

X. Basic statistics

1. Surface area

According to data supplied by the Dutch Geological Survey:

Prehistoric area within which flint was either picked up, excavated or worked: 25 hectares.
Prehistoric mining area, inclusive of exploitation by means of open-cast workings, bell-shaped pits and shafts: 12 hectares.

Prehistoric mining area with shafts and underground galleries: 8 hectares.

Each mine consists of a shaft (pit), the floor of which, on the flint layer, was extended through several galleries.

3. The excavation

Start of the excavation on June 6, 1964, completion on May 31, 1972.

Excavations were carried out by volunteers with an increasing number of participants (a

	people	time	man days	people/ day
1964	12	26	170	6.5
1965	13	53	313	5.9
1966	14	48	397	8.3
1967	19	47	489	10.4
1968	21	57	612	10.7
1969	23	51	561	11.0
1970	23	46	537	11.7
1971	23	50	506	10.1
1972	14	19	172	9.1
		378	3766	10.0

Table 8 Working capacity during the years of excavation.

2. Classification of exploitation

It was agreed to adhere to the following classification:

- 1 - picked up at the surface = 0.00 - 0.50 m depth
- 2 - exploited in open-cast workings = 0.50 - 2.00 m depth
- 3 - exploited in bell-shaped pits = 2.00 - 4.00 m depth
- 4 - dug from mines = 4.00 - 12.00 m depth

Bell-shaped pits are pits the floors of which, on the flint layer, were extended by means of niches. Shaft 1 may be an example of such a pit (with 5.6 square metres worked), whereas from a mine of the same depth 7.5 square metres or more was extracted.

minimum of 12 people and a maximum of 23). In total, from 1964 to 1972, 378 days were spent working by 10 members on average. The work done by one or two people at any time other than the normal working day (Friday night) has not been considered a working day, but been included in the normal day instead.

4. Excavated area

Numbers referring to areal extent shown here are based on measurements obtained by P.J. Felder by using a planimeter (Report 13). The gross size of the excavated area amounts to 2,436.6 square metres, inclusive of pillars and solution pipes in the area. The net size of the excavated area is 1,525.8 square metres, being

the areal extent of shafts and galleries, excluding pillars and solution pipes.

During measuring the shafts were consecutively numbered 1 to 80. Numbers 20, 31, 35, 36 and 65 were not used. Of 75 shafts, 56 mines were excavated completely, and portions of the remaining 19. Of those excavated completely 4 (shafts 1, 37, 67 and 68) have been excluded from measurements, and numbers 30 and 33 were considered to represent a single mine. In four places galleries were excavated, the shafts of which remained unknown.

5. Individual mines

Smallest mines:

shaft 12 = net 6.9 m² and gross 11.4 m²

shaft 3 = net 7.5 m² and gross 14.2 m²

Largest mines:

shaft 29 = net 56.8 m² and gross 100.8 m²

shaft 44 = net 58.4 m² and gross 88.0 m²

6. Increase in shaft depth and exploited area

For depths of mines reference is made to Report 30.

position	shaft depth	net area (m ²)	gross area (m ²)
0-30	5.0-8.0	6.9-16.0	11.4-36.0
30-40	8.0-8.4	17.4-20.7	30.3-35.2
40-72	8.4-9.1	16.0-29.1	25.0-46.1
72-104	9.1-11.0	21.8-56.8	31.8-100.8
104-150	11.0-12.0	27.4-58.4	41.0-86.0

Table 9 Position, depth and size of excavated shafts.

7. Percentages

Geological supply:

gross area - solution pipes (2,436.6 m² - 272.5 m²) = 2,164.1 m².

Exploited area:

1,525.8 m² = 70.51 % of geological supply.

8. Average size of mines

Based on the fact that the average gross area of the mines is 40.57 m² and that the excavated area amounts to 8 hectares, it may be assumed that there were a total of 1,972 shafts (round off to 2,000).

Average size of the 51 mines that were completely excavated:

25.1 m² = 70.3 %, 40.6 m² = 62.2 %

9. Flint layer

The amount of flint from the flint layer exploited (layer 10 of the Lanaye Chalk Member) could not be measured in the mines; instead measurements were taken in adjoining chalk quarries.

gross area	2,436.6 m ²	100.0 %
solution pipes	272.5 m ²	11.2 %
external pillars	576.5 m ²	23.7 %
internal pillars	61.8 m ²	2.5 %
exploited area	1,525.8 m ²	62.6 %

Table 10 Extension of excavated areas.

position	gross area (m ²)	net (exploited) area (m ²)	net area as % of gross area	net area as % of geological supply
0 - 30	19.5	11.3	57.9	66.4
30 - 40	32.8	19.1	58.2	78.9
40 - 72	35.7	22.9	64.3	73.9
72 -105	57.0	35.2	61.8	70.8
105-150	64.1	39.8	62.2	67.1

Table 11 Size of excavated mines.

W.M. Felder's measurement: average flint thickness is 20 cm. Average flint area is 50 %. Thickness per square metre equals 10.0 cm and weight per square metre is 275 kilos.

P.J. Felder's measurement: average flint thickness is 16.6 cm. Average flint area is 71.2 %. Thickness per square metre equals 11.8 cm and weight per square metre is 325 kilos.

