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ARCHAEOLOGICAL TRIAL EXCAVATIONS AND DETAILED GEOLOGICAL AND SOIL STUDIES IN THE AREA OF FOSSIL FIELDS IN THE ABRU FOREST OF THE JALASE VILLAGE DURING 1992—1993

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The establishing of the objects of archaeological interest, including fossil fields, in Jalase village reserve was started in 1990[1]. In this area remains of fossil fields are most abundantly preserved in the alvar forests surrounding the village, particularly in the Abru forest lying to the north and north-east of Jalase. The presence of ancient fields is evidenced by numerous old clearance cairns covered with turf or moss. More detailed investigation of ancient fields was started in 1992 by the team including the archaeologists Ü. Tamla and V. Lang, the geologist Ü. Heinsalu, the soil scientist H. Samel and the cartographer P. Kohava. The first trial excavation was made at a distance of 0.8—1 km from the present fields in section 71 of the Abru forest, in the western part of which ancient clearance cairns are more numerous. Judging from the cairns, the area turned into fields was about 200 m in the north—south direction and 100—150 m in the east—west direction (Fig. 1). In the east and south most of the area covered with cairns is bounded by elongated dry hollow (so-called *abru*), in the north and west, however, by a sparse alvar forest with the Quaternary cover of less than 0.3 m. Some scattered clearance cairns can also be seen on the bottom of the *abru* and eastward of it. Altogether, in an area of 3 ha, 66 cairns and a number of solitary large stones standing on their original sites, were recorded. Most of the cairns (49), located in an area of about 1 ha, were surrounded by a low turfed stone wall on their northern, eastern and southern sides. The Quaternary cover of the ancient field area is 0.5—0.8 m thick, its upper part being composed of aqueoglacial silt or loam sand, the lower part, however, of gritty till. The Quaternary cover is underlain by the limestone of the Raikküla Stage. Near the earth's surface the Quaternary cover was flushed by the waves of the Baltic Ice Lake, which spread here about 10000 years ago. At present the area is covered by a fir-pine forest with the density of stand of 0.6 . . . 0.8.

The upper part of the Quaternary cover contains abundantly granite, more rarely gneiss cobbles and small boulders. Their diameter is usually below 0.5 m, which can be seen from the 2—3 m-wide and up to 0.5 m-high clearance cairns. Part of the stones are with facets, not rounded at all sides like it should be in glacial sediments. Faceted rocks have formed by the destruction of rounded ones, obviously by fire during burnt-over clearing.

The soils of the fossil field area attracted attention due to the occurrence of relatively rare moderately humid (dry) saturated or unsaturated sod-gley soils in the combination with thin alvar and rendzina soils; these

[1] **Tamla, Ü.** Jalase arheoloogilis-etnograafiline kaitseala. — Eesti Arheoloogiaseltsi Teataja, 1991, 1(5), p. 7—8; **Tamla, Ü.** The Hillfort of Varbola-Jaanilinn and the Settlement at Jalase. — Estonia: Nature, Man and Cultural Heritage. PACT 37, 1992, p. 145—155.

moderately humid soils being surrounded by carbonate soils, are secondarily enriched with calcium. Therefore morphological features of podzolization have not developed — the soil profile is weakly differentiated.

The relatively thick, with slowly transition humus horizon (A/1 30... 40 cm) is succeeded by a transitional horizon (BC) containing humus in its upper part [could also be distinguished as A/1 B horizon, in its lower part resembling the colour of the initial rock (C)]. In the upper, topmost part of the humus horizon there occurs a litter composed of the saturated as well as unsaturated sod soil. The main difference between them lies in the soil reaction — in the first type the reaction of the humus layer is neutral or slightly acidious, in the second type it is acidious (pH below 5.5). As an example we can produce here the pH dynamics established by field studies in a profile of an excavation in which sand serves as a parent material for soil, limestone rubble lie at a depth of 75 cm: 0...20 cm — pH 4.6...4.8; 30...35 cm — pH 6.2...6.4; 55...60 cm — pH 6.4... 6.7; 65...70 cm — pH 6.4...6.6. The use of this area as an ancient field could have been facilitated by the following circumstances: favourable water regime (automorphic), relatively easy cultivability after the clearing of stones (soil poor in coarse particles), comparatively high fertility (thick humus layer).

For archaeological studies, one margin of a clearance cairn was opened and the profile of the trial excavation was cleaned in section 71 of the Abru forest[2].

Two samples were taken from the stripe of charcoal preserved under the stone heap since slash-and-burn time, in order to determine the age of the fields and the nature of the plant community destroyed during burning over woodland. The analyses were made at two different scientific institutions — at the Institute of Geology, Estonian Academy of Sciences and Uppsala University. The charcoal sample analysed at the Institute of Geology gave date of the supposed burnt-over layer 525±37 BP, by calibration 1312—1350 or 1386—1442 AD[3]. According to datings made at Uppsala University, the age of the same layer was 395±60 BP, by calibration 1410—1640 AD[4].

At Uppsala University, apart from the age also the plant remains occurring in the samples were determined. Of the ten identified remains six belonged to pine (*Pinus*), three to oak (*Quercus*) and one to juniper (*Juniperus*).[5] Although the results of the charcoal analyses made at two scientific institutions revealed somewhat different ages of the fields, it is clear that the fields in the Abru forest date back to the Middle Ages, at least to the 14th—15th centuries. Considering the distance of these fields from the village and village fields, their isolation from each other and the lack of settlement sites in the neighbourhood, we may presume them to be the so-called forest fields of the Jalase village. According to A. W. Hupel's definition from the end of the 18th century, "brushwood fields constitute pieces of land suitable for grain growing, which are, however, not used every year like long-cultivated fields but are turned fertile after several years by burning over or acidification; after having yielded three to five crops, they will have some time for recovery in order to overgrow with bushes or brushwood, from which they have also got their name".[6]

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[2] **Tamla, Ü.** Field-works at Jalase archeological-ethnographic reserv in 1990—1992. — Proc. Estonian Acad. Sci. Humanities and Social Sciences, 1994, 43, 1, p. 42—45.

[3] This sample was analysed by Raivo Rajamägi in the Laboratory of the Institute of Geology, Estonian Academy of Sciences.

[4] Analysed in the Laboratory of Uppsala University.

[5] Analysed in the Laboratory of Uppsala University.

[6] Eesti talurahva ajalugu. Vol. 1. Tallinn, 1992, p. 151.

Such fields were usually situated in forests far away from villages and were not included into regular crop rotation (i.e. into the three-course system applied in village community fields). Forest fields had to be fenced off like village fields[7], which accounts for the occurrence of a stone fence around the forest field studied in the Abru forest at Jalase.

New excavations in Jalase fields were started in September, 1993. This time the clearance cairns located in the eastern part of section 68 of the Abru forest were opened. These cairns lie about 1 km north-east of the previous trial excavation site in section 71 (Fig. 2). The fields of the nearest Tänavaotsa farmstead are 0.5 km away. Unlike the first excavation site, clearance cairns are not very numerous here: a bigger and higher cairn is located about 50 m southwest of the one selected for digging, a smaller cairn lies about 20 m south-southeast of it. Two apart-standing low stone heaps occur almost side by side about 100 m south of the excavation, an additional one 100 m to the west. Geologically this field area is located on the southern slope of an extensive limestone elevation with a very thin Quaternary cover (mostly below 0.3 m), remaining about 100 m south-west of Sõbessoo. The highest part of the slope (absolute height 55—56 m) where the soil often dries up in summer, is covered with a thin alvar pine grove. The middle, moderately moist part of the slope, i. e. the primitive field area, is characterized by a flat surface and small inclination to the east towards Sõbessoo (abs. height 54.5—55 m), which is covered with a spruce wood. In the lowest, already overly moist part of the slope, there grows a mixed forest (about 50 years ago there occurred a wooded meadow). On the spruce wood/mixed forest boundary small spring hollows were recorded, sometimes containing water. They are fed from the groundwater of the elevation when its level in the hollows reaches higher than the earth's surface. East and north of the swampy mixed forest there extend near-bog fen forests of Sõbessoo. About 150 m east of the fossil field the forest has been turned into a grassland drained several decades ago.

Unlike the site selected for archaeological trial excavations in 1992, where the thickness of the soil layer was 30—45 cm, here the soil layer amounts only to 20 cm and is immediately underlain by the limestone of the Raikküla Stage. The thickness of the soil layer increases eastwards, i. e. towards the bog. At the bog margin it is separated from the bedrock by an intercalation of clayey gravel, which rapidly thickens in the direction of the bog, in the catch ditch of the virgin land exceeding 0.5 m. A trial excavation (2 m by 1 m) was made in the south-western part of the smaller, about 60—70 cm high clearance cairn, just at its foot (Plate XXX, *1*). The size of this oval heap, consisting mostly of smaller granites, was 4 m in the NNW-SSE direction and 3.6 m in the NNE-SSW direction. The heap of stones was piled against a bigger greyish-red coarse-crystalline flat-surfaced boulder, sized 2.2 m along the NNW-SSE axis and 1.2 m along the transverse axis. The height of the boulder was 60—70 cm. Most of the stones picked from the field were thrown against the western side of the boulder, therefore only its moss-covered surface and eastern side were exposed to examination. The piled-up stones are mostly granite cobbles up to 40 cm in diameter. In the trial excavation the thickness of the evenly brown soil layer was about 20 cm, while that of the soil layer which lay between the clearance cairn and bedrock was only 5 cm. From under the edge of the stone heap profile some charcoal was collected, obviously preserved from the slash-and-burn time.[8]

As was seen from the excavation, the uppermost beds were composed

[7] Ibid., p. 187.

