[RADIOCARBON, VOL. 18, No. 1, 1976, P. 1-15]

Radiocarbon

1976

UNIVERSITY OF ALASKA RADIOCARBON DATES I

WILLIAM S REEBURGH and M SPRINGER YOUNG

Institute of Marine Science, University of Alaska,
Fairbanks, Alaska 99701

INTRODUCTION

The radiocarbon dating laboratory in the Institute of Marine Science at the University of Alaska was established in the fall of 1968 and became operational a year later. Most of the samples examined have been from Alaska and consist largely of wood and peat.

The procedure currently used is based on liquid scintillation counting of benzene (Noakes *et al*, 1965). Samples are examined for obvious contamination and are cleaned with hot .05 N NaOH and .1 N HCl. Depending on the material, the cleaned samples are either combusted or dissolved in acid to produce CO_2. The CO_2 is reacted with molten lithium to form lithium carbide. The cooled lithium carbide is reacted with distilled water to form acetylene, which is cleaned and placed on a vanadium-alumina catalyst to form benzene. Yields approach 90%.

Following dilution to constant volume with spectrochemical grade benzene, the samples are counted in modified 5cc vials in a Picker Liquimat 220 liquid scintillation counter. The background is 4cpm and counting efficiency is 63%. Ages are calculated using a ^{14}C half-life of 5568 years, using 95% of the activity of NBS oxalic acid as the contemporary standard, and using petroleum-derived benzene for background determinations. The results are not corrected for ^{13}C fractionation. Ages are quoted with a 1σ counting error, which includes variations in the sample, background, and contemporary standard counts. Samples whose count rate is less than four times the background standard deviation are reported as greater than the age calculated using four times the background standard deviation as the sample activity.

We have begun compiling a computer index of Alaska, Yukon Territory, and British Columbia radiocarbon dates. This index can be searched using a number of input parameters, such as age ranges, locations, and floral, faunal, or cultural associations. We welcome inquiries about the index and will appreciate assistance in keeping it current.

ACKNOWLEDGMENTS

J E Noakes and J P Cook supplied previously dated samples for use as interlaboratory check samples. I Frohne assisted with programming and computing, and F H Wilson and T D Hamilton compiled the computer index. Descriptive material about the samples was supplied by the submitters. Financial support by the State of Alaska is gratefully acknowledged. Institute of Marine Science contribution number 253.

SAMPLE DESCRIPTIONS

I. INTERLABORATORY CHECK SAMPLES

AU no.	AU date	Sample	Reported date	Reference
AU-1	>31,000	ORINS-20	>34,000	R, 1967, v 9, p 309-315
AU-2	4119 ± 137	UGa-75	3540 ± 65	R, 1974, v 16, p 131-141
AU-3	1004 ± 165	UGa-70	900 ± 50	*op cit*, AU-2
AU-4	979 ± 104	UGa-72	310 ± 50	*op cit*, above
AU-5	24,656 ± 1371	UGa-16	27,670 ± 1010	R, 1971, v 13, p 468-474
AU-6	10,434 ± 279	SI-739	10,040 ± 210	R, 1973, v 15, p 388-424
		GX-2175	8465 ± 360	Péwé, 1975
AU-7	9640 ± 373	SI-737	10,150 ± 210	R, 1973, v 15, p 388-424
		GX-2174	9895 ± 210	Péwé, 1975
AU-8	9401 ± 528	SI-738	8210 ± 155	R, 1973, v 15, p 388-424
		GX-2159	6645 ± 280	Péwé, 1975

II. GEOLOGIC SAMPLES

The following series of samples were coll 1969 to 1974 and subm by T D Hamilton, Geol Dept, Univ Alaska.

Ballaine Lake, Fairbanks, Alaska series

Sphagnum and sedge peat from trenches in a peat bog .97km E of Ballaine Lake (64° 52.4′ N, 147° 48′ W).

AU-11. Birch log — **5995 ± 305** / **4045 BC**

Sec A, from paleosol at 175cm depth.

AU-12. Birch log — **5370 ± 135** / **3420 BC**

Sec A, from paleosol at 175cm depth. Duplicate to sample AU-11.

AU-13. Silty peat — **1065 ± 135** / **AD 885**

Sec A, from paleosol at 30cm depth.

