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UNIVERSITY OF MICHIGAN RADIOCARBON DATES V

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The following is a list of radiocarbon dates obtained since the time of the preparation of Michigan list IV. The method of measurement and treatment of data are the same as those described in the introductions to lists III and IV.

We acknowledge the help of Patricia Dahlstrom for the chemical preparation of the samples, and of James J. Taylor and Alan L. McPherron in the preparation of descriptions. We are indebted to the Michigan Memorial-Phoenix Project for the major part of the financial support of the laboratory.

SAMPLE DESCRIPTIONS

I. GEOLOGICAL SAMPLES

M-834. Grand Traverse Bay, Michigan **7850 ± 350**

Vegetable matter, largely woody and partially decayed, from Grand Traverse Bay (45° 11′ 6″ N Lat, 85° 27′ 54″ W Long), Michigan. Sample is from an accumulation of organic debris at a depth of 80 ft near the mouth of the bay, in what may have been a pond or marsh at a time (late Chippewa stage of the Lake Michigan basin) when levels of the Great Lakes were considerably lower than they are today. Sample should date this period of low level; it is concurrently being analyzed for pollen and other plant fragments. Coll. June 1958 and subm. by P. A. Hyypio, University of Michigan.

M-862A. Tunnel Cave, Missouri **510 ± 200**

Guano from the bat (*Myotis grisescens*), Tunnel Cave (37° 56′ N Lat, 92° 16′ W Long), Pulaski County, Missouri. Sample was taken from bottom 4 in. of a 59-in. pile. Dated to determine time of beginning of deposition of large piles of bat guano in order to learn how long bat populations have been established at any one site, and whether the size of the population has remained constant as indicated by the layers of guano. There are no cultural associations; these caves are damp and were probably never inhabited. Coll. March 1959 and subm. by R. F. Meyers, University of Missouri, Columbia.

M-862B. Old Spanish Cave, Missouri **5770 ± 300**

Guano from the bat (*Myotis grisescens*), Old Spanish Cave (36° 21′ N Lat, 93° 31′ W Long), Stone County, Missouri. Sample was from the bottom 4 in. of a 32-in. pile of guano. See M-862A. Coll. December 1957 and subm. by W. H. Elder, University of Missouri, Columbia.

Muddy Creek series, Colorado

Wood from Muddy Creek (37° 49′ N Lat, 105° 16′ W Long), Huerfano County, Colorado. Samples date a major period of valley alluviation in Huerfano Park. Coll. August 1956 and subm. by D. F. Eschman, University of Michigan. *Comment*: what from field evidence appeared to be two separate bodies of alluvium seem to be closely related in time.

M-825. Muddy Creek, 27 ft **2630 ± 200**

Sample No. 56-1, from N wall of arroyo 27 ft below present surface of pink alluvium which underlies the now-dissected flat-floored valleys.

M-826. Muddy Creek, 8 ft **2110 ± 200**

Sample No. 56-2, from S wall of creek in horizon approximately 8 ft below modern surface.

M-898. Multorpor Mountain, Oregon **1670 ± 200**

Hemlock (Tsuga) wood (id. by E. J. Lodewick) from the base of Multorpor Mountain, N side (45° 18′ 0″ N Lat, 121° 45′ 10″ W Long), Mount Hood, altitude 3800 ft. Sample was from log imbedded in volcanic mudflow sediment beneath < 3 ft of peat. Wood from which sample was taken had been dead for at least 900 yr. Discussed by Lawrence and Lawrence (1959). Coll. July 1958 and subm. by D. B. Lawrence, University of Minnesota, Minneapolis. *Comment*: sample should date the bursting out of the SW wall of the main crater of Mount Hood, which released much water, possibly from a crater lake.

M-899. White River, Oregon **250 ± 150**

Hemlock (Tsuga) wood from E wall of W fork of White River Canyon (45° 19′ 36″ N Lat, 121° 41′ 40″ W Long), S side of Mount Hood, at an altitude of 5200 ft. Sample was from stump, imbedded in till, but in place on former land surface. Coll. July 1958 and subm. by D. B. Lawrence, University of Minnesota, Minneapolis. *Comment*: altitude suggests mountain hemlock. Sample probably dates 17th century advance of White River Glacier, latest event of the "Little Ice Age" (Lawrence and Lawrence, 1959).

M-900. Mount Hood, Oregon **920 ± 150**

Wood (Douglas fir: id. by D. B. Lawrence) from Twin Bridges Forest Camp (45° 19′ 0″ N Lat, 121° 48′ 30″ W Long), on Zigzag River, Mount Hood, altitude 2900 ft. Sample was from erect stump, with bark attached, imbedded in mudflow. Coll. July 1958 and subm. by D. B. Lawrence, University of Minnesota, Minneapolis. *Comment*: dates deposit of glacier outwash from enlarged Zigzag Glacier during a time of glacier advance, an event of the "Little Ice Age (Lawrence and Lawrence, 1959).

Spirit Lake series, Mount St. Helens, Washington

Samples should date period when valley was dammed by volcanic deposits from Mount St. Helens, forming present deep lake. This event preceded other volcanic eruptions, already dated, on N slope of the mountain and is one of the major events in its history. The snag from which M-901 was taken may have been carried to its present position by a landslide some years after the lake was formed. M-902, from the same location, cannot have been emplaced by landslide. Coll. and subm. by D. B. Lawrence, University of Minnesota, Minneapolis.

M-901. Spirit Lake, NE end **200 ± 150**

Wood (Douglas fir: id. by D. B. Lawrence) from a leaning snag standing in place in 96 ft of water, NE end of Spirit Lake (46° 17′ 25″ N Lat, 122° 7′ 0″ W Long).

M-902. Spirit Lake, middle **200 ± 150**

Wood (Tsuga hemlock: id. by D. B. Lawrence) from snag in middle of Spirit Lake (46° 16′ 10″ N Lat, 122° 8′ 45″ W Long), in section which connects two arms of the lake.

