NL Netherlands

NL 1 Rijckholt/St. Geertruid
NL 2-3 Valkenburg aan de Geul
NL 3 VALKENBURG AAN DE GEUL, LIMBURG PROVINCE

Neolithic flint extraction at Valkenburg aan de Geul

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INTRODUCTION

In 1970 a series of prehistoric flint procurement sites was discovered in the surroundings of Valkenburg aan de Geul (Fig. 1) (Felder and Bosch 1971a, 1971b; Felder 1975, 1980). Local amateur archaeologists appeared to have known some of those sites since the late twenties, but they had failed to make them public (Brounen, Pisters and Ploegaert 1993). In the eighties additional extraction sites of the so-called Valkenburg flint type were reported from Visé-St. Pietersberg (Marichal 1983), Valkenburg-Plenkertstraat (Brounen 1993; Brounen, Pisters and Ploegaert 1993; Brounen and Ploegaert, in press), Groot-Welsden and the Bemelerberg near Bemelen (pers. comm. W.M. Felder).

Since no excavations were conducted in the years subsequent to the discovery, only a limited amount of information on, for example, the nature of the exploitation and the range of implements used was available. Most authors that have published on the subject supposed that the flint nodules had been extracted from the more or less weathered chalk in shallow open pits, by means of antler "picks". Marichal (1983) and Pisters (1986) mentioned some notched mining implements, so-called Kerbschlägel (Weiner and Weisgerber 1980), which were found at the Schaelsberg procurement site. Radiocarbon dates of antler fragments from three different extraction sites clustered between $4385 \pm 60$ BP and $4150 \pm 60$ BP (Felder 1981).

It was not until 1990 that an exploitation zone of Valkenburg flint was examined by way of a small-scale excavation (Brounen 1992). The investigation formed part of a research project that in 1988 was initiated at the Leiden Institute of Prehistory. It was financially supported by the Foundation for Archaeological Research (ARCHON), which is subsidized by the Netherlands Organisation for Scientific Research (N.W.O.).

GEOGRAPHICAL LOCATION

Natural outcrops of chalk deposits bearing Valkenburg flint are geographically limited to south-west Limburg and a neighbouring part of Belgium. The extraction sites known so far are situated in the valley slopes of the rivers Maas and Geul.
and in the slopes of dry valleys that have eroded into the edge of the Margraten plateau.

![Prehistoric extraction sites of Valkenburg flint](image)

Fig. 1. Prehistoric extraction sites of Valkenburg flint: 1 — Valkenburg-Schaelsberg; 2 — Valkenburg-Plenkerstraat; 3 — Valkenburg-Heunsberg /-Sprookjesbos /-Geböschke; 4 — Valkenburg-Biebosch /-St. Jansbos; 5 — Valkenburg-Sibbergrubbe; 6 — Groot-Welzen; 7 — Bemelen-Bemelerberg; 8 — Cadier en Keer-Mettenberg; 9 — Cadier en Keer-Koeburg /-Bundlerberg /-Schiepersberg; 10 — Cadier en Keer-Keerderbosch; 11 — Gronsveld-Trichterberg; 12 — Gronsveld-Savelsbosch; 13 — Visé-St. Pietersberg.

**GEOLOGY**

In a primary geological position Valkenburg flint occurs in the Maastricht lithofacies of the Upper Cretaceous Maastricht Formation. Within the formation only two stratigraphical units contain exploitable quantities of nodules *vig*, the Schiepersberg and the Emael Chalk (Felder 1975, 1980). The horizontal distribution of flints is discontinuous. Concentrations of nodules are separated by “barren” zones of rock. Valkenburg flint can also be extracted from residual slope deposits or be collected in gravel deposits of the river Maas.

