TABLE S1. BASIC DATA FOR LOCALITIES AND WOOD SAMPLES OF DAWSON CUT FOREST BED (DCFB) NEAR FAIRBANKS, ALASKA

Sample No.	Location	Date	Specimen	Description	No. of Tree Rings	Age	Identified	Discussion and Stratigraphy	Comments
None	Engineer Creek	1937	Logs and stumps	Stratum of peat with cracked logs and stumps, little rot; locally impregnated with “sulfur” and rotted. Evidence of forest fire.			Spruce J.L. Giddings	Bed of logs and stumps lying on top Fox Gravel at base of 30-m thick silt section.	Data from J.L. Giddings (1938, p.3) and oral commun. 11/4/50).
None	Eva Creek	6/28/49	Log and spruce cone	10-cm diam. spruce log; spruce cone 3-cm long on tree layer with peat.			Spruce, TLP White spruce cone. W.S. Beninghoff USGS	Black silt termed lower muck & under green Gold Hill Loess	Clear-ice seams, lenses & masses of various shapes in forest bed.
None	Engineer Creek; north wall adjacent to Dawson Cut	8/9/49		Burnt vegetation including peat.		About 2 Ma		Base of Gold Hill Loess with gravel layer associated with EC tephra 5-cm thick. Stratigraphically close to PA tephra (2.02 Ma). EC tephra is enclosed in burnt peat layers of DCFB.	EC tephra (UA 351) type locality.
None	Cripple Sump	8/19/49 8/29/49	None	Black Silt		About 2 Ma	TLP	Black silt on Fox Gravel 2 m below Mining Camp tephra exposed on east side of cut 1 m above Fox Gravel.	Mining Camp tephra (UA352). PA tephra (UA335) (2.02 Ma). PA tephra first collected here.
None	Eva Creek East wall, lower end	9/8/49	Spruce stumps	Spruce stumps up to 25 cm diam. in place. Rooted in black silt & gravel.			Spruce, TLP	17 m below surface in Dawson Cut Forest Bed at base of Gold Hill Loess & overlying Fox Gravel. Logs also occur in top of gravel	

