

## TARTU RADIOCARBON DATES IV

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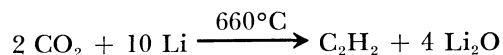
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The following list includes C<sup>14</sup> dates and deals with the results of the methodological investigations carried out at the Geobiochemical Laboratory of the Institute of Zoology and Botany of the Academy of Sciences of the Estonian SSR in 1967-1968.

Wood dating from A.D. 1850 ± 10 yr has been used as a contemporary reference standard of modern carbon. All radiocarbon dates were calculated with the half-life of C<sup>14</sup> being equal to 5568 ± 30 yr. All dates have been calculated from the year 1950.

In recent years several dating laboratories working by the scintillation method have been using solid catalysts for the trimerization of acetylene in benzene (Clark *et al.*, 1959; Noakes, 1965; Pietig and Scharpenseel, 1966). In our laboratory we have applied the aluminosilicate-vanadium catalyst suggested by Arslanov and Gromova (1967). Tempered at 500°C, the granulated aluminosilicate carrier was treated in vacuum with a solution containing 90 g of V<sub>2</sub>O<sub>5</sub> and 270 g of (COOH)<sub>2</sub> · 2 H<sub>2</sub>O in 0.5 l of distilled water for 1 kg of the carrier. After washing with distilled water, drying and tempering at 500°C the catalyst is ready for use. The absorption rate of C<sub>2</sub>H<sub>2</sub> on the catalyst (50 g of the catalyst and 12 l of C<sub>2</sub>H<sub>2</sub>) is 6 l per hour. The benzene yield (calculated on the basis of C<sub>2</sub>H<sub>2</sub>) is 92 to 98%.

The synthesis of carbide from carbonaceous samples is performed by the Barker method (1953) according to the formula:



When the molar ratio of CO<sub>2</sub>:Li equals 1:10, the C<sub>2</sub>H<sub>2</sub> yield (on the basis of CO<sub>2</sub>) accounts for 92%.

An additional one-channel scintillation device has been assembled and adjusted (Ilves, 1969). With 25 ml of benzene, the pure count of modern carbon has been 147.96 ± 0.23 cpm, the rate of the background was 8.31 ± 0.054 cpm, the maximum determinable age being 49,800 yr (48 hrs counting, 4 σ criterion).

### I. GEOLOGIC SAMPLES

#### **Kalina series**

Kalina peat bog is located in NE Estonia, 14 km SW of town Jõhvi. Samples from vertical wall of prospecting shaft dug 1 m from drainage channel crossing S part of bog (Ilves, E. and Sarv, A., 1969, Stratigraphy and chronology of lake and bog deposits of Kalina Peat Bog: ENSV TA Toimetised, Keemia, Geoloogia, v. 18, no. 4, in press, in Russian).

Coll. 1966 and subm. by E. Ilves and A. Sarv, Inst. Geol. Pollen analyses by A. Sarv. The Holocene is subdivided into pollen zones

TABLE 1

## Kalina peat bog, stratigraphy of section

Depth (cm)	Sediment type	Degree of decomposition (humification %)
to 15	<i>Sphagnum fuscum</i> peat	30
15 to 110	<i>Eriophorum</i> and <i>Sphagnum</i> peat	35 to 45
110 to 195	<i>Sphagnum fuscum</i> peat	25
195 to 200	pine and <i>Sphagnum</i> peat	30
200 to 205	<i>Eriophorum</i> and wood peat	30
205 to 230	wood and reed peat	35
230 to 235	<i>Sphagnum</i> peat	35
235 to 240	reed and <i>Sphagnum</i> peat	30 to 35
240 to 250	wood and reed peat	30 to 35
250 to 265	reed peat	25 to 30
265 to 270	<i>Bryales</i> and reed peat	25
270 to 275	peat sapropel	
275 to 290	brown sapropel, compact	
290 to 302	olive-green sapropel containing aleurite	
302 +	moraine	

according to T. Nilsson system (1961). Botanical analyses by H. and J. Allikvee.