II. ARCHAEOLOGICAL SAMPLES

A. Upper Mississippi Valley and Great Lakes

M-741. Fort Wayne Mound, Michigan **800 ± 150**

Charcoal from A-S layer in pit, Section 40-A, Fort Wayne Mound (42° 23′ N Lat, 83° 05′ W Long), Detroit, Michigan. The site is of the Late Woodland burial mound complex; the pit contained pottery of Owascoid type. Coll. 1944-1945 by Carl Holmquist; subm. by E. F. Greenman, University of Michigan.

M-777. Mikado Earthwork Enclosure, Michigan **500 ± 200**

Charcoal from Pine River, Mikado Earthwork Enclosure (44° 38′ N Lat, 83° 33′ W Long), Alcona County, Michigan. Sample is from excavation "A", 10 ft N of NW gate (no. 5), from a lens in the bottom 3 in. of the bank. Coll. August 1957 by H. W. and N. G. Moll; subm. by H. W. Moll, Midland, Michigan. *Comment*: sample is probably remains of fire built by constructors of earthwork. Post molds in bank of the 350-ft-diam. enclosure indicate that structure was palisaded. (See Greenman, 1927; Moll, 1958.)

M-779. Linseman-Walters Earthwork Enclosure, Michigan **600 ± 150**

Charcoal (birch, id. by H. W. Moll) from Linseman-Walters Earthwork Enclosure (44° 15′ N Lat, 84° 18′ W Long), Ogemaw County, Michigan. Sample came from S bank, excavation no. 2, 60 ft E of SW gate, 16 in. below top of bank, and is from the copious remains of logs and brush that were burned and covered with bank earth while hot. Post molds in the bank and arranged in 19 ovals within the 200-ft-diam. enclosure indicate the earthwork to be the remains of a palisaded village site. Coll. September 1957 by H. W. and N. G. Moll; subm. by H. W. Moll, Midland, Michigan, who has published a report on earthwork enclosures (1958).

M-905. Cedar Lake, Michigan **275 ± 150**

Wood (white pine: id. by R. Galbreath) from a dugout canoe dug from muck at edge of Cedar Lake (42° 39′ N Lat, 83° 29′ W Long), Oakland County, Michigan. Because of its blunt ends, thick walls, and absence of marks from steel tools, this canoe was suspected of predating white occupation of area. No cultural associations. A brief account has been published by Galbreath (1959). Coll. 1958 and subm. by R. T. Hatt, Cranbrook Institute of Science, Bloomfield Hills, Michigan.

Andrews Site series, Michigan

Charcoal and bone from the Andrews Site (43° 24′ 10″ N Lat, 84° 2′ W Long), Saginaw County, Michigan. This is a multiple occupation site from Late Archaic to Middle Woodland.

M-941. Andrews Site, charcoal **5300 ± 300**

Charcoal from feature 11 associated with fragmentary skull. Sample belongs to an unassigned component of pre-Nipissing age. No cultural material was recovered from this earlier burial complex. Second component (M-659) had been dug down through the level of these older burials. Coll. 1958 and subm. by M. L. Papworth, University of Michigan.

M-659. Andrews Site, bone **3170 ± 300**

Human bone from burial in fossil beach of Algoma phase of Great Lakes. Sample represents younger component of two burial complexes on this sand ridge, which yielded four birdstones and red ochre burials with a variety of copper and flint implements. Coll. 1956 by R. Pfeuffer, subm. by E. F. Greenman, University of Michigan. *Comment*: Late Archaic horizon similar to Ritchie's Burial Complex at Muskalonge and Red Lake.

Raddatz Rockshelter series, Wisconsin

Charred wood from Raddatz Rockshelter (43° 21′ N Lat, 89° 56′ W Long), Sauk County, Wisconsin. The geology and archaeology of this rock-shelter have been reported by Black (1959) and Wittry (1959a) respectively. Coll. August 1957 and subm. by W. L. Wittry, State Historical Society, Madison, Wisconsin.

M-812. Raddatz Rockshelter, 7.5 ft **11,610 ± 600**

From small fragments of charcoal in stratum "R", surface depth 7.5 ft. This stratum was interpreted geologically as Two Creeks interval from soil composition and stratigraphy by Black. No artifacts were present. Earliest occupation of this rock-shelter judged by Wittry to be between 9000 and 8000 B.C.

M-813. Raddatz Rockshelter, 3.0 ft **5200 ± 400**

From feature 3, a pit originating at depth below surface of 3.0 ft (boundary between Levels 9 and 10). Level is considered Archaic and contained Raddatz sidenotched points. *Comment*: date should be compared with M-784, 1380 ± 200 (Michigan IV), which was associated with similar projectile points at a depth of 1.9 ft.

M-814. Wakanda Park Mound Group, Wisconsin **750 ± 200**

Charred wood from Mound 16, Wakanda Park Mound Group (44° 53′ 45″ N Lat, 91° 55′ 21″ W Long), Dunn County, Wisconsin. Coll. September 1957 and subm. by W. L. Wittry, State Historical Society, Madison, Wisconsin, who has discussed the site (1959b). *Comment*: although only round and oval mounds are present, the group is interpreted as a late Effigy Mound culture manifestation.

M-887. Baumer Site, Illinois **1395 ± 200**

Charcoal and acorns from Baumer Village Site (37° 06′ N Lat, 88° 33′ W Long), Massac County, Illinois. Sample was from material contained in remnant of a storage (?) pit originating 9 to 10 in. below surface. Coll. March 1958 by J. R. Caldwell; subm. by Thorne Deuel, Illinois State Museum, Springfield. *Comment*: cultural material associated with sample and through-

out the 10- x 10-ft test square was typical of the Baumer Focus (Cole, 1951). Date is later than expected.

M-888. Kincaid Site, Illinois **675 ± 150**

Carbonized wood from Burial Mound Pp°2, from the portion known as the Lewis Property of the Kincaid Site (37° 05′ N Lat, 88° 29′ W Long), Pope County, Illinois. Sample was from log tomb associated with the surface of the earliest of three successive mound stages. Although there was little cultural material it is presumed that this mound stage was Mississippian, as were the two later stages (Cole, 1951). Coll. March 1958 by J. R. Caldwell; subm. by Thorne Deuel, Illinois State Museum, Springfield. *Comment*: date is about as expected.

