

WIETSKE PRUMMEL

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**ABSTRACT:** The study covers 238 animal remains from the churchyard of 'Ol Kerkhof', Scheemda, which was in use from the 13th to the early 16th century. Cattle, horse, sheep, pig and dog were represented among the remains. The high proportion of horse bones could indicate the use of the horse as a draught animal for the cultivation of arable fields.

**KEYWORDS:** Late Middle Ages, rural site, cattle, draught horse, sheep, pig, dog.

## 1. INTRODUCTION

In 1988 and 1989 two successive churches were excavated which belonged to the predecessor of the present village of Scheemda, province of Groningen (Molema, 1989; Molema, 1990; Casparie & Molema, 1990; Uytterschaut, 1991; Uytterschaut, 1990; Schelvis, 1990) (figs 1 and 2). The earliest church had been built at the beginning of the 13th century. As early as about 1275 its successor was erected, immediately north of the first church (fig. 3). Inundations with water from the large raised-bog areas surrounding the site forced the inhabitants of Scheemda in 1509 to move their village and church over a distance of about 1.5 km to the higher site of the present village (fig. 2). The subsequent floods from the Dollard sea-inlet covered the former village with a layer of clay (Casparie & Molema, 1990). The place of the former churchyard continued to be known as the 'Ol Kerkhof', i.e. 'Old Churchyard' (Molema 1989).

The former village of Scheemda was situated in the reclaimed raised bog that extended from the Pleistocene boulder-clay area of the 'Winschoten peninsula', on which the present Scheemda is situated, to the clay area in the north along the Dollard coast (Casparie & Molema, 1990). The distance from the site to the boulder-clay of the 'Winschoten peninsula' was c. 1 km, that to the clay area along the Dollard coast c. 20 km (fig. 2). The raised-bog area had been inhabited since the 12th century (Groenendijk, 1989).

The first object of this study is to find out what livestock species the inhabitants of Scheemda reared for what purposes, how animal husbandry was organized, how the inhabitants exploited the natural resources, how they dealt with the natural conditions of the site, whether hunting, fowling and fishing were performed and whether there was a bone industry.

The second object of this study is to assess whether

the bone material shows the influence of the disasters recorded in the 13th-century chronicles by the abbots Emo and Menko of Bloemhof Abbey at Wittewierum. In the year 1249 floods of salt water destroyed the grazing of the livestock (cattle) in the 'Wolden', as the wide surroundings of Scheemda were called. Almost all animals died. In 1250 a cattle plague swept across the region, which destroyed nearly all animals. The area was badly hit in the years after 1271 by high mortality of sheep. This disaster deprived the people even of the milk that they would drink to alleviate their hunger (Jansen & Janse, 1991: pp. 376-379, 449-453).

## 2. MATERIAL AND METHODS

Faunal remains were collected by hand from various features, dating from different periods (fig. 3). First, from a number of pits to the east of the first church, dating from c. 1275, that is the end of the period of use of the first church and the start of the building of the second church (group A, total number of faunal remains 12, table 1). Second, from the foundation trench of the wall around the churchyard of the second church, which had been dug and back-filled around 1275. The faunal remains from this trench, group B, a total of 25, date from about 1275 (table 2). Third, the largest group, group C, comprises 196 remains that were found dispersed over the area of the second church and its churchyard. These faunal remains are dated between 1275 and 1509 (table 3). Fourth, was the disturbed skeleton of a dog, from the ditch around the churchyard of the second church, dating from the period of abandonment of the site, c. 1509. Finally, there is one faunal specimen, a tibiotarsus of a domestic fowl, from the period 1509-1830. Including 4 faunal remains of unknown date, 238 faunal remains have been studied, with a total weight of 11.6 kg.

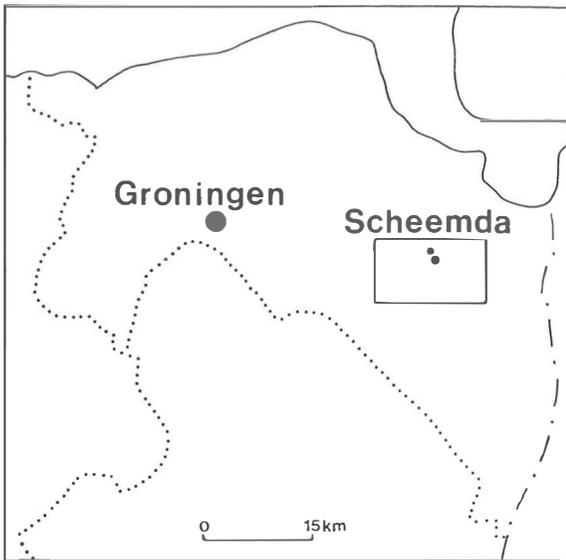


Fig. 1. Map of the province of Groningen. The framed area is shown enlarged in figure 2.

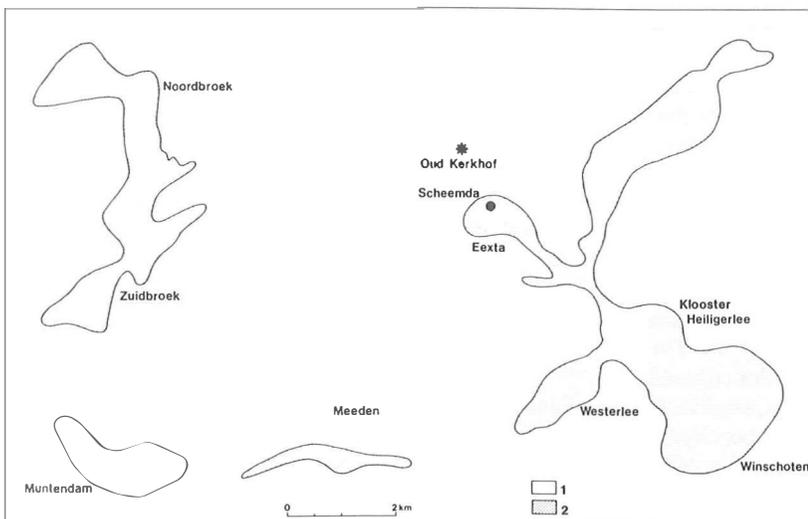


Fig. 2. Surroundings of the site 'Oud Kerkhof', Scheemda, in the period c. 1275-c. 1509. Key: 1. The raised bog, in which the site was situated (star); 2. The Pleistocene sand areas, amongst other the 'peninsula of Winschoten' on which the present village of Scheemda is situated (spot) (drawing J.H. Zwier, B.A.I.) (for more details see Casparie & Molema, 1990: fig. 1).

