

UNIVERSITY OF MICHIGAN RADIOCARBON DATES VIII

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The following is a list of dates obtained since the time of the compilation of List VII in December 1961. The method is essentially the same as that used for the work described in the previous list. Two $\text{CO}_2\text{-CS}_2$ Geiger counter systems are used. The equipment and counting technique have been described elsewhere (Crane, 1961a, 1961b). The dates and the estimates of error in this list follow the practice recommended by the International Radiocarbon Dating Conference of 1962, in that (a) dates are computed on the basis of a half life of 5568 years, (b) A.D. 1950 is used as the zero of the age scale and (c) the errors quoted are the standard deviations obtained from the numbers of counts only. In all previous Michigan date lists we have quoted errors at least twice as great as the statistical errors of counting, in order to take account of other errors in the over-all process. If the reader wishes to obtain a standard deviation figure which will allow ample room for the many other sources of error in the dating process, we suggest he double the figures that are given in this list. The procedures for converting the dates to the more recent half life scale and to a scale having its zero at any time other than 1950 need not be given here as they have been covered in this journal and elsewhere. Where there is no comment, it is because the submitter of the sample had none to make.

We wish to acknowledge the help of Patricia Dahlstrom in preparing chemical samples and of J. R. Parsons and T. J. Krajci in preparing the descriptions. The descriptions and comments are essentially those of persons submitting the samples.

SAMPLE DESCRIPTIONS

I. GEOLOGIC SAMPLES

Modern Marine And Freshwater Mollusc Shell series, Florida, California, Ohio, Michigan, Pennsylvania

The following series of shells of living specimens were dated in order to compare marine with freshwater species in connection with investigation of isotopic composition ($\text{C}^{13}:\text{C}^{12}$ and 018:016) of marine and freshwater mollusc shell. Samples subm. by M. L. Keith, Pennsylvania State Univ., University Park. *Comment* (M.L.K.): results show negative correlation between $\text{C}^{13}:\text{C}^{12}$ ratio and C^{14} "age." The fluvial specimens, relatively deficient in C^{13} , are also deficient in C^{14} ; the marine samples have the greatest enrichment of both C^{13} and C^{14} , and the single lacustrine sample is intermediate. It seems likely that C^{14} ages can be corrected by use of the $\text{C}^{13}:\text{C}^{12}$ ratio.

M-1220. Key Largo, Florida

**300 ± 75
A.D. 1650**

Marine gastropod shell (*Strombus gigas*) from Key Largo ($24^\circ 55'$ N Lat, $81^\circ 00'$ W Long), Dade Co., Florida. Collected alive 1960 at ca. 1.5 m depth by R. Eichler, Pennsylvania State Univ.

M-1221. Balboa Beach, California **40 ± 75**
A.D. 1910

Marine pelecypod shell (*Tivela stultorum*) from Balboa Beach (33° 00' N Lat, 117° 25' W Long), Newport, Orange Co., Calif. Collected alive 1959 at ca. 4 m depth by M. L. Keith.

M-1222. La Jolla, California **125 ± 75**
A.D. 1825

Marine gastropod shell (*Haliotis fulgens*) from La Jolla (32° 31' N Lat, 117° 22' W Long), San Diego Co., Calif. Collected alive 1959 at ca. 6 m depth by Lee Cozad, Scripps Inst. of Oceanography.

M-1223. Put-in-Bay, Ohio **440 ± 75**
A.D. 1510

Lacustrine pelecypod shell (*Lampsilis siliquioidea*) from Put-in-Bay on Lake Erie (41° 15' N Lat, 82° 45' W Long), Ottawa Co., Ohio. Collected alive 1959 at ca. 3 m depth by R. Eichler.

M-1224. Grand River, Michigan **1890 ± 100**
A.D. 60

Fluvial pelecypod shell (*Elliptio dilatatus*) from Grand River (43° 00' N Lat, 85° 15' W Long), 1 mi W of Saranac, Ionia Co., Michigan. Collected alive 1959 at ca. 0.5 m depth by R. Eichler.

M-1225. French Creek, Pennsylvania **1010 ± 75**
A.D. 940

Fluvial pelecypod shell (*Actinonaias carinata*) from French Creek (41° 40' N Lat, 80° 10' W Long), 5 mi N of Meadville, Crawford Co., Penn. Collected alive 1960 at ca. 0.3 m depth by M. L. Keith.

M-1226. Meramec River, Missouri **2300 ± 100**
350 B.C.

Fluvial pelecypod shell (*Ligumia recta latissima*) from Meramec River (38° 10' N Lat, 91° 00' W Long), near Sullivan, Franklin Co. Missouri. Collected alive 1959 at ca. 0.5 m depth by M. L. Keith.

M-1271a. Calumet, Michigan, 27 in. end of sampling tube **3550 ± 125**
1600 B.C.

M-1271b. Calumet, Michigan, 68 in. end of sampling tube **6400 ± 175**
4450 B.C.

Peat taken from Center Section 14, T56N, R33W, NW corner of Elm and Eighth Sts., Calumet (47° 15' N Lat, 88° 27.5' W Long), Houghton County, Michigan, in conjunction with study of the glacial deposits in the Keweenaw Peninsula, in progress since 1956. (J. D. Hughes, in progress). Peat occurs as a 41-in. bed beneath a 27-in. sand layer, whose surface is at alt 1210 ft, and overlying late Wisconsin till. Sample obtained using an Acker split-barrel soil sampler. Material from top and base of the peat bed (27-in. and 68-in. depth) were dated to obtain an indication of the time of peat accumulation. Coll. 1961, by J. D. Hughes, Calumet and Hecla, Inc., Calumet Div.; subm. 1961, by J. H. Zumbege, Univ. of Michigan, Ann Arbor. *Comment* (J.H.Z.): dates are obviously too young to be associated with glacial advances. Burial of this peat must have been caused by local factors. Pollen analysis is in progress.

M-1256. Trout Lake Dam Site No. 2, Washington **30,000 ± 2500**
28,050 B.C.

Wood (western hemlock? *id.* by R. Yarnell, Univ. of Mich., Ann Arbor) from Trout Lake Dam Site No. 2 (46° 01' 07" N Lat, 121° 32' 52" W Long), Klickitat Co., Washington. Sample taken from 251 ft below surface in drill hole 25, and was 1687.8 ft above mean sealevel. Occurred in a layer of sand and gravel below 210 ft of olivine basalt, in turn overlain by 40 ft of silt, clay, and gravel. A date on this sample will help fix the age of various stratigraphic units in the area (North Pacific Consultants, 1960). Coll. 1960 by O. O. Leaf, Spokane; subm. by E. E. Clouse, White Salmon, Wash. *Comment* (E.E.C.): in view of the stratigraphic position of the wood beneath massive lavas, it seems doubtful that the C¹⁴ dating is correct.

II. ARCHAEOLOGIC SAMPLES

A. Upper Mississippi Valley and Great Lakes

M-1086. Erp Site, Ohio **515 ± 75**
A.D. 1435

Charcoal from Erp Site (40° 3' N Lat, 84° 22' W Long), Miami County, Ohio. Sample is from campfire 1.7 ft deep and 55 ft from wall toward center of site, an enclosure and village site on bluff top on W side of Stillwater River, directly W of Pleasant Hill. Sample associated with tubular clay pipes, Fort Ancient pottery, and small triangular points. Coll. 1959 and subm. by J. C. Allman, 1336 Cory Dr., Dayton 6, Ohio. *Comment* (J.C.A.): pottery is all grit-tempered, mostly with crushed quartz. This, plus other similarities, makes it probable that site was associated with the Steele Dam Site at Dayton. There were some evidences of Late Woodland, such as shallow side-notched projectile points and parallel-sided gorgets. Date given by sample agrees with those generally accepted for Fort Ancient.

M-1145a. **less than 150**

M-1145b. "The Griffin," Mississagi Straits, Michigan **200 ± 75**
A.D. 1750

Wood (Appalachian oak, *id.* by S. B. Preston, Univ. of Michigan, Ann Arbor) from a shipwreck thought to be LaSalle's ship, the Griffin, lost in 1679. Sample found ca. 190 ft underwater in the Mississagi Straits, between Lake Huron and North Channel (45° 30' N Lat, 83° 15' W Long), Michigan. Sample M-1145a consists of outer rings (rings 74 to 94), and M-1145b composed of the inside rings (rings 0 to 12) of a floating sequence of 102 rings (*id.* by R. E. Bell, Univ. of Oklahoma, Norman). An iron pin found with the wreckage underwent metallurgical analysis by M. W. Lightner, U. S. Steel Corp., Pittsburgh, Penn. Analysis indicates that the pin could have been forged from wrought iron produced by the Walloon Process, used from the 14th through the 18th centuries. Coll. 1960 and subm. by N. L. McCready, Great Lakes Underwater Exploration Co., Cheboygan, Michigan. *Comment* (J.B.G.): wood seems too recent to be from the "Griffin."

