other factor was personal and visceral. The peasants of nineteenth century Europe may or may not have pined

after political and religious freedoms, but they certainly yearned after freedom from hunger. Famine and fear of famine had been constants in the lives of their ancestors, time out of mind. Most food shortages in Europe of the ancien régime were local, but no less deadly for that, because the distribution systems were poor. As for general shortages, France, agriculturally the richest nation in Europe, had sixteen in the eighteenth century. Hunger and periodic starvation were a part of life, and poor people even resorted to infanticide to maintain some sort of balance between food supply and population. In the rough-and-ready fairy tales of the peasantry, the triumphant hero receives as his reward not necessarily the hand of the princess or even heaps of gold, but invariably very large quantities of good food. In one tale, the climactic wedding feast features roast pigs scampering about with forks sticking in their sides for the convenience of protein-hungry guests.

For Europe's peasantry, the image of the lands beyond the oceans shimmered like steam rising from an ox spitted and roasting over hot embers. In North America, famine was unknown except in the first years of settlement or in times of war or extraordinary natural disaster. During Europe's potato famine in the middle of the nineteenth century, while a million Irish died of starvation and disease, Irish laborers on the pampa could earn ten or twelve shillings per day, along with all the meat they could eat. Samuel Butler, who herded sheep in New Zealand's South Island in the 1860s, painted a paradisical picture of colonial life. After a year or two, he said, addressing himself to the potential settler,

You will have cows, and plenty of butter and milk and eggs; you will have pigs, and, if you choose it, bees, plenty of vegetables, and, in fact, may live upon the fat of the land, with very little trouble, and almost as little expense.
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An immigrant would need to bring some capital with him and to conjure up a run of good luck to reach that plateau of bliss in only a year or two, but tens of millions of Europeans crossed the seas of Pangaea with such prospects in mind. Anthony Trollope, in Australia in the 1870s, reduced the whole matter of what lay behind the migration to Australasia to one sentence: “The labouring man, let his labour be what it may, eats meat three times a day in the colonies, and very generally goes without it altogether at home.”

Said meat was not roasted wapiti or kangaroo, but mutton, pork, and beef. Once ashore in the Neo-Europes, many migrants were at first discomfited to find themselves, in both the Northern Hemisphere and Southern Hemisphere, on a diet of non-European foods – raccoon, opossum, sweet and white potatoes, and, very often, maize – but in time, in all these locations, they were able to return to a diet based on Old World staples. In North America, the Old World pioneers had a two-century love affair with maize, but even there, wheaten bread has finally replaced cornbread. The change was predictable: Nearly every animal and plant and food source that Crèvecoeur mentioned in a positive way in his classic Letters from an American Farmer (1782) was of European origin, with the passenger pigeon as the outstanding exception.

And so the Europeans came between the 1840s and World War I, the greatest wave of humanity ever to cross oceans and probably the greatest that ever will cross oceans. This Caucasian tsunami began with the starving Irish and the ambitious Germans and with the British, who never reached peaks of emigration as high as some other nationalities, but who have an inextinguishable yearning to leave home. The Scandinavians joined the exodus next, and then, toward the end of the century, the southern and eastern European peasantry. Italians, Poles, Spaniards, Portuguese, Hungarians, Greeks, Serbs, Czechs, Slovaks, Ashkenazic Jews – for the first time in possession of knowledge of the opportunities overseas and, via railroad and steamship, of the means to leave a life of ancient poverty behind – poured through the ports of Europe and across the seas of Pangaea to lands as unfamiliar to their grandparents as Cathay. Russia, which sent 5 million to Siberia between the 1880s and World War I, sent another 4 million to the United States. It was as if these millions realized that a window of opportunity was open and that it would not stay open forever.

