Meddelelser om Grønland

Aasivissuit – The Great Summer Camp
Archaeological, ethnographical and zoo-archaeological studies of a caribou-hunting site in West Greenland

Bjarne Grønnow, Morten Meldgaard and Jørn Berglund Nielsen

Man & Society
5 · 1983

Meddelelser om Grønland

The series *Meddelelser om Grønland* started in 1879 and has since then brought results from all fields of research in Greenland. It has now been split into three separate series:

Bioscience
Geoscience
Man & Society

The series should be registered as *Meddelelser om Grønland, Man & Society (Bioscience, Geoscience)* followed by the number of the paper. Example: *Meddr Grønland, Man & Soc. 1,* 1979.

The new series are issued by Kommissionen for videnskabelige Undersøgelser i Grønland (The Commission for Scientific Research in Greenland).

Correspondence
All correspondence and manuscripts should be sent to:

The Secretary
Kommissionen for videnskabelige Undersøgelser i Grønland
Øster Voldgade 10
DK-1350 Copenhagen K.

Questions concerning subscription to any or all of the series should be directed to the agent.

Agent
Nyt Nordisk Forlag – Arnold Busck A/S, Købmagergade 49, DK-1150 Copenhagen K. Tlf. +45.1.111103.

Meddelelser om Grønland, Man & Society

Meddelelser om Grønland, Man & Society invites papers that contribute significantly to studies in Greenland concerning human beings (such as anthropology, archaeology, arts, economics, education, ethnology, history, law, linguistics, medicine, psychology, religion, social sciences). Papers dealing with borderline subjects as for instance exploitation of natural resources and environmental research may be referred to one of the series *Bioscience, Geoscience or Man & Society* according to what is considered appropriate from an editorial point of view. Papers primarily concerned with other areas in the Arctic or Atlantic region may be accepted provided the observations are considered important in a Greenland context.

Instructions to authors. – See page 3 of cover.

Aasivissuit – The Great Summer Camp

Archaeological, ethnographical and zoo-archaeological studies of a caribou-hunting site in West Greenland

Bjarne Grønnow
Morten Meldgaard and
Jørn Berglund Nielsen

MEDDELELSER OM GRØNLAND, MAN & SOCIETY 5 · 1983

Table of contents

Accepted 1983
ISBN 87-17-05121-5
ISSN 0106-1062
Printed in Denmark by AiO Print Ltd., Odense

Aasivissuit – The Great Summer Camp
Archaeological, ethnographical and zoo-archaeological studies of a caribou-hunting site in West Greenland

BJARNE GRØNNOW, MORTEN MELDGAARD and JØRN BERGLUND NIELSEN

Grønnow, Bjarne, Meldgaard, Morten and Nielsen, Jørn Berglund, 1983. Aasivissuit – The Great Summer Camp. Archaeological, ethnographical and zoo-archaeological studies of a caribou-hunting site in West Greenland. Meddr Grønland, Man & Soc. 5: 96 pp, Copenhagen 1983–12–22.

An interdisciplinary analysis of an archaeological source material from the caribou-hunting site Aasivissuit in central inland West Greenland is presented. Subsistence changes over the years are the subject of ethnographical, archaeological and zoo-archaeological investigations.

The following main points are treated:

1. Resource dynamics: The inland game – the caribou population – undergoes drastic changes in the course of time.
2. The ethnography of caribou-hunting: Ethnographical description of the caribou hunt and of life in the inland area based on hitherto largely unpublished ethnographical material.
3. Hunting structures: Cairn systems, shooting-hides, meat caches, etc., document the extent of the Aasivissuit site catchment area and the hunting activities carried out there – *i.a.* large-scale battues.
4. Occupation phases: Excavations in the stratified ossiferous midden deposits reveal 6 occupation phases of varying duration and intensity at Aasivissuit. The phases represent different segments of the period from about 200 B.C. to the present, the neo-Eskimo layers from the 18th–19th centuries in particular holding much information.
5. The game: Osteological analyses of the comprehensive bone material show total dominance of caribou (selective late summer and autumn hunting of bucks and young animals) and that the excavation covers an area where coarse butchering took place.

