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ILLINOIS STATE GEOLOGICAL SURVEY RADIOCARBON DATES V

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All samples processed from November 1971 through January 1973 at the Illinois State Geological Survey Radiocarbon Dating Laboratory are reported here. The benzene liquid scintillation technique was used. Laboratory procedures used were the same as those reported by Coleman (1973), with the exceptions that bone collagen was separated by the Longin (1970; 1971) technique and acetylene was trimerized to benzene as described by Coleman, *et al* (1972).

All ages are calculated on the basis of a ^{14}C half-life of 5568 years, and the NBS oxalic acid standard is used as reference. Errors (1σ) reported account only for uncertainties in activity measurements of the sample, standard, and backgrounds. Samples with net count rates $< 4\sigma$ are reported as minimum ages, calculated from an activity of 3σ plus the net count rate. No corrections have been made for isotopic fractionation or atmospheric ^{14}C fluctuations.

Chao Li Liu and L R Camp assisted in sample preparation. All requests for analyses were evaluated by a Radiocarbon Dating Committee consisting of J P Kempton (chairman), Charles Collinson, R E Bergstrom, J C Frye, and D D Coleman.

SAMPLE DESCRIPTIONS

I. GEOLOGIC SAMPLES

A. Illinois and Lake Michigan

Sangamon River Valley series

Samples from cores coll 1971 by W H Johnson, Univ Illinois, except where noted; subm by J A Miller.

ISGS-107. No. 36 — **22,020 ± 300 / 20,070 BC**

Silt rich in organic material from Sangamon Co, NW¼ NW¼ NW¼ Sec 23, T 16N, R 4W, 8km E of Springfield, Illinois (39° 49′ 45″ N, 89° 31′ 30″ W). From Robein Silt at 6.1 to 6.6m depth. Coll by J A Miller. *Comment* (JAM): in this locality Robein Silt underlies aeolian sands (part of Peoria Loess) of Woodfordian age. Date establishes maximum age for sand dune migration from Sangamon Valley.

ISGS-108. Boring 10 — **22,150 ± 330 / 20,200 BC**

Silt rich in organic material from Sangamon Co, center NW¼ Sec 9, T 15N, R 4W, 4.8km SE of Springfield, Illinois (39° 46′ 10″ N, 89° 33′ 00″ W). From 7.6 to 7.9m depth. *Comment* (JAM): from buried floodplain sediments underlying Woodfordian backwater silt and sand

(Equality Formation). Date is maximum for beginning of backwater sedimentation in S Fork of Sangamon R.

17,650 ± 450

ISGS-109. Boring 4 **15,700 BC**

Silt rich in organic material from Sangamon Co, SW¼ NE¼ NE¼ Sec 25, T 16N, R 6W, 1.6km W of Springfield, Illinois (39° 48′ 40″ N, 89° 42′ 45″ W). From Equality Formation at 4.3 to 5.6m depth. *Comment* (JAM): dates approximate midpoint for deposition of backwater sediments (Equality Formation) in tributaries of Sangamon R.

20,740 ± 720

ISGS-110. Boring 7 **18,790 BC**

Silt rich in organic material from Menard Co, NE¼ NE¼ NW¼ Sec 9, T 17N, R 6W, 4km W of Athens, Illinois (39° 56′ 40″ N, 89° 46′ 50″ W). From 7.5 to 7.9m depth in buried floodplain deposit overlain by Woodfordian gravel outwash. *Comment* (JAM): dates beginning of valley-train aggradation of Sangamon Valley.

10,770 ± 290

ISGS-111. No. 21 **8820 BC**

Silt with wood fragments, from Sangamon Co, NW¼ SW¼ SE¼ Sec 33, T 17N, R 5W, 6.4km N of Springfield, Illinois (39° 52′ 40″ N, 89° 39′ 45″ W). From interval 4.6 to 5.2m below surface in Cahokia Alluvium. Coll by J A Miller. *Comment* (JAM): sample from near bottom of shallow silt-and clay-filled meander scar of Sangamon R. Dates approximate time river channel in area was abandoned and estimates average rate of infilling (0.45mm/yr) since abandonment.

