

UNIVERSITY OF WISCONSIN RADIOCARBON DATES IX

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Radiocarbon dates obtained since December, 1969, are summarized here. Procedures and equipment have been described previously (R., 1966, v. 8, p. 522). 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 years as the half-life of C^{14} , with 1950 as the reference year. The standard deviation quoted includes only the 1σ of the counting statistics of background, sample, and standard counts. The $\text{C}^{13}/\text{C}^{12}$ ratios of the CO_2 samples prepared from NBS oxalic acid are measured and the activity of the methane used as standard is corrected for any deviation of the δC^{13} value of the CO_2 from the -19‰ value (compared to the PDB standard) reported by Craig (1961). The dated samples for which δC^{13} values are reported have been corrected to -25.0‰ (PDB standard), the "normal" value of terrestrial material.

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I. ARCHAEOLOGIC SAMPLES

A. Illinois

Cahokia, Monk's Mound

Wood charcoal from Monk's Mound, Cahokia site, Madison Co., Illinois ($38^\circ 40' \text{ N Lat}$, $90^\circ 04' \text{ W Long}$). Coll. 1967 and 1969 and subm. by M. L. Fowler, Univ. of Wisconsin-Milwaukee.

670 ± 55

WIS-443. Cahokia, Monk's Mound

A.D. 1280

Sample 69-847 from 1st terrace of Monk's Mound, Feature 113, N74-76, E102-104. Post 1 centered at N72.23, E103.19.

750 ± 55

WIS-444. Cahokia, Monk's Mound

A.D. 1200

Sample 67-388, burned post (E461.80-461.87, N327.65-327.70), from Feature 28. Post was found standing upright in trench fill of stockade E of Monk's Mound. This is latest stockade in sequence with open bastion.

WIS-447. Cahokia, Monk's Mound

1015 ± 60

A.D. 935

Sample 69-900 from pit, Mound 72, S841-845, E58-60, at +126 m. An irregular accumulation of debris, pottery, stone, and bone intruded into the earlier excavation of Feature 205. Pit was later used for burial of 22 individuals.

B. Iowa

WIS-393. A. C. Banks site (13PM40)

3680 ± 65

1730 B.C.

Charcoal from A. C. Banks site, Plymouth Co., Iowa (42° 42' N Lat, 96° 37' W Long). Coll. 1967 by R. Banks and D. A. Baerreis; subm. by D. A. Baerreis. Sample from 196 to 226 cm depth. Previous date, WIS-285, 3860 B.P., was obtained from charcoal of 198 cm depth (R., 1969, v. 11, p. 229). Date confirms earlier run and indicates cultural horizon is Archaic.

WIS-397. Jackson County, Iowa (13JK20)

1130 ± 60

A.D. 820

Charcoal from Henry Schnoor Rock Shelter on Maquoketa R. in Jackson Co., Iowa (42° 10' N Lat, 90° 48' W Long). Coll. 1969 by M. Jaehnig, Univ. of Wisconsin-Madison; subm. by D. A. Baerreis. Sample from Level 5, Sq. N5B, 48.3 to 63.5 cm deep. Dates bundle burial of young child. Other dates from site were pub. previously (R., 1970, v. 12, p. 336).

WIS-406. Robert Battey Rock Shelter (13JK21)

970 ± 60

A.D. 980

Charcoal from site in town of South Fork, Jackson Co., Iowa (42° 07' N Lat, 90° 47' W Long). Coll. 1969 by M. Jaehnig; subm. by D. A. Baerreis. Dates from this site, WIS-398-401, were pub. earlier (R., 1970, v. 12, p. 640-641). Sample from F 17, 259 cm down slope from rock shelter, Level 4, 30.5 to 41 cm below surface. Area seems to be separate occupation from rock shelter and it should date back to Archaic or Early Middle Woodland period. Artifacts are almost exclusively lithic with lanceolate to side-notched projectile points occurring as opposed to large variety of projectile points in shelter itself.

