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ILLINOIS STATE GEOLOGICAL SURVEY RADIOCARBON DATES II

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The following date list includes samples processed by the Illinois State Geological Survey Radiocarbon Dating Laboratory from September 1968 through November 1969. Detailed descriptions of sample methods are published elsewhere (Kim and Ruch, 1969; Kim, Ruch, and Kempton, 1969).

Ages are based on a C^{14} half-life of 5568 years, and errors (1σ) quoted are based on counting errors of NBS oxalic acid standard, sample, and background. In general, 200 years is chosen as a minimum error, if the calculated error is less than 200 years.

For geochemical samples, δC^{14} is calculated as follows:

$$\delta C^{14} = \frac{{}^{A}\text{sample} - {}^{A}\text{standard}}{{}^{A}\text{standard}} \times 1000$$

where ^{A}sample is specific activity of a sample and ^{A}standard is 95% of NBS oxalic acid standard specific activity.

The laboratory counting system used is capable of dating samples up to 48,000 years old with a 10cc counting vial and as much as 52,000 years old with a 20cc counting vial. Maximum ages are based on a counting period of 3 days and a counting error of 3σ.

Members of the Isotopic Analysis Committee, J. P. Kempton (Chairman), Charles Collinson, and R. E. Bergstrom, with John C. Frye, Chief, assisted in selecting and screening samples for radiocarbon dating. H. B. Willman helped to prepare the manuscript. R. R. Ruch and J. G. Goessling assisted with laboratory operations.

SAMPLE DESCRIPTIONS

GEOLOGIC SAMPLES

A. Illinois

ISGS-12. Danvers Section, Z-1 — **23,900 ± 200 / 21,950 B.C.**

Wood chips from organic silt; McLean Co., SE1/4 SE1/4 NW1/4 Sec. 34, T25N, R1W, 3 mi SW of Congerville, Illinois, 5 mi NW of Danvers, Illinois (40° 35′ N Lat, 89° 14′ 40″ W Long). From Farmdale Silt 4½ ft below the surface. Coll. 1967 by J. P. Kempton, P. B. DuMontelle, S. M. Kim, and R. R. Ruch, Illinois State Geol. Survey; subm. by S. M. Kim. *Comment* (S.M.K.): this sample was used principally as a check and was dated as 23,880±490 B.P. (TX-693, E. M. Davis, pers. commun.) and 24,000±870 B.P. (AERIK-2, K. R. Yang, pers. commun.). A sample was previously dated as 25,150±700 B.P. (W-406) from the same stratigraphic unit (Frye, Glass, and Willman, 1962, p. 50).

ISGS-16. Lake Bloomington Spillway Section >40,000

Wood chips from organic silt; McLean Co., NW¼ SW¼ NE¼ Sec. 1, T25N, R2E, 4.5 mi NE of Hudson, Illinois, 4 mi ESE of Kappa, Illinois (40° 39′ 45″ N Lat, 88° 56′ 15″ W Long). From an organic zone below 3 tills and above 2 lower exposed tills that are separated by boulder pavement (Leonard and Frye, 1960, p. 29). Coll. 1967 by J. P. Kempton, P. B. DuMontelle, and S. M. Kim, Illinois State Geol. Survey; subm. by J. P. Kempton. *Comment* (J.P.K.): date eliminates the possibility that the organic silt is Farmdalian in age.

ISGS-19. Mulberry Grove Section, P-3142 >40,000

Wood fragments in gravel; Fayette Co., SW corner, Sec. 31, T6N, R1W, ½ mi SE of Mulberry Grove, Illinois. From a gravel between Vandalia and Smithboro tills (Jacobs and Lineback, 1969). The gravel is part of a channel fill truncating the lower part of the Vandalia till and the upper part of the Smithboro till. The channel contains an abundance of twigs and branches. Coll. 1967 by A. M. Jacobs, Illinois State Geol. Survey; subm. by A. M. Jacobs and J. A. Lineback.

25,500 ± 600

ISGS-21. Macon County, P-3866 23,500 B.C.

