

## LETTERS TO THE EDITOR

## Accelerator Radiocarbon Date Indicates Mid-Holocene Age for Hickory Nut from Indiana Late-Glacial Sediments

Whitehead *et al.* (1982) reported the occurrence of a *Carya ovata*-type<sup>1</sup> nut in late-glacial sediments from the Christensen Mastodon site, Hancock County, Indiana. Here, we report the results of a tandem accelerator mass spectrometry (TAMS) radiocarbon measurement that indicates that the *Carya* specimen is mid-Holocene in age.

The nut was recovered during excavations at the site supervised by A. Mirsky. It was situated 58 cm below the modern surface of the basin in a fibrous peat. Other macrofossils obtained from equivalent levels in the peat include cones of *Picea glauca*, *P. mariana*, and *Larix laricina*, and needles of *Picea* and *Larix* (Whitehead *et al.*, 1982). Pollen assemblages from the peat are dominated by *Picea* (15-60%) and herbs (15-40%), with significant amounts of *Quercus* (10-20%) and *Fraxinus nigra*-type (5-15%) (Whitehead *et al.*, 1982). A <sup>14</sup>C date of 12,060 ± 100 yr B.P. (ISGS-601) was obtained from a bulk sample of the peat. Thus, the *Carya* specimen was assumed to be late-glacial in age (Whitehead *et al.*, 1982).

The stratigraphic provenance of the specimen was confirmed by pollen analysis of sediments scraped from the inside of the *Carya* nut (Table 1). The assemblage is dominated by *Picea* and herbs. *Quercus* is well represented, and other hardwoods and *Pinus* are very low. Except for the low percentage of *Fraxinus* pollen in the nut

sample, the pollen spectrum is virtually indistinguishable from several assemblages from the peat sediment (pollen zone CH-2) (Whitehead *et al.*, 1982).

A TAMS date of 4044 ± 163 yr B.P. (AA-942) on a 25-mg sample of the nut indicates that the *Carya* nut represents a Holocene intrusion into the late-glacial sediments. Obviously, *C. ovata*-type should be removed from the late-glacial macrofossil assemblage for the Christensen site.

As demonstrated by this and other recent papers (Betancourt *et al.*, 1984; Van Devender *et al.*, 1984), TAMS dating is a powerful tool in resolving stratigraphic uncertainties critical to important paleoecological and biogeographic problems. Because precise dates can be achieved using a

TABLE 1. POLLEN SPECTRUM (SELECTED TAXA) FROM SEDIMENT SCRAPED FROM INSIDE *Carya* NUT<sup>a</sup>

Taxon	% <sup>b</sup>
<i>Picea</i>	41
<i>Pinus</i>	3
Cupressaceae	3
<i>Quercus</i>	7
<i>Betula</i>	2
<i>Fraxinus</i>	1
<i>Ulmus</i>	1
<i>Ostrya/Carpinus</i>	3
<i>Carya</i>	1
Total arboreal pollen	68
Gramineae	10
Cyperaceae	14
Total herb pollen	32

<sup>a</sup> Analysis by O. K. Davis. Complete data available from the authors.

<sup>b</sup> Percentages based on sum of tree, shrub, and herb pollen, excluding obligate aquatics and spores.

<sup>1</sup> This morphotype includes both *C. ovata* and *C. ovalis*.

small amount of material (12 mg or less, L. J. Toolin, personal communication; Grootes, 1983), specimen-specific dates can be obtained for plant macrofossils, often (as in the present case) without destroying the specimen. We, therefore, strongly advocate wider application of the technique. For instance, in the central United States there are several full-glacial and late-glacial plant macrofossil assemblages of considerable significance because of the mixture of boreal and temperate elements they contain (e.g., Baker *et al.*, 1980; Delcourt and Delcourt, 1977; Delcourt *et al.*, 1980). Because these assemblages are from alluvial sediments, questions have been raised concerning the contemporaneity of the components of these assemblages (Watts, 1983). Application of TAMS dating would be an effective way of resolving these uncertainties.

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