29,140 ± 270

ISGS-118. Boring 8 **27,190 BC**

Wood fragments from Sangamon Co, NW¼ NE¼ SW¼ Sec 28, T 16N, R 4W, 4km E of Springfield, Illinois (39° 47′ 50″ N, 89° 33′ 00″ W). From gray sand rich in organic material at 17m depth overlying siltstone. *Comment* (JAM): dates start of rapid alluviation of valley floors of Sangamon R drainage system during latest Altonian and Farmdalian time.

12,900 ± 350

ISGS-121. Boring 12 **10,950 BC**

Wood fragments from NE¼ SE¼ NW¼ Sec 31, T 17N, R 4W, 9.7km N of Springfield, Illinois (39° 53′ 00″ N, 89° 35′ 30″ W). From 6.3m depth in top of 6m gray silt with lenses of organic material. Coll by N C Hester, Illinois State Geol Survey. *Comment* (JAM): from buried floodplain sediments that regional stratigraphy and other dates (ISGS-99: 22,700 ± 1100, ISGS-102: 24,640 ± 430 (R, 1973, v 15, p 82), ISGS-108, and ISGS-110) have shown >20,000 yr old. Sample believed contaminated.

General Comment (JAM): rapid alluviation of Sangamon Valley floor began ca 30,000 yr BP and continued until almost 20,000 yr BP. Much of sediment deposited during valley-fill interval was removed by short-lived phase of early Woodfordian channel erosion. Valley-train outwash from Woodfordian glaciers then filled scour channels and aggraded floor of Sangamon Valley with sand and gravel ca 20,000 yr BP. Aggraded valley floor caused damming of tributary systems, and lacustrine silts and clays were deposited in lower reaches of tributary valleys during interval from 20,000 to ca 14,500 yr BP. Ca 14,500 yr BP Woodfordian glaciers withdrew beyond limits of Sangamon R drainage basin, and river returned to meandering channel regime. Floodplain sedimentation in last 14,500 yr has proceeded at slow rate compared to that of other areas.

370 ± 75

ISGS-115. Spartan Supermarket Section **AD 1580**

Wood from Winnebago Co, NW¼ NW¼ SW¼ Sec 29, T 44N, R 2E, at Rockford, Illinois (42° 15′ 49″ N, 89° 02′ 19″ W). From 6m below surface in outwash sand and gravel. Coll 1964 by J C Frye and H B Willman; subm by J C Frye, Illinois State Geol Survey. *Comment* (JCF): sample obviously an old root and not relevant to age of deposit.

Ottawa Silica Pit series

Site in La Salle Co, NW¼ SW¼ NE¼ Sec 16, T 33N, R 3E, 1.6km W of Ottawa, Illinois (41° 20′ 07″ N, 88° 52′ 47″ W). Coll 1971 and subm by N C Hester.

7180 ± 75

ISGS-119. O-1 **5230 BC**

Peat from Grayslake Peat near top of Ottawa Terrace. *Comment* (NCH): date corresponds with beginning of Holocene and demonstrates that >15m mixed sediment filling channel at Ottawa was emplaced late in Wisconsinan.

11,740 ± 90

ISGS-120. O-2 **9790 BC**

Wood from alluvium in channel in Ottawa Terrace, ca 18m below surface. *Comment* (NCH): correlates with Calumet Stage of Lake Chicago and, because wood was from base of channel, indicates channel was cut during development of glacial sluiceway along Illinois Valley.

Cass County series

Wood and plant fragments from Cass Co. Coll 1971 by H J Kleiss and J B Fehrenbacher; subm by H J Kleiss, Univ Illinois.

24,980 ± 420

ISGS-122. Cass A **23,030 BC**

From NE¼ SE¼ NE¼ Sec 24, T 18N, R 11W, 8km NW of Virginia, Illinois (40° 00′ N, 90° 16′ W). From top of Robein Silt. *Comment* (HJK): material from region where basal increment of Peoria Loess

(Zone I by clay-mineral content) can be distinguished from overlying units. Suggests early burial of Robein by initial Peoria Loess increment.

