SPUR DOG SPINES FROM PREHISTORIC AND EARLY HISTORIC DENMARK

An unexpected raw material for precision tools

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91 spines of the Spur Dog shark, *Squalus acanthias* L., are described from eleven different sites ranging in time from the Atlantic Period to early Middle Ages. Two of them show clear signs of processing by human beings. The one, from the Atlantic Period, has been turned into a small chisel; the other, from the transition between the Atlantic and Subboreal Periods, has been turned into an instrument resembling a saddlery needle. Both were probably used for skin work. The needle-like tool, found inland, indicates a connection between the coastal settlements and the inland seasonal settlements.

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The large peat bog, Åmosen, is situated in central Sjælland (see map, fig. 1). On a small islet in the lake which preceded the bog, the site of a summer settlement has been excavated since 1964 (Præstelyngen, NM VIII I. no. A. 4436). The site was very briefly inhabited, perhaps only one or two summers. Pollen analysis indicates the Late Atlantic Period; the culture is typical Ertebølle culture (Troels-Smith 1967), and C^{14} analysis gives an age of 3.200–3.000 BC.

During the identification of bone material, a small "bone", marked "Fuglenæb" (bird-beak) especially caught my attention. It clearly had nothing to do with birds, but was a spine from a Spur Dog and, furthermore, showed clear signs of human processing (figs. 4, 5). This find led to a reexamination of the subfossil material of Spur Dogs in the collections of the Zoological Museum, Copenhagen. This revealed two more spines bearing traces of human workmanship (fig. 3). Three special points emerged from the study of the 91 spines from 11 sites: 1. Two of them have been converted into small precision tools; 2. One of the tools was found inland

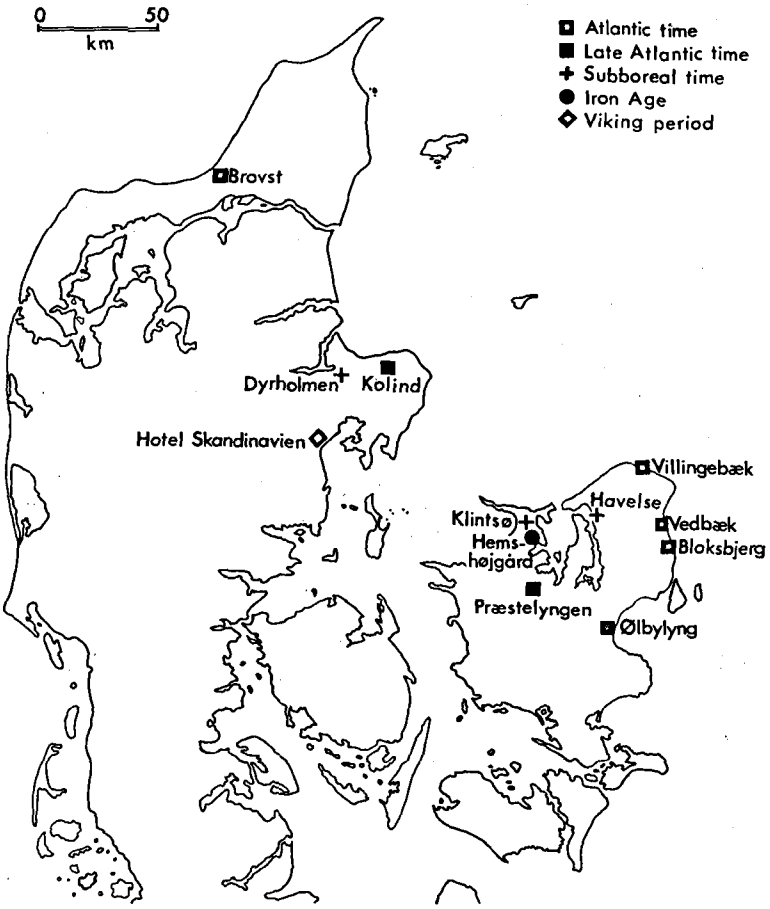


Fig. 1. Distribution of prehistoric and early historic finds of spines from the Spur Dog (*Squalus acanthias* Linnaeus).

many km from the sea; 3. Sixty of the spines were found together (Westerby, 1927). The following is an attempt to give a reasonable explanation of these problems and to draw attention to this new and unexpected raw material available to Mesolithic man, together with an account of the subfossil spines found to date.

The Spur Dog, *Squalus acanthias* Linnaeus, is a small shark (fig. 2). In Danish waters the female can reach a length of 110 cm. Its colour is greyish brown; it lacks an anal fin, but possesses two dorsal fins, each preceded by a stout spine. The anterior of these (first spine) is smaller than that of the posterior (second spine). These spines are built like a tooth, consisting of dentine covered with an enamel-like substance (Pfaff,

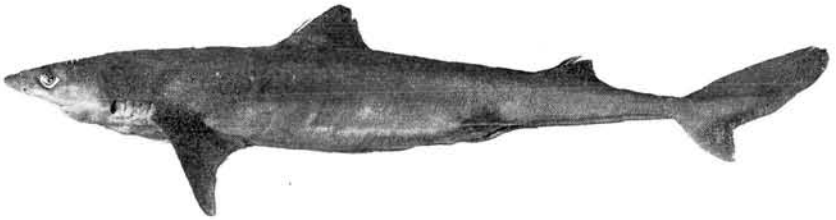


Fig. 2. A recent Spur Dog showing the position of the two spines in front of the two dorsal fins. The smaller one nearer the head is herein called no. 1 or first, the larger one nearer the tail, no. 2 or second. × 0.1.