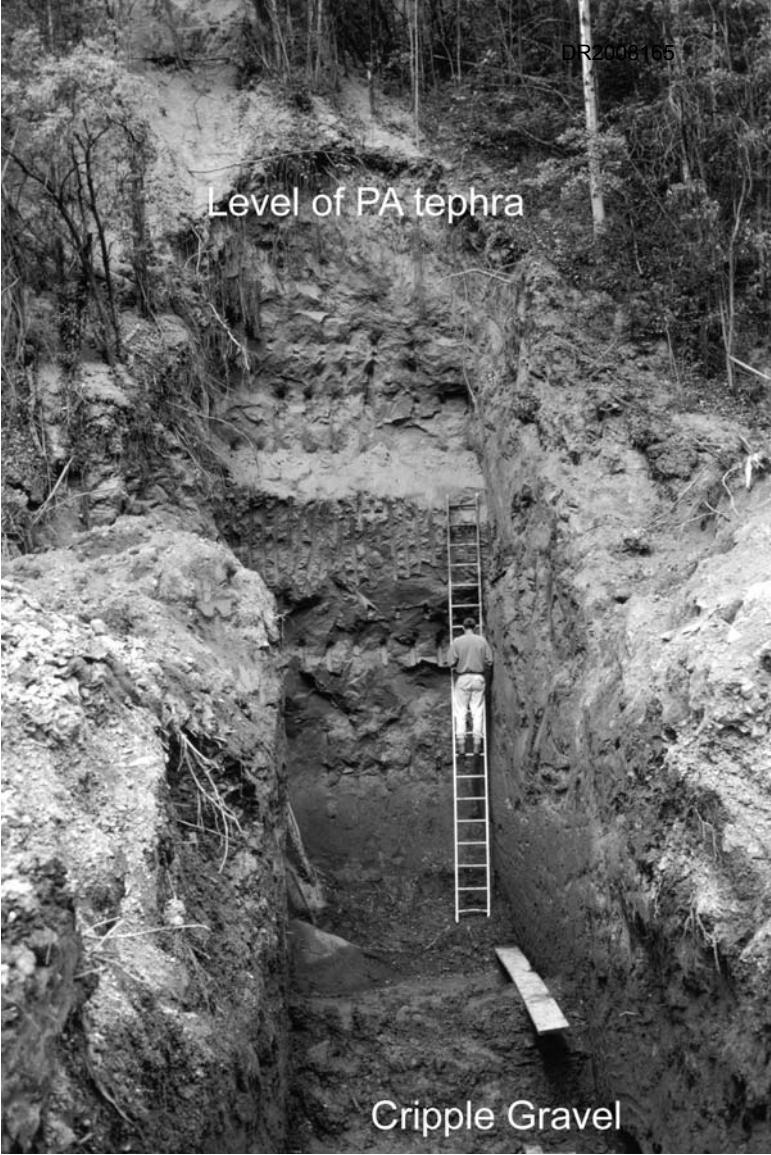
None	Eva Creek East wall, lower end	9/13/49	Spruce stumps	Spruce stumps up to 25 cm diam. in place. Rooted in black silt & gravel.			White spruce W. Drury USGS	17 m below surface in thin Dawson Cut Forest Bed at base of Gold Hill Loess overlying Fox Gravel	Drury, botanist, in field with Péwé
15	Engineer Creek; north wall adjacent to Dawson Cut	9/17/49	Spruce stumps	"Healthy" spruce stumps in place and wood "pieces".		About 2 Ma	White spruce W. Drury USGS	Stumps and logs underneath green Gold Hill Loess rooted & lying on angular Fox Gravel. Slightly above forest lies type specimen of Mining Camp tephra 5 cm thick.	Mining Camp tephra (UA360); occurs stratigraphically very close to PA tephra (UA355) (2.02 Ma) at Cripple Sump, and to EC tephra at Dawson Cut.
16	Eva Creek east wall Lower end	9/18/49	In situ stumps and prostrate logs	Several large (up to 22 cm diam.) upright white spruce rooted stumps with some bark. Burnt wood debris. Adjacent to stumps were horizontal logs 12cm diam; wood is "soft" smashed, & flattened. Interleaved angular gravel penetrates wood. Moss present.		Radio-carbon-date: U of Mich.-18,000 yrs. U of Chicago >20,000 yrs. Lamont (L 137X) >28,000 yrs.	White spruce-W. Drury USGS	Stumps and logs underneath green Gold Hill Loess rooted & lying on angular Fox Gravel tightly cemented by iron oxide. Dawson Cut Forest Bed approx. 1 m thick.	A thin coating of iron oxide stain and mica flakes cover the large stump. Near tree stump is type specimen of Weigh Scale tephra (UA361). Sample 16 no longer available. See Fig. 6, Péwé, 1975b. See Fig. 41, Péwé, 1975a.
None	Engineer Creek; adjacent to Dawson Cut	6/9/51		Several prostrate logs 35 cm dia & 2 ½ m long. Evidence of forest fire			Spruce TLP	Forest bed on Fox Gravel. Lies at base of 46 m thick section of loess	
69	Sheep Creek west wall	7/6/55	log	Prostrate log	45-47		Spruce TLP	In iron-stained and cemented sub-angular clasts; Fox Gravel	

