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SMITHSONIAN INSTITUTION RADIOCARBON MEASUREMENTS IV*

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INTRODUCTION

Most of these analyses we obtained during 1966 with equipment and techniques previously employed. Methane from the higher numbered samples was produced in a bomb reactor at pressures up to 1000 psi. Also, many smaller samples were counted in a 700-ml vol counter at 2 atm pressure, which has a background of 1.76 ± .02 counts/min.

Unless otherwise noted, all samples were submitted by Smithsonian staff members, each of whom supplied information pertaining to the samples and contributed generously to discussions of results.

SAMPLE DESCRIPTIONS

I. ARCHAEOLOGIC SAMPLES

A. Eastern United States

Shepard site series, Maryland

Charcoal from site No. 18M03 (39° 04′ 42″ N Lat, 77° 26′ 15″ W Long), Montgomery County. Preliminary analysis of pottery and other artifacts by Clifford Evans has tentatively placed site in early part of Late Woodland period. Coll. 1964 and subm. by Douglas Woodward, 4603 Woodfield Road, Bethesda, Md. *Comment:* cultural materials are similar to or slightly older than those at Shepard Barracks site, dated at 1520 ± 70 (SI-44, Smithsonian I).

SI-257. Village midden at 35 to 46 cm depth — **320 ± 240** / **A.D. 1630**

SI-258. Burial pit No. 32 — **1060 ± 280** / **A.D. 890**

SI-259. Burial pit No. 33 — **1630 ± 280** / **A.D. 320**

Lewis Creek mound series, Virginia

Charcoal from burial mound of a characteristic type 3.2 km E of Verona, Augusta County. Coll. 1964 by H. A. MacCord; subm. by Evans.

SI-218. Burial No. 16 — **860 ± 240** / **A.D. 1090**

* Published with the approval of the Secretary of the Smithsonian Institution.

		580 ± 200
SI-219.	**Burial No. 17**	**A.D. 1370**
		5120 ± 160
SI-363.	**Loudoun County, Virginia**	**3170 B.C.**

Charcoal from pre-pottery horizon at Jeffrey-Harris rock shelter (39° 15′ 30″ N Lat, 77° 32′ W Long). Associated with Archaic period projectile points. Coll. 1964 by A. F. Johnson and Janet Curtis; subm. by Evans.

B. Northern Great Plains

Pretty Head site series, South Dakota

Juniper wood samples from site No. 39LM232 (44° 04′ 10″ N Lat, 100° 20′ 20″ W Long), an early fortified village in Big Bend Reservoir, central South Dakota. Site has a cultural complex representing beginning of Grand Detour phase. Phase is distinguished by its houses with wide front and/or rear benches, its fortified villages and its grid-iron village plan. Coll. 1961 by W. W. Caldwell; subm. by R. W. Neuman.

		520 ± 80
SI-165.	**No. 650: from Over Focus complex**	**A.D. 1430**
SI-166.	**No. 1150: from the Grand Detour phase**	**650 ± 140 A.D. 1300**

General Comment (W.W.C.): dates are more recent than others from Grand Detour phase.

Grover Hand site series, South Dakota

Samples from site No. 39DW240 (45° 26′ 20″ N Lat, 100° 20′ 20″ W Long), representing Plains Woodland culture. Coll. 1963 and subm. by Neuman. *Comment* (R.W.N.): previous date from this site was from Mound III, A.D. 230 ± 75 (SI-48, Smithsonian I); thus SI-167 must be intrusive.

SI-167.	**No. 50: charcoal from burial pit fill in Mound I**	**650 ± 200 A.D. 1300**
SI-168.	**No. 51: wood from burial pit fill in Mound II**	**1640 ± 80 A.D. 310**

La Roche site series, South Dakota

Wooden post butts from Chouteau aspect site, 39ST9, in Stanley County (44° 13′ 20″ N Lat, 99° 55′ 30″ W Long). Coll. 1963 by J. J. Hoffman; subm. by Neuman. See Hoffman (1963).