1950), and have a furrow on the side nearest the fin, which is connected to a poison gland, with a rather unpleasant poison like that of the Greater Weever *(Trachinus draco)*.

The Spur Dog is a common shark in the northern North Sea, Skagerrak and Kattegat; in the summer it occurs in the Danish Belts and Øresund. It can be characterised as an occasional summer guest to the inner Danish waters, though it can also be encountered as a rare winter visitor. The animal prefers clay bottom and keeps near to it.

Although the inner Danish waters were warmer and more saline in Atlantic Time than now, it is most likely that the Spur Dog was also then a summer guest. Furthermore, at this time of year it migrates into shallower water, where it is more easily caught. Occurrences of its remains in settlement sites and kitchen middens probably represent summer catches.

Man's interest in catching an animal lies in his interest in the following: 1) food. 2) clothing. 3) raw materials. 4) religion. 5) sport.

Two of the reasons for which the Spur Dog was attractive is that it has tasty, firm, white flesh, and is probably a source of two raw materials. Mathiassen (1935) suggested that oil for the oil lamps was extracted from the shark's fat liver. Several thick-walled potshards from oil lamps have been found together with spines from the Spur Dog (Westerby, 1927). Furthermore, the two dorsal spines are composed of a very hard and strong material (see later) which is excellent for constructing small tools for precision work.

Systematic description

A systematic description of the Danish finds of *Squalus acanthias* in prehistoric and early historical times in Denmark follows below. The finds are grouped under headings according to age and localities.

Atlantic Time – Pollen zone VI and VII

Bloksbjerg

Christians Holm, Klampenborg. A coastal settlement find of 60 spines. "It is interesting to note the large amount of spines from the spur dog" (Westerby, 1927, pp. 30 and 34). I have not had the opportunity to examine them myself.

Brovst

Han Herred near Limfjorden. A settlement find of one spine, broken into three pieces, found in layer 8 which is older than layer 3–4 in the Norslund habitation (Andersen, 1969) both belonging to the early coast culture with no ceramics, and older or contemporary with the High Atlantic Transgression.

Dronningemølle (Villingebæk)

North Sjælland. A coastal settlement find of 21 spines, some of them frag-

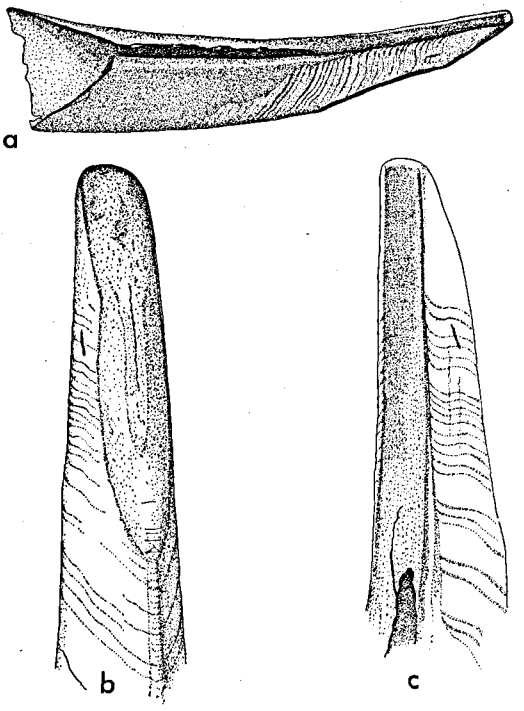


Fig. 3. The Spur Dog spine from Dronningemølle showing the chisel-like point, and the long cut on the cranial side which produces it. 3a: Lateral view, × 2. 3b: Cranial view of the point of the spine, × 4. 3c: Oblique caudal view of same, × 4.

mented. According to Kapel (1969) and to one of the excavators (K. V. Rosenlund, personal communication 1967) they were found scattered in different layers. One of them (e/13) has been turned into a small chisel-shaped tool.

One second dorsal spine (Dr. M. e/13) (pl. 2, fig. 3). The second dorsal spine has a length of 37 mm, and the part covered with enamel has a length of 29 mm. As the spine is rather fragmentary because of weathering the original full size cannot be estimated. Proximally the spine is broken off; distally the point is shortened with a long deep cut from the cranial side; a short cut from the caudal side makes the edge of the "chisel" very sharp. Across the long cut there are several scratches, among others three deep ones. Fine scars after flakes can be seen near the edge on the caudal side. The use of this instrument is discussed below together with the other tool found in Præstelyngen.

One second dorsal spine (Dr. M. f/14). The spine has a length of 56 mm, enamelled for 38.5 mm. It has been broken proximally, and distally the point is highly polished; this, together with the fact that the edges of some flaking-scars near the point have been smoothed, may indicate that it has been used after the death of the animal; furthermore, the enamel of the point is missing and the bone beneath shows many fine scratches.

