

UNIVERSITY OF WISCONSIN RADIOCARBON DATES XXII

RAYMOND L STEVENTON and JOHN E KUTZBACH

Center for Climatic Research, Institute for Environmental Studies
University of Wisconsin-Madison
1225 West Dayton Street
Madison, Wisconsin 53706

Procedures and equipment used in the University of Wisconsin laboratory have been described in previous date lists (Steventon & Kutzbach 1983; 1984). Except as otherwise indicated, wood, charcoal, and peat samples are pretreated with dilute NaOH-Na₄P₂O₇ and dilute H₃PO₄ before conversion to the counting gas methane; when noted, marls and lake cores are treated with acid only. Very calcareous materials are treated with HCl instead of H₃PO₄. Pretreatment of bone varies with the condition of the bone sample; solid bone with little deterioration is first cleaned manually and ultrasonically. The bone is treated with 8% HCl for 15 minutes, then dilute NaOH-Na₄P₂O₇ for 3 hours at room temperature, washed until neutral, and the collagen extracted according to Longin (1971). Charred bone is treated with dilute HCl, NaOH-Na₄P₂O₇, and then dilute HCl again.

The dates reported have been calculated using 5568 yr as the half-life of ¹⁴C. The standard deviation quoted includes only 1σ of the counting statistics of background, sample, and standard counts. Background methane is prepared from anthracite, standard methane from NBS oxalic acid. The activities of the dated samples for which δ¹³C values are listed have been corrected to correspond to a δ¹³C value of -25‰; the activity of the standard methane has been corrected to -19‰.

Sample descriptions are based on information supplied by those who submitted samples.

ACKNOWLEDGMENTS

This research is supported by the National Science Foundation under Grant #ATM-8219079. We thank the Geology and Geophysics Department for the use of the Finnegan Mat 251 isotope ratio mass spectrometer. We also wish to thank Steven V Bittorf for his technical assistance.

ARCHAEOLOGIC SAMPLES

United States

Illinois

Fentress Lake Slough site (11Jd126) series

Samples from Fentress Lake Slough site, Jo Davies Co (42° 27' N, 90° 35' W) coll Aug 1983 and subm by R A Birmingham, Berg-Zimmer and Assocs, West Allis, Wisconsin. Dates Late Woodland occupation zone (Boszhardt & Overstreet, 1981; Overstreet, 1983). Dates previously reported (R, 1984, v 26, p 135).

WIS-1546. 1170 ± 70

Charcoal from Feature 4, 28cm below disturbed surface, in top level of small pit, beneath mussel shell concentration. Pit yielded lithic debitage and undefined Woodland pottery.

WIS-1547. 1220 ± 70

Charcoal from Feature 7, 13cm below disturbed surface, large basin-shaped pit. Sample underlay large concentration of Madison Ware pottery.

*South Dakota***Archaeological site (39Pn607) series**

Samples coll June 1983 from Site 39Pn607, W Badlands, Pennington Co (43° 43' N, 102° 02' W) and subm by R J Rood, South Dakota Archaeol Research Center, Ft Meade. Assoc artifacts indicate Late Plains Archaic period utilization, although later component assoc with Plains Village period may be present.

WIS-1535. 920 ± 70

Wood charcoal from Feature 2, basin-shaped hearth 30 to 40cm below surface. Hearth was intact with assoc fire-cracked rock.

WIS-1539. 1090 ± 70

Wood charcoal from Feature 7, basin-shaped hearth 20 to 30cm below surface. Hearth was intact with assoc flakes and fire-cracked rock.

WIS-1540. 1510 ± 70

Wood charcoal from Feature 8, basin-shaped hearth 20 to 40cm below surface. Hearth was intact with assoc burned bone fragments, flakes, and fire-cracked rock.

WIS-1541. 640 ± 70

Wood charcoal from Feature 9, basin-shaped hearth 35 to 40cm below surface. Hearth was intact with assoc burned bone and fire-cracked rock.

