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# Noble Meals instead of Abstinence? A faunal Assemblage from the Dominican Monastery of Norden, Northern Germany

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## Abstract

*The faunal remains recovered from the site of a late medieval mendicant order are presented here. The assemblage shows indications for wealth and high social status. The archaeozoological results are discussed in the light of historic facts known about the Dominican order revealing obvious discrepancies. Differences are visible between the refuse from early and late features suggesting a change from a diet consisting predominantly of fish in the 13th century to a preponderance of meat from the 15th century onwards. It is assumed that these changes may reflect a shift in ethical values.*

## Keywords

*Middle Ages, northern Germany, monastic site, social status, mendicant order, dietary rules*

## Introduction

In this paper a faunal assemblage from a late medieval monastery at Norden, county Aurich in the region of Ostfriesland (East Frisia) in the federal state of Niedersachsen (Lower Saxony) shall be introduced. Today, Norden is a small city of about 25.000 inhabitants at the North Sea coastline. It is situated in a flat marshland area with clay soil and a tidal-influenced wadden sea. A sheltering dike was constructed in the 12th century. In medieval times the city was smaller, but the environmental conditions have been more or less similar. The archaeological site as well as the faunal material is published in several reports (Bärenfänger 2006a, 2006b, 2006c; Bärenfänger and Brüggler 2007; Küchelmann 2010a, 2010b). Only a short summary about the general features will be given here after which I will focus on some particular aspects that resulted into an assumption that I would like to put under discussion of the international community. Further details may be obtained from the above mentioned publications.

In AD 1264 the local nobility donated a former mint house to the Dominican order, who founded a monastery on the estate. The monks reconstructed and enlarged the buildings until the beginning of the 14th century. Of special importance for this research are two burning events that are documented in the annals of Norden, traces of which are mirrored by archaeological evidence. The monastery was raided and burnt down for the first time in 1430 and was re-erected subsequently. In 1527 it was closed in the course of the reformation and transferred into an earl's manor. In 1531 the buildings were

burnt and re-erected again. After several changes of usage they were turned into a Latin school in 1567. The successor of this institution, the present Ulrichsgymnasium, is still in function at the same place. The medieval buildings (Figure 1), however, have been replaced, the last remains were removed in the middle of the 19th century. During recent construction works a rescue excavation was undertaken by the Archaeological Service of the Ostfriesische Landschaft Aurich in 2004 - 2005. All finds were collected by hand. Three major complexes (Figure 2) which were chronologically distinguishable yielded animal bones. These are:

- The so called western room shows traces of burning and was not reconstructed after the fire but given up and filled with waste material. The dateable finds place this event in the early 15th century, which corresponds with the burning event of 1430.
- The ash layer of the first burning extends into the adjacent eastern room, but this room has been reconstructed after the first fire and was finally demolished in the early 16<sup>th</sup> century, a time which corresponds with the 1531 burning. Both rooms were probably part of a kitchen area.
- Feature 21 is a 12m long garbage pit underneath the monastery foundation walls. It was filled with 13th century material and therefore can be placed confidently into the time before or during monastery construction (late 13th to early 14th century).



FIG. 1 - ULRICHSSCHULE NORDEN, DRAWING OF 1840 (FROM BÄRENFÄNGER AND BRÜGLER 2007, 175)

### The bone assemblage

The recovered faunal remains consist of 5117 items with a weight of 73,4kg (Figure 3, in appendix). The number of identified specimens (NISP) is 3046. The bulk of the material are the usual medieval economically important domesticates cattle, pig and sheep/goat. Remains of horse, dog, cat, chicken, goose and duck appear in small numbers as expectable characters. Together the domestic species make up 94,1% of the NISP and 99,3% of the bone weight. The degree of fragmentation is 92%, most of the bones are heavily fragmented with only a few mammal foot bones and some bird bones being complete. About 20% of the bones show chop and cut marks. So far, the pattern is consistent with the general picture of nutritional refuse. The first unusual aspect is the representation of 36 different species in the whole assemblage (Figure 3, in appendix) – a rather large number for a rural or urban medieval site. Besides the already mentioned ten expectable domesticates there are five species of wild mammals (hare, rabbit, wild boar, polecat or ferret, harbour porpoise), ten species of wild birds and 11 fish species (Figures 3 and 4). They do not make up a relevant part of the NISP nor of the weight, but they are worth taking a closer look as evidence itself. Among the 27 wild bird bones are wild ducks, grey heron, waders, partridge and songbirds (Figure 3). More wild ducks and wild geese may be hidden within the 98 goose and duck bones as these could not be separated from domestic duck and goose with confidence in each case. The heron may be pointed out, which is represented by 14

mainly juvenile bones from a minimum of three individuals. Among the 118 fish bones are cod, haddock, several flat fish, sturgeon, salmon or trout and some rare species like mullets, seabass and swordfish (Figures 4 and 5).