**TA-143. Kalina****1415 ± 125****A.D. 535**

*Eriophorum* and *Sphagnum* peat at depth 55 to 60 cm. Contact between Pollen Zones SA<sub>1</sub> and SA<sub>2</sub>.

**TA-155. Kalina****2905 ± 65****955 B.C.**

*Eriophorum* and *Sphagnum* peat at depth 75 to 80 cm. Contact between Pollen Zones SB<sub>2</sub> and SA<sub>1</sub> (Sub-Boreal–Sub-Atlantic contact).

**TA-144. Kalina****3520 ± 65****1570 B.C.**

*Eriophorum* and *Sphagnum* peat at depth 85 to 90 cm. Pollen Zone SB<sub>2</sub>, maximum of spruce.

**TA-145. Kalina****3595 ± 65****1645 B.C.**

*Eriophorum* and *Sphagnum* peat at depth 95 to 100 cm. Contact between Pollen Zones SB<sub>1</sub> and SB<sub>2</sub>.

**TA-146. Kalina****4660 ± 95****2710 B.C.**

*Sphagnum fuscum* peat at depth 135 to 140 cm. Pollen Zone SB<sub>1</sub>.

- TA-147. Kalina** **4805 ± 65**  
**2855 B.C.**  
*Sphagnum fuscum* peat at depth 145 to 150 cm. Pollen Zone SB<sub>1</sub>.
- TA-148. Kalina** **4745 ± 95**  
**2795 B.C.**  
*Sphagnum fuscum* peat at depth 155 to 160 cm. Contact between Pollen Zones AT<sub>2</sub> and SB<sub>1</sub> (Atlantic-Sub-Boreal contact).
- TA-149. Kalina** **5395 ± 70**  
**3445 B.C.**  
*Sphagnum* peat with arboreal remains at depth 195 to 200 cm. Pollen Zone AT<sub>2</sub>, rational boundary of spruce pollen.
- TA-150. Kalina** **6410 ± 70**  
**4460 B.C.**  
Wood and reed peat at depth 245 to 250 cm. Pollen Zone AT<sub>2</sub>, empirical boundary of spruce and oak pollen.
- TA-151. Kalina** **7480 ± 190**  
**5530 B.C.**  
*Bryales* and wood peat at depth 265 to 270 cm. Pollen Zone AT<sub>1</sub>, maximum of walnut.
- TA-152. Kalina** **8040 ± 75**  
**6090 B.C.**  
Brown compact sapropel at depth 281 to 284 cm. Contact between Pollen Zones BO<sub>2</sub> and AT<sub>1</sub> (Boreal-Atlantic contact).
- TA-153. Kalina** **9130 ± 135**  
**7180 B.C.**  
Olive-green sapropel containing aleurite at depth 293 to 296 cm. Contact between Pollen Zones PB and BO<sub>1</sub> (Pre-Boreal and Boreal contact).
- Ulila series**
- Ulila peat bog lies in depression of Lake Võrtsjärv. Samples from wall of prospecting shaft dug ca. 1 km N of settlement Ulila (Tartu Dist., Estonian SSR).
- Samples coll. 1965 and subm. by E. Ilves. Pollen analyses by A. Sarv, botanical analyses by U. Valk, Silvicultural Research Lab., Ministry of Forest Management and Conservation of Estonian SSR.
- TA-164. Ulila** **515 ± 60**  
**A.D. 1435**  
Reed and *Sphagnum* peat at depth 25 to 30 cm. Pollen Zone SA<sub>2</sub>.
- TA-201. Ulila** **1740 ± 70**  
**A.D. 210**  
Reed and *Sphagnum* peat at depth 55 to 60 cm. Pollen Zone SA<sub>1</sub>.