21,080 ± 370

ISGS-123. Cass B **19,130 BC**

From NW¼ NW¼ SW¼ Sec 25, T 17N, R 9W, 5km W of Ashland, Illinois (39° 54′ N, 90° 04′ W). From top of Robein Silt. *Comment* (HJK): from 22km SE of ISGS-122. In this area, distinct basal increment of Peoria Loess (Zone I) not identified by clay minerals. Thus, 1st loess addition was incorporated in Robein, or succeeding increments overlapped 1st increment and were deposited at greater distances from source.

39,900 ± 1300

ISGS-124. Larsen Bros quarry **37,950 BC**

Wood from De Kalb Co, SW¼ SE¼ NW¼ Sec 15, T 40N, R 5E, 4.8km SSW of Sycamore, Illinois (41° 56′ 42″ N, 88° 39′ 10″ W). From Tiskilwa Till Member of Wedron Formation, 4.6m below top, 3m above base. Coll 1972 and subm by R C Flemal, N Illinois Univ, De Kalb. *Comment* (RCF): wood fragment evidently reworked from Altonian (Plano Silt Member) sediments and hence is out of place. Stratigraphic unit is Tiskilwa Till without break at position where wood was located.

22,190 ± 960

ISGS-125. E-W Tollway B-64 D **20,240 BC**

Wood chips from Lee Co, SW¼ SE¼ NW¼ Sec 10, T 21N, R 9E, 1.6km SE of Dixon, Illinois (41° 49′ 30″ N, 89° 27′ 15″ W). From Robein Silt. Coll 1972 by Westenhoff and Novick Co.; subm by J P Kempton, Illinois State Geol Survey. *Comment* (JPK): verifies existence of Robein Silt in area and eliminates existence of Roxana and Plano Silts at this locality.

ISGS-126. Test boring 13-40-7 **>37,900**

Silt rich in organic material from Kane Co, SE¼ NE¼ NW¼ Sec 13, T 40N, R 7E, 7.2km NW of St Charles, Illinois (41° 57′ 10″ N, 88° 23′ 10″ W). From silt at depth of 12.5 to 13.5m. Coll 1972 by P C Reed; subm by J P Kempton. *Comment* (JPK): along with stratigraphic occurrence below Capron Till Member and above Argyle Till Member of Winnebago Formation, date identifies organic-silt unit as Altonian Plano Silt.

25,230 ± 570

ISGS-127. Test boring 13-42-7 **23,280 BC**

Silt rich in organic material from Kane Co, NE¼ NE¼ NE¼ Sec 13, T 42N, R 7E, 8km SE of Huntley, Illinois (42° 07′ 30″ N, 88° 21′ 20″ W). From silt at depth 58 to 59.2m, overlain by sequence of tills. Coll 1972 by P C Reed; subm by J P Kempton. *Comment* (JPK): date and identification of overlying till as Tiskilwa Till indicates silt is Robein Silt, not Plano Silt as interpreted earlier.

Sunset Hills series

Wood chips from Madison Co, NW¼ NE¼ SE¼ Sec 29, T 4N, R 8W, 7km SW of Edwardsville, Illinois (38° 46′ 43″ N, 90° 00′ 25″ W). Coll 1972 by J C Frye, A B Leonard, and H B Willman; subm by H B Willman, Illinois State Geol Survey.

ISGS-128. 7644A — **19,900 ± 1300** / **17,950 BC**

From peat bed at base of Mississippi R bluffs.

ISGS-129. 7646A — **19,750 ± 500** / **17,800 BC**

From peat 1.5m above ISGS-128.

General Comment (HBW): dates relatively high stand of Mississippi R water during early part of Woodfordian glaciation.

Western Jersey County series

Wood from Jersey County, SW¼ NW¼ NE¼ Sec 14, T 7N, R 13W, 6km S of Fieldon, Illinois (39° 03′ 20″ N, 90° 30′ 34″ W). From silty clay unit that could be Robein Silt or late Yarmouthian accretion gley. Coll 1972 and subm by A M Timofeev, S Illinois Univ, Edwardsville.

ISGS-132. Sample B — **>33,500**

ISGS-133. Sample D — **>25,000**

General Comment (AMT): dates suggest material is not Robein; therefore identified as Type II Hard Clay as defined by Rubey (1952); overlain by sediments of Brussels Terrace.