### General interpretation

After several decades of archaeozoological research, a substantial amount of data is available for European medieval faunal assemblages from sites with different social contexts and several authors have focused on comparative aspects between such sites (see for instance Ashby 2002; Bartosiewicz *et al.* 2010; Ervynck 1992, 1997; Kühtreiber 2010; Rehazek and Marti-Grädel 2010; Serjeantson 2009; Schoon *et al.* 2007; Woolgar *et al.* 2009, 270-277). These studies revealed that apparent differences are observable in the faunal refuse, which resulted in the establishment of patterns and criteria that allow the distinction of high status (feudal, clerical) from common (urban, rural) sites. Particular markers for high status in the Middle Ages are:

- a high number and variation of species represented
- the representation of gamethe representation of wild birds
- the representation of species related to high status by specific rules, regulations, habits or fashions (e.g.

dwarf pet dogs, falconry, pheasant, swan, ‘royal’ fish, etc.)

- the representation of rare or expensive species (e.g. pea fowl)
- a high proportion of young animals
- a high proportion of selected high quality body parts.

Judging the Norden assemblage by these criteria, several indications for high status are visible, in particular:

- A quite high number of species, especially of wild birds and fish.
- Game is represented by wild boar and hare. Wild boar is classified as high game restricted to the high nobility in the medieval time we are dealing with here. The hunting of hare, however, was less restricted in Germany at that time with exceptions of hunting rights being granted to people of lesser rank eventually (Schmölcke 2009, 86).
- There are species which are related to high status by specific regulations. Porpoise and sturgeon are classified as royal fish in England, which had to be delivered to the crown by the fisherman (Ashby 2002, 42; Gardiner 1997). For the porpoise this has not been historically analysed in Germany, but for sturgeons there is historic evidence for fishing right regulations, expensiveness and other indications of high status for Germany and Austria as well (Kunst and Galik 2000, 252; Lampen 2000, 45, 51, 68-69, 91-92, 119; Tiedemann-Wingst 2001, 72-73).
- At least two species can be attributed as rare and/or expensive. The grey heron has been found regularly in noble contexts and is claimed to be a typical species at noble banquets (Baker 2010, 62; Eryvnc 1992, 153; Gardiner 1997, 186). The swordfish is certainly a rare species because its natural distribution does not include the North Sea although there are a few records of vagrant individuals captured or washed ashore on German and Dutch coasts for the last four centuries (Haas 1899, 170; Mohr 1935, 390). The rostrum fragment found in Norden (Figure 5) is the only representation in a northern European archaeological context I am aware of so far, apart from an amulet manufactured out of a modified vertebra found at the early medieval Slavic fortress of Starigard (Prummel 1993, 119, 132). This object, however, could have been imported from elsewhere.

- In cattle, pig and sheep/goat the proportion of the finds from body regions with nutritionally valuable meat parts (spine, upper limb, skull) are overrepresented, most explicitly in case of sheep/goat (Küchelmann 2010a, 198-200). However, this fact may also be a taphonomic bias caused by the accumulation of

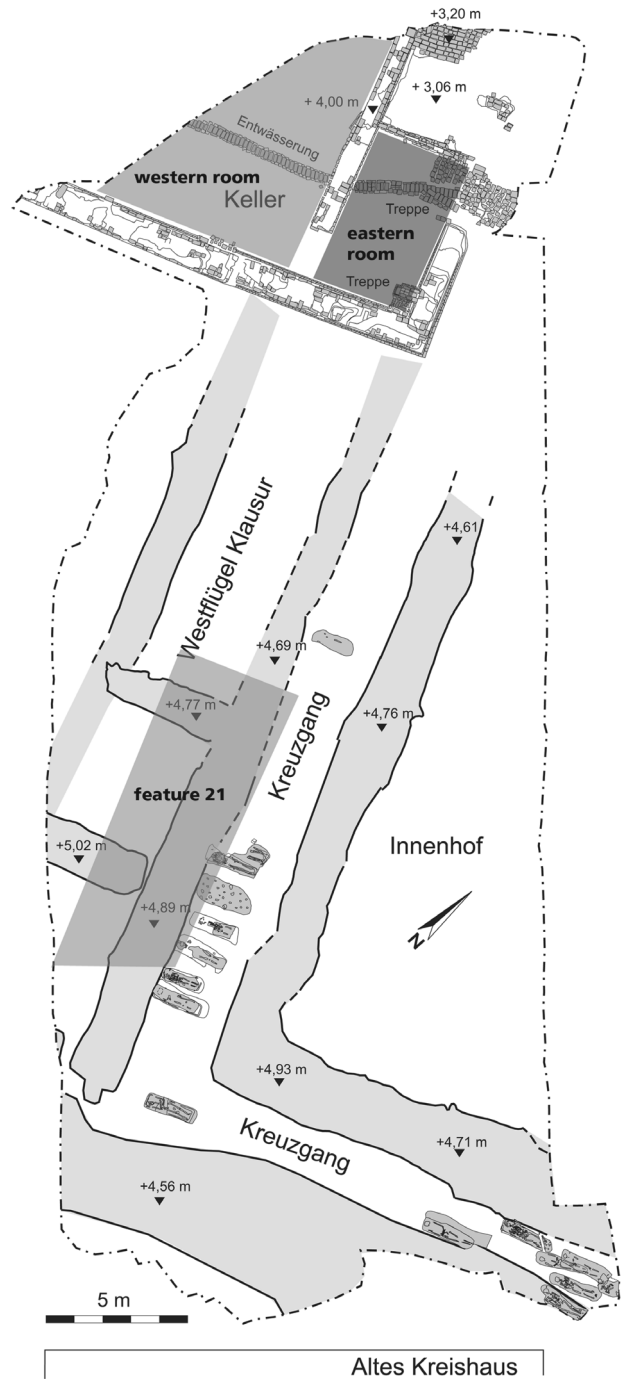


FIG. 2 - SITE PLAN (DRAWING G. KRONSWEIDE, OSTFRIESISCHE LANDSCHAFT AURICH)