Of these 50 million, the United States received two-thirds and kept a higher proportion of them than the other recipients, from which many returned to Europe or migrated elsewhere, often to the United States. The influx changed the United States forever, providing it with the farmers to fill in its north-central frontier and with the labor required for its burgeoning industrial revolution. The immigrants, especially the “new immigrants” from southern and eastern Europe, changed its big east-coast cities forever. To this day, many of the descendants of the “old immigrants” from northwest Europe find New York and Pittsburgh and Chicago, where lasagne and kielbasa are readily available, to be exotic, almost alien. Argentina received fewer immigrants than the United States, about 6 million between 1857 and 1930, and a great many of them left to go elsewhere, but immigration affected Argentina even more powerfully. Just before World War I, 30 percent of the Argentine population was foreign-born, as against about half that in the United States. The immigrants transformed the pampa. The Irish and Basques led the way in sheep raising; wool became the nation’s most important export in the 1880s. Italian sharecroppers plowed pasture and made it into wheat fields, and by the end of the century their new homeland was one of the world’s greatest sources of surplus grain. Brazil took in 5.5 million immigrants between 1851 and 1960 and kept about 2.5 million, most of
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whom settled in the southern sub of the country from Rio de Janeiro just north of the Tropic of Capricorn to Uruguay. And Uruguay, despite its small size, received over half a million Europeans, confirming its European qualities. Between 1815 and 1914, 4 million Europeans migrated to Canada, very few of them French, and although great numbers moved on, those who remained were enough to anglicize the nation; thus, from the middle of the nineteenth century, the descendants of the founders of New France have been a fretful minority in their own land.

The migration of hundreds of thousands to Australasia, most of them from the British Isles, between the middle of the nineteenth century and World War I confirmed the antipodean Neo-Europeans as Neo-Britains. New Zealand has remained so, by and large. But since World War II, Australia has received more immigrants in proportion to its population size than any other nation except Israel, and now lasagne and kielbasa are almost as easy to find in Sydney as in New York City.

The impact of the migration of Europeans across the seams of Pangaea to the Neo-Europeans was not limited to those lands. Europe’s population, already soaring — indeed, its growth was the push behind the European exodus — continued to grow as it was relieved of the weight of the departing millions; and these, once overseas, provided Europe’s industries with new markets, new sources of raw materials, and new prosperity, helping to maintain its population increases. Between 1840 and 1930, the population of Europe grew from 194 million to 463 million, double the rate of increase in the rest of the world. In the Neo-Europeans, the numbers of people bounded upward at rates previously unknown, or at least unrecorded. Between 1750 and 1930, the total population for the Neo-Europeans increased by almost fourteen times over, whereas that of the rest of the world increased by only two and one-half times.

Because of the explosion in population in Europe and the Neo-Europeans, the number of Caucasians increased over five times between 1750 and 1930, as compared with a 2.3 increase for Asians. Africans and Afro-Americans increased by less than two times, in spite of an enormous increase in blacks in the United States from 1 million in 1800 to 12 million in 1930. In the last fifty years, the prior surge in the Caucasian division of humanity ahead of the others has been largely canceled by their tardy but immense increases, but that surge remains one of the very greatest aberrations in the demographic history of the species. The 30 million square kilometers of land gained by the whites as both a cause and effect of their population surge remain in their control, a situation this minority considers permanent.

In the nineteenth century, the Neo-European populations soared not only because of immigration but also because their resident populations were enjoying the highest rates of natural increase; these countries would ever achieve. Death rates were hearteningly low, and food plentiful and good by Old World standards, and the Neo-Europeans were grateful and fruitful and they multiplied. In North America in the eighteenth and early nineteenth centuries, the fertility of the Neo-Europeans was among the highest ever recorded anywhere, as high as fifty to fifty-seven births per thousand inhabitants per year. In Australia in the 1860s, the birth rate was around forty per thousand, and in Argentina, where immigrants were beginning to pour onto the pampa for the first time in large numbers, about forty-six per thousand. In Australia, 1860–2, the number of deaths per thousand was 18.6, births 42.6, for a natural increase of twenty-four humans per thousand per year, as compared with 13.8 in England and Wales, where the population was considered to be growing rapidly. The pakeha birth rate and natural-increase rate in New Zealand were similarly high until well into the 1970s.
CONCLUSION

These Neo-European populations had in these years what we would consider abnormally large numbers of young adults, which helps explain the high birth and low death rates, but not completely. They also had populations, with the exception of North America, in which men sharply outnumbered women, an imbalance that often increases the death rate and certainly lowers the birth rate. No, the superiority of human existence in the Neo-Europes — for the newcomers — is the most important factor in their natural increase.

