The articulation of a "New neolithic"

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Appendix 2. A description of the flint artefacts

Introduction
In this section, a short explanation of the used code list is presented. This should clarify the use of various terms in this study. In this way, no explanations of the various terms need to be repeated in the sections on the flint artefacts of the various sites. The analysis of flint artefacts may be compared to the analysis of pottery in that all archaeologists prefer their own descriptive system. This is a serious hindrance in comparing the results of various studies. Instead of creating a new descriptive system, I decided to follow an existing system, developed for (amongst others) the description of Michelsberg flint artefacts by J. Deeben and J. Schreurs (in prep.). This choice of a descriptive system has as a direct consequence that comparison of the flint assemblages of the Swifterbant Culture with those of the contemporary Michelsberg Culture, studied by Schreurs, is comparatively straightforward. Since some tool types are absent in the Michelsberg Culture, but do appear in Swifterbant contexts, the descriptive system was expanded where necessary. However, the structure of the system remained intact. The code list is reproduced below. First, the variables of the system are presented.

Dimensions
The length, width, and height of the artefacts are measured in 1 mm intervals in order to analyse the dimensions of the flint pieces. In this study, the average lengths of complete blades and flakes are presented for all studied samples.
In general terms, the average length is used to assess the size of the raw material used. It may be clear that small-sized raw material prohibits the production of large tools.
It is thought that even if cores are rare finds in site contexts, the average length of blades and flakes may be used as an indication of the size of the raw material. See below, on raw material.

Weight
The weight is recorded down to 0.1 g for every artefact, since the use of different raw materials and the proportion of burnt flint can probably better be estimated on the basis of weight percentages than on the basis of numbers. A good example of the greater appropriateness of weight percentages is offered by the raw material type *polished fragments of indet raw material*. As polished flint axes are not thought to have been produced on the flint types which were acquired within a short distance, the presence of very small axe fragments (identified on the basis of a polished surface) is an indication of long-distance flint (see below for definitions of short-distance and long-distance flint). For this reason, the occurrence of small flint fragments with a polished surface is an important observation, which justifies the use of a special category for this material (see below, on raw material). The identification of other types of raw material is less simple, and only possible for larger artefacts. This implies that imported flint types are more important in number percentages than in weight percentages. It is thought that the weight percentages are in this case better suited for typifying the relative importance of the various types of raw material.

The extent and kind of cortex
Under this variable, two different aspects of cortex are coded: the extent of the dorsal side covered with cortex/patina, and the type of cortex/patina. Both patina and cortex are included in this variable, since they form the surface of the raw material. In contexts where flint material has been transported (river deposits, boulder-clay), a patina may have developed. This is coded as 'smooth cortex' (codes 1 and 2). Codes 1 and 2 can thus be related to three types of raw material: terrace flint, pebble-Meuse eggs, and boulder-clay flint. A second type of cortex is labelled rough cortex. This material has a more irregular surface which means that it has not been much transported (codes 3 and 4). The extent of cortex cover on the dorsal side is also coded, as it may produce insight into the size of the raw material used.

Fragment
The state of fragmentation of the flint artefacts is coded to allow the selection of complete artefacts for determining the average length of flakes and blades.

Degree of burning
The proportion of burnt flint material and the degree of burning might serve as a parameter of site function. See further section 3.8.4.

Raw material
The list of types of raw material which is reproduced below, consists of two major categories: flint types acquired within a short distance and long-distance ('imported') flint types. The first category comprises pebble-Meuse eggs and terrace flint, flint types that were probably the most easily available to the people in the river district (Hazendonk and Brandwijk), although the places of origin are impossible to determine. The nearest sources were perhaps located on the ter-