M-1000. McDonough Lake Site, Illinois **780 ± 75**
A.D. 1170

Charred acorns from McDonough Lake Site (42° 30' N Lat, 91° 0' W Long), Madison County, Illinois. Sample taken from 42-in. level in a deep refuse pit which, unlike nearby pits at the same level, contained thin, cord-marked Bluff culture sherds and no Mississippi pottery. Coll. 1958 and subm. by G. Perino, Thomas Gilcrease Foundation, Tulsa, Oklahoma.

Snyders Site series, Illinois

Wood charcoal from Snyders Site (39° 4' 10" N Lat, 90° 40' 16" W Long), Calhoun Co., Illinois. The artifact complex recovered from the features dated may be attributed to the middle span of Hopewellian developments in the lower Illinois and adjacent Mississippi valleys. Coll. 1960 and subm. by Stuart Struever, Univ. of Chicago. The site has been discussed briefly in several publications, among them Griffin (1952), Powell (1957), and Fowler (1955).

M-1154. Snyders Site, Feature 8c **1890 ± 75**
A.D. 60

Wood charcoal caked inside bottom portion of a Havana Cord-marked vessel located within Feature 8c, 4 in. below its discernible upper limits. Feature 8c was an oval-shaped storage/refuse pit with dimensions 6 ft 10 in. by 8 ft 3 in.; depth 4 ft 7 in.

M-1155. Snyders Site, Feature 8d **1720 ± 75**
A.D. 230

Charred wood from lens in Feature 8d, 6 in. beneath its discernible upper limits. Feature 8d was an oval-shaped storage/refuse pit with dimensions 4 ft by 6 ft 6 in.; depth 4 ft 3 in.

Mitchell Site series, Illinois

Vegetable matter from various locations at the Middle Mississippian Mitchell Site, (20B2-3) Madison Co., Illinois. Subm. by James Porter, Southern Illinois Univ., Carbondale, Illinois. A report on the site is in progress.

M-1298. Mitchell Site, Mound B **785 ± 75**
A.D. 1165

Charred wood (wall post or roof support) from a burned structure, Feature 44, on top of Mound B (Coord. 38° 45' 28" N Lat, 90° 05' 27" W Long). Sample represents latest occupation of Mound B. Stratigraphic evidence indicates M-1298 should be later than M-1299. Sample No. IAS-21 coll. 1960 by Eugene Fugle.

M-1299. Mitchell Site, Pre-Mound B **875 ± 75**
A.D. 1075

Charred wood (roof support) from house floor at NE corner of early ceremonial structure found under W flank of Mound B (Coord. as M-1298). Sample associated with Feature 32. Sample No. IAS-22 coll. 1960 by James Porter.

M-1300. Mitchell Site, Mound C **785 ± 75**
A.D. 1165

Charred bits of twigs from refuse pit in N profile of 320 test trench L61-62, at 58-93 cm below surface (Coord. 38° 45' 30" N Lat, 90° 05' 27" W Long). Dates occupation of Mound C, and should compare with M-1298. Sample No. IAS-23 coll. 1960 by James Porter.

M-1302. Mitchell Site, Mound H **750 ± 75**
A.D. 1200

Charred wood from dark fill over Features 77 and 79, 0-20 cm above "floor," Mound H area (Coord. 38° 45' 27" N Lat, 90° 05' 21" W Long). Should date period between destruction of Features 77 and 79 and the last occupation of Mound H. Sample No. IAS-25 coll. 1961 by Alan Harn.

M-1303. Mitchell Site, Mound H **950 ± 75**
A.D. 1000

Charred wood from near S wall trench of Feature 77, 5 cm below datum. (Coord. as M-1302). Dates occupation of pre-mound H buildings. Sample No. IAS-26 coll. 1961 by James Porter.

M-1304. Mitchell Site, Feature 28 **785 ± 75**
A.D. 1165

Charred wood from Feature 28, SW corner, 60-67 cm below surface. Dates N area of site for comparison with mound samples. Sample No. IAS-27 coll. 1960 by Vincent Foley.

M-1305. Mitchell Site, Feature 50 **1000 ± 75**
A.D. 950

Air-dried sample taken from between inner and outer rings, in middle area of large bald-cypress log, found in Feature 50, 3.6 m below surface but above water table (Coord. 38° 45' 30" N Lat, 90° 05' 21" W Long). Sample No. IAS-28 coll. 1961 by Peter Taylor.

M-1306. Mitchell Site, Feature 62 **395 ± 75**
A.D. 1555

Charred corn from fill of pit (Feature 62) in Mound H, 15 to 40 cm below surface (Coord. same as M-1303). Dates last occupation of Mound H; should postdate three earlier ceremonial structures (Features 47, 77, 79). Sample No. IAS-29 coll. 1961 by Alan Harn. *Comment* (J.P.): date seems much too recent. The pit was just below plow line and as a result more recent materials may have intruded.

Fill Site series, Illinois

Samples from the Fill Site (20 B2-5; 38° 45' 24" N Lat, 90° 05' 30" W Long), Madison Co., Illinois. Coll. 1960 and subm. by James Porter. Samples were collected under pressure of highway construction, and no exact provenience data is available. Samples should date occupation of site, thought to be contemporary with last occupation of Mitchell Site (Middle Mississippian, from late Old Village to early Trappist).

M-1301. Fill Site **910 ± 75**
A.D. 1040

Charred branches and thatch from burned house uncovered by bulldozers. Sample (IAS-24) from ca. 50-80 cm below surface.

M-1307. Fill Site (not yet dated)

Charred wall post found during scraper operations along S shore of Long Lake, ca. 50-80 cm below surface. Sample No. IAS-30.

Klunk Mound Group series, Illinois

Wood charcoal from Klunk Mound Group (39° 18' 14" N Lat, 90° 36' 7" W Long), Calhoun Co., Illinois. Coll. 1960 and subm. by Gregory Perino for the Thomas Gilcrease Foundation. A report on this mound group is to be published in the near future.

**M-1160. Klunk Mound 7 2870 ± 75
920 B.C.**

Gathered from crematory basin No. 1 excavated into the original natural surface on the bluff. The basin dated was found under a rock and earth mound which in turn had been capped by a later Hopewell structure. Artifacts found in basin indicate the existence under Mound 7 of a Late Archaic or Early Woodland mound. Charred bones of ca. 10 individuals, plummets, beads, and copper were also recovered from this crematory.

**M-1161. Klunk Mound 1 1775 ± 75
A.D. 175**

Found on and in the original surface under the N edge of primary mound. A charred stump was burned when site was prepared. Mound 1 was constructed during classic Hopewell period and contained three log tombs, Hopewell Zoned vessels, and other representative artifacts. The date should be earlier than the construction of the mound.

**M-1162. Banks Mound 3 875 ± 75
A.D. 1075**

Carbon from Banks Mound 3 (35° 19' N Lat, 90° 12' W Long), Crittenden Co., Arkansas. From one of the post molds that circled outer edges of a crematory basin on top of Mound 3. Circle of post molds was 14 ft in diam to inside edge of posts. Coll. 1960 and subm. by Gregory Perino for the Thomas Gilcrease Foundation. *Comment* (G.P.): Mississippian culture, probably early Walls-Pecan Point. Caddo and Old Village influence was noted. Date seems reasonable (J.B.G.).

**M-1182. Warren Gresham Site 1075 ± 75
A.D. 875**

Charcoal from a small log section of pole fragments lying horizontally in excavation unit 35 R 3, upon house floor, in NW corner. Surface depth 12 in. Fire baked wattle clay covered specimen. Warren Gresham Site (39° 12' N Lat, 94° 40' 40" W Long), Platte Co., Missouri, is of the Steed-Kisker Focus; this is the first dating of Middle Mississippian culture from western Missouri and should be of value in considering other manifestations up the Missouri River and its tributaries. Coll. 1959 and subm. by J. M. Shippee, Univ. of Missouri. A report on the house is found in Shippee (1960).

