some 2000 years. The age of the Unit III/II transition, which defines the transition from lacustrine to marine conditions, is dated in nine cores at 7350 BP in the organic carbon fraction, and 14,000 BP in the carbonate fraction. The organic carbon dates agree closely with the earlier ages and disagree with the varve chronology by some 2000 years. Most important, we see no change in the age of this boundary with water depth, as has been observed with varve counting, and as has been assumed in many models of the temporal development of anoxia in this basin. This result suggests the varve record is incomplete due to sedimentological processes, and that models of anoxia development need to be rethought.

MEASUREMENT OF COSMOGENIC ^{14}C PRODUCED BY SPALLATION IN TERRESTRIAL ROCKS AND IN METEORITES

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The production of radioisotopes at the earth's surface by cosmic-ray effects has been discussed for many years. Only in the past few years, with more sensitivity for the radioisotopes by accelerator mass spectrometry (AMS), detection of ^{10}Be, ^{26}Al and ^{36}Cl produced in this way have been measured by several groups. We report here on our efforts to measure cosmogenic ^{14}C in terrestrial rocks at high altitude, and comparisons to other exposure-dating methods.

The production of ^{14}C by cosmic-ray spallation effects in extraterrestrial samples, such as meteorites is well known. The amount of ^{14}C left in a meteorite can be used to determine its terrestrial residence time at the earth's surface. In this paper, we will discuss measurements of spallogenic ^{14}C in small meteorite samples from Antarctica, and the significance of the ages calculated. These ages allow us to place limits on infall rate of meteorites, and movement of the meteorites in ice.

A MINIVIAL FOR SMALL SAMPLE ^{14}C DATING

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A 0.3 ml teflon minivial has been designed for ^{14}C dating of small samples in a liquid scintillation counter. A special adaptor of standard vial size is used to optimize the position of the vial with respect to the phototubes and to intercept the light path between them, thus reducing optical cross-talk.

Better performance can be achieved by using customized vials than by diluting small samples for counting in large vials. Counting efficiencies up to 80% have been achieved in 0.3 ml vials typically with 0.05 cpm background.

We discuss the application of the minivial design criteria to other materials and demonstrate the power of electronic background reduction devices.