In Class Exercises (ICE) - 12/6/00

The "mega-tooth" shark (Carcharodon megalodon) is an extinct giant shark that scientists think was about the size of a Greyhound bus[1]. Much of what we know about this shark comes from fossilized teeth that have been found in coastal regions of Virginia and North Carolina. One fossil tooth had about 0.0000000001% of the carbon-14 remaining.

- ***The half-life of carbon-14 is 5730 years. How old is the tooth?***

Radio-carbon dating is one method to determine dates. In 1959, Dr. W. Tschernezky published an analysis[2] of C. megalodon teeth based on the amount of manganese dioxide deposited on the teeth. Two teeth were analyzed and the thickness of the layers of MnO_2 were 1.7mm and 3.7mm thick. Under typical conditions, MnO_2 is deposited on surfaces at a rate of somewhere between 0.15 and 1.4 mm per thousand years[3].

- ***According to this data, how old are the teeth?***

- ***Which of these two methods for dating do you consider to be the most reliable? Why?***

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[1] Gottfried, M.D., L.J.V. Campagno & S.C. Bowman. (1996) Size and skeletal anatomy of the giant "Megatooth" shark *Carcharodon megalodon*. In A.P. Klimley and D.G. Ainley (eds.) *Great White Sharks: The Biology of* Carcharodon carcharias. San Diego, CA: Academic Press.

[2] Tschernezky, W. (1959) Age of *Carcharodon megalodon*? *Nature*, Volume 184: 1331-1332.

[3] Roesch, B.S. (1998) A critical evaluation of the supposed contemporary existence of *Carcharodon megalodon*. *The Cryptozoology Review*, 3(2): 14-24.