One first and one second dorsal spine (Dr. M. – fallen out of the bags. Locality and horizon uncertain). 1: The first dorsal spine has a length of 37 mm, and the part covered with enamel has a length of 26 mm. The spine is very corroded and broken proximally. 2: The second dorsal spine has a length of 44 mm, the part covered with enamel measures 31 mm. The spine is very corroded and is broken proximally as well as distally.

Two second dorsal spines (Dr. M. A/8). 1: 56.5 mm long, covered with enamel for 37.5 mm. The spine is broken proximally, and is very corroded, a few cuts are seen on the caudal ridges. 2: 53 mm long, with enamel cover 41 mm. The spine is corroded, and broken proximally. The point of the spine has an abnormal shape caused by flaking, either naturally when the fish was alive, or man-made. Many tiny cuts and scratches especially round the distal 1 cm of the spines seem to confirm the theory of human influence on the present shape of the spine (pl. 2).

One second dorsal spine (Dr. M. H/15). The spine has a length of 55 mm, and is covered with enamel for 42.5 mm. The sample is very corroded, and broken proximally.

One second dorsal spine (Dr. M. i/17). 38 mm of the total of 48 mm are coated with enamel. The spine is very corroded and broken proximally. A few cuts are seen distally together with scars after small flakes.

One second dorsal spine (Dr. M. i/15). Length 48 mm, covered with enamel for 34 mm. The piece is corroded especially in two depressions, proximally, on the caudal side; these depressions are placed perpendicular to the two spine ridges (pl. 2); it is difficult to tell when these furrows were made.

One first dorsal spine and one second dorsal spine (Dr. M. g/13). 1: The second dorsal spine has a length of 51 mm, and is covered with enamel for 42.5 mm. It is strongly corroded, and proximally broken. The distal point is rather shiny. 2: The first dorsal spine has a length of 39 mm and is totally covered with enamel; it is perhaps a piece of a second dorsal spine. It is very corroded, and broken off proximally.

Three fragments of second dorsal spines (Dr. M. i/16). 1: Length 42 mm, covered with enamel for 31 mm. The spine is very corroded, and broken proximally. 2: Length 30.5 mm, totally covered with enamel. The spine is corroded, and broken proximally. 3: A fragment from the middle part of the spine, very corroded, and broken at both ends.

Three second dorsal spines (Dr. M. f/12). 1: Length 49 mm with enamel for 35 mm; it is very corroded, and broken proximally. 2: Length 49 mm with enamel for 33 mm; it is corroded and broken proximally. 3: Length 43 mm totally covered with enamel, corroded and broken proximally.

Four second and one first dorsal spines (Dr. M. Without number). 1: 51 mm long, 35 mm enamel; corroded, broken proximally. 2: 41 mm long, 33.5 mm enamel; corroded, broken proximally. 3: 44.5 mm long, 33.5 mm enamel; corroded, broken proximally. 4: 39.5 mm long and totally covered with enamel; corroded, broken proximally. 5: 28.5 mm long, 22.5 mm enamel; corroded, broken proximally.

All spines are without any signs of human processing.

Vedbæk

The settlement is situated c. 1 km from the famous settlement Vedbæk Boldbaner in north-east Sjælland. It was excavated by K. V. Rosenlund in 1964.

A fragment of a second dorsal spine (Vedbæk no. 6). The fragment is 30 mm long, and is totally covered with enamel. It is broken proximally,

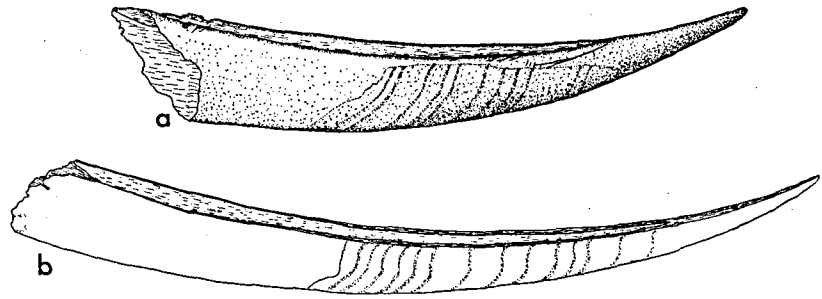


Fig. 4. Spur Dog spines, × 2. 4a: The spine from Præstelyngen showing the rounded point. 4b: Second spine from a recent Spur Dog. Note the poison duct leading right to the point.

the fracture showing a very clean and straight surface; this may indicate that the spine was cut off. Scars after flakes are visible on the point.

Late Atlantic to Subboreal time – Pollen zone VII and VIII

Kolind

Djursland. Three spines were found in the lower part of the kitchen midden, age "Dyrholm I" (Degerbøl, 1942).

One first and one second dorsal spine (Kolind nos. VI F7[6] and VI F7[9]). 1: Length 22 mm. Enamel on 13 mm. Proximally broken. 2: Length 33 mm. Enamel on 30 mm.

Normally a spine as small as no. 2 would be identified as a first dorsal spine. However, in this case the structure and colour of the two spines are so much the same that it is likely that they represent the first and second spines of the same small animal.

Dyrholmen

SE of Randers close to Kolind Sund. Settlement.

One second dorsal spine. The length of the spine is 43 mm. Covered with enamel for 29 mm. Proximally broken. Scars after flakes are seen at the point.

