



Gradual Climatic Change. The Mesozoic era that began with the Age of Reptiles more than 225 million years ago was a period of benign climate. The Earth's climate was not only relatively warm, but, as the age progressed, it is thought that there were not great temperature extremes of heat and cold. Two hundred million years ago the continents were assembled into one great land mass or mega-continent called Pangaea. But by 65 million years ago the continents had largely separated, and the northern land masses had drifted more toward the polar regions.

The vast shallow seas that existed on the fringes of and in the middle of continents gradually drained. The climate of continents was no longer ameliorated by these seas. Greater temperature extremes became common. The winter seasons became cold and long. Animals such as the dinosaurs that were *ectotherms* were hard pressed to survive.

All reptiles and amphibians are *ectotherms*. Their body temperatures fluctuate to match that of the surrounding air or water. They do not generate heat internally in an effort to maintain a constant body temperature as do *endotherms* (mammals and birds).

Amphibians and reptiles, the *ectotherms*, must derive their heat energy directly or indirectly from the Sun. When the climate is warm and mild, this is an advantage. The reptiles do not need to eat much to stay alive because they don't need to metabolize or convert food into energy to heat their bodies. The Sun does this for them. Consider the difference between a busy squirrel gathering nuts and a torpid lizard sitting on a rock. Reptiles may require only 10% of the food needed by the more active *endothermic* mammals and birds that must maintain a constant body temperature.

But when the climate turns cold, especially for long periods, the

FIGURE 9.12.

The sketch of a Stegosaurus skeleton, as it was discovered in the Jurassic formation, is essentially complete. (Courtesy Smithsonian Institution.).