Table 1. Scheemda, faunal remains. Group A, c. 1275. N. Number of remains; G. Weight in g.

	N	G
Domestic mammals		
<i>Canis familiaris</i>	1	9.6
<i>Equus caballus</i>	1	157.5
<i>Sus domesticus</i>	1	12.0
<i>Bos taurus</i>	7	346.6
<i>Ovis/Capra</i>	2	14.0
Total domestic mammals	12	539.7
Total identified	12	539.7
Total	12	539.7

Table 2. Scheemda, faunal remains. Group B, c. 1275. N. Number of remains; G. Weight in g.

	N	G
Domestic mammals		
<i>Equus caballus</i>	10	1667.0
<i>Bos taurus</i>	13	1130.2
Total domestic mammals	23	2797.2
Total identified	23	2797.2
Unidentified		
Size cattle/horse	1	.0
Bird	1	1.6
Total unidentified	2	1.6
Total	25	2798.8

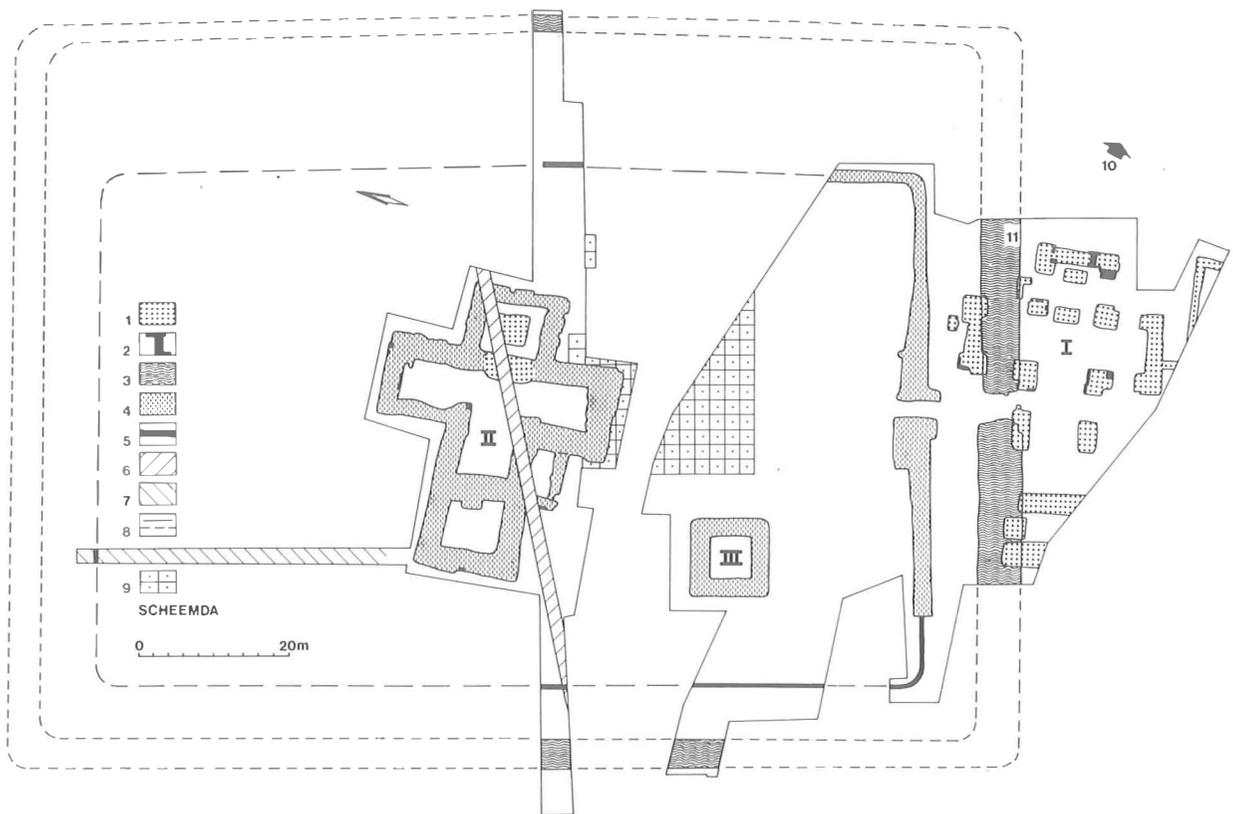


Fig. 3. Scheemda 'Ol Kerkhof'. Key: I. The oldest church, functioning from the early 13th century until c. 1275; II. The second church, functioning from c. 1275 until 1509, with separate tower (III) (faunal remains group C); 1. Foundation of the churches; 2. Brick; 3. Moat; 4. Trenches of the demolition of the second church; 5. The churchyard wall of the second church, c. 1275 (faunal remains group B are from the foundation trench of this wall); 6. Recent ditch; 7. Disturbed; 8. Presumed; 9. Inhumation burials; 10. The pits to the east of the first church, dating to c. 1275 (faunal remains group A); 11. The location of the disturbed skeleton of a dog, dating to 1509 (drawing J.H. Zwier, B.A.I.).

The state of preservation of the faunal remains was variable. Some had been preserved quite well, others very poorly. The peaty subsoil of the site is responsible for the deterioration of the bone. This decay took place during the occupation of the site. The Dollard clay that sealed the site after 1509 prevented further decay. The faunal remains have been identified with the aid of the reference collection of the B.A.I.

### 3. RESULTS

#### 3.1. Groups A (1275), B (1275) and C (1275-1509)

Dog, horse, pig, cattle and sheep/goat are represented by the remains in group A, from the eastern pits dating to about 1275 (table 1). The 25 faunal remains from the foundation trench B, dating to about 1275, proved to be of cattle (13) and horse (10), while 2 bones of B were left unidentified: a mammal bone of cattle/horse size and an unidentified bird bone fragment (table 2).

A total of 117 remains among the 196 fragments in group C, dating between c. 1275 and 1509, could be

identified to species level. Dog, horse, pig, cattle, sheep and sheep/goat are represented by these remains. Cattle and horse are the most important species in this sample: cattle is represented by 58 fragments (50% of the identified remains), horse by 46 fragments (39% of the identified remains). Pig is represented by 6 fragments, sheep by 1 fragment, sheep/goat by 3 fragments and dog by 2 fragments. The 79 unidentified fragments derive from mammals of cattle/horse size (48), of mammals of uncertain size (cattle/horse or sheep/goat/pig) (29), and of mammals of sheep/goat/pig size (2) (table 3).