**M-1188. Juntunen Site, Michigan: Ossuary 2 630 ± 75
A.D. 1320**

Charcoal from Ossuary 2, Juntunen Site (45° 49' N Lat, 84° 35' W Long), Bois Blanc Island, Mackinac Co., Michigan. Sample is from arbitrarily

defined Levels 1-2 of an ossuary (Feature 11) which yielded remains of 34 individuals, ranging from flesh interments to disarticulated bundles. Grave goods included two miniature vessels, one of Oneota style, and what is inferred to be the contents of a medicine kit. Ossuary represents a fairly late occupation of the site and stratigraphically overlies layers previously dated as M-1140 (890 ± 150), M-1141 (1050 ± 150), and M-1142 (1125 ± 150). See Michigan VI, p. 110. Coll. 1960 and subm. by Alan McPherron, Univ. of Michigan, Ann Arbor. A report on the site is in progress. *Comment* (A.M.): the four dates form a reasonable series and span major period of occupation. Absence of stab-and-drag decorated pottery from ossuary presents a problem, for this style of decoration is thought to have been prevalent at the time.

Riverton Site series, Illinois

Charcoal from the Riverton Site, Cw-170 ($39^{\circ} 01' 13''$ N Lat, $87^{\circ} 34' 31''$ W Long), SE $\frac{1}{4}$, SE $\frac{1}{4}$, NE $\frac{1}{4}$, Sec. 25, TWP. 7 N, Range 11 W, Crawford Co., Illinois. Samples are from a stratified shell midden with maximum depth of over 8 ft. Cultural affiliations are with the Archaic Midcontinent tradition, (Lewis and Kneberg, 1959), which seems to be intrusive into the Wabash Valley from the Tennessee Valley. Heaviest shell concentrations are in bottom 3 ft of the midden, with shell virtually absent in upper 2 ft. Artifacts indicated repeated re-occupations by people of the Swan Island component of the Riverton culture (Winters and Stephens, ms.) of the Midcontinent Tradition. The Riverton culture is typified by a micro-tool industry in chert which includes graters, projectile points, blades, and scrapers. Cultural change is not marked within the deposit, but in the upper level side-notched points seem to be replaced by expanding-stem points, notable for their small size. Samples were selected to cover most of the time span of the midden accumulation; to date the shift from intensive utilization of mussels to a more diversified hunting and gathering pattern; and to approximately date the time when mussels ceased to be a primary component of the diet. Dates will also be useful in establishing cross-ties with the nearby Robeson component of the Midcontinent tradition (see M-1288 and M-1289, this date list). The Swan Island and Robeson components, while sharing a common subsistence pattern and such diagnostic traits as antler gouges of the Robeson type and cloudblower pipes, have different projectile point congeries. Coll. 1961 by H. D. Winters, Illinois State Mus., Springfield; subm. by Thorne Deuel, Illinois State Mus.

M-1284. Sample No. 1

**3110 ± 100
1160 B.C.**

Charcoal from Level 4 (18 to 24 in. depth) in Square 0/80, at top of Zone III. Occurs at the juncture of the upper portion of the shell midden and overlying midden without shell. Sample should help date the end of utilization of mussel shell as a basic subsistence item by Archaic peoples in the central Wabash Valley. *Comment* (H.W.D.): in line with a predicted terminal date of after 1000 B.C. (Winters and Stephens, n.d.).

M-1285. Sample No. 2

**3460 ± 125
1510 B.C.**

Charcoal from Level 7 (36 to 42 in. depth) in Square 0/80, at bottom of

Zone III. Zone III is characterized by a mixed hunting and gathering pattern, with mussels an important part of the diet. Should date the shift in subsistence pattern from predominantly mussel gathering to a more diversified hunting and gathering. *Comment* (H.W.D.): obviously too early in respect to other samples of the series.

M-1286. Sample No. 3

3200 \pm 100
1250 B.C.

Charcoal from Level 11 (60 to 66 in. depth) in Square 0/80, near middle of Zone IV is marked by very intensive use of mussels and repeated short-term occupations of the site. Should help date time span of intensive shell utilization. Sample was also selected because of its association with faunal material never before reported historically or archaeologically in Illinois.

M-1287. Sample No. 4

3270 \pm 125
1320 B.C.

Charcoal from Level 14 (78 to 84 in. depth) in Square 0/80, at bottom of Zone IV. Sample should date the beginning of site occupation as well as the approximate time of entry of Archaic Midcontinent Tradition into the Wabash Valley. *Comment* (H.D.W.): a date of ca. 2000 B.C. had been predicted for this sample (Winters and Stephens, n.d.), but the date is acceptable. *General Comment* (H.D.W.): the four dates indicate that the deposit was accumulated in a very short time. Such a rapid rate of accumulation is not surprising in view of the frequent deposition of sand and clay by floods and the great bulk of mussel shell lenses.

Robeson Hills Site series, Illinois

Charcoal from Robeson Hills Site, Lw-1 (38° 42' 31" N Lat, 87° 31' 20" W Long), NE $\frac{1}{4}$, NE $\frac{1}{4}$, SE $\frac{1}{4}$, Sec. 9 (interpolated), Twp. 3 N, Range 10 W, Lawrence County, Illinois. Samples are from a stratified shell midden with maximum depth of 4.5 ft. Cultural affiliations are with Archaic Midcontinent tradition. As with the Riverton Site, the Robeson Site seems to belong within a culture intrusive into the Wabash Valley. Samples were selected to date earliest occupation of the site and diagnostic artifacts in the shell midden. Dates will also be useful in cross-dating the Riverton and Robeson Sites (see M-1284 through M-1287, this date list). Coll. 1961 by H. D. Winters; subm. by Thorne Deuel. Site report prepared for publication by H. D. Winters and Denzil Stephens (n.d.) for the Illinois State Mus.

M-1288. Sample No. 5

3490 \pm 100
1540 B.C.

Charcoal from fill of Pit S-14, which began at depth of 48 in. below surface in Test Pits B and D, in lower part of Zone II. Sample should provide date near the beginning of site occupation and the intensive utilization of mussels. In addition to quantities of bone and shell, the pit contained a cloudblower pipe and a perforated bear-canine pendant.

M-1289. Sample No. 6

3440 \pm 125
1490 B.C.

Charcoal from fill of Pit S-3 which began more than 48 in. below the surface of the midden and was dug into the sterile subsoil. Bulldozing of midden

prevented exact determination of depth, but pit was adjacent to controlled excavation units. Sample should date earliest occupation of the site as the pit mouth occurred at the junction of the midden and sterile subsoil.

General Comment (H.D.W.): both M-1288 and M-1289 are quite acceptable, since they are close to the predicted date of 2000 B.C. (Winters and Stephens, n.d.).

M-1290. Murdock Mound, Illinois **600 ± 75**
A.D. 1350

Charcoal (Sample No. 7) from Murdock Mound (38° 38' 20" N Lat, 90° 03' 20" W Long), St. Clair Co., Illinois. Sample taken from post molds of a round structure in Village Level V, just below loess pyramid. Coll. 1941 by H. M. Smith; subm. by Thorne Deuel. Should date uppermost level of "Old Village" deposits below Murdock Mound. Smith has prepared a preliminary discussion of the site for publication by the Illinois State Mus. *Comment* (T.D.): date is too late.

Cahokia series, Illinois

Charcoal samples from several sites at this large clustering of Middle Mississippian occupations, E. St. Louis, Ill. Subm. by C. J. Bareis, Dept. of Anthropol., Univ. of Illinois, Urbana. See Griffin (1949) for ceramic descriptions.

Cahokia, Site Ms-2-2 subseries

Village location (38° 39' 46" N Lat, 90° 05' 17" W Long), ca. 200 yd NE of old Powell Mound area and 1.5 mi W of Monks Mound, Madison Co., Ill.

M-1292. Cahokia, Site Ms-2-2, Feature 234, **1055 ± 75**
A.D. 895
House 26

From charcoal layer on floor of rectangular wall trench structure with long axis oriented NW-SE, probably Old Village. Sample No. IAS-11 coll. 1960 by C. J. Bareis.

M-1293. Cahokia, Site Ms-2-2, Feature 227 **1190 ± 75**
A.D. 760

From fire basin (Feature 227) ca. 9 ft diam located within and near center of large rectangular wall trench structure (Feature 202, House 15) with long axis oriented NE-SW; Old Village—Trappist. Sample No. IAS-12 coll. 1960 by D. W. Lathrap.