WIS-1536. Archaeological site (39Pn616) 990 ± 70

Wood charcoal from Feature 2, Site 39Pn616, W Badlands, Pennington Co (43° 42' N, 102° 09' W). Coll June 1983 and subm by R J Rood. Sample from basin-shaped hearth; inadequate artifacts for confident cultural affiliation.

WIS-1538. Archaeological site (39Pn102) 2490 ± 70

Wood charcoal from Feature 1, Site 39Pn102, W Badlands, Pennington Co (43° 44' N, 102° 25' W). Coll Aug 1983 and subm by R A Alex, South Dakota Archaeol Research Center. Sample from shallow hearth 271cm below present surface; inadequate artifacts for confident cultural affiliation.

Archaeological site (39Pn214) series

Charcoal samples from Site 39Pn214, central Black Hills, Pennington Co (44° 02' N, 103° 46' W). Coll 1983 and subm by J Buechler, South Dakota Archaeol Research Center. Artifactual materials range from late Paleo-Indian period through Historic period. Strat separation of various components is not apparent.

WIS-1563.	760 ± 70
Sample from Feature 35, slab-lined hearth.	
WIS-1564.	940 ± 70
Sample from Feature 122, N-most of two superimposed rock-filled hearth features.	
WIS-1565.	600 ± 70
Sample from Feature 122A, S-most of two superimposed rock-filled hearth features.	
WIS-1566.	990 ± 70
Sample from Feature 311, rock-filled hearth.	
WIS-1570.	1150 ± 70
Sample from Feature 180, large oval-shaped charcoal stain.	
WIS-1571.	300 ± 70
Sample from Feature 229, basin-shaped, rock-filled hearth.	
WIS-1572.	390 ± 70
Sample from Feature 107, large concentration of fire-cracked rock.	
WIS-1573.	1060 ± 70
Sample from Feature 69, rock-lined hearth.	
WIS-1574.	630 ± 70
Sample from Feature 25, rock-filled, basin-shaped hearth.	
WIS-1576.	790 ± 70
Sample from Feature 26, large rock-filled hearth. Non-diagnostic lithic debitage was also observed in fill.	
WIS-1577.	3690 ± 70
Sample from Feature 108, schist-lined hearth.	
WIS-1578.	3410 ± 70
Sample from Feature 115, rock-filled hearth.	
WIS-1586.	4980 ± 70
Sample from Feature 165, shallow rock-filled hearth.	

WIS-1587.	460 ± 70
Sample from Feature 205, rock-filled hearth.	
WIS-1588.	2340 ± 70
Sample from Feature 302, rock-filled hearth.	
WIS-1589.	580 ± 70
Sample from Feature 230, large rock-filled hearth.	
WIS-1590.	2670 ± 80
Sample from Feature 208, slab-lined hearth.	
WIS-1591.	3590 ± 80
Sample from Feature 193, rock-lined hearth.	
WIS-1592.	3330 ± 80
Sample from Feature 204, hearth.	
WIS-1593.	620 ± 70
Sample from Feature 135, rock-filled hearth containing micro-flakes, flakes, and lithic tools.	
	3480 ± 80
WIS-1594.	$\delta^{13}C = -24.3\text{‰}$
Sample from Feature 144, rock-lined hearth.	
	1390 ± 70
WIS-1595.	$\delta^{13}C = -24.9\text{‰}$
Sample from Feature 168, rock-filled hearth.	

Wisconsin

WIS-1517. Flambeau Lake canoe **220 ± 50**

Wood sample taken from white pine dugout canoe found at depth 3m in Flambeau Lake, Vilas Co (45° 55' N, 89° 55' W). Sample coll May 1980 by Lac du Flambeau Tribal Council and subm by Lac du Flambeau Band of Lake Superior Chippewa Indians. Canoe was in upright position and was loaded with clay (lake bottom is sand) containing two iron spade blades, 1 adze, 1 ax, and 1 animal trap. Sample was from hull sec.

Pammel Creek (47Lc61) series

Charcoal samples coll June–July 1983 from Pammel Creek, La Crosse Co (43° 45' 44" N, 91° 12' 35" W) by J P Gallagher *et al* and subm by J P Gallagher, Mississippi Valley Archaeol Center, La Crosse. Dates are of Oneota refuse/storage pits at village site. Ceramics from these features are predominantly representative of Orr phase, however, Blue Earth traits are also present.

