

## FOWLING IN THE DUTCH NEOLITHIC AT INLAND AND COASTAL SITES

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**ABSTRACT:** This article deals with the analysis of bird remains from four Neolithic sites in the western and central parts of the Netherlands. For the site of Bergschenhoek only the preliminary results are discussed. There is a striking difference between the inland sites of Swifterbant and Hazendonk and the coastal site of Kolhorn, both in number of remains and number of species.

**KEYWORDS:** FOWLING, NEOLITHIC, INLAND SITES, COASTAL SITES

**RESUMEN:** Este artículo trata del análisis de los restos de aves procedentes de cuatro yacimientos neolíticos, situados en el oeste y centro de Holanda. Del yacimiento de Bergschenhoek sólo se discuten los datos provisionales. Existe una notable diferencia entre los yacimientos interiores de Swifterbant y Hazendonk y el yacimiento litoral de Kolhorn, tanto en número de restos como en número de especies.

**PALABRAS CLAVE:** CAZA DE AVES, NEOLÍTICO, YACIMIENTOS INTERIORES, YACIMIENTOS LITORALES

### INTRODUCTION

#### Location of the sites (Figure 1)

The inland site of Swifterbant, S3, was located on a low-lying levee alongside a creek. During the period of habitation (5400-5300 B.P.) the area was dissected by a system of creeks, that developed around 6000 B.P. . Along the borders river dunes were found. These dunes were permanently dry, while the levees could become flooded during highwater periods. In the extensive backswamps behind the levees, an open-marshland vegetation and willow carr were found (Casparie et al., 1977; van Zeist & Palfenier, 1981). The deciduous forest growing on the levees and dunes seems to have been quite dense (Zeiler, 1992). In the course of time the conditions in the area became gradually wetter as a result of the rising sea level; around 5000 B.P. the system became totally submerged (Deckers et al., 1980).

In the same period that the Swifterbant site was occupied, habitation started on the second inland site, the river dune of Hazendonk. Louwe Kooijmans (1987) mentions seven phases of Neolithic habitation between 5400 and 3700 B.P. These phases alternate with periods in which the dune was not occupied. The majority of the bone material comes from the third phase of habitation (Hazendonk-3, c. 5000 B.P.) and from the fifth and seventh phase (Vlaardingen-1b, 4450-4350 B.P. and Vlaardingen-2b, 4100-3850 B.P.). Like Swifterbant, Hazendonk was located in a freshwater area. The reconstruction of the landscape made by van der Woude (1983) shows a sequence of different types of landscape between 7400 B.P. and 3000 B.P.: expansion of the lakes and disappearance of part of the swamp forest, alternating with a lowering of the water depth and expansion of the forest.

The coastal settlement of Kolhorn (c. 4140 B.P.) was located in a tidal flat area on a low sandridge alongside a creek, near a saltwater lagoon. The landscape was open and devoid of trees.



FIGURE 1

The settlement was divided into a southern and a northern site (van der Waals, 1989). It is not clear whether the two sites differ in time and/or use.

At the time people were present at the site of Bergschenhoek (5600 B.P.) the area was covered by peatbogs, with many small and large freshwater lakes, small rivers and creeks. The site was located on a peat at the edge of a freshwater lake; the sea was not far off. (Louwe Kooijmans, 1987).

#### Nature of the sites

It is still not clear whether the Swifterbant site S3 was inhabited throughout the year or only during part of the year. The conditions for winter occupation seem to have been unfavourable. The

sections showing thick layers of reed and willow wood that must have served to insulate the damp subsoil and to raise the ground level, indicate that the conditions on the levee must have been quite wet. Furthermore, there are indications that a part of the site was washed away during the period of occupation (Deckers et al., 1980). The absence of house structures pleads against permanent occupation, but, on the other hand, it is clear from the small cemetery on the neighbouring site S2 that S3 was occupied by men, women and children. To make things more complicated, the archaeozoological data suggest human activities on a year-round basis. Probably during some years the conditions were more favourable, so that there could have been an alternation between seasonal and year-round occupation (Zeiler, 1992).

As for Hazendonk, it is easier to imagine a permanent occupation in view of the natural conditions. Hazendonk was a permanently dry place in a wet landscape, unlike the levee of S3. However, it remains unclear the reasons for the site being abandoned and recolonized several times. Also here no house structures have been found.