Peat; Macon Co., NE¼ SW¼ NW¼ Sec. 13, T16N, R1W, 1 mi SSE of Niantic, 9 mi W of Decatur, Illinois (39° 50′ 20″ N Lat, 89° 09′ 10″ W Long). From silty peat unit overlying gray silt (Altonian-Sangamonian) below Peoria Loess. Coll. 1968 by J. A. Lineback and N. C. Hester, Illinois State Geol. Survey; subm. by J. A. Lineback. *Comment* (J.A.L.): pollen samples taken from this peat and gray silt below indicate that spruce-pine forest existed in this area before 25,500 B.P. during deposition of the peat (Farmdalian Substage).

ISGS-25. Macon County, Ni 323-335 >33,000

Organic silt from Macon Co., NE¼ SW¼ NW¼ Sec. 13, T16N, R1W, 1 mi SSE of Niantic, 9 mi W of Decatur, Illinois (39° 50′ 20″ N Lat, 89° 09′ 10″ W Long). From a core sample 323 to 335 cm below surface. Coll. 1968 by J. A. Lineback and N. C. Hester; subm. by J. A. Lineback. *Comment* (J.A.L.): sample is ca. 30 cm below a Farmdalian peat dated 25,500±600 B.P. (ISGS-21) and is probably from the Roxana Silt of Altonian age. Pollen samples from this core show that spruce-pine forest became dominant in the area at the horizon dated >33,000 B.P. Pollen studies indicate that this spruce-pine forest persisted until the end of Woodfordian time.

25,900 ± 500

ISGS-31. Wedron Section, P-1915 23,950 B.C.

Wood within pink till; LaSalle Co., NW¼ SE¼ NW¼ Sec. 9, T34N, R4E, W edge of Wedron, Illinois (41° 26′ 5″ N Lat, 88° 48′ 45″ W Long). The wood was found in pink "Bloomington" till 4 ft above base in Wedron sec. (Frye and Willman, 1965). Coll. 1964 by H. B. Willman and

J. C. Frye, Illinois State Geol. Survey; subm. by J. C. Frye. *Comment* (J.C.F.): wood almost certainly had been incorporated into till from underlying Farmdale Silt.

Vandalia Core series

ISGS-5.	VAND-B, 251 to 257 cm	>22,000
ISGS-9.	VAND-A, 237 to 243 cm	>22,300
ISGS-10.	VAND-A, 247 to 251 cm	>27,900
ISGS-11.	VAND-A, 273 to 280 cm	38,100 ± 1000 36,150 B.C.
ISGS-13.	VAND-A, 327 to 346 cm	>40,000
ISGS-14.	VAND-Q, 145 to 170 cm	8300 ± 1900 6350 B.C.
ISGS-22.	VAND-C, 257 to 267 cm	>40,000

Core samples of organic-rich sediments are from an ice-block lake basin formed in Illinoian drift. Site is located SW¼ NE¼ SW¼ Sec. 3, T5N, R1W of Fayette Co., 0.8 mi SSW of Hagarstown, 6.0 mi SW of Vandalia, Illinois (38° 54′ 00″ N Lat, 89° 11′ 30″ W Long). Series dated for current research project, "Pollen Analysis of Pleistocene Deposits from Illinois," conducted jointly by the Limnological Research Center, Univ. of Minnesota and the Illinois State Geol. Survey. Coll. 1968 by H. E. Wright and E. J. Grüger, Univ. of Minnesota, and A. M. Jacobs; subm. by A. M. Jacobs. *Comment* (A.M.J.): samples indicate more or less continuous sedimentation from Recent to ca. 40,000 B.P. Preliminary results on pollen analysis and clay mineralogy of the sediments and geomorphology of the lake basin were presented at the 7th INQUA Congress, Paris, France (Jacobs, 1969; Grüger, 1969).

