

The Flintminer as a Farmer, Hunter and Antler Collector.

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Introduction

In various parts of Europe where flint-bearing chalk layers are found at an exploitable depth Neolithic man quarried the flint nodules that were so important for the fabrication of many kinds of implements.

The following four groups of zoological material have been found in connection with flintmines.

1. Remains of domestic and wild animals;
2. The remains of animals that fell or crept into the mines by themselves;
3. The remains of some of the miners;
4. Implements of red deer antlers.

I will discuss here briefly the zoological remains in the mines of Rijckholt-St. Geertruid in the south of the Netherlands in Limburg (fig. 1), at the Camp-à-Cayaux near Spiennes in Belgium and those of Grime's Graves in England.

Remains of domestic and hunted wild animals

Remains of both groups of animals were found in the shafts of all three mining areas but not in corresponding places or in similar numbers.

Camp-à-Cayaux near Spiennes in Belgium.

At the Camp-à-Cayaux numerous bones of domestic and wild animals were found in the uppermost filling of the vertical mine shafts together with charcoal, many potsherds, querns, baking discs, pieces of clay with the impression of cereal grains in them, implements of bone and antler, and the usual flint implements and waste products (CLASON, 1967). These are all objects that are usually found in refuse pits of Neolithic and later settlements. It therefore seems to me that the upper part of the mine shafts were used as refuse pits by the flintminers, who had built their houses near their mines, on the Camp-à-Cayaux. The remains of domestic animals predominated over those of wild animals. Remains of cattle, small ruminants, goat, pig and dog were

found. The bones of larger wild animals belonged to wild boar, red deer, roe deer and aurochs. Also the remains of smaller mammals and larger carnivores such as hare, beaver, fox, bear, pine-marten, and wildcat were collected in small numbers. We can take it that the farmers had cleared part of the woods to obtain space to cultivate cereals, and that the domestic animals were kept on waste land and herded to some extent in the woods.

Rijckholt-St. Geertruid in the Netherlands.

In Rijckholt-St. Geertruid small-scale excavations were undertaken by the Biologisch-Archaeologisch Instituut in 1923, 1924, 1925 en 1927 under the direction of Prof. A.E. VAN GIFFEN in the area of the Schone Grub. In 1964 an excavation was conducted by Prof. H.T. WATERBOLK on the plateau east of the slope on which the Groot Atelier is situated, and just north of sites VII and VIII excavated by VAN GIFFEN in 1923 (fig. 1, 2).

From 1928-1930 a group of French Dominican monks excavated in 28 places along the Schone Grub (fig. 1). The Schone Grub is an erosion gully in the high plateau of the River Meuse which cuts through chalk layers covered by loess. The Groot Atelier is a large concentration of worked flints on the south slope at the entrance of the Schone Grub. It was found later that from this place a system of horizontal mine shafts radiated under the high plateau (FELDER and RADEMAKERS, 1969). In 1964 the tops of 10 mine shafts were found, four of which were partially further excavated. In the filling of three shafts a few animal remains were found: in shaft no. 10 the remains of a new born calf, in shaft 4 the tibia of new born pig, two molars of domestic cattle and one of a small ruminant, from shaft 7 the distal part of a tibia of a red deer was collected.

VAN GIFFEN (1925) mentions in general that he found remains of cattle, sheep, horse, red deer, roe deer and dog during the trial excavations of 1923. More specified are the finds from pits I, II and III where he found respectively: fragments of red deer antler and belemnites, fragments of red deer antler and an antler of a

Fig. 1. The Schone Grub and the places where Van Giffen (V.G.), the Dominican monks (D1-28) (after Van Giffen 1953) and Waterbolk (1964) excavated. The original data about the sites excavated by the Dominican monks were not available to me. D9 is missing but there are two places marked D6.