Batavia bog series

Peat from Kane Co, SE¼ SE¼ Sec 24, T 39N, R 7E, 4.8km WSW of Batavia, Illinois (41° 50′ 26″ N, 88° 22′ 42″ W). From hand auger boring in bog deposit overlying Wedron Formation. Depth to sterile clay, 5.2m. Coll 1972 and subm by A B Leonard, Univ Kansas.

ISGS-131. 3.7m depth — **1750 ± 100** / **AD 200**

ISGS-134. 1.4m depth — **1870 ± 100** / **AD 80**

General Comment (ABL): samples intended to show rate of growth of bog. ISGS-131 may have been contaminated by younger material during boring operation.

Strawn bog series

Organic muck from Livingston Co, SW¼ SW¼ SE¼ Sec 30, T 26N, R 8E, 7km ENE of Strawn, Illinois (40° 12′ 51″ N, 88° 21′ 01″ W). From 4.3m thick bog deposit overlying Wedron Formation. Sampled with hand auger. Coll 1972 and subm by A B Leonard.

[illegible] — [illegible] / **3400 BC**

Mollusk shells from ca 0.6m zone, 0.6m above Jules Soil. *Comment* (JCF, HBW): dates loess immediately below surface solum and above Jules Soil. Indicates loess accumulation along Illinois Valley continued longer than formerly supposed.

ISGS-139A. First 30% — **5030 ± 100** / **3080 BC**

ISGS-139B. 30 to 65% — **5865 ± 80** / **3915 BC**

ISGS-139C. 65 to 100% — **7370 ± 140** / **5420 BC**

ISGS-161. 0.3 to 0.6m depth	**2640 ± 75** **690 BC**
ISGS-162A. 1.5 to 1.8m depth, Split 1	**2330 ± 75** **380 BC**
ISGS-162B. 1.5 to 1.8m depth, Split 2	**2370 ± 100** **420 BC**
ISGS-164. 2.4 to 2.7m depth	**7760 ± 84** **5810 BC**
ISGS-167. 3.7 to 4.3m depth	**8940 ± 80** **6990 BC**

General Comment (ABL): dates give information about rate of growth of bog. Bog probably slightly older than oldest date indicates, as basal segment is largely inorganic.

ISGS-135. Boring 56 **>31,400**

Peat from Macon Co, SE¼ NE¼ NE¼ Sec 34, T 17N, R 1W, 3.6km NW of Niantic, Illinois (39° 53′ 08″ N, 89° 19′ 04″ W). From lower part of 15cm peat overlain by 2.6m Peoria Loess. Coll 1972 by R M Mason; subm by W H Johnson. *Comment* (WHJ): from Robein Silt in depression within valley cut during late Sangamonian or Altonian. Date indicates local accumulation of peat prior to Farmdalian.

ISGS-136. P-7681A **20,320 ± 120**
18,370 BC

Wood fragments from Henderson Co, NW¼ NW¼ NW¼ Sec 13, T 8N, R 6W, 2.8km NE of Lomax, Illinois (40° 41′ 32″ N, 91° 02′ 30″ W). From 0.6m bed of gray sand overlain by gray silt and underlain by peat. Coll 1972 by J C Frye, A B Leonard, and H B Willman; subm by J C Frye. *Comment* (JCF): dates earliest Woodfordian stream sediments after diversion of ancient Mississippi R to present channel. Also shows molluscan faunal zone, once classed as Yarmouthian, is much younger.

Cottonwood School—South Section series

Site in Cass Co, NW¼ NW¼ SW¼ Sec 12, T 18N, R 11W, 10.5km E of Beardstown, Illinois (40° 01′ 35″ N, 90° 17′ 31″ W). Coll 1972 by J C Frye, A B Leonard, and H B Willman; subm. by A B Leonard.

