

(mammal-like reptiles) gave rise to the first tiny primitive mammal at the beginning of the dinosaur reign, 190 million years ago (see figure 9.14). For the next 130 million years, they remained obscure little animals that scurried about the forest in search of food to meet the demands of their high metabolic rate. Theory suggests that to keep from becoming a dinosaur's dinner, they became creatures of the night, foraging for seeds, insects, and worms when the predatory dinosaurs were asleep. How mammals survived the 130-million-year dinosaur dynasty is uncertain, but during this time it is likely they developed increasing intelligence and keen senses of sight, smell, and hearing.

### **THE AGE OF MAMMALS**

Sixty-three million years ago the dinosaurs died out in a final wave of extinction, leaving many unoccupied ecological niches. The grasses appeared and concentrated protein in their seeds which provided nourishment for the high metabolic requirements of mammals. The mammals went forth, multiplied and filled the Earth. Within less than 20 million years, all the basic orders of the class Mammalia appeared and are thought to have changed subsequently over time into the familiar animals of today (see figure 9.13). Scientists call this rapid burst of new life forms the explosive adaptive radiation of the mammals.

Some of the mammals that appeared have not survived to the present time. Most changed in size and physical characteristics to adapt to a variable and changing environment. Continents drifted apart and changes in sea level isolated animal groups on different continents. It was a time of variable climates, but the warm-blooded mammals thrived.

About 3 million years ago, the glacial ordeal began. Great cold and sheets of ice crept down from the North. Woolly coats appeared on rhinoceroses and the elephant-like woolly mammoths. It was a time of great migrations and displacement. Although the total number of animals declined, most animal species were able to remain intact as the ice sheets advanced and retreated.

For some land animals, new ecological opportunities were created as ice bridges enabled them to migrate to new continents and new territories. For others, such as the primates, their forest habitats shrank and created pressures for new adaptations. The age of