In the case of Kolhorn it is still unclear whether we are dealing with a year-round or a seasonal occupation, although the presence of a man-made well in the southern site indicates that the site was at least visited over a longer period of time. In any case, none of these sites was a short-term camp for fishing, hunting and fowling, as was, without any doubt, the case with Bergschenhoek. For a period of c. 20 years this site was visited from eight to eleven times.

## RESULTS

### The species in relation to the landscape

The difference in composition of the species spectrum between the sites (Tables 1 and 2) can partly be explained by the different environmental conditions. As for Swifterbant and Hazendonk, the extensive backswamps and (mostly shallow) lakes must have been very attractive for waterfowl, especially for ducks of the genus *Anas*, swans and the Grey Lag-Goose, as well as for the Bittern. Also for the other bird species, such as the Cormorant, the White-tailed Eagle, the Eagle Owl and the Jay, the wooded, wet landscape around the sites must have been very suitable. The Carrion Crow may have taken advantage of the presence of man.

The species composition at Kolhorn is quite different, and reflects the open, wet environment with a maritime influence. Here we find species that are characteristic of a coastal environment, such as the Dunlin, the Knot, the Gannet and the Brent Goose. The open character of the landscape is reflected by species such as the Quail, the Golden or Grey Plover, the Ruff, the Marsh Harrier and the Blue-headed Wagtail. It seems that especially ducks, such as Mallard and the small *Anas*-species (Teal and Garganey), were very abundant in the area. The occurrence of Greater Flamingo may be related to the fact that the climate during the Subboreal was warmer than it is nowadays. Moreover, the saltwater lagoon that at that time was found in the vicinity of the site could have been an attractive habitat for the species. As in Swifterbant and Hazendonk, the Carrion Crow may have taken advantage of the presence of man.

Although at present the analysis of the bone material from Bergschenhoek has not been finished yet, some preliminary results can be presented here (Clason & Brinkhuizen, in prep.).

Species	SW	HA
Cormorant ( <i>Phalacrocorax carbo</i> )	2	-
Bittern ( <i>Botaurus stellaris</i> )	1	-
Mute Swan ( <i>Cygnus olor</i> )	1	1
Mute or Whooper Swan ( <i>C. olor/C. cygnus</i> )	4	8
Grey Lag-Goose ( <i>Anser anser</i> )	-	11
<i>Anser</i> sp.	-	11
Goose ( <i>Anser/Branta</i> sp.)	4	4
Mallard ( <i>Anas platyrhynchos</i> )	102	15
Tufted Duck ( <i>Aythya fuligula</i> )	1	-
Pochard ( <i>Aythya ferina</i> )	1	-
<i>Anas</i> sp.	15	4
Shelduck ( <i>Tadorna tadorna</i> )	1	-
Duck (Anatidae sp.)	498	13
(cf.) White-tailed Eagle ( <i>Haliaeetus albicilla</i> )	6	1
Small wader	1	-
Herring Gull ( <i>Larus argentatus</i> )	1	-
Eagle Owl ( <i>Bubo bubo</i> )	-	2
Jay ( <i>Garrulus glandarius</i> )	1	-
Carrion Crow ( <i>Corvus corone</i> )	3	1
<b>Total wild birds, identified</b>	<b>642</b>	<b>71</b>
Wild birds, indet.	775	61

TABLE 1 -Number of bird remains from Swifterbant (SW) and Hazendonk (HA).

As in Kolhorn, the species list reflects the wet environment with a maritime influence. The Long-tailed Duck, the Eider and the Scaup are characteristic of a coastal environment. The area must have been very attractive also for other waterfowl like Mute and Bewick's Swans, Mallard, Teal, Garganey, Wigeon, Tufted Duck, Goldeneye and Goosander, as well as for Cormorant, Bittern and White-tailed Eagle.

### The role of birds in the food economy

Apart from the different species composition, the most striking difference between the sites lies in another aspect. In the Hazendonk material, both the number of species and the number of remains are conspicuously low in view of the fact that the total period of habitation was far longer than it was either at Swifterbant or Kolhorn, and that the landscape was more or less comparable to that of Swifterbant. Sieving took place at all three sites, so the low numbers of remains and species at Hazendonk cannot be explained by a difference in retrieval methods. In most habitation phases of Hazendonk the total number of bird remains is less than 20; only in the last Neolithic phase (Vlaardingen-2b) does the number of remains increase considerably to over 90. All but one are from

ducks, geese and swans. The proportion in the total bone weight of identified remains (birds and mammals) is, however, almost the same as in the Hazendonk-3 period, so that it is questionable whether the higher number of bird remains in Vlaardingen-2b really indicates a change in the hunting habits of the Hazendonk people. Both in Hazendonk and Swifterbant the average percentage of bird remains in the total bone weight does not exceed 2%, so the higher number of bird remains in the Swifterbant material does not mean that fowling was more important than it was in Hazendonk.