[8] The charcoal sample analysed at the Institute ot Geology gave date 537±74.

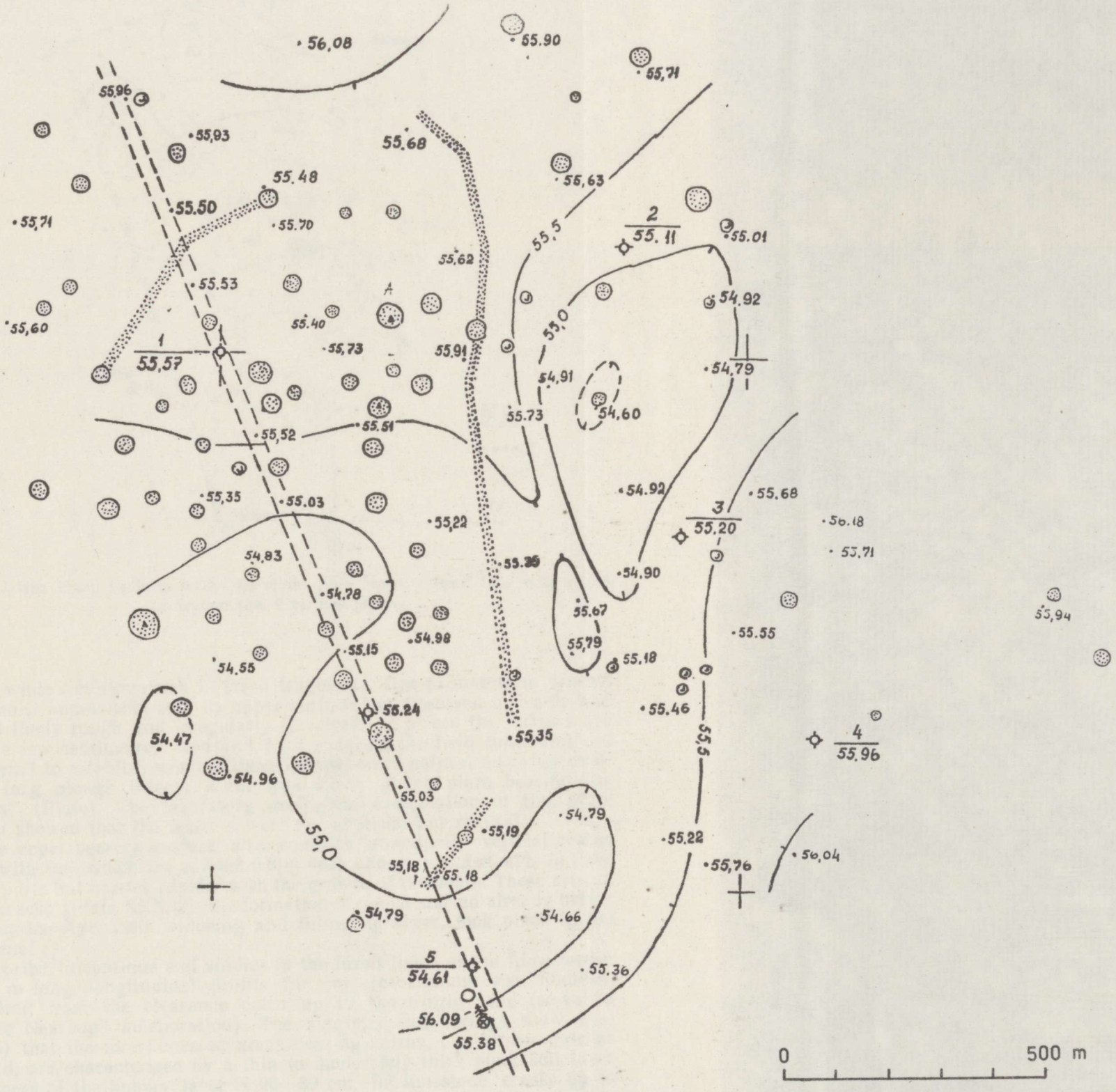


Fig. 1. Jalase. Fossil fields in section 71 of the Abru forest. Cartographed by P. Kohava.

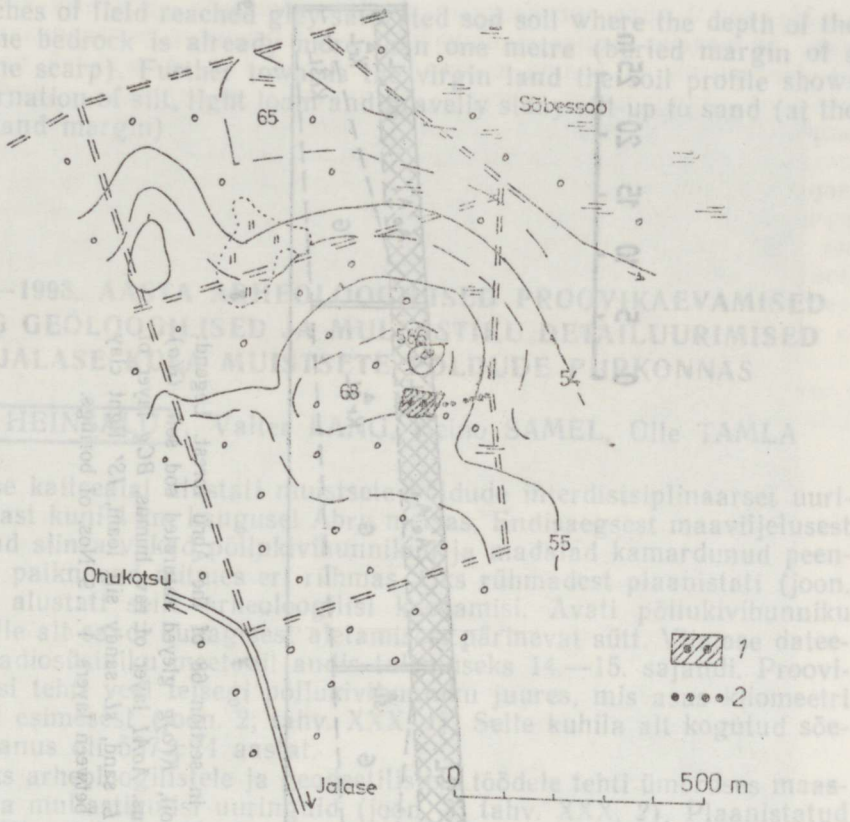


Fig. 2. Jalase. Fossil fields in section 68 of the Abru forest. *1* fossil field with a trial excavation site, *2* borings places.

of the white limestone rich in fossil fragments. Due to long-term contact with moist humus-acid soil, its upper surface has dissolved unevenly and turned finely rough and irregularly furrowed. In places the furrows are up to a few centimetres deep and 7 cm wide. As the field conditions did not permit to establish whether these furrows were natural or partly man-made (e. g. plough traces), a cut was made of the plate bearing the "traces" (Plate). The laboratory geological examination of this plate section showed that the furrows were not artificial but natural.

The upper bedrock surface also contains abundantly vertical cracks filled with soil, which are at least 0.8 m deep and up to 0.3 m wide in their upper parts but narrow rapidly with the growth of the depth. These are old karst cracks (Plate XXX, *2*), the formation of which started already before the last Ice Age, their widening and filling, however, took place in the Holocene.

In order to continue soil studies in the fossil fields of the Abru forest, a 120 m long longitudinal profile for soil researching was founded, extending from the clearance cairn up to the virgin land (so-called "Jalase Nearbog" amelioration). The diggings and borings show (see Fig. 3) that the forest-covered areas bearing cairns, i. e. former patches of field, are characterized by a thin to moderately thick alvar soil layer (thickness of the humus layer is 20—30 cm, in limestone cracks up to 60 (70) cm) and saturated sod soil (humus layer 40 cm). Presumably