C. Minnesota

Bartron site (21GD2)

Charcoal from Bartron site on S tip of Prairie I. in Mississippi R., Goodhue Co., Minnesota (44° 37' N Lat, 92° 39' W Long). Coll. 1969 by Elden Johnson, Univ. of Minnesota; subm. by D. A. Baerreis. Site is Oneota habitation site, classified as Blue Earth focus by Wilford (1955) and related to Silvernale, Bryan, and Mero sites, located within 16 km radius from Bartron.

850 ± 55**WIS-423. Bartron site (21GD2) A.D. 1100**

Sample (Accession no. 671-241) from Feature 76, a pit, 20 cm depth, at 39.85 to 41.55N, 3-4.12W. Assoc. with animal bone, sherds, antler.

890 ± 55**WIS-434. Bartron site (21GD2) A.D. 1060**

Sample (Accession no. 671) from Feature 39, fire pit, 40 cm depth, 41.65 N, 0.5 E. Assoc. with pottery sherds, clam shell, animal bone, rock.

*D. Wisconsin***1890 ± 60****WIS-426. Brogley Rock Shelter (47GT156) A.D. 60**

Charcoal from Brogley rock shelter in Grant Co., Wisconsin (42° 45' N Lat, 90° 37' W Long) during excavation in 1969 by R. H. Nelson, Platteville, Wisconsin; subm. by D. A. Baerreis. Sample (5W-105) from 112 to 117 cm below surface in Level 5.

*E. Oklahoma***730 ± 55****WIS-448. Creek site (D1-41) A.D. 1220**

Charcoal from Lillie Creek site (36° 30' N Lat, 94° 59' W Long) in Delaware Co., Oklahoma, coll. 1940 and subm. by D. A. Baerreis. Sample from Level 1, 0 to 10 cm below plow zone. Date agrees well with earlier date from site, A.D. 1190, WIS-42 (R., 1965, v. 7, p. 403), and implies rapid construction of subsequent mound addition.

960 ± 60**WIS-449. Weston site (Os 99) A.D. 990**

Charcoal from Weston site, Osage Co., Oklahoma (36° 54' N Lat, 95° 55' W Long) coll. 1969 by James Howard, Oklahoma State Univ., Stillwater, Oklahoma; subm. by D. A. Baerreis.

*F. Texas***Canyon Country Club Cave**

Samples from Canyon Country Club Cave, Randall Co., Texas (Panhandle Plains Historical Mus. Site No. A251) (35° 0' N Lat, 102° 58' 42" W Long). Coll. 1956 by Jack T. Hughes; subm. by D. A. Baerreis.

400 ± 60**WIS-410. Canyon Country Club Cave A.D. 1550**

Charcoal, Specimen 312, from Sq. N-2/N-S, Level 1.

300 ± 50**WIS-411. Canyon Country Club Cave A.D. 1650**

Charcoal, Specimen 183, from Sq. N-1/W-1, Level 1.

670 ± 50**WIS-403. Canyon Country Club Cave A.D. 1280**

Charcoal, Specimen 196, from Sq. N-1/W-1, Level 2.

