

The Columbian Exchange

In 1492, Columbus brought the Eastern and Western Hemispheres back together. The resulting swap of Old and New World germs, animals, plants, peoples, and cultures has been called the “Columbian Exchange.”

Humans from Asia probably first entered the Western Hemisphere between 20,000 and 30,000 years ago. They could have traveled by foot across a land bridge, by small boats along the bridge coastline, or by both methods.

About 10,000 years ago, the sea level rose, submerging the land connection between the two hemispheres. The two hemispheres took separate biological and cultural paths.

Christopher Columbus, an Italian sailing for King Ferdinand and Queen Isabella of Spain, landed his three ships on an island in the Caribbean in 1492. Columbus explored several nearby islands, including a large one the Spanish called Hispaniola, shared today by Haiti and the Dominican Republic.

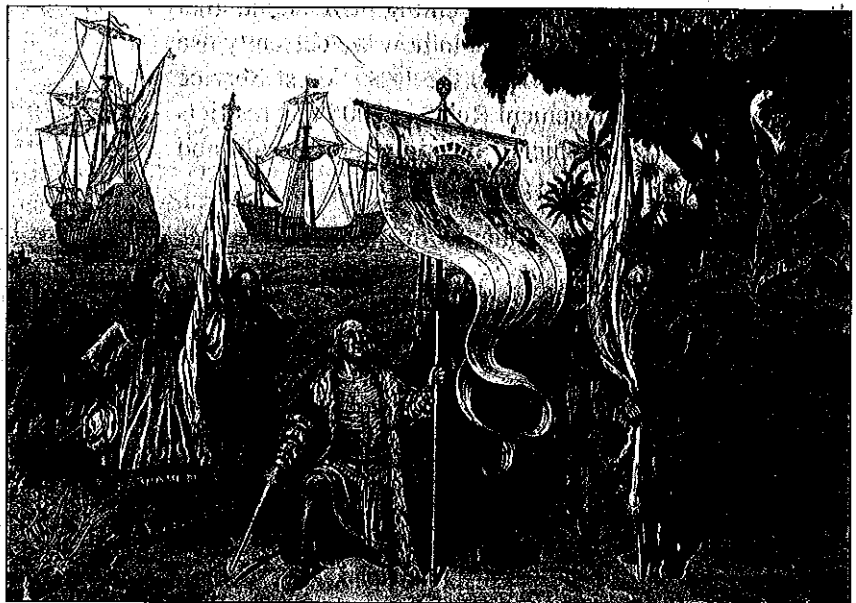
On Hispaniola, Columbus found the Taino, a people who grew crops he had never seen before, such as sweet potatoes, manioc, peanuts, and tobacco. The Spanish and Taino traded and enjoyed friendly relations. Columbus noted the Taino possessed small objects made of gold, which they mined on the island.

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Columbus established a settlement on Hispaniola, Villa de la Navidad, the first European outpost in America. He left about 40 of his men there and headed back to Spain with astounding news.

Aboard ship, Columbus wrote a report of his discoveries: “I discovered a great many islands inhabited by people without number, and of them all I have taken possession on behalf of Their Highnesses.” He described strange trees, fruits, birds, and “beautiful thick soil.”

Columbus described the Taino people as “very good looking” but “unbelievably fearful.” They had no iron or steel and only bows and arrows for weapons. “They still think I come from heaven,” he wrote with amazement. Columbus declared at the end of his report that in the future he could bring the king and queen gold, spices, cotton, and slaves.



The Columbian Exchange began with Columbus landing in the New World, establishing the first significant connection between the peoples of the Eastern and Western Hemispheres in 10,000 years. (Library of Congress)

At first, Columbus thought he had reached the Indies, islands off the southeast coast of Asia, and called the people he encountered “Indians.” In fact, Columbus had made a connection between the two hemispheres for the first time in 10,000 years.

On his second voyage in 1493, Columbus returned to America with 17 ships and 1,300 men, including several Catholic priests to convert the Taino to Christianity. Columbus discovered the Taino had killed all the men he had left at Navidad. He used this news as justification to take Taino slaves.

Of even greater long-term significance were the plants and animals that Columbus carried in the holds of his ships. He brought seeds and cuttings for Old World vegetables, wheat, grapevines, sugarcane, and fruit trees. In addition, he transported live pigs, cattle, chickens, sheep, goats, and horses, none of which lived in the New World. Horses had actually originated in America, spread to the Eastern Hemisphere over the land bridge, and then became extinct in their homeland.

