

"Radiocarbon dating is based on the discovery that all organisms contain a constant amount of Carbon-14, a radioactive isotope. However, when an organism dies radiocarbon is gradually lost, and the disintegration of this radioactive carbon proceeds at a known rate. This rate is such that one-half of the radioactive material has decayed at the end of about 5,568 years. In using this method the amount of Carbon-14 remaining in the sample is measured, and the approximate age of the specimen is ascertained by comparing the ratio of the radioactive carbon remaining in the specimen to the amount present in most living things.

"This method was discovered by Dr. W. F. Libby, who was awarded the Nobel prize in chemistry for his outstanding work in this field. The radiocarbon technique has been of particular value in dating archaeological objects, as well as wood, bone, or shells of less than forty thousand years in age.

"The following quotation will help us to appreciate the enormous amount of time involved in the history of the earth:

"'If we imagine the whole of earth's history compressed into a single year, then on this scale, the first eight months would be completely without life. The following two months would be devoted to the most primitive creatures ranging from viruses and single-celled bacteria to Jellyfish, while mammals would not have appeared until the second week in December. Man, as we know him, would have strutted onto the stage at about 11:45 p.m. on December 31. The age of written history would have occupied little more than the last sixty seconds on the clock.'

-- William H. Matthews III, *Fossils* (New York: Barnes & Noble, inc., 1962), pp. 36-38.

"Fortunately, there are methods of determining the ages of rock deposits in the earth's crust. The oldest method is applicable only to sedimentary rocks -- those successive layers or strata of rocks which are formed by slow settling out of sediments from the oceans or other large bodies of water. The use of the method for dating purposes is based upon the assumption that those geological processes which are observable in action now are the same ones which have determined the past history of this earth, and that they have in the past acted at rates comparable to those now observable. As applied to the problem at hand, this simply means that the sedimentary rocks of the past were deposited at rates comparable to those which are now being deposited. in a purely comparative way, dating by this means is fairly satisfactory. The deepest strata are the oldest, while the most superficial strata are quite recent. Thick strata represent long continued deposition, while thin strata represent short periods of deposition. Thus same relative concepts of geological time are readily gained from an inspection of the sedimentary rock deposits. But more exact ideas are difficult to obtain because it is clear that sedimentation is now progressing at very different rates in different parts of the world, and there is no reason to doubt that the variation in the rate of sedimentation has been as great over much of the world's history. It may well have been greater at times. Hence calculations