AU-14. Peat — **2705 ± 260** / **755 BC**

Sec A, from partly stripped surface peat.

AU-15. Peat — **6275 ± 485** / **4325 BC**

Sec A, from paleosol at 130cm depth.

AU-16. *Sphagnum* peat — **2180 ± 55** / **230 BC**

Sec 1, .6m deep in trough above ice wedge.

AU-17. Sedge peat **890 ± 175** **AD 1060**

Sec 1, .5m deep in trough above ice wedge.

AU-19. Woody peat **3325 ± 195** **1375 BC**

Sec 2, 2m deep peripheral to ice wedge.

AU-20. Woody peat **3430 ± 175** **1480 BC**

Sec 2, 1.1m deep peripheral to ice wedge.

AU-22. Woody peat **2640 ± 90** **690 BC**

Sec 2, .6m deep peripheral to ice wedge.

AU-23. Woody peat **4295 ± 405** **2345 BC**

Sec 2, .8m deep peripheral to ice wedge.

AU-24. Sedge peat **3285 ± 585** **1335 BC**

Sec 2, .6m deep in trough above ice wedge.

AU-25. Sedge peat **1380 ± 155** **AD 570**

Sec 2, .5m deep in trough above ice wedge.

AU-26. Sedge peat **445 ± 150** **AD 1505**

Sec 2, .3m deep in trough above ice wedge.

AU-27. Sedge peat **300 ± 145** **AD 1650**

Sec 2, .3m deep in trough above ice wedge.

General Comment: dates Holocene peat succession assoc with growth and thaw of ice wedges.

Alatna Valley, Brooks Range, Alaska

Pleistocene bluff exposure, E bank of Alatna R 24.1km below river head (67° 43′ N, 154° 56′ W). From fluvial sand and gravel of river bluff well below depth of modern weathering and soil formation (Hamilton, 1974a). Coll 1968; subm 1972.

AU-45. Alatna River **>29,000**

Sandy peat and humic sands, 20.7m above river level overlying diamicton of Late Wisconsin or Early Holocene age.

AU-46. Alatna River **>28,000**

Detrital wood, 12.2m above river level, underlying AU-45.

AU-47. Alatna River **>31,000**

Large piece of detrital wood, 9.1m above river level, underlying AU-46.

https://doi.org/10.1017/S0033822200002332 Published online by Cambridge University Press

General Comment: AU-46 and -47 postdate major valley-cutting by glacier ice but antedate final episode of glaciation here. AU-45 date is either an error or reflects redeposition of older organic material following last glaciation of region.

Ambler Valley, Brooks Range, Alaska

Detrital wood and peat from Fernald's Exposure 6 (Fernald, 1964), S bank of Ambler R, 12.9km upvalley from the Redstone R confluence (67° 08′ N, 157° 22′ W) (Hamilton, 1974a). Coll 1968; subm 1972.

AU-37. Ambler River **>30,000**

Detrital wood from well drained gravel alluvium beneath Late Wisconsin outwash; 14.33m above river level.

AU-38. Ambler River **>29,000**

Detrital wood from well drained gravel alluvium beneath Late Wisconsin outwash, 2.44m above river level.

AU-39. Ambler River **10,220 ± 490**
8270 BC

Silty peat and detrital wood from base of postglacial deposits, .3m above base of capping unit.

AU-40. Ambler River

Wood and peat from base of postglacial deposit, base of .91m capping unit.

AU-40B. Peat **8255 ± 1045**
6305 BC

AU-40C. Peat **7475 ± 705**
5525 BC

Comment: AU-40 was divided into 3 secs at request of T D H. Two are presented here.

General Comment: this series brackets Late Wisconsin glaciation in Ambler Valley, and provides limiting dates for Early Wisconsin glaciation and postglacial stream incision.

Redstone River, Brooks Range, Alaska

Detrital wood and peat from the W bank of Redstone R. Found in bluffs of fluvial sand and gravel well below depth of modern weathering and soil formation (Hamilton, 1974a). Coll 1968; subm 1972.

