LITERATURE REVIEWS

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NON-POISSON DISTRIBUTIONS OBSERVED DURING COUNTING OF CERTAIN CARBON-14-LABELED ORGANIC (SUB)MONO-LAYERS. John L. Anderson. 1972. The Journal of Physical Chemistry 76:3603-3612.

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The "Anderson experiment," which has evoked a great deal of general interest, has also been the subject of special discussions among creationists, because of the problems presented by the carbon-14 dating technique for believers in a short Biblical chronology. An analysis of Dr. Anderson's report follows.

Under certain circumstances the experimental arrangement used by Dr. Anderson yields data that slightly disagree with what one would expect for random, non-related events such as radioactive disintegrations. If C-14 nuclei in plant and animal tissue are interrelated to the extent which might be suggested by Dr. Anderson's data, the correction implied is inadequate to bring C-14 ages of 20,000 to 50,000 into harmony with a total elapsed time of less than 10,000 years since creation week. To accomplish this would require the C-14 disintegration rate to be increased approximately 500%. The largest apparent increase reported by Dr. Anderson in this article is less than 1%.

The phenomenon presented by Dr. Anderson is extremely subtle. It is scarcely discernable visually in a graphical presentation of his count data (Figure 1 of cited reference). Only refined, highly-sensitive statistical analysis provides unquestionable evidence that his data does not fully conform to expectation for random, non-related events.

An experimental arrangement such as that used by Dr. Anderson always gives normal count statistics for a bulk sample of material containing C-14. Anomalous behavior is only observed for mono-molecular layers of an organic molecule (stearic acid). The stearic acid used in this experiment has been synthesized so that at least some of the organic molecules contain one or more C-14 atoms. The concentration of C-14 in this stearic acid is so high that a few square centimeters of a mono-molecular layer produce in the order of 2000 times as many C-14 disintegrations per minute as is

produced by one gram of normal contemporary carbon. Since one square centimeter mono-molecular layer of pure carbon would weigh approximately 50 billionths (5×10^{-8}) of a gram, the stearic acid used in Dr. Anderson's experiments has a C-14 concentration in the order of 40 billion [$2000 \div (5 \times 10^{-8})$] greater than that found in pure carbon from contemporary natural plant and animal tissue. If the anomalous data obtained in Dr. Anderson's experiments are due to a proximity effect whereby one C-14 atom decay influences other C-14 atoms to decay, this effect would be expected to be much less apparent with the C-14 concentrations that occur in natural material.

It should be emphasized that the experimental arrangement used by Dr. Anderson gives expected counting statistics for the usual multi-molecular layer samples, for samples that are not adsorbed to a substrate, and for mono-molecular adsorbed layers on a metal (aluminum) foil which is either grounded or maintained at a negative potential with respect to the counting apparatus. Anomalous counting data is obtained only for mono-molecular adsorbed samples that are electrically biased with a positive potential or that are insulated to allow attainment of a positive potential as a result of radioactive decay electron loss. None of these specialized circumstances associated with anomalous counting data would be expected in the natural history of an organic or carbonate specimen which one might want to date.

To what may the anomalous counting data provided by the "Anderson experiment" be due? Possibly, probably in the judgment of this reviewer, to a complex effect of electric field configuration on the effective counting geometry for the unique physical arrangement of this experiment, i.e., to subtle effects of the electric field configuration on backscatter electrons and on the paths followed by the lowest energy beta particles emitted by C-14 decay.

Satisfactory accommodation of C-14 data to the requirements of Biblical testimony can probably best be achieved through models based on postulates concerning changes in earth's magnetic field, atmosphere, and biosphere that may have been a consequence of events associated with the flood.