of age based upon the thicknesses of stratified rocks lead to such statements as that the Mesozoic Era began somewhere between 190,000,000 and 240,000,000 years ago. But the difference between these figures is more than 25 percent of the smaller one. In addition to this difficulty the strata have been changed by such geological processes as folding and erosion, so that often the record is fragmentary and confused. There are a few instances in which stratified rocks appear to have been laid down in definite annual layers, the varves, more or less comparable to the annual growth rings of trees. In such cases, the extent of the periods of sedimentation can be determined with great exactness, if the varves actually do represent annual layers. But this is by no means certain. And even if it were certain, the number of known examples is so small that it could have little importance for the general problem of dating geological history. . . .

"The Lead Method. In 1907, Boltwood introduced a method for dating geological strata based upon radioactive elements. The conclusions to which the new method led indicated that the earth was vastly older than had been generally believed, and the method was received with skepticism. But it has since become the standard by which the accuracy of other methods of dating is judged. . . .

"While this so-called 'lead' method is now generally accepted as being highly accurate, it has some serious limitations. Uranium is not a common element. But in addition to this, it is most commonly associated with geological formations which have not been successfully fitted into their proper places on the geological time scale. Only a very few uranium deposits have been found which are actually useful for dating the main stages in geological history, but the importance of these outweighs their numbers. It appears that the oldest rocks which could possibly have supported life are 2,000,000,000 years old. As the oldest dated rocks are probably of much more recent origin than the world itself, it seems probable that the world is as old as 3,000,000,000 years. Around three-quarters of that 2,000,000,000 years during which life might have existed passed before the beginning of the Cambrian Period, with which the useful fossil record begins, for a lead measurement of the age of a late Cambrian deposit gave a figure of 440,000,000 years. The next exact determination is in the early Permian Period, at an age of 230,000,000 years. Thus the entire Paleozoic Era probably lasted about 300,000,000 years; the Mesozoic about 130,000,000 years; and the Cenozoic about 75,000,000 years up to the present. There is an accurately dated deposit from the beginning of the Eocene Epoch which places this at 58,000,000 years ago. This is all that the lead method has yielded thus far. The dates are few, but fortunately they are scattered widely in geologic time. But as yet, accurate determinations are not available for the extent of any of the Periods or epochs."

-- Edward O. Dodson, *A Textbook of Evolution*, 1952, pp. 70, 71, 74, 75.