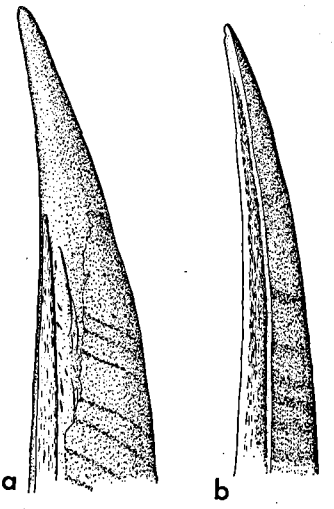


Fig. 5. Points of Spur Dog Spines, × 4. 5a: The spine from Præstelyngen. 5b: Second spine from a recent Spur Dog.

Præstelyngen

In Åmosen in central Sjælland a seasonal settlement find of one second dorsal spine which has obviously been treated by man to create a tool.

One second dorsal spine (PL 5612–54). The length of the piece is 45 mm, it is covered with enamel for 31 mm, (figs. 4, 5). The spine is broken proximally and several deep cuts are seen across the two spine ridges bordering the poison furrow (pl. 3), probably traces from the process of removing the spine from the body. Distally it shows clear signs of treatment from human beings. First of all the point was shortened and rounded so that the poison furrow has completely disappeared on the distal 6 mm (fig. 5). On recent spines the furrow continues to the very point. Instead a short, strong, sharp, conical point has been created. Cuts from the process of removing the spine ridges are already seen 18 mm from the point. The enamel at the distal part of the spine has been worn off, but whether this has been done by human beings or by the animal itself cannot be judged, since enamel can become worn, especially at the points, in living sharks.

Ølbylyng

Køge Bugt, south-east Sjælland. Settlement find (the site excavated by D. Liversage in 1964) of one first dorsal spine.

One first dorsal spine (layer 4–6). Length 31 mm; enamel covers 22 mm. Broken proximally.

Subboreal time – Pollen zone VIII

Klintesø

NW of Nykøbing Sjælland. Kitchen midden (Winge, 1900). A single dorsal spine, now lost.

Iron Age

Hemshøjgård

North-west Sjælland. A settlement excavated by D. Liversage in 1964. One second dorsal spine.

Length 46 mm, with enamel on 35 mm. The spine is cut off proximally, and clear cuts are seen on the ridges (pl. 3.).

Viking Time

A city excavation in the centre of Århus (Klindt-Jensen & Andersen, 1963). The site showed two periods of habitation: The first from the Viking Period, the second from early Middle Ages.

Two spines were found: One second dorsal spine from the Viking Period, and a first dorsal spine from the Middle Ages. 1: Length 42 mm. Enamel covered 32 mm. Broken proximally. Scars after flakes at the point. Viking Period. 2: Length 26 mm. Enamel covered 22 mm. Broken proximally. Middle Ages.

Aspect of the spine from Præstelyngen

The presence inland of artifacts with a close connection with the coast are known from several settlements from different periods. Limb bones of grey seal have been identified at archaeological sites belonging to the Maglemose Culture from central Sjælland (Øgårde and Sværdborg, Degerbøl et al. 1943). The spine from Præstelyngen is a find from a settlement and thereby safely dated to the Ertebølle Period, as opposed to the single finds of harpoons.

In the current discussion on different kinds of settlements all belonging to the Ertebølle Period, the spine is strongly indicative of close connection between coast and inland.

The presence of the spine at the inland settlement Præstelyngen is im-

portant from two standpoints: 1) It is an artifact (discussed below). 2) It must have been brought there from the coast.

Either it was processed at the coast and brought to Præstelyngen by the people who made it; or the people from Præstelyngen obtained it from the people who made it and lived at the coast.

Assuming that the spine was brought to Præstelyngen by the makers of the artifact three possible explanations may be suggested: 1) The people at Præstelyngen stayed at the coast rather permanently and they stayed seasonally at Præstelyngen. 2) The people at Præstelyngen lived permanently at the coast, but part of the family, the men perhaps, moved inland in the hunting season to get food and skin. 3) The Præstelyngen people moved in order to follow the game animals. While at the coast the game was supplemented by oysters, birds, fish etc.; at other times they were inland hunting red deer, roe and wild-boar. In winter they probably had a protected refuge.

Against the hypothesis, which involves two different groups of people, it should be stated that the artifacts found at Præstelyngen are very much the same type as the ones found at the coastal settlements belonging to the typical Ertebølle Culture (Troels-Smith, 1967) with thickwalled potshards and special flint tools.

Which of the three explanations involving only one group of people is correct is so far unknown. We do know, however, that, firstly, the spine has come from the coast and was probably obtained during the summer season; secondly, the Præstelyngen settlement was inhabitated during the summer from April to October. What we can conclude is that the spine indicates a strong connection between the coast and inland. This, together with the uniformity of the tools and pots, strongly suggests that the inland settlers and coastal settlers belonged to one group.

Possible uses of the Spur Dog spines

Rust (1943, p. 129) described how he thought certain bodkins with a notch could be used in the skin-sewing process (fig. 6). A similar explanation is possible for the use of the spine from Præstelyngen. All the means used to reshape it have combined to make the instrument more pointed, stronger and more suitable for penetration. The spine can actually be regarded as a combination of an awl for making the hole and a needle to guide the thread (fig. 7), like a saddlery needle.