TABLE 2  
Ulila peat bog, stratigraphy of section

Depth (cm)	Sediment type	Degree of decomposition (humification %)
to 30	wood peat	40 to 50
30 to 70	reed and <i>Sphagnum</i> peat	25 to 35
70 to 100	wood and reed peat	35 to 40
100 to 270	reed peat	25 to 35
270 to 285	calcareous sapropel with admixture of reed peat	
285 to 315	lacustrine lime	
315 to 490	clay containing lacustrine lime in top part	
490 +	sand	

	<b>2540 ± 70</b>
<b>TA-110. Ulila</b>	<b>590 B.C.</b>
Wood and reed peat at depth 70 to 75 cm. Pollen Zone SA <sub>1</sub> .	
	<b>3420 ± 90</b>
<b>TA-111. Ulila</b>	<b>1470 B.C.</b>
Wood and <i>Sphagnum</i> peat at depth 90 to 95 cm. Pollen Zone SB <sub>2</sub> , maximum of spruce.	
	<b>4635 ± 90</b>
<b>TA-112. Ulila</b>	<b>2685 B.C.</b>
Reed peat at depth 125 to 130 cm. Pollen Zone SB <sub>1</sub> .	
	<b>4905 ± 70</b>
<b>TA-113. Ulila</b>	<b>2955 B.C.</b>
Reed peat at depth 155 to 160 cm. Contact between Pollen Zones AT <sub>2</sub> and SB <sub>1</sub> (Atlantic and Sub-Boreal contact).	
	<b>5260 ± 70</b>
<b>TA-114. Ulila</b>	<b>3310 B.C.</b>
Reed peat at depth 170 to 175 cm. Pollen Zone AT <sub>2</sub> .	
	<b>5460 ± 70</b>
<b>TA-115. Ulila</b>	<b>3510 B.C.</b>
Reed peat at depth 180 to 185 cm. Pollen Zone AT <sub>2</sub> .	
	<b>5580 ± 70</b>
<b>TA-116. Ulila</b>	<b>3630 B.C.</b>
Reed peat at depth 195 to 200 cm. Pollen Zone AT <sub>2</sub> , rational boundary of spruce pollen.	
	<b>5890 ± 75</b>
<b>TA-117. Ulila</b>	<b>3940 B.C.</b>
Reed peat at depth 205 to 210 cm. Pollen Zone AT <sub>2</sub> , maximum of lime pollen and accumulation curve of broad-leaved species.	

	<b>6315 ± 70</b>
<b>TA-118. Ulila</b>	<b>4365 B.C.</b>
Reed peat at depth 215 to 220 cm. Pollen Zone AT <sub>1</sub> .	
	<b>6580 ± 90</b>
<b>TA-119. Ulila</b>	<b>4630 B.C.</b>
Reed peat coll. at depth 255 cm to 260 cm. Pollen Zone AT <sub>1</sub> , maximum of elm and walnut.	
	<b>6915 ± 70</b>
<b>TA-120. Ulila</b>	<b>4965 B.C.</b>
Calcareous sapropel with admixture of peat at depth 280 to 285 cm. Pollen Zone AT <sub>1</sub> , empirical boundary of spruce pollen.	

### Orgita series

Orgita peat bog is in NW part of Estonian SSR, 4 km NE of settlement Märjamaa. Samples from vertical wall of prospecting shaft dug 1.5 m from drainage channel.

TABLE 3  
Orgita peat bog, stratigraphy of section

Depth (cm)	Sediment type	Degree of decomposition
to 140	<i>Sphagnum</i> peat	little-decomposed
140 to 240	<i>Sphagnum</i> peat containing <i>Eriophorum</i> (particularly in lower part)	"
240 to 245	<i>Sphagnum</i> peat	"
245 to 252	<i>Eriophorum</i> and <i>Sphagnum</i> peat	"
252 to 260	wood and <i>Sphagnum</i> peat	"
260 to 270	sedge peat containing wood	"
270 to 280	<i>Bryales</i> and sedge peat	medium-decomposed
280 to 295	<i>Bryales</i> and sedge peat containing wood	"
295 to 310	wood peat	"
310 to 317	moraine containing organics	"
317 to 330 +	moraine	

Samples coll. 1967 and subm. by E. Ilves and A. Sarv. Pollen analyses by A. Sarv.