Subsistence changes (changes in hunting forms and exploitation of game) and the discontinuity of inland occupation can be documented ethnographically, archaeologically and zoo-archaeologically. The changes are seen as a function of resource fluctuations and socio-historical changes.

Bjarne Grønnow, Forhistorisk Arkæologisk Institut, University of Copenhagen, Vandkunsten 5[1], DK-1467 København K, Morten Meldgaard, Zoologisk Museum, 1. afd., University of Copenhagen, Universitetsparken 15, DK-2100 København Ø, Jørn Berglund Nielsen, Institut for Eskimologi, University of Copenhagen, Fiolstræde 10, DK-1171 København K.

Preface

Udvalget vedrørende fredningslov for Grønland, 'The Committee for a Conservation Law for Greenland', commissioned in 1976 and 1977 comprehensive investigations into the natural and cultural environment of Sisimiut (Holsteinsborg) municipality, West Greenland (Bøcher et al. 1980). The purpose of this study was to create a foundation for legislation aimed at the protection of natural environments and prehistoric monuments. In these investigations participated the then principal of the high school in Sisimiut, H. C. Petersen, who had, over a long period, collected information on caribou-hunting in West Greenland. It was natural that in connection with reconnaissance in the inland parts of Sisimiut municipality he should visit the caribou-hunting camp Aasivissuit ('The Great Summer Camp'), which is situated about 20 km NNW of Søndrestrømfjord Air Base (pos. 51°10'W, 67°06'N). In a preliminary report to the Committee, H. C. Petersen describes this locality as "the district's largest, perhaps Greenland's largest, caribou-hunting camp" and also points out the necessity of aquiring greater knowledge of the former settlements in the area.

The Committee therefore drew up a project for a single-season archaeological field study of Aasivissuit, and this plan was in March 1978 approved officially, and sanctioned by *Kalaallit Nunaata Katersugaasivia* (Grønlands Landsmuseum).

The fieldwork and subsequent processing has been

carried out by three students at the University of Copenhagen: Bjarne Grønnow, *Forhistorisk Arkæologisk Institut,* Morten Meldgaard, *Zoologisk Museum, 1. Afdeling,* and Jørn Berglund Nielsen, *Institut for Eskimologi.* The fieldwork was financed by *Ministeriet for Grønland* and carried out in the period 15th July to 4th September, 1978. Supplementary investigations in the field, supported by *Japetus Steenstrups Legat,* were carried out by B.Grønnow in August 1980.

The project aimed at solving a number of problems relevant to conservancy legislation for Greenland: which type of protection should be employed in protecting the caribou-hunting camps of the inland region and other culture-historical monuments from destruction? In a report on these investigations to Kalaallit Nunaata Katersugaasivia and the Ministry for Greenland, we conclude among other things that protection of whole inland tracts would be the only effective measure for the settlements (Grønnow et al. 1978).

However, The Aasivissuit Project has become more than a conservation study. Both the character of the locality and the interdisciplinary make-up of the project team have meant that a large number of subjects of culture-historical interest have been treated, resulting in the present publication.

From the outset, we have encountered great interest and readiness to help from numerous institutions and individuals:

For the loan of equipment and practical assistance we thank *Nationalmuseet, 1., 4. and 8. Afdeling,* and *Zoologisk Museum, 1. Afdeling.* For assistance during fieldwork we thank B. Hasholt, S. Holt, S. Malmquist, M. B. Meldgaard, K. Nygård, K. Secher, H. Søgaard, H. Thing and M. Thomsen, and during the subsequent processing K. Aaris-Sørensen, C. Andreasen, G. Brovad, H. C. Gulløv, I. Kleivan, J. Meldgaard, B. N. Mortensen, N. G. Mortensen, J. Møhl, G. Nellemann, E. Brinch Petersen, H. C. Petersen, R. Petersen, J. Rosing and Chr. Vibe. We thank P. J. Crabb for the translation into English and C. Oksen and P. Christensen for preparing the figures. We are grateful to *Statens humanistiske Forskningsråd* and *Det kongelige Grønlandsfond* for supporting the publication financially. The authors owe especial thanks to Dr. hon. Ulrich Møhl, to whom this publication is dedicated.