minal moraines near Nijmegen or in the province of Utrecht (pers. comm. L. Verhart 1997). For Swifterbant, P14 and Hüde, erratic flint of boulder-clay origin forms the only short-distance flint type. Other sources of flint material were farther away. Rijckholt, Valkenburg, Light-grey Belgian and Zevenwegen flint were in one way or other acquired over a long distance.
Erratic flint was transported to the northern part of the study area during the Saale glaciation. During this glacial period, the moraines reached far into Europe, depositing a large amount of material including flint nodules. Erratic flint may be identified by the frequent presence of inclusions of microfossils. Terrace flint and pebble-Meuse eggs were also transported into the study area, but in this case the rivers Rhine and Meuse were the medium of transportation. Both flint types were eroded from their primary locations by these two rivers, which subsequently reworked the material and transported it down-river. The reworking resulted in specific cortex characteristics and colours. Terrace flint is known in a wide variety of colours from grey, grey-brown, grey-green and grey-yellow to yellow and has a smooth cortex with the same colour. The oval to round Pebble-Meuse eggs are light-grey to dark-grey in colour and have a pecked, dark cortex (Löhr/Zimmermann/Hahn in Kuper *et al*. 1977, 158-159).
The Rijckholt flint type is named after the flint mines in this town in the southern part of Dutch Limburg. The flint is bluish to grey and black and sometimes has light coarser-grained inclusions. The cortex is often thin and is lined with a thin almost transparent zone (Löhr/Zimmermann/Hahn in Kuper *et al*. 1977, 157-158). Rijckholt-like flint is confined to the southern part of Dutch Limburg and the adjacent part of Belgium (Rullen; De Warrimont/Groenendijk 1993). A second group of imported material is known as Valkenburg flint. This flint type is found in primary position in southern Dutch Limburg and the adjacent part of Belgium. One variety is coarser-grained than Rijckholt flint and has a light-grey, blue-grey or brown-grey colour. The second variety is somewhat finer-grained and has a greyish-brown colour (Brounen/Ploegaert 1992, 189-190; Felder 1975; Floss 1994, 89; Marichal 1983, 6). A third distinct group of imported material is formed by flint artefacts of Light-grey Belgian type. The source of this flint type has not yet been identified, but a location in the Belgian province of Liège seems most likely. It is fine-grained and light-grey to dark-grey with lighter inclusions. The thin cortex is white to bluish and lacks an underlying translucent zone (Floss 1994, 90; Löhr/Zimmermann/Hahn in Kuper *et al*. 1977, 154). The final import group has been named ‘Zevenwegen’. The source of this flint type is unknown, but might be located in the south of Dutch Limburg (pers. comm. L. Verhart, 1996). It is translucent, fine-grained and black with a white cortex and sparse inclusions.
Polished fragments of ‘indet.’ material are also listed under the heading of *imported flint* as it is thought that polished flint axes were not produced on locally found flint types. The production of polished flint axes on erratic flint is generally believed to be impossible, as the quality of the material has been severely diminished by transport, frost and millennia of weathering between the deposition of the material during the Saale glaciation and the time of production (Beuker 1983, 10-13). Contrary to this view is a find in Hemmingstedt (Kr. Dithmarschen, Schleswig-Holstein). Here, debris from the production of various flint axes was found, suggesting that, at least in this area, erratic flint was indeed used for axe manufacture (Clausen in Bauch *et al*. 1994, 221-228). One may wonder whether erratic flint was also used for axe production in other areas. Until there is more evidence that this was the case, it is assumed that flint fragments with a polished surface from Swifterbant, P14 or Hüde contexts are remnants of imported flint axes.

Typology

The major difference between various descriptive systems of flint artefacts is found in the tool types defined. While there is a rough consensus on the use of terms describing the basic morphology of flint artefacts (cores, flakes, chips, *etc*.), the description of flint tools often starts with a new descriptive system. As stated in the introduction to this appendix, the singularity of all these descriptions makes it difficult to compare the flint assemblages of various sites. While descriptions of the flint artefacts of the Swifterbant culture are few — only the flint material from Hüde I and some material of the Swifterbant cluster has been published — it is quite difficult to compare the work of the two authors (Stapel 1991 and Deckers 1979; 1982; 1986 respectively). The work of both authors allows a detailed description of the flint artefacts of an individual site, because of large series of specific types and sub-types, but at the same time makes it more difficult to compare assemblages without concluding a) that the assemblages are dissimilar or b) that similarities can be found only by joining various subtypes into larger groupings. For example, it may be clear that if twenty subtypes of trapezes are distinguished (Deckers 1986, fig. 14), and an assemblage includes only five trapezes, any two assemblages will rarely show similar subtypes. The site-specific analyses of both Deckers and Stapel are not seriously hindered by this problem, but an intersite analysis such as this study needs a descriptive system better suited for a comparison of assemblages. The twenty subtypes of the example are therefore lumped as the single artefact type ‘trapeze’, thus showing that there are certain similarities between the assemblages studied by Deckers and Stapel (compare tables 3.9, 3.12, 3.14 and 3.43). To enable a comparison in terms of the major categories of tool types, the use of a less detailed classification of the tools is proposed.