WIS-421. Canyon Country Club Cave	700 ± 60 A.D. 1250 $\delta C^{13} = -26.2\text{‰}$
Charcoal, Specimen 53, from Sq. N-S/N-1, Level 2.	
WIS-402. Canyon Country Club Cave	1260 ± 55 A.D. 690
Charcoal, Specimen 306, from Sq. E-W/W-1, Level 3.	
WIS-408. Canyon Country Club Cave	620 ± 45 A.D. 1330
Charcoal, Specimen 217, from Sq. N-1/W-1, Level 3.	
WIS-404. Canyon Country Club Cave	1650 ± 55 A.D. 300
Charcoal, Specimen 309, from Sq. E-W/W-1, Level 4.	
WIS-414. Canyon Country Club Cave	1250 ± 60 A.D. 700 $\delta C^{13} = -26.4\text{‰}$
Charcoal, Specimen 395, from Sq. S-2/W-1, Level 4.	
WIS-394. Canyon Country Club Cave	Modern
Bones (<i>Bison bison</i>), A25/W, from Level 4.	
WIS-412. Canyon Country Club Cave	1050 ± 50 A.D. 900
Charcoal, Specimen 440, from Sq. N-2/E-1, Level 5.	
WIS-420. Canyon Country Club Cave	2100 ± 60 150 B.C. $\delta C^{13} = -25.7\text{‰}$
Charcoal, Specimen 231, from Sq. N-1/W-1, Level 5.	
WIS-430. Canyon Country Club Cave	2830 ± 60 880 B.C.
Charcoal, Specimen 311, from Sq. E-W/W-1, Level 5.	

II. GEOLOGIC SAMPLES

A. California

- WIS-413. San Miguel Island, California** **20,130 ± 215**
18,860 B.C.
- Sample SMI 178, charcoalized small tree (presumably *Rhus*) id. by R. C. Koeppe, Forest Products Lab., Madison, Wisconsin. Coll. from San Miguel I., California (34° 02' N Lat, 120° 20' W Long) 1969 by D. L. Johnson, Univ. of Kansas, Lawrence; subm. by R. A. Bryson. Tree grew on well-developed soil (paleosol) now overlain by 91.5 to 183 cm eolianite, 183 cm weakly developed paleosol with midden, and another eolianite and alluvial unit of variable thickness.

B. Wisconsin

- WIS-409. Iron County, Wisconsin** **10,100 ± 100**
8150 B.C.
- Spruce wood, id. by R. C. Koeppe, from 365 to 426 cm depth in sandy humic layer above clay till at 317 m elev. in Iron Co., Wisconsin

(46° 30' N Lat, 90° 27' W Long). Site similar to that of buried wood to NE (Black, 1969, Broecker *et al.*, 1956, Crane, 1956, Hack, 1965) which ranges from ca. 9500 to 12,600 B.P. Coll. 1968 by C. E. Lindsay; subm. by R. F. Black, Univ. of Wisconsin-Madison.

Disterhaft Farm Bog and Seidel Lake, Wisconsin

Undated pollen diagrams from Disterhaft Farm Bog, Green Lake Co., Wisconsin (43° 55' N Lat, 89° 10' W Long) and Seidel Lake, Kewaunee Co., Wisconsin (44° 26' 43" N Lat, 87° 31' 36" W Long) provided 1st detailed pollen stratigraphy for Wisconsin (West, 1961). The Disterhaft site lies on Cary (Woodfordian) till and should date from retreat of Cary ice; the Seidel site lies on what is presumed Valdres drift. Disterhaft Farm Bog was cored again in 1965 by H. E. Wright, E. J. Cushing, and J. K. Wasylikowa, and an 878 cm core was given to R. G. Baker for pollen analysis. The new pollen diagram closely supports West's 1961 diagram. Samples date pollen zone boundaries; subm. by R. G. Baker, Univ. of Wisconsin-Madison.

2850 ± 65
900 B.C.

WIS-422. Disterhaft Farm Bog

Brown fibrous peat from 200 to 210 cm of 878 cm core. Dates rise in *Betula*, *Tsuga*, and *Sphagnum* at base of Pollen Zone 8, uppermost zone.

5370 ± 70
3420 B.C.

WIS-427. Disterhaft Farm Bog

Brown fibrous peat from 390 to 397 cm depth. Dates fall of *Ulmus* pollen and rise of Gramineae and Cyperaceae pollen at base of Pollen Zone 7.

8480 ± 85
6530 B.C.

WIS-429. Disterhaft Farm Bog

Olive-gray gyttja from 520 to 530 cm interval of core. Dates decline of *Pinus* pollen and rise of *Quercus* pollen at base of Pollen Zone 6.