If those rates had been maintained, the Neo-Europes could not have remained underpopulated for many generations. Darwin, a man with a better sense of humor than those who admire but do not read his works realize, calculated that if the population of the United States continued to expand at the velocity that had brought it to 30 million in 1860, then it would “in 657 years cover the whole terraqueous globe so thickly, that four men would have to stand on each square yard of surface.” The joke strikes us, a century later, as hollow. If the Neo-Europes fill up their lands and eat all their own food, who shall feed the world? Fortunately, the nineteenth-century rates of natural increase soon fell off as the immigrant population pyramid evolved toward a normal distribution of ages and the young adults grew older and started dying, and as birth rates declined as rising standards of living and urbanization convinced Neo-Europes that very few children would die before growing up, and that large families were the enemy and not the ally of prosperity. The death rates of the Neo-Europes are among the lowest in the world, but so are their birth rates. The Neo-European rates of natural increase are low, and a great deal of the food that the Neo-Europes produce is available for export.

The Neo-Europes collectively and singly are important, more important than their sizes and populations and even wealth indicate. They are enormously productive agricul-
CONCLUSION

thrive. Within these zones the areas with rich soils that receive the greatest abundance of sunlight and, as well, the amounts of water than our staple crops require — the most important agricultural land in the world, in other words — are the central United States, California, southern Australia, New Zealand, and a wedge of Europe consisting of the southwestern half of France and the northwestern half of Iberia. All of these, with the exception of the European wedge, are within the Neo-Europe; and a lot of the rest of the Neo-European land, such as the pampa or Saskatchewan, is nearly as rich photosynthetically, and is as productive in fact, if not in theory. 28

As was stated in the Prologue, the total value of all agricultural exports in the world in 1982 was $210 billion. Of this, the United States, Canada, Argentina, Uruguay, Australia, and New Zealand accounted for $64 billion, or a little over 30 percent. They account for even more of the world's most important export crop: wheat. In 1982, $18 billion worth of wheat passed over national boundaries, of which the Neo-Europeans exported about $13 billion worth. 29

The Neo-Europeans' share of world grain exports — in fact, North America's share alone — is greater than the Middle East's share of petroleum exports. 30

An extraordinarily, perhaps frighteningly large number of humans elsewhere in the world depend on the Neo-Europeans for much of their food, and it appears that more and more will as world population increases. The trend is not a new one: Accelerating urbanization, industrialization, and population growth obliged Great Britain to give up hopes of autarchy nearly a century and a half ago, and in 1846 Britain repealed the Corn Law, lifting all duties on foreign grains. At the beginning of the next century, its farmers were producing only enough wheat to feed Britain for eight weeks annually; in both world wars, submarine blockade, constricting its access to the Neo-Europeans, almost starved Britain into defeat. In the nineteenth century, a great deal of Britain's imported grain came from tsarist Russia, but many of the same demographic and economic factors that forced Britain to accept dependence on others for food have since had their effect on communist Russia, and in the 1970s the USSR began to buy enormous quantities of grain from the Neo-Europeans, and continues to do so. Increasingly, the Third World also turns to the Neo-Europeans for food. 31 Often in defiance of ideology and perhaps of good sense, more and more members of our species are becoming dependent on parts of the world far away where pale strangers grow food for sale. A very great many people are hostage to the possible effects of weather, pests, diseases, economic and political vagaries, and war in the Neo-Europeans.

The responsibilities of the Neo-Europeans require unprecedented ecological and diplomatic sophistication: statesmanship in farm and embassy, plus greatness of spirit. One wonders if their comprehension of our world is equal to the challenge posed by the current state of our species and of the biosphere. It is an understanding formed by their own experience of one to four centuries of plenty, a unique episode in recorded history. I do not claim that this plenty has been evenly distributed: The poor are poor in the Neo-Europeans, and Langston Hughes's nagging question "What happens to a dream deferred?" still nags, but I do insist that the people of the Neo-Europeans almost universally believe that great material affluence can and should be attained by everyone, particularly in matters of diet. In Christ's Palestine, the multiplication of the loaves and fishes was a miracle; in the Neo-Europeans it is expected.