The distribution over the skeleton of the fragments of the various species was fairly even in group C (table 6). The sample sizes of groups A and B were too small to allow such observations (tables 4-5). The high proportion of horse cervical vertebrae in group C (10 fragments = 22% of the horse bones from this group, table 6) is caused by seven fragments from three vertebrae, presumably from the same horse.

Most cattle had been butchered as adults, but some died at younger ages (table 8). Calf bones have been found in groups A, B and C (one in each group), suggesting natural death of calves. A cattle humerus

Table 3. Scheemda, faunal remains. Group C, c. 1275-1509. N. Number of remains; G. Weight in g. The first columns after N and G contain the proportions among the total number of remains and the total weight. The second columns after N and G contain the proportions among the domestic mammals.

	N	%	%	G	%	%
Domestic mammals						
<i>Canis familiaris</i>	2	1.0	1.7	54.1	.7	.7
<i>Equus caballus</i>	46	23.5	39.3	4399.3	53.6	55.8
<i>Sus domesticus</i>	6	3.1	5.1	237.1	2.9	3.0
<i>Bos taurus</i>	58	29.6	49.6	3159.0	38.5	40.1
<i>Ovis aries</i>	1	.5	.9	3.3	.0	.0
<i>Ovis/Capra</i>	4	2.0	3.4	30.1	.4	.4
Total domestic mammals	117	59.7	100.0	7882.9	96.0	100.0
Total identified	117			7882.9		
Unidentified						
Size sheep/goat/pig	2			2.9		
Size cattle/horse	48			284.3		
Size unknown	29			38.5		
Total unidentified	79	40.3		325.7	4.0	
Total	196			8208.6		

Table 4. Scheemda, mammal remains. Group A, c. 1275. distribution over the skeleton. N. Number of remains; S/G. Sheep or goat.

	Dog N	Horse N	Pig N	Cattle N	S/G N
Cranium	–	–	–	1	–
Mandibula	–	–	1	1	–
Epistropheus (Axis)	1	–	–	–	–
Cervical vertebra	–	–	–	–	1
Costae	–	–	–	1	–
Humerus	–	1	–	1	–
Tibia	–	–	–	2	1
Metatarsus III+IV	–	–	–	1	–
Total	1	1	1	7	2

from group A proves butchering of cattle at an age older than 15-20 months. A mandibula and a tibia from B demonstrate butchering of cattle of 25-28 months old and younger than 2½ years old, respectively. Three tibia fragments and a femur fragment of B demonstrate butchering of cattle at ages older than 2½(2x), 3½-4 and 3½ years. All cattle bones with indications of age from group C, apart from the calf bone mentioned, are from cattle aged at least 7-10 months to at least 3 years (table 8).

Most horses died as adults, i.e. were at least 10-12 months old, as most horse bones had fused epiphyses (table 8). Some horses died or were killed at ages of

Table 5. Scheemda, mammal remains. Group B, c. 1275. distribution over the skeleton. N. Number of remains.

	Horse N	Cattle N
Cranium	–	1
Mandibula	3	1
Thoracic vertebra	2	–
Costae	–	1
Radius	–	1
Ulna	1	–
Metacarpus III+IV	–	2
Pelvis	1	–
Femur	2	1
Tibia	1	4
Astragalus	–	1
Metatarsus III+IV	–	1
Total	10	13

around 3½ years (group C) or 4-5 years old (group B and C). Data on the slaughtering age of pig are available only from group C. Pigs were slaughtered at an age of 16-24 months, younger than 3½ years and older than 1 or 2 years (table 8). The only information on the age at death of sheep/goat is a cervical vertebra of a sheep/goat from group A, whose age was at least 4-5 years (table 8).

The horses of Scheemda were small (128-136 cm) to medium-sized (136-144 cm). This has been established

Table 6. Scheemda, mammal remains. Group C, c. 1275-1509, distribution over the skeleton. N. Number of remains.

	Dog N	Horse N	Pig N	Cattle N	Sheep N	S/G N
Cranium	—	1	—	4	1	—
Maxilla	—	3	1	5	—	—
Mandibula	—	2	1	11	—	1
Cervical vertebra	—	10	—	—	—	—
Thoracic vertebra	—	1	—	2	—	—
Costae	—	—	2	—	—	—
Scapula	—	1	—	3	—	—
Humerus	1	4	1	2	—	—
Radius	—	6	—	4	—	—
Ulna	1	1	—	1	—	—
Metacarpus III+IV	—	—	—	1	—	—
Metacarpus III	—	1	—	—	—	—
Metacarpus IV	—	1	—	—	—	—
Pelvis	—	—	—	3	—	—
Femur	—	3	1	—	—	—
Tibia	—	1	—	7	—	2
Calcaneus	—	1	—	1	—	—
Centrotarsale	—	—	—	—	—	—
Metatarsus III+IV	—	—	—	12	—	1
Metatarsus III	—	7	—	—	—	—
Phalanx I, pes	—	2	—	—	—	—
Phalanx I	—	1	—	1	—	—
Phalanx 3	—	—	—	1	—	—
Sesamoideum	—	—	—	—	—	—
Total	2	46	6	58	1	4

Table 7. Scheemda. Degree of fragmentation of long bones of cattle and horse in groups A, B and C. p. Proximal end; s. Shaft (diaphysis); d. Distal end; psd. (parts of) Proximal end, shaft and distal end present; ps. (parts of) Proximal end and shaft present; sd. (parts of) Shaft and distal end present; N. Number of remains; %. Proportion.

	Cattle	Horse
<i>Group A, c. 1275</i>	N	N
psd	—	—
ps or sd	1	1
p, s or d	5	—
Total number	6	1
<i>Group B, c. 1275</i>	N	N
psd	1	4
ps or sd	2	1
p, s or d	7	2
Total number	10	7
<i>Group C, c. 1275-1509</i>	%	%
psd	13	30
ps or sd	38	23
p, s or d	49	47
Total %	100	100
Total number	(45)	(30)

Table 8. Age data of cattle, horse, pig, sheep/goat and dog, arranged by group and age (the nearly complete dog, group D, not included). N. Number of elements; Cri. Criterion (long bones: the first symbol refers to the proximal epiphysis, the second to the distal one; — Unfused; + Fused; 0 Part of bone absent; maxillae and mandibulae: cattle 3: M1 erupting, 7: M3 erupting, 9+: M3 slightly worn; pig 6: M3 erupting, 7+: M3 slightly worn); Age: m. months; y. years.