97A	Sheep Creek	9/20/55	Flattened wood	Prostrate, iron-stained, flattened burnt wood, root.	32	Spruce- R.C. Koeppen, USDA (9/28/67)	Iron-stained flattened wood at top of Fox Gravel tightly cemented by iron oxide.	
97B	Sheep Creek	9/20/55	Stem	5 cm dim. stem burned. Extemely narrow rings	200+	Black spruce TLP; PMB	Wood at top of Fox Gravel	
101	Sheep Creek East-facing wall center of linear cut	6/13/56	Wood & organic silt.	Wood and organic silt at underlying gravel contact.	60-70	Spruce. R.C.Koeppen, USDA (9/28/67)	Flattened wood near top of Fox Gravel	Dawson Cut Forest Bed has clear ice seams. No foliated ice.
102	Sheep Creek East-facing wall center of linear cut	6/13/56	Spruce fragments	Vertical, burnt spruce fragments. Burnt clump (3 cm diam.) of peat.	27-29	Spruce TLP	Fragments in possible ice wedge cast.	
103	Sheep Creek west wall	8/9/56	Spruce logs spruce	Iron-stained logs 10 cm diam in gravel.	22	Spruce TLP	Smashed forest on Fox Gravel. Joints in black silt & overlying green Gold Hill Loess are heavily cemented with iron oxide.	Mining exposure cliff of frozen sediments 35m high.
None	Sheep Creek Bend in dredge section	8/14/56	Spruce logs	Horizontal wood & logs 10 cm diam. of spruce; cracked, iron-stained.		Spruce TLP	At base of green Gold Hill Loess is a 1 m thick forest bed with cobbles; knocked flat in torrential deposit, overturned stumps.	
None	Sheep Creek NW wall above bend in dredge section.	8/14/56	Logs	Prostrate Logs			Black, 1-to2-m thick silty forest bed of horizontal logs over-lying iron-stained cemented Fox Gravel.	
None	Sheep Creek east wall; down-stream from bend in section	8/14/56	Horizontal logs.	Prostrate spruce logs up to 2 ½ m long		Spruce forest TLP	Forest bed up to 1 m thick; black organic silt crops out at base along a 500 m-long	Joints in the silty forest bed & over-lying green Gold Hill Loess are

							mining cut under Gold Hill Loess & on top of & in upper meter of underlying iron-cemented Fox Gravel. Lens 1 m thick of organic rich silt in gravel.	heavily iron-stained.
None	Sheep Creek lower end	5/31/57	Spruce logs & cones	Badly weathered prostrate logs 10 to 35 cm diam. in tightly cemented iron-stained gravel.		Spruce TLP	Black silty layer with forest bed of spruce logs at & on top of Fox Gravel underlying Gold Hill Loess	
None	Sheep Creek lower end	7/2/57	Horizontal logs	White spruce & birch up to 25 cm-diam. Also, black spruce & cottonwood (Populus). Some specimens twisted & gnarled similar to tree line specimens. Some slightly to badly charred by fire. Wood shows evidence of bark beetles (Scolytidae) (Dr. Lutz)		Black & white spruce, cottonwood birch. Lutz (Yale)	Wood of Dawson Cut Forest Bed incorporated into top of iron-stained strongly cemented Fox Gravel; iron-stained joints 2 mm thick in forest bed & Gold Hill Loess. Ball of mammoth femur & part of pelvis of bison associated with wood in top of gravel.	Lutz, botanist at Yale, in field with Péwé.
139	Sheep Creek upper end	6/2/60	Peat & sticks (pollen sample)	Compressed sticks 5 to 15 cm diameter		Deciduous (?) AZLTRR	Wood and peat at top of iron-cemented Fox Gravel underlying 28 m of loess & reworked loess.	Exposed at top of bank of dredged pond.
180	Eva Creek upper end	7/2/67	Small sticks	Sticks 40 cm long and organic matter. Fragments of bark.	11	Spruce TLP	Dawson Cut Forest Bed specimens in reddish cemented Fox Gravel under 30 m of overlying loess formations.	Complete section sampled for geochemical analysis of silts. See Fig. 6. Péwé, 1975b See Fig. 29. Péwé, 1975a

None	Eva Creek upper end	7/8/70	Small logs & sticks	Logs & sticks		Spruce TLP	Dawson Cut Forest Bed on Fox Gravel	Complete section sampled for geochemical analysi of silts. See Fig. 6. Péwé, 1975b See Fig. 29. Péwé, 1975a
185A	Eva Creek upper end west wall	6/27/87	Flattened log	Flattened spruce log 18 cm dia and ¾ m long (part remains in frozen iron-cemented gravel). Canary-yellow stained and "rotten".	188	Spruce. US Forest Products Lab Dept. of Agriculture 3/7/88 AZLTRR Spruce, TLP	Prostrate logs, stumps, & sticks pointing downstream in silt lenses at top of iron-cemented angular Fox Gravel. Under Gold Hill Loess.	
190	Eva Creek upper end west wall	6/15/88	Somewhat flattened log	Log 1.3 m long & 20 cm diameter with no bark.		Spruce TLP	Prostrate log, in reddish iron-cemented top of Fox Gravel. Part of Dawson Cut Forest Bed. Part of skull & left horn of Bison priscus & other vertebrates from this horizon.	Bison identified by R.D. Guthrie (oral commun: June 1988)
191	Eva Creek upper end west wall	6/13/89	Spruce log	Spruce log with bright yellow staining. Log 21 cm diam. at base of tree near roots. Large 25-50 cm root system. Log 1 1/2m long. Prostrate & broken over to point downstream. Adjacent log burned and with bark.	152	Spruce, TLP AZLTRR Tree 152 yrs. old†	Prostrate log in 1/2m thick silt lenses 2 m below top of iron-cemented reddish FoxGravel. Log battered.	Entire specimen donated to Univ. of Alaska Fairbanks Museum, June 1989