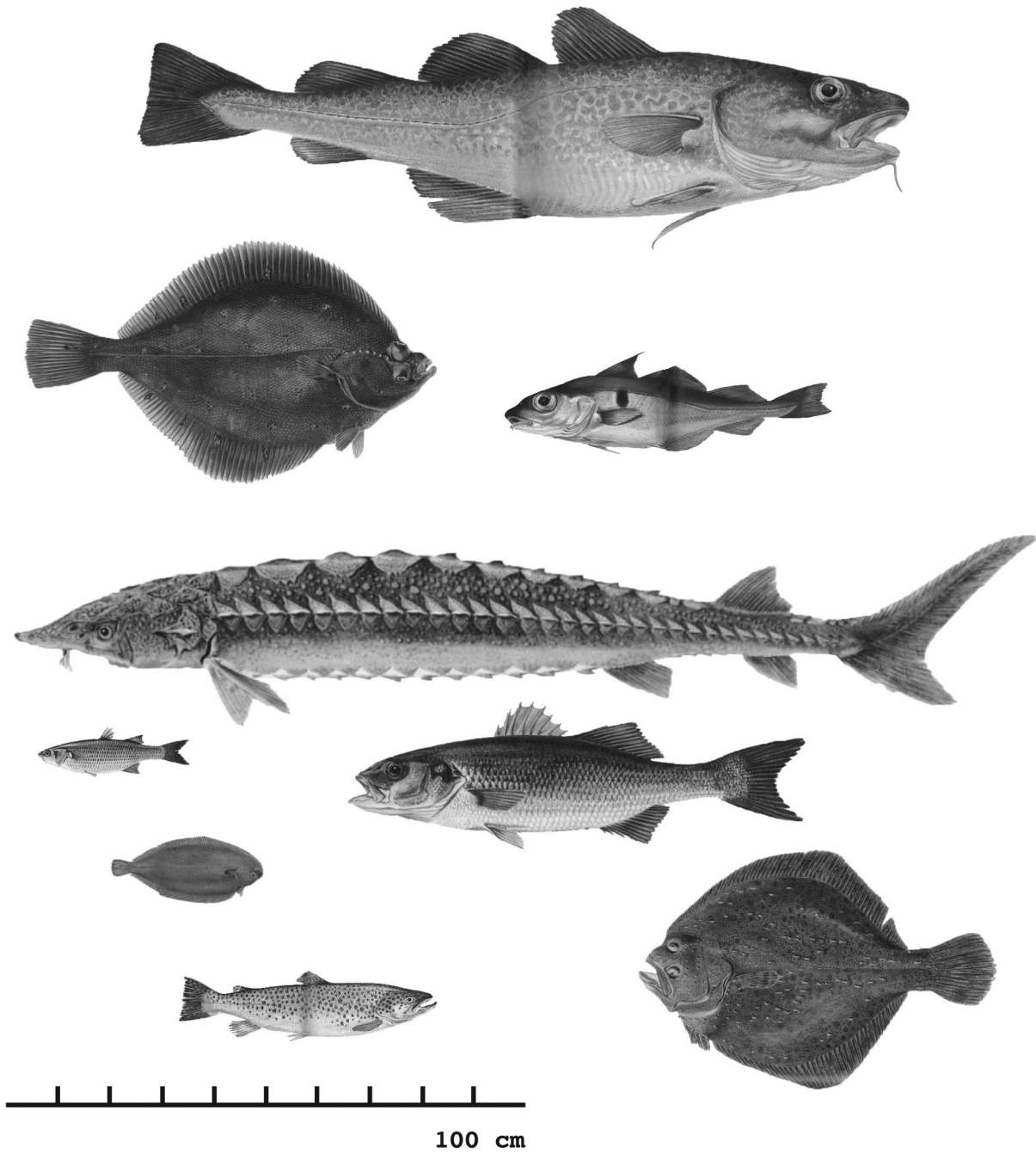


FIG. 4 - FISH SPECIES REPRESENTED IN THE DOMINICAN MONASTERY NORDEN IN ORDER OF THEIR ABUNDANCE. FROM TOP TO BOTTOM: COD, PLAICE, HADDOCK, STURGEON, THICKLIP GREY MULLET, EUROPEAN SEABASS, COMMON SOLE, TURBOT, SEA TROUT (FROM MUUS AND NIELSEN 1999)

the assemblage as kitchen or table refuse (in contrast to primary slaughtering waste) and may not be over-estimated.

- The majority of the sheep/goat bones comes from juvenile individuals (86% less than two years), among these a high proportion (73%) of lambs less than 3 months old (Küchelmann 2010a, 163, 169, 194).