**CHARACTERISTICS OF THE FLINT TYPE**

The raw material is usually described as rather coarse-grained. In a fresh condition it is predominantly light- to bluish- and brownish-grey in colour. It is matt and granular-looking at the fracture and completely opaque. The flint may be banded. Its cortex is granular and rough, but mostly even, well delineated and of variable thickness (1–10 mm). Due to the susceptibility of the flint type to chemical alterations, prehistoric artefacts often have changed in appearance. They look coarser grained and more “porous” compared to the original raw material. Those that have been collected in a loess soil tend to have become pale brown. Artefacts from (poor) sandy or gravelly soils often have changed to a smudged light grey.

Within the broad range of variability in colour and texture a certain subtype should be mentioned that in archaeological collections usually is not identified as Valkenburg flint. It is medium-grained, greyish brown and somewhat translucent, showing many light dots. The comparatively smooth fracture displays a slight lustre. Artefacts produced from this subtype of raw material seem to patinate at a slower rate.
EXTRACTION UNITS

The Biebosch

In 1990 a number of small trial pits was dug at the Biebosch site. It is a wooded promontory overlooking the Geul valley. flakes and bits of chalk on the surface indicate that flint had been extracted in the slope. The artefact scatter has the shape of a long, narrow zone of more than 1500 m length. The assumed practice of open exploitation was validated by the uncovering of a few shallow diggings of some 1.9 m deep, about half-way up the slope of a dry valley flanking the Biebosch on the west side. It is known as the Sibbergrubbe. In the immediate vicinity of these features a small flint mine was discovered (co-ordinates: 186.550/318.375). It consisted of a trench measuring $5 \geq 1 \geq 3$ m and two relatively short galleries at its extremities. The largest of those was 2.5 m long and 1.5 m wide. The mine was sunk into the solid Emael Chalk. Several Kerbschlägel were found, embedded in a layer of chalk debris covering the floor of the trench and partly filling the two workings.

As one of the galleries was connected to the working of an adjacent mine, it is to be expected that more of these shallow mines can be found in the Biebosch.

The Plenkertstraat

In January 1992 three galleries of separate Neolithic flint mines were discovered in a chalk-bluff bordering on the Plenkertstraat at Valkenburg aan de Geul (co-ordinates: 185.685/319.625). They had been cut as a result of chalk quarrying that presumably took place in the early 19th century (Brounen 1993; Brounen, Pisters and Ploegaert 1993; Brounen and Ploegaert in press). The mines are situated at the foot of a slope that adjoins the bottom of the Geul river valley.

A trial excavation revealed the galleries (Fig. 2) and sectioned shafts (Fig. 3) of seven mines, each about 5 m apart from the other. Their depth ranges from about 4 to 6 m in those cases in which the floor of the shafts was reached in trial pits. The exception is a shaft where a testpit and subsequent borings have indicated that its depth surpasses 8 m. The diameter of the partly preserved shafts ranges from nearly 3 to more than 6 m. Comparatively shallow shafts gave access to galleries of modest proportions: 3.5 m long at the maximum. Information on galleries of the deep shafts is lacking, since their subterranean workings were not investigated.

All but one mine were sunk into the Emael Chalk. In the deepest extraction unit nodules seem to have been extracted from the Schiepersberg Chalk.

The seven damaged extraction units that were explored are likely to represent the poor remains of a far larger exploitation zone along the valley slope, that for the greater part has been destroyed by chalk quarrying and building activities.

Apart from the mines at the Biebosch and the Plenkertstraat similar extraction units have been noticed in rock-faces at other locations in Valkenburg aan de Geul.
Fig. 2. NL. 3 Valkenburg aan de Ceul. Galleries in a rock-face at Valkenburg-Plenkenstraat.
They too had been cut by chalk quarrying. Consequently it can be suggested that besides open pit exploitation the mining of flint was a regular way of extracting raw material from chalk beds in the Valkenburg region.

MINING TOOLS

At three extraction sites antler implements have been found (Fig. 4), all of them in an archaeological context suggestive of open pit exploitation (Eggen 1971; Felder 1973, 1981). The excavations at the Biebosch and at the Plenkertstraat have not
Fig. 4. NL 3 Valkenburg aan de Geul. Antler “pick” found at Valkenburg ± 1930.

yielded a single piece. Apart from flint artefacts, charcoal and an occasional snail-shell the mines are bare of finds.