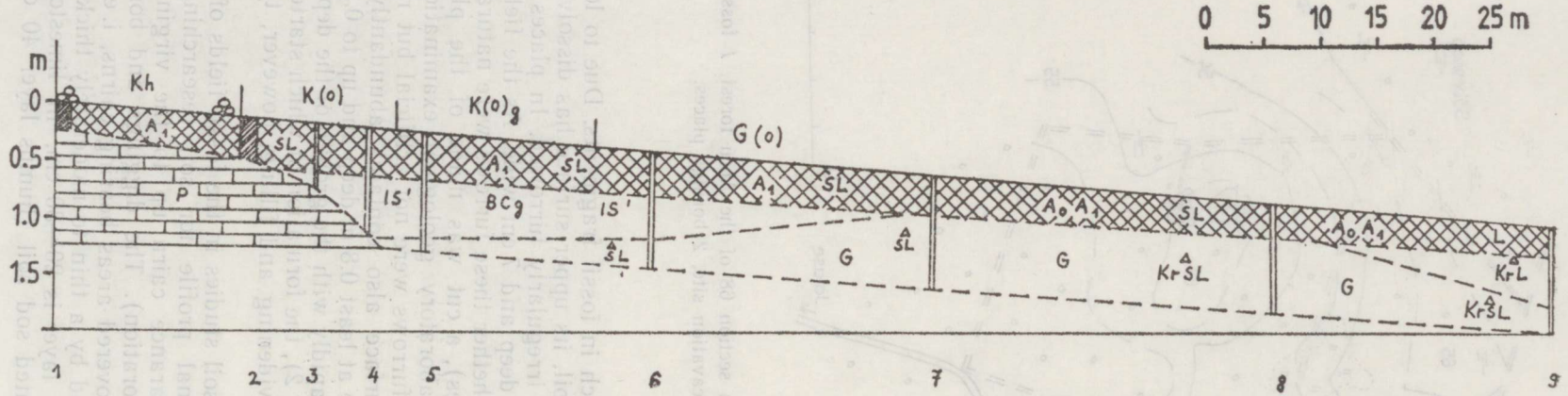


Fig. 3. Jalase. Profile for soil researching in section 68 of the Abru forest. Legend: *Kh* alvar soil layer, *K(o)* saturated sod soil, *K(o)g* gleyed saturated sod soil, *G(o)* saturated soddy-gley soil, *A1* layer of humus. *AoA1* layer of raw humus, *BCg* layer of transition, *G* layer of gley, *P* limestone, *L* sand, *sL* sandy silt loam, *IS'* light clay loam, *Kr* gravel, △ stony, --- margin between layers, 1 ... 9 Nos. of borings.

the patches of field reached gley-saturated sod soil where the depth of the limestone bedrock is already more than one metre (buried margin of a limestone scarp). Further towards the virgin land the soil profile shows the alternation of silt, light loam and gravelly stony silt up to sand (at the virgin land margin).

1992.—1993. AASTA ARHEOLOOGILISED PROOVIKAEVAMISED NING GEOLOOGILISED JA MULLASTIKU DETAILUURIMISED JALASE KÜLA MUISTSETE PÕLDUDE PIIRKONNAS

Ülo HEINSALU, Valter LANG, Heino SAMEL, Ülle TAMLA

Jalase kaitsealal alustati muistsete põldude interdistsiplinaarset uurimist külast kuni 1 km kaugusel Abru metsas. Endisaegsest maaviljelusest kõnelevad siin arvukad põllukivihunnikud ja madalad kamardunud peenrad, mis paiknevad mitmes eri rühmas. Üks rühmadest plaanistati (joon. 1) ning alustati selle arheoloogilisi kaevamisi. Avati põllukivihunniku serv, mille alt saadi kunagisest aletamisest pärinevat sütt. Viimase dateerimine radiosüsiniku meetodil andis tulemuseks 14.—15. sajandi. Proovikaevamisi tehti veel teisegi põllukivihunniku juures, mis asus kilomeetri kaugusel esimesest (joon. 2; tahv. XXX, *1*). Selle kuhila alt kogutud söeproovi vanus oli 537±74 aastat.

Lisaks arheoloogilistele ja geodeetilistele töödele tehti ümbruses maastikulisi ja mullastikulisi uuringuid (joon. 3; tahv. XXX, *2*). Plaanistatud muinaspõllu alal oli pinnakatte paksus 0,5—0,8 m ja see koosnes ülaosas glatsiaalsest saviliivast (liivsavist) ja alaosas rähksest moreenist. Pinnakatte all on Raikküla lademe lubjakivi kihid. Täheldati parasniiskete küllastunud ja küllastumata kamarmuldade esinemist õhukeste paepealsete muldade ja rähkmuldade kompleksis. Teisena uuritud põllukivihunniku ümbruses oli pinnakatte paksus üksnes 20 cm ja kohe selle all paljandusid Raikküla lademe lubjakivikihid.

ПРОБНЫЕ АРХЕОЛОГИЧЕСКИЕ РАСКОПКИ И ДЕТАЛЬНЫЕ ГЕОЛОГИЧЕСКИЕ И ПОЧВЕННЫЕ ИССЛЕДОВАНИЯ ТЕРРИТОРИИ ДРЕВНИХ ПОЛЕЙ В ЯЛАЗЕ В 1992—1993 ГОДЫ

Юло ХЕЙНСАЛУ, Вальтер ЛАНГ, Хейно САМЕЛЬ, Юлле ТАМЛА

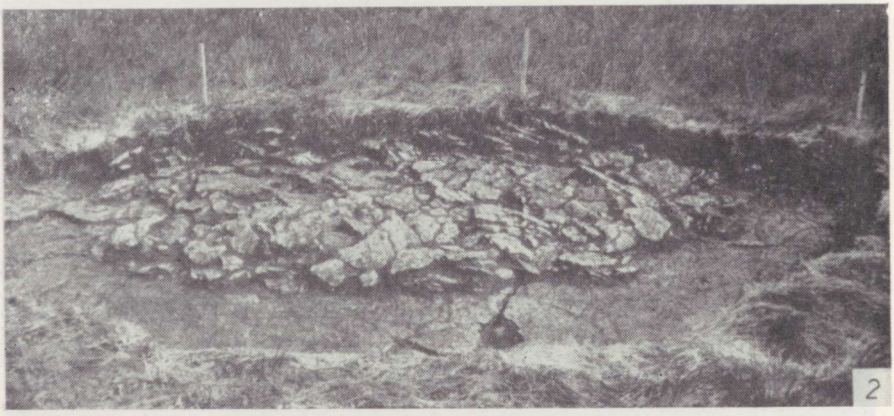
Междисциплинарное исследование древних полей в заповеднике Ялазе было начато с удаленного на 1 км от деревни леса Абру. О древней системе землепользования здесь говорят многочисленные кучи камней и низкие межи, расположенные группами. Одна из таких групп (квартал 71) нанесена на план (рис. 1). С нее начаты археологические раскопки. Вскрыта с краю куча камней, под которой обнаружен уголь от спаленной подсеки. Радиоуглеродный метод датирования указал на 14—15 вв. Пробные раскопки проведены и в километре от первой кучи, в квартале 68 (рис. 2; табл. XXX, *1, 2*). Уголь отсюда датируется 537±74.

Наряду с археологическими и геодезическими работами в заповеднике проведены также ландшафтные и почвенные исследования (рис. 3). Четвертичная толща составляла 0,3—0,8 м, в верхней части она сложена гляциальной супесью (суглинком), в нижней — щебеночной мореной. Под четвертичной толщей залегали слои известняка райккюлаского горизонта. Отмечено присутствие насыщенных и ненасыщенных дерновых почв в комплексе с альварными и рихковыми. Вокруг второй кучи камней четвертичная толща составляла 20—30 см, непосредственно под ней прослеживались известняковые слои райккюлаского горизонта. Там же установлено наличие дерново-карбонатных типичных известняковых (альварных) почв с толщиной гумусового слоя в 20—30 см, а в трещинах плитняка — до 60—70 см. По краям полей попадались насыщенные дерновые толщи с гумусовым слоем до 40 см. Глубина слоя плитняка превышала 1 м (край погребенного глинта—уступ плитняка).

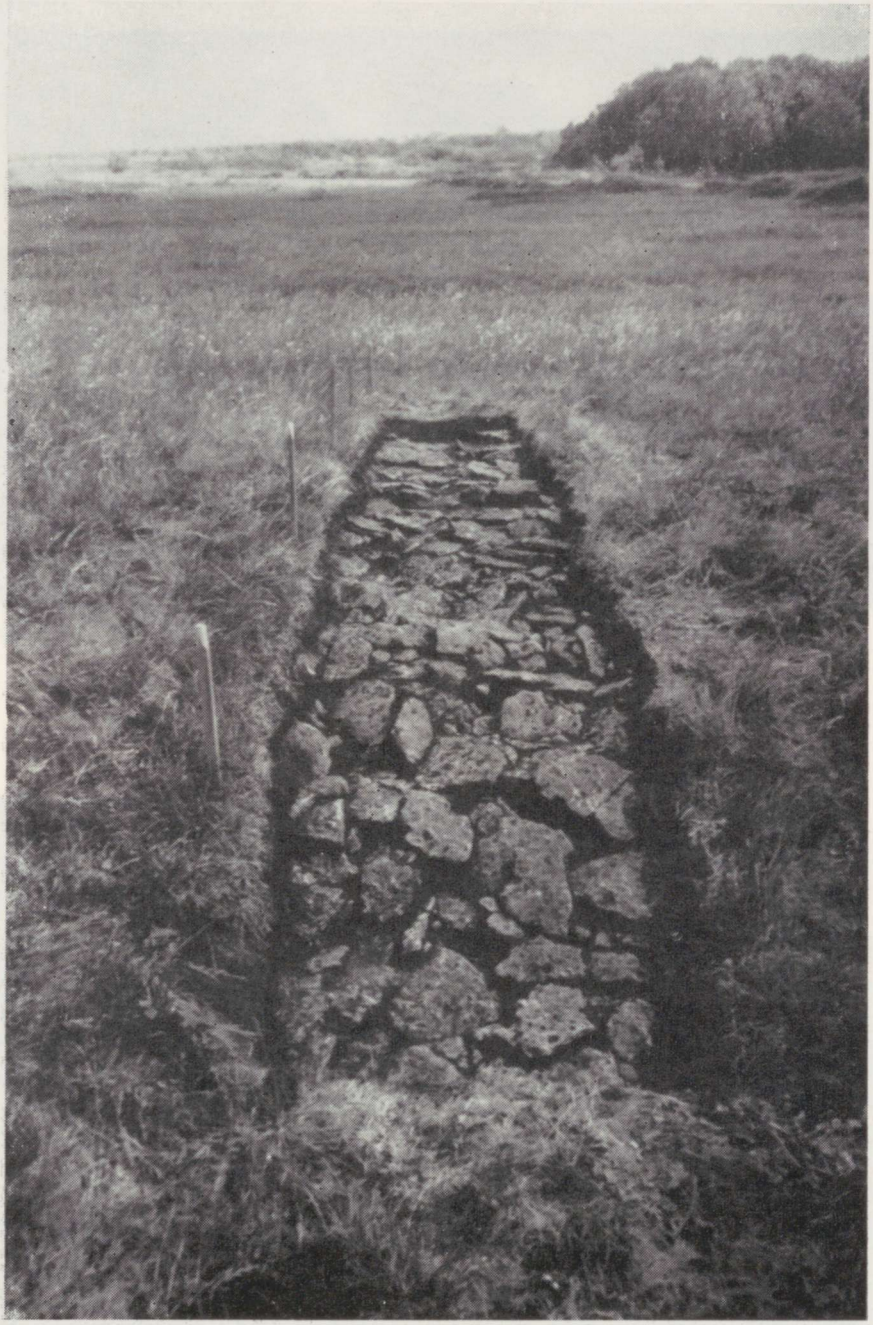
Trench in baulk no. 12 at Saha-Loo, the first layer of stones. Taken from the south.