WIS-1522. **520 ± 70**

Sample from Level 3, Feature 99.

WIS-1523. **480 ± 70**

Sample from Level 6, Feature 2.

WIS-1524. **430 ± 70**

Sample from Level 2, Feature 7.

WIS-1525. **510 ± 70**

Sample from Level 5, Feature 96.

400 ± 60

WIS-1584. State Road Coulee site (47Lc176) $\delta^{13}C = -10.0\text{‰}$

Charred corn kernels coll Aug 1983 from State Road Coulee site, LaCrosse Co (43° 47' N, 91° 12' 30" W) by R F Boszhardt; subm by J P Gallagher. Sample from Zone E of Bank Cut 1 profile, undisturbed Oneota ridged field, 1m below surface. Layer also yielded ceramic sherds, flakes, bone, charcoal, and shell (Boszhardt & Gallagher, 1983).

WIS-1617. State Road Coulee site (47Lc176) **420 ± 70**

Charcoal coll April 1984 from State Road Coulee site, LaCrosse Co (43° 47' N, 91° 12' 00") by R F Boszhardt *et al* and subm by J P Gallagher. Sample from Oneota midden which may include ridged agric fields (Boszhardt & Gallagher, 1983).

WIS-1585. Mill Coulee shell heap (47Cr100) **1180 ± 70**

Charcoal from site in Crawford Co (43° 04' N, 91° 09' W) coll July 1983 and subm by J B Stoltman, Univ Wisconsin, Madison. Dates charcoal directly assoc with shell midden containing preponderantly Lane Farm Cord-Imprinted pottery. Provides first reliable data for Lane Farm phase in SW Wisconsin.

WIS-1607. Zoots site (47Ve512) **1620 ± 70**

Charcoal coll July 1981 from Zoots site, Vernon Co (43° 41' 26" N, 91° 13' 7" W) by R Saft and D M Stemper. Sample subm by J T Penman, State Hist Soc Wisconsin, Madison. Feature eroded from creek bank contained flakes and mussel shell (Penman, 1984).

1560 ± 70

WIS-1608. Striped Steer site (47Bn161) $\delta^{13}C = -26.3\text{‰}$

Charcoal coll July 1981 from Striped Steer site, Barron Co (45° 25' N, 92° 06' W) by R Saft and subm by L Rusch, State Hist Soc Wisconsin. Sample from Feature 3, possibly Middle Woodland component not represented in artifact assemblage (Rusch & Penman, 1984).

GEOLOGIC SAMPLES

*United States**Alaska***WIS-1575. Pleasant Island** **8520 ± 90**

Three overlapping drives of Davis sampler, coll Sept 1983 from Pleasant I., SE Alaska, near town of Gustavus and Glacial Bay National Park (58° 21' N, 135° 39' W) by D R Engstrom and M Noble; subm by D R Engstrom, Univ Minnesota, Minneapolis. Sample from 250 to 260cm below peat surface, at base of peat, overlying contact with mineral soil. Dated to provide first est of age of Pleasant I. surface, which is just outside limits of neoglacial advance in Glacial Bay region (Reiners, Worley, & Lawrence, 1981).

*Florida***WIS-1618. Lake Tulane** **>33,000**

Core coll April 1984 from Lake Tulane, Highlands Co (27° 35' N, 81° 30' W) and subm by H E Wright Jr, Univ Minnesota, Minneapolis. Organic silty lake sediment from 4095 to 4105cm below water surface. Lake depth 23.2m. Basal date of late Wisconsin age or older (Watts, 1980). (1 4-day count.)

*Massachusetts***Winneconnet Pond series**

Core coll Sept 1982 from Winneconnet Pond, Bristol Co (41° 58' N, 71° 07' W) by D C Gaudreau *et al*; subm by S Suter and T Webb, III, Brown Univ, Providence. Water depth 3m. Measurements from sediment surface. Core is being used in study of vegetational history of New England.