The Americas and Australasia have provided windfall advantages to humanity twice, once in the Paleolithic and again in the last half millennium. The profits from the first entry into these lesser divisions of Pangaea were largely used up in the first few thousand years of the Holocene.
CONCLUSION

Today we are drawing on the advantages accruing from second entry, but widespread erosion, diminishing fertility, and the swift growth in the numbers of those dependent on the productivity of Neo-European soils remind us that the profits are finite. We are in need of a flowering of ingenuity equal to that of the Neolithic or, lacking that, of wisdom.

Appendix

What was the “smallpox” in New South Wales in 1789?

The disease that struck the Australian Aborigines in 1789 was undoubtedly new to them, as evidenced by its impact upon them, and it seems unlikely that it had often raged in their continent before. But was it smallpox? Smallpox is a disease that combines virulence and extreme communicability and has no dormant state in humans or any other species – it can only rage, it cannot lurk. Even the virus living in the scabs from the pustules of its victims soon dies; there is nothing like a spore state. So the British must have brought it with them. But they could not have done so – not according to the record and what we know of the disease. There were no active cases of smallpox on board the First Fleet on the high seas, nor in the French ships that were cruising in the waters of New South Wales in 1789. In fact, the written record does not indicate any
ship with the disease on board at or near New South Wales in 1788 or 1789. Ordinarily, such evidence, being purely negative, would not be worth much, but smallpox is such a frightful disease, and the Europeans in and around New South Wales at that time were so conscious of what devastation it could wreak, that it would be very odd, indeed, if one or more of them had it and no one thought to mention it in a letter, diary, or report. 

None of the white settlers caught the disease, which is not surprising, because most likely they had all been immunized to this “childhood disease” back in Europe. But a number of white children had been born in Sydney, and none of these caught it either, despite the presence of Aborigines with active cases in the settlement. The only non-Aborigine who caught the disease in Sydney in 1789 was a seaman belonging to a visiting ship. He was – and this may be significant – an Amerindian from North America. He died of it.

Perhaps the disease was smallpox, but introduced by Malay seamen, visiting far northern Australia. Perhaps, but what a coincidence that they should bring smallpox just in time for it to meet the British on the beach, so to speak. Perhaps it was not smallpox, but chicken pox, a pustular disease with a dormant stage. Chicken pox is considered a minor disease today, but severe cases often lead to dangerous pneumonic infection and even to death. Among a people like the Aborigines who had never been exposed to it or related viral infections before, it might have been more severe than in epidemiologically experienced populations.

But chicken pox is about as communicable as smallpox. Why did none of the white children, individually about as immunologically inexperienced as the Aborigines, catch it? Perhaps the sick Aborigines were quarantined. Maybe the white children were still young enough to be shielded by antibodies passed on to them from their mothers' bloodstreams and through their mothers' milk. Or maybe they were simply lucky, which would confound all analysis (especially if sophisticated). Or perhaps the native Australians, who had been in isolation for thousands of years, lacked any and all immunological defenses to some infection so minor among the Europeans that the settlers never noticed it in themselves. If so, then we would have to take another look at “smallpox” wherever it appeared for the first time.
Notes

Chapter 1. Prologue


4 For purposes of this book, I shall define North America as that part of the continent north of Mexico.

5 Colin McEvedy and Richard Jones, Atlas of World Population History

Chapter 2. Pangea revisited, the Neolithic reconsidered


8 Loring, Stages of Human Evolution, 78.

9 Campbell, Humankind Emerging, 383-4; Loring, Stages of Human Evolution, 95.

NOTES TO PP. 168–174


Salisburys, Weeds, 97, 188.


Chapter 8. Animals


3 Watkin Tench, Sydney’s First Four Years (Sydney: Angus & Robertson, 1961), 48–9.

4 Anthony Leafield and Andrew P. Vayda, eds., Man, Culture and Animals, the Role of Animals in Human Ecological Adjustments (Washington, D.C.: Association for the Advancement of Science, 1965), 233.