The small chisel-like artifact from Dronningemølle is also a precision tool, and has probably been used for skin work too. Many applications may be considered, but to me it looks like a kind of a diminutive scraper. Many

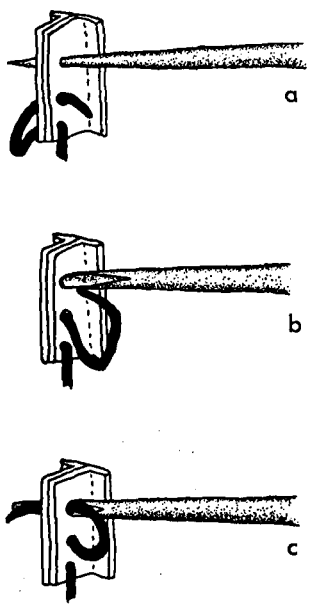


Fig. 6. Method of sewing skin suggested by Rust (1943). 6a: A hole is made with an awl. 6b: A tool with a groove in it is pressed through the hole. This tool could be made from a very small bone of a bird. 6c: The thread is placed in the groove and pressed through the hole.

small precision tools for skin work and decoration are normal equipment among the household utensils of the Eskimo culture (Larsen, 1934, p. 128; Glob, 1935, p. 59), and skin work must have been a prominent part of the work of Ertebølle man. The two small tools just described might equally well have been used for decoration of clay, wood and amber, or even of tattooing human beings, as suggested by U. Møhl (personal communication).

The 60 spines from Klampenborg (Westerby, 1927) indicate that the Spur Dogs were a normal prey of man; but whether they were caught only for food or were used also as a raw material for oil or tools it is impossible to say, as I have not been able to see the spines myself. The skeleton of the Spur Dog is very poorly ossified, so not much more than the spines are likely to survive. Nevertheless a few vertebrae were found from Dronningmølle.

The 60 spines from Klampenborg, together with the distribution in time of the other 31 spines (fig. 8) show that this shark probably was of special interest to the Ertebølle people; the later finds seem relatively accidental.

Other working traces

On the spine from Præstelyngen and the one from Hemshøjgård cuts were found on the proximal caudal side on the ridges (pl. 3). The explanation

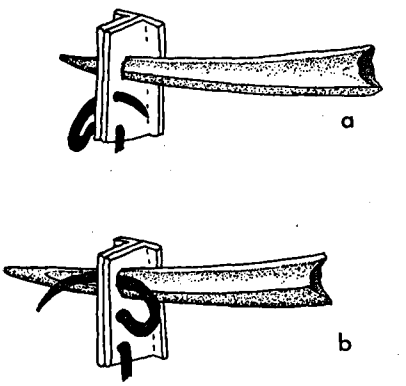


Fig. 7. Proposed use of the tool from Præstelyngen. 7a: A hole is drilled in the skin. 7b: The thread is placed in the furrow and passed through the hole.

became clear when, through the kindness of A. H. Hansen of Esbjerg, I received 20 recent spines newly cut off with the flesh still on them. When removing the meat, cuts were found in the same position as the cuts on the subfossil spines (pl. 3). The cuts were caused by the process of removing the pines, either in order to preserve them, or to avoid injury from them.

Investigation of recent animals

Having received about 20 fresh animals from A. H. Hansen, the author took the opportunity to find out if there was any relationship between

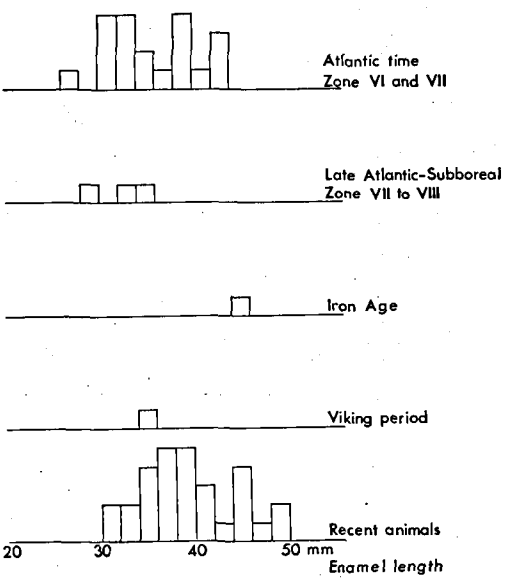


Fig. 8. Variation in length of the enamel of subfossil second dorsal spines in relation to their number. Heights of columns are proportional to the number of spines, a square being equivalent to one spine.

