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Small Mammals from Danish Mesolithic Sites

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INTRODUCTION

Bones of small mammals (Insectivora and Rodentia) have often been dealt with briefly or even neglected in archaeozoological studies of faunal remains from Danish Mesolithic sites. This may be due partly to the moderate number of specimens usually recovered at each site, and partly to the fossorial habits exhibited by most of the species. The latter circumstance often casts doubt on whether the small mammal bones share with the rest of the bone assemblage a contemporaneous origin in the deposits.

Modern excavation techniques, applied at Mesolithic sites for the last twenty years, have included water-screening of selected samples or even of the entire deposit. This procedure has substantially increased the quantities of small mammal bones retrieved, making interpretations of micro-faunal assemblages more urgent. The aim of this paper is to model the pre-burial taphonomic pathway of small mammal bones at Mesolithic sites. This is attempted through a detailed analysis of a large sample from an Ertebølle settlement, combined with an overview of data from 29 other Mesolithic sites in Denmark.

It will be demonstrated that no single process can explain the presence of the rodents and insectivores at the settlements. Several causes are involved and only some of them include human activity.

MATERIAL

The primary sample used in this study consists of 220 small mammal bones from the Mesolithic settlement of Maglemosegård (Table 1). This settlement is situated on the south coast of the former Vedbæk Fjord, a small Atlantic-Early Subboreal inlet in northeastern Zealand.

The great majority of the bones derive from a large midden accumulated on land, and they date to the older part of the Ertebølle period. The site was excavated in 1975-78 in connection with the interdisciplinary "Vedbæk-project" of which the main participants were the National Museum, the Institute of Prehistoric Archaeology and the Zoological Museum, both at the University of Copenhagen (see e.g. Brinch Petersen *et al.* 1976, 1977, 1979 & 1982).

An overall description of the faunal remains from Maglemosegård and other Vedbæk Fjord settlements has previously been published (Aaris-Sørensen 1980a, 1980b, 1982 & 1988), and the Maglemosegård assemblage has been used in a study of the magnitude of the general taphonomic loss at Mesolithic sites (Aaris-Sørensen 1983). The large number of fishbones and the kind of fishing they represent have also been studied in detail (Enghoff 1983 & 1994). This study, however, is the first description of the small mammals from Maglemosegård.

The analysis of Maglemosegård is supplemented with an overview of 29 other Danish sites. They represent the majority of the most important Mesolithic sites excavated in Denmark during the past hundred years. From an archaeological point of view, several important sites are not represented simply because they lack remains of small mammals.

Table 2 lists the 30 sites with information on the years of excavation, the species identified, the techniques (waterscreening) applied, and references. All samples are curated at the Zoological Museum, University of Copenhagen.

Chronologically, the sites span the Maglemose (with the exception of the earliest phase), Kongemose and Ertebølle cultures, which corresponds to the time period from about 8,000 to 4,000 BC (calendar years). Eight sites (no. 23-30), which mainly date from younger Ertebølle, were also occupied during early Neolithic Funnel Beaker Culture (Fig. 1).

Table 1

Skeletal elements n=220	*Sorex araneus*	*Sorex* sp.	*Neomys fodiens*	*Erinaceus europ.*	*Sciurus vulgaris*	Muridae/Arvicolidae	*Clethrionomys gl.*	*Arvicola terrest.*	*Microtus agrestis*	*Apodemus* sp.
Cranial bones				2						
Maxilla										
Mandible	3		1	2		2	5	4	1	
Incisiva upper						4	6	6	3	12
Incisiva upper/lower				2				3		4
Incisiva lower						18	16	4	9	21
Molars				3		2	22	10	26	
Scapula										
Humerus shaft		1		1					1	
Humerus distal	1					1				2
Radius proximal								1		
Radius/ulna shaft								1		1
Radius/ulna proximal								1		
Ulna proximal						1				
Carpales										
Pelvis				1						2
Femur schaft							1		1	3
Tibia proximal										1
Tibia shaft					1	1		1		4
Tarsales				1						
Metapodials										
Phalanges										
Ribs										
Vertebrae										
Total	4	1	1	12	1	29	50	31	41	50