AU-41. Redstone River **5510 ± 435**
3560 BC

Exposure 5. Detrital wood, 10.5km N of mouth of Redstone R (67° 14′ N, 157° 38′ W), 2.13m below surface of postglacial alluvial succession, 4.87m above river level.

AU-42. Redstone River **6610 ± 350**
4660 BC

Exposure 5. Detrital wood, 2.44m below surface of postglacial alluvial succession, 4.57m above river level.

AU-43. Redstone River **>29,000**

Exposure 9. Detrital wood, 6.4km N of the mouth of Redstone R (67° 12′ N, 157° 34′ W), below Late Wisconsin advance outwash and till, 4.27m above river level.

AU-44. Redstone River **>31,000**

Exposure 17. Detrital peat and wood, 3.2km N of the mouth of Redstone R (67° 10′ N, 157° 34′ W), below Late Wisconsin outwash, 6.71 to 7.01m above river level.

General Comment: samples provide limiting dates for termination and beginning of Late Wisconsin glaciation in the Redstone Valley.

Killik Valley, Brooks Range, Alaska

Peat and detrital wood from late glacial and postglacial sediments, fluvial, aeolian, and lacustrine sand in river bluff exposures, well below depth of modern weathering zone and soil profiles (Hamilton, 1974a). Coll 1968; subm 1972.

AU-48. Killik River **1970 ± 175**
20 BC

Exposure 11. Detrital wood, W bank of Killik R, 4km below Easter Creek confluence (68° 09′ N, 154° 10′ W), near exposed base of postglacial fluvial succession, 1.4m above river level.

AU-50. Killik River **2410 ± 190**
460 BC

Exposure 16. Sedge peat, W bank of Killik R, 4.8km below Easter Creek confluence (68° 09′ N, 154° 08′ W), near base of postglacial aeolian-lacustrine succession, .6m above river level.

AU-52. Killik River **1740 ± 120**
AD 210

Exposure 20, E end. Rooted willow stump in growth position from N bank of Killik R, immediately S of Lake Udrivik (68° 30′ N, 154° 01′ W). From 6.1m above river level within aeolian sand, overlying pond and bog sediments.

AU-53. Killik River **8505 ± 215**
6555 BC

Exposure 20, central. Detrital wood from within pond and bog unit beneath aeolian sand, 2.4m above river level.

General Comment: samples provide limiting dates on Late Wisconsin glacial recession from Killik Valley. They date postglacial lake formation and destruction, aeolian episodes, and stream incision to modern level.

https://doi.org/10.1017/S0033822200002332 Published online by Cambridge University Press

Sagavanirktok Valley, Brooks Range, Alaska

Detrital wood, mostly willow and some dwarf birch assoc with Late Wisconsin glacial readvances. Found within exposures of stratified alluvial sediments of stream terraces. Coll and subm 1972.

AU-69. Sagavanirktok River **11,760 ± 200** **9810 BC**

Exposure 1, Unit 6. Wood from W bank of Sagavanirktok R 12.1km upstream from Atigun R confluence (68° 24′ N, 148° 58′ W). Lies near base of postglacial alluvial succession.

AU-70. Sagavanirktok River **11,890 ± 200** **9940 BC**

Exposure 2, Unit 2. Wood from N bank of the river, 4km above Atigun R confluence (68° 28′ N, 149° 01′ W), 3.05m below top of Unit 2 within an alluvial succession confined behind a moraine of Late Wisconsin readvance.

AU-71. Sagavanirktok River **12,170 ± 270** **10,220 BC**

Exposure 4, Unit 3. Peat and small twigs, W bank of river, .5km above Accomplishment Creek (68° 41′ N, 148° 55′ W), within basal .61m of Unit 3, composed of bedded fluvial sand beneath outwash of Late Wisconsin readvance.

AU-72. Sagavanirktok River **12,780 ± 440** **10,830 BC**

Exposure 5. Unsorted muck clots and pebbles, S bank of Ribdon R, 4km upvalley from its confluence with Sagavanirktok R (68° 46′ N, 148° 45′ W). From top of outwash gravel overlying glacial-lacustrine sediments. Postdates major Late Wisconsin readvance in this area, antedates stream incision to present level.

General Comment: series defines a major glacial readvance ca 12,000 yr ago in Sagavanirktok Valley.