M-1294. Cahokia, Site Ms-2-2, Feature 217, **1125 ± 75**
A.D. 825
House 21

From floor of rectangular post structure with long axis oriented NW-SE. Old Village sherds were found on floor of house though house construction is of Bluff type. Sample No. IAS-13 coll. 1960 by C. J. Bareis.

M-1295. Cahokia, Site Ms-2-2, Feature 197 **1915 ± 150**
A.D. 35

From Square J-1-36, Level 6, depth 31 in. in Feature 197, charcoal area. Near refuse pit but apparently not related to the pit. Sample No. IAS-14 coll.

1960 by D. W. Lathrap. Post structure and wall trench house were located nearby. These structure are apparently Old Village. *Comment* (C.J.B.): date is too early for Old Village occupation as well as Late Woodland occupation at the site. Specimen may be contaminated.

Cahokia, Site S-34-1 subseries

Village location at W border of Collinsville Airport property, ca. .5 mi SE of Monk's Mound (38° 39' 21" N Lat, 90° 03' 15" W Long), St. Clair Co., Ill.

M-1296. Cahokia, Site S-34-1, House 3 **725 ± 75** A.D. 1225

From top of W wall of rectangular wall trench structure with long axis oriented N-S. Structure is probably Trappist. Sample No. IAS-15 coll. 1961 by C. J. Bareis.

M-1297. Cahokia, Site S-34-1, Feature 1 **675 ± 75** A.D. 1275

Charcoal and charred corn from large Trappist refuse pit (Feature 1); nonstratigraphic cut. Sample No. IAS-16 coll. 1961 by C. J. Bareis.

M-1150. Tinsley Hill Site, Ly 18B, Kentucky **570 ± 150** A.D. 1380

Charred wood from a Middle Mississippian Stone Grave Cemetery Site (37° 01' 38" N Lat, 88° 03' 23" W Long), Lyon Co., Kentucky (Schwartz, 1961). The site is located on a high bluff overlooking an extensive Middle Mississippian village in bottomland of the Cumberland River with a small mound on an adjacent bluff. The specimen was found 30 to 40 cm below surface, associated with a multiple burial in a partial stone grave (Burial #46a), and was in contact with undisturbed legs of a partly-disturbed burial. Trade material found on the site could be related to aboriginal material but not to the stone graves. This was probably left by later visitors and not by Indians who buried their dead there. Coll. 1959 by J. T. Carter; subm. by D. W. Schwartz, Univ. of Kentucky, Lexington. *Comment*: this is the first good date obtained from a well-documented stone grave site.

B. Lower Mississippi Valley and Southeast

Lawhorn Site series, Arkansas

Charred wood from the Lawhorn Site (35° 58' N Lat, 90° 23' W Long), Craighead Co., Arkansas. Subm. by John Moselage, Chucalissa Mus., Memphis, Tennessee. Samples should help assess the chronological position of the Mississippian component, which is difficult to place typologically because of the many variations from the standard Mississippian sites of this area. There are no publications to date, although one is planned as a future release of the Missouri Archaeol. Soc.

M-1156. Lawhorn Site, general midden **625 ± 75** A.D. 1325

Charred log (*F.S.* 78) very near Burial 21 but judged not in actual as-

sociation. Dates general midden deposit W of drainage ditch. Coll. 1957 by John Moselage.

M-1157. Lawhorn Site, House 3 **375 ± 75**
A.D. 1575

Charred pole, possibly oak (F. S. 408) from floor of House 3, Mississippian component. Coll. 1960 by John Moselage. *Comment* (J.M.): a burned structure which yielded considerable data on house construction techniques and a large number of specimens *in situ* on the house floor, including a unique strap-handled water bottle. Evidence also indicated much of this site to be late in time; the date is about what was expected.

M-1158. Lawhorn Site, House 1 **750 ± 75**
A.D. 1200

Charred pole, possibly oak (F. S. 518) from floor of House 1, Mississippian component. Coll. 1957 by John Moselage. *Comment* (J.M.): this house was essentially the same as House 3 although data was not as complete. Date indicates a rather long period of occupation at the site with little change in this aspect of technology.

M-815. Spiro Site (Lf-Cr-1), Oklahoma **580 ± 75**
A.D. 1370

Conch shell fragments from Craig Mound (35° 15' N Lat, 94° 20' W Long), Le Flore Co., Oklahoma. Shell fragments were associated with a large multiple burial (No. 62), deep within the conical portion of the mound. Burial 62 contained: two pottery bottles, four shell gorgets, 385 pieces of engraved conch shell, 18 conch shells, 77 pearl beads, several projectile points, five stone ear spools, two wooden ear spools, one stone ornament, one stone discoidal, one stone mace, one stone celt, one stone pipe, a wide variety of shell beads, one awl, one rim sherd, galena and black pigment (Bell, 1953). Sample should date the Gibson aspect at this site (Orr, 1946; 1952). Coll. 1937 by F. E. Clements, Univ. of Oklahoma, Norman; subm. by R. E. Bell. *Comment* (R.E.B.): this date agrees well with the results of the following Gibson-aspect samples from the Spiro Site: M-54, A.D. 1315 ± 250; M-309, A.D. 1477 ± 200; and 0-596, A.D. 1457 ± 100 (Bell, 1961). Another Gibson aspect sample from the Spiro Site dated at A.D. 789 ± 150 (Michigan V).

Harlan Site (Ck-6) series, Oklahoma

Charcoal samples from the Harlan Site (35° 55' N Lat, 95° 14' W Long), Cherokee Co., Oklahoma, in Sequoia State Park. Bell (1949) discusses the site. The three specimens are from superimposed layers within mound Unit 4, and represent a component of the Early Gibson aspect at this site. The charcoal is assumed to come from the house structures associated with each layer. Stratigraphically, Layer A is the youngest, Layer C the oldest, and Layer B intermediate. House patterns in Unit 4 have some minor differences; however, their outlines are basically square with four central roof supports and an entrance pasageway. Coll. 1949 by Leonard Johnson, Univ. of Oklahoma; subm. by R. E. Bell.

M-858. Harlan Site, Layer A **610 ± 75**
A.D. 1340

Charcoal from mound Unit 4, Square N1-L6, Layer A.

M-859. Harlan Site, Layer B **820 ± 75**
A.D. 1130

Charcoal from mound Unit 4, Square N1-L5, Layer B.

M-860. Harlan Site, Layer C **775 ± 75**
A.D. 1175

Charcoal from mound Unit 4, Square N1-L5.

General Comment (R.E.B.): dates are quite in harmony with the stratigraphy, and agree closely with M-65, A.D. 1236 ± 200 (Bell, 1961). Specimen M-64, A.D. 676 ± 300 (*ibid.*), also from Unit 4, now appears to be somewhat too early, although not unreasonable.

M-1107. Williams Site (9-Go-507) Georgia **470 ± 75**
A.D. 1480

Charred wood fragments from the Williams Site (ca. 34° 35' N Lat, 84° 57' W Long), Gordon Co., Georgia. Sample associated with charred corncobs in Feature 7, which is apparently Early Woodland (Williams focus), estimated at ca. 500 to 250 B.C. Coll. 1960 and submitted by D. F. Morse, then of Georgia Hist. Comm., Atlanta. *Comment* (D.F.M.): date is younger than expected. Here there is no certainty that the corn is associated with the Williams focus, but there is a high probability, as this is the latest component at the site. M-1116, 2580 ± 200 B.P. and M-1117, 2490 ± 200 B.P. (this date list), were associated with the slightly earlier Mahan focus (Early Woodland), at the Mahan Site.

Bilbo Site series, Georgia

Charcoal and bone from the Bilbo Site (32° 04' 20" N Lat, 81° 03' 57" W Long), Chatham Co., Georgia. Samples date two phases in Savannah River delta; M-1111 and M-1112 date time of introduction of pottery; M-1109, when compared with the preceding samples, should indicate the duration of Archaic materials for most of the occupation of the site. M-1111 and M-1112 would also date the time that sealevel had reached its present level. All the cultural material involved between the two sample levels belongs to the Archaic phase. See Caldwell (1952) for references to site. Coll. 1957 and subm. by W. G. Haag, Louisiana State Univ., Baton Rouge.

M-1109. Bilbo Site 3.0 to 3.5 ft layer **3700 ± 125**
1750 B.C.

Charcoal from 3.0 to 3.5 ft layer of nearly solid shell.