Some of the remains of ducks and Mute Swan in the Hazendonk material were burned, which indicates that they had been eaten. Furthermore, a claw of White-tailed Eagle was burned. This could mean that this bird was also eaten. It is remarkable that in Swifterbant none of the bird remains were burned. It can nevertheless be assumed that most birds were eaten, especially the ducks, geese and swans.

In Kolhorn we find the highest numbers of both remains and species, as well as the highest percentage of bird remains in the total bone weight. This indicates not only the abundance of birds in this area, but also that most birds seem to have played a role in the meat supply of the inhabitants, compared to those of Hazendonk and Swifterbant. In the southern site the average percentage of bird remains in the total bone weight is 7.6%, while in the northern site it is 4.3%. A considerable number of ducks remains, as well as some of Brent Goose, Quail, Golden or Grey Plover, Dunlin, Knot, Ruff and Herring Gull are burned. This indicates that at least these species were eaten. Just as in the Hazendonk material, a claw of White-tailed Eagle was burned, as was one from a harrier.

At present no data on the number and the weight of the bird remains from Bergschenhoek are available. In any case we can say that the number of species is comparable to that of Swifterbant. In view of the character of the site the hunters will have taken most of the catch back to their homes. However, some of the birds caught were eaten at the spot, as is evidenced by the burning, traces and cut marks on some of the bone fragments. A special find was that of a nearly complete rump skeleton of a Bewick's Swan: vertebrae (including those of the tail), ribs, coracoids, scapulae, furculae, the proximal part of the humeri, breastbone, pelvis and ribs. The ribs were cut midway. Their ends, as well as those of the humeri, were burned, which indicates that the swan was halved and roasted over a fire (Clason & Brinkhuizen, in prep.).

#### **Possible seasons of fowling**

The bird species found in Swifterbant and Hazendonk give no indication of the season(s) in which they were caught. All species could have been present in the vicinity of the sites the year round, with the probable exception of the swans. The majority of the recent Mute Swan population in Western Europe are descended from birds that escaped or that were released from captivity. Until some 50 years ago they were breeding almost exclusively in Eastern and Northern Europe. At that time the Mute Swan was a characteristic species of very cold winters (Bekhuis et al., 1978).

As for Kolhorn, in some cases the bird remains could tell us something about the time of year during which certain species were caught. Of course we cannot be completely sure whether the migratory birds had the same behaviour during the Neolithic as they have nowadays, so some caution is necessary in this respect. According to the inventory maps of the SOVON atlas of Dutch birds (Bekhuis et al., 1978), at least three species found in Kolhorn must have been caught between spring

Species	KS	KN
Black-throated Diver ( <i>Gavia arctica</i> )	-	1
Black- or Red-throated Diver ( <i>Gavia arctica</i> / <i>G. stellata</i> )	1	1
Great Crested Grebe ( <i>Podiceps cristatus</i> )	-	1
Gannet ( <i>Sula bassana</i> )	-	1
Greater Flamingo ( <i>Phoenicopterus ruber</i> )	-	1
Swan ( <i>Cygnus</i> sp.)	-	2
Brent Goose ( <i>Branta bernicla</i> )	1	10
<i>Branta</i> sp.	-	2
Grey Lag-Goose ( <i>Anser anser</i> )	1	1
Mallard ( <i>A. platyrhynchos</i> )	94	97
Gadwall ( <i>A. strepera</i> )	1	-
Wigeon ( <i>A. penelope</i> )	-	1
Shoveler ( <i>A. clypeata</i> )	2	1
Teal ( <i>Anas crecca</i> )	25	7
Garganey ( <i>Anas querquedula</i> )	2	4
Teal/Garganey( <i>A. crecca</i> / <i>A. querquedula</i> )	194	368
<i>Anas</i> sp.	240	308
Red-crested Pochard ( <i>Netta rufina</i> )	1	-
<i>Aythya</i> sp.	-	1
Duck (Anatidae)	385	546
Marsh Harrier ( <i>Circus aeruginosus</i> )	-	1
Harrier ( <i>Circus</i> sp.)	1	1
cf. White-tailed Eagle ( <i>Haliaeetus albicilla</i> )	1	3
Bird of prey, indet.	-	1
Quail ( <i>Coturnix coturnix</i> )	2	-
Golden Plover/Grey Plover ( <i>Pluvialis apricarius</i> / <i>P. squatarola</i> )	2	1
Dunlin ( <i>Calidris alpina</i> )	-	31
Knot ( <i>Calidris canutus</i> )	-	8
<i>Calidris</i> sp.	1	-
Ruff ( <i>Philomachus pugnax</i> )	-	10
Herring Gull ( <i>Larus argentatus</i> )	3	-
Blue-headed Wagtail ( <i>Motacilla flava</i> )	-	1
Carrion Crow ( <i>Corvus corone</i> )	-	1
<b>Total wild birds, identified</b>	<b>957</b>	<b>1411</b>
Wild birds, indet.	6585	8409