		450 ± 120
SI-169.		**A.D. 1500**

No. 56: Area A, House 1, Post 102, 45.7 cm to 72.7 cm below surface. *Comment:* same provenience as SI-95.

560 ± 150

SI-170. **A.D. 1390**

No. 83: Area E, House 2, Post 11, 30.8 to 58.6 cm below surface. *Comment:* same provenience as SI-105.

General Comment: previously dated samples from site include SI-95, A.D. 1680 ± 50; SI-97, A.D. 1660 ± 60; SI-104, A.D. 1520 ± 60; SI-105, A.D. 1380 ± 55; SI-106 A.D. 1620 ± 55 (Smithsonian II).

SI-309. Stelzer site, South Dakota **Modern**

Sample nos. 1228 and 1229, charcoal from 39DW242, Early Ceramic period site in Dewey County (46° 26′ N Lat, 100° 20′ W Long). From Test Pits 74 and 75, 40 to 46 cm into the midden deposits. Coll. 1965 and subm. by Neuman. *Comment:* apparently sample is a more recent intrusion of charcoal.

1850 ± 90

SI-311. Arpan Mound site, South Dakota **A.D. 100**

Sample No. 2, wood from 39DW252, Early Ceramic period site in Dewey County (45° 25′ 40″ N Lat, 100° 19′ 30″ W Long). From Feat. 1, the burial complex, 45.8 to 97.6 cm below surface. Coll. 1965 and subm. by Neuman.

Sommers site series, South Dakota

Charcoal from site 39ST56 (44° 15′ 30″ N Lat, 99° 56′ 40″ W Long), Stanley County. Site is one of latest Anderson-Monroe sites in central South Dakota and is characterized by Foreman and Anderson ceramics and rectangular houses. Coll. 1964 by R. E. Jensen; subm. by Neuman.

SI-314. No. 924: wall post set in floor of House XU-18 **550 ± 100 A.D. 1400**

SI-315. No. 348: wall post set in floor of House XU-17 **975 ± 185 A.D. 975**

Cattle Oiler site series, South Dakota

Wood and charcoal from site 39ST224 (44° 18′ N Nat, 100° 04′ W Long), Stanley County. This is only site now known in Missouri Basin which contains both Initial and Extended Middle Missouri tradition. Samples should date initial horizon at this site. Associated cultural materials are similar to Anderson component at Dodd site. Coll. 1965 by D. E. Moerman and D. T. Jones; subm. by Neuman. *Comment* (R.W.N.): SI-317 is in close agreement with date of Anderson component at Dodd site, 800 ± 200 B.P. (M-843, Michigan V).

980 ± 130

SI-316. **A.D. 970**

No. 2471: large post at rear wall of Feat. 40, a long, rectangular house.

SI-317. No. 2375: Feat. 90, in subfloor cache pit in Feat. 39, a rectangular house **840 ± 100 A.D. 1110**

SI-318. No. 2351: wall post in Feat. 85, a rectangular house **690 ± 140 A.D. 1260**

SI-181. Huff site, North Dakota **530 ± 100 A.D. 1420**

Wood post from House 8 at site 32MO11 (46° 37′ 05″ N Lat, 100° 38′ 35″ W Long), Morton County. Associated cultural materials are related to Huff focus. Coll. 1960 by W. R. Wood; subm. by W. R. Wedel. *Comment:* analysis agrees with tree ring date of A.D. 1500 (Will and Hecker, 1944), and with others in this suite already reported (SI-178 through SI-183, Smithsonian III).

SI-310. Alkire mound, North Dakota **1650 ± 200 A.D. 300**

Sample A, wood from 32SI200, Early Ceramic period site in Sioux County (45° 58′ 40″ N Lat, 100° 33′ 30″ W Long). From Feat. 2, a burial pit 1.07 m below surface. Coll. 1964 by D. D. Henning; subm. by Neuman.