M-1111. Bilbo Site, 5.5 to 6.0 ft layer **3820 ± 125**
1870 B.C.

Charcoal from 5.5 to 6.0 ft layer, immediately above bottom limit of pottery.

M-1112. Bilbo Site, 5.5 to 6.0 ft layer **3730 ± 125**
1780 B.C.

Bone from 5.5 to 6.0 ft layer, immediately above bottom limit of pottery.

General Comment: dates are as anticipated and fit well with two other dates

for the Bilbo site area: Humble Co. sample no. 1046, 5500 ± 115 B.P.; Humble Co. sample no. 1047, 4125 ± 115 B.P.; private communication to W. C. Haag.

Mahan Site series, Georgia

Charred wood from the Mahan Site ($34^{\circ} 25' N$ Lat, $84^{\circ} 42' W$ Long), Gordon Co., Georgia. Samples taken from the base of refuse pits below a 4 to 12 in. thick midden, which in turn underlay a 6 in. plow zone. Refuse pits extend into a drab sandy layer which contains evidence of an Archaic occupation. Both samples date from an Early Woodland occupation of the site and are associated with grit-tempered, fabric-impressed pottery. Coll. 1959 and subm. by J. H. Wear, Fairmont, Georgia.

M-1116. Mahan Site, Feature 20 **2580 ± 100**
630 B.C.

Charred wood (pine ?; *id.* by R. A. Yarnell) from within 2 in. of the base of a refuse pit (Feature 20). Besides grit-tempered pottery, Feature 20 contained limestone and sand-tempered sherds.

M-1117. Mahan Site, Feature 25 **2490 ± 100**
540 B.C.

Charred nuts (hickory; *id.* by R. A. Yarnell) from near the base of a refuse pit (Feature 25). Feature 25 contained some limestone and sand-tempered sherds in addition to the dominant grit-tempered ware.

General Comment: previous publications (Caldwell, 1958; Sears and Griffin, 1950; Lewis and Kneberg, 1958) have reported Dunlap Fabric-marked (Early Woodland) as the earliest pottery in the Mahan-site area. It is now believed that Mahan site grit-tempered ware is ancestral to the Dunlap and Kellog sand-tempered series, and that these samples date the grit-tempered series, or just prior to the advent of the sand-tempered series.

Helena Crossing Site series, Arkansas

Charcoal from burial mounds ca. 1.5 m SW of Helena ($34^{\circ} 30' 10'' N$ Lat, $90^{\circ} 36' 40'' W$ Long), Phillips Co., Arkansas. Coll. 1960 and subm. by J. A. Ford, Am. Mus. of Nat. Hist. Series dates burial vaults from the Hope-well culture of Marksville areal variant. Burial vaults B and D were both excavated into the ground surface beneath Mound C. They were constructed within a very short time, and were immediately covered over by the core of Mound C. This is indicated by the lack of water deposited soils in the tombs.

M-1196. Helena Crossing Site, Mound B **1740 ± 75**
A.D. 210

Charcoal from the charred end of an oak log ca. 3 ft in diam. Log was a roofing timber for the large burial vault in Mound B.

M-1197. Helena Crossing Site, Mound C, Tomb B **2100 ± 75**
150 B.C.

Charcoal apparently formed by slow oxidization of an 8 in. diam roofing timber placed over Tomb B in burial Mound C.

M-1198. Helena Crossing Site, Mound C, 1625 ± 75
Floor of Tomb D A.D. 325

Charcoal from the floor of Tomb D. Vault had roofing timbers 3 to 4 ft in diam which had been burned after the structure was covered with 2 ft of earth.

M-1199. Helena Crossing Site, Mound C, 1930 ± 75
Tomb D, Roofing Log A.D. 20

Charcoal from cast of a roofing log on W end of Tomb D. Judging from cast this was an oak log ca. 3.5 ft in diam.

M-1168. George C. Davis Site, Texas 655 ± 75
A.D. 1295

Charred corn kernels from Davis Site (ca. 31° 40' N Lat, 95° 04' W Long), Cherokee County, Texas. Coll. 1939-1941 by H. P. Newell from a post-hole of Feature 31, a house outline, under the Davis mound. This feature was assigned by Krieger (Newell and Krieger, 1949, p. 180) to the Phase 1 occupation at the site. Kernels were submitted by J. B. Griffin from the collection sent to the Mus. of Anthropol. by Alex Krieger in 1947. A Chicago black carbon date of A.D. 398 ± 175 (C-153, Chicago II) was obtained on charred corn from the floor of a cache pit in Feature 31. *Comment* (J.B.G.): this sample was submitted in order to check it against the Chicago date which was regarded by some archaeologists as too early for the associated cultural complex. Other archaeologists felt the date was satisfactory. The M-1168 of ca. A.D. 1300 may err on the modern side but seems to be closer to the "true" date than the Chicago run.

C. Northeastern United States and Canada

M-1095. Oaklawn Steatite Quarry, Rhode Island 1080 ± 75
A.D. 870

Charcoal from the Oaklawn steatite quarry (41° 46' N Lat, 71° 30' W Long), Providence Co., Rhode Island. Sample taken from depth of 5 ft below ground surface in an ash deposit, directly above a fine specimen of a platform stone pipe form. No stone bowl remains occurred with or beneath the sample. Numerous straight-platform and elbow-style stone pipe forms have been found in association with elongated side-notched projectile points at this quarry, which is stratitranstitional between Late Archaic and Early Woodland (ceramic). Stratigraphic evidence from this quarry and from camp sites in the area indicate the projectile points are transitional between stone-bowl-making and ceramic horizons (Fowler, 1947, 1951). The quarry also shows all types of stone bowls which have been identified at other quarries in the area. Coll. 1959 by J. Hudson, Narragansett Archaeol. Soc. of Rhode Island; subm. by W. S. Fowler, Bronson Mus., Attleboro, Mass. *Comment* (W.S.F.): dates a period after manufacture of stone bowl had ceased, but during which stone pipes were still being made. This correlates well with evidence of stone-pipe making at the Locust Spring Site (Fowler, 1962), ca. 5 mi from the Oaklawn Quarry, where small platform-pipes seem to have been made into Early Woodland time.

Serpent Mound series, Ontario

Charcoal from Serpent Mound Site (44° 12' 24" N Lat, 78° 09' 14" W Long), Peterborough Co., Ontario. Site discussed by R. B. Johnston (1958, 1959, 1960). Coll. 1959 and subm. by R. B. Johnston, Royal Ontario Mus., Toronto.

M-1104. Shell midden

2020 ± 75
70 B.C.

Wood charcoal from Square 60-S-2 of shell midden. Charcoal occurred 20 in. below the ground surface, resting on a yellow sandy loam which was everywhere the sterile foundation of the midden. Overlying the charcoal was 3 in. of shell-flecked, dark brown loam, a 12 in. shell layer, and a 5 in. sod zone. Provenience of sample suggests that it would date construction of midden at this point, or, perhaps better, indicate the time of the earliest shell accumulation. The charcoal was derived from what seems to be the old ground surface upon which the shell layer rests.

Midden has produced a considerable ceramic sample, of which the earliest is of Vinette 2 character. A few Late Woodland (chiefly Glen Meyer) types have been recovered. This sample is the only direct means of establishing a chronological reference for the midden. A date for the midden will, of course, aid considerably in defining its relationship to the Serpent Mound, dated already at 1830 ± 200 B.P. (M-850, Michigan IV). *Comment* (R.B.J.): date corroborates placement of the lower midden levels on internal and comparative seriation evidence.

M-1105. Serpent Mound

1660 ± 75
A.D. 290

Charcoal from an extensive concentration of pure charcoal that extended through two 5 ft squares (C12d 10-1, and C12c 10-10) near the southern extent of the mound. Charcoal mass was evidently the remains of several logs or a portion of a tree buried in mound fill an average of 2 ft below the surface, and ca. 1.5 ft above the buried old-sod layer. Sample should date construction of mound, at least that portion from which it was recovered. *Comment* (R.B.J.): materials dated as M-1105 (A.D. 302) and M-850 (A.D. 128), from different sections of the fill of the Serpent Mound, could be regarded as contemporary if adjusted within the indicated ranges of probable error. However, I would be inclined to accept the results at face value, as suggested by indirect internal evidence, indicating a difference of 174 yr between the two samples which were separated in the mound by ca. 111 ft. I would then, given a choice, consider the 174 yr age difference as a maximum. Both M-850 and M-1105, falling as they do in the early centuries A.D., would place construction of the Serpent Mound chronologically in the later portion of Adena and the middle range of Hopewell as it is understood from C¹⁴ dates in the Ohio Valley.