WIS-1508. **6520 ± 80**

Gyttja from 520 to 523cm depth, first significant appearance of *Fagus* pollen.

WIS-1509. **9710 ± 100**

Gyttja from 650 to 655cm depth, first appearance of *Tsuga* pollen.

WIS-1510. **10,820 ± 100**

Gyttja from 777 to 782cm depth, date for second peak in spruce pollen.

WIS-1511. **13,360 ± 110**

Gyttja from 949 to 956cm depth, basal date for core.

WIS-1567. **3480 ± 70**

Gyttja from 150 to 156cm depth, uppermost absolute data in sedimentary record.

WIS-1568. 4020 ± 70

Gyttja from 284 to 290cm depth, marks decline in *Tsuga* pollen percentages.

WIS-1569. 11,860 ± 120

Gyttja from 858 to 865cm depth, marks rise in *Alnus* pollen percentages and decline in *Quercus*.

*Minnesota***WIS-1605. Wentzel's Pond 590 ± 70**

Livingston core, 5cm diam, from Wentzel's Pond, Hubbard Co (46° 57' N, 94° 57' W). Coll March 1980 and subm by J C Almendinger, Univ Minnesota. Calcareous algal copropel, 46 to 55cm below sediment surface. Water depth 1.57m. Dates rise in *Ambrosia* pollen and decline in pine pollen. Marks beginning of land clearance and logging ca AD 1860 to 1870. Difference will be used to adjust ¹⁴C dates down core (R, 1983, v 25, p 159). Acid treatment only.

WIS-1606. Peterson Slough 510 ± 70

Livingston core, 5cm diam, from Peterson Slough, Becker Co (46° 58' N, 95° 19' W). Coll Feb 1981 and subm by J C Almendinger. Calcareous algal copropel, 21 to 30cm below sediment surface. Water depth 3.9m. Dates rise in *Ambrosia* pollen and decline in pine pollen. Marks beginning of land clearance and logging ca AD 1860 to 1870. Difference will be used to adjust ¹⁴C dates down core (R, 1983, v 25, p 160). Acid treatment only.

*Nebraska***WIS-1537. Swan Lake 3680 ± 70**

Core coll Jan 1967 from Swan Lake, Garden Co (41° 43' N, 102° 30' W) and subm by H E Wright, Jr, Univ Minnesota. Organic lake sediment from 800 to 820cm below water surface. Date marks conversion of interdune marsh to lake, and thus, rise in water table.

*New York***WIS-1518. Cayuga Lake 1630 ± 70**

Core coll from Cayuga Lake (42° 35' 48" N, 76° 39' 25" W) by M Heit, Dept Energy, New York, NY; subm by A M Swain, Univ Wisconsin-Madison. Water depth 126m. Sample was 68 to 70 cm below sediment surface. Acid treatment only.

WIS-1516. West Sand Lake 10,300 ± 100

Livingstone core, 5cm diam, from West Sand Lake peat bog, Rennselaer Co (42° 32' N, 73° 36' W) coll by D C Gaudreau *et al*, subm by T Webb, III. Sample 245 to 250cm below surface dates uppermost marly sediment. Core is being used for Holocene pollen analysis. Date previously reported (R, 1984, v 26, p 140).

*Wisconsin***Lake Mendota—Middleton series**

Livingston core, 5cm diam, from Lake Mendota, Dane Co (43° 06' N, 89° 29' W) coll Feb 1983 and subm by A M Swain. Water depth 360cm. Measurements from sediment surface. Dates bracket sand lens and hiatus in pollen record from this core. Acid treatment only. Dates previously reported (R, 1983, v 25, p 164; R, 1984, v 26, p 142–143).

WIS-1512. **2320 ± 70**

Fine sandy marly gyttja from 120 to 130cm depth. Sec of core above sand lens.

WIS-1513. **8870 ± 90**

Silty marly gyttja from 170 to 180cm depth. Sec of core below sand lens.