Combining this evidence shows a clear pattern of a high status site, which is surprising since it is in contradiction to the historical data available for the Dominican order. The Dominican order was founded in 1215 by Dominicus of Guzman (1170-1221) in Toulouse in order to regain power over the heretic provinces in Southern France for the Roman Catholic Church. To restore the lost credibility of the church, which was under accusation of enrichment and turning away from Christian values, Dominicus built the order as a strictly mendicant fraternity. Its statutes include the prohibition of any property for the monks as well as for the fraternity in general. The consumption of meat of four-footed animals is completely forbidden throughout the whole year and the defiance of this rule is set under penalties (*ad poenam*) (Grabner-Haider 2007, 105-113; Bretscher-Gisinger and Meier 2000, 1192-1194). Unlike the moderate Benedictine dietary rules (see for instance Eryvynck 1997, 5-7; Lampen 2000, 42-52) no exceptions were allowed, not even in certain circumstances (e.g. illness). Fish, however, classified as “river vegetable” (*fluminum legumina*) in the *Regula Sancti Benedicti*, was an allowed food item. The terminus is also applied to the beaver and other water-bound mammals. Fowl is not mentioned by Benedict and remained a matter of discussion between the Christian scholars.

Applying these facts one would expect neither remains of mammals nor indications of wealth and high status at the site of a Dominican monastery. The impression of the faunal assemblage does not fit to this expectation at all. The picture becomes more differentiated if we take a view at the different chronological sub-samples (Figure 6). In the late 13th to early 14th century sample fish makes up more than 55% of the NISP despite the probable loss of small fish bones caused by the coarse collection method. Although fish bones are much lighter than mammal bones they still hold a percentage of 26% of the weight. The proportion of fish is declining rapidly in the 15th century. The contrary is visible for the domestic animals, the proportion of which is increasing dramatically. It seems that a major change occurred in the composition of the diet between the 14th and the 15th century. The sample from the 13th-14th century does fit much more to the expectation of the diet of a mendicant order than the later sub-samples.

Turning again to the historic facts about the Dominicans and taking a closer look at its development reveals that the order was quite efficient and successful in its attempt to regain political and religious control and power for the Roman church. The order became very popular in the 13th century and developed very rapidly: In 1277 it counted



FIG. 5 - FRAGMENT OF ROSTRUM OF A SWORDFISH (*XIPHIAS GLADIUS*) (PHOTO G. KRONSWEIDE)

404 convents all over Europe. Subsequently the Dominicans were granted substantial privileges by the Vatican in the late 13th and 14th century. The Dominicans became a principal power in the inquisition. Already in the 14th century the statutes demanding poverty were loosened partially (e.g. by the introduction of the *vita privata*, the permission of private property for certain high ranked friars). In 1478 the statute prohibiting any wealth and property was abolished (Grabner-Haider 2007, 105-113; Bretscher-Gisinger and Meier 2000, 1192-1194). In the following period the order became more and more powerful and wealthy like many other Christian orders. Comparing the historic data with the assemblage, it appears as if the monks in the foundation period of the Norden monastery, 49 years after the foundation of the Dominicans, kept their dietary Lenten rules more or less. In the later phases a shift seems to have occurred, allowing large scale meat consumption. One possibility that may account for this change may be the shift in ethical values documented in the historical sources.

A few more details may be discussed here in the light of this assumption. Eryvynck (1997) refers to the ‘consumption of otters, beaver tails or sea mammals [...] often quoted in popular literature as being typical for the food supply of medieval abbeys’ and assesses this assumption as probably ‘no more than the uncritical extrapolation of some historical anecdotes’ since no evidence for this practise has been discovered in Flanders. In case of the Norden assemblage there is at least proof for the consumption of porpoise, which is represented by four finds (all displaying cut or chop marks), two of which were recovered from the 13th-14th century pit, one each from the western and eastern room. Other single finds of porpoise and dolphin were

recovered from clerical contexts in Canterbury, Norwich and Westminster (Curl 2006, 376; Gardiner 1997, 190-191). While the porpoise is certainly a rare species as well as a luxury item as historical documents and the scarce archaeological finds confirm, it was also regarded as fish in the Middle Ages and hence a permitted and recommended Lenten animal (porpoise fat in French was called *lard de carême*, Lenten fat). It may therefore be evidence for wealth and high status but not for disobedience against fasting rules. Beaver and otter bones have been recovered from 17th century features in the Carthusian monastery of Mauerbach, Austria, where beaver and otter consumption is also supported by historical documents (Galik and Kunst 1999, 677-678; Kunst and Galik 2000, 255).

The single find of a rabbit bone points towards the custom of rabbit keeping in *Leporariae*, a practise documented for the Frisian coast since the 13th century by historic sources and archaeozoological evidence. Rabbit keeping was a guarded privilege of monasteries and the gentry until the 16th century (Benecke 1994a, 356-361, 1994b, 183-184; Ervynck 1992, 153; Grimm 2006a, 19, 2006b, 15; van Damme and Ervynck 1988). The rabbit femur belonged to an adult individual and therefore cannot be related to the historically documented permission to eat unborn or newborn rabbits as Lenten food (Benecke 1994a, 359; Ervynck 1997). The skull of a mustelid – either a polecat or a ferret – from the early 15th century feature may be interpreted in a similar way. If it can be proved to be a ferret it will add weight to the rabbit keeping practise, which is closely related to ferreting (Benecke 1994a, 355-356, 1994b, 185; van Damme and Ervynck 1988; Owen 1973), and it would become another high status marker.