	<b>790 ± 60</b>
<b>TA-226. Orgita</b>	<b>A.D. 1160</b>
<i>Sphagnum</i> peat at depth 150 to 155 cm. Contact between Pollen Zones SA <sub>1</sub> and SA <sub>2</sub> .	
	<b>1470 ± 70</b>
<b>TA-227. Orgita</b>	<b>A.D. 480</b>
<i>Sphagnum</i> peat at depth 215 to 220 cm. Pollen Zone SA <sub>1</sub> .	

- TA-228 A. Orgita** **2240 ± 70**  
**290 B.C.**  
Sedge peat at depth 260 to 265 cm. Pollen Zone SA<sub>1</sub>. *Comment:* sample contained fragments of carabid beetles *Pteroscitchus* sp., *Agonum* cf. *ericeti* (Panz.), and *Agonum* cf. *mülleri* (Hbst.); and of dytiscid beetles, *Ilybius* sp. Determinations were carried out by Prof. H. Haberman.
- TA-228 B. Orgita** **2000 ± 70**  
**50 B.C.**  
Wood (pine) coll. at depth 260 to 265 cm. Pollen Zone SA<sub>1</sub>.
- TA-229. Orgita** **2620 ± 75**  
**670 B.C.**  
*Bryales* and sedge peat at depth 270 to 275 cm. Contact between Zones SB<sub>2</sub> and SA<sub>1</sub>. (Sub-Boreal—Sub-Atlantic contact).
- TA-230. Orgita** **3815 ± 70**  
**1865 B.C.**  
Wood peat at depth 300 to 205 cm. Pollen Zone SB<sub>2</sub>.
- TA-178. Vesiku** **6350 ± 80**  
**4400 B.C.**  
Reed peat on right bank of R. Vesiku (I. Saaremaa). Peat layer, 30 cm thick, underlies coastal sands and gravel of Littorina Sea. Organogenous layer is underlain by lacustrine clayey marl. Sample coll. at depth 0 to 3 cm (from top of organogenous layer). Pollen analysis by H. Kessel, Inst. Geol. Sample is referred to Pollen Zone VII (after von Post and Nilsson). Coll. 1966 and subm. by J.-M. Punning.
- TA-179. Vesiku** **7960 ± 80**  
**6010 B.C.**  
Sample from same complex as TA-178 at depth 33 to 36 cm from top of organogenous layer. Sample is assigned to Pollen Zone VII (after von Post and Nilsson).
- Gorelovo series**  
Profile Gorelovo is situated in SW suburb of Leningrad. Description of this dist. is given in monograph by K. Markov (1931). Recent geomorphologic and palynologic investigations carried out in this dist. and a number of C<sup>14</sup> datings indicate that organogenous materials accumulated in early Holocene and were later probably submerged under river deposits (Serebryanny and Punning, 1969).
- TA-184. Gorelovo** **9470 ± 120**  
**7520 B.C.**  
Peat at depth 110 to 112 cm.
- TA-185. Gorelovo** **9740 ± 80**  
**7790 B.C.**  
Peat at depth 112 to 114 cm.

**TA-186. Gorelovo** **10,010 ± 120**  
**8060 B.C.**  
Peat at depth 114 to 116 cm.

**TA-187. Gorelovo** **10,070 ± 130**  
**8120 B.C.**  
Peat at depth 120 to 122 cm.

### Märkys and Ula series

In many places along R. Märkys and its left tributary R. Ula in SE Lithuania, one can observe among sands dark-colored organogenous layers of interstadial character. These sediments contain aleurites, sapropels, peat, sometimes accumulations of considerable woody remains (*Pinus silvestris* L.). Shells of subfossil mollusks have been found in all profiles.