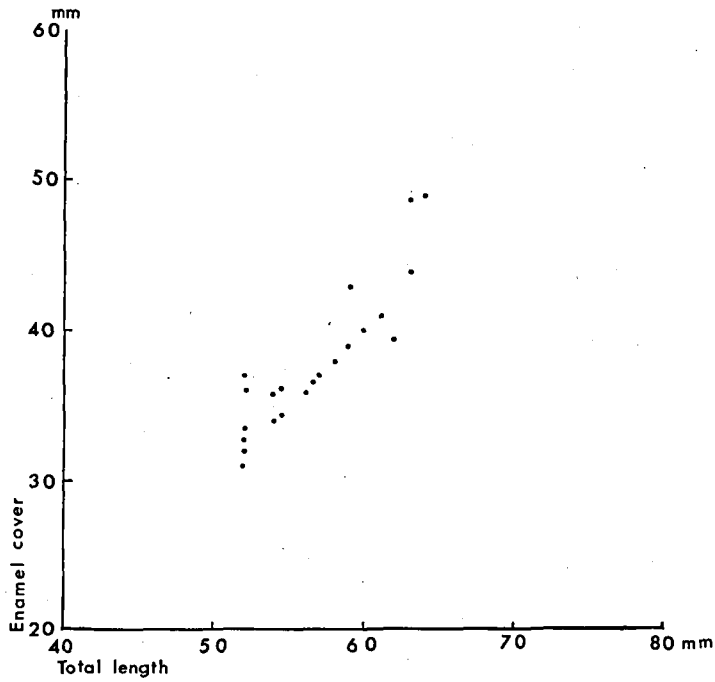


Fig. 9. Total length of recent dorsal spines in relation to the enamel cover of the spines, showing that the enamel cover is a useful expression for the total size of the spines.

the total length of the animal and the total length of the second dorsal spine (fig. 10). The relationship found, together with that found between the total length of the second dorsal spine and the length of the enamelled portion of the spine (fig. 9) made it reasonable to estimate the length of the animal from the length of enamel. This has special interest in the case of subfossil spines which are often broken proximally, leaving the enamel length as the only possible measurement to be made (pl. 1).

The variation of size and number of the subfossil Spur Dog spines during time may give an indication of the period in which it was most important as prey animal, and which size of animal was most desired, thereby giving a bias to the size of subfossil spines likely to be found (fig. 8). The size variation may, however, have other reasons, e.g. the animals could have been smaller in prehistoric time than now; all the subfossil finds of Spur Dogs could have been males, which are slightly smaller than the females; or finally there might be a tendency for the smaller animals to go closer to the coast and thereby be easier for Ertebølle man to catch.

The subfossil material at my disposal is very small and it would be wrong to draw any final conclusion from it. It can be said, however,

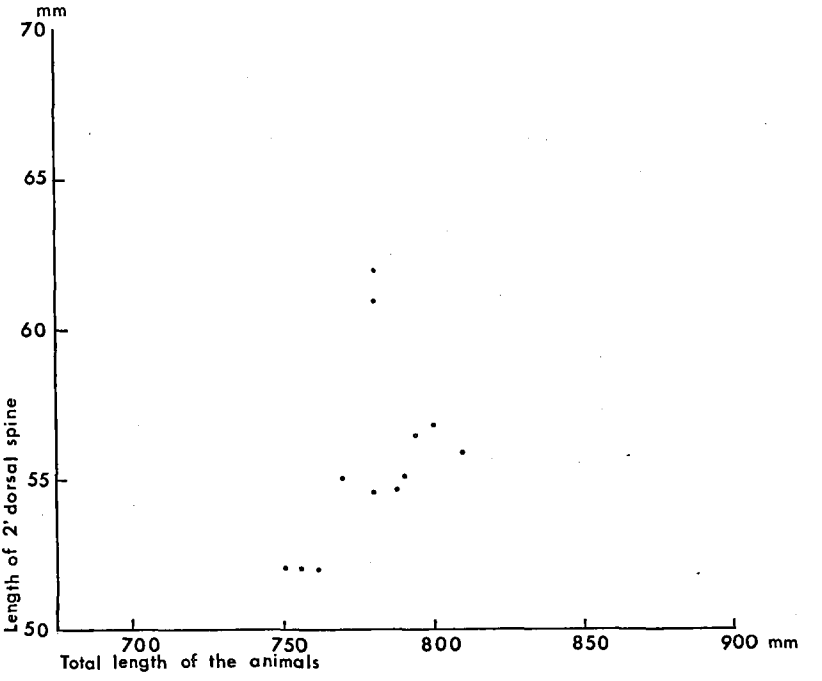


Fig. 10. Total length of the Spur Dog in relation to the total length of the second dorsal spine of recent animals, showing that it is justifiable to use the length of the second spine as an expression of the total length of the animal.

that most of the spines are from the Atlantic Period, and the size of the animals seems to be only slightly smaller than today.

Acknowledgements. My warm thanks to Dr. J. Troels-Smith, who organised and directed the excavation of the settlement Præstelyngen, and to U. Møhl who has helped in the identification of the bones. Special thanks are due to K. Vedelsby-Rosenlund, Zoological Museum of the University of Copenhagen, for valuable suggestions and for extracting the subfossil Spur Dog spines from the archaeological finds and putting the material at the authors disposal. Erna Nordmann has made all the drawings for which I am very grateful. My thanks go to P. Nielsen, Dept. of Geology, Copenhagen, and G. Brovad, Zoological Museum, Copenhagen, for the photographic work.