M-893. Eveland Site, Illinois **1020 ± 200**

Charcoal from storage pit (F3), house no. 1, Eveland Site (40° 20′ N Lat, 90° 10′ W Long), Fulton County, Illinois. M-894, charcoal from the same occupation, was combined with sample for this run. Coll. April 1958 by J. R. Caldwell; subm. by Thorne Deuel, Illinois State Museum, Springfield. *Comment*: the associated pottery resembles the Cahokia "Old Village" types. Date is about as expected.

M-890. Linn-Heilig Site, Illinois **950 ± 150**

Carbonized wood and acorn fragments from a large storage pit, Linn-Heilig Site (37° 25′ N Lat, 89° 20′ W Long), Union County, Illinois. Pit contained pottery of Dillinger types only and originated immediately below an 8-in. plow zone containing an overwhelming majority of Middle Mississippian pottery. This is regarded as evidence that Dillinger precedes Middle Mississippian at this site. Coll. March 1958 by J. R. Caldwell, subm. by Thorne Deuel, Illinois State Museum, Springfield. *Comment*: this is the site called Linn's Place in Thomas (1894). Date is about as expected.

M-891. Raymond Site, Illinois **1745 ± 200**

Charcoal from the Raymond Site (37° 45′ N Lat, 89° 10′ W Long), Jackson County, Illinois. Sample was from fire pit containing two Raymond Cordmarked vessels. Fire pit originated at base of 6-in. plow zone and extended 10 in. into undisturbed soil. Coll. April 1958 by J. R. Caldwell; subm. by Thorne Deuel, Illinois State Museum, Springfield. This is the Raymond Site described by Maxwell (1951). *Comment*: the date is considerably earlier than expected for Raymond style, but Maxwell mentioned a Crab Orchard occupation of this site.

M-892. Ferry Site, Illinois **8160 ± 400**

Carbonized acorn fragments from the Ferry Site (37° 35′ N Lat, 88° 10′ W Long), Hardin County, Illinois. Sample was from test trench on S side of site in an extensive area of burned soil below plow zone. Coll. April 1958 by J. R. Caldwell, subm. by Thorne Deuel, Illinois State Museum, Springfield. This is the site described by Fowler (1957). *Comment*: date is considerably earlier than expected. Fowler estimated the complex described by him to be about 2500 B.C. The very few artifacts in this level seemed different from those described by Fowler.

M-619. D. J. Wright Site, Missouri **1240 ± 200**

Charcoal (sample A2) from the D. J. Wright Site (38° 48′ N Lat, 90° 29′ W Long), St. Charles County, Missouri. Sample is from Pit A, associated with sherds of large cord-marked vessels of Canteen and Korondo types and one dentate-stamped sherd; temper was shale and grit. Coll. September 1956 by J. M. Shippee and L. Blake; subm. by J. M. Shippee, University of Missouri, Columbia.

B. Lower Mississippi Valley and Southeast

M-908. Gaines Mound, Kentucky **1975 ± 200**

Charcoal from the Gaines Mound (39° 8′ N Lat, 84° 44′ W Long), Boone County, Kentucky. Sample is from large log on mound base forming part of log tomb at site 26. The cultural material is judged to be late Adena. Coll. 1958 by Ellis Crawford; subm. by J. B. Griffin.

Research Cave series, (23-CY-64), Missouri

Charcoal from Research Cave (38° 44′ N Lat, 91° 45′ W Long), Calloway County, Missouri. Coll. June 1956 and subm. by J. M. Shippee, University of Missouri, Columbia.

M-615. Research Cave, 18 to 24 in. **6720 ± 300**

Sample no. 1397, from square 100R23. From very consolidated fill which appeared to be a midden against the E wall of the cave. An atlatl hook of antler occurred in the fill at depth of 24 in. A Graham Cave lanceolate point with ground and thinned base also came from the fill. A nearly complete lanceolate point without grinding or thinning of the base occurred at depth of 24 in. in same square.

M-616. Research Cave, 24 to 30 in. **6180 ± 300**
5580 ± 250

Sample no. 1409A, same midden as M-615. A drill, reworked from a large lanceolate point, came from this square at depth of 28 in. A point base also occurred in this level. The earlier date is considered by the laboratory to be the more reliable.

M-617. Research Cave, 30 to 36 in. **6500 ± 300**

Samples no. 1424 and 1420, same midden as that from which M-615 and M-616 came. Thinned but nonground base of a lanceolate point occurred here at 35-in. level.

M-618A. Research Cave, 36- to 42-in. level **6280 ± 350**

Sample no. 1496, from hard, light-colored fill. A Dalton (Meserve) point occurred at 37 in. and a lanceolate point at 48 in. depth (Davis, 1953). Davis recovered charcoal from Zone 88 with Meserve points.

Jakie Shelter series, Missouri

Charcoal from the Jakie Shelter (36° 31′ 20″ N Lat, 93° 37′ 35″ W Long), Barry County, Missouri. Coll. 1955-1956 and subm. by C. Chapman, University of Missouri, Columbia.

M-697. Jakie Shelter, level 7 **7070 ±450**

Sample MU-2, from square 95L7, level 7. Lanceolate projectile points

were found in this level, which is separated from those above by what appeared to be a sterile deposit of gravel.

M-698. Jakie Shelter, level 9 **6380 ± 400**

Sample MU-4, from square 95L7, level 9, from a hearth. MU-3 (M-699), charcoal from the same level, was combined with this sample for dating.

M-702. Jakie Shelter, level 5 **870 ± 150**

Sample MU-6, from square 60L5, level 5. *Comment*: although this was relatively deep in the deposit it appears to be associated with the late occupation estimated to date approximately A.D. 1200-1600.

M-703. Jakie Shelter, level 1 **100 ± 150**

Sample MU-8, from square 60L4, level 1, from a fireplace area in which small sidenotched arrowheads were found.