M-1163. Portage Site, New York

950 ± 75
A.D. 1000

Charcoal from the Portage Site (43° 09' 56" N Lat, 79° 02' 49" W Long), Niagara Co., N. Y. Sample was from Late Point Peninsula pit, top of which was overlaid by 16 in. deposits containing Iroquois, French, and English

occupation, the whole being covered by 1.5 ft recent fill. Pit contained shark teeth and tubular beads made from conch shell. Coll. 1960 and subm. by R. L. McCarthy, 40 Grant St., Lockport, N. Y. (McCarthy, 1961, 1962). *Comments* (R.L.McC.): date is satisfactory.

625 ± 75

M-1185. Oak Hill 7 Site, New York

A.D. 1325

Charcoal from bottom of Pit 1, Oak Hill 7 (42° 57' 30" N Lat, 74° 40' 00" W Long), town of Minden, Montgomery Co., N. Y. Subsoil upon which sample rested, at depth of 18 in., was reddened from heat of fire. Many fire-broken stones, fragments of the major portion of a Chance Incised vessel with incised-platted neck decoration and check-stamp body surface treatment, a single rimsherd of the Durfee Underlined pottery type and a fragment of an undecorated trumpet pipe occurred in the pit fill. Sample should date the end of the Oak Hill horizon and beginning of the Chance horizon, early stages of New York Iroquois development. A paper on the Oak Hill horizon is being prepared for publication. Coll. 1960 and subm. by Donald Lenig, 5 Cottage St., St. Johnsville, N. Y. *Comment* (J.B.G.): date is acceptable.

3300 ± 100

M-1187. Bent Site, New York

1350 B.C.

Wood charcoal from the Bent Site (42° 51' N Lat, 74° 01' W Long), Schenectady Co., N. Y., found in close association with several projectile points of the Normanskill type, calcined animal bone, and carbonized nuts, within and under Feature 1. This feature consisted of a mass of burned stone cobbles and small boulders ca. 6 ft in diam and 13 in. thick, located in Sec. W130 S50 and W120 S50 at depth 9 to 22 in. below present ground surface. Overlying floodplain silt ca. 39 in. had been removed from site prior to excavation. Bent Site is the largest known component of a newly defined Archaic complex called the River Focus, and the Normanskill type point is diagnostic for this focus. For a formal description of the point type, see Ritchie (1961, p. 57-8); definition and description of the River Focus is yet to be published. Coll. 1960 and subm. by W. A. Ritchie, New York State Mus. and Sci. Service, Albany. *Comment* (W.A.R.): date seems too young.

1125 ± 75

M-1189. Winslow Site, Maryland

A.D. 825

Charcoal (charred hickory nuts) from the Winslow Site, 18-M09 (39° 04' 05" N Lat, 77° 23' 52" W Long), Montgomery Co., Maryland. From a storage pit belonging to Woodland occupation of site, which appears to have many similarities to the Owasco culture of New York State. This is the first dating for the Montgomery focus, one of the major Woodland occupations in Maryland. The site will be reported in a Bulletin of the Archeol. Soc. of Maryland. Coll. 1960 and subm. by W. A. Tidwell, 3701 Blackthorn, Chevy Chase, Maryland.

D. United States Great Plains

Site 25 DK7 series, Nebraska

Charcoal from post mold of a rectangular house at an Aksarben (formerly "Nebraska culture") site, 25 DK7 (42° 20' N Lat, 96° 30' W Long), Dakota

Co., Nebraska. Site includes house structures and a possibly associated ossuary burial. Part of a single charcoal sample was saturated with paraffin (M-1074), for purposes of comparison with an uncontaminated portion (M-1073) to test paraffin-extraction technique. If paraffin-extraction was successful both M-1073 and M-1074 should give the same date. Coll. 1940 and subm. by J. L. Champe, Univ. of Nebraska, Lincoln.

M-1073. Uncontaminated charcoal sample **515 ± 75**
A.D. 1435

M-1074. Paraffin-saturated charcoal sample **830 ± 75**
A.D. 1120

General Comment (J.L.C.): experiment not conclusive.

M-1069. Squaw Creek Site, Kansas **390 ± 75**
A.D. 1560

Charcoal from the Squaw Creek Site (39° 59' N Lat, 95° 19' W Long), Doniphan Co., Kansas. Sample taken from the bottom of a pit exposed in a bank recently cut by a grader. The charred material was 2 ft in from the front of the cut and ca. 4 ft below the old ground surface, now covered by 2 ft of later deposit. A portion of what appeared to be a Middle Mississippi pot, and a large complete pot of very distinct Nebraska aspect were also found in the pit. Coll. 1959 and subm. by J. M. Shippe. *Comment* (J.M.S.): date seems to be too recent according to estimates made over the years and date for the Budenbender Site (14-P04) which was A.D. 1199 ± 200 (M-869, Michigan V). Wedel (1961) suggests a date for the Nebraska aspect as A.D. 1300-1400. According to Meyer Rubin (private communication) the C¹⁴ level between A.D. 1300 and 1600 was higher than normal and would tend to reflect a younger reading.

E. Western United States

M-1131. Brewster Site, Wyoming **9990 ± 225**
8040 B.C.

Charcoal from the Brewster Site (43° 22' N Lat, 104° 04' W Long), 3 mi NE of Mule Creek oilfield, T.39N., R.60W., Niobrara Co., Wyoming. Sample collected from lower 6 in. in upper half of Unit C—a tannish-gray gypsiferous sandy-silt—which contains Agate Basin artifacts (Agogino and Frankforter, 1960; Roberts, 1961). A carbonaceous layer in Unit D, overlying Unit C, also contained Agate Basin artifacts, and was C¹⁴ dated at 9350 ± 450 yr B.P. (Humble Co., Sample 1252, private communication). The Folsom level underlying Unit C was dated at 10,375 ± 700 yr B.P. (Isotopes Inc., Sample 1-472, unpublished). Unit C sample was submitted in order to determine the earliest date of Agate Basin occupation in conjunction with climatic changes indicated in the stratigraphy. Coll. 1960 by G. A. Agogino, Harvard Univ., Cambridge, Massachusetts, W. D. Frankforter, Sanford Mus., Cherokee, Iowa, and C. V. Haynes, Univ. of Arizona, Tucson; subm. by Agogino. *Comment* (G.A.G.): this sample series is interesting as all three were dated by different laboratories yet all agree with the stratigraphy at the site.

Arlington Springs Site series, Santa Rosa Island, California

Shell from the Arlington Springs Site ($34^{\circ} 00' \text{ N Lat}$, $120^{\circ} 10' 02'' \text{ W Long}$), Santa Rosa Island, Calif. (Orr, 1960, 1962a, 1962b). The site consists of 37 ft of deposition with three cultural horizons: human bone at a depth of 37 ft, dated at $10,400 \pm 200 \text{ B.P.}$ (L-568-A), and $10,000 \pm 200 \text{ B.P.}$ (L-650) by the Lamont Geol. Observatory (Lamont VII); a midden at depth of ca. 11 ft, dated by the Michigan Memorial-Phoenix Proj. Lab. at $7350 \pm 350 \text{ yr B.P.}$ (M-1133, Michigan VII); and a second midden which occurs from immediately below the surface to a maximum depth of 3 ft. Coll. 1960 by P. C. Orr, W. A. Davis and William Merseilles; subm. by P. C. Orr, Santa Barbara Mus. of Nat. Hist., Santa Barbara, California.

M-1147. Second midden **2090 ± 100
140 B.C.**

Shell (*Mytilus californianus*) from a depth of 18 in. below surface in site's uppermost midden. Sample taken 200 ft N of Datum B, at 127 ft above sea-level, ca. 35 ft directly above the human bone material. This should date one of the last occupations of the site.

M-1148. Modern shell specimen from off **0 ± 75
A.D. 1950**
Tecolote Point

Living specimen of *Mytilus californianus*. Dated for purposes of C^{14} control on archaeological sample.