SI-308. Sorensen site, Montana **7960 ± 150 6010 B.C.**

Sample No. 259, charcoal from earliest cultural level at site 24CB202 (45° 08′ N Lat, 108° 10′ W Long). Feat. 22, a small, oval, basin-shaped firepit, coordinates N-O, E-O, 1.07 m below surface. Projectile points from level are intermediate between Agate Basin-like and Lovell Constricted types, the latter appearing in level immediately above. Coll. 1962 by W. M. Husted; subm. by Neuman. *Comment:* Lovell constricted points occur above sample and are dated at 7800 ± 250 B.P. (I-612) and 7560 ± 250 B.P. (I-689) (Isotopes, Inc., unpub.).

SI-192. Medicine Creek Reservoir site, Nebraska **750 ± 80 A.D. 1200**

Charred wood from 25FT36 (40° 08′ N Lat, 100° 14′ W Long), Frontier County. From Feat. 9, a house floor, Upper Republican aspect. Coll. 1948 by G. S. Metcalf and M. F. Kivett; subm. by Wedel.

Tobias site series, Kansas

Charcoal from 14RC8 (38° 27′ 30″ N Lat, 98° 06′ 07″ W Long), Rice County, a Great Bend aspect site of early white contact communities where four pithouse structures form a "council circle," a unique feature of this cultural complex. Pithouses were burned and probably rebuilt. Upper Rio Grande glaze paint (Glazes C through F; circa A.D. 1450 to 1720) appear at site. Each sample is from one of the pithouses in council circle. See Wedel (1959).

SI-303. **Modern**

Sample e, Sq. 130/W10/NW 1/4 66 to 76 cm below surface. Feat. 65-1 (Basin 3) roof-wall material of pithouse.

SI-304. **Modern**

Sample b, Sq. 130/W20, 1.02 to 1.22 m below surface. Feat. 65-20, pocket cache in floor of pithouse, Basin 3, Feat. 65-1.

SI-305. **170 ± 80**
A.D. 1780

Sample a, 76 to 91.5 cm below surface from Feat. 65-1 (Basin 3), a 17.7 by 3.66 m pithouse. Sample is from various parts of pithouse floor.

SI-306. **Modern**

Sample c, 76 cm below surface, Sq. 90/W 40. Feat. 65-5 (Basin 4), burned pole 7.6 to 15.2 cm above house floor.

SI-307. **Modern**

Sample d, 91.5 cm below surface, Sq. 80/W30; Feat. 65-5 (Basin 4), floor of pithouse.

General Comment: discrepancy of C^{14} ages might be resolved by considering deVries effect. From Table I in Stuiver and Seuss (1966) it is apparent that these Tobias samples may indeed represent 17th century material, yet yield results shown above.

SI-312. McAninch Mound Group, Iowa **1790 ± 300**
A.D. 160

Sample No. 1, charcoal from 13AN10, generalized Woodland site in Appanoose County (40° 52′ 30″ N Lat, 92° 59′ W Long). From Feat. 4, a burial in Mound 2, 49 cm below surface, coordinates N 77.5, E 53.7. Coll. 1965 by L. A. Brown; subm. by Neuman.

SI-313. Hawk Mound Group, Iowa **1230 ± 180**
A.D. 720

Sample No. 1, charcoal from 13AN207, Woodland site in Appanoose County (40° 51′ N Lat, 92° 57′ 30″ W Long). From Feat. 2, a burial in Mound 3, 58 cm below surface, coordinates N 59.5, E 51.1. Cord-roughened pottery and side-notched points were associated with burial. Coll. 1965 by Brown; subm. by Neuman.

C. Georgia

Cool Branch site series

Charcoal from site 9QU5, Quitman County (31° 50′ N Lat, 85° 09′ W Long), a Mississippian mound site with enclosing palisade, presumably of immediate pre-Spanish period. Probably older and younger cultural materials also are present. Coll. 1962 and subm. by H. A. Huscher.

SI-260. **1610 ± 140**
A.D. 340

No. (FN)4081 from palisade trench fill yielding Mississippian shell tempered and grit tempered pottery with luted rims and pots with lobed bodies.

SI-261. **660 ± 280**
A.D. 1290

No. (FN)4179 from grave fill 1.5 m below mound contact, not accompanied by burial offerings.

