[RADIOCARBON, VOL 22, No. 1, 1980, P 115-129]

UNIVERSITY OF WISCONSIN RADIOCARBON DATES XVII

MARGARET M BENDER, DAVID A BAERREIS,
and REID A BRYSON

Center for Climatic Research, 1225 W Dayton Street,
University of Wisconsin-Madison

Procedures and equipment have been described in previous date lists. Except as otherwise indicated, wood, charcoal and peat samples are pretreated with dilute NaOH and dilute H_3PO_4 before conversion to the counting gas methane; marls and lake cores are treated with acid only. Very calcareous materials are treated with HCl instead of H_3PO_4.

The dates reported have been calculated using 5568 as the half-life of ^{14}C with 1950 as the reference year. The standard deviation quoted includes only the 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 $\delta^{13}C$ values are listed have been corrected to correspond to a $\delta^{13}C$ value of $-25‰$.

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

ACKNOWLEDGMENTS

This research is supported by the National Science Foundation under Grant No. ATM74-23041. We thank the Chemistry Department for the use of the RMS 6-60 mass spectrometer. We also wish to thank Raymond Steventon and Arden Berge for technical assistance.

I. ARCHAEOLOGIC SAMPLES

A. North Dakota

Anderson Mound site (32RM236)

Charred wood (either *Pinus* or *Juniperus* spp) from wood-lined burial pit, 50 to 75cm below ground level, in early Plains Woodland burial mound excavated 1959-1960 by Elden Johnson, Univ Minnesota, in Ransom Co (46° 31′ 20″ N, 97° 26′ 15″ W). At least 2 burials recovered from mound, assoc with cord-roughened pottery, projectile points, scrapers and lithic debitage. Mound may be related to Sonata complex (Hewes, 1949; Neuman, 1975). Subm by Rain Vehik, Univ Oklahoma, Norman.

WIS-1016. Anderson Mound site (32RM236) **470 ± 75**
$\delta^{13}C = -26.0‰$

Acid treatment only. Sample counted only once.

WIS-1021. Anderson Mound site (32RM236) **265 ± 70**
$\delta^{13}C = -25.9‰$

Sample treated with base and acid.

B. South Dakota

WIS-1074. Crow Creek site (39BF11) **610 ± 55**

$\delta^{13}C = -26.8‰$

Charcoal from outer fortification ditch, lower level of Bone Bed "B", mass deposit of human bone, Crow Creek site, Buffalo Co, (43° 59′ 50″ N, 99° 19′ 54″ W). Material dates end of occupation of site when massacre of at least 500 people occurred. Event took place in middle or end of Initial Coalescent component (Kivett & Jensen, 1976). Sample coll Oct 1978 and subm by T E Emerson, Univ S Dakota, Vermillion.

II. GEOLOGIC SAMPLES

A. Kansas

WIS-1030. Max Brown Gravel Quarry **2395 ± 65**

$\delta^{13}C = -27.4‰$

Quercus sp (id verified by R Miller, Forest Products Laboratory, Madison, Wisconsin) buried within river terrace gravel at depth of 12m in Max Brown Gravel Quarry, Bonner Springs, Johnson Co (39° 3′ N, 94° 5′ W). Coll October, 1978, by W C Johnson, Univ Kansas, Lawrence. Specimen dates lowermost (youngest) terrace level within lower Kansas R system; identifies period of intensified river activity thought to be in response to climatic change during Holocene. Sample dated to attempt to document synchroneity of Kansas R system and those of upper Midwest, specifically Kickapoo R system (Johnson, 1978).

B. Minnesota

Horseshoe Lake series

Core HD taken with 2.5cm diam Livingstone piston sampler in March 1974 from Horseshoe Lake, Isanti Co (45° 27′ N, 93° 2′ W). Core from area of thickest sediments in lake basin, depth to glacial drift 1110cm. Depths measured from water surface, depth of water at core site 117cm. Horseshoe Lake is on Anoka Sand Plain in E central Minnesota in tension zone between conifer forest and deciduous forest, near S limit of continuous range of *Pinus strobus* and *Betula Papyfera*. Pollen diagram from core is near completion. Coll and subm by E J Cushing, Univ Minnesota, Minneapolis. Late glacial portion of pollen stratigraphy was dated by Stuiver, Y-1973 -1978 (R, 1969, v 11, p 574).