Leopold Marsh series

Livingstone core, 5cm diam, from Leopold Marsh, Sauk Co (43° 33' N, 89° 39' W) coll July 1982 and subm by M J Winkler, Univ Wisconsin-Madison. Site is within present Wisconsin R floodplain on Aldo Leopold Memorial Reserve. Dates should define paleoenvironmental changes during deglaciation of area and subsequent vegetational changes during postglacial period.

WIS-1514. **10,980 ± 110**

Decomposed peat from 557 to 567cm depth. Dates presence of spruce-*Sphagnum* bog assoc during late glacial time.

WIS-1515. **16,580 ± 120**

Fibrous peat grading into blue-gray clay and then red coarse sand from 757 to 773cm depth. Basal date in spruce-sedge late glacial zone.

WIS-1548. **1670 ± 70**

Decomposed peat and charcoal from 20 to 23cm depth.

WIS-1549. **6630 ± 80**

Fibrous peat from 200 to 204cm depth.

WIS-1550. **9100 ± 90**

Fibrous peat from 400 to 403cm depth. Dates disappearance of alder and hazel shrubs.

WIS-1551. **13,130 ± 120**

Fibrous peaty silt and clay from 752 to 757cm depth, dates high amounts of spruce, ash, and sedge pollen.

Hook Lake Bog series

Livingstone core, 5cm diam, from Hook Lake Bog, Dane Co (42° 57' N, 89° 20' W) coll July 1980 and subm by M J Winkler. Dated to correlate late glacial and Holocene pollen and charcoal changes. All measurements from bog surface.

WIS-1600. **2300 ± 70**

Fibrous peat from 187 to 191cm depth, marks beginning of very low charcoal levels and increase in ericad and *Sphagnum* growth.

WIS-1601. **4350 ± 70**

Fibrous peat from 295 to 300cm depth, dates lowest percentages of elm pollen and low pollen percentages from other mesophytic trees.

WIS-1602. **7880 ± 90**

Peat from 491 to 495cm depth, dates decrease in high charcoal levels and elm pollen and increase in oak, grass, composite, and aquatic macrophyte pollen.

WIS-1603. **8950 ± 90**

Decomposed peat from 750 to 756cm depth, dates spruce and fir pollen percentages below 1%, decrease in ash pollen and increase in oak pollen.

WIS-1604. **12,410 ± 120**

Clayey gyttja from 836 to 846cm depth, organic matter increased to over 10%, presence of sponge spicules indicates standing water. Pollen strat shows high percentages of spruce, ash, and poplar.

WIS-1519. **15,940 ± 150**

Gray-green clay from 986 to 1006cm depth, pollen is predominately spruce, *Artemisia*, and grass, suggesting open taiga-like environment as glacier receded. Basal date.

Washburn Bog series

Livingstone core, 5cm diam, from Washburn Bog, Sauk Co (43° 32' N, 89° 39' W) coll and subm by M J Winkler. Dates to be used in Holocene pollen analysis. Measurements from bog surface. Dates previously reported (R, 1984, v 26, p 145).

WIS-1520. **11,260 ± 100**

Spruce wood from 1117 to 1118cm depth, spruce and ash pollen are dominant.

WIS-1521. **13,500 ± 120**

Organic clay and sand from 1119 to 1147cm depth, dates basal sediment. Sample is in spruce pollen zone during late glacial time.

Ridges Sanctuary series

Core coll Aug 13, 1983 from Lake Michigan beach ridge, Door Co (45° 04' 40" N, 87° 06' 50" W) and subm by T Marquardt, Univ Wisconsin-Green Bay. Dates provide time frame for onset and periodicity of ridge formation and palynol interpretations.

WIS-1609.	280 ± 70
Peat from 55 to 60cm depth.	
WIS-1610.	880 ± 70
Peat from 103 to 113cm depth.	

*Bermuda***Mangrove Lake series**

Core coll April 1979 from Mangrove Lake, Bermuda (32° 18' N, 64° 45' W) by W A Watts and H E Wright, Jr; subm by H E Wright, Jr. Samples determine vegetational and climatic history during late Quaternary. All samples were of organic lake sediment gyttja (with occasional mollusk shells), water depth 140cm. Depths measured from water surface.