Gereral Comment (H.A.H.): these two dates should agree; older one cannot be correct.

Gary's Fish Pond site

Charcoal from site 9QU1, Quitman County (31° 52′ N Lat, 85° 07′ W Long), a two-phase mound site (caracol and platform) apparently Middle and Late Middle Mississippian. Latter is just pre-Spanish. Part of site is underlain by Woodland culture. Coll. 1960, 1961 and subm. by Huscher.

SI-262. **1240 ± 120**
A.D. 710

No (FN)326 pit in caracol-type mound containing charred chinquapins.

SI-263. **530 ± 120**
A.D. 1420

No. (FN)3460, a charcoal-ash midden lens in outwash apron of platform mound, above caracol mound, associated with Ft. Walton-Lamar pottery.

General Comment (H.A.H.): unexpected difference in age between these two types of mounds places the caracol-like type, with its Coles Creek-Weeden Island-Moundville Plain type of thickened rim pottery on the Chattahoochee at a time ca. 300 yr earlier than appearance of Browns Mount-Bibb Plain Mississippian occupation at Macon.

SI-264. Walker Street site **2190 ± 140**
240 B.C.

Charcoal sample No. (FN)77A, from site No. 9ME60, Muscogee County (32° 24′ N Lat, 85° 58′ W Long), a terrace-edge site buried under a natural levee. Site yields Late Deptford pottery at depths of 1.37 to 1.83 m below present surface. Sample is from Feat. 13, pit extending from 1.7 to 2.0 m below surface, and is associated with Deptford sherds. Coll. 1963 and subm. by Huscher. *Comment* (H.A.H.): in light of a previous date from this site of A.D. 385 ± 150 (I-1232, Isotopes, Inc., unpub.) two separate time levels are probable. The 240 B.C. date is more in line with expected date for Late Deptford pottery and raises possibility that A.D. 385 sample intruded from above.

D. Western United States

Bottleneck Cave series, Wyoming

Charcoal from site 48BH206 (44° 52′ N Lat, 108° 24′ W Long), cave at entrance to Bighorn Canyon on Bighorn River, north central Wyoming. Coll. 1964 by W. M. Husted; subm. by Neuman. Stratigraphy in cave is as follows: fine, sterile gravels at bottom overlain by eolian sands, then Lower Cultural Level III containing Archaic projectile points. Above are eolian sands, overlain by Lower Cultural Level II, containing small, triangular, stemmed, beveled projectile point, other stone and bone tools, and grinding stones characteristic of Paleo-Indian or Archaic cultures. Next above are eolian sands overlain by Lower Cultural Level I, subdivided into I and IA below, separated by eolian sands. Cultural Level I, representing Archaic complex, contains distinctive projectile point with a stem and with beveled and serrated edges, and contains base of what is probably an Agate Basin point. Level is characterized by large stemmed and beveled points. A greater depth of eolian sands overlie Lower Cultural Level I, which is interrupted by McKean level, with associated McKean points (Early Middle Prehistoric) and firepits characteristic of Bighorn Canyon area. Finally, there are more eolian sands, then Upper Cultural level, of Transitional Late Middle Prehistoric to Late Prehistoric period.

8270 ± 180
6320 B.C.

SI-237.

No. 190 from Feat. 30 deep oval firepit in N0, E10 in Lower Cultural Level III. Projectile points apparently same as those from 24CB202 dated at 7800 ± 250 B.P. (I-612) and 7560 ± 250 (I-689, Isotopes, Inc., unpub.).

8210 ± 200
6260 B.C.

SI-236.

No. 125 from Feat. 32, deep oval firepit in N0, E5, in Lower Cultural Level II.

8160 ± 180
6210 B.C.

SI-240.

No. 276 from Feat. 22, oval, basin-shaped firepit from N5, E5, in Lower Cultural Level I. A point similar to the type found in this level was found at site 24CB221 in Agate Basin complex level, and is dated at 8690 ± 100 B.P. (SI-98) and 8600 ± 100 B.P. (SI-101, Smithsonian II).

8040 ± 220
6090 B.C.