ISGS-137. P-7655 **15,640 ± 580**
13,690 BC

Mollusk shells from ca 0.3m matrix in top of Jules Soil. *Comment* (JCF, HBW): dates start of loess accumulation after formation of Jules Soil. Soil, correlated with glacial withdrawal preceding advance to Bloomington Morainic System, records major hiatus in Woodfordian Substage

ISGS-154. 75 to 80cm core depth	5620 ± 140 3670 BC
ISGS-155. 100 to 105cm core depth	7460 ± 150 5510 BC
ISGS-158. 25 to 40cm core depth	3390 ± 150 1440 BC

Fraction soluble in hot 1N NaOH. *Comment*: agreement with other dates suggests absence of contaminating materials.

General Comment (DLG): dates used to determine sedimentation rate for bottomset beds of Waukegan Member and top of underlying Lake Forest Member of Lake Michigan Formation in S Lake Michigan. On depth vs age plot, points approximate straight line with slope of 19cm/

10,410 ± 650
ISGS-138. P-7656 **8460 BC**

Mollusk shells from ca 0.6m zone, 0.6m above Jules Soil. *Comment* (JCF, HBW): dates loess immediately below surface solum and above Jules Soil. Indicates loess accumulation along Illinois Valley continued longer than formerly supposed.

5030 ± 100
ISGS-139A. First 30% **3080 BC**

5865 ± 80
ISGS-139B. 30 to 65% **3915 BC**

7370 ± 140
ISGS-139C. 65 to 100% **5420 BC**

Calcium-carbonate concretions from same position as ISGS-137. As CO_2 was released with acid, 3 fractions were collected. ISGS-139A should represent outer rims of concretions and ISGS-139C should correspond to cores. *Comment* (JCF, HBW): although concretions are from Cca position of Jules Soil, deposits above Jules Soil gave older age (ISGS-137). Concretions started growth during formation of Jules Soil, but continued to grow during development of surface soil 3m above this zone. Rate of growth was slow.

2890 ± 75
ISGS-143. Illinois River flood plain **940 BC**

Clam shells from Greene Co, NW cor Sec 29, T 9N, R 13W, 6.4km NE of Hardin, Illinois (39° 12′ 17″ N, 90° 34′ 42″ W). From Cahokia Alluvium. Coll 1972 by J C Frye and H B Willman; subm by J C Frye. *Comment* (HBW): dates upper portion of alluvium in this part of Illinois Valley.

Lake Michigan Core 800-5 series

Silty clay rich in organic material from core in Lake Michigan bottom sediments 53km E of Zion, Illinois (42° 25′ 00″ N, 87° 09′ 18″ W). From top of core to 85cm is Waukegan Member and from 85 to 162cm (bottom of core) is Lake Forest Member, both from Lake Michigan Formation. Coll 1971 by D L Gross and J A Lineback; subm by D L Gross, Illinois State Geol Survey.

2770 ± 230
ISGS-159. 5 to 10cm core depth 820 BC

2243 ± 76
ISGS-156. 10 to 15cm core depth 293 BC

3050 ± 120
ISGS-153. 20 to 25cm core depth 1100 BC

3890 ± 120
ISGS-152. 40 to 45 cm core depth 1940 BC

15′ 39″ W). From Unit 3, below till of Fayette Stade and above loess of Illinoian Glaciation. Coll 1971 and subm by R P Goldthwait. *Comment* (RPG): pollen from this zone suggests cold "early" Wisconsinan climate preceding deposition of overlying till. Date neither supports nor denies this interpretation.

New Mexico series

ISGS-154. 75 to 80cm core depth	5620 ± 140 3670 BC
ISGS-155. 100 to 105cm core depth	7460 ± 150 5510 BC
ISGS-158. 25 to 40cm core depth	3390 ± 150 1440 BC

Fraction soluble in hot 1N NaOH. *Comment*: agreement with other dates suggests absence of contaminating materials.

General Comment (DLG): dates used to determine sedimentation rate for bottomset beds of Waukegan Member and top of underlying Lake Forest Member of Lake Michigan Formation in S Lake Michigan. On depth vs age plot, points approximate straight line with slope of 19cm/1000 yr.