	N	Cri	Age
<i>Cattle (Bos taurus)</i>			
<i>Group A, c. 1275</i>			
Mandibula	1	3	5-6 m
Humerus	1	0+	>15-20 m
<i>Group B, c. 1275</i>			
Cranium	1		Calf
Tibia	1	0-	<2½ y
Mandibula	1	7	25-28 m
Radius	1	+0	>12-15 m
Tibia	2	0+	>2½ y
Femur	1	0+	>3½ y
Tibia	1	+0	>3½-4 y
Total	8		
<i>Group C, 1275-1509</i>			
Mandibula	1		Calf
Scapula	1	0+	>7-10 m
Pelvis	2	+0	>7-10 m
Radius	3	+0	>12-15 m
Phalanx I	1	+0	>20-24 m
Tibia	1	0+	>2-2½ y
Metatarsus	3	0+	>2-2½ y
Maxilla	2	9+	>3 y
Mandibula	2	9+	>3 y
Total	16		
<i>Horse (Equus caballus)</i>			
<i>Group A, c. 1275</i>			
Humerus	1	0+	>15-18 m
<i>Group B, c. 1275</i>			
Pelvis	1	+0	>10-12 m
Femur	1	0+	>3½ y
Tibia	1	++	>3½ y
Thoracic vertebra	2	+-	4-5 y
Total	5		
<i>Group C, 1275-1509</i>			
Scapula	1	0+	>10-12 m
Metatarsus III	2	0+	>12-15 m
Phalanx I	3	+0	>12-15 m
Humerus	4	0+	>15-18 m
Radius	1	+0	>15-18 m
Tibia	1	+-	>2 y
Radius	1	+±	c. 3½ y
Radius	2	++	>3½ y
Femur	1	0+	>3½ y
Femur	1	+0	>3½ y
Thoracic vertebra	1	+-	4-5 y
Cervical vertebra	10	++	>4-5 y
Total	28		

Table 8 (Continued)

	N	Cri	Age
Pig ( <i>Sus domesticus</i> )			
<i>Group C, 1275-1509</i>			
Humerus	1	0+	>1 y
Mandibula	1	6	16-24 m
Maxilla	1	7+	>2 y
Femur	1	0-	<3½ y
Total	4		
Sheep/goat ( <i>Ovis/Capra</i> )			
<i>Group A, c. 1275</i>			
Cervical vertebra	1	++	>4-5 y
Dog ( <i>Canis familiaris</i> )			
<i>Group A, c. 1275</i>			
Epistropheus	1	++	>20-24 m
<i>Group C, 1275-1509</i>			
Ulna	1	+ -	5-8 m

Table 9. Scheemda, height at the withers of horse, *Equus caballus*. Elm. Skeletal element (ra: radius; mt: metatarsus III); Mea. Measurement (GL: maximum length; LI: lateral length); Methods of estimation of height at the withers: May (after Vitt); May (1985); Kiesewalter: see von den Driesch & Boessneck (1974).

Feature	Elm	Mea	Height at the withers		
			mm	cm	Method
1988/XI.73	ra L	GL	336.7	138.7	May (Vitt)
1988/XI.85	ra R	GL	319.0	131.6	May (Vitt)
1989/IX.30	ra R	LI	306.6	133.1	Kiesewalter
1988/XI.86	mt R	GL	248.6	129.8	May (Vitt)
1988/XI.86	mt L	GL	260.2	136.0	May (Vitt)

Table 10. Scheemda, dog without its skull, feature 1988/XI.73, dating c. 1509. Calculation of the height at the withers on the basis of the length measurements of the long bones. The method used is that of Harcourt (1974). Side (R = right; L = left); Mea. Measurement (GL = maximum length; GLC = maximum length from caput of femur); HW. Estimation of height at the withers in cm. Average height at the withers c. 43 cm.

Element	Side	Mea	mm	HW
Humerus	R	GL	134.9	43.6
Radius	R	GL	123.1	41.1
Ulna	R	GL	143.0	40.4
Femur	L	GL	151.7	46.3
		GLC	145.0	44.2
Femur	R	GL	148.9	45.5
		GLC	144.3	44.0
Tibia	L	GL	136.3	40.7



Fig. 4. Scheemda, two humeri of horse, *Equus caballus*: on the left from a small horse, on the right from a medium-sized horse. Scale 1:3 (photograph R.J. van Ewyck, C.F.D.).

from five complete horse bones, from which heights at the withers have been calculated as 130, 132, 133, 136 and 139 cm (tables 9 and 11). The variation in size is shown in figures 4-5. A complete cattle metatarsus with a total length of 211.6 mm (table 11) was of an animal with a height at the withers of about 115 cm. The height at the withers of sheep/goat, pig and dog, apart from the nearly complete dog, could not be estimated, as no complete bones of these animals were available (table 11).

Two bones from group C showed clear traces of bone implement manufacture: a horse metatarsus III that had been worked at both ends, was possibly a handle (fig. 6); part of the thoracic edge of a cattle scapula that had been rounded off by use, may have been used as a polisher for hides or textiles (fig. 7). A cattle phalanx 1 from C showed a black circle around one of its natural foramina, of which the origin, natural or man-made, is unclear (fig. 8).

A total of 17 bones from group A, B and C showed traces of gnawing by dogs. These were 14 cattle bones (a metatarsus from A, an ulna from B, and 2 mandibulae, a humerus, 2 radii, 2 ulnae (fig. 9), 4 metatarsi and a calcaneus from C), 2 horse bones (two radii from C) (fig. 10) and an unidentified bone (from C). Cut marks have been recognized on 8 bones: a horse pelvis from B and a horse humerus from C, a cattle humerus and tibia from C, 2 pig ribs (fig. 11), a pig humerus and a pig femur from C. A horse scapula from C showed root

Table 11. Schemda. Measurements of animal bones, after the system of von den Driesch (1976); for abbreviations of the measurements see her publication. Elm. Skeletal element; Fea. Feature; Si. Side; Gr. Group.