SI-241.

No. 297, from Feat. 26, circular, basin-shaped firepit in N5, E10, in Lower Cultural Level I. See SI-240.

3820 ± 200
1870 B.C.

SI-239.

No. 271, from Feat. 13, shallow, circular, basin-shaped firepit in

N10, E5 and N5, E5, in McKean occupation level. A level in site 24CB202 containing variants of McKean points was dated at 4900 ± 250 B.P. (I-691, Isotopes, Inc., unpub.).

SI-238. **1510 ± 200**
A.D. 440

No. 224, from Feat. 20, very large, deep rock-filled firepit in N10, E0 and N5, E0 in Upper Cultural level. This type of firepit was used over a considerable time span in Bighorn Canyon area, A.D. 150 to A.D. 880 at least. They were considerably earlier to south, 1500 B.C. or earlier.

Snaketown series, Arizona

Samples from Hohokam village site (33° 11′ 12″ N Lat, 111° 55′ 18″ W Long), in Pinal County. Coll. 1964 and subm. by E. W. Haury, Arizona State Mus., Tucson. See Gladwin *et al.* (1937) and Haury (1966).

SI-187. **1130 ± 70**
A.D. 820

Charcoal from 10D Stratigraphic Test 1, Level 6. Cultural association Sweetwater-Snaketown phase transition.

SI-188. **990 ± 70**
A.D. 960

Carbonized corn contained in jar on floor of 9E House 2. Sweetwater phase. *Comment:* sample from same jar was also dated by Arizona at 830 ± 120, A.D. 1120 (A-599, Arizona, unpub.).

SI-189. **1260 ± 70**
A.D. 700

Wood charcoal, architectural from floor 9E House 2. Sweetwater phase.

SI-190. **1200 ± 70**
A.D. 750

Wood charcoal from fill of pit 6, 9E. Pit was cut through floor of 9E House 2 after its destruction, and was, therefore, considerably later. Gila Butte phase.
General Comment (E.W.H.): dates are much later than other lines of evidence indicate.

Mt. Albion site series, Colorado

Charcoal from site in Boulder County (40° 02′ N Lat, 105° 36′ W Long). Site ranges from Early Middle to Late Middle Prehistoric. Coll. 1963 and 1964 by D. F. and B. M. Murray; subm. by J. B. Benedict, Inst. of Arctic and Alpine Research, Nederland, Colorado.

SI-301. **670 ± 150**
A.D. 1280

Pit 4, rock-filled pit 3.35 m diam, 20 cm below surface, representing Late Middle Prehistoric.

SI-302. **1230 ± 360**
A.D. 720

Center of Pit 16, rock-walled barren pit 3 m in diam. Projectile points on surface adjacent to Pit 16 resemble Duncan points. *Comment:* sample appears to date the 900 to 1300 B.P. occupation.

E. Mexico

Chalahuites series, Vera Cruz

Charcoal from a site (19° 26′ N Lat, 96° 23′ W Long), which has stratigraphic cross section through "Pre-Classic" or Formative cultures on coast of Vera Cruz. Detailed ceramic studies are presently underway by J. A. Ford, Florida State Mus. Coll. 1964 by Ford; subm. by K. V. Flannery. Stratigraphic sequence is (youngest to oldest) SI-265, SI-266, SI-267, SI-268, SI-269.

SI-265.	**No. 461: Cut 2, Level 36 350 to 360 cm**	**2110 ± 140 160 B.C.**
SI-266.	**No. 474: Cut 2, Level 49 480 to 490 cm**	**2110 ± 120 160 B.C.**
SI-267.	**No. 555: Cut 2, Level 58 570 to 580 cm**	**2090 ± 100 140 B.C.**
SI-268.	**No. 556: Cut 2. Level 59 580 to 590 cm**	**2090 ± 100 140 B.C.**
SI-259.	**No. 558: Cut 2, Level 61 600 to 610 cm**	**2200 ± 120 250 B.C.**
SI-285.	**No. 332: Cut 1, Level 8 70 to 80 cm**	**1600 ± 150 A.D. 350**
SI-386.	**No. 342: Cut 1, Level 18 170 to 180 cm**	**2020 ± 80 70 B.C.**

Viejon site series, Mexico

Charcoal from deep stratigraphic excavation through Pre-Classic or Formative cultures on Vera Cruz Coast (19° 40′ N Lat, 96° 40′ W Long). Coll. 1963 by Ford; subm. by Flannery.