Fish in general was regarded as precious food addition to the daily vegetable diet of the monks. According to historic documents the fish diet consisted mainly of stockfish (dried cod) and salted herring, which were produced and traded in large amounts for a relatively cheap price. In fact, it sometimes proved to be an economic problem for some monasteries to supply enough fish for its inhabitants to fulfil the fasting rules (documented e.g. in debates about well guarded fishing rights or through the exceptional permission for meat consumption in case of monasteries with geographically restricted access to fish). As can be seen from medieval account lists other fish like freshwater species (except domestic carp), sturgeon, salmon, fresh gadids, turbot or seabass are notably precious food items (Ervynck 1997; Lampen 2000, 44-52; van Neer and Ervynck 1996). The information from the historic sources is generally consistent with the archaeozoological record. Herring and gadid species (predominantly cod and haddock) are regularly present in monastic assemblages and dominate the fish spectrum in some cases, which proves them to be part of the regular diet. The composition of the other fish varies. In coastal sites flat fishes are the next abundant group, but here differences in detail are visible: flounders are common, turbot and sole are rare. Inland sites often display various freshwater species (Ervynck 1997; Lampen 2000, 52-60; van Neer and Ervynck 1996, 160-161). Summaris-

ing the historic and archaeozoological evidence means that gradients in wealth will be detectable even in fraternities who are living in accordance to the Lenten rules. A low diversity of fish species consisting mainly of cheap species like herring, stockfish and maybe the domestic carp will characterise an economically poor community, whereas a high diversity of species containing fresh fish and expensive species will be the signature of a wealthy community. Applied to the Norden assemblage we observe cod and haddock as the most abundant species, which is consistent with the general trend, but in both species skull elements are represented pointing towards fresh individuals instead of dried ones. The gadids are followed by flat fish, mainly of the flounder family but a partial skeleton of a sole and one anal bone of a turbot account for the expensive species. It is surprising that no herring has been found but this is probably due to the hand collection method. The identification of fresh cod and haddock, turbot, sole, sturgeon, salmon/trout, seabass and some other rare species reveals that the community was wealthy enough to buy a diversity of expensive (fresh) sea fish even in the early occupation phase. Living may have been not that full of deprivation under a rule of poverty...

The fact that all identifiable fish were marine species is probably mainly due to the easy supply of marine fish in a coastal city. It also proves that at least a major part of the fish was bought instead of subsistence production (e.g. fish farming or regulated river fishing).

## Conclusion

In 1993 Terry O'Connor concludes in his summary of archaeozoological analyses in monastic sites in the UK that there are many interesting questions left open and that '*progress in this area will require the collection of new data*' to solve them. Since then a substantial convolute of faunal remains from monastic sites has been studied and published (see for instance Ayres *et al.* 2003; Ervynck 1997; Galik and Kunst 1999; Kunst and Galik 2000; Powell *et al.* 2001; Schoon *et al.* 2007; van Neer and Ervynck 1996; just to note a few). It became apparent that the remains of every day life often manifest themselves as hard evidence.

One of the most interesting questions in case of monastic sites is the potential to monitor distinctions in the composition of the faunal material in functionally different locations within one site, in chronologically different features and between different monastic communities. Differences that may reflect social status, wealth, ethical values and their change and development. Such in-depth results can be compared with written historic, iconographic and other sources in which concepts of social identity, status symbolism, self representation, ethical values and claims, etc. are expressed (e.g. Bartosiewicz *et al.* 2010).

This paper is an attempt to link the data of the faunal assemblage of the Dominican monastery of Norden to historical data about the Dominican order in particular and



	% of NISP		% of weight	
	early 14th cent.	early 15th cent.	early 14th cent.	early 15th cent.
cattle, sheep/goat, pig	89,9	88,9	56,1	98,4
horse, dog, cat	1,0	5,5	0,0	0,3
domestic birds	5,7	4,6	8,0	0,8
wild mammals	0,3	0,5	9,9	0,1
wild birds	1,7	0,0	0,0	0,2
fish	1,7	0,5	26,0	0,3
	100,1	100,3	100,0	100,0

cattle, sheep/goat, pig  
 horse, dog, cat  
 domestic birds  
 wild mammals  
 wild birds  
 fish