Elm/Fea	Si	Gr	Measurements in mm					
<i>Cattle (Bos taurus)</i>								
Cranium 1988/XII.93	L+R	B	#32 143.9					
Maxilla 1989/IX.33	L	C	P2-M3 126.9	P2-P4 47.9	M1-M3 77.5			
Maxilla 1989/IX.33	L	C	L M1 23.1	B M1 18.6	L M2 24.6	B M2 18.9	L M3 28.2	B M3 19.1
Mandibula 1988/XII.99	L	C	P2-M3 131.4	P2-P4 50.0	M1-M3 83.3	HDIA 27.0	HfM1 40.4	HbM3 63.6
Mandibula 1988/XII.99	L	C	L M1 19.9	B M1 13.9	L M2 22.2	B M2 15.1	L M3 36.5	B M3 14.0
Scapula 1988/XII.99	L	C	SLC 47.2					
Humerus 1988/XII.99	L	C	SD 27.8					
Radius 1988/XI.73 1988/XII.91 1988/XII.93	L L R	C C B	BP – – 73.1	BFp 67.2 – 66.4	SD 35.6 37.4 –			
Ulna 1988/XII.93 1988/XI.73	R L	B C	BPC 46.2 41.5	DPA 56.7 –				
Tibia 1988/XI.25 1988/XII.93	L L	C B	SD 29.0 31.4					
Metatarsus 1988/XII.99 1988/XI.77 1988/XI.83 1988/XII.91 1989/IX.16 1989/IX.42	R L R L R L	C C C C C A	GL – – – 211.6 –	Bp – 47.1 – 39.1 – –	SD 24.0 25.5 21.7 – 23.4 20.5			
Phalanx I 1988/XI.15	–	C	GLpe 57.9	SD 22.1				
<i>Horse (Equus caballus)</i>								
Cranium 1988/XI.25	L+R	C	#34 77.8	#35 100.1	#36 38.2	#37 40.1	#50 93.5	
Mandibula 1988/XII.93 1988/XII.93	L R	B B	P2-M3 164.5 163.7	P2-P4 82.4 82.4	M1-M3 81.6 81.0	HfM1 61.0 58.8	HDia 37.3 –	
Mandibula 1988/XI.42 1988/XII.91 1988/XI.60	R R L	C C B	L M1 – 25.1 –	B M1 – 16.8 –	L M2 – 25.8 22.4	B M2 – 15.1 14.0	L M3 34.4 30.9 –	B M3 15.2 12.7 –

Table 11 (Continued).

Elm/Fea	Si	Gr	Measurements in mm						
Scapula			SLC	LG	BG				
1988/X1.68	R	C	59.9	54.2	42.6				
Humerus			SD	BT					
1988/X11.96	L	C	37.0	–					
1988/X11.99	L	C	30.4	67.3					
1989/IX.42	R	A	29.0	60.7					
Radius			GL	LI	BP	BFp	SD	Bd	BFd
1988/X1.73	L	C	336.7	–	–	–	33.3	–	56.2
1988/X1.85	R	C	319.0	–	–	–	34.6	71.6	59.6
1988/X1.71	R	C	–	–	–	–	34.5	–	–
1989/IX.30	R	C	–	306.6	69.9	65.6	34.5	–	–
Pelvis			SH	SB					
1988/X1.13	L	B	36.1	24.4					
Femur			SD						
1988/X1.86	L	C	37.0						
Tibia			GL	SD	Bd	Dd			
1988/X1.23	R	B	317.7	33.4	62.4	37.0			
1988/X1.71	L	C	–	34.2	59.9	35.2			
Metatarsus			GL	Bp	SD	Dd			
1988/X1.86	R	C	248.6	43.6	26.5	–			
1988/X1.86	L	C	260.2	–	28.6	34.8			
1988/X11.99	R	C	–	46.5	26.4	–			
1988/X11.92	R	C	–	–	26.3	–			
1989/IX.40	L	C	–	–	26.6	–			
Phalanx I of hind leg		GL	SD	Bd					
1988/X1.14	–	C	–	33.1	42.3				
1988/X11.99	R	C	73.2	28.9	39.8				
Pig ( <i>Sus domesticus</i> )									
Maxilla			M1-M3	L M1	B M1	L M2	B M2	L M3	B M3
1988/X1.79	R	C	61.1	14.8	12.3	20.1	14.7	30.7	16.3
Mandibula			L M2	B M2					
1988/X11.99	R	C	19.1	11.7	Male				
Humerus			SD	Bd	BT				
1988/X1.77	L	C	16.9	40.3	30.5				
Dog ( <i>Canis familiaris</i> )									
Humerus			SD						
1988/X1.15	R	C	17.5						
Ulna			DPA	SDP	BPC				
1988/X1.83	R	C	24.6	20.5	17.6				
Nearly complete dog 1988/X1.73 (c. 1509)									
Scapula			SLC	GLP	LG	BG			
	L		27.0	32.4	27.5	18.1			
	R		27.2	32.9	25.6	18.4			

Table 11 (Continued).

Elm/Fea	Si	Gr	Measurements in mm					
Humerus			GL	GLC	Bp	Dp	SD	Bd
	R		134.9	128.9	32.1	40.4	15.6	33.6
Radius			GL	Bp	BFp	SD	Bd	BFd
	R		123.1	19.9	18.8	15.3	24.2	20.4
Ulna			GL	DPA	SDO	BPC		
	R		143.0	29.4	21.8	19.2		
Os carpi intermedium	GB							
	L		24.1					
Pelvis			GL	LAR	SH	SB		
	L		—	22.5	20.4	9.5		
	R		140.8	23.0	20.4	10.0		
Femur			GL	GLC	Bp	DC	SD	Bd
	L		151.7	145.0	37.7	18.0	15.2	32.3
	R		148.9	144.3	37.5	18.1	15.2	33.3
Tibia			GL	Bp	SD	Bd		
	L		136.3	35.1	16.2	23.3		
	R		—	35.2	17.5	23.2		
Fibula			Bd					
	R		11.5					
Metacarpus I			GL	Bd				
	L		20.6	5.7				
Metacarpus II			GL	Bd				
	L		48.7	9.6				
	R		48.3	9.8				
Metacarpus III			GL	Bd				
	L		54.7	8.9				
	R		54.8	8.8				
Metacarpus IV			GL	Bd				
	L		54.1	8.9				
	R		54.0	8.6				
Metacarpus V			GL	Bd				
	R		46.7	9.6				
Metatarsus II			GL	Bd				
	L		50.6	—				
	R		50.5	9.0				
Metatarsus III			GL	Bd				
	L		58.0	8.9				
	R		57.4	9.0				
Metatarsus IV			GL	Bd				
	L		59.7	8.9				
	R		59.2	8.5				
Metatarsus V			GL	Bd				
	L		51.7	7.6				
	R		51.7	7.7				

Table 11 (Continued).