WIS-1025. Horseshoe Lake site **910 ± 70**

$\delta^{13}C = -18.9‰$

Algal copropel with fine plant detritus, scattered *Najas* seeds, from 207 to 217cm segment of core. Increase of birch pollen at 200cm and of white pine at 185cm suggests invasion of oak forest by these sp near lake; southward migration of sp may have resulted from cooling of climate. Sample counted only once.

WIS-1028. Horseshoe Lake site **2290 ± 65**
$\delta^{13}C = -19.9‰$

Non-calcareous algal copropel with fine plant detritus from 347 to 352cm segment of core. Pollen assemblage between 200 and 450cm in core is thought to represent closed vegetation of *Quercus macrocarpa* and *Q ellipsoidalis* grubs, sprouts and scattered trees. An increase in *Larix* pollen in this zone may mark immigration of tamarack to marshes in area.

WIS-1024. Horseshoe Lake site **3705 ± 70**
$\delta^{13}C = -21.0‰$

Non-calcareous algal copropel with fine plant detritus from 487 to 492cm section. At this level in core oak pollen increases (above 25%), birch and alder increase and grass, *Ambrosia,* and *Artemisia* decrease. May mark invasion of prairie by *Quercus* shrubland and forest and of open marsh by shrubs from decrease in frequency of fire.

WIS-1027. Horseshoe Lake site **4650 ± 75**
$\delta^{13}C = -20.7‰$

Non-calcareous humified copropel from 607 to 612cm section. *Quercus* pollen increases at this level in core suggesting invasion of open prairie and marsh by oaks in local habitats protected from fire.

WIS-1026. Horseshoe Lake site **6165 ± 80**
$\delta^{13}C = -18.6‰$

Non-calcareous algal copropel with fine plant detritus from 787 to 792cm sect. Pollen assemblage between 500 and 980cm is dominated by non-arboreal pollen. At ca 780cm dominant herb type changes from *Artemisia* to Gramineae. At 810cm sharp but brief increase of *Pinus strobus* pollen probably marks its initial immigration to this area. Similar event is known from nearby Cedar Bog Lake where it was dated at 7880 BP (Y-1197) (R, 1963, v 5, p 323).

WIS-1029. Horseshoe Lake site **7550 ± 90**
$\delta^{13}C = -18.0‰$

Moderately calcareous algal copropel 947 to 952cm sec of core. Boundary between *Pinus pteridium* pollen assemblage zone and *Quercus*-Gramineae-*Artemisia* assemblage zone is at 980cm. In adjacent core, correlative pollen-stratigraphic event was dated at 8510 BP, Y-1973 (R, 1969, v 11, p 574).

French Lake site

Core, 5.1cm diam, coll Feb 1978 from French Lake, McLeod Co, (44° 57′ N, 94° 25′ W) by E C Grimm; subm by H E Wright, Jr. Pollen analysis of core is in preparation for study of vegetation history along prairie-forest border in S central Minnesota. Site was only a few km from prairie-forest border at time of settlement by European man.

WIS-1011. French Lake site **390 ± 60**
$\delta^{13}C = -30.9‰$

Detritus gyttja 60 to 70cm below sediment surface immediately below *Ambrosia* rise at beginning of cultural horizon in sediment. Lake is located on calcareous till.

WIS-1012. French Lake site **810 ± 60**
$\delta^{13}C = -26.8‰$

Lake sediment 720 to 730cm below water surface, sediment surface at 5.76m. Sample marks increase in *Carya* and *Juglans cinerea* pollen, may mark development of Big Woods at this site.

WIS-1009. French Lake site **2615 ± 65**
$\delta^{13}C = -22.6‰$

Silty gyttja 945 to 955cm below water surface. Sample marks dramatic increase in *Quercus* pollen percentages and forest invasion of prairie.

WIS-1013. French Lake site **3785 ± 70**
$\delta^{13}C = -24.6‰$

Silty gyttja 1150 to 1160cm below water surface. Pollen assemblage at this depth typical of that from prairie.

Wolsfeld Lake site

Lake core, 12m in length, 5cm diam, coll Dec 1977 by E C Grimm, Univ Minnesota, from Wolsfeld Lake, Hennepin Co, Minnesota (45° 00′ N, 93° 34′ W). Pollen analysis of core to be used in study of vegetational history of prairie-forest border in S central Minnesota. Depths are from water surface, sediment surface was 6.48m deep. Subm by E C Grimm.