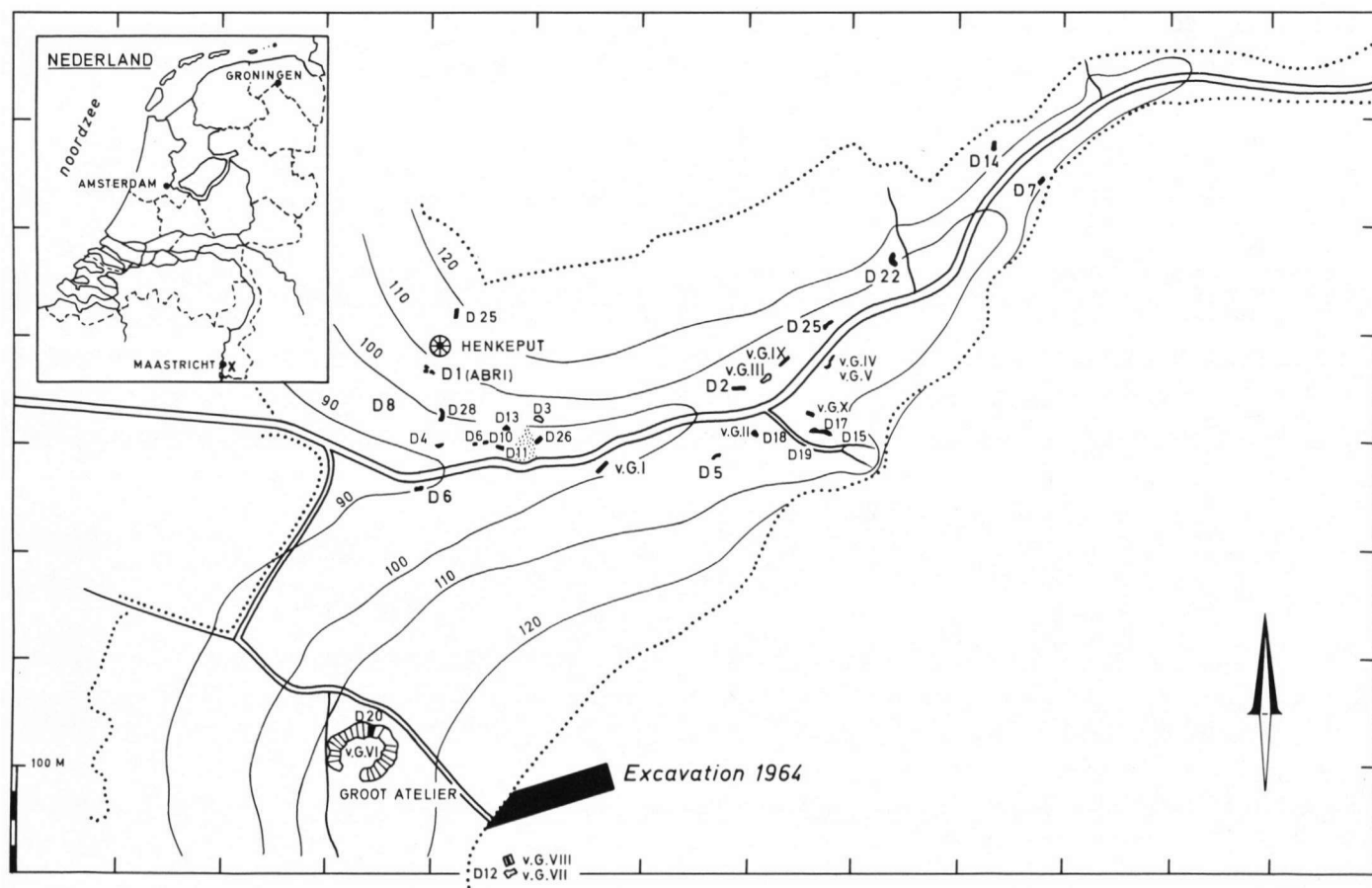




Fig. 2. The Schone Grub, 'Groot Atelier', site VII (1923) and the cutting of 1964.

Fig. 3. The miner of Obourg, Belgium (after De Laet, 1974).