Elm/Fea	Si	Gr	Measurements in mm	
Calcaneus			GL	GB
	L		42.2	18.0
	R		42.0	17.9
Astragalus			GL	
	L		27.4	
Domestic fowl ( <i>Gallus gallus domesticus</i> )				
Tibiotarsus 1988/X.4			SD	Bd
	L	-	6.0	10.0



Fig. 5. Scheemda, two metatarsi of horse, *Equus caballus*; on the left from a small horse, with a height at the withers of 130 cm, on the right from a medium-sized horse, with a height at the withers of 136 cm. Scale 1:2 (photograph R.J. van Ewyck, C.F.D.).

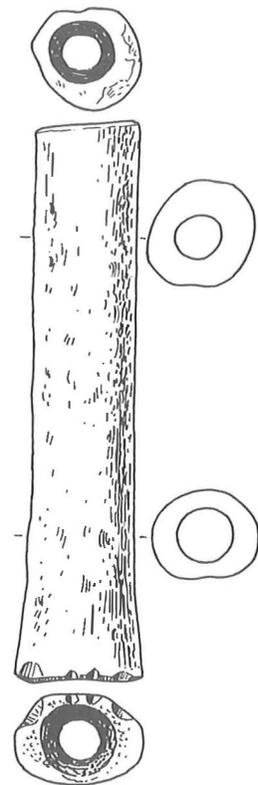


Fig. 6. Scheemda, worked metatarsus of horse, *Equus caballus* (1988/XII.92), possibly a handle. Group C: 1275-1509. Scale 1:2 (drawing H.R. Roelink, B.A.I.).

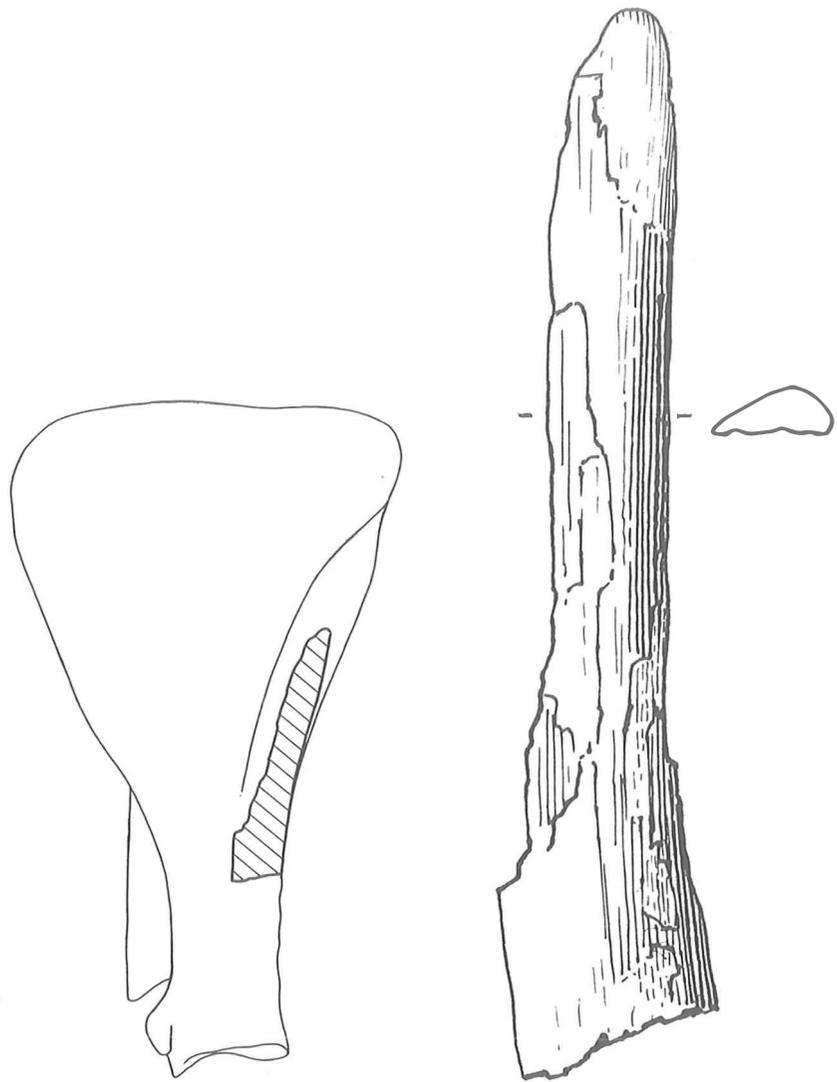


Fig. 7. Scheemda, worked part of a scapula (thoracic edge) of cattle, *Bos taurus* (1988/XI.14), possibly a polisher for hides or textiles. Group C; 1275-1509. Scale 1:1 (drawing H.R. Roelink, B.A.I.).

marks, apart from traces of dog gnawing at the processus coracoideus (fig. 10). Not a single bone of cattle, horse, sheep or pig had been pathologically affected.

### 3.2. The dog from c. 1509

A disturbed skeleton of a dog dates from about 1509 (number 1988/XI.73) (figs 12-14). It comprises the last cervical vertebra, the first four and the last four thoracic vertebrae with some of the ribs, the first sternum element (the manubrium sterni), the lumbar vertebrae apart from the last one, the sacrum and the first two caudal vertebrae. The right foreleg was complete, apart from the carpus. The left foreleg was represented by the scapula, one carpal bone (the intermedium) and the metacarpalia I-IV. The hind legs were complete, apart from the patellae

and the smaller tarsus bones. The toes of forelegs and hind legs were only represented by three first phalanges (in fig. 12 arbitrarily placed with the right foreleg). No baculum was found, so we are not informed on the sex of the dog.

All epiphyses of the skeleton of the dog had been fused, indicating an age of at least 20 months. The dog was small. Its height at the withers was about 43 cm (tables 10 and 11). The trochanter major of the femur protrudes by about 5.5 mm over the proximal end of the caput (fig. 13). This feature is characteristic of modern dogs of Dachshund type (Detels, 1980; Prummel, Udrescu & Cordy, in prep.) (height at the withers 30-35 cm, sometimes as much as 42 cm). The tibiae of the Scheemda dog were slightly curved, another feature of dogs of Dachshund type (fig. 14).