Trench in baulk no. 12 at Saha-Loo, the second layer of stones. Taken from the north.

Trench in the cattle path (baulks nos. 117 and 118) at Saha-Loo. Taken from the east.



Saha-Loo. Clearance cairn p-48. The first (*1*) and the second (*2*) layers and limestone bedrock (*3*). Taken from the south.



Proosa. Trench in baulk no. 30. The first layer of stones.

1. Tōugu. Stone grave before the excavations. Taken from the south-east.

2. Tōugu. The cist in the grave. Taken from the west.

1. Tōugu. Tarand-walls of the grave. Taken from the north-east.

2. Tōugu. Tarand-walls of the grave. Taken from the east.

1. Tõugu. Clearance cairn before the excavations. Taken from the south-east.

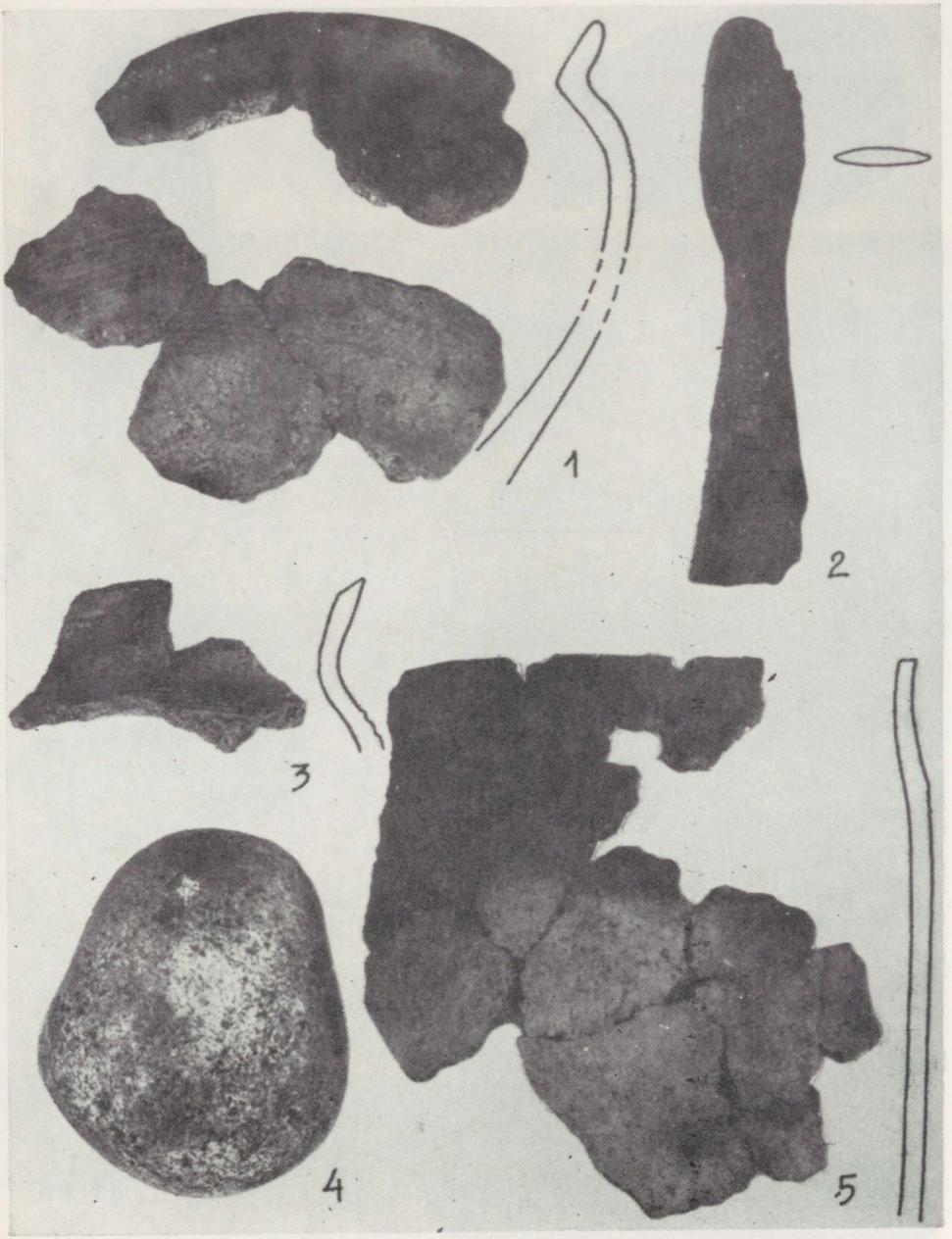
2. Tõugu. The first layer of stones of the clearance cairn.

1. Aindu. A view of the excavations area from the north.

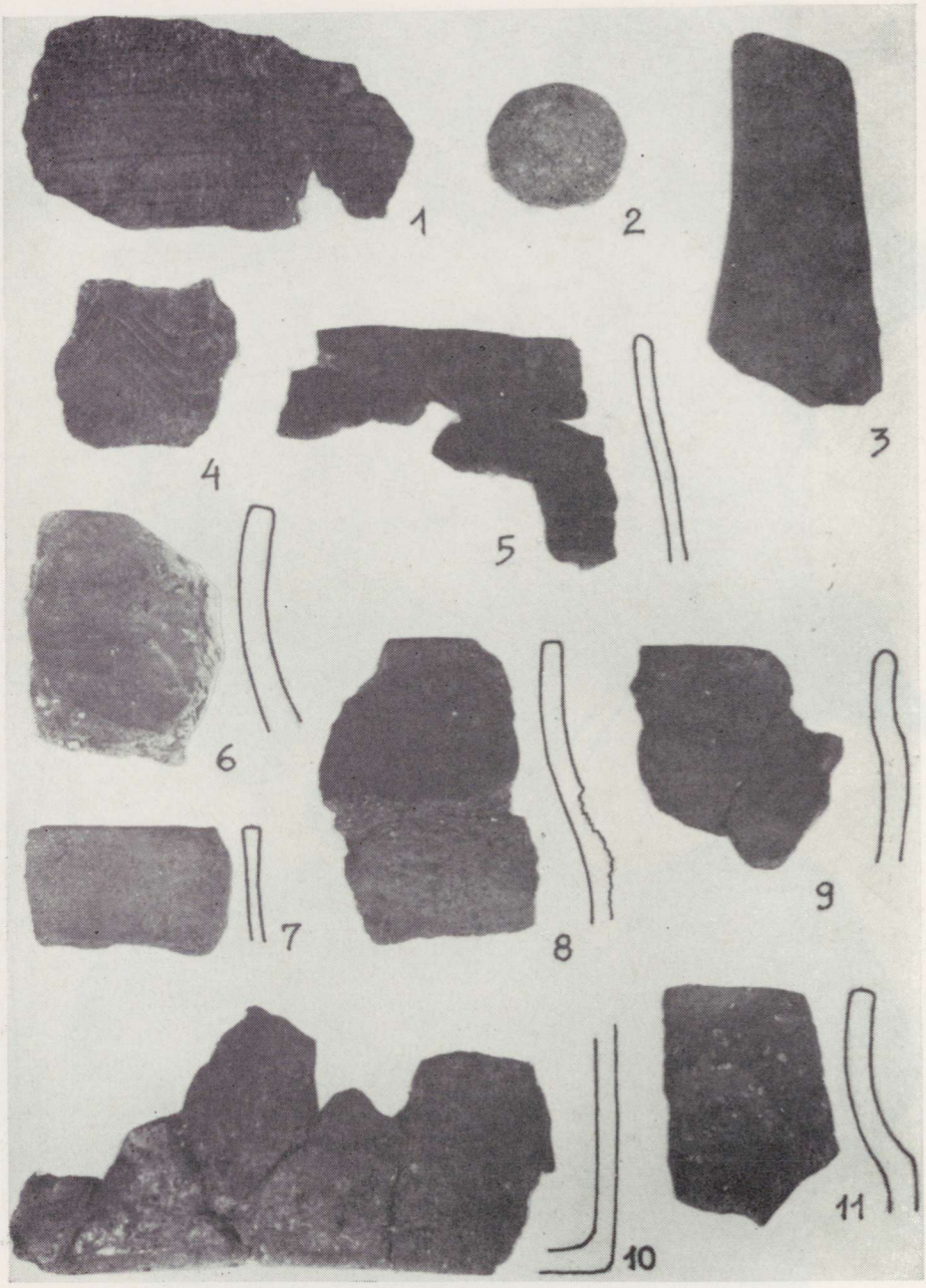
2. Aindu. Stove remains from the east.