WIS-1556.	970 ± 70
250 to 260cm depth.	
WIS-1557.	2690 ± 70
450 to 460cm depth.	
WIS-1558.	3170 ± 70
650 to 660cm depth.	
WIS-1559.	4240 ± 70
850 to 860cm depth.	
WIS-1560.	4940 ± 80
1050 to 1060cm depth.	
WIS-1561.	6020 ± 80
1250 to 1260cm depth.	
WIS-1562.	7310 ± 80
1450 to 1460cm depth.	
WIS-1579.	9260 ± 90
1609 to 1620cm depth.	

Canada

Lac Gras series

Livingstone core, 5cm diam, Lac Gras, Quebec (52° 15' N, 67° 04' W) coll June 1981 and subm by H E Wright and G A King, Univ Minnesota, Minneapolis. One of 7 sites being studied along transect from Sept-Iles to Schefferville, Quebec. Closed black spruce forest and old black spruce-jack pine lichen woodland surround lake. Dated to calculate sediment accumulation dates and pollen influx. All measurements from water surface. Water depth 7.95m. Samples previously dated from Harrie Lake (R, 1984, v 26, p 145–146; Short, 1981).

WIS-1542. **3830 ± 70**

Gyttja from 938 to 950cm, just after beginning of *Picea* zone.

WIS-1543. **2450 ± 70**

Gyttja from 897 to 909cm, in *Picea* zone, just before slight increase in *Pinus* pollen percentages.

WIS-1544. **1730 ± 70**

Gyttja from 863 to 875cm, in *Picea* zone after slight increase in *Pinus* pollen percentages.

WIS-1545. **690 ± 70**

Gyttja from 825 to 837cm, in *Picea* zone.

Ranger Bog series

Cores coll July 1982 from Ranger Bog, Labrador (53° 52' N, 59° 49' W) by D R Foster and G A King; subm by G A King. Cores will be used in strat interpretation of bog development. All measurements from surface of bog (Foster & King, 1983).

WIS-1532. **5360 ± 80**

Peat from 173 to 177cm sec of core in *Sphagnum fuscum* hummock. Dates transition from sedge fen to ombrotrophic raised bog.

WIS-1533. **6300 ± 80**

Basal peat from 233 to 237cm sec of core, in *Sphagnum rubellum* hollow in ombrotrophic raised bog. Dates peatland initiation.

WIS-1534. **5940 ± 80**

Basal wood from 252cm depth in *Sphagnum fuscum* hummock of ombrotrophic raised bog. Dates peatland initiation.

Shovel Fen series

Cores coll July 1982 from Shovel Fen, Labrador (52° 32' N, 65° 56' W) by D R Foster and G A King; subm by G A King. Cores will be used in strat interpretation of patterned fen development (Foster & King, 1983).

WIS-1526. **3210 ± 80**

Wood from peat/water interface 90cm below surface of pool on mine-trophic patterned fen. Dates timing of pattern development.

WIS-1527. **5940 ± 80**

Basal peat from 136 to 139cm below surface of a wooden peat ridge. Dates peatland initiation.

Rose Fen series

Cores coll June 1982 from Rose Fen, Labrador (55° 14' N, 67° 14' W) by D R Foster and G A King; subm by G A King. Same observations as for Shovel Fen series above.

WIS-1528. **3430 ± 70**

Fibrous sedge peat from 20 to 22cm below sediment surface of pool 1.2m deep. Dates pool formation on this patterned fen.

WIS-1529. **4120 ± 80**

Wood basal peat from 143 to 148cm below surface of peat ridge. Dates peatland initiation.

WIS-1530. **4510 ± 80**

Well-humified sedge peat from 168 to 173cm below surface. Date provides correlation with adjacent cores.

WIS-1531. **4700 ± 70**

Basal peat from 190 to 195cm below surface of sedge mat. Dates peatland initiation.