10. Amount of flint

Based on a minimum amount of 275 kg and a maximum of 325 kg per square metre, and an average 70.5 % of the geological supply exploited, the following can be deduced (of the areal extent 11 % must be subtracted, this being the area occupied by solution pipes in which no exploitable flint occurs):

Area 25 hectares = 250,000 m² - 11 % = 222,500 m²

flint weight:

gross minimum	61,187,500 kg
gross maximum	72,312,500 kg
extracted minimum	43,143,306 kg
extracted maximum	50,987,543 kg

Area 12 hectares = 120,000 m² - 11 % = 106,800 m²

flint weight:

gross minimum	29,370,000 kg
gross maximum	34,710,000 kg
extracted minimum	20,708,787 kg
extracted maximum	24,474,021 kg

Area 8 hectares = 80,000 m² - 11 % = 71,200 m²

flint weight:

gross minimum	19,580,000 kg
gross maximum	23,140,000 kg
extracted minimum	13,805,858 kg
extracted maximum	16,316,014 kg

11. Flint knapping

Extracted flint nodules were primarily worked for blanks, semi-finished axes, stone picks and blades. This process resulted in 70-85 % of waste.

12. Number of artefacts found

Registration numbers 1 to 15,371 refer to artefacts. A total of 14,549 objects were collected and subsequently numbered, which means that 822 registration numbers were not used.

The numbered objects comprise:

	N	%
picks or fragments of picks	14,217	97.7
hammerstones	216	1.5
cores	58	0.4
other artefacts	37	0.3
miscellaneous	21	0.1

Table 12 Numbers of excavated artefacts.

13. Pick, stone pick, and fragmentary pick

It was agreed to use the term pick to refer to the tool proper, viz. the handle and the pick itself. The term stone pick refers to the worked flint, which together with the handle forms a pick. A fragmentary stone pick may consist of a pointed end, a top end or a middle portion.

In order to determine the number of stone picks found, three samples were counted:

- Sample 1, numbers 1-250:
247 objects (161 stone picks, 77 fragmentary picks and 7 miscellaneous).
- Sample 2, numbers 14,101-14,601:
406 objects (250 stone picks, 137 fragmentary picks and 19 miscellaneous).
- Sample 3, numbers 15,000-15,371:
406⁷ objects (227 stone picks, 23 dubious stone picks, 146 fragmentary picks and 10 miscellaneous).

This listing shows that out of the 1,059 finds in these samples there were 360 fragmentary picks, i.e. 34 % of the total. Assuming this percentage to be valid for the total number of artefacts found, 4,946 fragmentary picks have been encountered during the excavation (34% of 14,549). The total number of 14,217 of stone picks and fragmentary picks would thus comprise 9,271 stone picks and 4,946 fragmentary picks.

To arrive at the total number of stone picks the number of fragmentary picks need to be subdivided by 2 ($4,946:2 = 2,473$) and these should be added to the number of stone picks: $9,271 + 2,473 = 11,744$.

The number of stone picks calculated in this way (11,744) may be subdivided by the exploited area of 1,525.8 m², so as to obtain the average number of stone picks per square metre, viz. $11,744:1,525.8 = 7.7$.

14. Average size of stone picks

Sample	N	length (mm)	width (mm)	thickness (mm)	weight (gr)
1 (Nrs. 1-250)	161	154.86	53.03	35.58	292.74
2 (Nrs. 14,101-14,601)	250	148.78	55.83	36.88	301.14
3 (Nrs. 15,000-15,371)	227	141.67	48.98	34.88	281.11
4 (Stone picks without traces of wear; measured by W.M. Felder)	96	169.38	54.30	35.38	296.67
5 (Stone picks without traces of wear; measured by P.J. Felder)	25	161.04	50.04	37.08	308.08

Table 13 Average size of stone picks.

⁷ This series of finds was only numbered after fragments had been assembled. Of the 146 fragmentary picks, 48 pieces could be reassembled to 24 broken stone picks.

15. Minimum and maximum size of stone pics

Sample	length (mm)	width (mm)	thickness (mm)	weight (gr)
1 (Nrs. 1-250)	min. 115 max. 221	min. 35 max. 74	min. 18 max. 50	min. 140 max. 498
2 (Nrs. 14,101-14,601)	min. 116 max. 195	min. 37 max. 70	min. 20 max. 58	min. 125 max. 455
3 (Nrs. 15,000-15,371)	min. 109 max. 182	min. 35 max. 69	min. 17 max. 49	min. 170 max. 480

Table 14 Minimum and maximum size of stone picks.

16. Hammerstones

Silicified chalk:	147
Ditto with flint fragments:	11
Flint:	2
Quartzite:	42
Quartz:	11
Conglomerate:	3
Total:	216

17. Miscellaneous

Cores: 58
Voids: 42
Antlers: 6

Other bone objects:
Scapula (14 cm) and a single pick or a joint of bone.
Bones of 6 birds
Bones of amphibians (not counted, 12 sites).
Bones of small mammals (12 species), e.g. bat, mole, shrew, squirrel and diverse species of mice (not counted).
Snail shells, 15,771 specimens representing 24 species.
One human skull lacking mandible.

18. Start and finish

Start of excavation: June 6, 1964.

Completion of excavation: May 31, 1972.

Earliest dated find at Rijckholt-St. Geertruid:
Middle Palaeolithic (ROEBROEKS 1980).

Latest dated find of flint implements from
Rijckholt-St. Geertruid:
Iron Age (de GROOTH 1991).

Start of prehistoric flint mining activities at
Rijckholt-St. Geertruid:
5,200 BP (= 4,000 BC).

End of prehistoric flint mining at Rijckholt-St. Geertruid:
4,100 BP (= 2,650 BC, end of Stein Group) or
possibly 4,700 BP (= 3,400 BC, end of
Michelsberg Culture).