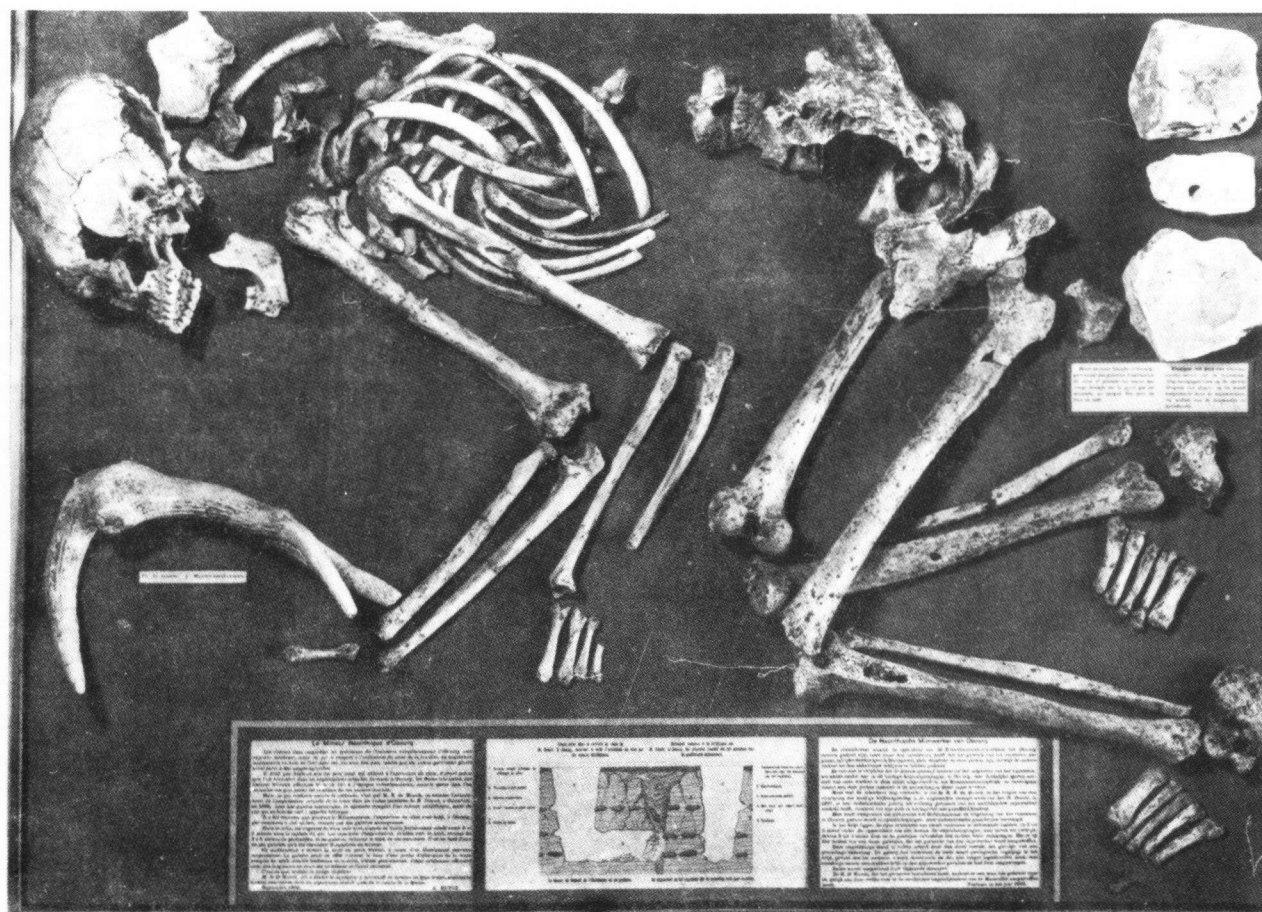




Fig. 4. Site VII (1923) with 'second pick' (Rijc. 71) in situ.