**TA-188. Mančiagire** **11,630 ± 120**  
**9680 B.C.**  
Fragment of tree trunk from left bank of R. Ula, ca. 7 km below Mančiagire. Tree trunk is embedded in layer of dark-gray aleurite peat overlain by sands 16 m thick. Limonitized sands underlie organogenous layer. Coll. 1967 and subm. by J.-M. Punning and P. Vaitiekunas, Vilnius State Univ. *Comment:* C<sup>14</sup> dating by Inst. Geol., Acad. Sci., Lithuanian SSR put putative age of sample at 17,340 ± 840 yr (Shulia *et al.*, 1967).

**TA-240. Mančiagire** **11,930 ± 110**  
**9980 B.C.**  
Moss peat from same layer as TA-188.

**TA-189. Pauosupe** **8790 ± 90**  
**6840 B.C.**  
Tree trunk from right bank of R. Uosupe near village Pauosupe. Sample is interbedded in fine- and medium-grained sands at depth 650 to 660. Coll. 1967 and subm. by J.-M. Punning.

**TA-190. Rudnja** **11,530 ± 120**  
**9580 B.C.**  
Tree trunk on right bank of R. Ula near village Rudnja. Wood and peat lie interbedded in complexes of horizontal layers of sand. Overlying layer is 9 m thick, ca. 2 m back from edge of water. Check sample was taken from same trunk. Coll. 1967 and subm. by J.-M. Punning and P. Vaitiekunas. *Comment:* datings by Uppsala C<sup>14</sup> Lab. are as follows:

U-2107: 12,080  $\begin{matrix} +460 \\ -430 \end{matrix}$   
U-675: 11,970 ± 180 (Olsson, written commun.)

**TA-191. Zervynos** **12,650 ± 130**  
**10,700 B.C.**  
Peat on left bank of R. Ula near village Zervynos, from prospecting shaft 5 m from place of contact of floodland with lower slope of left bank of R. Ula. Coll. 1967 and subm. by J.-M. Punning and P. Vaitiekunas. *Comment:* absolute ages of samples TA-124 and TA-125 from

same profile had been previously dated at  $11,930 \pm 110$  and  $12,160 \pm 120$ , respectively (Radiocarbon, 1968, v. 10, p. 128-129).

**TA-192 A. Pamärkes****11,730  $\pm$  110  
9780 B.C.**

Wood on right bank of R. Märkis near village Pamärkes. Lake and bog deposits are included in sand beds. Coll. 1967 and subm. by J.-M. Punning and P. Vaitiekunas. Age of sample was determined by lignin fraction.

**TA-192 B. Pamärkes****11,820  $\pm$  110  
9870 B.C.**

Same piece of wood as TA-192 A, but its age was determined by cellulose fraction.

**TA-195. Ohtla****8560  $\pm$  110  
6610 B.C.**

Brown wood peat N of town Keila (N Estonia), 17 cm thick, overlain by deposits of Littorina Sea and clayey-aleuritic interbed of transgression of Lake Ancylus. Coll. 1967 by S. Püvi, Geol. Board; subm. by H. Stumbur, Geol. Board.

**TA-196. Sosnovy Bor****8060  $\pm$  70  
6110 B.C.**

Wood fragments on left bank of R. Kovash (central part of Leningrad Region) at depth 10.4 m. Sands overlying peat and arboreal remains are characterized by Atlantic pollen spectrum and salt-water diatomaceous flora. Accumulation of peat started after regression of Ancylus Lake. Coll. 1967 and subm. by L. Serebryanny, Inst. Geog., Acad. Sci., USSR.

**TA-197. Molodyozhnoye****7350  $\pm$  70  
5400 B.C.**

Wood fragments on left bank of R. Chornaya W of town Zelenogorsk, NW part of Leningrad Region. Sample lies at depth 205 cm in lower part of organogenous complex buried under beach barrier of Littorina Sea. Coll. 1967 and subm. by L. Serebryanny. On basis of pollen-analytic data L. Serebryanny attributed accumulation of organogenous layers to Pollen Zone VII (after von Post and Nilsson).