WIS-1002. Wolsfeld Lake site **630 ± 55**
$\delta^{13}C = -28.5‰$

Lake sediment, gyttja, 7.10 to 7.20m deep, immediately below stratigraphic marker that should date ca AD 1860. Sample dated to check on influence of ancient carbon in sediment of lake.

WIS-1003. Wolsfeld Lake site **920 ± 60**
$\delta^{13}C = -31.4‰$

Lake sediment 7.80 to 7.90m deep. Sample marks beginning of succession from oak dominated vegetation to mesic deciduous forest.

WIS-1005. Wolsfeld Lake site **2790 ± 65**
$\delta^{13}C = -29.4‰$

Lake sediment 9.70 to 9.80m deep. Sample marks an increase in grass pollen percentage.

WIS-1006. Wolsfeld Lake site **3705 ± 60**
$\delta^{13}C = -27.4‰$

Lake sediment 10.60 to 10.70m deep. Sample marks significant decrease in organic matter on layer of silt.

WIS-1007. Wolsfeld Lake site **4030 ± 75**

Lake sediment 11.30 to 11.40m deep. Sample marks increase in *Quercus* pollen percentage which presumably indicates forest invasion of prairie.

WIS-1008. Wolsfeld Lake site **5640 ± 70**
$\delta^{13}C = -25.1‰$

Lake sediment 13.40 to 13.50m deep. Sample marks lowest stratigraphic position used in study.

WIS-1033. Wolsfeld Lake site **800 ± 60**
$\delta^{13}C = -29.8‰$

Lake sediment 7.45 to 7.55m deep. Sample marks change from oak dominated vegetation to mesic deciduous forest, marks significant change in pollen spectra and dates above and below sample are in very different sediment types. Lake sediment dates require correction because of ancient carbon and correction may be different in these 2 sediment types.

WIS-1034. Wolsfeld Lake site **12,060 ± 125**
$\delta^{13}C = -27.2‰$

Trash layer at base of lake sediment core 1770 to 1778cm deep. Glacial till immediately below; sample contained wood, needles, and roots of *Picea* and *Larix*.

WIS-1037. Chasebrook 14 site **3950 ± 80**
$\delta^{13}C = -28.6‰$

Peat coll Oct 1978 by H E Wright, Univ Minnesota, Minneapolis from site in Koochiching Co (48° 20′ N, 94° 23′ W). Sample from 320 to 352cm below surface at base of peat on top of till. Dates beginning of peat growth at this locality in Red Lake Peatland (Griffin, 1977). Subm by H E Wright.

WIS-1035. Chasebrook 17 site **1950 ± 65**
$\delta^{13}C = -26.9‰$

Peat coll Oct 1978 by H E Wright, from site in Beltrami Co (48° 17′ N, 95° 01′ W). Sample from 150 to 155cm below surface at base of peat on top of sand. Dates beginning of peat growth.

C. New York

Brandreth Lake Inlet site

Eight cores sampled Sept 1978 from bog 2km up Brandreth Lake Inlet in Adirondack Mts, Hamilton Co, New York (44° 55′ N, 74° 41′ W). Samples dated to establish deposition rates in paleoecological/paleoclimatological study of peat bog. Pollen analysis of cores is underway. Coll and subm by J T Overpeck and R R Kautz, Hamilton Coll, New York.

WIS-1050. Brandreth Lake Inlet site **10,360 ± 100**
$\delta^{13}C = -31.3‰$

Peat, 997 to 1023cm interval of 10.52m core through homogeneous peat and into underlying lake bottom sediments.

WIS-1052. Brandreth Lake Inlet site **3245 ± 65**
$\delta^{13}C = -28.3‰$

Peat, 231 to 249cm interval of 10.52m core.

WIS-1051. Brandreth Lake Inlet site **7880 ± 100**
$\delta^{13}C = -28.6‰$

Slightly micaceous peat, 231 to 249cm interval of 298cm core through homogeneous peats and into underlying sediments.

D. Wisconsin

South Waubesa Wetlands site

Core samples obtained Nov 1978 from South Waubesa marsh, Dane Co (42° 59′ N, 89° 21′ W) by T K Kratz and R M Friedman, Univ Wisconsin-Madison. Subm by C B DeWitt, Univ Wisconsin-Madison. Peat samples from selected portions of marsh dated to determine rate of lake edge wetlands formation (Friedman & DeWitt, 1978). Dates on samples coll earlier have been reported (R, 1979, v 21, p 128-129).

