recorded in the fossil record. Fortunately, there are inherent limitations in size (related to their breathing mechanism) to which insects can grow. These upper limits in size were achieved about 300 million years ago when giant cockroaches were one foot (30 cm.) long, and dragonflies attained wingspans of two feet (60 cm.).

The aerial monopoly of the insects was broken about 200 million years ago with the appearance of primitive gliding reptiles. These were highly modified lizards. The bat-like *pterosaurs* appeared about 150 million years ago. Some gliding reptiles were the size of the familiar sparrow, and others were giants of the sky with wingspans of more than twenty-seven feet (see figure 8.5). Their leathery, membranous wings lacked feathers and are thought to have been used more for gliding than true flight.

Birds and reptiles share the common reproductive habit of laying eggs. However, birds differ from reptiles in important respects. Reptiles have teeth to capture food and tear it into digestible portions. The beak of a bird is used to gather food. It uses its specially constructed muscular gizzard to break up the food for digestion.

Another major difference between birds and reptiles is maintenance of internal body temperature. The warm-blooded birds are highly dependent on feathers for insulation. Flying is an extremely energy-consuming process, and feathers conserve body heat so that energy may be reserved for flight. Feathers are even more efficient

FIGURE 8.3.

Scorpion-like arthropods called *eurypterids* inhabited freshwater habitats from 250 to 500 million years ago. This well-preserved fossil specimen is from 400-million-year-old rocks in western New York state and measures about 20 centimeters (8 in.) in length. (Courtesy Buffalo Museum of Science.)

FIGURE 8.4.

Three fossil forms of pectens in sandstone. Fossil at upper left is actual shell. Fossil in center is stone replacement of original shell material which had dissolved after burial. Fossil at upper right is impression or natural mold of original shell.