Table 2

Sites	*Talpa europaea*	*Sorex araneus*	*Neomys fodiens*	*Erinaceus europ.*	*Sciurus vulgaris*	*Clethrionomys gl.*	*Arvicola terrest.*	*Microtus agrestis*	*Apodemus syl./fla.*	
1. Lundby II 1945					X					
2. Mullerup 1900				X	X					
3. Ulkestrup Lyng Ø 1947-51							(X)			
4. Sværdborg I 1917-44				X	X		(X)			
5. Holmegård I 1922-23				X						
6. Stationsvej, Vedbæk 1985				X			X			S
7. Maglemosegårds Vænge 1976	X	X		X	X	X	X	X	X	S
8. Henriksholm-Bøgebakken 1975					X	X				S
9. Lystrup Enge 1983-94			X			X	X			S
10. Norslund 1958-63					X					
11. Sønderholm 1979				X			(X)			S
12. Godsted 1903-04				X			(X)			
13. Præstelyngen 1963-72				X			(X)			
14. Vejleby 1910							(X)	(X)		
15. Norsminde 1972-87							X			
16. Nederst 1989-92						X	(X)	X	X	(S)
17. Bjørnsholm 1985-91	(X)				X		(X)		(X)	S
18. Ertebølle 1893-97				X	X	X	(X)		(X)	
19. Mejlgård 1888					X		(X)			
20. Salpetermosen 1957-61				X	X		(X)		X	
21. Maglemosegård 1976-78		X	X	X	X	X	X	X	X	S
22. Nivå 1912-14				X			(X)			
23. Dyrholmen 1923-32 & 37-39					X					
24. Neverkær 1944				X						
25. Klintesø 1897				X	X		(X)			
26. Kassemose 1908				X			(X)			
27. Maglelyng 1952				X						
28. Nøddekonge 1983-85				X	X		X		X	(S)
29. Vejkonge 1983-85				X	X		X			
30. Åkonge 1983-85				X	X		X		X	(S)

Table 1. The distribution of species and skeletal elements in the Maglemosegård assemblage. In identification of the many incisors a distinction has been made based on the fact that arvicolid incisors have a triangular cross section in contrast to the more rectangular in the murid group. The arvicolid sample has furthermore been seperated according to size differences.

Table 2. Small mammals from 30 Danish Mesolithic sites.
1. Lundby II, Rosenlund *det.* (Rosenlund 1980). 2. Mullerup, Winge *det.* (Winge 1904). 3. Ulkestrup Lyng Ø, Richter *det.* (Richter 1982). 4. Sværdborg I, Winge *et* Aaris-Sørensen *det.* (Winge 1919; Aaris-Sørensen 1976). 5. Holmegård I, Winge *det.* (Winge 1924). 6. Stationsvej, Vedbæk, Møhl *det.* (unpubl.). 7. Maglemosegårds Vænge, Aaris-Sørensen *det.* 8. Henriksholm-Bøgebakken, Aaris-Sørensen *det.* 9. Lystrup Enge, Ljungar *det.* (Ljungar in print.). 10. Norslund, Møhl *det.* (Møhl 1966). 11. Sønderholm, Aaris-Sørensen *det.* (Jønsson & Pedersen 1983). 12. Godsted, Winge *det.* (Winge 1905). 13. Præstelyngen, Noe-Nygaard *det.* (Noe-Nygaard 1969). 14 Vejleby, Winge *det.* (Winge 1912). 15. Norsminde, Møhl *et* Rowley-Conwy *det.* (Andersen 1989). 16. Nederst, Aaris-Sørensen *det.* 17. Bjørnsholm, Bratlund *det.* (Bratlund 1991). 18. Ertebølle, Winge *det.* (Winge 1900). 19. Mejlgård, Winge *det.* (Winge 1888). 20. Salpetermosen, Møhl *det.* (unpubl.). 21. Maglemosegård, Aaris-Sørensen *et* Andreasen *det.* 22. Nivå, Winge *det.* (Degerbøl 1926). 23. Dyrholmen, Degerbøl *et* Møhl *det.* (Degerbøl 1942). 24. Neverkær, Aaris-Sørensen *det.* 25. Klintesø, Winge *det.* (Winge 1900). 26. Kassemose, Winge *det.* (Winge 1910). 27. Maglelyng, Møhl *det.* (unpubl.). 28. Nøddekonge, Gotfredsen *det.* (Gotfredsen 1990). 29. Vejkonge, Gotfredsen *det.* (Gotfredsen 1990). 30. Åkonge, Gotfredsen *det.* (Gotfredsen 1990).
X: species recorded, (X): recent intruder, S: sieving applied, (S): sieving applied on selected samples.

RESULTS

Number of bones and species

Not surprisingly, the settlements excavated before 1975 generally yielded only a few species of small mammals (Table 2). Waterscreening had not yet become rutine procedure, and the species recovered were consequently the largest of the small: the hedgehog (*Erinaceus europaeus*), the red squirrel (*Sciurus vulgaris*) and the water vole (*Arvicola terrestris*). Of course, sieving is a necessary but not sufficient prerequisite for recovering large quantities of small mammal bones. Small mammal remains may have been absent or sparse from the beginning, and even if abundant the preservation may have been poor, and the excavated area may be too small. Thus, even modern excavations (e.g. no. 6 & 11) may yield only a few micro-mammalian species.