WIS-1036. South Waubesa Wetlands site **620 ± 65**
$\delta^{13}C = -30.3‰$

Band peat, 12cm, immediately above fibrous to lake sedimentary peat transition 1.05m below surface.

WIS-1038. South Waubesa Wetlands site **1615 ± 65**
$\delta^{13}C = -32.0‰$

Band fibrous peat, 12cm immediately above fibrous to lake sedimentary peat transition, 1.45m below surface.

WIS-1039. South Waubesa Wetlands site **1505 ± 65**
$\delta^{13}C = -28.4‰$

Band fibrous peat, 12cm, immediately above transition zone, 1.25m below surface.

WIS-1040. South Waubesa Wetlands site **3215 ± 55**
$\delta^{13}C = -25.7‰$

Band fibrous peat, 12cm, immediately above transition zone, 1.55m below surface.

WIS-1041. South Waubesa Wetlands site **6840 ± 90**
$\delta^{13}C = -30.1‰$

Band fibrous peat, 12cm, immediately above transition zone, 1.55m below surface.

WIS-1042. South Waubesa Wetlands site **<150**
$\delta^{13}C = -27.5‰$

Peat 10 to 15cm below surface, level at which *Ambrosia* pollen increased. Dates beginning of European settlement in area.

WIS-1043. South Waubesa Wetlands site **1760 ± 70**
$\delta^{13}C = -29.8‰$

Peat 76 to 81cm below surface, above transition lake sediment to peat. Increase in total pine pollen and decrease in oak and hickory pollen occur above this level.

WIS-1045. Lima Bog site **8070 ± 100**
$\delta^{13}C = -27.5‰$

Calcareous organic gyttja, 990 to 1000cm sec of core from Lima Bog, Rock Co (42° 48′ N, 88° 51′ W). Sample from base of core into early postglacial sediments. Oak and elm pollen decreasing, Gramineae, *Artemisia,* and *Ambrosia*-type pollen percentages increasing at this horizon. One 3-day count. Coll and subm by K Van Zant, Earlham Coll, Richmond, Indiana.

Devil's Lake site

Core, 6.03m coll Feb 1978 by L J Maher, Jr, Univ Wisconsin-Madison from NW part of Devil's Lake, Sauk Co (43° 25′ N, 89° 44′ W). Core to be used in pollen influx study. Sample depths are below sediment surface, water depth 11.75m. Second core coll March 1979, water depth 12.1m. Subm by L J Maher, Jr.

WIS-993. Devil's Lake site **245 ± 55**

Organic lake sediment from 16 to 21cm below sediment surface.

WIS-994. Devil's Lake site **2055 ± 65**
$\delta^{13}C = -25.4‰$

Gyttja from 138 to 144cm interval.

WIS-995. Devil's Lake site **2430 ± 65**
$\delta^{13}C = -23.0‰$

Gyttja from 164 to 169cm below sediment surface.

WIS-996. Devil's Lake site **4105 ± 65**
$\delta^{13}C = -24.8‰$

Gyttja from 263 to 267cm below sediment surface.

WIS-997. Devil's Lake site **5245 ± 65**
$\delta^{13}C = -27.5‰$

Gyttja from 334 to 338cm below sediment surface.

WIS-998. Devil's Lake site **6920 ± 75**
$\delta^{13}C = -28.0‰$

Gyttja from 395 to 399cm below sediment surface.

WIS-999. Devil's Lake site **8640 ± 85**

$\delta^{13}C = -26.6‰$

Gyttja from 455 to 459cm below sediment surface.

WIS-1000. Devil's Lake site **10,080 ± 100**

$\delta^{13}C = -29.7‰$

Gyttja from 514 to 518cm interval of core.

WIS-1001. Devil's Lake site **10,620 ± 105**

$\delta^{13}C = -29.2‰$

Silty gyttja 541 to 547cm below surface.

WIS-1004. Devil's Lake site **12,880 ± 125**

$\delta^{13}C = -31.3‰$

Silty gyttja 599 to 603cm below surface.

WIS-1073. Devil's Lake site **12,260 ± 115**

[$\delta^{13}C = -31.0‰$]

Gyttja, 4cm interval, from 6m depth of second core. Sample is lowermost organic sediment lying over laminated clay. $\delta^{13}C$ value assumed from WIS-1075.