M-916. Banks Site, Arkansas **425 ± 150**

Charred corn cobs (Eastern Complex, id. by V. H. Jones) from the Banks Site of the Gilcrease Foundation excavations (35° 20′ N Lat, 90° 15′ W Long), Crittenden Country, Arkansas. Sample from square 5-D, depth 12 in., which is about halfway down to base of site. Coll. December 1957 by Gregory Perino; subm. by the Thomas Gilcrease Foundation, Tulsa, Oklahoma. *Comment*: site is somewhat earlier than the Walls-Pecan Point complex.

M-917. Cherry Valley Site, Arkansas **1250 ± 150**

Charcoal from a charred post from house beneath Mound 2, Cherry Valley Site (35° 26′ N Lat, 90° 45′ W Long), Cross Country, Arkansas. The site yielded a new culture complex for northeast Arkansas and is important because of the remarkable resemblance of the pottery vessels to those found at Cahokia in Illinois. Cherry Valley may represent a splinter group created by population increase at Cahokia. Coll. November 1958 by Gregory Perino; subm. by Thomas Gilcrease Foundation, Tulsa, Oklahoma.

M-508. Camp Creek Site, Tennessee **1940 ± 200**

Antler from the Camp Creek Site (36° 7′ N Lat, 82° 47′ W Long), Greene County, Tennessee. This is described (Lewis and Kneberg, 1957) as a pure Early Woodland site, with fully flexed burials, fabric- and cord-marked limestone- or quartzite-tempered pottery. Coll. 1956-1957 and subm. by T. M. N. Lewis, University of Tennessee, Knoxville.

M-816. Spiro Site, Oklahoma **1170 ± 150**

Charcoal from the Craig Mound (35° 15′ N Lat, 94° 20′ W Long), N of Spiro, Le Flore County, Oklahoma. Sample from a burned area in the basal section of the mound from the saddle section just S of the central ceremonial chamber (square 13-3, North 4.85′, East 8.1′, elevation .8′). Sample should date Early or Middle Spiro of the Gibson Aspect, as suggested in the Spiro sequence of Orr (1946, 1952). Coll. July 1937 by F. E. Clements; subm. by R. E. Bell, University of Oklahoma, Norman.

M-817. Hughes Site, Oklahoma **1050 ± 150**

Charcoal from Hughes Site (35° 45′ N Lat, 95° 20′ W Long), Muskogee County, Oklahoma. Sample from post in house no. 3. This house is square in

outline, about 20 ft on each side, containing four central roof supports but lacking an interior fireplace and passageway entrance. Site is of the Gibson Aspect, Caddoan area. Coll. 1939 by Lynn Howard; subm. by R. E. Bell, University of Oklahoma, Norman.

M-818. Norman Site (Wa-Nr-1), Oklahoma **1050 ± 150**

Charcoal from Norman Site (35° 50′ N Lat, 95° 18′ W Long), Wagoner County, Oklahoma. Sample from mound unit 1A, second substage below surface in square S13-L6. Site is of Gibson Aspect, Caddoan area, described by Finkelstein (1940). Coll. 1934 by J. J. Finkelstein; subm. by R. E. Bell, University of Oklahoma, Norman.

M-819. Reed Site, Oklahoma **1100 ± 150**

Charcoal from the Reed Site (36° 30′ N Lat, 95° W Long), Delaware County, Oklahoma. Sample from N side of the south house, about 14 in. below the surface. Site is of Gibson Aspect, Caddoan area. Coll. 1937 by J. J. Finkelstein; subm. by R. E. Bell, University of Oklahoma, Norman.

M-820. Lacy Site, Oklahoma **800 ± 150**

Charcoal from Lacy Site (34° 50′ N Lat, 97° 37′ W Long), Garvin County, Oklahoma. Sample from house post of a rectangular house, 25 x 28 ft, with central fireplace, six interior roof-support posts, and short entranceway on eastern wall. Site is a typical component of the Washita River Focus, southern Plains, reported by Oakes (1953). Coll. 1949 by R. E. Bell and K. Schmitt; subm. by R. E. Bell, University of Oklahoma, Norman.

C. Northeastern United States and Canada

M-903. Welcome Mound, West Virginia **2300 ± 200**

Wood from Welcome Mound (39° 45′ N Lat, 80° 50′ W Long), 16 mi S of Moundsville, West Virginia. Sample from central base of mound. Mound contained one burial 10 ft above base with duck effigy pipe at right knee, and two other burials on unprepared floor with no identifiable artifacts. Period is Adena. Coll. November 1957 and subm. by F. M. Setzler, U. S. National Museum, Washington, D. C., whose report on site is to be published in *American Antiquity*.

M-912. Lamoka Lake Site, New York **4410 ± 250**

Charcoal (mostly carbonized bark) from hearth no. 3, test trench 2, at head of Lamoka Lake, on Frank Wood farm (42° 25′ N Lat, 77° 05′ W Long), Schuyler County, New York. Hearth was in depression of 16 in. diam. and 7 in. depth, dug into the subsoil which showed fire-reddened color on walls. Top of hearth lay 18 in. below surface. Coll. August 1958 and subm. by W. A. Ritchie, New York State Museum, Albany, who published a report on the site (1932). *Comment*: this is the type site of the Lamoka culture.

M-657. Raccoon Point Site, New Jersey **1170 ± 200**

White cedar charcoal (id. by C. F. Kier) from the Raccoon Point Site (39° 48′ 7″ N Lat, 75° 22′ 16″ W Long), Gloucester County, New Jersey. Sample from charcoal-filled pit, depth 17 to 26 in., grid LJ7/2, associated with Early Woodland Argillite points, fully-grooved axe, steatite sherds, steatite-

tempered pottery, and a notched net-sinker. Also associated was a kiln-like heap of stones surmounted by a sandstone slab and possibly used for firing pottery vessels. Reported by Kier and Calverley (1957). Coll. and subm. by C. F. Kier, 619 Broadway, Hammonton, New Jersey. *Comment*: this seems an unusually late date for such an artifact assemblage.