SI-282. **Cut 10, Level 21, 200 to 210 cm** **2720 ± 800 770 B.C.**

Comment: sample very small.

SI-283. **Cut 10, Level 34, 330 to 340 cm** **12,150 ± 200 10,200 B.C.**

SI-284. **Cut 12, Level 20, 190 to 200 cm** **3680 ± 120 1730 B.C.**

F. Central America

1110 ± 80

SI-281. Bilbao site, Guatemala **A.D. 840**

Charcoal from soil zone representing last phase of ball court complex at Finca Las Ilusiones (14° 20′ N Lat, 91° 01′ W Long), Santa Lucia Cotzumalguapa, Escuintla. Based on ceramic and stone sculpture evidence, this phase is probably Late Classic. Coll. 1963 by S. F. de Borhegyi and Lee Parsons; subm. by Evans and Flannery.

1580 ± 100

SI-278. Monte Libano site, Honduras **A.D. 370**

Charcoal from mound site (13° 10′ 30″ N Lat, 87° 10′ 45″ W Long), in Cholutaca Province. Sample from E:4-9, an oven of 200 cm diam and 80 cm depth, 140 cm below surface. Feature was filled with potsherds representing Early Classic, Phase A of occupation. Coll. 1965 and subm. by Claude Baudez, Musee de l' Homme, Paris, France.

1270 ± 240

SI-280. La Danta site, Honduras **A.D. 680**

Charcoal from a circular hearth (Feat. VW6:12) 60 cm diam, 30 cm deep, 120 cm below surface (13° 10′ 45″ N Lat, 87° 22′ 30″ W Long), in Departmento de Choluteca. Associated pottery related to Middle and Late Polychrome styles of northwestern Costa Rica, and to Plubmate Wares. Coll. 1965 and subm. by Baudez.

G. Colombia

810 ± 180

SI-254. Palma Seca site, Tulipan **A.D. 1140**

Charcoal and soil from site near Palmira (3° 30′ 56″ N Lat, 76° 26′ 08″ W Long), state of Valle. Sample from Trench 4, Level 3, 0.40 to 0.75 m depth, associated with ceramics and stone tools related to Upper Rio Bolo complex of Ford (1944). Coll. 1965 by J. C. Cubillos; subm. by Carlos Lehman, Director, Museo de Historia Natural, Cali, Colombia.

H. Brazil

Tapera series, Santa Catarina

Charcoal from Tapera site (27° 35′ 37″ S Lat, 48° 30′ 03″ W Long), near Florianopolis. Coll. 1964 by P. J. A. Rohr, Colegio Catarinense, Florianopolis; subm. by Evans. Layer A is uppermost, stratigraphically.

550 ± 70

SI-244. **A.D. 1400**

No. 1: Layer A, associated with Guarani pottery. Layer B is shell layer.

1140 ± 180

SI-245. **A.D. 810**

No. 3: Layer C, associated with non-Guarani pottery.

1030 ± 180

SI-246. **A.D. 920**

No. 4: Layer D, just above human burials.

800 ± 70

SI-243. Cajacanga-Mirim, Santa Catarina **A.D. 1150**

Charcoal from level D firehearth associated with human skeletal remains at site near Florianopolis (27° 35′ 37″ S Lat, 48° 30′ 03″ W Long). Coll. 1958 by Rohr; subm. by Evans. *Comment:* cultural materials at site similar to that at Tapera site, Layer D.