WIS-1075. Devil's Lake site **12,520 ± 160**

$\delta^{13}C = -31.0‰$

Lake sediment and laminated olive black clay, 8cm interval, from 6m depth of 2nd core. Sample is uppermost portion of laminated inorganic clay unit under organic lake sediments. One 3-day count.

Platte River

Site is part of river reach currently undergoing in-depth studies of late Quaternary fluvial deposits. Samples coll Sept and Dec, 1978 by J C Knox, Univ Wisconsin-Madison, from Grant Co (42° 56′ N, 90° 30′ W). Subm by J C Knox. Approx base of Woodfordian age fluvial deposit at this site also recently dated (22,270 ± 650, IGS-558).

WIS-1029. Platte River site **<150**

Wood (*Fraxinus*) 180cm deep in silty sand near contact with gravel base.

WIS-1072. Platte River site **380 ± 50**

Wood (*Ulmus rubra*) 140cm deep in organic rich sandy silt near contact with gravel base. Above dates, with other Holocene radiocarbon dates for SW Wisconsin valley alluvium (R, 1971, v 13, p 481; R, 1973, v 15, p 622-623; R, 1975, v 17, p 133; R, 1976, v 18, p 135-137; R, 1977, v 19, p 134-135) reveal that valley bottom alluviation by coarse gravels was relatively modest in response to climatic changes of Holocene in comparison to effects of agricultural land use in past 150 yr.

WIS-1023. Pine River site **9520 ± 95**

Stump wood (*Picea*) coll April 1975 by J C Knox from drainage ditch tributary to Fancy Creek, Pine R system, Richland Co, (42° 24′ N, 90° 24′ W). Sample 180 to 190cm deep in dense stump horizon; represents termination of spruce growth at site. Silt unit directly above stump zone probably correlates with climate shift to warmer and drier conditions during early Mid-Holocene. Silt unit (80cm) in turn buried by 1m of peat thought to be assoc with return to cooler/wetter conditions of late Holocene.

Brush Creek, Wisconsin

Samples coll Sept, Oct and Nov, 1978, from stream deposits in Brush Creek, Monroe Co, by P F McDowell, Univ Wisconsin-Madison. Dates on previous samples from Brush Creek have been reported (R, 1975, v 17, p 133; R, 1976, v 18, p 135). Brush Creek is site of intensive study of relationship between fluvial activity and climatic change during Holocene (Johnson, 1976; Knox, 1972).

WIS-1022. Brush Creek site **4410 ± 75**

Wood from 2.1m below surface of silty alluvial deposits and immediately above stream laid gravels in stream bank exposure on Kuder Farm (43° 44′ N, 90° 42′ W). Date fluvial deposition related to adjacent peat deposit on valley floor. Fluvial activity and peat growth resulted from shift to cooler/wetter climatic conditions.

WIS-1018. Brush Creek site **9060 ± 95**

Wood, *Fraxinus* sp, 2.5m below surface of silty alluvial deposits and immediately above stream-laid gravels from right bank of Upper Brush Creek on Helmuth Farm (43° 44′ N, 90° 41′ W). Sample found 8m downstream from WIS-674, dated at 5055 ± 65 (R, 1975, v 17, p 133). Sample dates deposition of early Holocene valley fill assoc with fluvial adjustments to post-glacial climatic change. Early Holocene deposits were extensively eroded some time before 5055 BP.

WIS-1044. Brush Creek site **4540 ± 70**

Wood fragments 2.2m below surface of alluvial deposits on Hansen Farm, Monroe Co (43° 44′ N, 90° 40′ W). Sample taken from drill hole 170m N of WIS-757 (2940 ± 60; R, 1976, v 18, p 135). Dates indicate late Holocene shift in channel of Brush Creek and extent of erosion of early Holocene alluvial deposits.

WIS-1046. Brush Creek site **7810 ± 95**

Wood, 2.5m below surface of alluvial deposits from right bank of Brush Creek on Feitner Farm (43° 44′ N, 90° 38′ W). Dates episode of fluvial adjustment to mid-Holocene shift to drier climatic and vegetation conditions. With WIS-1018 (9060 ± 95) and several younger dates from Brush Creek, sample dates soil chronosequence developed in alluvial deposits of early, mid-, and late Holocene ages.