11,150 ± 160
9200 B.C.

WIS-441. Disterhaft Farm Bog

Olive-gray gyttja from 665 to 675 cm interval of core. Dates rise in *Pinus* pollen and decline in *Picea* pollen at base of Pollen Zone 5.

12,520 ± 115
10,570 B.C.

WIS-457. Disterhaft Farm Bog

Sandy calcareous gyttja from 770 to 780 cm interval of core. Dates beginning of slight decline of *Picea* and maximum of *Artemisia* pollen in late-glacial time.

15,560 ± 150
13,610 B.C.

WIS-442. Disterhaft Farm Bog

Sandy olive-gray gyttja from 868 to 878 cm interval. Dates retreat of Woodfordian (Cary?) ice from Green Lake Co., Wisconsin, and initial establishment of late-glacial *Picea* forest.

WIS-462. Seidel Lake**12,360 ± 125****10,410 B.C.**

Silty mud with detritus and nodules of limestone, 1417 to 1442 cm depth from core of 1574 cm. Date is inconsistent with identification of till as Valders.

WIS-445. Cold Spring Peat Mound**10,800 ± 110****8850 B.C.**

Core of 100 cm obtained in 1969 from peat mound in Jefferson Co., Wisconsin (42° 54' N Lat, 88° 36' W Long), by T. Webb and R. G. Baker. Sample dated was dark brown bryophytic peat 55 to 58 cm below surface of mound, from just above break in stratigraphy from upper layer of brown bryophytic to black fine-grained peat. Lower layer contains *Picea* pollen and *Picea* wood fragments and extends 42 cm to bottom of mound which rests on layer of sand. Earlier date from base of mound was 12,800 B.P., WIS-48, (R., 1965, v. 7, p. 407).

WIS-425. Lake Wingra Fen**8570 ± 90****6620 B.C.**

Core of 4.5 m obtained 1969 by R. G. Baker and T. Webb, Univ. of Wisconsin-Madison, from Lake Wingra Fen, Dane Co., Wisconsin (43° 03' N Lat, 89° 26' W Long). Sample dated was detrital peat with snail shells from 265 to 280 cm interval in core. Sharp contact between peat and marl occurs at 280 cm depth. Pollen evidence indicates that contact represents hiatus of a few thousand yr; late-glacial spruce pollen occurs in marl and mid-postglacial grass-oak occurs in lowest peat.

Lake Mary, Wisconsin

Sediment core, 248 cm length, from center of meromictic Lake Mary, Vilas Co., Wisconsin (46° 15' N Lat, 89° 54' W Long) coll. 1962 by G. Likens, Dartmouth College, New Hampshire; subm. by R. A. Bryson. Date, 9460 B.P., WIS-371, (R., 1970, v. 12, p. 335-345) for 186 to 201 cm interval was reported earlier.

WIS-435. Lake Mary, Wisconsin**3650 ± 65****1700 B.C.**

45.5 to 54 cm interval in core at level in pollen stratigraphy where birch and hemlock show distinct rise.

WIS-437. Lake Mary, Wisconsin**8540 ± 90****6590 B.C.**

Sample from 137.5 to 145 cm interval in core at level where ratio of *Pinus strobus* pollen to *Pinus banksiana/resinosa* pollen changes from 1:6 at 145 cm to 9:1 at 135 cm.

Neath site, Wisconsin

Samples obtained during excavation of mastodon skeleton from peat bog on farm of John Neath, Jr., in Dane Co., Wisconsin (43° 04' N Lat, 89° 07' W Long). Coll. 1969 and subm. by J. E. Dallman, Univ. of Wisconsin-Madison. Bulldozing activities covered old ground level to depth of 41 cm.

WIS-424. Neath site**10,790 ± 105****8840 B.C.**

Wood (either tamarack or blue spruce), beaver cuttings, from 117 to 119 cm depth below old surface in peat level of bog. May indicate time of shift from spruce to mixed hardwood forest.