Thus, in 1493, Columbus began a process of swapping Old and New World plants and animals along with stowaway pests, weeds, and germs. As a result, both the Old and New Worlds were changed. Texas historian Alfred W. Crosby called this global enterprise the “Columbian Exchange.”

Why Did Europeans Conquer America So Easily?

Estimates of the population of the Western Hemisphere before Columbus generally range between 30 and 100 million people. Recent studies lean to the high end of this range. Possibly more people lived in the New World in

1492 than in Europe. Early reports indicate that Hispaniola alone held a million Taino Indians.

How did the Spanish and other Europeans so easily conquer America when huge numbers of potentially hostile people outnumbered them? Although they were superior farmers, the peoples of the New World lagged far behind the Spanish in technology. Some knew about the wheel, but since they had no horses, donkeys, mules, or oxen, they never developed wheeled vehicles. They made no steel tools or weapons. Neither did they possess gunpowder.

The greatest weakness of New World peoples, however, proved to be their lack of resistance against Old World diseases. Some of the people who entered America from Asia before the land bridge disappeared might have carried Old World pathogens (bacteria or viruses causing disease). But biologists think these people or the pathogens themselves would not have survived long in the Arctic cold.

New World peoples were relatively healthy compared to their Old World cousins. Without exposure to Old World pathogens, however, the people of New World had no chance to pass on genetic resistance or acquire lifetime immunities by surviving diseases in childhood.

Europe and later Africa exported, unintentionally, more than a dozen diseases that killed large numbers of American natives. Some, like measles and chickenpox, were childhood diseases that usually did not cause many deaths in the Old World but killed millions of American natives.

The Old World disease that killed more New World people than any other was smallpox. A person caught this disease by breathing in the smallpox virus or by coming into contact with the pus-filled boils or scabs on a victim's skin. Death often occurred after a high fever, the eruption of boils, and massive vomiting of blood. Scars from the boils disfigured victims who survived. Survivors were also usually immune from another smallpox infection.

The first smallpox epidemic in the New World began in 1518 on Hispaniola among the Taino. Up to 50 percent of them, about a half-million people, died within two years. Few of the Spanish suffered the disease since most acquired immunity after surviving smallpox as children. Within 100 years, the Taino were extinct, mainly due to smallpox and other diseases.

The Taino disaster was repeated many times in the New World. The native peoples had no experience with quarantines. Their medicines and religious beliefs could not stop the sicknesses. The epidemics struck down their leaders, farmers, and warriors, leaving few to care for or protect those who might have survived. Famine, something rare in the Western Hemisphere before Columbus, often went hand-in-hand with the epidemics.

In 1519, Hernando Cortez invaded Aztec Mexico with 600 soldiers, 14 cannons, 13 muskets, and 16 horses. After gaining the support of discontented peoples ruled by the Aztecs, Cortez seized their capital city. Tenochtitlan, with a population of 200,000, was larger than Paris, Europe's greatest city.

After the Spanish abused the people, the Aztecs revolted, and drove the Spanish out of their city. By the time Cortez regrouped and returned, however, smallpox was raging within Tenochtitlan, wiping out a third of the people. Cortez had little difficulty defeating the sick and starving Aztecs.

Once they reached the mainland, smallpox and other Old World diseases spread unbelievably fast. Epidemics actually struck before the Spanish conquistadors entered new lands in Central and South America. Infected natives fleeing an epidemic made better carriers of the disease than the Spanish themselves.

Smallpox killed the Inca leader, which set off a civil war before Francisco Pizarro reached Peru in 1530. In 1620 when the Pilgrims landed in New England, typhus or the bubonic plague had depopulated the entire coastal region a few years before. In 1837–38, smallpox killed up to 50 percent of the North American Plains Indians.

Most historians now agree that over a period of about 300 years, about 90 percent of New World peoples died of Old World diseases or related causes such as lack of care and starvation. Taking the average of the low and high estimates of people living in the Western Hemisphere before 1492 (65 million), at least 58.5 million people would have perished. Geographer W. George Lovell has called this "the greatest destruction of lives in human history."

Did New World diseases go the other way and devastate Old World peoples? The only candidate is syphilis, a sexually transmitted venereal disease.

A syphilis epidemic erupted suddenly and killed many in Europe only a few years after Columbus returned from his first voyage. The deadliness of this epidemic seems to be evidence that it was new to Europeans. A recent genetic study indicates that a bacteria subspecies of American yaws, a non-venereal skin disease, may have mutated into syphilis in Europe's cooler climate. Scientists, however, still debate the origin of this disease.