WIS-1071. Brush Creek site **5145 ± 65**

Wood 2.3m below surface of alluvial deposits from left bank of Upper Brush Creek on Peter Leis pasture, Monroe Co (43° 44′ N, 90° 42′ W).

With WIS-813 (5045 ± 70: R, 1977, v 19, p 135) and WIS-1022 (4410 ± 75) above dates period of intensive fluvial adjustment in response to climatic change to cooler and wetter conditions and helps to explain origin of valley floor peat deposits.

Stewart's Dark Lake site

10.45m core coll from Stewart's Dark Lake, Rusk Co (45° 18′ N, 91° 27′ W) March 1978. Because of possibility that core top was 20cm below sediment surface, 2nd core was sampled Nov 1978 and 95 to 110cm sec dated (WIS-1081) to correlate pollen records from overlapping core segments. Pollen analysis of core is being completed by A Peters and T Webb III, Brown Univ. Depths are from top of core, water depth of coring site 8.5m. Coll and subm by A M Swain, Univ Wisconsin-Madison. Earlier date on sediment sample 603 to 612cm deep from another core has been reported, WIS-373, 10,280 ± 105 (R, 1970, v 12, p 341).

WIS-1081. Stewart's Dark Lake site **1370 ± 70**

Lake sediment 95 to 110cm from sediment surface of 2nd core. Date will be used to estimate rates of sediment deposition and to correlate pollen records of the 2 cores.

WIS-1078. Stewart's Dark Lake site **1770 ± 70**

Lake sediment 100 to 110cm from top of core.

WIS-1049. Stewart's Dark Lake site **4185 ± 70**

Gyttja, 2.95 to 3.05m sec. Sample dates beginning of decline in percentages of oak and herb pollen and beginning of rise in percentages of birch and white-pine pollen.

WIS-1048. Stewart's Dark Lake site **6350 ± 70**

Gyttja, 4.60 to 4.70m sec. Sample dates rise in oak pollen, decline in elm and hornbeam pollen, brief peak in birch pollen, and min in pine pollen.

WIS-1015. Stewart's Dark Lake site **8640 ± 90**

Dark brown lake sediment, 6.15 to 6.30m sec of core. Sample marks 1st significant increase of white pine pollen percentages.

WIS-1017. Stewart's Dark Lake site **10,140 ± 105**

Laminated dark brown to black (with gray layers) lake sediment, 7.95 to 8.10m sec. Sample dates decline of spruce pollen percentages.

WIS-1019. Stewart's Dark Lake site **10,570 ± 110**

Clay with large plant fragments, 10.10 to 10.30m sec. Sample gives min date for beginning of sedimentation in lake.

E. Canada

Mount Yamaska site

Core, 575cm, of lake sediment coll 1977 under direction of Pierre Richard, Univ Montreal, Canada, from small lake in Quebec near

Granby (45° 27′ 30″ N, 72° 52′ 20″ W). Subm by Thompson Webb, III. Samples dated to determine accurate sedimentation rate for computation of paleoisopols for Montreal region. Site is in strategic position to link results from St Lawrence valley and Lake St John's area.

WIS-979. Mount Yamaska site **1135 ± 60**
$\delta^{13}C = -32.0‰$

Gyttja, 90 to 100cm portion of core.

WIS-980. Mount Yamaska site **2850 ± 65**
$\delta^{13}C = -32.0‰$

Gyttja, 190 to 200cm sec of core

WIS-981. Mount Yamaska site **4510 ± 75**
$\delta^{13}C = -33.2‰$

Gyttja, 290 to 300cm sec.

WIS-982. Mount Yamaska site **7265 ± 85**
$\delta^{13}C = -33.3‰$

Gyttja, 390 to 400cm sec.

WIS-983. Mount Yamaska site **9840 ± 100**
$\delta^{13}C = -30.9‰$

Gyttja, 490 to 500cm sec.

WIS-985. Mount Yamaska site **10,040 ± 95**
$\delta^{13}C = -31.3‰$

Gyttja, 500 to 505cm sec of core, just above transition of mineral sediment.

WIS-987. Mount Yamaska site **10,260 ± 100**
$\delta^{13}C = -29.0‰$

Sandy gyttja, 505 to 515cm sec, transition to inorganic sediments. Age should be min for deglaciation in area.