Site 18An18 series, Maryland

Charcoal from central pit of Site 18An18 (38° 53′ N Lat, 76° 31′ W Long), Anne Arundel County, Maryland. Site is a cremation ground and reburial pit of a culture with many similarities to Adena and with Ohio pipestone tubular pipes. Coll. 1954 and subm. by T. L. Ford, 1906 Ruxton Road, Ruxton, Maryland. This is the same site as M-419C (Michigan I).

M-416A. Site 18An18, 42 to 51 in. 2310 ± 200

Sample 4A, excavation no. 4, 42 to 51 in. below base line.

M-417A. Site 18An18, 30 to 42 in. 1850 ± 200

Sample 5A, excavation no. 5, 30 to 42 in. below base line.

M-622. Engigstciak Site, Yukon, Canada 1570 ± 200

Twigs from peat layer, Engigstciak Site (69° 22′ N Lat, 139° 39′ W Long), Firth River, Yukon Teritory, Canada. It was thought that sample (no. 43) would date the British Mountain complex; according to MacNeish, however, the peat bed moved into its present position beneath blue sea clays by a soil phenomenon peculiar to the Arctic. Coll. August 1956 and subm. by R. S. MacNeish, National Museum of Canada, Ottawa, who has published on the site (1956, 1959).

D. United States Plains

M-608. Breeden Site, South Dakota 1240 ± 150

Charcoal from the Breeden Site (44° 25′ N Lat, 100° 23′ 33″ W Long), Oahe Dam Area, near Fort Pierre, Stanley County, South Dakota. Sample no. 7; from fill of feature 14, a subfloor cache pit in SW corner of feature 1. Feature 1 is a long-rectangular house of Component C, which has affinities with Monroe Focus. Coll. October 1955 by R. P. Wheeler; subm. by R. L. Stephenson, Missouri Basin Project, Lincoln, Nebraska. Monroe Focus at the nearby Dodd Site has been described by Lehmer (1954).

M-637. Kelso Site, Nebraska 1150 ± 200

Charcoal from the Kelso Site (42° 2′ 59″ N Lat, 100° 54′ 13″ W Long), Hooker County, Nebraska. Sample from feature 2, a hearth which occurred at a depth of 5.6 ft in a single-occupation level buried beneath a sand dune with depths up to 12 ft. Coll. 1949 by A. T. Hill and M. F. Kivett; subm. by M. F. Kivett, Nebraska State Historical Society, Lincoln. Sample dates an unassigned Woodland variant, the pottery of which is commonly found in surface sites in the Sandhills of W Nebraska and E Colorado. Pottery has been tentatively designated "Ash Hollow Cord Roughened" (Kivett, 1952). This type of ware was first described from Lens D in Ash Hollow Cave (Champe, 1946), which had an estimated date of A.D. 1000 to 1150.

M-837. Logan Creek Site, Nebraska **6633 ± 300**

Charcoal from level B (second-lowest lithic level) of the multilevel Logan Creek Site (41° 49′ N Lat, 96° 28′ W Long), Burt County, Nebraska. Sample dates a preceramic complex not previously recorded in Nebraska, which includes fairly large (3 to 5 cm) sidenotched concave base points, of which about half have ground bases and edges; sidenotched plano-convex scrapers; and a large amount of bison bone. The projectile-point type of the Logan Creek and related complexes is similar to that found with Turin Man (Wormington, 1957, p. 246). Coll. 1957 and subm. by M. F. Kivett, Nebraska State Historical Society, Lincoln, who has prepared a mimeographed report on the site (1959).

M-839. Swanson Site, South Dakota **1100 ± 250**

Wood from post C, house no. 2, Swanson Site (43° 54′ N Lat, 99° 20′ W Long), Brule County, South Dakota. Sample dates the long-rectangular house component at this site and provides a date for one of the earliest sedentary village foci in the area. Swanson is an Over Focus site and may represent a late component of that focus (Hurt, 1951, 1959). Coll. and subm. by W. L. Hurt, University of South Dakota, Vermillion.

M-840. Cheyenne Village Site, South Dakota **650 ± 200**

Charcoal from house post (F103) in a long-rectangular house (F34) at Cheyenne Village Site (44° 46′ N Lat, 100° 43′ W Long), Stanley County, South Dakota. Sample should date the oldest component at the site, characterized by long-rectangular houses. Coll. 1951 by W. R. Wedel; subm. by R. L. Stephenson, Smithsonian Institution, Washington, D. C.

M-841. Site 25FT18, Nebraska **1130 ± 200**

Charcoal from several features in occupation zone, Site 25FT18 (40° 24′ N Lat, 100° 14′ W Long), Frontier County, Nebraska. Site showed only one occupation, Plains Woodland, assigned to the Keith Focus. Coll. 1948 by M. F. Kivett, who reported (1949) on sites in the area; subm. by R. L. Stephenson, Smithsonian Institution, Washington, D. C.

M-842. Lynch Site, Nebraska **250 ± 150**

Charcoal from trench S1-4, Lynch Site (42° 50′ 00″ N Lat, 98° 28′ 30″ W Long), Boyd County, Nebraska. A large ceramic sample was obtained from this site. Much of the material is like that reported from the Arzberger Site in South Dakota, but there is a small amount of Oneota pottery at the Lynch Site. Site may represent more than one occupation. Site is discussed by Freed (1954). Coll. 1936 by E. H. Bell; subm. by J. L. Champe, University of Nebraska, Lincoln.

M-843. Dodd Site, South Dakota **800 ± 200**

Wood and charcoal from a wall post in a long-rectangular house (F29), Dodd Site (44° 27′ N Lat, 100° 25′ W Long), Stanley County, South Dakota. Sample dates an Anderson Focus house that is stratigraphically later than a long-rectangular house (F5) of the Monroe Focus and is stratigraphically earlier than a circular house (F1) of the Stanley Focus. Coll. 1950 by D. J.

Lehmer, who has discussed the site (1954); subm. by R. L. Stephenson, Smithsonian Institution, Washington, D. C.

