

layers? In some local stratigraphic columns the Cambrian strata have a total thickness of more than 20,000 feet, but not even the teeth of any vertebrate animals are found mixed in with the abundance of other fossils. It is a well known fact that sharks shed large numbers of teeth during their lifetime, and many of the beaches of the world are practically strewn with fossilized shark teeth; but none of these dense, highly durable objects are found in the lower strata of the fossil record.

We are thus forced to conclude that many earlier kinds of animals and plants lived, thrived in abundance, and became sealed off in the lower strata before the vertebrates, flowering plants, and diatoms came into existence. (Then we believe that man, the highest of the vertebrates, was created later than any of the organisms we have been discussing.) The facts concerning the earlier organisms speak to us of long periods of time, and have greatly aided geologists in understanding the fossil record and the sedimentary deposits of the earth.

The Forming of Rock Layers

It is very generally known that most sedimentary rocks are formed in or at the edge of bodies of water. The most common types of sedimentary rock are sandstone, conglomerate, siltstone, mudstone, shale, limestone, dolostone, and evaporite. We will here restrict our discussion of age to these types, and not deal with igneous and metamorphic rocks. When one encounters a stratigraphic column composed of sedimentary types of rocks (as is often the case), an approximate age for the column can be obtained by adding together the minimum formation times for the various layers present, and allowing appropriate additional time if unconformities are found.

In order to obtain an idea of the minimum age of such a column, one must take into consideration the types of rock, and also the thickness and number of layers of each type. For example, sandstones and conglomerates, being composed of rather large particles, are usually laid down by moving water which carries the particles along for a time and then drops them as the water movement decreases somewhat. Considerable thicknesses of deposits, to form sandstones and conglomerates, can be laid down within a matter of days. (This often occurs on slopes of the ocean floor, as a result of what are called "turbidity currents" sweeping down the slope.) Similarly, a layer of siltstone might not take any great length of time to form, since its particles are large enough to settle out fairly rapidly. After the deposition of these layers of sand, gravel, or silt, the particles will eventually be converted into sedimentary rock, if they continue to lie in an aquatic or other water-soaked environment. The conversion into rock requires a considerable amount of time because of the changes which must take place. One of these necessary changes consists of an extensive process of cementation, in response to the circulating of mineral-laden water through the pores of the rock mass. This causes the formation of many hard crystals of minerals between the sand or silt particles, with the aid of at least slow water circulation around the particles. These processes