The Kerbschlägel seems to be the most characteristic type of implement used by Neolithic miners extracting Valkenburg flint (Fig. 5). Specimens have been found at the Schaelsberg, the Biebosch, the Wiegersdel (west slope of the Sibbergrubbe, opposite the Biebosch) and the Plenkertstraat. At the Plenkertstraat, moreover, flake-axe-like instruments have been found in the galleries (Fig. 6). The narrow end usually is the functional part of the tool (cf. Weiner and Weisgerber 1980). Rejected rough-outs for axes were also used in the mines.
Fig. 5. NL 3 Valkenburg aan de Geul. Kerbschlägel (Valkenburg-Plenkertstraat).

Fig. 6. NL 3 Valkenburg aan de Geul. Flake-axe-like implement (Valkenburg-Plenkertstraat).

PRODUCTION

Though blade and flake tools and even some tanged-and-barbed points made of Valkenburg flint are known, the greater part of the implements collected are axes.

From the massive amount of flakes and a number of rejects at sites like the Biebosch and Schaelsberg it is clear that primary and to a lesser extent secondary reduction took place at the extraction sites. Workshops have also be found on the fringes of plateaux and headlands in the vicinity of exploitation zones. Others were discovered at distances up to
5 km from the raw material sources. Judging from the character of the flint debris, people seem to have been engaged in the production of rough-outs for axes at those sites. Flint nodules or primary flaked pieces have been worked at settlements as well (cf. below).

**DISTRIBUTION**

Artefacts — mostly (fragments of) axes — of Valkenburg flint have been found at distances of about 200 km from the source area, that is in Luxembourg (Marichal 1983) and in the Dutch province of Drenthe (Beuker 1988)

**DATING AND CULTURAL RELATIONS**

In addition to the dates on three procurement sites mentioned by Felder (1981), radiocarbon dates are known for charcoal samples collected in two of the Plenkerstraat mines and the Biebosch mine:

- GrN-19830: 4610 ± 80 BP (Plenkerstraat IV)
- GrN-19831: 4670 ± 70 BP (Plenkerstraat II)
- GrN-19832: 4330 ± 60 BP (Biebosch)

In cultural terms the greater part of the five extraction sites dated are contemporary with the Stein group of the Wartberg/Stein/Vlaardingen complex (Louwe Kooijmans 1983). When the dates for the Plenkerstraat mines are calibrated using a double s.d., it appears that they possibly could have been exploited during the period of the late Michelsberg Culture.

Data from excavated settlement sites allow for broadening the time-span in which the raw material was used. Occasional, regional use is documented for the Middle and Late Palaeolithic (Magdalenian). The same goes for the Mesolithic, though it should be noted that it concerns pieces that have been collected from surface scatters. In the late Linear Bandkeramik (LBK) nodules of Valkenburg flint were worked to produce mediolithic blades in settlements that are located at 10–15 km from the source area (De Grooth 1987). In the form of blanks or tools it was transported to LBK and Rössen settlements in the German Aldenhovener Platte area (Zimmermann 1988).

Since the raw material type is especially suited for the production of axes, the greater part of the exploitation should have taken place in the middle and late Neolithic. Besides the above-mentioned ¹⁴C-dates, this is corroborated by finds at, for example, the early Michelsberg Culture (MK I) site Koslar 10 (Marichal 1983) and the Hazendonk site Linden (Louwe Kooijmans and Verhart 1990). Recent excavations at a MK II site at Maastricht-Vogelzang (Brounen 1994) have revealed two concentrations of Valkenburg flint flakes that presumably are indicative of the production of rough-outs for axes at the settlement. Late Neolithic axes or fragments of those are known from for example Koningsbosch (Van Haaren and Modderman 1973; cf. Brounen and Ploegaert in press) and Ewijk (Asmussen and Moree 1987).
REFERENCES