F. Mexico and South America

M-1151. Mound 5-W, Yagul, Oaxaca **1060 ± 75
A.D. 890**

Charred beam of unidentified species of wood from above intact cement floor related to Tomb 10, but lower than cement floor related to Tombs 10 and 13, Mound 5-W mound facing on Patio 5 ($16^{\circ} 58' \text{ N Lat}$, $96^{\circ} 27' \text{ W Long}$), Yagul, Oaxaca. Work at Yagul is reported in several publications, notably various issues of Boletín de Estudios Oaxaqueños (Paddock, 1958a, 1958b, 1958c; Leigh, 1958). Coll. 1955 by Gareth Lowe; subm. by John Paddock, Mexico City College, Km. 16, Carretera Mexico-Toluca, Mexico 10, D. F. *Comment* (J.P.): Tomb 10 *id.* by A. Caso as marking end of Monte Albán III-B or beginning of IV; Tombs 11 and 13, Monte Albán V. Sample definitely earlier than the two latter tombs which are of interest for having greca mosaic decorations. Site has remains of all known occupation periods for the region, so should be suitable source for dating the Oaxacan sequence, one of the three major subdivisions of Mesoamerica.

M-1164. Amapa Site, Nayarit, Mexico **700 ± 75
A.D. 1250**

Charcoal from the Amapa Site ($21^{\circ} 49' \text{ N Lat}$, $105^{\circ} 14' \text{ W Long}$), Nayarit, Mexico. Taken from Pit B-15 at depth of 4.15 to 4.25 m. Associated potsherds are equivalent to Kelly's Early Chametla (Kelly, 1938) which she estimates at A.D. 300-500; however, trade sherds in the same level seem to tie in with Gifford's Early Nayarit shaft-tomb complex (Gifford, 1950), which

may date at the beginning of the Christian era. Pottery from the Amapa Site charcoal sample level is stylistically older than Kelley's "Suchil Engraved" (Kelley and Winters, 1960), which is dated at ca. A.D. 500. Coll. 1959 by C. Meighan, Univ. of California, Los Angeles; subm. for the Inst. of Andean Research by Clifford Evans, U. S. Natl. Mus., Washington, D. C. *Comment* (C.M.): there is abundant stratigraphic and cross-cultural evidence to indicate that the date obtained cannot possibly apply to the associated cultural remains. The charcoal may somehow be intrusive from post-classic levels 2 m higher in the same pit.

San Jeronimo Site series, Guerrero, Mexico

Charcoal from the San Jeronimo Site (17° 08' N Lat, 101° 03' W Long), Guerrero, Mexico. Samples should date the Post-classic period, Galeana phase and the Classic period, Josefina phase on the basis of associated pottery. Coll. 1960 by Gordon Ekholm, Am. Mus. of Nat. Hist., New York, and Charles Brush, 791 Park Ave., New York 21, N. Y.; subm. for the Inst. of Andean Research by Clifford Evans.

M-1165. San Jeronimo Site, 2.60 to 3.00 m depth **770 ± 75**
A.D. 1180

Taken from road cut directly across from Excavation 1, approximately level with Excavation Level No. 8 (2.60 to 3.00 m). This should date the Early Post-classic period, Galeana phase.

M-1166. San Jeronimo Site, 4.80 to 4.83 m depth **1360 ± 75**
A.D. 590

Taken from side of previously excavated pit at 4.80 to 4.83 m below datum point, from Excavation Level 13. This should date the Classic period, Josefina phase with some of the pottery showing Teotihuacan similarities.

Minguimalo series, Colombia

The Minguimalo site (4° 52' N Lat, 76° 49' W Long), is located in the Chocó Dept., Colombia, along the San Juan River. All samples were taken from strata-cuts where they were associated with pottery and lithic artifacts. Coll. 1960 by Gerardo and Alicia Reichel-Dolmatoff, Inst. Colombiano de Antropol., Apartado Nac. 407, Bogotá, Colombia; subm. for the Inst. of Andean Research by Clifford Evans. Several cuts in this site, located on a silted-up arm of the main river, produced abundant cultural remains which were classified into three successive complexes: Murillo, Martincito, and Minguimalo, the latter being chronologically the latest. The same stratigraphic sequence was observed in other sites in the valley of the San Juan River.

M-1167. Minguimalo Site **710 ± 75**
A.D. 1240

Charcoal taken from Cut I, at 90 cm below surface. Associated with Minguimalo complex materials. This complex which is widespread in the San Juan Valley, has been guess-dated at about the time of the Spanish Conquest or a few centuries earlier.

M-1168. Minguimalo Site**1130 \pm 75
A.D. 820**

Charcoal taken from Cut I, at 1.85 m below the surface. Associated with Murillo complex material. *Comment* (G.R.D.): date corresponds well to stratigraphic observations and to a date (M-1169) obtained at another site, for the Murillo complex.

M-1171. Minguimalo Site**530 \pm 75
A.D. 1420**

Wood taken from Cut I, at 2.60 m below the surface. This and other pieces of house posts belonged to a round structure built probably in proto-historic times. The posts had penetrated the underlying earlier Minguimalo and Martincito materials, and had come to rest in Murillo material. Should date closely to M-1167. *Comment* (G.R.D.): upper parts of the posts lying in Martincito and Minguimalo complex material had rotted away and only the pointed ends which were imbedded in very wet clay containing Murillo complex material, were preserved.

M-1169. Murillo Site**1040 \pm 75
A.D. 910**

Charcoal taken from Murillo Site (4° 41' N Lat, 76° 50' W Long), Chocho Dept., Colombia, along the San Juan River. Sample taken from Cut I, at 70 cm below the surface. Associated with Murillo complex material. *Comment* (G.R.D.): this date pertains to an important phase of the Murillo complex and is consistent with the corresponding date from the Minguimalo Site (M-1168).

M-1170. Catanguero Site, Colombia**2200 \pm 100
250 B.C.**

Charcoal from the Catanguero Site (4° 05' N Lat, 77° 02' W Long), Valle Dept., Colombia, along the lower Calima River. Taken from Cut I, at 1.80 m below the surface. Coll. 1960 by Gerardo and Alicia Reichel-Dolmatoff; subm. for the Inst. of Andean Research by Clifford Evans. *Comment*: at the time this site was investigated no comparable pottery was known and it was thought the complex might be a late intrusion from the upper Calima Valley and the neighboring Cauca Valley. However, recent (1962) research on the southern coast suggests that the Catanguero materials are closely related to early cultural materials from the Mataje River on the Ecuadorean border which, typologically, form part of the so-called Tumaco culture. The Catanguero complex seems to constitute the northernmost evidence for this culture which seems to have penetrated from the coast by following the San Juan River. Catanguero might well be related to the Calima culture of the Western Cordillera which, in turn, seems to be related to the San Agustín culture on the headwaters of the Magdalena River. If this should be the case and if the earlier Tumaco samples should give B.C. dates, the age of the Catanguero date would not be surprising.

M-1172. Chahuite Escondido Site, Costa Rica**920 \pm 75
A.D. 1030**

Charcoal from the Chahuite Site (10° 55' N Lat, 85° 43' W Long), Santa

Elena Peninsula, Costa Rica. Taken from Cut 4, 0.90 to 1.05 m level. Ceramically this is the Late Chombo phase (Zoned Bichrome) or Early Santa Elena phase (Coe, ms.; Baudez, C. and Coe, M. D., 1960). Final classification is now in progress, but Meso-American dates suggest this sample should date from ca. A.D. 1 to ca. A.D. 600. Coll. 1959 by M. D. Coe, Yale Univ., New Haven, Conn.; subm. for the Inst. of Andean Research by Clifford Evans. *Comment* (M.C.): the date would appear too late (recent) for either the Zoned Bichrome or Early Polychrome phases; detailed pottery analyses have since shown that the stratigraphy of the deposit from which the sample taken is complex and there has been much intrusion by Late Polychrome sub-floor burials into the deeper strata. The late date is undoubtedly due to mixed strata, not evident at time of excavation and only proven by pottery type classification.

M-1173. Matapalo Site, Costa Rica **1270 \pm 75**
A.D. 650

Charcoal from the Matapalo Site (10° 22' N Lat, 85° 49' W Long), Tamarindo Bay, Santa Elena Peninsula, Costa Rica. Taken from Cut 1, 0.60 to 0.75 m level. From Matapalo phase (Early Polychrome B period) which has affinities with other Middle American pottery sequences dated at ca. A.D. 500 \pm 100 yr (same ref. as M-1172). Coll. 1959-1960 by M. D. Coe; subm. for the Inst. of Andean Research by Clifford Evans. *Comment*: checks well with previous archaeological estimates (A.D. 500-700) for Matapalo phase and for the Early Polychrome B period. Fits with the date of A.D. 565 \pm 90 on the same phase from another sample dated by Yale Laboratory (Y-811), in Yale VI.