The general increase in number of species is accompanied by a greater increase in the number of bones recovered. This pattern is not evident from Table 1, but can be illustrated by a comparison between two sites. The excavations chosen for this comparison are of the same order of size and both have a calcareous midden with well preserved bones as a main element. From the famous Ertebølle site, where 314 m^2 were excavated in 1893-97, Winge (1900) reports 5 different species of small mammals represented by 17 bones. In contrast, the 1975-78 excavations of 480 m^2 at Maglemosegård, where sieving was employed, yielded 220 small mammal bones representing eight species (Table 1).

In the Maglemosegård assemblage the majority of recovered skeletal elements are incisors and molars. This pattern is typical for both natural as well as anthropogenic deposits because tooth enamel is the most resistant to destruction of any part of the skeleton.

The 220 bones of small mammals are a relatively large quantity, but seen in retrospect they must be considered as only a fraction of the preserved bones. Micromammalian bones were found only in about 15 % of the square meters excavated. This is due to the relatively coarse mesh size of 3 mm used in the field. From an archaeological point of view, 3 mm can be considered as a fine mesh and from a paleozoological point of view it is better than no sieving at all, but ideal studies of small mammals require a finer mesh size (1 mm). This point was confirmed by applying a 1 mm sieve in 10 different squares on Maglemosegård, which considerably increased the quantities of small bones and teeth that were recovered. Using a fine sieve is of course very time consuming, and impossible to carry through as a normal procedure of a large excavation, but small representative samples must be fine-sieved.

Studies of other small faunal remains also require fine-sieving. For example, in a study of fish bones from the kitchen-midden at Bjørnsholm, Enghoff (1991) monitored bone loss from 2-3 mm mesh sieving by later using 0.6 mm mesh sieve in the laboratory. The results show that the fine-sieving is essential for any qualitative and quantitative assessments of the Mesolithic fishing carried out from the site.

Burrowers

Brackets around a record in Table 2 indicate that the author responsible for the identification considers the age of the specimen dubious. For example two of the five species mentioned above from Ertebølle are described by Winge (1900:88) as the results of recent intruders.

It is of course a general problem to interpret the remains of many rodents and insectivores because of their fossorial habits. Nevertheless, it is usually possible through a sequence of observations to identify the recent intruders. The water vole (*Arvicola terrestris*) may be a good example. The burrows of this species are often encountered during archaeological excavations, and Winge (1904b:222) wrote about the problem many years ago (in translation):"All the bones of water vole found in the middens are found so complete and often still articulated or so close to burrows, that it is most likely that they belong to animals which have dug themselves into the middens after these were deposited."

If we add to those observations the colour or patina of the bones, a distinction between recent and fossil material should be possible. Bones found in Mesolithic deposits usually have a uniform colour or patina, often light to dark brownish, whereas bones of later intruders will be whitish or light yellow. And, continuing to use the water vole as an example, recent specimens will still exhibit the characteristic yellow-orange enamel colour of the incisors.

Finally, in problematical cases of special interpretive importance, an AMS C-14 dating of the bone itself may solve the problem.

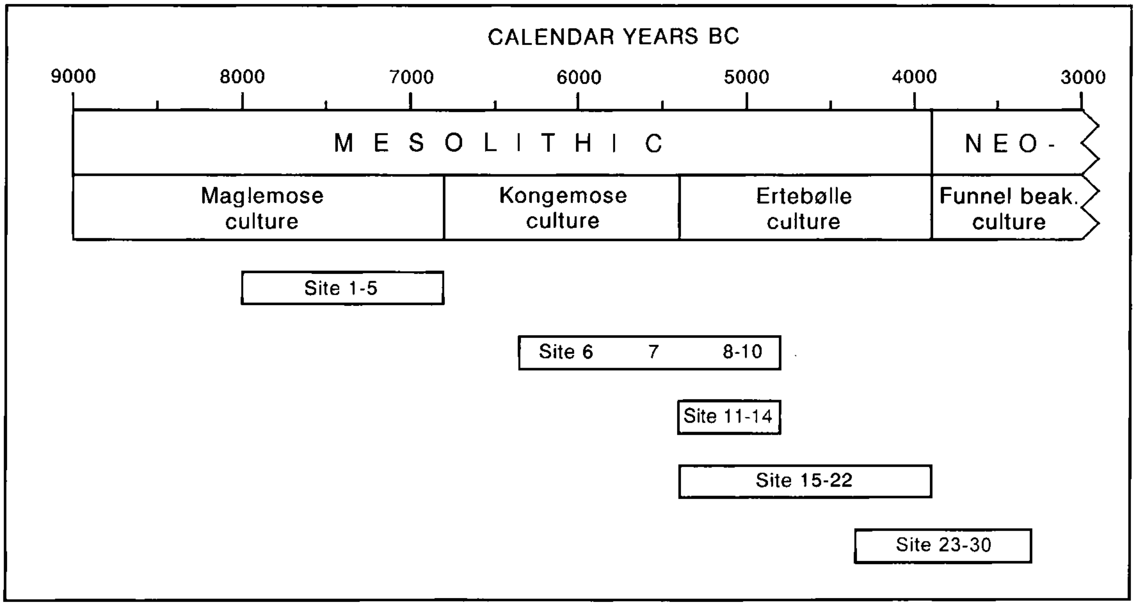

Fig. 1. Chronological distribution of the 30 sites investigated.