Dansk sammendrag

Et fund af en forarbejdet pighaj-pig fra Præstelyngs-bopladsen, en sæson-boplads beliggende i det indre af Sjælland, dateret til 3.200–3.000 f. Kr., gav anledning til en gennemgang af alle de kendte danske fund af pighaj-pigge fra forhistorisk og tidlig historisk tid. Fundet er bemærkelsesværdigt af to grunde. 1: Piggen er forarbejdet. 2: Den er fundet inde i landet. Ad 1. Den er tildannet ved afrunding og afkortning af spidsen, hvorved man har fået et meget spidst, lille præcisionsinstrument, der er tolket

som en skindnål, hvor tråden har været fremført i furen på bagsiden (fig. 7). Pighajpiggen er her for første gang påvist som råmateriale til fremstilling af redskaber. Ad 2. Den til kysten hørende pighaj-pigs tilstedeværelse i Præstelyngen inspirerer til flere tolkninger. A. Beboerne på Præstelyngen har haft sæsonbetonet ophold ved kysten, ligesom deres ophold på Præstelyngen har været det. B. Beboerne har boet permanent ved kysten, medens dele af familien har taget ind og jaget i de bedste måneder for at skaffe skind og føde. C. Man har til stadighed rejst rundt og ikke haft noget permanent tilholdssted, men har ladet de bedste fangstmuligheder været afgørende. D. En befolkningsgruppe hørende til ved kysten har lavet piggen og »solgt« den til indlandsbefolkningen på Præstelyngen. Den sidste forklaring er den mindst sandsynlige, da kulturelementerne ved kysten og inde i landet synes at være de samme, alle tilhørende typisk Ertebølle kultur. Hvilken af de øvrige forklaringer, man skal vælge, er svært at sige, men ét er klart, piggen fra Præstelyngen beviser, at befolkningen på denne indlandsplads har haft kontakt til kysten.

Under gennemgangen af de øvrige fund fandtes yderligere en forarbejdet pig fra lokaliteten Dronningemølle, dateret til den Atlantiske periode. Piggen er omdannet til et lille mejsellignende instrument, der kunne tænkes anvendt som en miniskraber til dekoration af ler, træ, rav eller måske tatovering af mennesker (Møhl, personlig information); det er dog mest sandsynligt, at den har stået i skindforarbejdningens tjeneste, ligesom piggen fra Præstelyngen.

Fundet af de 60 pigge fra Klampenborg-pladserne, sammenholdt med dateringerne af de øvrige fund (fig. 8), synes at vise, at det især var Ertebølle-folkene, der viste interesse for pighajen, med de muligheder den indebar for levering af mad og råmateriale; det sidste måske både i form af olie fra dens lever og som leverandør af pigge til præcisionsværktøj.

En undersøgelse af recente pighajer og deres pigge synes, trods det spinkle materiale, at vise, at emaljelængden er et rimeligt udtryk for piglængden (fig. 9), og piglængden er et rimeligt udtryk for totallængden af pighajen. De fiskede hajer i Ertebølle tid synes at være lidt mindre end dem, jeg har i det recente sammenligningsmateriale, der både repræsenterer hanner og hunner; det kunne skyldes, at dyrene i det subfossile materiale udelukkende var hanner, som er en smule mindre end hunnerne; det lyder dog ret usandsynligt. Det kunne også skyldes, at de recente eksemplarer er fisket på dybere vand end man må formode de subfossile har været.

Plate 1

First and second dorsal spines from a recent Spur Dog, c. × 2.

Fig. 1. First spine. 1a: Lateral view, with the meat removed, showing the long, paper-thin proximal part, which has not been found preserved in the subfossil specimens. 1b: With the meat still present. 1c: Caudal view.

Fig. 2. Second spine. 2a: Lateral view, with the meat removed. 2b: With the meat still present. 2c: caudal view.

1a

1b

1c

2a

2b

2c

Plate 2

Subfossil Spur Dog spines from Dronningemølle, c. × 2.

Fig. 1a–b. Spine (i/15) in lateral and caudal view. Note the two depressions on the ridges on the caudal side.

Fig. 2. Spine (A/8). Note the specially shaped point.

Fig. 3. Spine (e/13). 3a: Caudal view. 3b: Cranial view; note the chisel-shaped point. 3c: Lateral view; note the shortened point and the long abraded area on the cranial side.