Old World Animals

Old World domesticated animals caused major changes in New World nutrition, cultures, and ecology. The only significant New World domesticated animal capable of carrying small loads was the llama in the South American Andes.

The pigs that Columbus first brought in 1493 flourished on Hispaniola and eventually everywhere in the New World. Soon, wild herds of them roamed the land, eating almost everything in sight, including the food crops of the natives.

Major Biological Contributions to the Columbian Exchange

Type of Contribution	Old World to New	New World to Old
Domesticated Animals	Pigs Cattle Horses (reintroduced) Sheep Goats Chickens Donkeys and Mules	Llamas Alpacas Turkeys
Food Crops	Wheat Barley Rice Soybeans Lettuce and other vegetables	Maize (corn) Potatoes (white & sweet) Manioc (tapioca) Peanuts Beans (many varieties) Squash Tomatoes
Cash Crops	Sugarcane Coffee Bananas Citrus and Stone Fruits Olives Wine Grapes	Tobacco Long-fiber cotton Cacao (chocolate) Vanilla Chile Peppers & Paprika Pineapples Avocados Papayas and Guavas Rubber Coca (cocaine)
Invasive Organisms	Black Rats Weeds and Grasses	Gray Squirrels Potato Fungus
Human Diseases	Smallpox Measles Plague Influenza Chickenpox Malaria Yellow Fever Typhoid Fever Typhus Whooping Cough Cholera Diphtheria Scarlet Fever	Syphilis (?)

But they provided a plentiful supply of protein for the Spanish and natives alike.

European cattle, too, soon multiplied into vast wild longhorn herds in the highlands of Mexico and the Pampas, the grassy plains of Argentina. The Spanish established ranchos with hundreds of thousands of cattle that provided beef for local consumption and hides for export.

Some native people adopted livestock ranching as a new way of life. No European domesticated animal, however, had a bigger impact on New World peoples than the horse.

The horse amazed the Aztecs, who at first believed men were riding huge deer. Once horses migrated into the grasslands of North and South America in the late 1500s, they exploded in population and were free for the taking.

Horses were a weapon of war, hauled freight, made cattle ranching possible, and totally transformed the cultures of American Great Plains Indians. For a few generations, the Great Plains Indians became buffalo hunters and warlike raiders on horseback, the last of the New World peoples to hold out against the European invasion.

Old World domesticated animals contributed mightily to the food supply, hauling power, and transportation of New World peoples. But there were also some negative ecological consequences. Steel plows pulled by horses, oxen, and mules plus overgrazing by herds of pigs, cattle, sheep, and goats speeded up erosion of rich soil.

Along with the feed for animals transported to America came Old World grasses and weeds like the dandelion. Old World plants sometimes displaced native plants and threatened animal habitats. Then there were the European rats that competed with small native animals and spread the bubonic plague through the fleas that infested them.

New World Crops

The Spanish discovered that wheat, Europe's basic food crop, did poorly in tropical America where they first established colonies. Maize (corn), potatoes, beans, and other New World crops, however, eventually flourished in Europe and spread to the rest of the Old World.

Corn produces more food per acre than wheat or any crop imported to America from Europe. The leaves covering the ears of corn help to protect the kernels from hail, birds, insects, and drought. People can eat corn raw as well as roasted on the cob, baked into bread, popped, and made into cornmeal mush. It can also be stored for long periods.

Indian farmers had created corn from a wild grass several thousand years ago. By carefully selecting seed kernels and controlling pollination, farmers gradually increased the size of ears of corn. Humans must plant seed corn for it to grow because the leaf husk protecting the kernels prevents natural germination.

The farmers inserted several corn kernels into small hills about a yard apart and added fish heads or bird guano as fertilizer. Then they planted beans, squash, and other vegetables among the hills. This method of cultivation, called *milpa* farming, prevented exhaustion of the soil, and produced a balanced human diet.

At first, people in Europe grew corn as animal fodder. But the value of corn as human food proved itself. Capable of growing fast in a variety of climates, corn prevented starvation when wheat crops failed. It soon spread throughout Europe, Africa, and then the rest of the world.

Pizarro discovered Indians growing white potatoes in the Andes Mountains of Peru. The white potato was a wild plant that the Indians developed into thousands of varieties. This plant produces more food on less land than any other crop. It is also easy to grow from seed or potato cuttings.