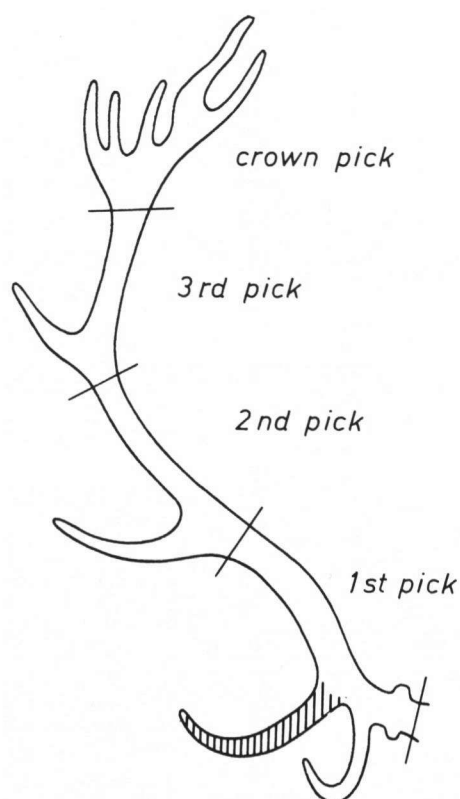


Fig. 5. Red deer antler with places of the 1st, 2nd, 3rd and crown pick.

roe deer, and the metatarsus and phalanx III of cattle and an upper jaw of a dog. In figure 5 of his article he depicts a lower jaw of a pig among the finds from the shaft fillings of one of the mines of the plateau (VII). In a later article (1953) he also published the picture of a dog's lower jaw together with the upper jaw from trench III.

The filling of the entrance of the mine shaft found at site no VII, excavated by Van Giffen contained ashes, sherds, charcoal, a polished stone axe and a flint arrowhead. It seems possible that at Rijckholt-St. Geertruid we have excavated part of the edge of the settlement, which was situated south of the 1964 excavation trench.

During the later excavations in the same area, carried out by the 'Workgroup Prehistoric Flintmining', of part of the galleries and a shaft no remains of any domestic or hunted animals were found. Five antler fragments of red deer are an exception most probably they were collected shed antlers.

Grime's Graves (Norfolk) in England.

In Grime's Graves an area of 700 square meters was recently investigated by members of the 'Workgroup Prehistoric Flintmining' from the Dutch Geological Society (department of Limburg) together with staffmembers of the British Museum in London (FELDER, 1977; BURLEIGH et al., 1977). During those excavations of Greenwell's Pit the nearly complete skeleton of a dog was found next to numerous picks of red deer antler of which a small number (2%) belonged to hunted stags*. No other remains of domestic or hunted wild animals were found in the excavated shaft of Grime's Graves.

It therefore seems justified to postulate that the miners working at Grime's Graves did not live in the immediate vicinity of the mining area, as the Spiennes miners certainly did, and probably also those of Rijckholt-St. Geertruid.

The dog skeleton had belonged to an animal that according to Clutton-Brock (BURLEIGH et al., 1977) stood 52 cm at the shoulder, had a rather short broad head and was young, healthy

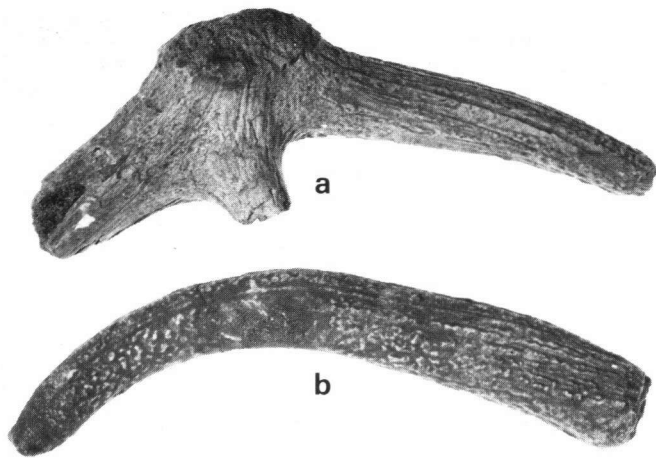


Fig. 6. a. First pick, Rijckholt, 74;
b. cut-off tine with rounded top, Rijckholt, 73.

