water. Hence, the simplest method of determining $A_0$ would be to measure $^{14}$C activity of either bicarbonate precipitated from water or of calcium carbonate collected in sediment traps or precipitated on artificial substrata in the case of tufa-depositing streams. However, the present $^{14}$C activity of dissolved bicarbonates in water cannot be used to correct the age of old carbonate sediments for the so-called “hard water effect” because of the contamination of ground and surface waters with bomb-produced $^{14}$C. A reconstruction of the initial activity of DIC is still possible by $^{14}$C activity measurements of samples of pre-bomb calcareous deposits of known age in lake sediments or tufa and organic samples (eg, wood) from the same layer. We describe several methods of experimental determination of $A_0$, which we used in a case study of geochronology of carbonates in the Plitvice Lakes area.

The $^{14}$C activity of depth profiles can be correlated with sediment depth. The slope of the regression line gives the sedimentation rate, and the intercept gives the initial activity. Care must be taken of the uppermost part of the sediment, which is usually less thick than the lower part, and is affected by the global increase of natural $^{14}$C activity.

Assuming that wood fragments embedded in the lake sediment are contemporary with the surrounding sediment, initial $^{14}$C activity can be calculated as the ratio of the $^{14}$C activity of the sediment to that of the wood. In carbonate-rich waters, submerged material becomes coated with a calcareous crust having the $^{14}$C activity close to the $A_0$ of water. Several prebomb test samples of wood coated with calcite crust were found, and the initial $^{14}$C activity was calculated. The $A_0$ values obtained by different methods for Lake Prošće range from 71.6 to 72.2%, and those for Lake Kozjak from 74.8 to 75.9%. These values are also in accordance with the calculated values based on the downstream increase of $^{14}$C activity of bicarbonates in fresh waters open to the atmosphere (Srdoč et al 1986).

REFERENCE


*Work supported in part by NSF grant JF-800.

AMS RADIOCARBON MEASUREMENTS AT THE UNIVERSITY OF WASHINGTON

TA BROWN\textsuperscript{1,2}, GW FARWELL\textsuperscript{1}, PM GROOTES\textsuperscript{1,3}, FH SCHMIDT\textsuperscript{1} and MINZE STUIVER\textsuperscript{3}

Preliminary results of recent radiocarbon studies on Galapagos Islands corals and on pollens extracted from lake sediment cores are presented. Recent technological improvements to our AMS system are also discussed.

\textsuperscript{1}Department of Physics and Nuclear Physics Laboratory
\textsuperscript{2}GeophysicsProgram
\textsuperscript{3}Quaternary Isotope Laboratory and Department of Geological Sciences, University of Washington, Seattle, Washington 98195 USA