INDIVIDUAL NUMBER

LENGTH	(.1mm)
WIDTH	(.1mm)
HEIGHT	(.1mm)
WEIGHT	(.1g)

KIND AND DEGREE OF CORTEX/PATINA

- 0 = absent
- 1 = smooth, <50%
- 2 = smooth, >50%
- 3 = rough, <50%
- 4 = rough, >50%

FRAGMENT

- 0 = complete
- 1 = distal part
- 2 = medial part
- 3 = distal and medial part
- 4 = proximal part
- 5 = proximal and medial part
- 6 = broken along longitudinal axis
- 9 = uncertain

DEGREE OF BURNING

- 0 = unburnt
- 1 = gloss
- 2 = red
- 3 = crackled
- 4 = potlidded
- 9 = uncertain

RAW MATERIAL

- 1 = terrace flint
- 2 = pebble-Meuse egg
- 3 = Rijckholt
- 5 = Valkenburg
- 8 = Light-grey Belgian
- 12 = Obourg/Zevenwegen
- 20 = erratic Northern flint
- 29 = indet.
- 30 = polished fragment of *indet.* material

TYPOLOGY

- 1000 Points
  - 1013 Trapezes
  - 1035 Triangular points with concave base and retouch covering half of surface
  - 1040 Drop-shaped points
  - 1051 Leaf-shaped points with straight sides
  - 1052 Leaf-shaped points with curved sides
  - 1071 Transverse arrowheads with straight base
  - 1072 Transverse arrowheads with pointed base
- 1100 Pointed blades
- 1200 Borers
  - 1210 Blade borers
  - 1220 Flake borers
  - 1290 Borer, basic morphology uncertain
- 1300 Burins
  - 1320 AA-burins
  - 1340 Multiple burins
- 1400 Combination tools
  - 1490 Reamers/blades with retouched sides
- 1500 Scrapers
  - 1511 Blade scrapers
  - 1512 Blade scrapers with retouched sides
  - 1513 Double blade scrapers
  - 1515 Blades with concave end retouch
  - 1516 Blades with nosed end
  - 1521 Flake scrapers
  - 1522 Flake scrapers with retouched sides
  - 1523 Double flake scrapers
  - 1524 Thumb-nail scrapers
  - 1525 Round scrapers
  - 1527 Side scrapers
  - 1560 Block scrapers
  - 1590 Scrapers, indet.
- 1600 Flint axes
- 1700 Retouched blades
  - 1710 Retouched blades (>1mm)
  - 1711 Retouched blades (<1mm)
  - 1740 Truncated blades
  - 1750 Denticulated blades
- 1800 Retouched flakes
  - 1810 Retouched flakes (>1mm)
  - 1811 Retouched flakes (<1mm)
  - 1813 Flakes with surface retouch
  - 1850 Denticulated flakes
- 1900 Retouched blocks and other material
  - 1910 Retouched core-rejuvenation flakes
  - 1961 Retouched block (<1mm)
- 2000 Other tools
  - 2090 Indet.
- 3000 Waste
  - 3010 Blocks
  - 3030 Cores
    - 3035 Flake cores with single negative
    - 3036 Flake cores with two negatives
    - 3037 Flake cores with multiple negatives
  - 3050 Flakes
  - 3059 Chips
  - 3060 Blades
- 4000 Miscellaneous

Code list for the description of flint artefacts.