and probably thin. We can compare this shoulder height with those calculated for two Spiennes dogs of 34.7 and 42.9 cm. Belonging to the same period are remains of a dog of Bergschenhoek (not published) with a shoulder height of 44.8 cm. Younger is a dog of Vlaardingen (ca. 2400 BC) with a shoulder height of 47.7 cm. The condylobasal length of the Grime's Graves dog of 168.8 cm can be compared with an estimated condylobasal length for Spiennes of 147.4 cm, for Rijckholt of 153.0 cm and for Swifterbant (ca. 3400 BC) of 159.0 cm (CLASON, 1979). It seems that these continental dogs were smaller than the dog of Grime's Graves.

The remains of animals that fell or crept into the mines by themselves.

This group includes snails, animals that crept into the mines by themselves, and small mammals such as shrews and rodents, as well as frogs and toads that fell into the mine shaft when these were open.

In Grime's Graves no such remains were found, which according to the excavators implies that the mine shafts were immediately filled again with waste material from the shaft excavated next. In Rijckholt-St. Geertruid the situation seemed to have been different as in some shafts (no. 13 and 21) numerous snail shells were found, as well as the remains of small vertebrates. This implies that at any rate some of the mine shafts in South-Limburg were not immediately refilled. It also implies that the shafts were open during summer or early autumn.

The miners

Both in Belgium and in Limburg remains of the miners themselves have been found during the excavations of the shafts and galleries.

Well-known are the skeletons of miners who died as a result of accidents in the Belgian mines of Obourg (fig. 3) and Devy. From Grime's Graves and Rijckholt-St. Geertruid no such finds are known.

Both in Belgium and in Rijckholt-St. Geertruid human skulls were found in connection with the mines. In Spiennes nine skulls were found, in the upper filling of mine shafts. According to DE LAET (1974) these skulls were intentionally buried in the shafts. In Limburg a skull was found by HAMAL-NANDRIN in the Schone Grub. A second skull was found in one of the mine galleries during the systematic excavations of the Workinggroup.

It is not the aim of this paper to describe and discuss the human remains further.

Implements of red deer antler

The fourth group of animal remains found in connection with the mines are numerous picks and other tools made of red deer antler.

Antler picks were found in the shafts and galleries of Grime's Graves and Spiennes. In Rijckholt-St. Geertruid only five antlers were found in the galleries during the systematic excavation of the mines by the Mine Workgroup. Of these five antlers only one was a pick.

The other antler implements, belonging to the collection of the Biologisch- Archaeologisch Instituut, were found during the trial



Fig. 7. Second pick, Rijckholt, 71.

excavations of VAN GIFFEN in 1923 and later, and by the Dominican monks who worked in the same area from 1928-1930. Only one pick is known to have been found in a mine shaft (no. VII of VAN GIFFEN) (fig. 4). For the other implements it is not always certain where they were found. The Dominican monks however have in a number of cases noted the depth at which the antler tools were found. Unfortunately not all the tools have been numbered, or the number was lost. VAN GIFFEN has published in 1953 a map with a number of the sites where the Dominican monks collected antler tools. The original of this map and the data concerning the finds are not at the B.A.I. Probably they are part of the inheritance of VAN GIFFEN (died 1971) that is blocked.

Deer population dynamics and the necessity to herd deer

Before describing and discussing the antler tools for Rijckholt-St. Geertruid first something has to be said about the way in which the antlers were acquired by the miners. Antlers are grown and cast annually by the male red deer - the stag. According to LOWE (1977) antlers are cast mainly in March and April in Britain. Old stags and those in optimal conditions cast first. Yearlings seldom cast before June and occasionally delay casting until August or September. The antlers are always cast in the same area by the same animal. In the Netherlands stags in the Veluwe cast their antlers from February until May (YSSELING and SCHEYGROND, 1950).

Little is known about red deer population dynamics in woodland. There are however some data available for Scotland. The adult sex ratio is variable. The average is 1 stag to 1.6 hinds in Scotland, but 1 stag to 1.3 hinds is more probably elsewhere. Also the population is very variable. On an average 13 deer live on 1 km², with a maximum of 77 deer per km² in some deer forests in Scotland.