1. Aindu. The cup-marked stone used in the stove in situ.

2. Aindu. The stone row foundations of log houses from the south.

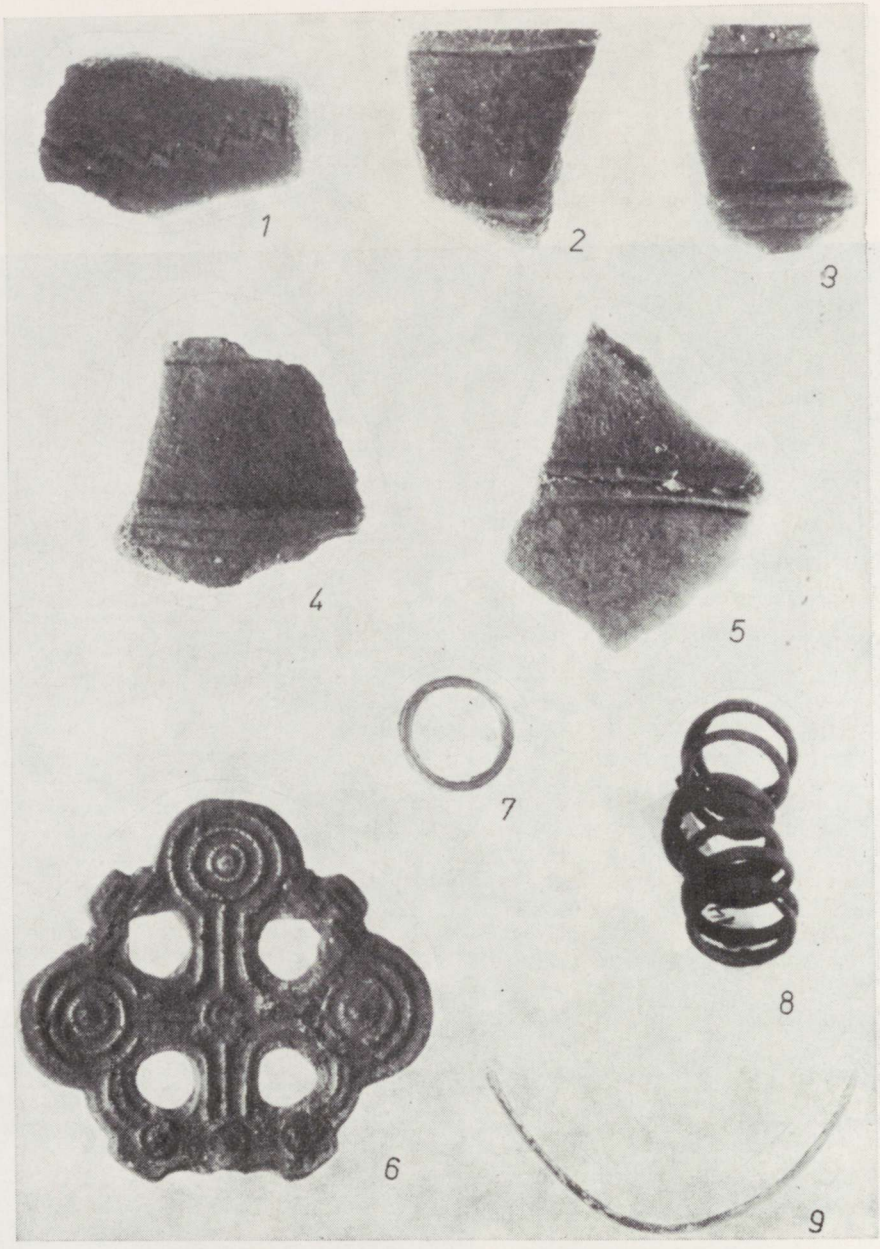


Finds from Aindu. *1*, *3*, *5* pottery, *2* spearhead, *4* grinding-stone. (TÜ 113: 28, 1, 45, 16, 58. — *1—3* — 2:3, *4*, *5* — 1:2.)



Finds from Aindu. *1*, *4—11* pottery, *2* clay ball, *3* whetstone fragment. TÜ 113: 67, 147, 69, 90, 108, 91, 89, 127, 130, 13, 109. — *1*, *5*, *8*, *9*, *11* — 3:4; *2—4*, *6*, *7* — 1:1; *10* — 2:3.)

Põide. Stoves nos. 2 and 3. Countours of buildings.



Põide. Finds from stronghold. *1* potsherd from the 12th—13th cen., *2—5* potsherds from the Merovingian period/early Viking Age, *6* double crossed pin-head, *7*, *8* spiral finger-rings, *9* piece of spiral bracelet. (SM 1460: 619, 669, 612, 617, 630, 677, 658, 624. — *6—9* bronze; all 3:4.)

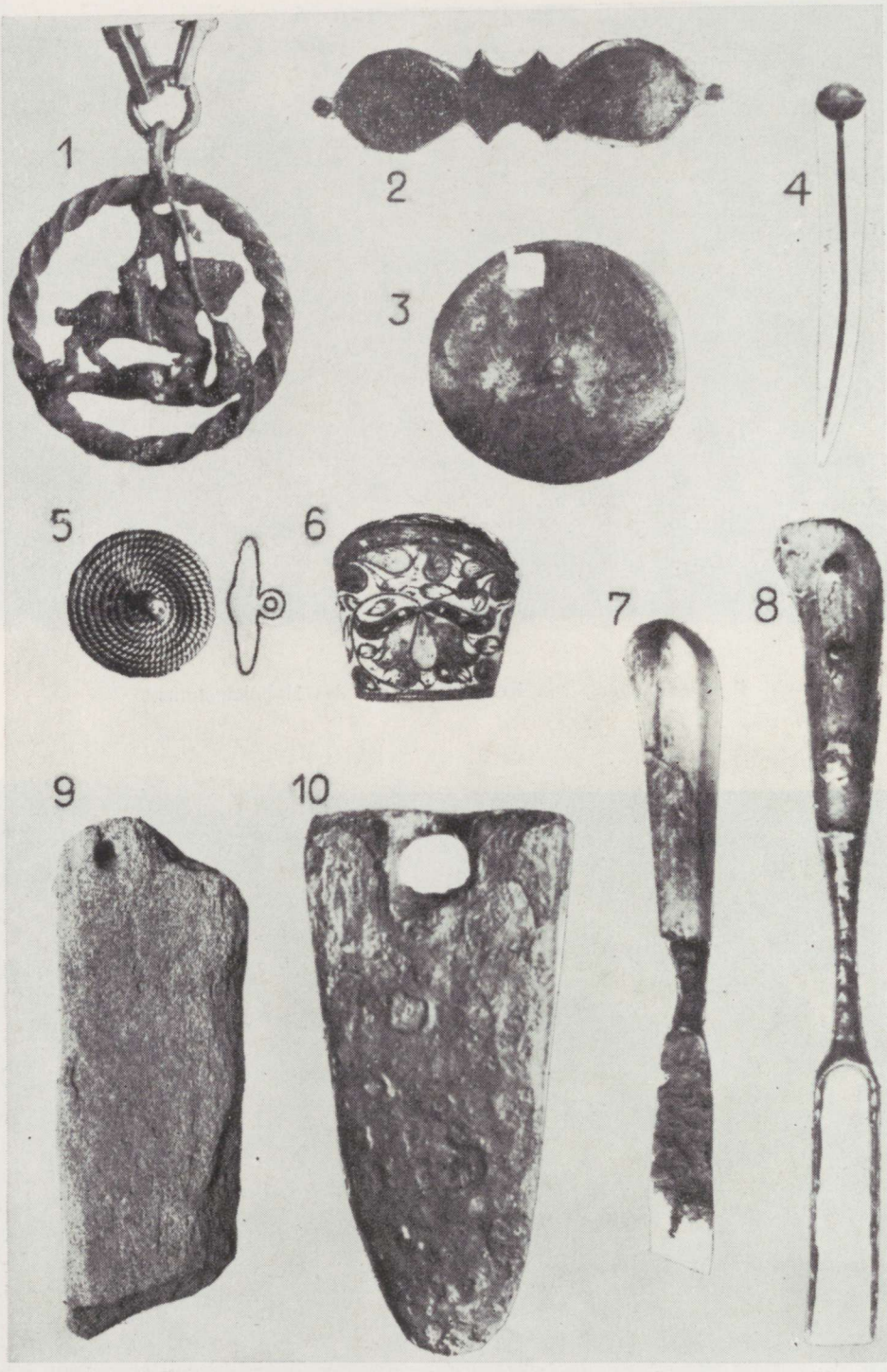
Pöide. Iron artefacts from stronghold. *1* spearhead, *2* blade of sword, *3* javelin, *4* knife with wooden haft, *5* fire-iron. (SM 1460: 700, 675, 679, 692, 614. — *1—3* ca 1:3, *4*, *5* 3:4.)