5 Victor M. Patiño, Plantas Cultivadas y Animales Domésticos en América Espanola, V, Animales Domésticos (Impronta Dependental, 1990), 308.


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NOTES TO PP. 174–176


11 Bartolomé de las Casas, Historia de las Indias, ed. Agustín Millares Carlo (México: Fondo de Cultura Económica, 1951), I, 351; Patiño, Plantas, V, 312.


16 Harry F. Recher, Daniel Lunney, and Irina Dunn, eds., A Natural Legacy: Ecology in Australia (Rushcutter’s Bay, N.S.W.: Pergamon Press, 1979), 136; Eric C. Rolls, They All Ran Wild, the Story of Pests on the Land in Australia (Sydney: Angus & Robertson, 1969), 338.

• 337 •
18 Hudson, Far Away, 170, 172. Today's pigs are no different from yesterday's in their ability to go wild. In 1983, an estimated 5,000 wild pigs were roaming the Cape Kennedy Space Center in Florida, descendants of tame swine owned by local residents whose land the National Aeronautics and Space Administration bought in the 1960s to expand the base. "Space Center's Problem Pigs a Taste Treat at Florida Jail," New York Times, 12 September 1983, p. A20.
20 Crosby, Columbian Exchange, 88.
22 Rollie E. Poppino, Brazil, the Land and People, 2nd ed. (Oxford University Press, 1973), 71, 109, 233.
25 Hudson, Far Away, 288.
26 Martin Dobrizhoffer, An Account of the Abipones, or Equatorial People (London: John Murray, 1822), I, 219; Crosby, Columbian Exchange, 88.

34 Historical Records of Australia, Series I, I, 590–1.
35 Historical Records of Australia, Series I, I, 310, 451, 603, 608; II, 589; V, 990–2; VI, 641; VIII, 150–1; IX, 715.
37 Haygarth, Recollections, 35.
38 Peter Cunningham, Two Years in New South Wales (London: Henry Colburn, 1828), I, 272.
43 Patino, Plantas, V, 137–8.
44 Samuel Purchas, ed., Hakluytus Posthumus, or Purchas His Pilgrimes (Glasgow: James McLehose & Sons, 1905–7), XIV, 500.
46 Denhardt, Horse, 92.
47 Denhardt, Horse, 92, 126.
49 Peter Kalm, Travels into North America (Barre, Mass.: The Imprint Society, 1972), 115, 226, 255, 266; Denhardt, Horse, 92; John Jesup, An Account of Two Voyages to New England Made During the Years 1658, 1659 (Boston: William Vezzie, 1685), 146.
NOTES TO PP. 184–189

John Clayton, 105; Gray, History of Agriculture, I, 140; Beverley, History and Present State of Virginia, 322.
54 Falkner, Description of Patagonia, 39.
55 Historical Records of Australia, Series I, I, 55.
59 Haygarth, Recollections, 77, 81; Trollope, Australia, 212.
60 Rolls, They All Ran Wild, 349–51.
61 Judge 14:8; Rémy Chauvin, Traité de Biologie de l'Abécédaire (Paris: Masson et Cie, 1968), I, 38–9.
64 Crane, Honey, 476.

NOTES TO PP. 189–193

67 Irving, Tour, 52–3.
71 Crane, Honey, 65–70.
72 Trollope, Australia, 211.
73 Crane, Honey, 116–39.
78 Historical Records of Australia, Series I, I, 143–4.
79 Rolls, They All Ran Wild, 330.
29 Donald R. Hopkins, Princes and Peasants, Smallpox in History (University of Chicago Press, 1983), 98.

NOTES TO PP. 288-295

Chapter 12. Conclusion
7 Sánchez-Albornoz, Population of Latin America, 154.

NOTES TO PP. 301–306
18 Woodruff, Impact of Western Man, 77–8; Sánchez-Albornoz, Population of Latin America, 155.
19 Woodruff, Impact of Western Man, 69–70.
20 Woodruff, Impact of Western Man, 86; Australian Encyclopedia, III, 376–8; New Zealand Encyclopedia, II, 131–2.
NOTES TO PP. 307–310

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