Only in Grime's Graves were the antler picks collected systematically during the excavation of the Dutch Flintmining Workgroup. From the number found it was estimated that 82,000 antler picks were used under the ground and another 12,000 pieces for digging the shafts. It was taken that one pick was needed for one m². This means that annually 354 antlers were used.

According to Dr. CLUTTON-BROCK, of the British Museum (Natural History), who is studying these antlers, 98% of these picks are made of naturally shed antlers. Antlers both of the right and the left side were used. In Grime's Graves only the base of the antler with the first tine and beam were used as pick, so that the antlers of at least 177 stags had to be collected annually. If we use the numbers given by LOWE for mean and maximum density of deer in Scotland, then this means that in the former case the antlers had to be collected from an area of ca. 35 km² and in the latter case from an area of ca. 5 km². The latter number will probably approach the situation around Grime's Graves, where woodland was present better than the former. So we can surmise that the antlers were collected in spring around Grime's Graves or in the not too remote area where the settlement of the



Fig. 8. a. Second pick, Rijck. 75;
b. Second pick, Rijck. 2.

Fig. 9. Detail of second pick, Rijck. 75 (fig. 8a) with a little flint piece embedded in the spongiosa.



miners was situated. It is not necessary to postulate that during the Neolithic red deer were kept in a (semi-) domesticated state and herded by man in England. This also applies to the Southern Netherlands. Here the antlers were used more economically than in England, since not only the base, brow tine and beam were used to make picks but also the trez tine with part of the upper part of the beam as handle. In favourable cases it was even possible to make a pick out of the crown. Also the tines were used without handles. If in South-Limburg the same number of picks had been used each year as in Grime's Graves there would have been even less need for the flint miners to herd red deer than in England.

The antler tools in the collection of the B.A.I. in Groningen
As already stated these antlers were collected by VAN GIFFEN and Dominican monks in the nineteen-twenties. For only one of the antlers is the findspot exactly known. This was in the upper filling of a mine shaft (VI) on the high plateau (fig. 1).

Since only a few antlers were found in the galleries it is not certain whether in Rijckholt-St. Geertruid the antlers were used for mining the flint as was the practice in Grime's Graves. It is more likely that most of them were used for digging the shafts, as is suggested by the way in which they were found, probably in shafts, during digging of small trial trenches in the slopes of the Schone Grub by Dominican Monks. It has been suggested that in Limburg the chalk was too hard to use antler picks, in contrast to the situation at Grime's Graves and probably also in Belgium, where the miner of Obourg died with a pick in his hand. The possibility that the antler tools were used for digging shafts has not been proven by the excavations of the Flintmining Workgroup, who restricted their work to the horizontal galleries, with the exception of shaft 32 (BOSCH, 1975). Further excavation of other shafts might shed light on this question.

At least nine types of antler tools can be distinguished, for six of which a digging function seems appropriate**.

1. First Pick

The first picks are made out of the base, brow tine and beam of an antler. If a bez tine has been developed this is cut away. In total six first picks are present in Groningen.

Nr. Rijck. 74. 1923/VIII¹⁴ — First pick made out of a l. naturally shed antler. The bez tine was chiselled away. The brow tine is broken. The rose has been worn away by use (fig. 6a).

Nr. Rijck. 41 1929/XII³⁷⁸ (D15, 6") — First pick made out of a l. naturally shed antler. The brow tine is rounded, the rose missing and the beam broken.



Fig. 10 Fragments of an object that was probably an axe, Rijc. 72.

Nr. Rijc. 45, ? — First pick made out of a r. naturally shed antler. The rose is worn away by use, the bez tine possibly broken off. The beam is broken.

Nr. Rijc. 48, ? — First pick made out of a r. naturally shed antler. The rose is worn away. The bez tine is undeveloped. The beam was cut off and hollowed out.