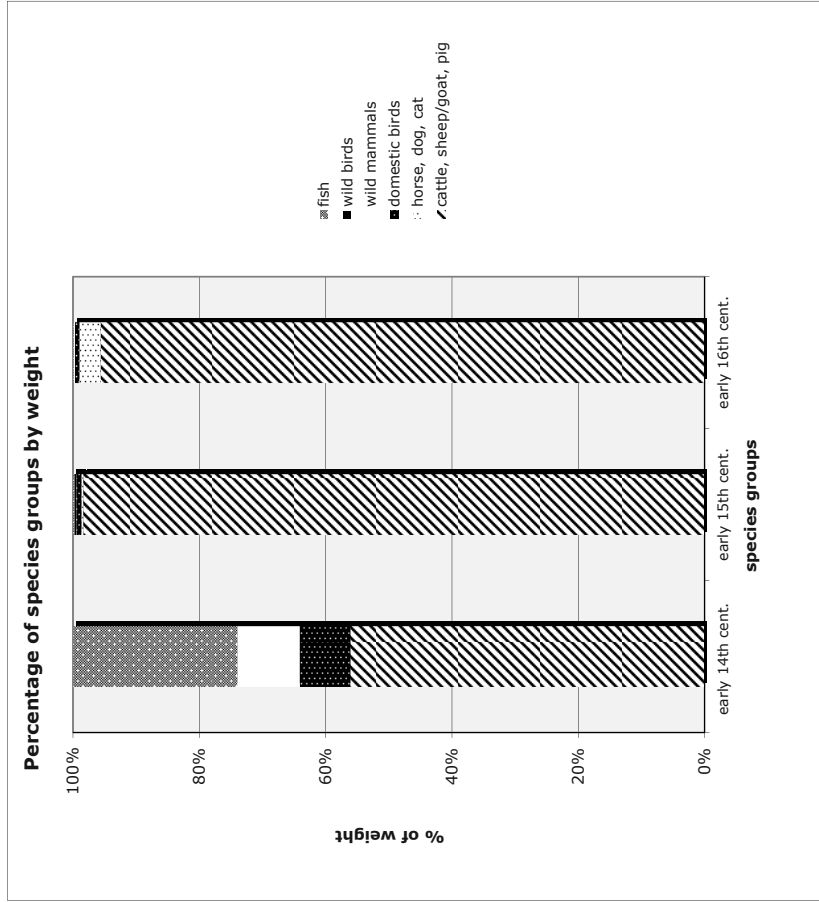
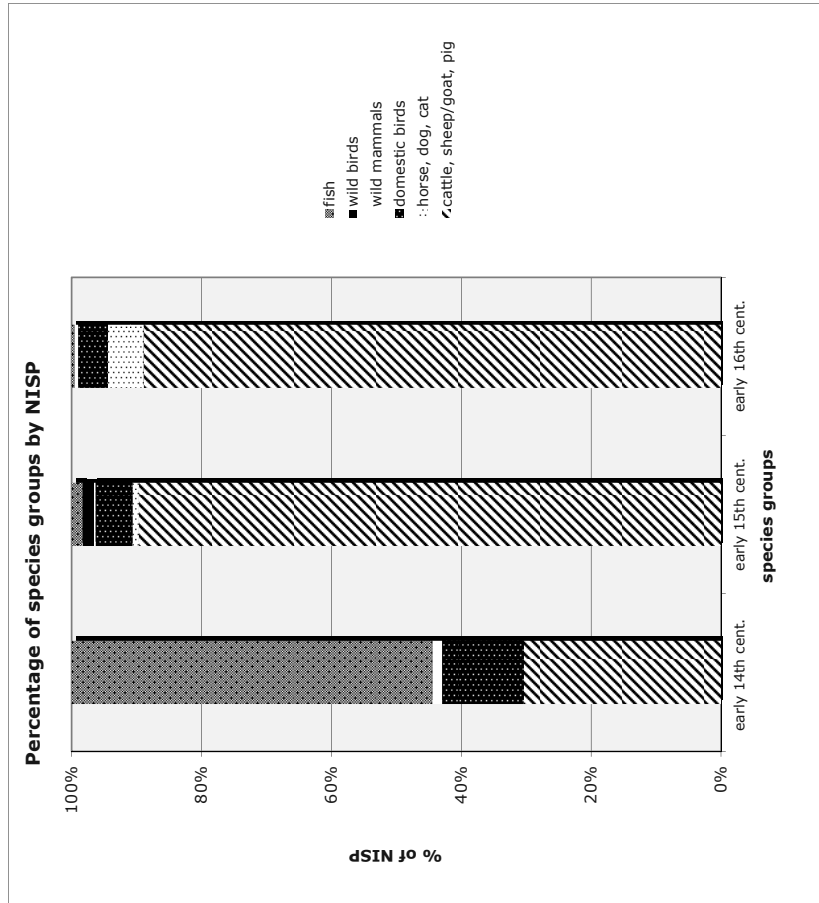