Olson Basin Sheet Solifluction, Alaska

Buried peat at AS-84, Sta 892, left 22.86m from center line of Trans Alaska Pipeline in Olson Basin (66° 25′ N, 150° 35′ W) (Hamilton, 1974b). Coll and subm 1974.

AU-110. Olson Basin **1530 ± 200** **AD 420**

Peat, largely old root mat, paleosol overridden by solifluction.

AU-111. Olson Basin **615 ± 150** **AD 1335**

Bryophytic peat, largely *sphagnum*, paleosol at front of solifluction feature.

General Comment: indicates interval during which this slope has remained virtually stable.

AU-94. Nenana Valley, Alaska **9055 ± 160**
7105 BC

Peat from a road cut in new hwy grade at S approach to Nenana R crossing, .3km SW of McKinley Village (63° 39.5′ N, 148° 50′ W). Sample is from 2m below a dozer-scarred surface, at base of peat fill within a kettle-like depression on the surface of the Carlo outwash train. Coll and subm 1973.

General Comment: sample postdates Carlo readvance in the Nenana Valley (Wahrhaftig, 1958).

Kvichak Peninsula series, Alaska

Coll by D M Hopkins and Chindi Hopkins, USGS, Menlo Park, California June 1972 and subm Feb 1973 by D M Hopkins. Pollen analyses by R E Giterman, Geol Inst Acad Sci USSR, Moscow (written commun, July 1974).

AU-79. Detrital peat **12,420 ± 400**
10,470 BC

Shore bluffs near Lake Point, E coast Kvichak Peninsula, Naknek C-6 Quad (58° 14.7′ N, 157° 48′ W). Peaty zone covered by aeolian sand and loess 5m thick and underlain by fluvial gravel and then by glaciomarine dimicton. *Comment*: sample dates beginning of dune formation on Kvichak Peninsula. Pollen spectrum indicates herbaceous tundra vegetation.

AU-80. Detrital peat **>31,000**

Shore bluffs near Lake Point, W shore Kvichak Bay, Naknek C-6 Quad (58° 41.3′ N, 157° 13.5′ W). From zone of detrital peat overlain by dimicton and gravel ca 3m thick and then by aeolian sand 4.5m thick and underlain by glaciomarine dimicton >6m thick. *Comment*: date is minimum for glaciomarine dimicton exposed in many places along shores of Kvichak Peninsula. This seems to correspond to Halfmoon Bay Glaciation of Muller (1952). Pollen in peat horizon suggests herbaceous tundra vegetation with widespread sedge marshes, id by R E Giterman.

Shore bluffs, S end Kvichak Peninsula .6km S of Etolin Point, Nushagak C-1 Quad (58° 38.6′ N, 157° 17.5′ W). This series consists of peat intercalated with loess. Lower in bluffs is fluvial sand (probably outwash) ca 4m thick underlain by dimicton (probably glaciomarine) at least 3m thick.

AU-81. Humified peat, depth .5m **7600 ± 100**
5650 BC

AU-82. Sedge peat, depth 1.5m **12,760 ± 300**
10,810 BC

AU-83. Humified peat, depth 3.5m **>33,000**

AU-84. Humified peat, depth 4m **>33,000**

Comment: AU-83 and -84 establish minimum age of dimicton evidently representing Halfmoon Bay Glaciation of Muller (1952). AU-83 and -84 represent a widespread horizon of peaty silt. AU-83 contains pollen suggestive of herbaceous tundra with significant quantities of *Artemesia*. AU-84 is similar but contains a small quantity of dwarf-birch pollen. AU-82 was coll from a higher widespread peat horizon underlain by thick loess and overlain by thin loess; age and pollen spectra suggest correlation with detrital peat buried by dune sand from which AU-79 was coll. AU-81 was coll at base of surficial peat; its age is minimum for end of loess deposition. Pollen spectrum includes some spruce, dwarf birch, and abundant alder indicating shrub-tundra vegetation with forest nearby.

Shore bluffs along W coast Kvichak Peninsula N of Etolin Point, Nushagak C-1 Quad (58° 38.6′ N, 157° 17.5′ W). Samples were coll from peaty beds intercalated with loess as at site yielding AU-81 to -84, but -87 is underlain by an additional 1m loess and then by dimicton which is probably glaciomarine.