Lac au Sable series

Livingstone core, 5cm diam, from Lac au Sable, Quebec (51° 42' N, 66° 13' W) coll June 1982 and subm by D R Foster and G A King. Dated to calculate tree arrival time, sediment accumulation rates, and pollen influx. All depths from water surface. Water depth 6.95m. Contact with glacial silt at 9.57m (Mott, 1976; Short, 1981).

WIS-1554. **3620 ± 70**

Gyttja from 849 to 860cm depth, *Picea* zone.

WIS-1555. **5090 ± 70**

Gyttja from 902 to 912cm depth, *Picea* zone. Dates dip in *Picea* pollen percentages following initial rapid increase after deglaciation.

Coghill Lake series

Core, 7.5cm diam, from Coghill Lake, Labrador (53° 36' N, 66° 46' W) coll July 1981 and subm by H E Wright, Jr and G A King. Dated to calculate sediment accumulation rates and pollen "influx." All depths from water

surface. Water depth 5.65m. Contact with glacial silt at 7.8m (Short, 1981; Stravers, 1981).

WIS-1552. **3350 ± 70**

Silty gyttja from 683 to 690cm depth.

WIS-1553. **4100 ± 70**

Silty gyttja from 720 to 728cm depth, *Picea* zone.

Lac Pètel series

Core, 5cm diam, coll June 1982 from Lac Pètel, Quebec (50° 33' N, 66° 16' W) 40km N of Sept-Iles by G A King and D R Foster, subm by G A King and H E Wright, Jr. Lake elev 290m, which is above marine limit of 130m. Dates will be used to calculate time of tree arrival, sediment accumulation rates, and pollen influx. All depths from water surface. Water depth 5.7m. Sediment contact with glacial silt at 7.73m (Mott, 1976; Lowdon, Robertson, & Blake, 1971).

WIS-1580. **2380 ± 70**

Gyttja from 595 to 603cm depth.

WIS-1581. **3180 ± 70**

Gyttja from 620 to 628cm depth.

WIS-1582. **4670 ± 70**

Gyttja from 650 to 660cm depth.

WIS-1583. **6180 ± 80**

Silty gyttja from 683 to 688cm depth.

WIS-1596. Battery Lake **6120 ± 90**

Core 7.5cm diam coll July 1982 from Battery Lake (unofficial name), S-central Labrador (52° 18' N, 62° 07' W) and subm by H E Wright, Jr and G A King. Gyttja from 613 to 618cm below water surface where percent organic matter reaches first peak. Water depth 5.2m and sediment contact with glacial silt at 6.52m. Dated to determine tree arrival time at site (Morrison, 1970).

WIS-1597. Leaky Lake **4640 ± 80**

Core 7.5cm diam coll July 1982 from Leaky Lake (unofficial name), S-central Labrador (52° 34' N, 63° 36' W) and subm by H E Wright, Jr and G A King. Gyttja from 773 to 779cm below water surface where percent organic matter reaches first peak. Water depth 6.18m and sediment contact with glacial silt at 8.18m. Dated to determine tree arrival time at site (Morrison, 1970).

Pine Lake series

Core 7.5cm diam coll July 1982 from Pine Lake (unofficial name), E Quebec (51° 08' N, 69° 16' W) by H E Wright, Jr and G A King. Dates for calculating sediment accumulation rates and pollen influx. Depths from water surface. Water depth 9.14m and sediment contact with glacial silt at 10.91m (Mott, 1976).

WIS-1598. **3440 ± 70**

Gyttja from 995 to 1001cm depth.

WIS-1599. **4980 ± 80**

Gyttja from 1038 to 1048cm depth, dates dip in percent organic matter.

*England***Forest of Bowland series**

Wood samples coll 1983–84 from 8 sites in Langden/Dunsop/Hodder drainage basin of Central Bowland, Lancashire by A M Harvey and W H Renwick. Subm by W H Renwick, Dept Geog, Rutgers Univ, New Brunswick, New Jersey. Dated to detail sequence of Holocene erosion and deposition in upland England (Harvey, in press).

WIS-1611. **980 ± 70**

Wood (*Betula*) from Langden Valley, below Langden Castle (53° 57' N, 02° 36' N). Antedates main aggradation of Langdon Castle Fen.