FIG. 6- RELATIVE PROPORTIONS OF SPECIES GROUPS BY NISP AND WEIGHT

Christian monasteries in general. During the analysis the question arose if the observed characteristics of the assemblage – and especially their change within the occupation time of the site – may reflect such a change of consumption patterns, dietary habits and ethical values connected with them. I am quite aware that the database for such an assumption is rather thin and I am not sure if the facts are not overexploited, but on the other hand the difference between the sub-samples is so eye-catching that it might at least be worth to search for comparative situations within other (mendicant) orders. Several faunal assemblages from monastic sites have already pointed towards the assumption that the meat abstinence rule has not always been followed in strict sense (see e.g. Ervynck 1997; Lampen 2000, 42-52; van Neer and Ervynck 1996). I would like to proceed one step further here, raising the question if it might be possible to track down the development of social and maybe even ethical changes through time in closed communities with well documented rigid rules like Christian mendicant orders – supposed a broader database will be available in the future. It may become possible to analyse the ethical claims of certain communities reflected in their dietary rules and to judge them by their practical reality reflected by their daily refuse in much more depth than today. Of course this would require a much higher resolution in the excavation and sampling methods including regular (wet) sieving of samples from different features within one site. One might proceed to compare different orders with each other. Investigations like the one in Ename (van Neer and Ervynck 1996), Mauerbach (Kunst and Galik 2000; Galik and Kunst 1999) or Eynsham Abbey (Ayres *et al.* 2003) are a good starting point here. Van Neer and Ervynck (1996, 158) concluded for the Benedictine abbey of Sint-Salvator at Ename, Belgium (11th-16th century) that ‘the dietary rules were rather strict in the 11th century abbey, but that their application became more and more relaxed through time. It is possible that the monks originally followed a vegetarian diet, but archaeological contexts from the earliest occupation phase [...] suggest that this diet was not strictly followed or that the rules were soon applied in a more flexible way. [...] In late medieval or post-medieval times, however, meat was gradually more and more included in the diet.’ The analysis of the Norden material may provide another mosaic piece in this direction. The ethical difference behind the sites is that the Benedictine rule supports a moderate way of life allowing meat consumption on special occasions and in certain times of the year, while the original Dominican rule demanded an extreme form of abstinence. The Norden assemblage may reflect the decay of these strict rules and the turning away from the ethical claims the Dominicans set out with in the 13th century (which brought them under accusation of the 16th century reformation movement). However, other possible reasons need to be taken into account before a final conclusion can be drawn. A fraternity with a similarly strict ascetic rule including mandatory abstinence from the meat of four-footed animals is the Carthusian order. In case of the Carthusian monastery of Mauerbach several features yielded

remains that were almost entirely in accord with the fasting rules while others contained substantial amounts of domestic mammal bones, a circumstance which is supported also by historical inventory lists proving the storage of meat of cattle and pig, stock-breeding and poultry farming (Kunst and Galik 2000, 251-255). Kunst and Galik suggest that this meat may have been consumed by persons who were not obliged to the fasting rules like guests and lay brothers. The analysis of this large assemblage has just begun and future work may provide arguments for one or the other assumption. The very accurate excavation of the Benedictine abbey at Ename provided the opportunity to compare different locations within the site. The proportion of mammal bones was extraordinary high in the vicinity of the lodge of the abbot. The authors relate this as well to the hospitality of guests at the abbot’s home and to historically documented exceptions from the abstinence of meat for the abbot. Nevertheless substantial amounts of mammal bones were also found in other parts of the abbey e.g. in the refectory (van Neer and Ervynck 1996; Ervynck 1997). In Norden the resolution of the stratigraphy and the features is not as high as in Ename or Mauerbach. Also, no historic documents have survived giving clues about the daily life in the monastery. Therefore the possibility of the provision of mammal meat for guests only cannot be ruled out. Since the dietary rules of the Dominicans were much stricter than the Benedictine rules at least the prior (originally) would not have had privileges like the ones described for the Benedictines.

One obstacle that may influence this assumption needs to be mentioned here: According to the annals of Norden the monastery became a manor of earl Enno II in 1527. The datable finds support that the eastern room was finally destroyed and filled with rubble in the late 15th or early 16th century, probably after the fire of 1531. This offers the (not very likely) possibility that all the faunal material found in the eastern room derives from the four years of noble occupation from 1527-1531, but it cannot account for the similar pattern of the western room.

One theoretical approach may be useful to be taken into account here: As Ashby (2001, 37-38) points out, wealth and high social status are not necessarily synonymous. Economically wealthy groups can be socially underprivileged and economically poor groups may be socially powerful. I have used the term ‘social status’ in this paper in the broad sense defined by Ashby as ‘socioeconomic status meaning an advantaged position within the community, whether that be based on social or economic factors’. The development of the Dominican order may be described as a shift from an economically poor but socially powerful group to an economically wealthy and socially powerful group. It might be useful to apply a refined definition of social status in a research like this the future.

Ervynck (1997) closes his status report on the archaeozoology of Flemish monastic sites with the pessimistic expectation that the addressing of questions like those dealt with here would require much more ‘care taken in the sam-

pling and recovery of organic remains' and that this 'will remain impossible [...] as long as Flemish archaeology stays overwhelmed with an ever increasing obligation of rescue excavations.' I can only subscribe to this. An approach like this would be especially useful in case of monastic sites as they provide the opportunity to investigate a relatively closed group of people with a similar social background often with continuity over long time periods – in contrast to e.g. urban sites with their much more diversified social structure (see also Kunst and Galik 2000, 249; O'Connor 1993, 107). Moreover the historical documentation for monasteries is often better than for other contexts.