AU-86. Fibrous peat, depth 1m **6330 ± 150**
4380 BC

AU-87. Fibrous peat, depth 5m **>29,000**

Comment: series confirms that the glaciomarine dimicton of the Kvichak Peninsula (Halfmoon Bay Glaciation of Muller, 1952) is of Early Wisconsin age. The pollen spectrum assoc with AU-87 is similar to the pollen spectrum with AU-82. The peat layer represented by AU-86 is overlain by a thin loess layer and was assumed in the field to be correlated with AU-81. However, the pollen spectrum is similar to pollen from AU-81 and radiocarbon dating confirms that the peat is of Early Holocene age.

AU-88. Peaty silt **>30,000**

Shore bluffs at Etolin Point, Kvichak Peninsula, Nushagak C-1 Quad (58° 38.5′ N, 158° 13′ W). Sample coll from lenses of peaty silt that probably represent ice-wedge pseudomorphs. Covered by 2m aeolian sand and loess and incised into dimicton; probably is glaciomarine. *Comment*: date is minimum for dimicton.

AU-89. Peat **>30,000**

Shore bluffs at S coast Kvichak Peninsula, Nushagak C-1 Quad (58° 37.2′ N, 157° 13.5′ W). Sample coll in basal beds of a 12m sec stratified peaty silt consisting mostly of pond deposits. Underlain by glaciomarine dimicton >10m thick. *Comment*: date is minimum for dimicton (Mak Hill Glaciation of Muller, 1952).

Baldwin Peninsula Mammoth site, Alaska

AU-90. Twigs and peaty debris **26,900 +2400 −3400** **24,900 BC**

Coastal bluffs on W coast of Baldwin Peninsula, Kotzebue C-1 Quad (66° 36.9′ N, 162° 8′ W). Coll July 1971 by D M Hopkins and O M Petrov. Subm Jan 1973 by D M Hopkins. Sample coll in thaw-lake deposits probably of Wisconsin age underlain by glacial drift of Nome River (Illinoian) Glaciation. Regional geology is described by McCulloch *et al* (1965) and McCulloch (1967). *Comment*: sample dates a mammoth skeleton buried at same horizon in pond sediment. Pollen indicates shrub tundra rich in dwarf birch but lacking alder or spruce and thus suggests deposition during an interstadial interval. Id by R E Giterman (written commun, July 1974).

Seward Peninsula, Alaska

AU-109. Twigs **5170 ± 265** **3220 BC**

Coastal bluffs on shore of Port Clarence ca .6km SW of Teller Village, Teller B-3 Quad (65° 15′ 05″ N, 166° 23′ 25″ W). Coll July 1973 by D M Hopkins and R E Nelson, and subm Oct 1973 by D M Hopkins.

Sample consists of twigs in thickened peat sec filling ice-wedge pseudomorph covered by ca 4m colluvial peaty silt. Pseudomorph is intruded into underlying beach sediments (aeolian sand and pebbly sand of beach facies) of Pelukian or Sangamon age. *Comment*: ice-wedge interpreted in the field as recording an early Wisconsinan interstadial warming. Radiocarbon determination indicates, however, that the ice-wedge pseudomorph formed during early Holocene time.

AU-112. Bulk peat **19,900 ± 800** **17,900 BC**

Bluff at W-most tip of thaw-lake which lies ca 1.2km SE of Whitefish Lake, Kotzebue B-6 Quad (66° 21′ 35″ N, 164° 42′ 30″ W). Coll and subm June 1973 by D M Hopkins.

Sample consists of organic duff (twigs, fossil grass stems) at top of soil developed in loess. The soil and duff were buried by an ashfall from eruption of South Devil Mountain Lake maar (unpub studies by D M Hopkins) and is now represented by basaltic tephra ca 2m thick. Tephra layer is covered by 2.5m loess and aeolian sand and then by a few cm ash from eruption of North Devil Mountain Lake and finally by ca 1m aeolian sand and modern turf. *Comment*: sample was coll to establish more precise dating for eruption of South Devil Mountain Lake. Previous unpub dating in other secs showed that South Devil Mountain Lake erupted between 14,500 and 10,400 yr ago.