M-844. Site 25FT70, Nebraska **500 ± 200**

Charcoal from a rectangular house (F30) from an unnamed site (40° 24′ N Lat, 100° 14′ W Long), Frontier County, Nebraska. Sample dates an Upper Republican house at an extensively excavated site. Coll. 1948 by M. F. Kivett, who has published on the site (1949); subm. by R. L. Stephenson, Smithsonian Institution, Washington, D. C.

Bean Hollow Site series, Kansas

Charcoal from the Bean Hollow Site (39° 35′ N Lat, 96° 30′ W Long), Marshall County, Kansas. Samples were consolidated from numerous small particles gathered in two levels of a cross trench. Coll. June 1957 and subm. by C. S. Smith, University of Kansas, Lawrence, who is preparing a report on the site.

M-867. Bean Hollow Site, 6 to 12 in. **1470 ± 150**

From 6- to 12-in. level. Sample probably pertains to Woodland occupation; ceramic content of this level is varied, with sherds attributable to Woodland, Central Plains, and Coalescent.

M-868. Bean Hollow Site, 15 to 30 in. **2350 ± 250**

Sample no. 2, from 15- to 30-in. level, associated with stemmed projectile points and long, wide polyhedral flakes. Horizon appears to be assignable to the Archaic, or Intermediate Lithic, period.

M-869. Budenbender Site, Kansas **760 ± 150**

Charcoal (sample no. 3) from post mold in house 1, Budenbender Site (39° 30′ N Lat, 96° 35′ W Long), Potawotamie County, Kansas. House 1 was covered by a thin layer of undisturbed soil below plowed-soil level. Coll. July 1957 and subm. by C. S. Smith, University of Kansas, Lawrence. This site is a Central Plains Phase village, with strong Middle Mississippi influence. In the house was found a jar in the form of a human head, along with shell-tempered black pottery associated with grit-tempered, earth-colored pottery. *Comment*: this date correlates well with those from the Woods and the Coufal sites, also dated by this laboratory (M-113, 780 ± 150, Michigan I; M-835, 820 ± 200, Michigan IV).

E. Western United States

Tularosa Cave series, New Mexico

Wood and plant materials from Tularosa Cave (33° 53′ N Lat, 108° 30′ W Long), Catron County, New Mexico. Samples from square 3R2, described by Martin and others (1950). Coll. August 1950 by P. S. Martin and J. B. Rinaldo; subm. by J. B. Rinaldo, Chicago Natural History Museum.

M-715. Tularosa Cave, level 11 **2080 ± 200**

Wood and plant materials from lowest occupation level (level 11), resting on sandstone bedrock. 7 ft 4 in. below surface of dry midden. This level is pre-pottery, designated Tularosa I for the earlier C^{14} dating (C-584, 2223 ± 200, Chicago II) and is associated with a primitive form of corn.

M-716. Tularosa Cave, level 4 **1810 ± 200**

Corn cobs from level 10, 6 ft 8 in. below surface of dry midden. Level contained materials assigned to the Pine Lawn phase, designated Tularosa II for the earlier C^{14} dating (C-585, av. 2145 ± 160, Chicago II) and was the first pottery-making period of this area.

O Block Cave series, New Mexico

Charcoal from O Block Cave (33° 36′ N Lat, 108° 47′ W Long), Catron County, New Mexico. Samples from square C-2. Site was described by Martin and others (1954). Coll. August 1952 by P. S. Martin and J. B. Rinaldo; subm. by J. B. Rinaldo, Chicago Natural History Museum.

M-717. O Block Cave **2780 ± 200**

Level 7, the lowest occupation level, resting on sterile sand and bedrock. Level represents same preceramic Cochise culture as in Tularosa I (see M-715, above).

M-718. O Block Cave **2600 ± 200**

Level 4, representing Pine Lawn phase, as Tularosa II (see M-716).

Tillamook Village Site series, Oregon

Wood and charcoal from Tillamook Village, Ti-1A (45° 25′ 05″ N Lat, 123° 57′ W Long), Netarts Sand Spit, Tillamook County, Oregon. Subm. by L. S. Cressman, University of Oregon, Eugene. Site is discussed by Newman (1959).

M-805. Tillamook Village Site, house wall **150 ± 150**

Plank from house wall, house pit 12. Sample was wet and pierced by numerous rootlets. Coll. August 1957 by L. S. Cressman, University of Oregon, Eugene. *Comment*: date seems too late but is confirmed by M-806.

M-806. Tillamook Village Site, fire pit **280 ± 150**

Charcoal from sand-lined fire pit in floor fill, house pit 12. Sample was dated as check on M-805. Coll. August 1957 by L. S. Cressman, University of Oregon, Eugene. *Comment*: date is acceptable.

M-904. Tillamook Village Site, occupation debris **550 ± 150**

Charcoal from occupation level below fill of house pit 13 which is later than house pit 12. Level of occupation is below high tide and is bisected by present fresh-water table; this, with other data, suggests a general and recent eustatic sealevel adjustment on the West Coast. Coll. August 1958 by T. M. Newman, University of Oregon, Eugene. *Comment*: sequence of dates appears to span the whole occupation of the site; cultural associations are not clear but probably an early Coast Salish.

M-866. Hollister Site, California **510 ± 150**

Charred wood, basketry, and string from the Hollister Site (38° 18′ N Lat, 121° 28′ 30″ W Long), Sacremento County, California. The sample is from the gravepit-burning of burial 33, found at a depth of 54 in. in the multiphase deposit. The burial offering represents the middle Phase 1 period of the Late Horizon culture (Beardsley, 1948). Coll. 1937 by F. Fenenga and J. B. Lillard; subm. by J. A. Bennyhoff, Yale University, New Haven, Connecticut.

Comment: date for this sample does not agree with other dates obtained for this period (C-689, 1229 ± 200, Chicago V); M-886, 1080 ± 200; M-865, 925 ± 150, this date list). Contamination of the sample during storage was possible.