WIS-431. Neath site**13,120 ± 130****11,170 B.C.**

Spruce, id. by Botany Dept., Univ. of Wisconsin-Madison, from large deposit of small diam. trees 246 to 257 cm below old surface level in bog. This level is 48 cm below bottom of marl stratum containing mastodon remains.

Blockhouse Creek Drainage Basin

Samples obtained in 1969 and 1970 in peat deposits exposed by stream cuts below alluvial fan at tributary entrance to flood plain in Blockhouse Creek Drainage Basin, Grant Co., Wisconsin (42° 41' N Lat, 90° 32' W Long). Coll. and subm. by J. C. Knox, Univ. of Wisconsin-Madison.

WIS-450. Blockhouse Creek Drainage Basin**6000 ± 80****4050 B.C.**

Quercus of white oak group, id. by R. C. Koeppen, at 30.5 cm depth in gravel horizon at base of 229 cm bank at tributary entrance. Gravel deposit assoc. with max. drought of Atlantic time; finer overlying sediment assumed assoc. with increasing precipitation of Sub-Boreal and Sub-Atlantic times.

WIS-454. Blockhouse Creek Drainage Basin**Modern**

Bone fragments from B horizon of well-developed dark black paleosol underlying 46 cm of stratified light colored alluvium exposed in stream bank near center of Blockhouse Creek flood plain. Indicates overlying light colored sediment is related to accelerated hillslope erosion of post-settlement time.

WIS-459. Elvers Creek site**1200 ± 55****A.D. 750**

Wood (*Quercus* sp., red oak) from layer of brushwood peat in paleosol 244 cm below ground surface immediately above gravel in Elvers Creek branch of Blue Mounds Creek, Wisconsin (42° 04' 03" N Lat, 89° 47' 44" W Long). Coll. 1970 by G. H. Dury, Univ. of Wisconsin-Madison; subm. by G. H. Dury and J. C. Knox. Samples help elucidate probably complex history of cut and fill which includes periglacial sludging before ca. 12,000 B.P. and accumulation of brushwood peat with mainly spruce pollen between ca. 12,000 and 11,000 B.P. At least 2 subsequent episodes of partial re-clearance followed by infilling are tentatively recognized: samples dated appear to represent 2nd of these infillings.

*C. Iowa***WIS-465. Amos Ross site (13PM47)****2170 ± 55
220 B.C.**

400 cm sec. of dried pond silt coll. for seed and mollusk study in 1970 on Amos Ross farm in Plymouth Co., Iowa (42° 37' 30" N Lat, 96° 06' 30" W Long). Coll. by R. G. Baker and D. A. Baerreis; subm. by D. A. Baerreis. Sample dated was basswood (*Tilia*), id. by R. C. Koepfen, from 377 to 383 cm depth, Level 16, in Col. B.

*D. Yellowstone Park***WIS-432. Swan Lake Flats****13,530 ± 130
11,580 B.C.**

Marly, carbonaceous, laminated lacustrine silt from 402 to 419 cm in 500 cm core from Swan Lake Flats, Yellowstone Park, Wyoming; elev. 2220 m (44° 55' N Lat, 110° 44' W Long). Coll. 1969 by K. Pierce and H. Waldrop; subm. by R. G. Baker. Sample from lowest organic sediments overlying laminated glacial lake sediments. Dates local retreat of Pinedale (Late Wisconsin) ice. Pollen analysis indicates a tundra environment at this time.

Cub Lake, Idaho

330 cm core was obtained in 1969 from Cub Lake, Idaho, 6.44 km W of SE corner of Yellowstone Park, elev. 1840 m (44° 7' 30" N Lat, 111° 11' W Long), by R. G. Baker and H. A. Waldrop; subm. by R. G. Baker.