1. Vasallenburg von Keila. Diele.

2. Vasallenburg von Keila. Vertiefung des Hypokaustofens.

1. Vasallenburg von Keila. Heizraum des Hypokaustums.

2. Vasallenburg von Keila. Mauerähnliche Bildung im östlichen Teil der Grabungsstelle.



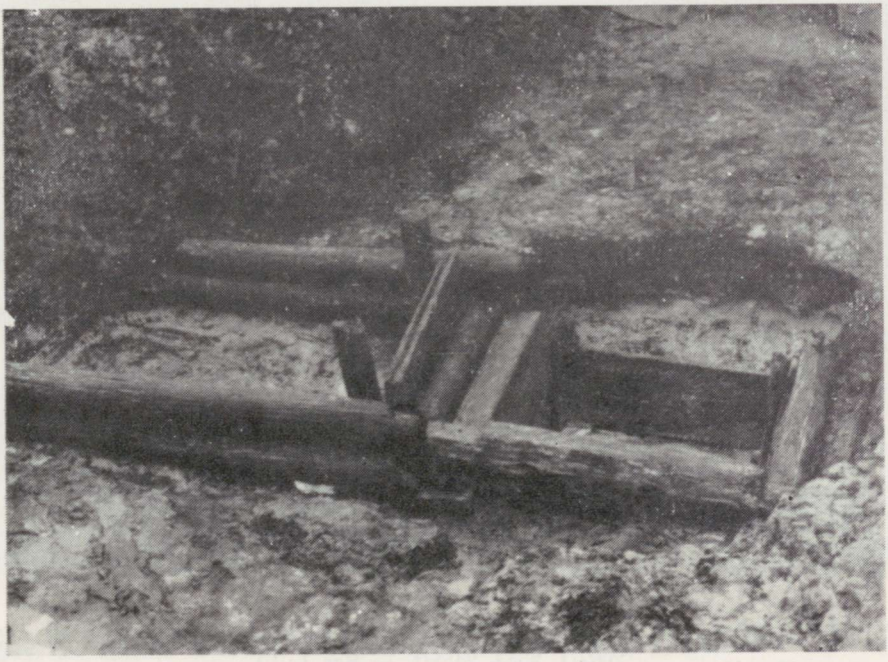
Funde von Keila, *1* Anhänger, *2*, *3* Beschläge, *4* Stecknadel, *5* Knopf, *6* Messergriff, *7* Messer, *8* Gabel, *9* Schleifstein, *10* eiserner Gegenstand. (HMK 1155: 308, 166, 280, 288, 279, 266, 167, 188, 344, 195, — *7*, *8*, *9*, *10* — 2:3, alle anderen — 1:1.)

1. Тарту, ул. Кююни. Остатки деревянных заборов на юго-восточном краю раскопа. Вид с юго-запада.

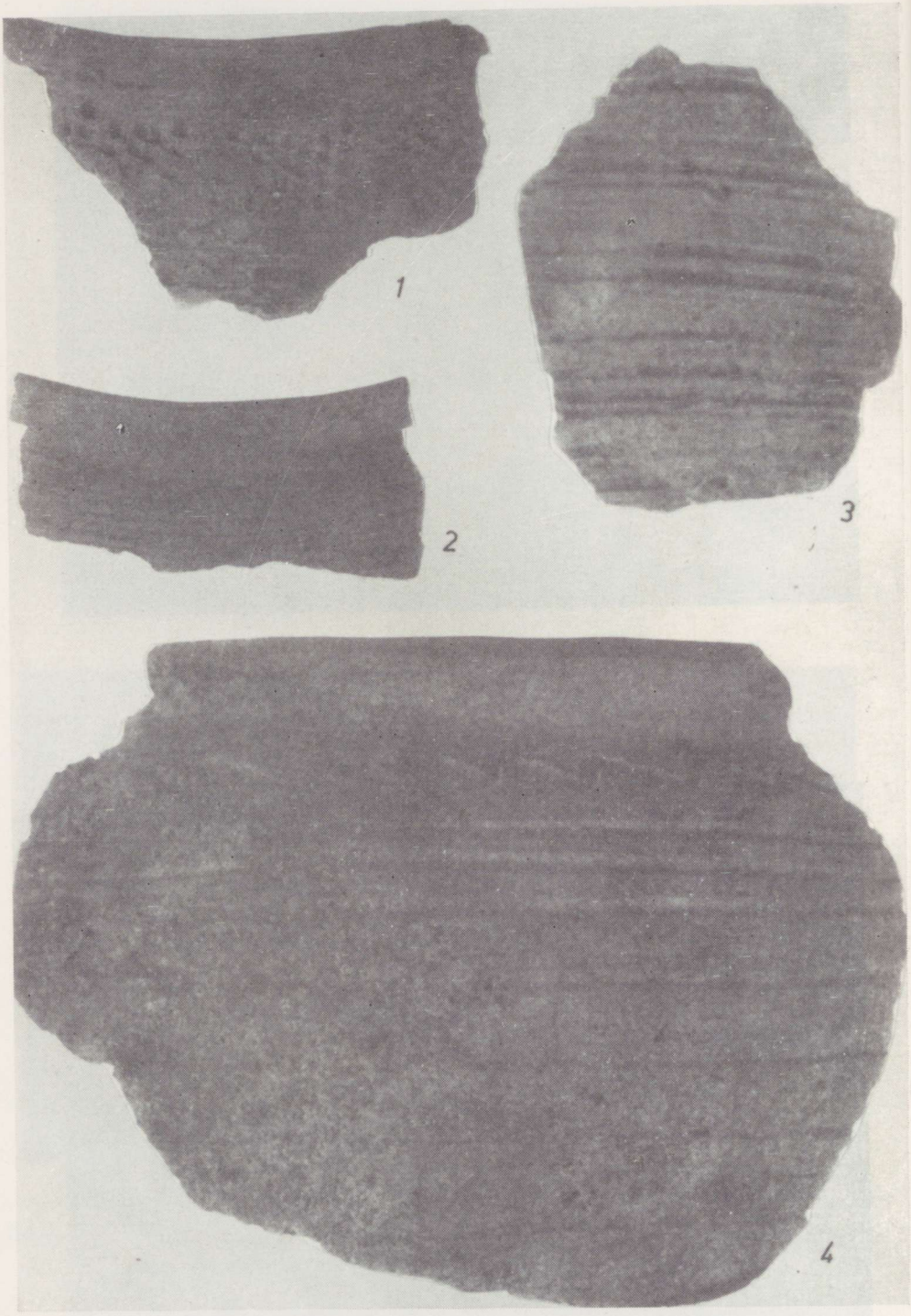
2. Тарту, ул. Кююни. Остатки печи. Поздний строительный этап. Вид с севера.

Тарту, ул. Кююни. Остатки печи. Ранний строительный этап. Вид с северо-запада.

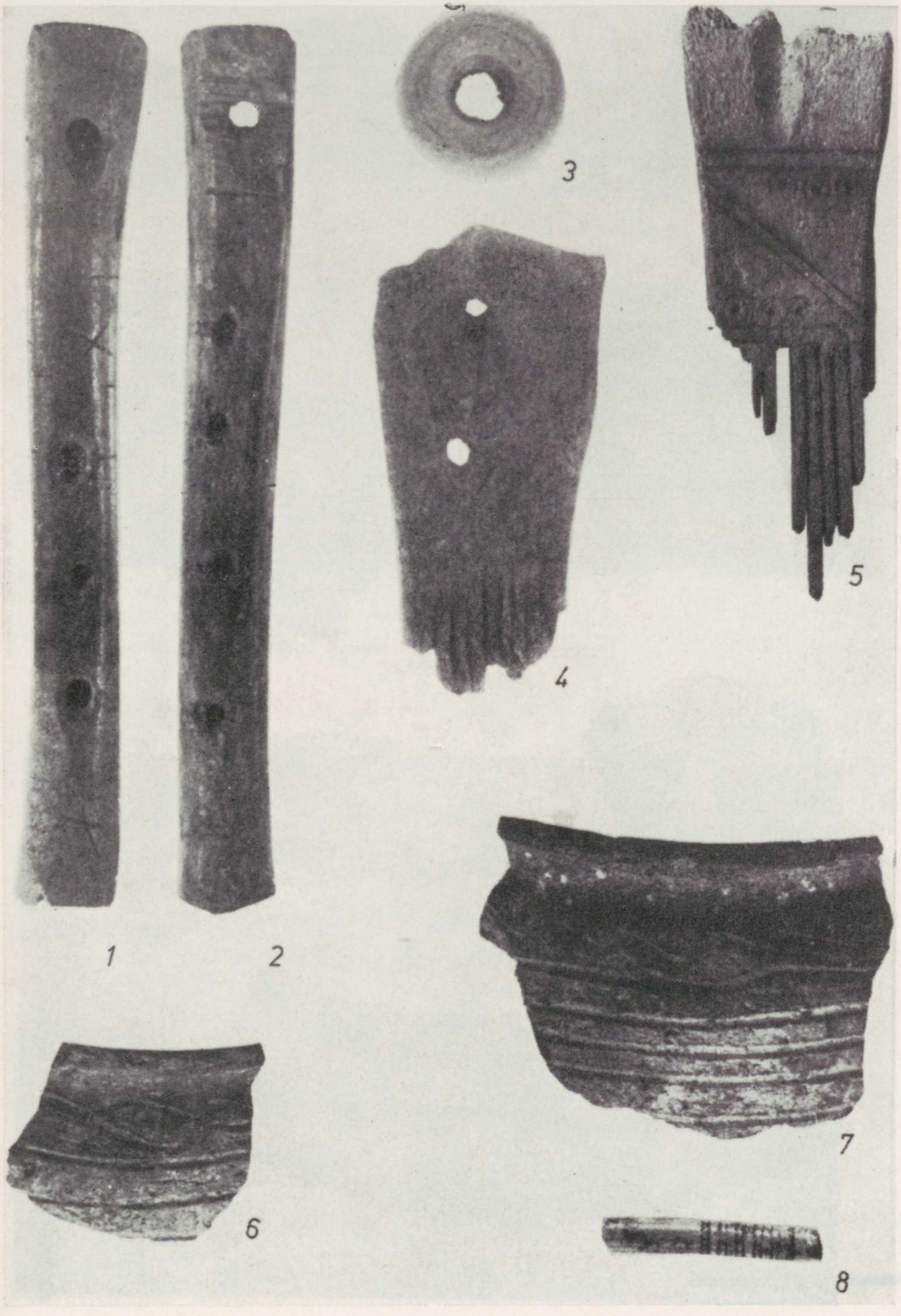
1. Тарту, ул. Кююни. Остатки водоотводной системы. Вид с юга.