Danville area samples

ISGS-15. Vermilion County, Danville 1-Wood >38,000

Wood in till; Vermilion Co., NE¼ SW¼ SW¼ Sec. 33, T20N, R12W, 1.25 mi N, and 1.75 mi W of Hillery, Illinois (40° 8′ 45″ N Lat, 87° 44′ 0″ W Long). From basal Wisconsinan till, 3rd till in the sec. 25 ft below surface (Johnson, Gross, and Moran, 1969, ms. in preparation). This till includes the interval from 15 ft 8 in. to 38 ft 8 in. from top of sec. Coll. 1968 by W. H. Johnson, D. L. Gross, and S. R. Moran, Univ. of Illinois; subm. by D. L. Gross. *Comment* (D.L.G.): no samples from Danville, Illinois, region have yielded a finite date.

ISGS-23. Vermilion County, 5-14 >40,000

Wood in silt; Vermilion Co., SE¼ NE¼ NE¼ Sec. 2, T19N, R12W, 3 mi W of Danville, Illinois (40° 8′ 35″ N Lat, 87° 40′ 43″ W Long). From 2½ ft bed of carbonaceous silt between 2 till units; top of bed is 17 ft below surface, and bottom of silt bed is 20 ft above base of exposure.

Coll. by W. H. Johnson, D. L. Gross, and S. R. Moran; subm. by D. L. Gross. *Comment* (D.L.G.): from regional correlations, this silt is now believed to be Illinoian.

ISGS-29. Vermilion County, Danville K-19 >47,000

Wood from Vermilion Co., SW¼ NW¼ NW¼ Sec. 4, T19N, R12W, 4.5 mi W of Danville, Illinois (40° 8′ 30″ N Lat, 87° 43′ 50″ W Long). From peat and silt 2.5 ft thick, below 2 tills. Coll. and subm. 1969 by W. H. Johnson. *Comment* (D.L.G.): from regional correlations, this peat is now believed to be Illinoian.

Urbana Mastodon site

ISGS-17A. Urb Mast No. 1 7490 ± 200 5540 B.C.

Bone dissolved in 2N HCl; insoluble fraction combusted and dated.

ISGS-17B. Urb Mast No. 1 8330 ± 200 6380 B.C.

Bone washed with 0.1N NaOH; then dissolved in 2N HCl. Insoluble fraction combusted and dated.

ISGS-17C. Urb Mast No. 1, Ivory 9190 ± 200 7240 B.C.

Ivory first dissolved in dilute CH_3COOH; insoluble fraction acidified with H_3PO_4; resulting CO_2 was dated.

Bones of *Mammut americanum* from Urbana, Illinois, near center SW¼ SW¼ Sec. 15, T19N, R9E, 20° N from WCCR Radio Tower (40° 06′ 03″ N Lat, 88° 10′ 45″ W Long). The fragmented but well-preserved sample is from homogeneous, gray, slightly sandy clay that apparently represents deposition in a pond on the Urbana Moraine. Clay apparently overlies the uppermost of 3 tills above the Farmdale horizon, and is overlain by 31 in. of dark, humic soil. Coll. 1969 by C. Collinson, Illinois State Geol. Survey; subm. by C. Collinson and J. P. Kempton. *Comment* (S.M.K.): sample is contaminated with modern humic acids. The bone "collagen fraction" and the ivory ages do not agree, perhaps due to carbon-isotopic fractionation or old carbonate contamination of the ivory.

Stockton Northeast Core 2

ISGS-24. Jo Daviess, B-2JD-5, depth 13½ to 5 ft 27,200 ± 400 25,250 B.C.

ISGS-30. Jo Daviess, B-2JD-6, depth 16 to 17½ ft 26,300 ± 400 24,350 B.C.

Organic silt from Jo Daviess Co., NE¼ NW¼ NE¼ Sec. 32, T28N, R5E, ca. 3½ mi NE of Stockton, Illinois (89° 56′ 10″ N Lat, 89° 56′ 35″ W Long). From Farmdale Silt. Sequence from top: Peoria Loess 13 ft, Farmdale Silt 5 ft, accretion-gley (Sangamonian Stage?) and Illinoian drift including Winslow till 40 ft (Frye *et al.*, 1969). Coll. and subm. 1969 by J. P. Kempton. *Comment* (J.P.K. and S.M.K.): dates indicate that silt

is entirely Farmdalian in age. Sample B-2JD-6 was from base of the organic silt. Time inversion shown by dates should be ignored and dates considered equivalent because humic acids were not removed from the samples prior to processing, and the dates are within 3σ error.