**TA-198. Järise****6960  $\pm$  70  
5010 B.C.**

Dark-brown well-decomposed peat near village Järise (W Estonia). Organogenous deposits, 20 cm thick, overlain by beach barrier of Littorina Sea. Coll. 1967 and subm. by G. Eltermann, Geol. Board.

**TA-199. Deseles Leinieki** **$\geq$ 55,000**

Dark-brown hard sapropelite near village Deseles in basin of R. Letize (SW Latvia). Sapropelite layer is embedded in moraines. Coll. 1966 and subm. by J.-M. Punning. Pollen-analytic investigations by M. Danilans (1966) assigned accumulation of lake and bog deposits to Likhvin (Mindel-Riss) Interglacial. *Comment:* at Vernadski Inst. of Geochem., sample had been dated  $\geq 34,000$  yr (Vinogradov *et al.*, 1966).



**TA-200. Gvildzai** **≥50,000**

Submorainic lake and bog deposits in valley of R. Dange N of town Klaipeda (NW Lithuania). Sample coll. 1967 and subm. by P. Vaitiekunas and J.-M. Punning. *Comment*: accumulation of these deposits has been referred to Riss-Würm Interglacial (Woldstedt, 1955; Vaitiekunas, 1961), to Neo-Pleistocene (Gudelis, 1961; Vonsavičius, 1967), and to Mindel-Riss Interglacial (Kondratene, 1967).

**11,690 ± 150****TA-194. Kunda****9740 B.C.**

Bryales moss near town Kunda (N Estonia). Moss is contained in lacustrine marl and overlies varved clay and sand. Coll. 1967 and subm. by R. Pirrus, Inst. Geol., Acad. Sci., Estonian SSR.

**6100 ± 50****TA-193. Oara****4150 B.C.**

Lagoon sapropel on beach of Bay of Pärnu, 6 km N of Audru (SW Estonia). Sample coll. in upper part (0 to 3 cm) of organogenous layer whose total thickness amounts to 33 cm. Lower and upper parts of this layer contain remains of salt-water diatomaceous algae. Coll. 1967 and subm. by J.-M. Punning. Pollen analysis performed by H. Kessel refers upper part of submerged deposits to Pollen Zone VI (after Post-Nilsson).

**TA-222. Drörestorp starr** **$\delta C^{14} = 616 \pm 10\%$** 

Plants (*Carex elata*) coll. 1966 in Sweden (56° 35' N Lat, 16° 33' E Long). Coll. by L. K. Königsson, subm. by I. U. Olsson (Univ. of Uppsala). Sample was measured at Uppsala C<sup>14</sup> laboratory as follows: U-51,  $\delta C^{13} = -28.1\%$ ,  $\Delta = 699.5 \pm 12.6\%$ , (Olsson, written commun.).

**9150 ± 80****TA-225. Kakra****7200 B.C.**

Well-preserved piece of wood (pine, ca. 4 cm diam. with 33 year-rings) from NE part of I. Kihnu, Pärnu Dist., SW Estonia. Sample coll. from 4.2 m deep prospecting shaft lying horizontally at depth 4 m (ca. 1 m above sea level) in fine-grained sand. Sample overlain by fine-grained sand 2.5 m thick, pebble and gravel 1 m thick, and eolian sand 0.5 m thick. Coll. 1967 and subm. by H. Sepp, Collective Farm "Soviet Partisan".

**10,330 ± 100****TA-223. Naroch****8380 B.C.**

Wood remains (pine) from outcrop on S bank of R. Naroch (Belorussian SSR). Coll. 1967 and subm. by L. N. Voznyachuk, Belorussian Lenin State Univ. See TA-134, TA-135, Radiocarbon, 1968, v. 10, p. 379.

**2850 ± 130****TA-239. Pühajoe****900 B.C.**

Wood remains from boring on left bank of R. Pühajõe (N Estonia). Remains are embedded in coarse-grained, little-graded sand containing gravel, pebble, and boulders. Subjacent to them lie deposits of Lower

Cambrian system. Sample lay at depth 16 m. Coll. 1968 and subm. by H. Erisalu (Geol. Board).