Lake Marcotte site

Core, 3.72m coll July 1977 by Claude Labelle and Pierre Richard from Lake Marcotte, 15km NW of Quebec City, Quebec (47° 04′ 40″ N, 71° 25′ 24″ W). Pollen analysis of core is underway. Subm by Thompson Webb, III.

WIS-1065. Lake Marcotte site **8940 ± 90**
$\delta^{13}C = -32.9‰$

Gyttja from 270 to 280cm sec of core. Sample dates max of *Alnus crispus* curve.

WIS-1066. Lake Marcotte site **6920 ± 85**
$\delta^{13}C = -29.7‰$

Gyttja from 185 to 195cm sec of core. Samples date max of *Pinus strobus* curve.

WIS-1064. Lake Marcotte site **4040 ± 80**
$\delta^{13}C = -31.1‰$

Gyttja from 90 to 100cm sec of core. Sample dates beginning of *Fagus* curve.

CLO site

Core, 550cm, 5cm diam, coll 1978 by Pierre Richard from unnamed lake near Lake Abitibi, Quebec (48° 29′ 50″ N, 79° 21′ 10″ W), alt 280.4m. Subm by Thompson Webb, III. Samples dated to check sedimentation rate for paleoisopol determination. Core contained 360cm of gyttja on glacial lake Barlow-Ojibway varved clay.

WIS-1061. CLO site **8310 ± 80**
$\delta^{13}C = -33.2‰$

Gyttja and silty clay from 362 to 352cm sec of core.

WIS-1060. CLO site **5210 ± 70**
$\delta^{13}C = -28.9‰$

Gyttja from 280 to 270cm sec of core.

WIS-1059. CLO site **2835 ± 75**
$\delta^{13}C = -31.8‰$

Gyttja from 160 to 150cm sec of core.

Lake Yelle site

Core, 500cm, 5cm diam, coll Feb 1978 by Pierre Richard from Lake Yelle, Abitibi, Ontario (48° 30′ 15″ N, 79° 38′ 15″ W). Core included 385cm gyttja on glacial lake Barlow-Ojibway clay. Palynologic study is underway. Core sampled to obtain sedimentation rate for paleoisopol determination.

WIS-1047. Lake Yelle site **3350 ± 70**
$\delta^{13}C = 33.3‰$

Gyttja from 200 to 190cm sec of core.

WIS-1054. Lake Yelle site **5625 ± 75**

Gyttja from 300 to 290cm sec of core.

WIS-1053. Lake Yelle site **8900 ± 90**

Gyttja from 385 to 375cm sec of core. Min age for 350.5m alt of glacial lake Barlow-Ojibway. Pollen diagram shows open vegetation phase.

Lake Romer site

Core, 5m, of lake sediment on clay coll May 1978 by P Comtois from old channel of St Lawrence R, Lake Romer, Lanoraie, Berthier Co, Prov Quebec (45° 58′ N, 73° 20′ W). Palynologic study and correlation of post-Champlainian core is underway. Subm by Pierre Richard.

WIS-1058. Lake Romer site **620 ± 70**
$\delta^{13}C = -31.0‰$

Gyttja, 50 to 60cm sec of core.

WIS-1057. Lake Romer site **3860 ± 70**
$\delta^{13}C = -31.7‰$

Gyttja, 240 to 250cm sec of core.

WIS-1056. Lake Romer site **4520 ± 80**
$\delta^{13}C = -32.2‰$

Gyttja, 310 to 320cm sec of core.

WIS-1055. Lake Romer site **6920 ± 80**
$\delta^{13}C = -31.6‰$

Gyttja, 430 to 440cm sec of core.

La Tuque site

Core, 496cm, coll 1977 under direction of Pierre Richard from small lake with 4.9m water depth in La Tuque, Quebec (47° 28′ 29″ N, 72° 45′ 55″ W). Subm by Thompson Webb, III. Samples dated for determination of systematic sediment accumulation rate for precise determination of paleoisopols. Site is important because of strategic position to link results from St Lawrence valley and Lake St John area.

WIS-986. La Tuque site **1840 ± 60**
$\delta^{13}C = -32.5‰$

Gyttja, 90 to 100cm sec of core.

WIS-989. La Tuque site **2355 ± 55**
$\delta^{13}C = -32.9‰$

Gyttja, 190 to 200cm sec of core.

