

Lesson 2

Student Handout 2.1—Animals and Plants Crossed the Atlantic Both Ways

Background

Some of the movements in the Columbian Exchange of this period were heavily one-directional, for example, the movements of domestic animals, weeds, and disease microorganisms. Others were two-directional, as was the case with cultivated plants. The passage of some plants was deliberately engineered by humans. For instance, ships sailing to America were required by the Spanish crown to carry seeds, cuttings, roots, and breeding stock. Europeans, for example, deliberately introduced olive trees. But many plants and some animals arrived uninvited. Seeds of European weeds such as thistles, dandelions, and many others survived on sailors' clothes and in the earth often used as ships' ballast. Old World rats invaded the New World as stowaways. All these thrived in their new habitat, unlike the American ragweed, goldenrod, and others that never got a foothold in Afroeurasia. Turkeys were widely raised for food in Europe. But while cattle, pigs, horses, goats and, more rarely, sheep in America multiplied explosively on their own in the wild, turkeys never did so in Europe.

Afroeurasian people, animals, and plants transformed the ecology in large areas of the Americas. The hordes of Old World feral livestock contributed to erosion in the Americas. Huge herds of cattle and horses roamed the grasslands. Overgrazing in a number of places led to the replacement of pasture with scrub growth. European weeds and grasses took over large areas. They were more adapted than many native plants to being trampled on or chewed to ground level by grazing. After various experiments with European crops that failed in the Americas because climate or soil conditions were wrong, successful natural niches were often found. Forests also fell as immigrant settlers cut down trees to make room for fields. Crops such as sugarcane, tobacco, and wheat began to be grown on a large scale not only for home consumption but also for export, requiring increasing clearing of land. Growing trans-oceanic trade required more ships, which took large amounts of timber to build. Smelting metal and shoring up mine shafts for silver production, and boiling down the sap from sugarcanes on huge plantations, took wood from forests in enormous quantities. English earthworms established themselves in New England's forests, destroying the understory litter needed for the survival of tree seedlings there.

In the case of people, some crossed the Atlantic of their own free will, either because of what they hoped to gain in work and wealth, or because they were driven away by conditions at home. Others were forced to cross against their will.

The exchange of goods before 1650 overwhelmingly favored American gold and silver, which, in turn, lubricated the trade of many other commodities around the world.

Document 1

Valuable plants that were confined before 1492 to one side of the Atlantic, crossed to the other side, and flourished there.

Cultivated plants of American origin established in Afroeurasia by about 1650 CE	Nourishment value: millions of calories per hectare that the crop may produce	Cultivated plants of Afroeurasian origin established in the Americas by about 1650	Nourishment value: millions of calories per hectare that the crop may produce
Maize (corn) *+ #	7.3	Wheat	4.2
Potatoes * +	7.5	Barley	5.1
Sweet potatoes +	7.1	Rice	7.3
Cassava (manioc) #	9.9	Oats	5.5
Vanilla		Sugarcane	
Peanuts		Olives	
Tobacco		Peaches	
Beans (several types)		Okra	
Squash		Cabbage	
Tomatoes		Spinach	
Chili peppers		Turnips	
Cocoa		Mustard	
Pineapple		Coffee	

* In Europe, maize and potatoes became significant only after 1650.

+ In China, sweet potatoes were grown by the 1560s. They grew on earlier unproductive land, and were unattractive to locusts. Along with maize and potatoes, they became staple food crops in China in the seventeenth century. The introduction of new crops resulted in large-scale Chinese migrations to previously thinly-populated and unproductive areas.

In Africa, cassava (which keeps well in the ground for long periods, is not eaten by locusts and, unlike surface-growing crops, is not trampled by animals or soldiers) inspired “a veritable agricultural **revolution** in the seventeenth century, enabling the population to grow to previously unattainable levels ... Maize had similar consequences a little later.”

Sources: André Gunder Frank, *ReOrient: Global Economy in the Asian Age* (Berkeley: University of California Press, 1998), 60; Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (Cambridge: Cambridge UP, 1986), 154 (spinach), 157 (peach); Luis Martin, *Daughters of the Conquistadores: Women of the Viceroyalty of Peru* (Albuquerque: University of New Mexico Press, 1983), (olives) 42; Paula de Vos, "The Science of Spices: Empiricism and Economic Botany in the Early Spanish Empire," *Journal of World History* 17, 4 (2006): 422 (ginger). For information on plants of American origin, see U. P. Hedrick, ed., *Sturtevant's Edible Plants of the World* (New York: Dover Publications, Inc., 1972), 48, 59, 136, 212, 303, 314, 343, 353, 384, 422, 545, 568, 591; * William H. McNeill, *Plagues and Peoples* (Garden City, NY: Anchor Books, 1976), 317, n. 58; + André Gunder Frank, *ReOrient: Global Economy in the Asian Age* (Berkeley: University of California Press, 1998), 60; # Hugh Thomas, *The Slave Trade* (New York: Simon & Schuster, 1997), 133; ** Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, CT: Praeger, 2003), 175.