Footnotes AZLTRR University of Arizona Laboratory of Tree Ring Research, Tucson, AZ 85721
† Peter Brown determined number of tree rings
UA351, etc. are laboratory numbers of J.A. Westgate
All wood & tephra samples in this table collected by T.L. Péwé.


DRZ2008165
Level of PA tephra
Cripple Gravel

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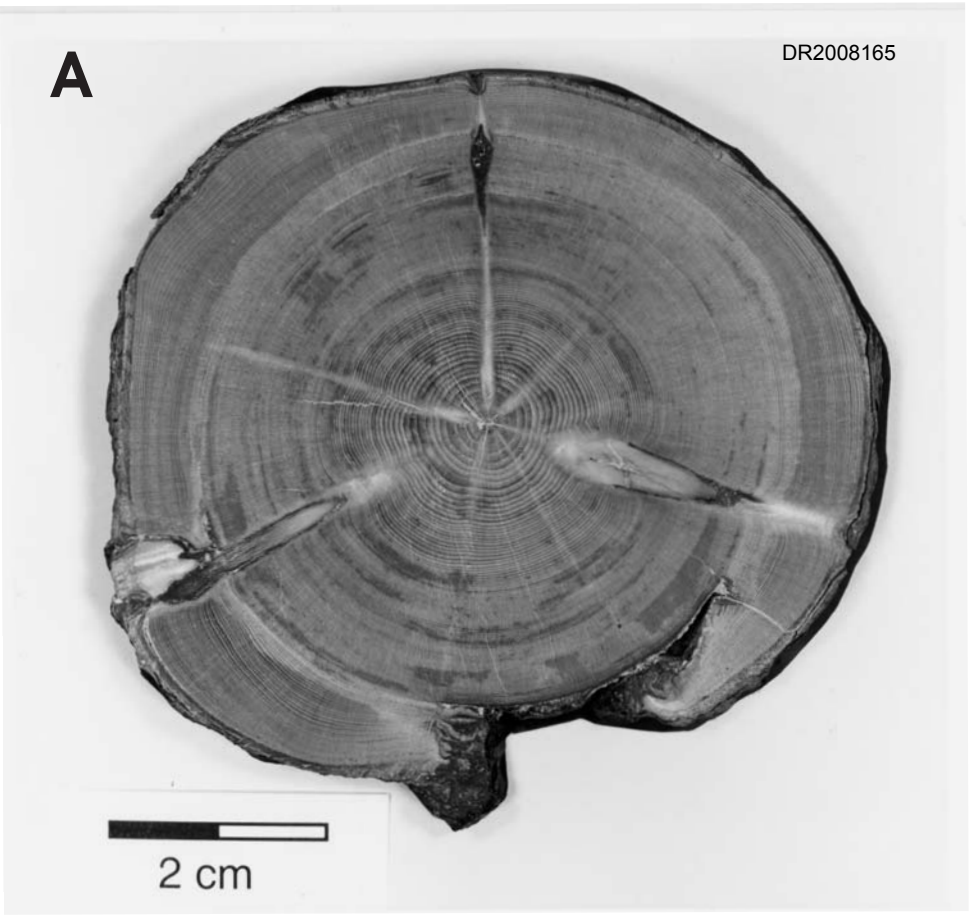