Malambo Site series, Colombia

Charcoal from the Malambo site (10° 50' N Lat, 74° 45' E Long), Atlantico Dept., Colombia. Coll. 1960 by Carlos Angula V., Inst. Colombiano de Antropol.; c/o Apartado 495, Barranquilla, Colombia; subm. for the Inst. of Andean Research by Clifford Evans.

M-1174. Malambo Site, 0.40 to 0.50 depth **1270 \pm 75**
A.D. 650

Taken from Cut 3, 0.40 to 0.50 m level. Associated with materials from the Plato-Zambrano phase, guess-dated at ca. A.D. 1000 to 1400, at least several centuries before the historic Tairona II occupation. *Comment*: reasonably good agreement with date estimated from other evidence.

M-1175. Malambo Site, 0.60 to 0.70 depth **1890 \pm 100**
A.D. 60

Taken from Cut 3, 0.60 to 0.70 m level. Sample associated with Plato-Zambrano phase material, but is stratigraphically below M-1174. Should date slightly older than M-1174 on basis of stratigraphic position and different ceramic complex. *Comment* (C.A.V.): within the estimated range of complex based on other evidence.

M-1176. Malambo Site, 1.00 to 1.10 m depth **3070 \pm 100**
120 B.C.

Taken from Cut 3, 1.00 to 1.10 m level. Represents the Malambo phase,

separated from the overlying Plato-Zambrano phase horizon by a sterile soil layer. Sample associated with Formative-period pottery which shows relationships to Momil and Barrancoid traditions. May date as early as 1000 to 500 B.C. *Comment* (C.A.V.): confirms the estimated range of this Formative period complex.

M-1177. Malambo Site, 80 to 90 cm depth **350 ± 75**
A.D. 1600

Taken from Cut 4, 80 to 90 cm level. Represents the Malambo phase, and should date equal to sample M-1176 due to association with Formative Period pottery that shows relationships to Momil and Barrancoid traditions. *Comment* (C.A.V.): impossible to explain the date; has no relationship to archaeological horizon.

M-1178. Malambo Site, 90 to 1.00 m depth **1385 ± 75**
A.D. 565

Taken from Cut 4, 90 to 1.00 m level. Represents the Malambo phase and should date slightly older than M-1177 and should be equal to M-1176 due to association with Formative period pottery that shows relationships to Momil and Barrancoid traditions. *Comment* (C.A.V.): impossible to explain the date in terms of the results for M-1176. Too recent to be associated with archaeological horizon of the Malambo phase.

M-1283. Pyramid of the Sun, Teotihuacan, Mexico **1870 ± 75**
A.D. 80

Carbonized wood and charcoal obtained by scraping N wall (Bay 89/90) of upper tunnel at head of stairs, near center of Pyramid of Sun (19° 40' N Lat, 98° 50' W Long), Teotihuacan, Mexico. Sample was found in scattered association with sherds of the Teo. I (Tzacualli) phase in midden fill. Coll. 1959 and subm. by R. F. Millon, Univ. of Rochester, New York. *Comment* (R.F.M.): age falling between 1861-2161 yr B.P. was expected. Two runs on a heterogeneous sample from the pyramid hearting (lower tunnel) were discordant: 2434 ± 500 and 1519 ± 200 (C-203, Chicago I). Teo. I associations are reported for an Oztoyahualco date of 1930 ± 80 (Y-644, Yale V). An account of work within the Pyramid is found in Millon and Drewitt (1961).

G. Far East and Pacific

M-564. Kuliouou Shelter Cave (Site 01), **220 ± 75**
Kuliouou, Oahu, Hawaii **A.D. 1730**

Charcoal from Kuliouou shelter cave (21° 17' 20" N Lat, 157° 44' W Long), Kuliouou, Oahu, Hawaii. Sample taken from Square D7, in a cultural deposit 18 to 24 in. below present surface. Other charcoal collected at the bottom of Square D7, at a depth of 24 to 36 in., was dated by Libby as A.D. 1004 ± 180 (C-540, Chicago II). M-564, collected halfway between C-540 and the surface, was submitted in an attempt to substantiate the Chicago date. Coll. 1950, and subm. by K. P. Emory, Bernice P. Bishop Mus., Honolulu. See Emory, Bonk, and Sinoto (1959), and Emory and Sinoto (1961) for discussion relevant to the site. *Comment* (K.P.E.): because *ti*-leaves still retaining

green color were found within this level, the late date is not surprising. However, the closeness to the level of the older date inclines to the acceptance of (A.D. 1184 (A.D. 1004 \pm 180) as probably nearer the true date.

**M-1245. Waiahukini Shelter Cave (Site H8), 600 \pm 100
Kau, Hawaii A.D. 1350**

Charcoal from Waiahukini shelter cave (18° 51' N Lat, 155° 42' W Long), Kau district, Hawaii Co., Hawaii. Sample taken from Square F5, 17 to 21 in. deep, marking the point above which notched two-piece hooks were no longer found. This sample was sent in for a third rechecking of the same charcoal sample. Previous dates were: M-863B, A.D. 1229 \pm 200 (Michigan IV) ; GrN-2901 (unpub. date) less than 300 yr B.P. Coll. 1957, and subm. by K. P. Emory. *Comment* (K.P.E.) : in view of the GrN date on the same sample, the second dating from the same sample by Michigan (M-1245) is reassuring for this very important point in the stratigraphy of Waiahukini shelter, which we have been employing as our control in cross-dating. Here we seem to have a laboratory error by Groningen not only in this date, but in a second, GrN-2149, Groningen IV) giving 110 \pm 40 yr B.P., with a correction of plus 200 yr for Suess effect, or A.D. 1650, for the lowest level in the shelter. Michigan IV (M-666) had given A.D. 957 \pm 200 for the same level.

**M-875. Bungo Cave, Philippines 330 \pm 100
A.D. 1620**

Charcoal from Bungo Cave (ca. 13° 15' N Lat, 121° 51' E Long), Malsing Pulo (Gasper Island), of the Tres Reyes group, SW of Marinduque Island, Philippines. The sample is from the 15 to 30 cm level in the 50 cm porcelain layer. Cultural deposit excavated to a maximum depth of 170 cm below surface. Coll. 1958 and subm. by Prof. E. Arsenio Manuel, Univ. of the Philippines, Quezon City.

**M-1181. Ungch'eon Shell Mounds, Korea 1910 \pm 75
A.D. 40**

Charcoal from the Ungch'eon shell mounds (35° 07' 02" N Lat, 128° 45' 45" E Long), Mt. Jae-mi, Ung-ch'eon-myeon, Ch'ang-weon-gun, Kyeong-sang-nom-do, Korea. Sample taken from Location B, in shell layer 55 to 60 cm beneath the surface soil. Associated with a few iron implements, many bone and horn artifacts, and abundant pottery. Cultural remains seem to suggest that this is an early Korean Iron Age site. A similar site, the Keum-hae shell mound, was excavated in 1919 (Chosen Govt. General, 1922). Coll. 1959 by Choe Yeonghi, Korea Univ., Seoul; subm. by Kim Jeong-hak, Korea Univ.

**M-674. Amaknak-D Site, Aleutians 1710 \pm 75
A.D. 240**

Humus with some charcoal from the Amaknak site (53° 53' 06" N Lat, 166° 33' 36" W Long), Dutch Harbor, Unalaska Bay, Amaknak Isl., Aleutians. From Sec. 3 Shelf; 200 in. below surface datum, immediately above a 4 in. layer of shell and fish bone, the oldest cultural stratum at the site. Other Amaknak dates are published in Michigan IV (p. 193) and Michigan VI (p. 120). Areal cultural sequence is discussed in Bank (1953). Coll. 1951 and

subm. by T. P. Bank II, American Inst. for Exploration, Chicago Teachers College—North, Chicago, Illinois. *Comment* (T.P.B.): although this does not date the earliest human occupancy of the Aleutians, it does provide a date that approximates earliest occupation of the site, and corroborates previous dates (Laughlin, 1951; Spaulding, 1953). Most significantly it tends to disprove part of Laughlin's (1951) and Hrdlicka's (1945) contention that the Aleutians were occupied first by long-heads who were replaced by a broad-headed population less than 1000 yr ago.

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