

## Geologic Periods Subsequent to the Time When Fossils First Became Abundant

(The Carboniferous is frequently subdivided into two periods, Mississippian [earlier] and Pennsylvanian [later]. The time estimates are based on the rate of disintegration of radioactive materials found in a number of deposits.)

| <b>Era<br/>(and Duration)</b>  | <b>Period</b>      | <b>Estimated Time<br/>Since Beginning<br/>of Each Period<br/>(In Millions<br/>of Years)</b> | <b>Epoch</b>   | <b>Life</b>   |
|--|--------------------|---|--|---|
| <i>Cenozoic (age<br/>of mammals;<br/>about 65 mil-<br/>lion years)</i>   | Quater-<br>nary    | 2+  | Holocene<br>(Recent)                                 | Modern species and subspecies;<br>dominance of man.   |
|  |                    |   | Pleistocene  | Modern species of mammals or<br>their forerunners; decimation of<br>large mammals; widespread gla-<br>ciation.                      |
|  | Tertiary           | 65  | Pliocene   | Appearance of many modern gen-<br>era of mammals.   |
|  |                    |   | Miocene  | Rise of modern subfamilies of<br>mammals; spread of grassy<br>plains; evolution of grazing<br>mammals.                              |
|  |                    |   | Oligocene  | Rise of modern families of mam-<br>mals.  |
| Eocene   |                    |   | Rise of modern orders and sub-<br>orders of mammals. |   |
|  |                    |   | Paleocene  | Dominance of archaic mammals.   |
| <i>Mesozoic (age<br/>of reptiles;<br/>about 165 mil-<br/>lion years)</i> | Creta-<br>ceous    | 130   |  | Dominance of angiosperm plants;<br>extinction of large reptiles and<br>ammonites by end of period.                                  |
|  | Jurassic           | 180   |  | Reptiles dominant on land, sea,<br>and in air; first birds; archaic<br>mammals.   |
|  | Triassic           | 230   |  | First dinosaurs, turtles, ichthyo-<br>saurs, plesiosaurs, mammals;<br>cycads and conifers dominant.                                 |
| <i>Paleozoic<br/>(about 340<br/>million<br/>years)</i>                   | Permian            | 280   |  | Radiation of reptiles, which dis-<br>place amphibians as dominant<br>group; widespread glaciation in<br>southern hemisphere.        |
|  | Carbon-<br>iferous | 350   |  | Fern and seed fern coal forests;<br>sharks and crinoids abundant;<br>radiation of amphibians; first<br>reptiles.                    |
|  | Devonian           | 400   |  | Age of fishes; first trees, forests,<br>and amphibians.   |
|  | Silurian           | 450   |  | Invasion of the land by plants and<br>arthropods; archaic fishes.   |
|  | Ordo-<br>vician    | 500   |  | Appearance of vertebrates (ostrac-<br>oderms); brachiopods and<br>cephalopods dominant.   |
|  | Cambrian           | 570   |  | Appearance of all major inverte-<br>brate phyla and many classes;<br>dominance of trilobites and<br>brachiopods; diversified algae. |