WIS-1612. **1790 ± 70**

Wood (*Betula*) from Fiendsdale/Langden Valley (53° 57' N, 02° 37' W). Marks late stage in main aggradation of Fiendsdale Fen and is approx equivalent in age to lower terrace in Langden Valley at this site.

WIS-1613. **4320 ± 80**

Wood from Hodder Valley (53° 56' N, 02° 31' W). Occurs within abandoned channel, equivalent in age to lower terrace of Hodder near confluence of Langden and Dunsop valleys. Pollen indicates valley floor woodland dominated by *Alnus* and *Corylus*, probably of Zone VIIb, post 3000 BP.

WIS-1614. **4680 ± 80**

Wood from Langden Valley, terrace opposite Langden Castle (53° 57' N, 02° 36' W). Postdates aggradation of main terrace in Langden Valley and probably marks onset of peat formation on this terrace.

WIS-1615. **2000 ± 70**

Wood (*Betula*) from Little Haredon Fen (53° 57' N, 02° 34' W). Post-dates first main aggradation phase of Little Haredon Fen.

WIS-1616.**1020 ± 70**

Wood (*Betula*) from Little Haredon Fen (53° 57' N, 02° 34' W). Antedates aggradation phase of Little Haredon Fen.

REFERENCES

- Boszhardt, R F and Gallagher, J P, 1983, Cultural resources investigations: Survey of portions of the State Road and Ebner Coulee Project, LaCrosse, Wisconsin: Mississippi Valley Archeol Center, Rept Inv No. 11.
- Boszhardt, R F and Overstreet, D F, 1981, Preliminary investigations—archeology and sediment geomorphology, Navigation Pool 12, Upper Mississippi River: The Wisconsin Archaeologist, v 64, p 1–2.
- Foster, D R and King, G A, in press, Landscape features, vegetation, and developmental history of a patterned fen in Southeastern Labrador, Canada: Jour Ecology, in press.
- Harvey, A M, in press, The river systems of Northwest England, in Johnson R H, ed, The geomorphology of Northwest England: Manchester, England.
- Longin, R, 1971, New method of collagen extraction for radiocarbon dating: Nature, v 230, p 241–242.
- Lowdon, J A, Robertson, I M, and Blake, W, Jr, 1971, Geological survey of Canada radiocarbon dates XI: Radiocarbon, v 13, p 255–324.
- Morrison, A, 1970, Pollen diagrams from interior Labrador: Canadian Jour Bot, v 98, p 1957–1975.
- Mott, R J, 1976, A Holocene pollen profile from the Sept-Iles area, Quebec: Naturaliste Canada, v 103, p 457–467.
- Overstreet, D F, 1983, Intensive survey at 11Jd126, Jo Davies Co, Illinois: Great Lakes Archaeol Research Center, Inc, Rept Inv No. 125.
- Penman, J T, 1984, Archaeology of the Great River Road: Wisconsin Dept Transportation Archaeol Rept 10.
- Reiners, W A, Worley, L A, and Lawrence, D B, 1981, Plant diversity in a chronosequence at Glacier Bay, Alaska: Ecology, v 55, p 55–69.
- Rusch, L A and Penman, J T, 1984, Transportation archaeology in Wisconsin, the 1983 field season: Wisconsin Dept Transportation Archaeol Rept 9.
- Short, S K, 1981, Radiocarbon date list 1, Labrador and Northern Quebec, Canada: Inst Arctic Alpine Research, Univ Colorado, Occasional Paper 36, 33p.
- Stevenson, R L and Kutzbach, J E, 1983, University of Wisconsin radiocarbon dates XX: Radiocarbon, v 25, p 152–168.
- 1984, University of Wisconsin radiocarbon dates XXI: Radiocarbon, v 26, p 135–147.
- Stravers, L K S, (ms), 1981, Palynology and deglaciation history of the Central Labrador—Ungava Peninsula: M S thesis, Univ Colorado, Boulder, 171p.
- Watts, W A, 1980, The Late Quaternary vegetation history of southeastern United States: Ann rev Ecol Systematics, v 11, p 389–409.