Nr. Rijc. 26, 1929/XII³⁸⁰ (D24, 50 cm). — Fragment of a first pick made out of a naturally shed r. antler. Both beam and brow tine were broken recently. The bez tine was cut off. The rose has been worn away by use.

Nr. Rijc. 70, ? (D9, 4m). — First pick made out of a r. antler. The rose has been cut away. The bez tine was cut as far as the spongiosa and then broken. The brow tine is rounded and shows cut marks.

2. Second Pick

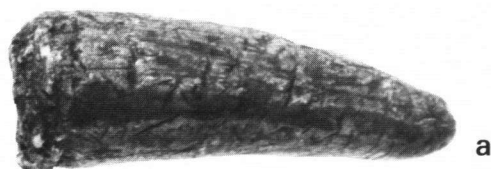
Second picks are made of the trez tine and part of the beam. Nine second picks are present in the Groningen collection.

Nr. Rijc. 75, 1925/VII^{19b}. — The trez tine is worn down nearly to the beam. In the working part a flint splinter is embedded (fig. 9). The beam has been severed by chiselling (fig. 8a).

Nr. Rijc. 71, 1925/VII¹⁹. — This second pick is made out of a 1. antler. It was found in the top filling of a mine shaft by Van Giffen during his excavation in 1923 (fig. 7a). The beam under the trez tine was severed by chiselling.

Nr. Rijc. 55, 1929/XII³⁸⁵. — Second pick made out of a 1. antler. The beam above the trez tine has been cut off. This tool was probably used for a short time.

Nr. Rijc. 1, ? (D9, 2^m). — Second pick made out of a r. antler. The beam was cut off under the trez tine. The trez tine and the beam above the trez tine were damaged recently.

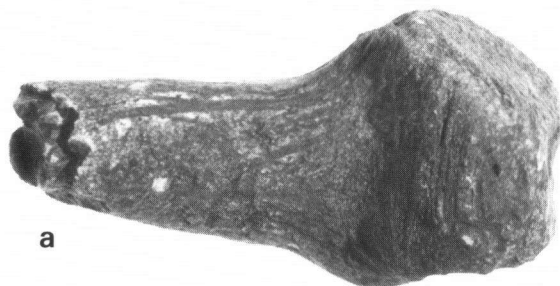


a

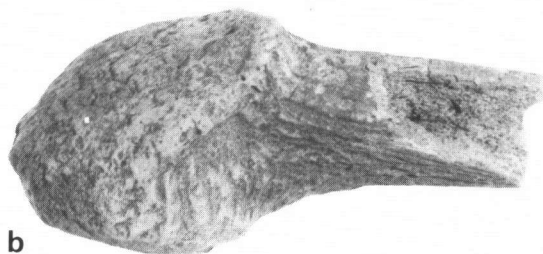


b

Fig. 11, a. Intentionally cut-off tip of a tine rounded by use, Rijc. 72; b. manchet ? , Rijc. 72.



a



b

Fig. 12, a. Antler hammer, Rijc. 76; b. idem, Rijc. 66.

Nr. Rijc. 47, 1929/XII³⁷⁷ (D10, 1.50 m). — Second pick made out of a 1. antler. All ends have been broken recently.

Nr. Rijc. 64, ? (D9, ?). — Second pick made out of a r. antler. The trez tine and the beam above the trez tine have been broken recently. The beam above and below the trez tine has been severed by cutting.

Nr. Rijc. 52, ? (D15, 2m) — Second pick made out of a r. antler. The trez tine and the beam above the trez tine have been broken recently. The beam below the trez tine has been severed from the antler by cutting. The cut marks are still clearly visible.

Nr. Rijc. 46, ? (D19, 4m). — Fragment of a second pick.

Nr. Rijc. 2, ? — Second pick made out of a r. antler. The trez tine is rounded by use. The beam under the trez tine has been severed from the antler by chiselling (fig. 8b).

3. Third pick

These are made out of the fourth tine and part of the beam and possibly the crown. Three third picks are present in the Groningen collection.

Nr. Rijc. 77, 1929/XII³⁸⁴. — This pick was possibly made out of a r. antler. The fourth tine was smooth due to use.