7070 ± 145

AU-113. Wood **5120 BC**

Cut-bank in outlet stream of North Killeak Lake ca .4km SE of lake shore, Kotzebue B-5 Quad (66° 16′ 21″ N, 164° 01′ 25″ W). Coll and subm July 1973 by D M Hopkins.

Sample consists of large stems of *Salix, Betula,* and *Alnus* chiseled from frozen gravel at base of oldest and highest beach ridge of North Killeak Lake. Id by Virginia Page, Stanford Univ, and R C Koeppen, Forest Products Lab. *Comment*: lack of loess on beach ridges indicated that they are much younger than the maar crater occupied by North Killeak Lake, which Hopkins' unpub studies indicate as forming during or before early Wisconsin time. Lake level declined and underwent tilting during deposition of a sequence of ice-push ridges that form beach-like terraces around the margins of the lake basin. Ice-push ridges probably developed following deposition of large amounts of tephra from North Devil Mountain Lake early in Holocene time. Sample date is maximum for tilting of basin of Killeak Lake, minimum for eruption of North Devil Mountain Lake maar. Sample also helps date colonization of Seward Peninsula by alder, since *Alnus* pollen and wood are lacking in deposits as young as 8200 yr old according to unpub wood identifications by Virginia Page, and unpub palynologic determinations by C E Schweger, Univ Alberta.

AU-28. Alaska Pipeline Roadway **>30,000**

Wood, Trans Alaska Pipeline Roadway, ca 3.2km S of Hess Creek bridge, in cut sec through permafrost (65° 39′ N, 149° 0′ W), sample from depth 2.44m in ice-rich, perennially frozen organic silt. Coll and subm 1970 by D C Esch, Alaska Dept Hwys, to determine age of material and rate of deposition. *Comment*: slope is 10° to 15° to NE, the active layer is ca .61m thick.

AU-36. Kenai River, Alaska **>30,000**

Organic portion (mostly wood with silt and mineral matter) of wash sample from unlogged strata, Kenai R, B-43032, PTL-3 (60° 31′ N, 151° 13′ W), depth 30.79 to 32m. Coll and subm 1971 by G E Utermohle, Jr, Alaska Dept Hwys, State Materials Lab, College, Alaska to determine age of deposition to evaluate foundation characteristics of strata.

1760 ± 280

AU-58. Conception Bay, Newfoundland **AD 191**

Shell (*Yoldia limatula*) id by R M Slatt, Conception Bay (47° 36.1′ N, 53° 6.1′ W), core, Con 46, 15.24cm depth. Coll and subm 1972 by R M Slatt, Dept Geol, Memorial Univ, Newfoundland. *Comment*: small sample size gave difficulty during synthesis.

4120 ± 190

AU-91. Simpson Lagoon, Alaska **2170 BC**

Tundra, Simpson Lagoon, 300m SE of small spit marking W boundary of channel between Egg and Long Island (70° 26.42′ N, 148°

47.1′ W), from near shore, shallow arctic lagoon ca 2m below Lagoon floor. *Comment*: should date post-Wisconsin inundation of land surface.

3465 ± 290
AU-92. Beaufort Sea, Alaska **1515 BC**

Shell material (*Portlandia arctica, Portlandia intermedia, Astarte borealis, Astarte montagui "typica", Comphina fluctuosa, Cyrtodaria* sp, *Macoma bathica, Cyclichna occulta, Solariella* sp), Beaufort Sea (70° 33.72′ N, 149° 27.3′ W) from base of Holocene offshore sediments. Id by R Rowland, USGS. *Comment*: should date post-Wisconsin transgression, or depth of modern re-working. AU-91 and -92 were coll and subm 1972 by E Reimitz, USGS, Menlo Park, California.

7670 ± 190
AU-64. Johnson River, Alaska **5720 BC**

Detrital peat from bottom of core raised from Johnson River Bog, .12km NW of Johnson River Bridge, on SW side of Alaska Hwy, Tanana Valley, Alaska (63° 42′ 40″ N, 144° 39′ W). Core site is near center of bog, adjacent to a small open water pond. The bog is in a depression on Donnelly (Wisconsin) glacial drift. Radiocarbon date is minimum for recession of Donnelly-age ice. Dated core interval: 291 to 310cm. Peat is probably underlain by loess-capped Donnelly till.