For a long time, most people in Europe considered the white potato merely as food for animals or the poor. But this New World crop again came to the rescue when grain failures

occurred. In addition, since potatoes grow underground, bad weather and rampaging armies did not destroy them.

The potato proved to be a major food for England's new industrial workers. It did best, however, in Ireland's soil and climate. Poor people could grow enough potatoes on tiny plots to feed their families.

The fatal flaw was that the Irish grew only one or two varieties, which turned out to be vulnerable to an American fungus that made its way to Ireland in the 1840s. The resulting potato famine caused a million Irish to die of starvation and even more to leave the country, especially to the United States.

The New World provided many other popular food crops. Among them were root crops like sweet potatoes and manioc (tapioca), which grow in poor soils and resist drought. American peanuts offered a new source of protein.

New World crops helped create a food revolution in Europe and most of the rest of the Old World. This helped set off a population explosion.

Europe's population went from about 70 million in 1492 to 90 million in 1600 and 180 million by 1800. The world's population doubled between 1650 and 1850. Today, one-third of all food for people and animals comes from plants with New World origins.

The Desperate Need for Labor

The Spanish conquistadors quickly put Indians to work, often as slaves, mining gold and silver. Mine owners discovered that if Indian miners working at high altitudes in the mountains chewed coca leaves, they were stimulated to work longer each day. The gold and silver sent back to Spain financed a new European global trading system.

The Spanish conquistadors also found they could make a lot of money ranching cattle and growing plantation cash crops like sugar, tobacco, and long-fiber cotton for export to Europe. The Spanish crown granted the conquistadors *encomiendas*, which gave them the right to use the labor of Indians to work their ranchos and plantations.

The continuing epidemics and harsh working conditions, however, caused most Indian workers to die off quickly. The Spanish and other Europeans colonizing the New World needed a new source of labor. They tried European indentured servants, convicts, and even kidnap victims. But by about 1550, African diseases like yellow fever and malaria had crossed the Atlantic and were killing Europeans and Indians alike.

The African slave trade then began. The Portuguese were the first to cash in on selling African slaves in the New World, but the Dutch, English, French, and Danes soon joined this business. Africans proved resistant to yellow

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fever and malaria and survived working in the tropical heat better than Indians or Europeans.

From the 1500s until 1870, when the slave trade finally ended, Europeans transported an estimated 10 million Africans to America. Europeans also came in large numbers. Prompted by Europe's rapidly growing population, shortage of cheap land, and poor industrial conditions, about 50 million Europeans had crossed the Atlantic by 1930. In effect, the African and European mass migrations helped repopulate the New World.

The Global Exchange

Around 1630, Indians in Peru passed on their knowledge of a tree bark that produced quinine, which treated and helped prevent malaria in tropical regions around the world. Europeans in the mid-1800s also extracted cocaine from coca leaves, unleashing a global plague of drug trafficking and addiction.

Kudzu, a fast-growing vine from Japan, appeared at the Philadelphia Centennial Exposition of 1876 as an animal fodder. Farmers later used it to control erosion. But the plant took off in the South, smothering everything it could reach.

On the other hand, the Asian soybean helped restore nutrients to the soil in the Dust Bowl of the U.S. during the 1930s. Rich in protein, the versatile soybean can be processed into flour, cooking oil, milk, ice cream, paint, plastics, and even silk.

Today, diseases can spread much faster than in the days of Columbus, as the recent pandemic of swine flu proved. The mobility of people throughout the world in an age of air flight has enabled germs to rapidly spread and sometimes mutate into deadly diseases.

Thus, the swapping of germs, animals, and plants that Columbus began has continued and expanded worldwide to the present day. Today's "Global Exchange," like the Columbian Exchange before it, also has its positive and negative consequences.

For Discussion and Writing

1. In what ways did the New and Old Worlds change as a result of the "Columbian Exchange"?
2. What do you think was the best Old World contribution to the New World and best New World contribution to the Old World? Why?
3. Do you think the "Columbian Exchange" was more of a positive or negative development in world history? Give evidence from the article to support your view.

For Further Reading

Crosby Alfred W. *The Columbian Exchange: Biological and Cultural Consequences of 1492*. 30th anniversary ed. Westport, Conn.: Praeger, 2003.

Mann, Charles C. *1491, New Revelations of the Americas Before Columbus*. New York: Alfred A. Knopf, 2005.