Hotchkiss Site series, California

Charred wood, acorns, and textiles from the Hotchkiss Site (37° 57′ N Lat, 121° 35′ W Long), Contra Costa County, California. Coll. 1936 by E. N. Johnson (M-865) and 1937 by R. F. Heizer (M-884); subm. by J. A. Bennyhoff, Yale University, New Haven, Connecticut.

M-865. Hotchkiss Site, burial 13-1 **925 ± 150**

Charred wood, acorns, and textiles from gravepit-burning of burial 13-1 (sample UCMA no. 1-39100), depth 54 in. Burial represents beginning of the middle Phase 1 period of the Late Horizon culture and should be somewhat older than another burial from this site previously dated at 1229 ± 200 (C-689, Chicago V).

M-884. Hotchkiss Site, burial 8 **500 ± 150**

Charred wood and seeds from cremation (burial 8; sample UCMA no. 1-39174) found at depth of 20 in. in culturally stratified, multiphase midden deposit. Burial offering represents the late Phase 1 period of the Late Horizon culture. *Comment*: date is consistent with other dates: C-689, 1229 ± 200 (Chicago V); M-648, 620 ± 200 (Michigan III); M-886 (this date list), and the local cultural sequence.

M-886. Glen Cove Site, California **1080 ± 200**

Carbonized wood from the Glen Cove Site (38° 02′ 30″ N Lat, 122° 09′ 30″ W Long), Solano County, California. Sample (UCMA no. 1-21975) is from cremation 12, depth 78 in., and represents the middle Phase 1 period of the Late Horizon culture. *Comment*: date is consistent with other dates and with local cultural sequence. Coll. 1912 by L. L. Loud; subm. by J. A. Bennyhoff, Yale University, New Haven, Connecticut.

F. Mexico

M-774. Santa Isabel Iztapan, Mexico **2640 ± 200**

Mammoth bone from Santa Isabel Iztapan (19° 35′ 5″ N Lat, 98° 56′ 15″ W Long), State of Mexico, Mexico. From Mammoth no. 2, found in lacustrine deposits of the upper Becerra formation in May 1954 by L. Aveleyra, M. Maldonado, and A. Romano; subm. by A. Romano, Instituto Nacional de Antropología e Historia, Mexico City. The mammoth remains were found in direct association with stone implements such as atlatl points or knives of flint. Published by Aveleyra (1955). *Comment*: seems impossibly late. Evidently the bone has been infiltrated by younger carbon.

M-776. San Bartolo Atepehuacan, Mexico **9670 ± 400**

Charcoal from San Bartolo Atepehuacan (19° 29′ 40″ N Lat, 99° 08′ 00″ W Long), Avenida Cien Metros 71, Col. Vallejo, Mexico, D. F., Mexico. Sample from a lacustrine deposit of the upper Becerra formation and found in direct association with mammoth remains and stone implements such

as obsidian and basalt flakes and an obsidian knife. Coll. September 1957 by A. Romano and A. Delgado; subm. by A. Romano, Instituto Nacional de Antropología e Historia, Mexico City.

G. Far East and Pacific

M-13. Krugloi Point, Aleutians **1300 ± 150**

Peatlike charcoal, possibly humified, from a midden at Krugloi Point (52° 30′ 45″ N Lat, 173° 46′ 50″ E Long), Agattu Island, Aleutians. Sample from E section of excavation unit 4, 2 to 3 ft cut E of burial pit fill. Material dates an Aleut village of pre-Russian period. Coll. 1949 and subm. by A. C. Spaulding, National Science Foundation, Washington, D. C.

M-687. Eider Point, Aleutians **740 ± 150**

Humus, burned plants, and wood from Eider Point (53° 57′ 35″ N Lat, 166° 35′ 40″ W Long), a long low spit forming western entrance to Unalaska Bay, Unalaska Island, eastern Aleutians. Sample (orig. no. EP-248) came from 24 in. above datum, i.e. from the bottom black organic layer. Site is one of the deepest in the Unalaska area (30 ft of cultural deposit); it is located only 5 mi from the Amaknak-D site (see M-676, 677, 678, 681, 682; Michigan IV, p. 193), though the cultural aspects of the two mounds are quite different (Bank, 1953a, b). Coll. August 18, 1951 and subm. by T. P. Bank II, Ann Arbor, Michigan.

M-564. Kuliouou Shelter Cave, Oahu, Hawaii **220 ± 150**

Charcoal from square D 7, 18 to 24 in. deep, Kuliouou Shelter Cave (21° 17′ 20″ N Lat, 157° 44′ W Long), Oahu, Hawaii. Sample from layer above the first sample (24 to 36 in.), which was dated by Chicago as A.D. 1004 ± 180 (Chicago I). Coll. 1958 and subm. by K. P. Emory, Bishop Museum, Honolulu.

M-565. Haeleele Bluff Shelter, Kauai, Hawaii **720 ± 200**

Charcoal from Haeleele Bluff Shelter (22° 5′ 30″ N Lat, 159° 44′ 30″ W Long), Kauai, Hawaii, square F 34, 42 to 46 in. deep. Coll. 1958 and subm. by K. P. Emory, Bishop Museum, Honolulu. *Comment*: sample was sent in to serve as a check on the previous Haeleele sample (Sw. E 32, 42 in. deep), dated A.D. 1655 ± 200 (M-477). This date was regarded by the excavator as too recent for its position in the site. By a clerical error, M-477 was reported (Michigan II) as 520 ± 200; however, it should be 300 ± 200.

M-906. Nualolokai Bluff Shelter, Kauai, Hawaii **570 ± 150**

Charcoal from Nualolokai Bluff Shelter (22° 9′ 30″ N Lat, 159° 42′ W Long), Kauai, Hawaii, square G 10, 72 to 88 in. deep. Coll. 1958 and subm. by K. P. Emory, Bishop Museum, Honolulu. *Comment*: this was first sample sent from this site for dating. It comes from the same district as M-565, the Napali Coast of Kauai Island. Date agrees with M-477 and M-565, dating a time when the Island of Kauai was already well populated.