**TA-241. Nouni** **10,900 ± 110**  
**8950 B.C.**

Plant remains picked from prospecting shaft near Lake Nõuni, Valga Dist., SE Estonia. Stratigraphy of sec.: gravel, 50 cm; layered fine-grained sand, 50 cm; layered medium-grained sand with aleurite interbeds, 25 cm; aleurite fine-grained sand with plant and moss remains, 20 cm; below bluish-gray coarse sand and gravel. Coll. 1968 and subm. by J.-M. Punning and R. Pirrus, Inst. of Geol.

#### II. ARCHAEOLOGIC SAMPLES

**TA-202. Usvyaty** **4230 ± 70**  
**2280 B.C.**

Wood from Neolithic settlement Usvyaty IV, Usvyaty Dist., Pskov Region, RSFSR on S outskirts of settlement Usvyaty in flood-land of N part of Lake Usvyaty. Sample coll. from lower horizon (IV) of cultural layer (B) at depth of 110 cm and represents log fragment lying horizontally with peg driven through it (Sample TA-203). Pollen-analytic data by E. Spiridonova attribute Layer B to 2nd half of Atlantic period. Presumed archaeologic age of Layer B: 2nd half of 3rd millennium or boundary of 3rd/2nd millennium B.C. Coll. 1966 and subm. by A. Miklayev, State Hermitage of USSR.

**TA-203. Usvyaty** **4110 ± 70**  
**2160 B.C.**

Wood fragment of peg driven through log (Sample TA-202) coll. from Neolithic settlement Usvyaty IV. Top of peg 65 cm, its end driven through log 130 cm deep. Coll. 1966 and subm. by A. Miklayev. Probable age of sample: 2nd half of 3rd millennium or boundary of 2nd/3rd millennium B.C.

**TA-204. Lohavere** **705 ± 70**  
**A.D. 1245**

Charcoal from NW part of wall of fortified stronghold Lohavere, Viljandi Dist., Estonian SSR, 4 km E of settlement Suure-Jaani. Depth of sample 72 cm. Coll. 1960 by A. Liiva; subm. by Acad. H. Moora, Inst. of Hist., Acad. Sci., Estonian SSR. Putative age of sample: 1st half of 13th century.

**TA-217. Padise** **780 ± 100**  
**A.D. 1170**

Charcoal from S part of E wall of fortified stronghold Padise, Harju Dist., N Estonia. See TA-73, Radiocarbon, 1966, v. 8, p. 436. Depth of sample 225 cm. Presumed archaeologic age: ca. 700 A.D. Coll. 1964 and subm. by O. Saadre, Inst. of Hist.

**TA-218. Medvezhya peshchera (cave)** **8480 ± 100**  
**6530 B.C.**

Fragments of subfossil bones from Medvezhya peshchera (cave), Ust-Unyin village soviet, Troitskõ-Pechorski Dist., Komi ASSR. Coll.

1966 and subm. by I. Kuzmin, Inst. of Zool., Acad. Sci., USSR. Putative age: Late Pleistocene.

**4080 ± 100**  
**2130 B.C.**

**TA-219. Tamula**

Wood from Burial 22 of Late Neolithic settlement Tamula, 0.5 km S of town Võru, SE Estonia. Sample coll. from under cultural layer at depth 58 to 77 cm and is referred to early stage of settlement. Coll. 1961 and subm. by L. Jaanits, Inst. of Hist. Presumable age: boundary of 3rd/2nd millennium or early 2nd millennium B.C.

**1900 ± 110**  
**A.D. 50**

**TA-221. Kaninskaya**

Fragment of subfossil bones from monastery Kaninskaya, Ust-Unyin, village soviet. Troitsko-Pechorski Dist., Komi ASSR. Coll. 1966 and subm. by I. Kuzmin. Putative age of sample: 2nd millennium B.C.

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