Document 2

Valuable animals that were confined before 1492 to one side of the Atlantic, crossed to the other side, and flourished there.

Domestic animals of American origin established in Afroeurasia by about 1650	Domestic animals of Afroeurasian origin established in the Americas by about 1650
Turkeys	Cattle
	Pigs
	Sheep
	Horses
	Goats
	Chickens
	Honeybees
	Dogs (bigger and fiercer than American ones)

The only other domestic animals in the Americas were high-altitude-adapted llamas and alpaca, guinea pigs, muscovy ducks, and small dogs. None of these became established in Afroeurasia.

Sources: Alfred W. Crosby, *The Columbian Exchange: Biological and Cultural Consequences of 1492* (Westport, CT: Praeger, 2003), 74-5, 92; Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (Cambridge: Cambridge UP, 1986), 188.

Lesson 2***Student Handout 2.2—Unofficial and Official Introductions of Afroeurasian Plants to the Americas*****Document 1****How wheat and olive trees came to Peru: A twentieth-century historian's account.**

A few months after the foundation of Lima [in 1535], Inés [Muñoz, sister-in-law to Pizarro and one of the dozen or so women among the founders of that city] received from Spain a barrel filled with rice. ... One day Inés sat to pick and clean some of the rice. ... [While doing so, she] noticed a few grains of wheat mixed in with the rice which she picked out carefully with the intention of planting them to see if wheat would grow in Peru. She planted a few grains of wheat in a flowerpot “with the same care and attention she would give carnations or sweet basil.” Inés took unusual care of her flowerpot, and was delighted when a bundle of large, healthy spikes of wheat grew from the few grains she had planted. ... [T]he first spikes of wheat were threshed by hand and Inés replanted her first tiny crop. ... [W]ith the intense care and interest of Inés Muñoz, the wheat multiplied so much that within three or four years the production of bread began in Lima. ...

[Her second husband in 1560] returning from a trip to Spain and well aware of what would please Inés most ... brought to Lima the first olive trees to arrive in Peru. ... Only two or three survived the long journey. ... [These] were protected like a rare treasure and were planted with the utmost care in [Inés'] vegetable garden. ... Day and night a group of slaves accompanied by Castilian watchdogs kept a vigil ... [but] one of the olive trees was stolen one night from the garden to reappear months later on the frontier of Chile. In Chile, the stolen tree multiplied with ease, and in a few years groves of olive trees overlooked the Pacific Ocean.

Source: Luis Martin, *Daughters of the Conquistadores: Women of the Viceroyalty of Peru* (Albuquerque: University of New Mexico Press, 1983), 39-40, 42.

Document 2**How the government worked to get ginger grown in Mexico: A twenty-first century historian's account.**

The transplantations [of spices from the East Indies to the Americas] took place through a combination of efforts on the part of the state in coordination with colonial leaders and local [businessmen]. ... The earliest evidence of long-distance transplantation of spice in the Spanish empire took place sometime in the 1550s and involved the transport of spice seeds from the East Indies to New Spain [Mexico]. ... It seems they were smuggled out of Portuguese India and came [into] the possession of Antonio de Mendoza, the first Viceroy of New Spain, who was granted a monopoly to plant [and cultivate] them. ... The cultivation of ginger, ... a highly prized spice ... was clearly successful on the island of Hispaniola. ... By the end of the sixteenth century ... ginger constituted the island's main export. ... In the 1580s, it received higher prices in Europe than sugar did ... [and] two million pounds of ginger reached Seville annually. ... In 1606 ... of 9,648 slaves in Hispaniola, 6,742 worked producing ginger while only eight hundred served in the sugar mills. [However, plans for the cultivation in Spanish America of pepper, cloves, and cinnamon never got off the ground.]

Source: Paula de Vos, "The Science of Spices: Empiricism and Economic Botany in the Early Spanish Empire," *Journal of World History* 17, 4 (2006), 415, 417, 422-3.