M-920. Holualoa Cave, North Kona, Hawaii **220 ± 150**

Charcoal from Holualoa Cave. Site H 60 (19° 36′ N Lat, 155° 59′ W Long), North Kona, Hawaii. Sample from square D 5, bottom of cultural de-

posit, 38 in. below surface. Coll. July 1958 and subm. by K. P. Emory, Bishop Museum, Honolulu. *Comment*: on cultural grounds this is the oldest site excavated on west Hawaii.

M-720. Rano Raraku, Easter Island $0 \begin{smallmatrix}+200\\-100\end{smallmatrix}$

Charcoal from Rano Raraku (27° 07′ S Lat, 109° 18′ W Long), Easter Island. Sample found in trench through one of the big refuse mounds at the foot of the hill. Horizontal 9 to 10 m, vertical 1.8 m. Mound was believed to consist of stone refuse from the carving of the large stone statues. Coll. 1955 by W. Mulloy, University of Wyoming, Laramie; subm. by him for Thor Heyerdahl. *Comment*: sample contained many roots.

M-870. Ahu Tepeu, Easter Island **330 ± 150**

Human bone, representing parts of nine individuals, unburned, from Grave 2, Ahu # 1, Ahu Tepeu (27° 20′ S Lat, 109° 25′ W Long), Easter Island (Note that coordinates as supplied for M-711 (Michigan IV) appear to be not correct.) Coll. December 19, 1955 by C. S. Smith, University of Kansas, Lawrence; subm. by him for Thor Heyerdahl. *Comment*: sample was associated with totora reeds collected during the Norwegian Expedition to Easter Island (1955), which yielded the unexpected date of 1640 ± 250 yr (M-732, Michigan IV). A sample of contemporary totora reed (M-921) is being run to check the reed date. The new date places Grave 2 in Epoch II and supports the assignment of cyst burial to Epoch II in other ahus.

Natsushima Shell Mound series, Japan

Shell and charcoal from Natsushima site (35° 19′ 7″ N Lat, 139° 38′ 37″ E Long), Natsushima-machi, Yokosuka city, Kanagawa Pref., Japan. Samples are from the second cultural layer or the first shell layer from the bottom of the mound, and are designated Natsushima II. This assemblage is the earliest manifestation of Jomon, the earliest known ceramic culture in Japan. See Sugihara and Serizawa (1957). Coll. June 1955 and subm. by Prof. Sosuke Sugihara, Meiji University, Tokyo.

M-769. Natsushima Shell Mound, shell **9450 ± 400**

Oyster shell.

M-770. Natsushima Shell Mound, charcoal **9240 ± 500**

Charcoal. M-770 was a small sample, and M-771, also charcoal, was combined with it for the measurement.

M-768. Tokyo Bay, Japan $\delta C^{14} = 0 \pm 20‰$

Modern oyster shell from Tokyo Bay, the same species as M-769, subm. by Prof. Susuke Sugihara. The reference standard is modern wood as described in the preface to Michigan IV.

H. Continental Old World

'Abka Rock-drawing series, Sudan

Shell and charcoal from various sites at 'Abka (21° 50′ N Lat, 31° 12′ E Long), Sudan. Samples came from rock-drawing sites in ancient beds of the Nile in the middle of the Second Cataract 20 km S of Wadi Halfa, and are no

longer submerged even at very high flood tides of the Nile. Coll. 1958 and subm. by O. H. Myers, Barclay's Bank, London NW 1, who published on the sites (1958).

M-794. 'Abka Site 32, upper levels **9175 ± 400**

Shell of Nile oyster from upper levels of a site judged by Myers to be Mesolithic, as the flint industry is derived Capsian and there is no pottery.

M-795. 'Abka Site 32, lower levels **9450 ± 400**

Shell of the Nile oyster from lower levels of this site, interpreted by Myers as Mesolithic.

M-798. 'Abka Site 9, level 2 **1355 ± 200**

Charcoal from level 2.

M-799. 'Abka Site 9, level 3 **1300 ± 200**

Charcoal collected throughout the site from level 3.

M-800. 'Abka Site 9, level 3, hearth **1280 ± 200**

Charcoal from one hearth in level 3.

M-801. 'Abka Site 9, level 4, charcoal **4500 ± 350**

Charcoal from level 4.

M-802. 'Abka Site 9, level 4, shell **4470 ± 300**

Ostrich egg shell from level 4.

M-803. 'Abka Site 9, level 5 **5960 ± 400**

Shell of the Nile oyster from level 5.

M-804. 'Abka Site 9, level 6 **8260 ± 400**

Shell of the Nile oyster from level 6. This is the oldest level.

M-793. Nile River $\delta C^{14} = 0 \pm 20‰$

Modern shell from the Second Cataract area of the Nile.

Altamira Cave series, Spain

Shell and charcoal from Altamira Cave (43° 22′ 35″ N Lat, 04° 07′ 03″ W Long), Santillana del Mar, Santander, Spain. Samples are from first layer, Magdalenian III deposits just inside and to the left of the present entrance. Coll. September 1957 and subm. by Sr. D. Joaquín Gonzáles Echegaray, Santander, Spain. See Breuil and Obermaier (1935).

M-828. Altamira Cave, shell **13,900 ± 700**

Snail shells (*Patella vulgata*) and marine shells (*Littorina littorea*), id. by H. van der Schalie, University of Michigan.

M-829. Altamira Cave, charcoal **15,500 ± 700**

Charcoal.

M-830. Juyo Cave, Spain **15,300 ± 700**

Charcoal from Juyo Cave (43° 26′ N Lat, 03° 54′ 50″ W Long), Igollo, Santander, Spain. Level VI, trench 1. Coll. 1955-1956 and subm. by Sr. D. Joaquín Gonzáles Echegaray, Santander, Spain, who published a report on the site (Janssens and Gonzáles, 1958). *Comment*: the accompanying culture is Magdalenian III.

M-856. Persian Door **350 ± 150**

Chips from back of a Persian door submitted by R. J. Gettens, Freed Art Gallery. Door bears inscription with date equivalent to A.D. 1148. It was suspected that specimen might be a forgery. Purchased specimen; no provenience known.

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