I. Ecuador

470 ± 180

SI-299. Nuevo Rocafuerte, Napo-Pastaza **A.D. 1480**

Potsherds tempered with organic matter from site No. N-P-3 (0° 57′ S Lat, 75° 24′ 30″ W Long). Sherds are from 0.50 to 1.00 m depth in oval-shaped trash pit representing early part of Napo phase. Coll. 1956 by Evans and B. J. Meggers; subm. by Evans. *Comment:* should be slightly earlier than A.D. 1100 (see Evans and Meggers, 1962, 1967). Sample must be contaminated with younger organic material.

2000 ± 90

SI-300. Puerto Miranda Hill, Napo-Pastaza **50 B.C.**

Potsherds tempered with organic matter from site N-P-10 (0° 52′ S Lat, 75° 31′ W Long). Sherds are from 0 to 0.3 m depth and represent Yasuni phase. Coll. 1956 by Evans and Meggers; subm. by Evans. *Comment* (C.E.): Yasuni phase pottery resembles Tutishcainyo phase pottery of Eastern Peru, estimated to be prior to 1000 B.C. Result suggests that Peruvian material is more recent than supposed.

1440 ± 70

SI-330. Chacra Alfaro, Napo-Pastaza **A.D. 510**

Potsherds tempered with organic material from 0 to 8 cm depth in test excavation at a Tivacundo phase site (0° 48′ S Lat, 75° 38′ W Long). Coll. 1956 by Evans and Meggers; subm. by Evans. *Comment* (C.E.): date fits estimate based on seriation analysis and Napo phase dates (see Evans and Meggers, 1962, 1967), based on relative chronological position of Tivacundo phase intermediate position between Yasuni and Napo phases.

J. Iran

Yafteh cave series, Luristan

Charcoal from Baradostian (Upper Paleolithic) cave in the Khorramabad Valley (33° 30′ N Lat, 48° 13′ E Long). Coll. 1965 by Frank Hole; subm. by Flannery.

SI-332. No. 201: 200 to 210 cm depth, grid 4e **29,410 ± 1150** **27,460 B.C.**

SI-333. No. 212: 210 to 220 cm depth, grid 6e — **30,860 ± 3000 / 28,910 B.C.**

SI-334. No. 280: 280 cm depth, grid 6d — **31,760 ± 3000 / 29,810 B.C.**

SI-335. No. 285: 285 cm depth, grid 4e — **> 40,000**

SI-336. No. 250: 250 cm depth, grid 4e — **21,000 ± 800 / 19,050 B.C.**

Tepe Sabz series, Khuzistan

Samples from midden area of site in southwest Iran (32° 20′ N Lat, 47° 16′ E Long). Coll. 1963 (SI-255) and 1964 (SI-203 through SI-206) by J. A. Neely; subm. by Flannery. *Comment:* one sample from zone A_3 (Bayat phase) gave 3820 ± 120 B.C. (SI-156, Smithsonian III). See Hole, Flannery and Neely (1965).

SI-203. No. TS-485 — **6170 ± 200 / 4220 B.C.**

Charcoal fragments from stratigraphic zone A_1 (Bayat phase) 125 cm depth, Sq. 1. Associated with Late Ubaid pottery.

SI-204. No. TS-1-125 — **6060 ± 200 / 4110 B.C.**

Charcoal fragments from stratigraphic zone A_2 (Bayat phase) 125 cm depth, Sq. 1. Associated with Late Ubaid pottery.

SI-205. No. TS-9-150-160 — **5700 ± 250 / 3750 B.C.**

Carbonized wood *(Tamarix?)* from stratigraphic zone A_2 (Bayat phase) 150 to 160 cm depth, Sq. 9. Associated with Late Ubaid pottery.

SI-206. No. TS-34-620-630 — **7200 ± 1000 / 5250 B.C.**

Carbonized wood from stratigraphic zone C_1 (Khazineh phase) 620 to 630 cm depth, Sq. 34. Associated with Early Ubaid or Hajji Muhammad pottery. *Comment:* sample very small.

SI-255. No. TS-20-940-960 — **1460 ± 400 / A.D. 490**

Charcoal fragments from stratigraphic zone D, 940 to 960 cm depth, Sq. 20. *Comment:* sample was very small and considering result, probably contaminated.