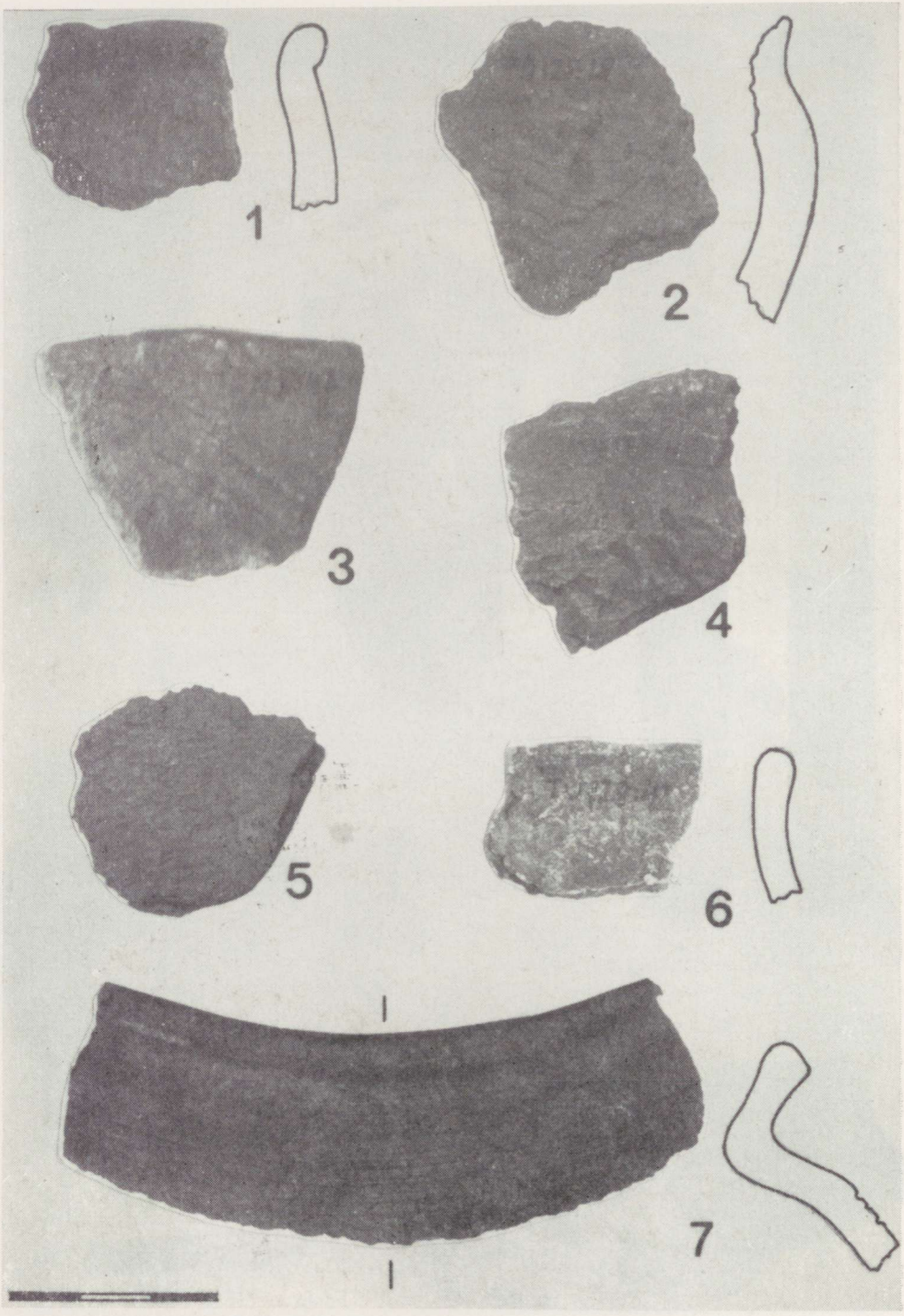
2. Тарту, ул. Кююни. Остатки водоотводной системы. Вид с запада.



Тарту, ул. Кююни. Образцы профилей гончарной керамики (TM 2126/A 51: 2521, 2067/1, 2553, 2455/1. — Все 1 : 1.)



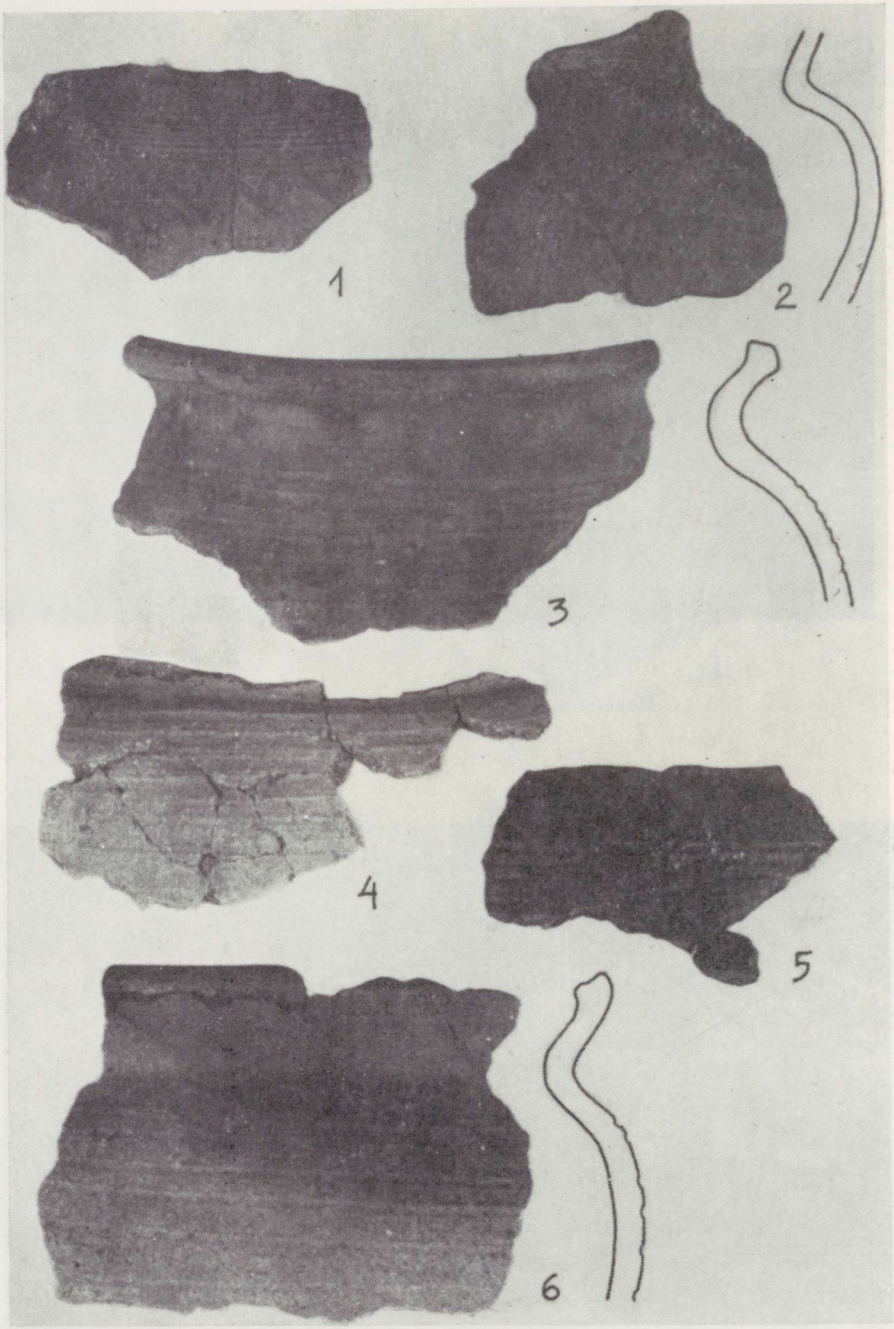
Тарту, ул. Кююни. Вещевые находки. *1, 2* костяные свирели, *3* пряслице, *4, 5* фрагменты костяных гребней, *6, 7* гончарная керамика, *8* фрагмент глиняной курительной трубки. (ТМ 2126/А 51: 3139, 3145, 2320, 2284, 2537, 2455/2, 2460/6, 3234. — *1—5* — 1 : 1; *6—8* — 1 : 2.)