Hunting and man made biotopes

During the excavation of Maglemosegård recent burrows of the water vole were encountered frequently, along with light coloured, complete bones of the species. However, dark coloured, fragmented bones of the water vole, and seven other small mammals as well, were found in undisturbed midden layers among thousands of other vertebrate bones. This pattern holds for other settlements as well (Table 2), and the question is how these remains found their way into the middens.

There is little doubt that Mesolithic people sometimes took small mammals, for example red squirrel, in addition to their primary, larger fur-bearing prey such as beaver (*Castor fiber*), the pine marten *(Martes martes)*, the otter *(Lutra lutra)* and the wild cat *(Felis silvestris)*. The red squirrel is represented in half of the sites investigated and at least one mandible from Vejkonge (no. 29) (Gotfredsen 1990:61) shows clear cut marks. The red squirrel was probably hunted especially for its long, silky winter coat. It is possible that the water vole and the mole (*Talpa europaea*) were also trapped because of their fur. The water vole stays warm and dry by a short, dense undercoat below a longer outer fur, and the mole has a silky, velvety fur. Both could have provided furs that were useful for special purposes.

The hedgehog is found in 70 % of the sites, and cut marks on some of the bones clearly indicate that the animals were deliberately procured. Gotfredsen (1990) has analysed the bones from Åkonge (no. 30) and found 34 fragments from at least 4 hedgehogs. Cut marks can be seen on a mandible, in the temporal region of a skull and on a tibia (Fig. 2, 3, & 4).

Practically all meat on a hedgehog is concentrated in the big dorsal muscle which lies just below the skin and enables the animal to curl up and to erect the spines. The meat has been considered edible and even tasty up to modern times, and fat built up in the autumn before hibernation can be melted down and used for various purposes. Besides meat and fat, there can be little doubt that the sharp 2-3 cm long spines were also utilized by Mesolithic people.

Today the hedgehog thrives in the cultural landscape around farms, along edges of a wood and hedgerows, and in gardens and parks. Moreover there seems to be a special bond between the hedgehog and man, which, for example, prompts people to move hedgehogs from one place to another to prevent local extinctions. On a larger scale, the northernmost distribution of the species in Norway, Sweden and Finland is heavily influenced by mans intentional introductions (Kristiansson 1981).

We may therefore consider the Mesolithic settlement area as a man-made biotope that was favorable for the

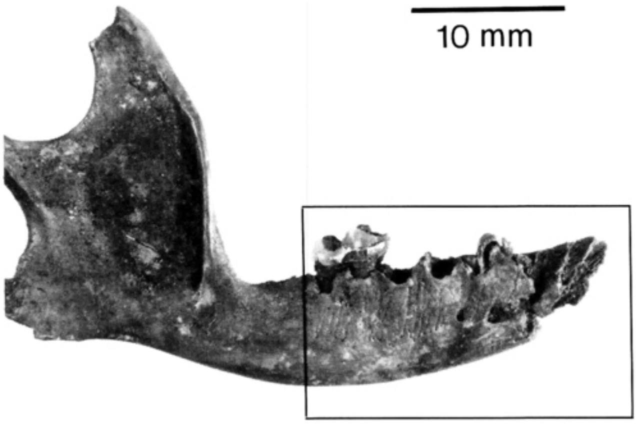

Fig. 2a. Mandible of a hedgehog (*Erinaceus europaeus)* from the site Åkonge with cut marks. (Foto: Geert Brovad).

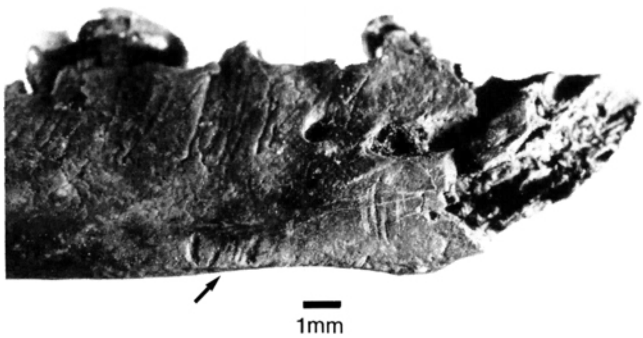

Fig. 2b. Enlargement of the mandible from Åkonge showing clear cut marks. (Foto: Geert Brovad).