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APPENDIX

species	feature 21 13th - early 14th century			western room 1st half 15th century			eastern room end 15th - early 16th cent.			other features 13th - 16th century			total			
	NISP	%	weight (g)	NISP	%	weight (g)	NISP	%	weight (g)	NISP	%	weight (g)	NISP	%	weight (g)	
<b>domestic mammals</b>																
cat	3	2.2	40	770	42.2	29401.2	320	41.7	10331.0	140	44.2	2970.8	1233	40.5	42743.0	
sheep / goat	26	19.3	44.1	613	33.6	5676.6	230	29.9	2019.5	46	14.5	292.4	915	30.0	8032.6	
theropt. sheep				32	1.8	405.8	17	2.2	206.0	2	0.6	17.2	51	1.7	629.0	
theropt. goat				3	0.2	27.8	1	0.1	7.0	0.05			4	0.1	34.8	
pig	12	8.9	31	260	14.2	4496.5	133	17.3	1832.0	23	7.3	307.1	428	14.1	6666.6	
horse				1	0.1	43.7	3	0.4	155.0	7	2.2	420.4	11	0.4	619.1	
dog				3	0.2	30.1	1	0.1	362.0	2.4	0.9	18.9	43	1.4	411.0	
catle				12	0.7	53.0	2	0.3	2.0	0.01	13	4.1	16.8	27	0.9	71.8
total domestic mammals	41	30.4	115.1	1659	90.9	39701.1	725	94.4	14701.5	99.0	73.2	4026.4	2657	87.2	58544.1	
<b>wild mammals</b>																
<b>Mammalia</b>																
wild boar																
<i>Sus scrofa</i>							1	0.1	13.0				1	0.03	13.0	
porpoise	2	1.5	20.3	1	0.1	6.2	0.02	0.1	6.0	0.04			4	0.1	32.5	
polecat or ferret				1	0.1	9.5	0.02						1	0.03	9.5	
hare				1	0.1	4.3	0.01						22	0.7	37.0	
<i>Lepus europaeus</i>							1	0.1	2.0	0.01			1	0.03	2.0	
rabbit							3	0.2	20.0	0.05			29	1.0	94.0	
<i>Oryctolagus cuniculus</i>	2	1.5	20.3	9.9									29	1.0	94.0	
total wild mammals																
<b>total mammals</b>	43	31.9	135.4	1662	91.0	39721.1	729	94.9	14729.5	99.2	79.5	4052.1	2686	88.2	58638.1	
<b>birds</b>																
chicken	17	12.6	16.5	46	2.5	85.9	0.2	13	1.7	20.0	0.1	35	11.0	42.0	164.4	
goose				55	3.0	225.0	0.6	17	2.2	78.0	0.5	12	3.8	23.3	326.3	
mallard or dom. duck				4	0.2	5.6	0.01	5	0.7	7.0	0.05	5	1.6	3.8	16.4	
pintail				1	0.1	2.3	0.01						14	0.0	2.3	
duck				11	0.6	15.0	0.04						11	0.4	15.0	
eider													1	0.3	1.1	
<i>Somateria mollissima</i>													1	0.03	1.1	
partridge													1	0.03	0.1	
<i>Pardix perdix</i>													1	0.03	0.1	
plover													1	0.03	0.4	
<i>Pluvialis sp.</i>													1	0.03	0.4	
thrush													1	0.03	0.1	
grey heron				14	0.8	49.4	0.12						14	0.5	49.4	
<i>Ardea cinerea</i>				1	0.1	1.9	0.005						1	0.03	1.9	
carion crow				1	0.1	0.1	0.0002						1	0.03	0.7	
<i>Corvus monedula</i>													2	0.07	0.7	
jackdaw													2	0.07	0.7	
<b>total birds</b>	17	12.6	16.5	133	7.3	385.2	1.0	35	4.6	105.0	0.7	57	18.0	71.4	578.1	
<b>fish</b>																
haddock	1	0.7	0.7	3	0.2	4.1	0.01	3	0.4	5.0	0.03	3	0.9	6.5	16.3	
<i>Melanogrammus aeglefinus</i>													10	0.3	16.3	
cod	13	9.6	14.9	17	0.9	46.7	0.12	1	0.3	3.6	0.09	1	0.3	3.6	65.2	
<i>Gadus morhua</i> , <i>Gadidae</i>				1	0.1	3.4	0.01						31	1.0	65.2	
turbot													1	0.03	3.4	
<i>Psetta maxima</i>				41	6.1	6.1							41	1.3	6.1	
common sole													12	0.4	7.7	
<i>Solea solea</i>				6	4.4	4.8	2.3	2	0.1	1.5	0.04		4	0.3	7.7	
flounders													1	0.03	0.1	
<i>Pleuronectidae</i>													1	0.03	0.1	
swordfish													1	0.03	50.5	
<i>Xiphias gladius</i>													8	0.3	31.5	
sturgeon				7	0.4	27.5	0.07	1	0.1	4.0	0.03		8	0.3	31.5	
<i>Acipenser sturio</i>													1	0.03	1.6	
salmon or trout	1	0.7	1.6										5	0.2	16.9	
<i>Salmo sp.</i>				5	3.7	16.9	8.2						5	0.2	16.9	
European seabass				8	5.9	8.3	4.0						8	0.3	8.3	
<i>Dicentrarchus labrax</i>													8	0.3	8.3	
mullet													8	0.3	8.3	
<i>Mugilidae</i>													8	0.3	8.3	
<b>total fish</b>	75	55.6	53.3	31	1.7	133.7	0.3	4	0.5	9.0	0.1	8	2.5	11.5	207.5	
<b>NISP</b>	135	100.0	205.2	1826	100.0	40240.0	100.0	768	100.0	14843.5	100.0	317	100.0	4135.0	59423.7	

FIG. 3 - SPECIES DISTRIBUTION OF THE DOMINICAN MONASTERY NORDEN