10,910 ± 510
AU-93. Birch Lake, Alaska **8960 BC**

Sediment core of silty lacustrine mud from Birch Lake, Tanana Valley, Alaska (64° 19′ N, 146° 40′ W). Low organic content of sediments accounts for large counting error. Sample was selected to approximate date of arrival of spruce in the middle Tanana Valley, based upon pollen analysis of the core. Sample interval from core was 244 to 270cm (Birch Lake Core I). Pollen diagram and interpretation in Ager (1975). *Comment*: AU-64 and -93 were coll and subm 1973 by Thomas Ager, Inst Polar Studies, Ohio State Univ, Columbus, Ohio.

The following samples, AU-59-114, were coll 1972-1974 and subm by J H Anderson, Inst Arctic Biol, Univ Alaska, Fairbanks, and M M Miller, Foundation for Glacier and Environmental Research, Dept Geol, Michigan State Univ, East Lansing.

AU-59. Boulder Creek, Atlin region, British Columbia **>31,000**

Indurated peat; lower Boulder Creek, .6km S of Boulder Creek bridge, N shore of Surprise Lake, NE of Atlin (59° 38′ N, 133° 24′ W); from peat .10 to .20m thick at base of compacted glacial till on W bank of Boulder Creek, near floor of valley, beneath second till sequence from surface. *Comment*: an important site in determining glacial chronology of Atlin Valley area.

AU-77A. Cathedral Glacier, Atlin region, British Columbia **3470 ± 90** **1522 BC**

Silty peat; lower foreland of Cathedral Glacier, ca .6km below terminus at alt 1463m on Cathedral Mt, near S end of Torres Channel, Atlin Lake (59° 21′ N, 134° 04′ W); site between 2 recessional glacial moraines, each probably Early Holocene, near present outwash stream; from lower part of peaty layer resting on material of high silt, sand, and gravel and low organic matter content, 20 to 25cm below surface. *Comment*: possibly subject to infrequent flooding and silt deposition, represents organic development during thermal maximum interval.

General Comment: sample will help date geobotanic evolution of Atlin area; no other dates from this site, which is especially interesting from the standpoint of glacial stratigraphy, vegetation, and accessibility.

1195 ± 150
AU-100. Mendenhall Glacier Terminus, Alaska **AD 753**

Fossil wood; 8.1km NE of Juneau airport (58° 25′ N, 134° 38′ W); buried in 1968 moraine ca 9m from 1973 ice front, NW side of glacier front. *Comment*: overridden forest floor material, covered by Neoglacial ice advance and subsequently uncovered by downwastage and retreat of ice ca 1968 to 1970. Sample id as *Tsuga* sp, possible *T heterophylla*, presently abundant here. Id by R B Miller, Center for Wood Anatomy Research, USDA, Madison, Wisconsin.

General Comment: extended interpretations into recently uncovered part of the Mendenhall Glacier Valley.

3090 ± 170
AU-107. Palsa Bogs, Atlin region, British Columbia **1140 BC**

Icy peat in palsa in high lat cold bog in upper Fourth of July Creek Valley ca 40.2km NE of Atlin (59° 50′ N, 133° 20′ W). Organic deposition uplift in palsa (hydrolaccalith) formation. *Comment*: basal twigs from palsas in upper palsa zone at alt ca 1036m were dated at 8050 ± 530 yr BP, GX2694 and 9315 ± 540 yr BP, GX2695 (Miller and Anderson, 1974, p 211, 217).

General Comment: to extend dating of start of palsa development into lower, W part of upper Fourth of July Valley.

7810 ± 120
AU-108. Gastineau Channel, Alaska **5860 BC**

Fossil wood near Glacier Hwy opposite Lemon Creek Valley, E side of channel (50° 20′ N, 134° 30′ W), from base of hwy excavation in solid peat and forest litter horizon, at sea level, slightly above, ± .6m but not above periodic high tide zone, in epeirogenic uplift (coastal rebound) area.

General Comment: useful in establishing Holocene geobotanic chronology in Juneau area.