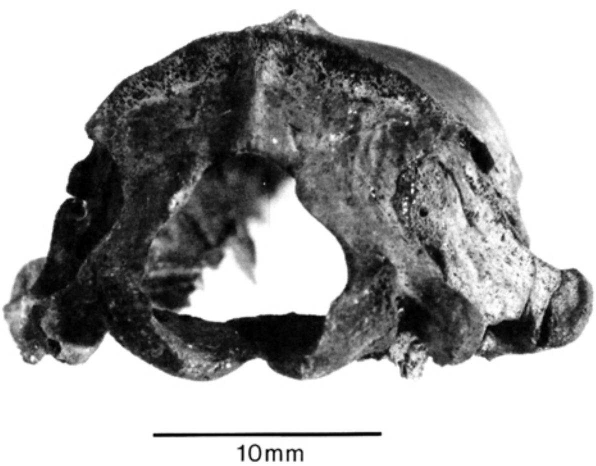

Fig. 3. Skull of hedgehog (*Erinaceus europaeus)* from Åkonge showing cut marks in the right temporal region. (Foto: Geert Brovad).

hedgehog. The settlement and associated human activity opened up the forest and made it an excellent area for foraging hedgehogs. The price they had to pay for this was the occasional exploitation by man. On the other hand, investigations in Sweden suggest that Mesolithic and Neolithic people actually helped the hedgehog expand its distribution.

On the island of Orust in Bohuslän, Leif Jonsson has recently found the oldest known remains of hedgehog in western Sweden. They were found on a Mesolithic site dated to 7,000 BP (in conventional C-14 years) corresponding to the Middle Atlantic. The straits separating Orust from the mainland were so wide at that time, that introduction by man seems the only possibility for the hedgehog to have invaded the island (Jonsson pers. comm.).

By going through the bone assemblages from Mesolithic and Neolithic sites on the island of Gotland, Lindqvist & Possnert (in print) have shown that the hedgehog is absent from Mesolithic and Early Neolithic sites, but suddenly turns up at Middle Neolithic Pitted Ware sites (including five hedgehog mandibles found in a grave on the chest of a young girl!). Gotland has been isolated since the deglaciation of the area and the hedgehog must have been introduced by man in the Middle Neolithic.

Pellet and scat remains

Predators other than humans may add to the accumulation of small mammalian bones in the kitchen-middens. Bones may be deposited in pellets of diurnal raptors or owls or in scats of carnivores, especially the dog. These predators may find their prey in the surrounding country or in the settlement area itself. Like the hedgehog, other small mammals may have been attracted by the open man-made biotope. The bank vole *(Clethrionomys glareolus)*, for example, prefers young forest with a dense undergrowth, while the field vole *(Microtus agrestis)* is most common around glades. The scats of dogs were most likely dropped on the settlement while it was still inhabited, whereas the pellets may have accumulated during periods when the site was abandoned by the people as a part of their seasonal migration.

Winge (1900:85) made a short note on what he believed to be dog scats from the kitchen-midden of Ertebølle. The scats were found between the shells in the

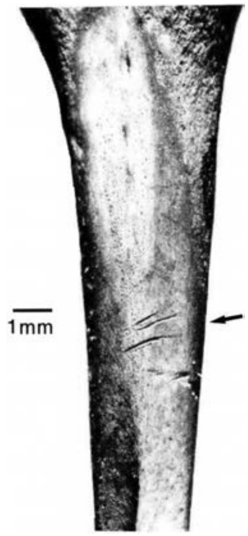

Fig. 4. Tibia diaphyse of hedgehog (*Erinaceus europaeus*) from Åkonge with cut marks. (Foto: Geert Brovad).

Fig. 5. Incisor from a mandible of a bank vole (*Clethrionomys glareolus*) found in dog scat at Ertebølle. The tip of the incisor shows heavy etching of the enamel characteristic for digestion.

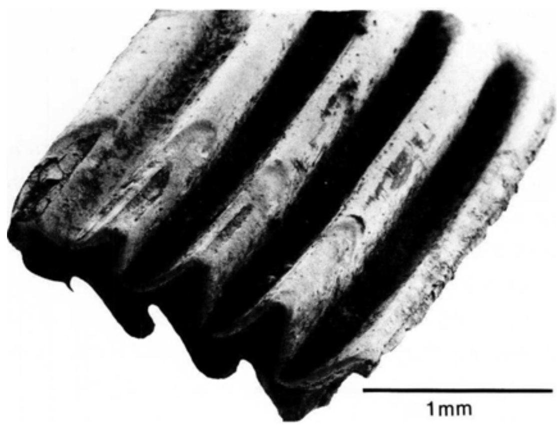

Fig. 6. Molar of vole showing enamel penetration characteristic of light digestion by owls.

midden as "collapsed lumps of chewed and corroded bone fragments of fishes, birds and mammals." One of the fragments can still be identified by a label in Winge's handwriting. It is a piece of a mandible of a bank vole including a molar and an incisor. The mandible, which has now fallen into several pieces, and the teeth show clear signs of corrosion typical of digestion. The tip of the incisor is shown on a SEM (scanning electron microscope) micrograph in Fig. 5, revealing heavy etching of the enamel, which is characteristic of digestion. Thus, Winge's interpretation of these "collapsed lumps of chewed and corroded bones" as scats from carnivores is reasonable, and the dog is the most likely species.