Fig. 8. Scheemda, phalanx I of cattle, *Bos taurus* (1988/XI.15), with a (man-made?) black circle around a natural foramen. Group C: 1275-1509. Scale 2:1 (photograph R.J. van Ewyck, C.F.D.).



Fig. 10. Scheemda, scapula of horse, *Equus caballus* (1988/XI.88); the processus coracoideus has been gnawed away (arrow). root prints over the whole surface of the bone. Group A: c. 1275. Scale 2:3 (photograph R.J. van Ewyck, C.F.D.).

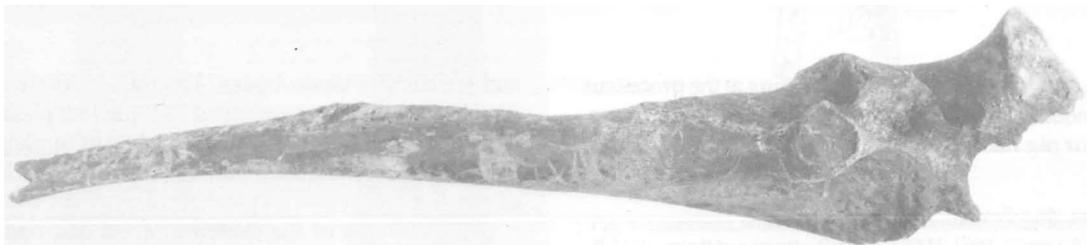


Fig. 9. Scheemda, ulna of cattle, *Bos taurus* (1988/XI.73); the proximal end has been gnawed away by dogs. Group C: 1275-1509. Scale 2:3 (photograph R.J. van Ewyck, C.F.D.).



Fig. 11. Scheemda, ribs of pig, *Sus domesticus*, with butchering marks (1988/XII.94). Group C: 1275-1509. Scale 3:2 (photograph R.J. van Ewyck, C.F.D.).

#### 4. DISCUSSION

Cattle and horse are the animal species that are best represented by the remains at Scheemda. The cattle yielded milk and manure during life, and meat, fat, hide, bone (fig. 7) and horn after being slaughtered at mature ages. The raised-bog area evidently offered good pasture for cattle.

The horse is remarkably well represented at Scheemda, especially in groups B and C (43 and 40% of identified remains, tables 2 and 3).<sup>1</sup> In other Dutch sites from the 13th-16th century, horse is poorly represented (e.g. urban sites: Amsterdam and Dokkum: not a single horse bone at either of these sites (Clason, 1966; van Gelder-Ottway, 1979), Haarlem-Brinkmann-complex: 4 horse bones among 686 bones of domestic mammals (van Wijngaarden-Bakker 1980); castles: Huis te Merwede: not a single horse bone among 271 mammal bones (Clason, 1967), Voorst: one horse bone among 1597 identified bones (IJzereef, 1983)). No other village sites of the 13th-16th centuries have been studied archaeozoologically, so we cannot compare their proportions of horse remains with those of Scheemda. Early medieval rural sites generally show low pro-

portions, up to 5%, of horse bones (e.g. Kootwijk (IJzereef, 1987), Dorestad (partly of rural nature; Prummel, 1983), Rijnsburg (Clason, 1967), Oldeboorn (Zeiler, 1988) and Schagen-Dorpen (Prummel, 1989)).

How can we explain this high proportion of horse remains in Scheemda? Horses will not have been reared for their meat, as this, in spite of a few cut marks, generally was not consumed at Scheemda. This is deduced from the fact that the horse's long bones are far less fragmented than the cattle bones (table 7). Horsebone fragments on average weigh 101 g, against those of cattle 53 g (averages of groups A, B and C). The most likely explanation for the high proportion of horse bones is that the 13th-16th century inhabitants of Scheemda kept horses in considerable numbers to cultivate the raised bog as arable fields (Bitter, 1991: pp. 369-370). That most horses died at a fairly advanced age (table 8) confirms that the horses of Scheemda were not kept for meat production, but were draught horses. After death, their hide and bones were used (fig. 6).

Before the 10th century horses were not used for ploughing in Europe, because the collar, a Chinese invention which enables a horse to develop the great force needed to pull a plough, was not yet in use (Barclay, 1980: pp. 106-113). In the Early Middle Ages oxen were used for this purpose. Schelvis (1990; in press) established by acarological research that horses were presumably kept at the site itself. He found mites (Acari) that are characteristic of horse dung in the pits to the east of the first church (Group A, c. 1275).

Sheep/goat and pig were kept in small quantities at Scheemda. Sheep has been demonstrated with certainty (in group C). Whether goats were kept is uncertain. The sheep yielded milk and wool during life, and meat and skins after death. The moist surroundings of the site will have been unsuitable for sheep, because of the presumable presence of the endoparasite liver fluke, which occurs in moist environments (Prummel, 1979). Another endoparasite of sheep that possibly occurred at Scheemda is the flatworm *Moniezia expansa*. The intermediate host between this endoparasite and the sheep, the mite *Scheloribates laevigatus* (C.L. Koch 1836), has been identified at 'Ol Kerkhof' (Schelvis, 1990; and pers. comm.). The liver fluke and *Moniezia expansa* are possible causes of the high mortality of sheep chronicled by Emo and Menko in the years after 1271 (*Kronieken van de abdij Bloemhof te Wittewierum*).

The pigs yielded meat, skins and bristles after being slaughtered. The low proportion of pig remains may be explained by the scarcity of woods in the surroundings of the site (Casparie, 1990), woodland being the most suitable vegetation for pigs.

The dogs will have been watchdogs, guarding the house and livestock. Domestic cat has not been demonstrated by bone remains. The only indication of a cat are two footprints in a roofing-tile (fig. 15). As the tile may have been produced elsewhere, the cat did not