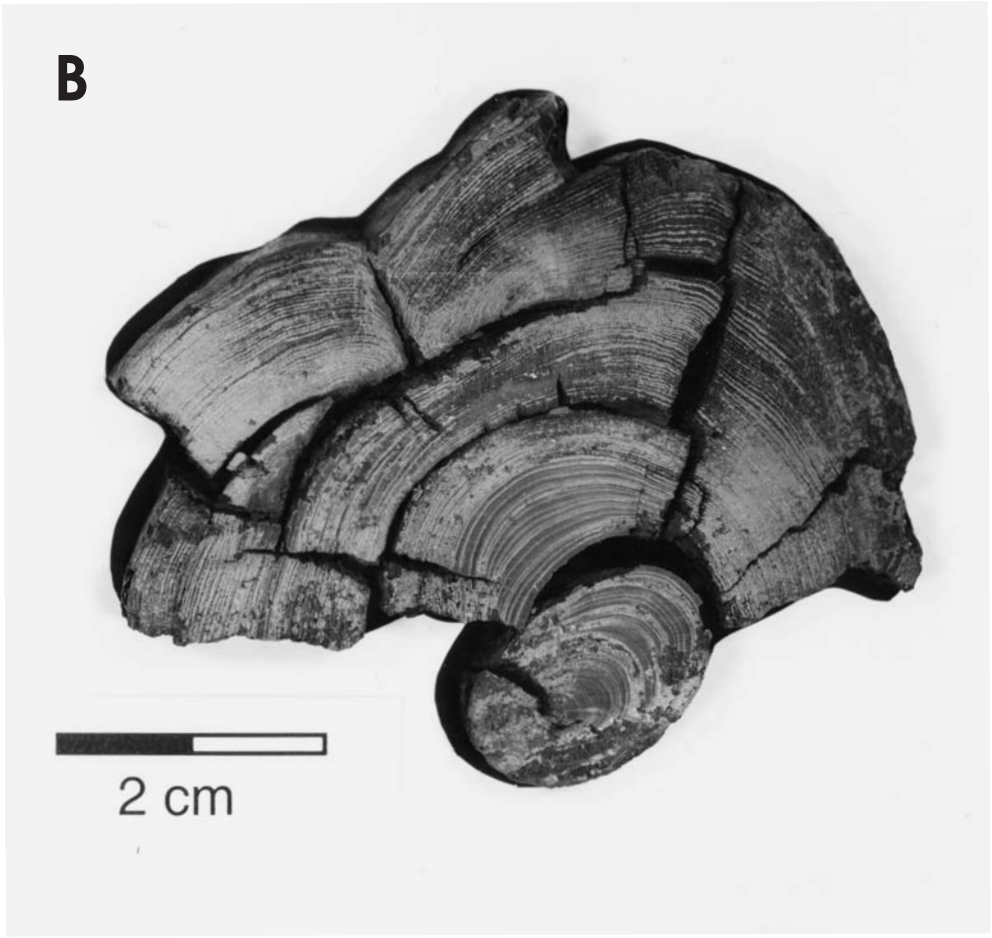

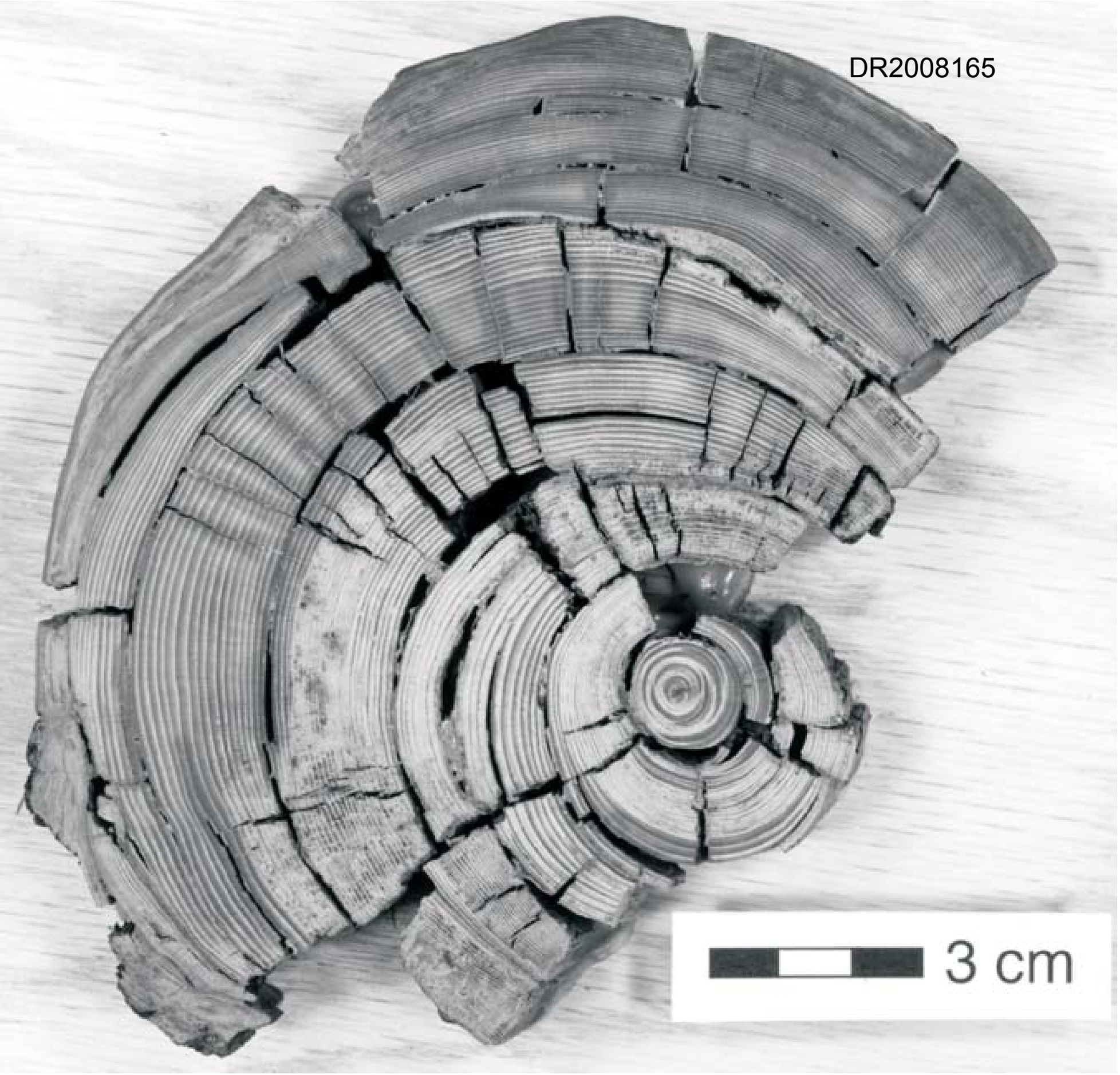
DR2008165
3 cm

SUPPLEMENTARY INFORMATION

CAPTIONS TO FIGURES

Figure S1. Excavation exposing entire section of lower Gold Hill Loess at lower part of Trench 3, east end of Gold Hill Cut, 10 km west of Fairbanks, Alaska. Loess extends from level of PA tephra at top of lower Gold Hill Loess to Cripple Gravel at the base. See Figure 6 for stratigraphic details. Photograph PK 29310 by T. L. Péwé, June, 1989.

Figure S2. Stem disks of modern and fossil black spruce (*Picea mariana*) from central Alaska. (A) Modern black spruce 207 years old that grew at an elevation of 130 m on flood plain of Yukon River, Fort Yukon, Alaska, at the junction with the Porcupine River (Fig. 1). Section collected and cut by W. S. Benninghoff, U. S. Geological Survey, 1948. (B) Fossil black spruce 200+ years old that grew at an elevation of 230 m on the lower north-facing hill slope, 10 km northwest of Fairbanks, Alaska. Sample no. 97b (Table S1, Supplementary Information) collected by T. L. Péwé in 1955 in perennially frozen Dawson Cut Forest Bed exposed at the base of the east wall of Sheep Creek Cut. Wood specimens identified by D. Marguerie and Y. Bégin, University of Laval, Quebec, 1997. Photographs by D. H. Ball, Arizona State University, Tempe.

Figure S3. Stem disk of spruce cut from rooted stump preserved in permafrost in Dawson Cut Forest Bed. Section has 152 rings and tree grew on gravel at an elevation of 250 m in Eva Creek valley bottom, 14 km west of Fairbanks, Alaska. Sample no. 191 (Table S1, Supplementary Information). Photograph by D. H. Ball, Arizona State University, Tempe.