Recently Andrews (1990) has published a comprehensive and detailed study of small mammal taphonomy based on descriptions of present day small mammal faunas. How do we identify faunal remains as being prey assemblages accumulated by predators? Of course pellets or scats themselves may occasionally be preserved, but usually one will have to answer the question by analysing the species composition and size distribution of the prey animals found, and the types of modifications seen on their bones.

Analyses of the small mammal bones from Maglemosegård have been tried following the directions of Andrews (op.cit.). The sample, however, turned out to be too small and too heavily impacted by later depositional agencies to provide a basis for reliable calculations of skeletal element proportions or breakage patterns. Nevertheless, "the corrosive effects of digestion on bones and teeth in the predators stomach are not duplicated by any other alteration process" (Andrews 1990:64) and clear signs of digestion can be seen on several murid-arvicolid teeth in the Maglemosegård assemblage. Incisors, for example, show light digestion characterized by a slight wavy outline of the enamel surface, recession of the enamel along its contact with the dentine, penetration of the enamel surface and splitting of the dentine (Fig. 7).

Molars of voles also show light digestion, with the enamel penetrated along the salient angles of the teeth – sometimes limited to near the occlusal surface, indicating that the teeth were still in the jaw when exposed to digestion (Fig. 6).

The light to moderate digestion of the Maglemosegård teeth is typical for some owls, suggesting that the bones were accumulated on the site in regurgitated pellets. Several owl species may have contributed, including the barn owl *(Tyto alba)*, the short-eared owl *(Asio flammeus)* and the long-eared owl *(Asio otus)*.

CONCLUSION

Small mammal bones found on Mesolithic sites are important for paleoenvironmental reconstructions and add to the cultural and faunal history of the region.

Waterscreening, which has been a routine procedure in excavations of Mesolithic sites in Denmark since about 1975, has increased the number of species and the number of bones retrieved. The sieves used, however, are usually too coarse (c. 3 mm) to catch all the remains of small mammals or other small-sized vertebrates. Fine-sieving (1 mm mesh) should be applied to selected samples or columns as a supplement.

Sorting out recent intruders from those species originally belonging to the deposit is a problem – but the problem is not insoluble. Colour, patina and the degree of fragmentation often reveal the recent intruders, and in problematical or crucial cases an AMS C-14 date can resolve the question.

The accumulation of small mammal bones on the Danish Mesolithic sites is partly a result of human activity. Hunting, trapping and gathering for furs, meat and fat (e.g. *Sciurus vulgaris* and *Erinaceus europaeus*) are evident from clear cut marks on the bones. Bones of the majority of the smaller rodents and shrews probably reached sites in scats of carnivores, especially the dog, and pellets of diurnal raptors and owls. This is confirmed by analyses of incisors and molars of voles from the sites of Ertebølle and Maglemosegård. The teeth show corrosion and etching of the enamel and splitting of the dentine characteristic of digestion. Heavy digestion is seen on an incisor of *Clethrionomys glareolus* from