AU-114. McKee Creek, Atlin region, British Columbia >36,000

Wood fragments, Vesnaver Mine, lower McKee Creek, Atlin region, NW British Columbia (59° 28′ N, 133° 34′ W), from bedrock-till interface in mine tunnel.

General Comment: will help date onset of Wisconsin glaciation, and it might corroborate a date from a similar stratigraphic position elsewhere in region (see AU-59).

Hidden Lake, Alaska

Cores taken from lake ca 51.5km E-SE of Delta Junction, ca 3.2km E of S end of Healy Lake, Mt Hayes D-2 Quad. Coll 1970 and subm 1971 by J H Anderson, Inst Arctic Biol, Univ Alaska, Fairbanks.

4870 ± 220
AU-32. Hidden Lake, South, P-511 2920 BC

Silt with minor admixture of fine-grained organic particles; from S end of Hidden Lake (63° 5.6′ N, 144° 39.5′ W); 44 to 49cm in core, extrapolated to 57.5 to 64cm depth below sediment surface assuming linear compaction rate.

4530 ± 95
AU-33. Hidden Lake, Middle, P-545 2580 BC

Muck; in middle of Hidden Lake (63° 56.9′ N, 144° 39.5′ W); 28 to 33cm in core, extrapolated to 48.4 to 57cm depth below sediment surface assuming linear compaction rate.

3020 ± 155
AU-34. Hidden Lake, North, P-570 1070 BC

Silt with minor admixture of fine-grained organic particles; at N end near shore of Hidden Lake (63° 57.4′ N, 144° 39.5′ W): 41.5 to 46.5cm in core, extrapolated to 47.6 to 53cm depth below sediment surface assuming linear compaction rate.

General Comment: to help develop an absolute chronology of geobotanic events as determined by palynology (Anderson, 1975).

El Dorado Creek Tributary, Alaska

El Dorado Creek Tributary (65° 03′ N, 147° 31′ W). Coll and subm 1973 by K Sieh, Woodward-Lundgren and Assoc, Oakland, California.

5130 ± 215
AU-101. Muck 3 3680 BC

Solid wood, twigs, 4.57 to 2.13m, ca 10 to 15cm above loess/muck.

880 ± 155
AU-102. Muck 4 AD 1071

Peaty stratified mulch, 4.88 to 1.37m; 6cm above muck.

395 ± 150
AU-104. Muck 6 **AD 1555**

Fibrous mat of leaves (willow and/or birch and aspen), from continuous grassy horizon 2.54 to 10cm thick from vertical exposed banks; 18 ± 1.52m above Muck 3 and 4.

475 ± 165
AU-105. Muck 7 **AD 1475**

Stalk of shrub-sized woody plant in growth position, in grass deposit above first muck deposit, 19.51 ± 1.07m.

1294 ± 136
AU-106. Muck 8 **AD 656**

Pieces of wood, twigs.

III. ARCHAEOLOGIC SAMPLES

A. Alaska

Old Fish Camp (Delaguna, 1947, p 61-64) 35.4km upstream from mouth of Khotohl R (64° 12′ 38″ N, 158° 30′ 42″ W). Coll and subm 1972 by J Dixon, Dept Anthropol, Brown Univ, Providence, Rhode Island.

485 ± 95
AU-66. Old Fish Camp, 72-70-189 **AD 1463**

Ash and bone, House #1, hearth, 10cm deep into hearth, (ca 50cm) N6, W4 quad. *Comment*: assoc with stone and bones, bird and small animal, fish vertebrae, and shell.

65 ± 115
AU-68. Old Fish Camp, 72-70-173 **AD 1884**

Charcoal, House #1 ("house cut") N6, W6 quad. *Comment*: believed to be refuse dumped into old house pit, should date younger than house proper, precontact, Athabascan, earliest occupation unknown.

General Comment: both radiocarbon dates, AU-66 and -68, are consistent with known historic accounts of archaeologic site (Old Fish Camp) from which samples came. Historically site was abandoned during the mid-1800's, well within error of AU-68, which should date to approx this period. AU-66 was recovered stratigraphically below AU-68 and consequently must date a period of occupation prior to AU-68. Dates of both samples are therefore consistent with archaeologic and historic data.

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