Nr. Rijc. ? — Of another third pick the end of the tine was rounded by use (fig. 7b).

Nr. Rijc. 69, ? — The last third pick is made out of a fourth tine. The tine was sharpened on two sides. The marks are still clearly visible.

4. Crown pick

The terminal tines and antler crowns were apparently also used as is shown by the points of tines which have been worn down by use. There are six crown picks in Groningen.

Nr. Rijc. 54, 1929/XII³⁸³. — Two terminal tines rounded by use and a part of the beam.

Nr. Rijc. 40, 1929/XII³⁷⁹ (D17, 4m). — Part of a crown. The beam has been carved away. The carving marks still show clearly. One of the tines was severed from the antler by chiselling.

There are four more crowns or parts of crowns. All four have one or more tines rounded by use.

5. Cut-off tine with rounded top

Nr. Rijc. 73, ? (D9, 1.5m) and ? — Both have been cut off the beam (fig. 6b).

There are three more tines that have been intentionally cut off the beam but these are without rounded tops (Rijc. 5, 8, 9, 32).

In the case of four tines with rounded tops it is not possible to see whether they were broken off, or whether they were intentionally severed from the beam.

Nr. Rijc. 37, ? (D3). — The top is much rounded and the surface shows many cut marks. The tine is hollow.

Nr. Rijc. 60, 1929/X³⁸². — This piece could belong to group 5.

Nr. Rijc. 10, ? — The tip is not exceptionally rounded.

Nr. Rijc. 50, ? — The tip is rounded. The surface shows many cut marks.

6. Tips

In a number of cases the tip of a tine was cut off intentionally and used. These are not longer than 6-8 cm. There are three in Groningen, nr. Rijc. 18, ? (D3) and two without any old number (Rijc. 67, 79) (fig. 11a). To this group may belong two other tips, which seem however to have been broken off naturally. One of them is covered with many cut marks (Rijc. 19, 30).

7. Manchet

Nr. Rijc. 68, ? (D3, 1m). — A Fragment of a beam is hollowed on one side. This piece resembles a haft for a stone axe as found in the Swiss lake dwellings. The 'shaft hole' is more or less rectangular (fig. 11b).

8. Axe

Nr. Rijc. 72, ? (D9, 3m). — The pedicel and the

base of an unshed antler were used for the fabrication of an object that was probably an axe. The working part is however missing. The shaft hole is more or less rectangular (fig. 10).

9. Antler hammer

Two objects, resembling hammers, were made out of the base of an antler and the brow tine. The beam was cut off intentionally. Two such objects are present in Groningen.

Nr. Rijc. 66, ? (D17). — Hammer made out of the base of a naturally shed r. antler. The rose worn away by use (fig. 12b).

Nr. Rijc. 76, ? — Hammer made out of the base of a naturally shed 1. antler. The rose is worn away by use (fig. 12a).

10. Waste and damaged fragments

There are 16 fragments that must be waste or that have been so much damaged recently it is impossible to say whether they are tools. Three of them are beams which show one or two places where it was attempted to drill a hole through the beam. These are numbered Rijc. 57, ? (D19, 1 m); ? (D20, 50 cm) and ? . The others are partly numbered: Rijc. 25, 1925/VII^{19a}; Rijc. 15, 1929/XII³⁸¹; Rijc. 39, 1929/XII³⁷⁰ (D9, 2.50 m); Rijc. 34, 1925/VII²⁸; Rijc. 33, ? (D10 probably; Rijc. 14, ? (D9); Rijc. 7, ? (D19). Three were without any number.

11. Unshed, unused antlers

Nr. Rijc. 4, ? (D19). — Left antler with part of the skull.

Nr. Rijc. 12, ? — A r. antler of a young animal with a part of the skull.

? — Antler and pedicle of a young animal.

* Personal communication of J. Clutton-Brock

** Since only a small number of antlers of Rijckholt-St. Geertruid of the B.A.I.-collection were numbered, we numbered them Rijc. 1979, 1-88.

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