Shelby County Moraine section

ISGS-26. 16-12 **20,000 ± 200**
18,050 B.C.

ISGS-32. 16-17 **21,300 ± 500**
19,350 B.C.

Silty peat samples from Shelby Co., NE¼ SW¼ SW¼ Sec. 8, T11N, R3E, 1 mi E of Shelbyville, Illinois (39° 24′ 36″ N Lat, 88° 46′ 54″ W Long). Upper sample from upper 2 in. of 18 in. peat bed; lower sample is from base of peat, which underlies Shelbyville till. Section includes 30 ft of Shelbyville till, 2 to 4 ft of silt, 18 in. of peat, 5 to 10 ft of accretion-gley, and 18 ft of Vandalia till over bedrock. Coll. 1969 by D. L. Gross and W. H. Johnson, Univ. of Illinois; subm. by D. L. Gross. *Comment* (D.L.G.): samples collected below base of Woodfordian deposits in the Wisconsinan terminal moraine. Upper sample dates maximum advance of ice of the Wisconsinan Stage in this region, the lower dates beginning of peat deposition. Together, samples indicate time span represented by the peat at this locality.

Quarry, Coles County

ISGS-27. 68F4-8A **19,500 ± 200**
17,500 B.C.

Wood from bedded sand and silt samples; Coles Co., NW¼ NE¼ SW¼ Sec. 5, T12N, R10E, 3 mi ENE of Charleston and 5 mi WSW of Ashmore, Illinois (39° 30′ 50″ N Lat, 88° 6′ 56″ W Long). Sample collected from a thick-bedded sand and silt 1 ft above the top of an organic silt and peat of probable Farmdalian age and below Woodfordian till. Coll. 1969 by W. H. Johnson, J. P. Kempton, and J. P. Ford, Illinois State Geol. Survey; subm. by J. P. Kempton. *Comment* (J.P.K.): sample indicates that the Woodfordian glacier reached this area, which is near the southernmost limit of Wisconsinan glaciation in Illinois, $<19{,}500 \pm 200$ B.P. yr ago.

ISGS-28. 68F3-8 **21,300 ± 200**
19,350 B.C.

Wood chips and organic silt sample from Coles Co., SW¼ NE¼ NW¼ Sec. 5, T12N, R10E, 3 mi ENE of Charleston and 5 mi WSW of Ashmore, Illinois (39° 31′ N Lat, 88° 6′ 56″ W Long) ca. 1/3 mi N of ISGS-27 but in the same quarry. Sample came from organic silt 1 ft thick 46.5 ft below land surface. Silt lies below 2 tills that are similar but separated by thin sand and gravel, and overlies another till that is correlated with Vandalia till. Coll. 1969 by W. H. Johnson, J. P. Kempton,

and J. P. Ford: subm. by J. P. Kempton. *Comment* (J.P.K.): date indicates that both tills above silt are Woodfordian.

B. Canada

ISGS-18. Yukon, PA-12 $\delta C^{14} = +19.6‰$

Decomposed peat from area 140 mi W of Whitehorse, Yukon Territory, Canada (61° 23′ N Lat, 138° 13′ W Long). Sample was 5 in. below surface at bottom of modern organic layer. Coll. 1968 by C. S. Alexander and L. W. Price, Univ. of Illinois; subm. by C. S. Alexander.

ISGS-20. Yukon, 18 $\delta C^{14} = -35.8‰$

Decomposed peat from area 140 mi W of Whitehorse, Yukon Territory, Canada (61° 23′ N Lat, 138° 13′ W Long). Sample was 55 in. below surface. Coll. 1968 by C. S. Alexander and L. W. Price; subm. by C. S. Alexander.

CORRECTION

ISGS-3. Shark Bay, Australia **38,600 ± 500**
36,650 B.C.

Date previously pub. as 38,600 ± 200 (Radiocarbon, 1969, v. 11, p. 394).

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