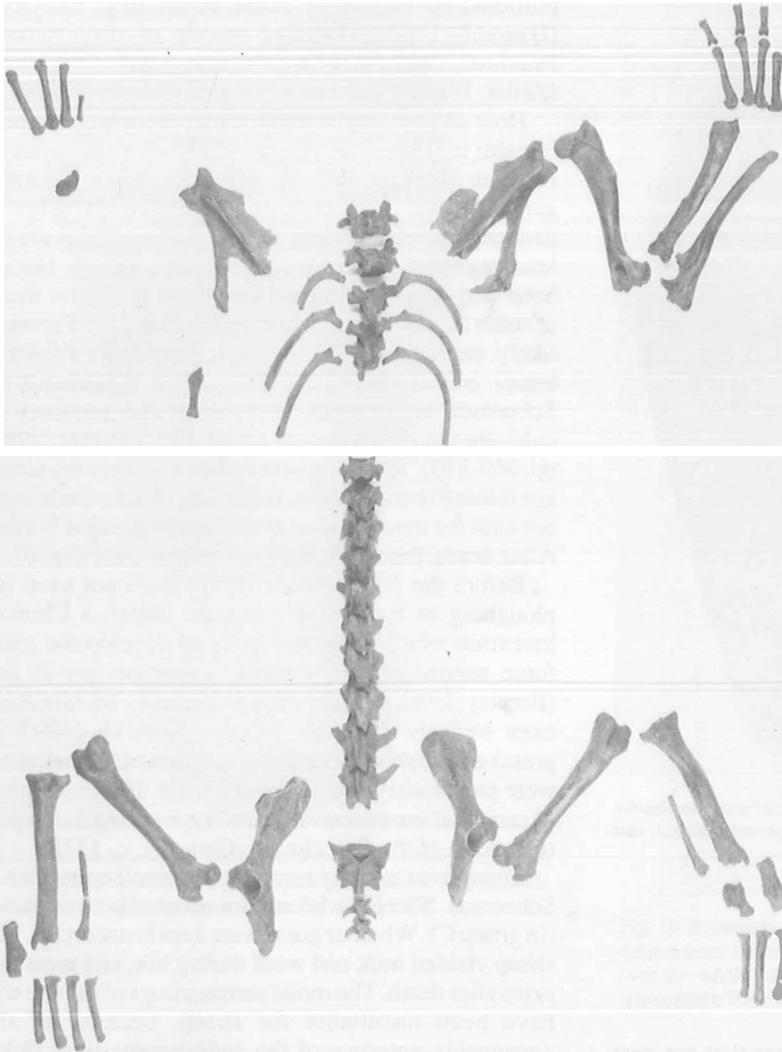


Fig. 12. Scheemda, nearly complete skeleton of dog, *Canis familiaris* (1988/XI.73), c. 1509. Scale 1:6 (photograph R.J. van Ewyck, C.F.D.).

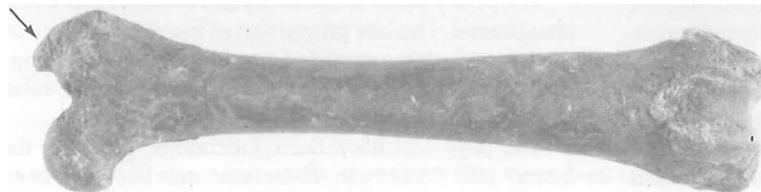


Fig. 13. Scheemda, left and right femora of the nearly complete dog, *Canis familiaris* (1988/XI.73), 1509; the trochanter major (arrow) protrudes over the caput femoris. Scale 1:2 (photograph R.J. van Ewyck, C.F.D.).

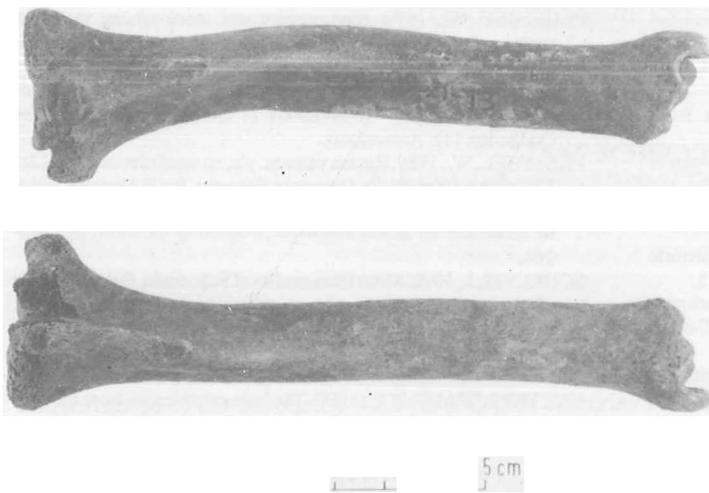


Fig. 14. Scheemda, curved left and right tibiae of the nearly complete dog, *Canis familiaris* (1988/XI.73), 1509. Scale 1:2 (photograph R.J. van Ewyck, C.F.D.).

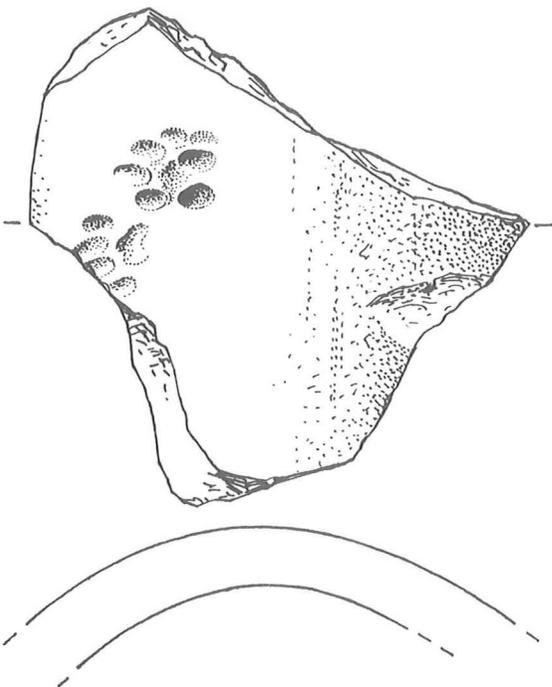


Fig. 15. Scheemda, roofing tile (1989/IX.19) with two footprints of a cat. Group C: 1275-1509. Scale 1:2 (drawing H.R. Roelink, B.A.I.).

necessarily step on the tile at Scheemda itself. An unidentifiable bird bone has been preserved from the period around 1275. The only domestic-fowl bone originates from a later period. There is no evidence of hunting, fowling or fishing, but as no soil sieving was carried out we cannot conclude that these activities were not performed.

Of the disasters chronicled by Emo and Menko (Jansen & Janse, 1991) the high mortality of sheep is the

only one that may be reflected in the faunal remains of Scheemda, namely by the low proportion of sheep remains. The bones of cattle, pig and sheep/goat appear to be normal normal butchering remains.

## 5. ACKNOWLEDGEMENTS

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## 6. NOTE

1. In A horse bones are less well represented. However, the proportion of horse to cattle bones is not significantly lower in A than in B and C (A to B, Fisher test:  $p = 0.108$ , A to C:  $\chi^2 = 1.906$ ).

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