1a

1b

2

3a

3b

3c

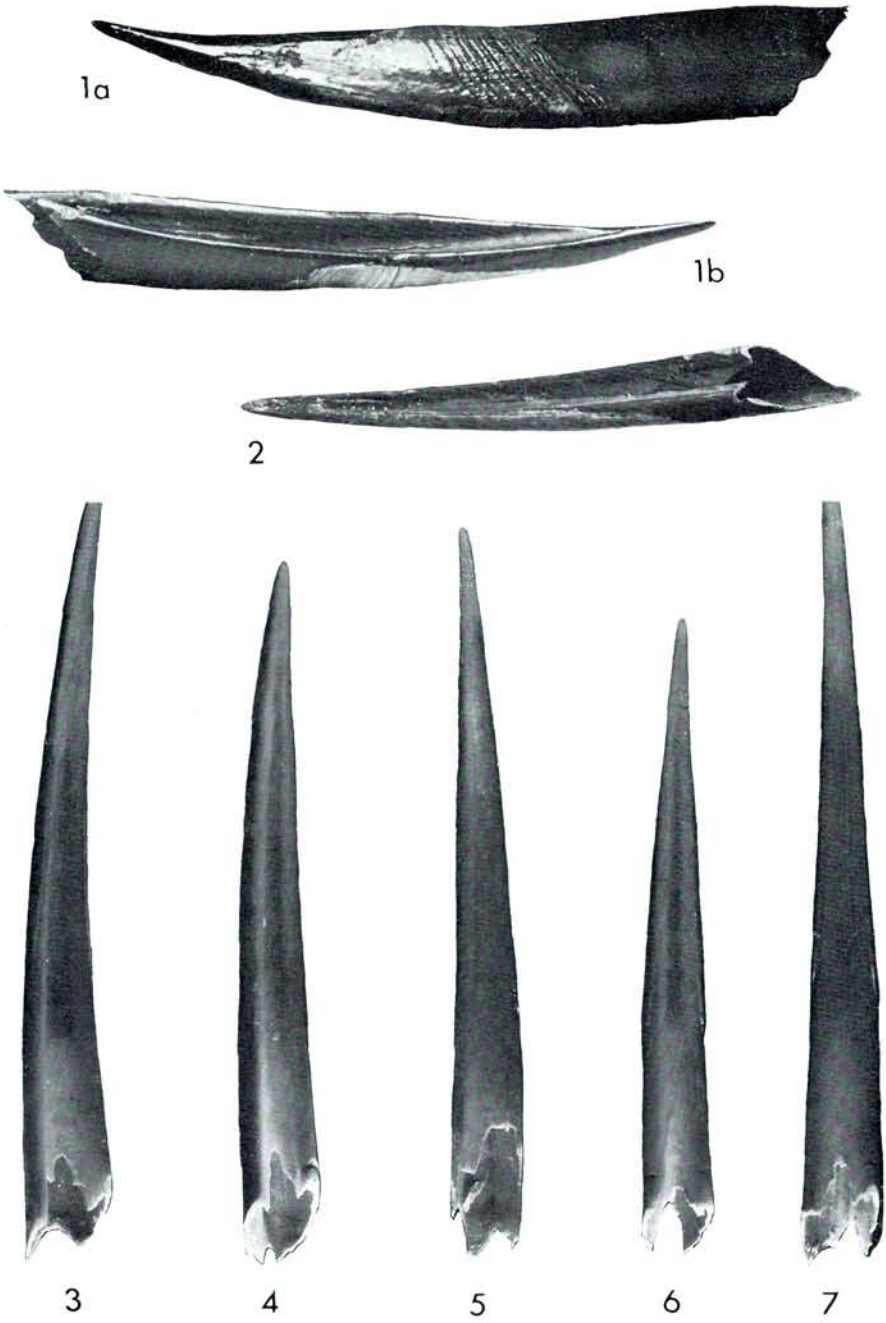
Plate 3

Cuts and marks on Spur Dog spines, c. × 2.

Fig. 1. Spine from Præstelyngen. 1a: Lateral view; note the shining, shortened distal part. 1b: Caudal view; note the cuts on the proximal part of the ridges.

Fig. 2. Spine from Hemshøjgård. Note the cuts on the proximal part of the ridges on the caudal side.

Fig. 3–7. Second dorsal spines from recent Spur Dogs. Note the cuts on the proximal part of the ridges being in the same position as the cuts on the spines from Præstelyngen and Hemshøjgård. The cuts on subfossil and recent specimens were produced during the removal of the spines from the animals.


1a
1b
2
3
4
5
6
7

References

Andersen, H. S. 1969: Brovst. En kystboplads fra ældre stenalder. *Kuml,* 67–90. (Summary in English.)

Andersen, H. S. in press: Ertebøllekulturens harpuner. *Kuml.* (Summary in English.)

Degerbøl, M., Mathiassen, T. & Troels-Smith, J. 1943: Dyrholmen. En stenalderboplads på Djursland. *K. danske Vidensk. Selsk. arkæol.-kunsthist. Skr.* I **(1),** 212 pp. (Summary in English.)

Degerbøl, M. 1945: Subfossile fisk fra Kvartærtiden. *Vidensk. Meddr dansk naturh. Foren.* **108,** 103–160. (Summary in English.)

Glob, P. V. 1935: Eskimo settlements in Kempe fjord and King Oscar fjord. *Meddr Grønland* **102,** 97 pp.

Kapel, H. 1969: En boplads fra tidlig-atlantisk tid ved Villingebæk. *Nationalmuseets Arbejdsmark 1969,* 85–94.

Klindt-Jensen, O. & Andersen, H. 1963: Det ældste Århus. *Kuml,* 75–87. (Summary in English.)

Larsen, H. 1934: Dødemandsbugten, an eskimo settlement on Clavering island. *Meddr Grønland* **102** (1), 187 pp.

Mathiassen, T. 1935: Blubberlamps in Ertebølle culture. *Acta Archaeologica* **VI,** 140–141.

Otterstrøm, C. V. 1917: *Danmarks fauna* **20,** Fisk III, 166 pp.

Pfaff, J. R. 1950: Hajer, Pleurotremi. *In* Bræstrup, F. W. (ed.): *Vort lands dyreliv* **II,** 19–26.

Rust, A. 1943: *Die alt- und mittelsteinzeitlichen Funde von Stellmor.* 240 pp. Archäologisches Institut des Deutschen Reiches.

Troels-Smith, J. 1968: The Ertebølle culture and its background. *Palæohistoria* **12,** 505–528.

Westerby, E. 1927: *Stenalderbopladser ved Klampenborg. Nogle bidrag til studiet af den mesolitiske periode,* 300 pp. (Summary in French.). København: Reitzel.