WIS-438. Cub Lake, Idaho**7910 ± 85
5960 B.C.**

Fibrous sedge peat from 45 to 50 cm interval of core. Dates beginning of *Pseudotsuga-Pinus contorta* dominance in pollen profile. Sediment deposition at site apparently slowed greatly or ceased shortly after this date.

WIS-436. Cub Lake, Idaho**10,620 ± 100
8670 B.C.**

Dark brown detritus peat from 160 to 165 cm interval of core. Dates decline in *Artemisia* pollen usually assoc. with transition from late- to postglacial deposits in Yellowstone Park.

*E. Nevada***Pyramid Lake, Nevada**

Sampling during 1968-69 by S. M. Born, Univ. of Wisconsin-Madison, in Truckee R. valley downstream from Nixon, Nevada, near Pyramid Lake (39° 51' N Lat, 119° 24' to 119° 26' W Long), in conjunction with study of lake-level chronology of late Quaternary Pyramid Lake (Born, 1970). Related earlier studies include those of Broecker *et al.* (1958; 1965) and Morrison and Frye (1965). Results indicate 3 separate lacustrine cycles during past 10,000 yr. Sediments of oldest cycle include only declining lake-level deposits, dating to ca. 8000 B.P. A major low-

stand is indicated from 8000 to 3500 B.P., resulting in development of a locally prominent angular unconformity and assoc. with widespread deposition of fluvial gravel. This lowstand interval correlates well with high aridity of ca. 6500 B.P. determined by Sears and Roosma (1961) and the Toyeh soil-forming interval which began ca. 5000 B.P. (Morrison and Frye, 1965). A relatively minor lowstand occurred from ca. 2000 B.P. to 1000 yr B.P.; this interval was bracketed by 2 lesser lake-level cycles, from 3500 to 2000 B.P. and from ca. 1000 B.P. to present.

WIS-374. Pyramid Lake, Nevada **8800 ± 90**
6850 B.C.
 Wood from foreset beds near lake level, +1168 m.

WIS-377. Pyramid Lake, Nevada **9720 ± 100**
7770 B.C.
 Macerated plant debris from deltaic sediments near lake level, +1169 m.

WIS-375. Pyramid Lake, Nevada **2690 ± 65**
740 B.C.
 Tree bark (probably Ponderosa pine), id. by B. F. Kukachka, Forest Products Lab., Madison, Wisconsin, from foreset sediments, +1166 m.

WIS-361. Pyramid Lake, Nevada **2710 ± 60**
760 B.C.
 Pieces of wood from foreset beds, +1159 m.

WIS-376. Pyramid Lake, Nevada **2890 ± 50**
940 B.C.
 Wood from fluvial deposits, +1174 m, short distance upstream from delta.

WIS-378. Pyramid Lake, Nevada **2270 ± 55**
320 B.C.
 Wood from fluvial deposits, +1172 m, deposited short distance upstream from delta.

WIS-363. Pyramid Lake, Nevada **670 ± 55**
A.D. 1280
 Wood from fluvial gravel +1174 m.

WIS-364. Pyramid Lake, Nevada **1110 ± 55**
A.D. 840
 Log from fluvial gravel +1173 m.

F. Northwest Territories

Southwest Keewatin series

Charcoal layers capping paleosols N of tree line in SW Keewatin show 2 periods when forest extended into present tundra: prior to ca. 3500 B.P. and prior to ca. 1000 B.P. (Bryson *et al.*, 1965). During intermediate period, either tree line fluctuated near present tree line, or scattered forest fires occurred (WIS-37, -15, -29, R. 1965, v. 7, p. 405-407).

Distribution of these paleosols and their dates indicate former extension of Boreal forest into present tundra, but do not show southern limit of tundra after fires which terminated soil-forming episodes.

