

# DIFFERENT STROKES

Evolution is the theory of how life forms become different over several generations.

Inventions aren't merely objects or devices. They're also ideas, given physical shape by their creators, that change the way people do things. In addition to the great inventors, there were other kinds of innovators as well, all over the world, in the nineteenth century — creative minds whose ideas also changed the lives of the people around them.

## THE EVOLUTION REVOLUTION

Two English naturalists of the nineteenth century had theories about **evolution**. They proposed a likely new idea of just how the huge variety of life on Earth came about. Charles Darwin (1809–1882) had sailed around the world aboard HMS *Beagle* from 1831 to 1836. Alfred Russel Wallace (1823–1913) had studied the plants and animals of Brazil and the East Indies in the 1840s and 1850s. Working separately, Darwin and Wallace observed that because available food, water, sunlight, and other resources are limited, plants and animals must struggle to survive in their environments. The individuals that thrive long enough to produce the most offspring, said Wallace and Darwin, are those with certain traits that give them an advantage in the competition for resources. Both Darwin and Wallace called this difference in survival rate **natural selection**. Over

time, they said, favorable variations — such as different bird beak shapes or flower colors, for example — are passed down from generation to generation and can produce entirely new types of organisms, each “adapted” to its habitat. Thanks to Darwin's book *On the Origin of Species*, the new theory revolutionized the way people all over the world looked at life on this planet.



People often say that inventors seem to create “out of thin air.” In other words, almost like magic, they “think” their ideas into existence. But what about composers? Their magic may be even more impressive, because from the ideas and feelings within themselves they create something that has no tangible existence — music! Ludwig van Beethoven, the greatest composer of the nineteenth century, is a perfect case in point. He grew up in a time of great turmoil, when all of Europe was torn apart by war and revolutionary struggle. He himself was a man of strong personal emotions and deeply felt ideals. The great symphonies he composed in the early 1800s are nearly perfect musical expressions of those feelings — and his reactions to the momentous events taking place around him. What makes Beethoven particularly unique is that he gradually became deaf just at this point in his life. Yet, completely from within himself, he was able to write powerful and beautiful music that he could not even hear — creating it literally “out of thin air.”

## MUSIC IN THE AIR

## THE LIBERATOR

Simón Bolívar was neither scientist nor mathematician, but more than any other individual, he helped “invent” the idea and the reality of an independent Latin America in the nineteenth century. When he was born in 1783 in Venezuela, almost every country in Central and South America was ruled by Spain. (Portugal controlled Brazil.) By the time he was just over forty, those same countries had become independent republics. From a privileged background, Bolívar was well educated and traveled widely in Europe and the United States. Impressed by the ideals of both the French and American revolutions, he returned home to begin a twenty-year struggle for Latin

American independence. A brilliant and daring military leader, Bolívar defeated Spanish armies in Colombia, Venezuela, Ecuador, and Peru. To this day, Bolívar “the Liberator” is remembered throughout South America.