WIS-990. La Tuque site **2675 ± 60**
$\delta^{13}C = -34.9‰$

Gyttja, 290 to 300cm sec of core.

WIS-991. La Tuque site **7870 ± 85**
$\delta^{13}C = -36.6‰$

Gyttja, 390 to 400cm sec of core.

WIS-992. La Tuque site **8740 ± 90**
$\delta^{13}C = -34.4‰$

Sandy gyttja, 450 to 465cm sec of core.

WIS-1062. Lac aux Quenouilles **8340 ± 90**
$\delta^{13}C = -34.5‰$

Core, 945cm, 5cm diam, coll Feb 1977 by Louise Savoie from small lake near Lac aux Quenouilles, 15km NW of Sainte-Agathe (46° 10′ 20″ N, 74° 23′ 45″ W). Subm by Thompson Webb, III. Sample, organic lake mud from 825 to 835cm sec of core, dates balsam fir phase in vegetation history of area.

WIS-1063. Lake Manitou site **3330 ± 70**
$\delta^{13}C = -31.7‰$

Core, 855cm, 5cm diam, coll Feb 1977 by Pierre Richard from small lake near Lake Manitou, 15km W of Sainte-Agathe (46° 03′ 30″ N, 74°

28′ 00″ W). Subm by Thompson Webb, III. Sample, gyttja from 285 to 300cm sec of core, dated to check sedimentation rate for paleoisopol determination.

F. Peru

Huatacocha Delta Site 2

Peat coll July 1978 at peat-covered delta from glacial stream at NE edge of Lake Huatacocha Junin prov, Oyon map sheet, Peru (18° 47′ S, 76° 35′ W). Coll July 1978 and subm by H E Wright.

WIS-1032. Huatacocha Delta Site 2 **5670 ± 80**
$\delta^{13}C = -34.4‰$

Moss peat 728 to 736cm below surface. Sample dates inception of outwash supply to delta from glacial advance. Underlying sediments are lacustrine, overlying sediments are glacial silts up to level of 240cm.

WIS-1031. Huatacocha Delta Site 2 **1100 ± 70**
$\delta^{13}C = -26.6‰$

Peat 225 to 235cm below surface. Dates termination of outwash supply to delta from recent glacial advance and thus dates withdrawal of ice. Peat has subsequently grown over site.

WIS-1068. Huatacocha Delta Site 2 **10,050 ± 100**
$\delta^{13}C = -28.8‰$

Banded marl and organic clay 895 to 902cm below delta surface. Sample dates beginning of lake sedimentation after retreat of ice from Huatacocha glacier.

WIS-1070. Huatacocha Delta Site 2 **455 ± 60**
$\delta^{13}C = -27.2‰$

Sample 118 to 123cm below delta surface. Dates beginning of peat growth after withdrawal of local Huatacocha glacier when outwash ceased to flow to site.

WIS-1067. Pistag Fan site **Modern**
$\delta^{13}C = -25.6‰$

Peat 25 to 32cm below surface of peat-covered fan formed during retreat of Pistag glacier, Junin prov, Oyon map sheet, Peru (10° 47′ S, 76° 35′ W). Coll July 1978 and subm by H E Wright. Sample dates beginning of peat growth after withdrawal of local Pistag glacier when outwash ceased to flow to site.

G. Bulgaria

Lake Blatnica site

Core coll from Lake Blatnica, Duranculac, Black Sea coast of N Bulgaria (43° 43′ N, 28° 35′ E) in 1976 by E Bozilova, Univ Sofia, Sofia, Bulgaria; subm by Thompson Webb, III. History of vegetation to be in paleoclimatic reconstruction of region and archaeol investigations of Lake Blatnica and island in lake. Pollen diagram of core has been prepared.

WIS-1010. Lake Blatnica site **1810 ± 60**
$\delta^{13}C = -27.5‰$

Phragmites peat from 146 to 150cm sec of core.

WIS-1014. Lake Blatnica site **2625 ± 65**
$\delta^{13}C = -28.1‰$

Phragmites peat from 182 to 185cm sec of core.

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WIS-1010. Lake Blatnica site **1810 ± 60**
$\delta^{13}C = -27.5‰$

Phragmites peat from 146 to 150cm sec of core.

WIS-1014. Lake Blatnica site **2625 ± 65**
$\delta^{13}C = -28.1‰$

Phragmites peat from 182 to 185cm sec of core.

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