SI-207. Tepe Ali Kosh, Iran — **7740 ± 600 / 5790 B.C.**

Charcoal from site in SW Iran (32° 20′ N Lat, 47° 16′ E Long), from just above ancient mound surface. From stratigraphic unit B_1, Sq. 89, 280 cm depth, associated with preceramic Late Ali Kosh phase (see Hole and Flannery, 1962). Coll. 1964 by Hole and Flannery; subm. by Flannery. *Comment:* sample was very small.

II. GEOLOGIC SAMPLES

A. Canadian Arctic

SI-393. Tanquary Fiord, Ellesmere Island **4220 ± 100**
2270 B.C.

Preserved hard parts of *Echinoidea* from head of Tanquary Fiord (81° 24′ N Lat, 76° 55′ W Long), from gray marine silt 9 m above sea-level. Silt dips seaward and is truncated at top by 25-m strandline. Coll. 1966 by U. H. O. Embacher; subm. by Geoffrey Hattersley-Smith, Canadian Defence Research Board, Ottawa, and Long. *Comment:* shells were rinsed in acid before analysis to remove possible post-depositional contamination.

SI-296. Antoinette Bay, Ellesmere Island **> 40,000**

Calcilutite from bottom of bay near Lake Tuborg, (80° 53′ 30″ N Lat, 76° 37′ W Long), below 60.4 m of water. Coll. 1965 by Hattersley-Smith; subm. by Long.

SI-297. Lake Tuborg, Ellesmere Island **25,410 ± 400**
23,460 B.C.

Calcilutite from lake bottom (80° 57′ 20″ N Lat, 75° 54′ W Long), below 95.4 m of water. See Hattersley-Smith and Serson (1964). Coll. 1965 by Hattersley-Smith; subm. by Long.

B. Alaska

SI-292. Fairbanks **22,540 ± 900**
20,590 B.C.

Horn sheath from *Bootherium nivicoleus* (id. by C. Frick) from gold-bearing frozen muck (65° N Lat, 148° W Long). Coll. 1935 by Otto Geist; subm. by Clayton Ray. *Comment:* other samples of musk-oxen from similar sites nearby have yielded dates from 12,000 to 28,000 yr B.P.

C. Israel

SI-191. Haifa **35,000**

Oolitic sandstone from top of Calcareous Sandstone II, at Kyriat Elicha (33° N Lat, 35° E Long). According to Slatkine and Rohrlich (1965) Calcareous Sandstone II was deposited by Pleistocene, probably Late Monastirian sea at + 5m. Coll. 1964 by A. Slatkine; subm. by Long. *Comment:* sample pulverized and rinsed in acid before analysis.

III. GEOCHEMICAL SAMPLE

SI-388. Patricks Air Force Base, Florida **1160 ± 120**
A.D. 790

Mercenaria campechiensis Gmelin (id. by J. P. E. Morrison, Div. of Mollusks) sample M-1 from apparent kitchen midden (28° 16′ N Lat,

80° 36′ W Long), 60 cm above sealevel. Coll. 1964 by Ed Hare; subm. by Long. *Comment:* analysis confirms estimated age of 1000 yr based on Hare's study of isoleucine-alloisoleucine ratios in modern and ancient marine shells. See Hare (1966). $\delta C^{14} = -135 \pm 14$.

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Charcoal. Date would pertain to later Wilton occupation of shelter (37°31′ N Lat, 2° 56′ E Long). Coll. and subm. G. Cole, Uganda Mus., P.O. Box 365, Kampala, Uganda. *Comment:* see Wayland and Burkitt (1932) and Posnansky and Cole (1963).

1935 ± 110

SR-91. Nsongezi, Uganda **A.D. 15**

Charcoal from 230 cm depth; date could give estimate of more recent phase of gully erosion as sample is from surface of clay filling of channel cul. Fill could be result of adjacent gully erosion at higher levels (0° 58′ S Lat, 30° 45′ E Long) (O'Brien, 1939). Coll. and subm. by G. Cole.

B. West Africa

3270 ± 100

SR-81. Ntereso, Ghana **1320 B.C.**