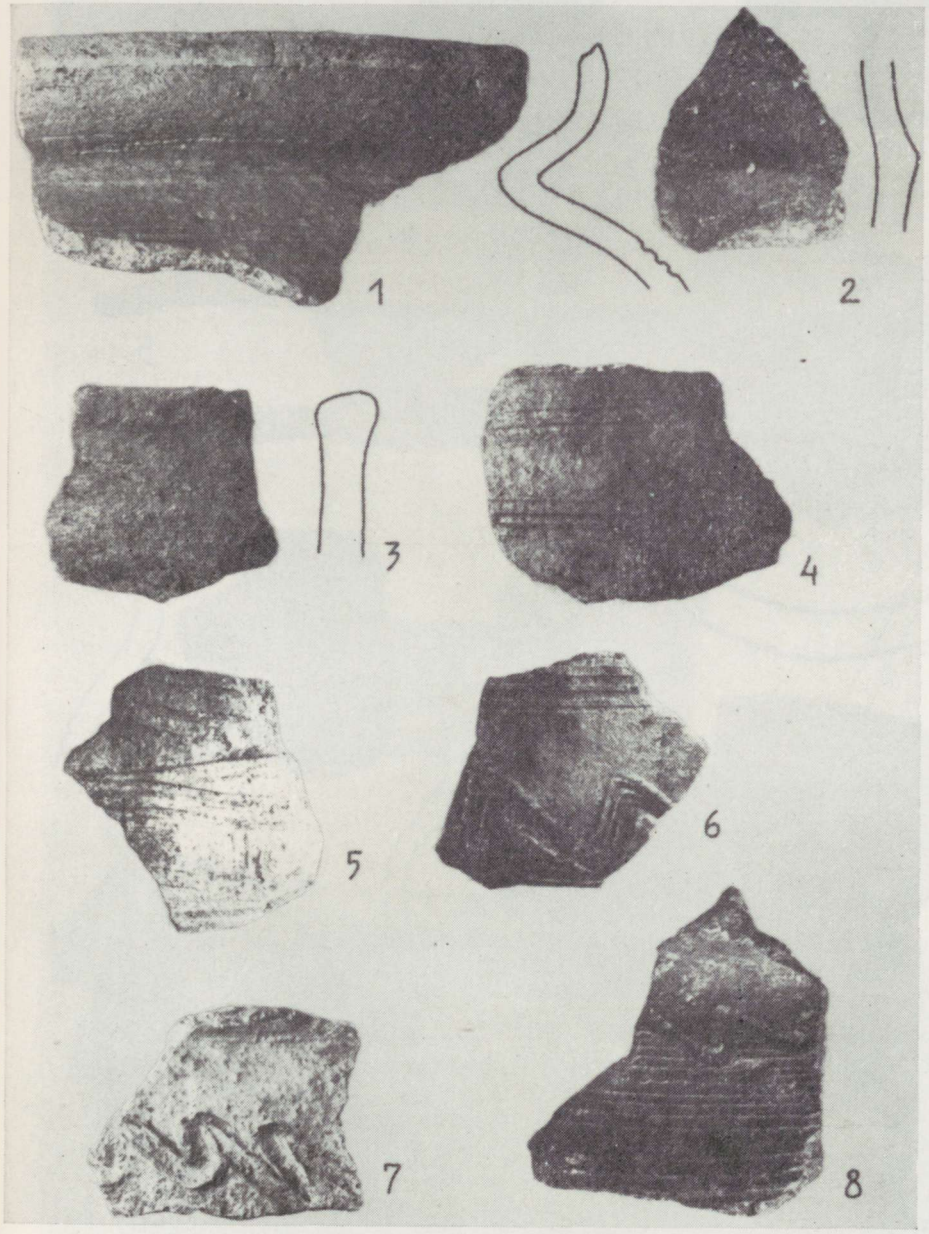
Керамика из Калатсова. (TU 128. — Все 1 : 1.)

1. Раскоп в месте заселения Уусвада.

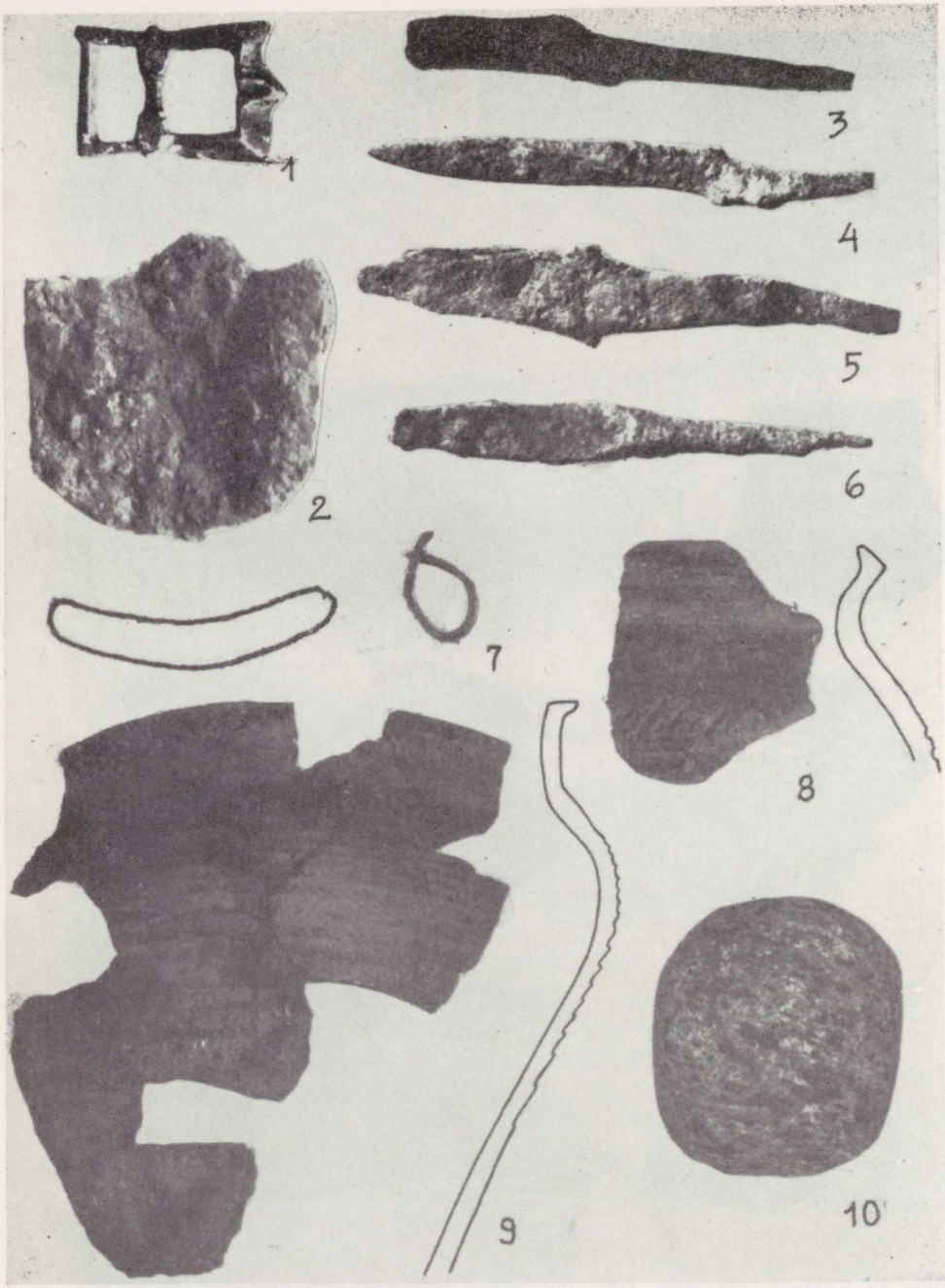
2. Лес Талька. Группа Талька-1, курган № 3.



Керамика из Уусвада. (TÜ 113: 1701, 1703, 1645, 1706, 1699, 1673. — Все 2 : 3.)



Керамика из Уусвада. (TÜ 113: 1458, 1063, 1418, 963, 758, 916, 1651, 855. — *1, 3* — 2 : 3; *2, 4—8* — 1 : 1.)



Находки из Уусвада. *1* пряжка, *2* фрагмент сохи, *3—6* ножи, *7* колечко, *8*, *9* образцы профилей гончарной керамики, *10* зернотерка. (TÜ 113: 1131, 1963, 704, 1549, 1672, 1029, 765, 854, 962; TÜ 117: 6. — *1, 2, 4—6* — 1 : 1; *3, 8* — 3 : 4; *9, 10* — 1 : 2. — *1, 7* бронза, *2—6* железо.

Глиняная посуда из Талька. (ТÜ 115: 45, 44. — 1 : 2.)

1. Fossil fields in Jalase. Trial excavation of the clearance cairn No 1 in section 68 of the Abru forest. Taken from the west.

2. Jalase. An old karst crack in section 68 of the Abru forest. Taken from the east.