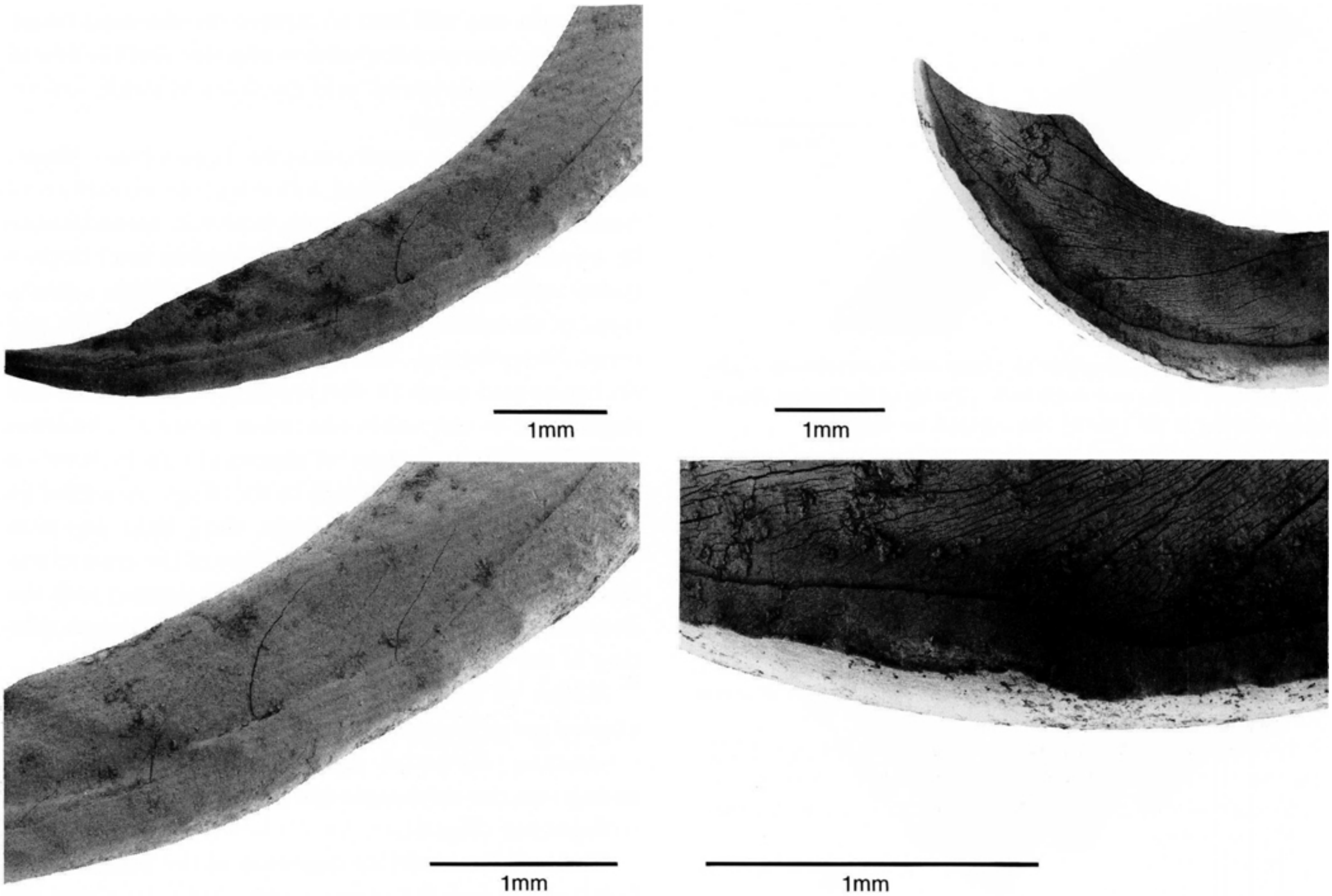

Fig. 7. Two incisors showing light digestion of enamel and dentine typical for teeth found in pellets of e.g. barn owl *(Tyto alba)*, the short-eared owl *(Asio flammeus)* and the long-eared owl *(Asio otus)*.

lumps of corroded and chewed bone fragments that were interpreted as dog scats. Light to moderate digestion is seen on several incisors and molars of voles that have been interpreted as originating from owl pellets.

Waterscreening alone prevents us from observing the distribution pattern of bones in the deposit. The sieving should therefore be supplemented with careful observations while trowelling down level by level in order to locate any *in situ* scats and pellets.