ISGS-157. French Village **35,750 ± 760**
33,800 BC

Snail shells from St Clair Co, SE¼ SW¼ SW¼ Sec 24, T 2N, R 9W, in French Village, Illinois (38° 36′ 07″ N, 90° 03′ 03″ W). From McDonough Member of Roxana Silt. X-ray diffraction showed small amount of calcite that could not be removed by acid leaching. *Comment* (JCF): younger age than expected could be result of partial recrystallization in solutions containing younger carbon. Establishes minimum date for upper part of McDonough Member of Roxana Silt and supplements earlier dates from overlying Meadow Loess Member (W-729: 35,200 ± 1000, and W-869: 37,000 ± 1500; R, 1960, v 2, p 137-139).

B. Other Localities

ISGS-114. Sao Paulo City site, RP-3 **>50,000**

Charcoal from within Sao Paulo City, Brazil (23° 35′ S, 47° 42′ W). From alluvial river channel sediments formed by braided-pattern paleodrainage. Coll 1972 and subm by Kenitiro Suguoi, Univ Sao Paulo. *Comment* (KS): date is minimum for deposits, whose sedimentation occurred under conditions different from those actually found in assoc rivers. Pinheiros R, which flows near these deposits, at present can carry only silt- and clay-size particles.

ISGS-116. Eaton-Frederick Section **21,940 ± 130**
19,990 BC

Wood from Preble Co, Ohio, NW¼ SE¼ Sec 3, T 7N, R 2E, at Eaton, Ohio (39° 44′ 45″ N, 84° 30′ 30″ W). From till 60cm above Sangamon Soil. Coll 1971 and subm by R P Goldthwait, Ohio State Univ. *Comment* (RPG): indicates till correlated as Fayette is indeed early Woodfordian and correlates closely with Boston Till of Scioto Lobe.

ISGS-117. Commins Farm Section **>46,900**

Organic litter from Fayette Co, Indiana, NW¼ NW¼ NW¼ Sec 13, T 14N, R 11E, 3.6km ESE of Fairview, Indiana (39° 40′ 13″ N, 85°

ISGS-149. De Baca County, 127 **16,490 ± 120**
14,540 BC

Snail shells from Sec 23, T 3N, R 25E, 3km W of Ft Sumner, New Mexico (34° 28′ N, 104° 18′ W). From pond sediment on Pleistocene terrace.

13,820 ± 270

15′ 39″ W). From Unit 3, below till of Fayette Stade and above loess of Illinoian Glaciation. Coll 1971 and subm by R P Goldthwait. *Comment* (RPG): pollen from this zone suggests cold "early" Wisconsinan climate preceding deposition of overlying till. Date neither supports nor denies this interpretation.

New Mexico series

Coll 1972 by J C Frye and A B Leonard; subm by J C Frye.

5865 ± 90

ISGS-144. Chaves County, 197 **3915 BC**

Clam shell from Sec. 26, T 15S, R 26E, 5.3km ESE of Lake Arthur, New Mexico (32° 59′ N, 104° 18′ 30″ W). From sand and silt with some gypsum at base of low terrace of Pecos R. *Comment* (JCF): dates base (on Permian) of youngest terrace in this segment of Pecos R Valley and assoc fauna.

14,310 ± 230

ISGS-145. Roosevelt County, 216 **12,360 BC**

Clam shells from Sec 12, T 3S, R 36E, 24km SE of Portales, New Mexico (34° 04′ 30″ N, 103° 07′ 30″ W). From light gray bedded silt and sand of Pleistocene lake beds in large subsidence area. *Comment* (JCF): dates upper part of lacustrine fill in large solution-subsidence basin, below level of earlier Pleistocene sediments, which are much below level of Ogallala Formation.

15,280 ± 210

ISGS-151. Roosevelt County, 169 **13,330 BC**

Snail shells from Sec 6, T 2N, R 30E, 10.5km ESE of Tolar, New Mexico (34° 26′ 30″ N, 103° 49′ 30″ W). From pond sediments on surface of abandoned Pleistocene Portales Valley. *Comment* (JCF): dates last episode of pond sediments and faunas on surface of alluvium in floor of abandoned Portales Valley.

13,690 ± 160

ISGS-147. Lea County, 204 **11,740 BC**

Snail shells from Sec 15, T 10S, R 37E, 18km ESE of Crossroads, New Mexico (33° 27′ N, 103° 09′ 30″ W). From Pleistocene pond deposit. *Comment* (JCF): dates youngest pond fill and fauna in floor of minor abandoned valley and below stabilized dune sand.