TABLE 2 - Number of bird remains from Kolhorn, southern site (KS) and northern site (KN).

and late summer or early autumn. The Garganey can be found in the Netherlands between March and September, while the Blue-headed Wagtail arrives in March or April, depending on the weather conditions, and stays until October. The first Quails arrive in April, though most arrive in May and June; they leave in September.

The Brent Goose and the Black-throated Diver, and probably also the swans, indicate fowling between autumn and early spring. The first Brent Geese arrive in October and leave for their breeding grounds at the end of April or the beginning of May, although regularly small groups stay in the Netherlands during the summer. The Black-throated Diver can be found in the Netherlands almost exclusively from November to the end of March.

In the case of Bergschenhoek we can also draw some (cautious) conclusions about the time of year in which certain species were caught. According to the SOVON atlas mentioned above, the Garganey indicates fowling between spring and late summer, while Bewick's Swan and the Long-tailed Duck must have been caught between October and the end of April.

### CONCLUSIONS

In the sites of Swifterbant and Hazendonk birds seem to have played a minor role in the meat supply of the inhabitants. The data from Kolhorn suggest that fowling here was more important. As in Bergschenhoek, the hunters will have taken most of their catch back to their homes, so nothing can be said about the importance of fowling for their meat supply.

In some cases the bird remains indicate in which season they were caught. It must be stressed that this does not provide an answer to the question whether in Swifterbant, Hazendonk and Kolhorn we are dealing with a seasonal or a year-round occupation. Indications of human activities during a specific season do not exclude occupation during the rest of the year.

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### BIBLIOGRAPHY

- Bekhuis, J.; R. Bijlsma; A. van Dijk; F. Hustings; R. Lensink & F. Saris (eds.) (1978) - *Atlas van de Nederlandse vogels*. SOVON, 2e druk. Almelo.
- Casparie, W.A.; B. Mook-Kamps; R.M. Palfenier-Vegter; P.C. Struijk & W. van Zeist (1977) - The paleobotany of Swifterbant. (Swifterbant contribution 7). *Helinium* 17: 28-55.
- Clason, A.T. & D.C. Brinkhuizen (in prep.) - Bergschenhoek.

**Deckers, P.H.; J.P. de Roever & J.D. van der Waals (1980)** - Jagers, vissers en boeren in een prehistorisch getijdengebied bij Swifterbant. *Z.W.O.-jaarboek*: 111-145.

**Louwe Kooijmans, L.P. (1974)** - *The Rhine/Meuse delta. Four studies on its prehistoric occupation and Holocene geology* (thesis). Leiden.

**Louwe Kooijmans, L.P. (1987)** - Neolithic settlements and subsistence in the wetlands of the Rhine/Meuse delta of the Netherlands. In: Coles, J.M. & A.J. Lawson (eds.). *European Wetlands in Prehistory*: 227-256. Oxford.

**Waals, J.D. van der 1989** - Excavations of two Beaker domestic sites near Kolhorn. General introduction. *Palaeohistoria* 31: 139-149.

**Woude, J.D. van der (1983)** - Holocene paleoenvironmental evolution of a perimarine fluvial area (Hazendonk paper 1). *Analecta praehistorica Leidensia* (XVI) (thesis).

**Zeiler, J.T. (1989)** - Archeozoologisch onderzoek van de laat-Neolithische vindplaats Kolhorn (N.H.). *Paleo-aktueel* 1: 25-30.

**Zeiler, J.T. (1992)** - Hunting and animal husbandry at Neolithic sites in the western and central Netherlands; interaction between man and the environment. *Helinium* XXXI: 60-125.

**Zeist, W. van & R.M. Palfenier-Vegter (1981)** - Seeds and fruits from the Swifterbant S3 site. *Palaeohistoria* 23: 105-168.