

## CHAPTER 9

# EVIDENCE FOR PLANT AND ANIMAL EVOLUTION

## BIOGEOGRAPHY OF FOSSILS

**B**iogeography is the study of how different species are distributed around the world. Biogeography evidence supports common ancestry and the theory of evolution. The geographic locations of plants and animals alive today lead scientists to predict certain patterns for the geographic locations of fossils. A good example of this is the fossils of marsupial animals and their locations on earth.

Nearly all of the world's marsupials (mammals that carry their young in pouches, like kangaroo and koalas) live on Australia and nearby islands. Marsupials fill many ecological niches. On other continents, these ecological niches are filled by non-marsupial (placental) mammals. Geologists tell us that Australia and Southeast Asia were connected by a land bridge long ago. When geologists study rocks in both Australia and in Southeast Asia from an era when the land bridge was still in place, they see fossils indicating that early marsupials and early placental mammals lived together. When they look at rocks from a few million years after the land bridge submerged, the fossils in the two regions become increasingly different. In Asia the placental mammal fossils become dominant and marsupial fossils disappear after a certain point, whereas in Australia, placental mammal fossils disappear and marsupial fossils become dominant. The fossil record also shows that the marsupials in Australia changed over time to become increasingly like modern marsupials. This is the pattern predicted by common ancestry and the theory of evolution.

Similar patterns can be found elsewhere in the world. The drift of the continents today indicates that Africa and South America were once connected as a single continent but then split apart. (Even today, the two continents look like they fit together like puzzle pieces.) Common ancestry predicts that fossils on these two continents should show similar species before the split, and increasingly different species after the split, and increasingly different species split. When geologists look at rocks from western Africa and eastern South America from the time before the two continents separated, they see some identical fossils in both places. These fossils are not found anywhere else in the world. Fossils from rocks dated to a few million years after the two continents separated show that the species begin to look different. More recent fossils in Africa are increasingly similar to some modern African species, and more recent fossils in South America are increasingly similar to some modern South American species.

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