16,010 ± 180

ISGS-148. Lea County, 205 **14,060 BC**

Soil caliche from Sec 25, T 9S, R37E, 21km E of Crossroads, New Mexico (33° 30′ N, 103° 06′ 30″ W). From lower of 2 soils developed in calcareous and fossiliferous pond sediment. *Comment* (JCF): caliche formed in pond deposits dated by ISGS-147. Caliche nodules probably contained significant amount of older carbonate.

16,490 ± 120

ISGS-149. De Baca County, 127 **14,540 BC**

Snail shells from Sec 23, T 3N, R 25E, 3km W of Ft Sumner, New Mexico (34° 28′ N, 104° 18′ W). From pond sediment on Pleistocene terrace.

13,820 ± 270

ISGS-150. De Baca County, 129 **11,870 BC**

Snail shells from Sec 23, T 3N, R 25E, 1.8km W of Ft Sumner, New Mexico (34° 28′ N, 104° 16′ W). From upper level of low Pleistocene terrace. *Comment* (JCF): dates terrace horizon adjacent to but ca 6m below that dated by ISGS-149 and ISGS-91 (17,180 ± 140; R, 1973, v 15, p 84). Lower terrace is, in turn, 4.5 to 6m above distinct floodplain terrace, 2.5 to 3m above active flood plain of Pecos R. Dates Wisconsinan terraces in this segment of Pecos Valley.

II. ARCHAEOLOGIC SAMPLES

A. Illinois

Collins site series

Wood charcoal from Vermilion Co, SW¼ NW¼ SE¼ Sec 8, T 20N, R 12W, 9.7km NW of Danville, Illinois (40° 12′ 30″ N, 87° 44′ 30″ W). Subm by J G Douglas, Univ Illinois.

930 ± 140

ISGS-112. Feature 12 **AD 1020**

From Late Woodland refuse pit containing cord-impressed and incised pottery, other cultural debris, maize kernels, unidentified seeds, animal bones, and mollusk shells. Coll 1971 by R L Griffin.

853 ± 75

ISGS-113. Feature 31 **AD 1097**

From refuse pit containing Late Woodland and Mississippian pottery and stone tools, maize, and great quantities of other plant and animal food debris. Coll 1971 by J G Douglas and E R Pearlman.

General Comment (JGD): dates support interpretation that Collins site represents two-component Late Woodland occupation history, concluded from intrasite and extrasite ceramic associations. Earlier component, ca AD 1000, is noted for pottery decorated by single-cord impressions (cf Canton Ware, Madison Cord-Impressed, etc), and general lack of shell-tempered pottery. Later component, ca AD 1100, shows decline in cord-impressing, and increase in rim thickening, or collaring (cf Starved Rock Collared, Aztalan Collared, Albee Cordmarked). Shell-tempered "Mississippian" sherds are common. Maize apparently more abundant in features relating to second component. Cultural continuity is suggested in spite of apparent temporal discontinuity.

Powell Tract series

Site in Madison Co, NW¼ SE¼ NW¼ Sec 34, T 3N, R 9W, 1.6km N of Fairmont City, Illinois (38° 39′ 43″ N, 90° 05′ 17″ W). Coll 1960 and subm by D W Lathrap, Univ Illinois.

950 ± 75

ISGS-130. Feature 331, #1 **AD 1000**

Hickory nut shells from refuse pit containing other organic materials and large quantities of potsherds. Pit penetrated into sterile alluvial soil, and fill extended up to plow zone. *Comment* (DWL): six-period sequence of occupation has been established for Powell tract of Cahokia site. Refuse pit (Feature 331) contained rich and homogeneous ceramic assemblage that is typically Period III, as defined by O'Brien (1969). This is the period of densest urban occupation on the Powell tract.

1000 ± 75

ISGS-140. Feature 331, #2 **AD 950**

Squash seeds from same refuse pit as ISGS-130.

780 ± 150

ISGS-141. Feature 331, #3 **AD 1170**

Maize assoc with ISGS-130 and -140.

General Comment (DWL): all 3 dates agree when correction is made for known peculiarities of maize. Dates indicate that Phase III on Powell tract was extant at AD 1000.

