FIGURE 8.9.

The peppered moth and its color adaptation to changing environment. The sketch at left shows trees with lichens. Note how difficult it is to spot the well-camouflaged, lighter form in the lower part of the picture. The sketch at right shows the same forms after soot from factories in industrial England destroyed the lichens. The dark (melanic) form then became far more prevalent. This is the classic example of observed *microevolution*. It also demonstrates that life has been endowed with an inherent genetic potential for change.
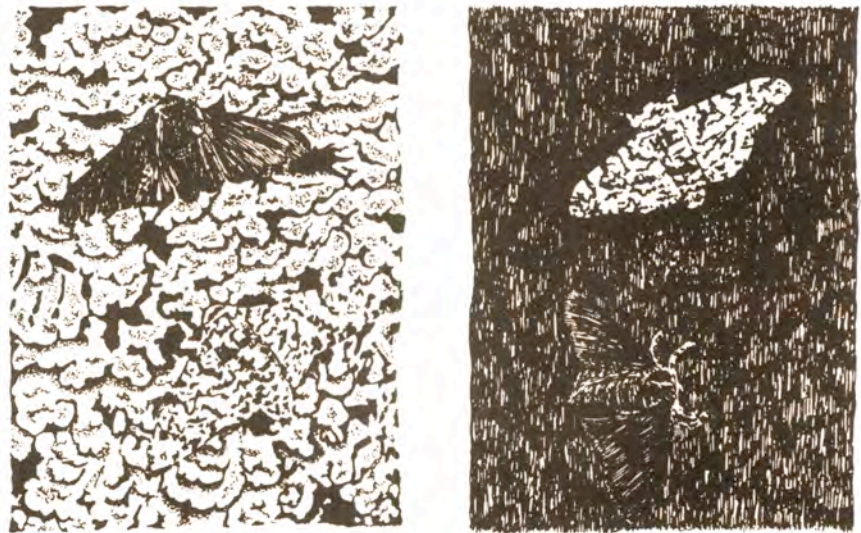
History credits Charles Darwin with originating and developing the theory of evolution. Darwin's theory holds that life forms have changed over time and have developed into the types of plants and animals that are present on the Earth today. According to this theory, all life is related; all life is descended from a common ancestor. The primary mechanism that has determined the direction that life has taken is "natural selection".

In analyzing "natural selection", the term "survival of the fittest" is frequently used. If we picture the world of fang and claw, we can visualize that the fastest zebra escapes the charge of the lion. He or she survives to produce more offspring and thus, over time, the zebras become faster runners. The slow zebras are caught; the fast ones survive to produce offspring. The race in life goes to the swiftest.

We can also look at giraffes and their eating habits. Those giraffes with the longest legs and longest necks can reach higher in the trees to get food. Since they obtain more food when food is scarce, they produce more offspring. In this case, the race goes to the tallest.

The problem with these examples is that they are too simple and therefore scientifically incorrect. To base natural selection on one trait implies zebras would break the sound barrier and giraffes would be as tall as four-story buildings. But as the zebras got faster, so would the lions chasing them. As the giraffes got taller, so would the trees they eat. There are obvious limitations and other factors that make