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REFERENCES

AARIS-SØRENSEN, K. 1976: A Zoological Investigation of the Bone Material from Særdborg I-1943. In: B. B. HENRIKSEN: *Sværdborg I.* Arkæologiske Studier Vol. III. 137-148.
– 1980a: Depauperation of the mammalian fauna of the island of Zealand during the Atlantic period. *Vidensk. Medd. fra Dansk naturh. Foren.* Bd. 142:131-138.
– 1980b: Atlantic fish, reptile and bird remains from the Mesolithic settlement at Vedbæk, North Zealand. *Vidensk. Medd. fra Dansk naturh. Foren.* Bd. 142:139-149.
– 1982: Jæger og bytte. In: E. BRINCH PETERSEN *et al.*: Vedbækprojektet. *Søllerødbogen* 131-138.
– 1983: An example of taphonomic loss in a mesolithic faunal assemblage. In: J. CLUTTON- BROCK & C. GRIGSON (ed.): *Animals and Archaeology: 1. Hunters and their Prey.* BAR International Series 163:243-247.
– 1988: *Danmarks forhistoriske Dyreverden.* København. 1-252.
ANDERSEN, S. H. 1989: Norsminde. A "Køkkenmødding" with Late Mesolithic and Early Neolithic Occupation. *Journal of Danish Archaeology,* Vol. 8:13-40.
ANDREWS, P. 1990: *Owls, Caves and Fossils.* Natural History Museum Publications. London. 1-231.
BRINCH PETERSEN, E. *et al.* 1976: Vedbækprojektet. Udgravningerne i Vedbæk-området. *Søllerødbogen* 97-122.
BRINCH PETERSEN, E. *et al.* 1977: Vedbækprojektet. I marken og i museerne. *Søllerødbogen* 113-176.
BRINCH PETERSEN, E. *et al.* 1979: Vedbækprojektet. Ny og gammel forskning. *Søllerødbogen* 21-97.
BRINCH PETERSEN, E. *et al.* 1982: Vedbækprojektet. Under mosen og byen. *Søllerødbogen* 117-152.
BRATLUND, B. 1991: The Bone remains of Mammals and Birds from the Bjørnsholm Shell-Mound. *Journal of Danish Archaeology,* Vol 10:97-104.
DEGERBØL, M. 1926: Bibliographia Wingeiana. *Vidensk. Medd. fra Dansk naturh. Foren.* Bd. 82:37-40.
– 1942: *Et Knoglemateriale fra Dyrholm-Bopladsen, en ældre Stenalder-køkkenmødding.* Det Kgl. Danske Vidensk. Selskab. Arkæologisk-kunsthistoriske Skrifter, Bind I, Nr. 1. 77-135.
ENGHOFF, I. B. 1983: Size distribution of cod (*Gadus morhua* L.) and whiting (*Merlangius merlangus* (L.)) (PISCES, GADIDAE) from a Mesolithic settlement at Vedbæk, North Zealand, Denmark. *Vidensk. Medd. fra Dansk naturh. Foren.* Bd. 144:83-97.
– 1991: Mesolithic Eel-Fishing at Bjørnsholm, Denmark, Spiced with Exotic Species. *Journal of Danish Archaeology,* Vol. 10:105-118.
– 1994: Fishing in Denmark During the Ertebølle Period. *International Journal of Osteoarchaeology,* Vol. 4:65-96.
GOTFREDSEN, A. B. 1990: *En rekonstruktion af palæomiljøet omkring tre senmesolitiske bopladser i Store Åmose.* Unpublished Master thesis, Københavns Universitet.
JØNSSON, B. & L. PEDERSEN 1983: Sønderholm. *Antikvariske Studier* 6:173-185.
KRISTIANSSON, H. 1981: Distribution of the European hedgehog (*Erinaceus europaeus* L.) in Sweden and Finland. *Annales Zoologici Fennici,* Vol. 18 no 2:115-119.
LINDQVIST, K. C. & G. POSSNERT in print: The subsistence economy and diet at Jakobs/Ajvide and Stora Förvar, Eksta Parish and other prehistoric sites on Gotland in long-term perspective. In: G. BURENHULT (ed.): *Remote Sensing Techniques for the Study of Cultural Resources and the Localization and Identification of sub-surface Prehistoric Remains in Swedish Archaeology* – Theses and Papers in North-European Archaeology, Vol. 13
MØHL, U. 1966: Knoglematerialet. I: *S. H. Andersen & C. Malmros:* Norslund. *Kuml* 1965, 107-109.
NOE-NYGAARD, N. 1969: *Præstelyngen, en boplads i Åmosen.* Unpublished prize dissertation, Københavns Universitet. 1-307.
RICHTER, J. 1982: Faunal Remains from Ulkestrup Lyng Øst, a Hunters Dwellingplace. In K. ANDERSEN, S. JØRGENSEN & J. RICHTER: *Maglemose hytterne ved Ulkestrup Lyng.* Nordiske Fortidsminder, Bind 7:141-177.
ROSENLUND, K. 1980: Knoglematerialet fra bopladsen Lundby II. In: B. B. HENRIKSEN: *Lundby-holmen.* Nordiske Fortidsminder, Bind 6:128-142.
WINGE, H. 1888: Dyrelevninger fra Ældre og Yngre Stenalders Bopladser. *Aarbøger for Nordisk Oldkyndighed og Historie.* 310-316.

WINGE, H. 1900: Knogler af Dyr. In: A.P. MADSEN *et al.*: *Affaldsdynger fra Stenalderen i Danmark.*

– 1904a: Knoglerne. In: G. SARAUW: En stenalders boplads i Maglemose ved Mullerup. *Aarbøger for Nordisk Oldkyndighed og Historie.* 194-198.

– 1904b: Om jordfundne Pattedyr fra Danmark. *Vidensk. Medd. fra Dansk naturh. Foren.* Bd. 56:193-304.

– 1905: Fuglene ved de danske Fyr i 1904. *Vidensk. Medd. fra Dansk naturh. Foren.* Bd. 57:223-224.

– 1912: Fuglene ved de danske Fyr i 1910. *Vidensk. Medd. fra Dansk naturh. Foren.* Bd. 63:185.

– 1919: Levninger af Hvirveldyr fra Stenalders-Bopladsen i Sværdborg Mose. In: K. FRIIS-JOHANSEN: En Boplads fra den ældste Stenalder i Sværdborg Mose. *Aarbøger for Nordisk Oldkyndighed og Historie.* 128-133.

– 1924: Levninger af Hvirveldyr fra Stenalders-Bopladsen i Holmegaard Mose. In: H. C. BROHOLM: Nye fund fra den ældste Stenalder, Holmegaard- og Sværdborgfundene. *Aarbøger for Nordisk Oldkyndighed og Historie.* 28-30.