The following dates were obtained in a continuation of this study, to determine extent of paleosols and terminal fires S of present tree line. Three buried charcoal layers capping paleosols were found in blowout on gentle esker side slope in Kasba, N.W.T., Canada (60° 15' N Lat, 101° 55' W Long). Coll. 1970 and subm. by C. J. Sorenson and R. A. Bryson. Since soils appeared to have formed under forest, samples believed to be related to fluctuation of forest border to S-ward of present position (Bryson *et al.*, 1965).

WIS-458. Kasba **780 ± 55**
A.D. 1170

Charcoal, (*Picea*) id. by B. F. Kukachka, uppermost of 3 buried charcoal layers in blowout. Matrix was aeolian sand over well-stratified sand and gravel.

WIS-460. Kasba **1810 ± 55**
A.D. 140

Intermediate of 3 buried charcoal layers.

WIS-467. Kasba **2940 ± 50**
990 B.C.

Lowest of 3 buried charcoal layers.

G. India

WIS-405. Lunkaransar Salt Lake, Rajasthan, India **9260 ± 115**
7310 B.C.

Lacustrine silty clay with dispersed charcoal (B.S.I.P. 1023A/RC-12) at depth 230 cm from pit in bed of Lunkaransar Salt Lake, Dist. Bikaner, Rajasthan, India (28° 50' N Lat, 73° 80' E Long). Coll. 1968 by Gurdip Singh, Birbal Sahni Inst. of Palaeobot., Lucknow, India; subm. by R. A. Bryson. This level is lowest containing *Cerealia* pollen. Other dates from same pit have been reported (R., 1970, p. 643).

WIS-415. Didwana Salt Lake, Rajasthan, India **2970 ± 65**
1020 B.C.

$$\delta C^{13} = -23.1\text{‰}$$

Laminated clay with dispersed charcoal, B.S.I.P. 1024/RC-25, coll. at 120 to 130 cm depth from profile exposed in pit in sec. of lake deposit at Didwana Salt Lake, Dist. Nagaur, Rajasthan, India (27° 22' N Lat, 74° 35' E Long). Coll. 1968 by Gurdip Singh, Birbal Sahni Inst. of Palaeobot., Lucknow, India; subm. by R. A. Bryson. Sample dated as part of study of postglacial pollen chronology of Rajasthan lake deposits (Singh, 1968) in relation to history of Rajasthan desert (Bryson and Baerreis, 1967).

Khajiar and Rewalsar, Himachal Pradesh, India

Samples from an area glaciated during Pleistocene in NW India

were dated to determine time of biostratigraphic and climatic changes during postglacial period in Himachal Pradesh. A 550 cm core was obtained with a Hiller sampler in lake deposit at Khajiar, Dist. Chamba, Himachal Pradesh, India (32° 32' 30" N Lat, 76° 03' 25" E Long) and a 350 cm core at Rewalsar, Dist. Mandi, Himachal Pradesh, India (31° 38' N Lat, 76° 50' E Long). Coll. 1969 by Gurdip Singh; subm. by R. A. Bryson.

520 ± 55

WIS-419. Rewalsar, Himachal Pradesh A.D. 1430

Coarse organic detritus (B.S.I.P. 1172/RC-29) from 135 to 145 cm depth.

1410 ± 60

WIS-417. Rewalsar, Himachal Pradesh A.D. 540

$\delta C^{13} = -27.0\%$

Dark brown coarse organic detritus (B.S.I.P. 1172/RC-30) from 280 to 290 cm depth.

1150 ± 60

WIS-418. Khajiar, Himachal Pradesh A.D. 800

$\delta C^{13} = -28.5\%$

Phragmites peat (B.S.I.P. 1171/RC-26) from 143 to 150 cm depth.

1800 ± 55

WIS-416. Khajiar, Himachal Pradesh A.D. 150

Clay with pieces of charcoal (B.S.I.P. 1171/RC-27) from 512 to 522 cm depth.

1830 ± 50

WIS-428. Khajiar, Himachal Pradesh A.D. 120

Coarse organic detritus (B.S.I.P. 1171/RC-28) from 522 to 532 cm depth.

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