1170 ± 80

ISGS-163. House #13 **AD 780**

Wood charcoal from refuse pit of House #13 assoc with pottery typical of Phase V of O'Brien's sequence. *Comment* (DWL): from layer of refuse deposited shortly after Phase V house abandoned. Refuse contained Phase V pottery and abundant remains of distinctive microdrill industry. This date insures that Phase V precedes Phase II at Powell tract and that sequence should be Phase I, V, II, III, IV, VI. Present date reinforced by earlier date of AD 825 ± 75 (M-1294; R, 1963, v 5, p 236) on Phase V structure and by presence of trade ware from Lower Mississippi Valley (Coles Creek), which has been repeatedly dated there in AD 800 to 1000 range.

B. Other Localities

Loma Alta site series

Wood charcoal from vicinity of village of Loma Alta, Ecuador, ca 19km up road from mouth of Valdivia R (01° 54′ S, 80° 38′ W). Coll 1972 by Presley Norton; subm by D W Lathrap.

5000 ± 190

ISGS-142. Stone cairn No. 6 **3050 BC**

From within stone cairn No. 6, assoc with Cranium #3, covered by 2.1m of midden.

4750 ± 120

ISGS-146. Stone cairn No. 1 **2800 BC**

From within stone cairn No. 1, covered by 1.9m refuse.

General Comment (DWL): dates assoc with distinct ceramic assemblage characterized by 2 forms of elaborately decorated pots with flaring rims and by red slipped, gourd-shaped bowls. Assemblage is 2 definable phases earlier than earliest phase defined for Valdivia site, ca 19km downstream at mouth of Valdivia R. Relevant dates on pottery at Valdivia site range from 4620 ± 140 to 4100 ± 140 (M-1322 and M-1321; R, 1964, v 6, p 18). See Meggers *et al* (1965, Table G). Recently, a distinctive ceramic complex called San Pedro, that is not represented at Loma Alta, and a nonceramic complex, were defined at base of Valdivia site. Chronologic relation between 2 new complexes defined at Valdivia and basal occupation at Loma Alta, dated here, should be clarified by ^{14}C age determinations now in progress at various labs.

5520 ± 270

ISGS-160. Puna 03 **3570 BC**

Collagen fraction of bone from 150km NW of Jujuy City, Argentina (23° 17′ S, 65° 42′ W). From Holocene fluvial terrace with a stratum containing lithic artifacts. Coll 1971 and subm by Jorge Fernández, Mina Aguilar-Provincia de Jujuy, Argentina. *Comment* (JF): date is 1st for Puna Argentina related to settlements of early man, at 4000m alt. Analysis on bones of camellids permits temporal placement of posthumous phase of monofacial lithic industry known as Saladillense.

Brynjulfson Cave series

Bone from Boone Co, Missouri, SW¼ NE¼ SW¼ Sec 16, T 47N, R 12W, ca 19km S of Columbia, Missouri (38° 51′ 07″ N, 92° 16′ 50″ W). Subm by P W Parmalee, Illinois State Mus, Springfield, Illinois.

15,220 ± 360

ISGS-166A. Cave #1, Collagen #1 **13,270 BC**

4130 ± 110

ISGS-166B. Cave #1, carbonate **2180 BC**

16,650 ± 320

ISGS-166C. Cave #1, Collagen #2 **14,700 BC**

21,150 ± 430

ISGS-166D. Cave #1, Collagen #3 **19,200 BC**

Bones coll randomly throughout cave fill for ca 12m. Coll by M G Mehl. *Comment*: previously dated at 9440 ± 760 (ISGS-70; R, 1973, v 15, p 84). Dates indicate cave material consists of bones of many different ages. Progressive increase in age of collagen fraction is result of bias towards less altered materials in choosing fragments for analysis.

ISGS-165. Cave #2, Collagen **2400 ± 100**
450 BC

Bone from darker of 2 horizontal soil layers, ca 1m above cave floor. Coll 1969 by P W Parmalee and R D Oesch. *Comment*: agrees well with previous date of 2460 ± 230 (ISGS-66, R, 1973, v 15, p 84).

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