The Aasivissuit material is the property of Kalaallit Nunaata Katersugaasivia, Nuuk, and is there accessible under Journal no. 67V2–III,6. The bone material is at present stored at the Zoological Museum, University of Copenhagen. The preliminary reports on fieldwork in 1978 and 1980 and the final excavation report are kept at the Kalaallit Nunaata Katersugaasivia.

Concerning the Greenlandic orthography in this publication it should be noted that new orthography is used except when quotation prevents this, e.g. Aussivigssuit (old orthography) = Aasivissuit (new orthography).

I Introduction

Culture-historical research in Greenland has hitherto to a major degree concentrated on life in the coastal regions, whereby the importance of the inland area for hunting and settlement has not been sufficiently illuminated. Nearly all previous Eskimo-archaeological excavations have thus occurred at settlements along the outer coasts, and through major campaigns there from the end of the 1920's to the beginning of the 1950's Therkel Mathiassen (1930, 1931, 1934, 1958) and Larsen and Meldgaard (1958) were able to construct an archaeological chronology for West Greenland.

Investigations have, however, been carried out at inland fjord settlements of the Nuuk district at Itinnera (J. Meldgaard 1961, Møhl 1972) and Tuapassuit (Gulløv & Ilkjær 1968), and Nellemann describes a smaller investigation of an inland site found during E. Knuth's inland reconnaissances, at Kangerluarsunnguup Tasersua also in the Nuuk district (Nellemann 1955). Jens Rosing has from the same area published the results of a number of reconnaissances covering prehistoric hunting-structures (1958b).

The still relatively unknown culture-historical conditions in the inland regions of West Greenland thus constitute a previously neglected but very important field of research. The interdisciplinary Aasivissuit project, the purpose of which is to cast light on the subsistence history of a West Greenland inland occupation site, is a contribution to this research. The analysis, which takes its starting point in an ethnographical and ethnohistorical source material and in an archaeological material obtained by means of reconnaissance and excavation, thus concentrates on *the development of hunting forms and the exploitation of game resources at the Aasivissuit occupation site, Sisimiut municipality.*

Subsistence conditions are one part of a complex interaction between a society of hunters and nature. Forms of hunting and the treatment of the kill are on the one hand determined by natural conditions (the nature, amount and accessibility of game resources) and on the other by cultural factors such as tradition, technology, social organization and demography. On the basis of this conception, which will be discussed in greater detail in the Conclusions, and of the investigation results, we shall endeavour to place the changes in subsistence conditions at Aasivissuit in a culture-historical and natural-historical context.

II Nature of the inland region

Geography

Aasivissuit is situated in the centre of Greenland's largest and best known caribou terrain, bordered to the north by Nordre Isortoq, to the south by the ice of Sukkertoppen Iskappe, and to the west and east by the Davis Strait and inland Ice Cap, respectively. The region forms, with an east–west extent of up to 180 km and an area of 18 000 sq. km, the most extensive ice-free continuous land area in West Greenland (Fig. 1 A–C).

The coastal tract is predominantly mountainous, with high fells often reaching over 500 m above sea level. Numerous fjords extend branches inland and the lush valleys which as a rule form their natural continuation ameliorate the otherwise rather harsh character of the high fell.

Inland, the terrain is considerably flatter, and rounded fells, worn down by erosion, alternate with extensive plains. Everywhere in this landscape, in particular in the valleys, the effects of the ice, in the shape of moraines, eskers, gravel terraces and other features, are seen.

The inland area contains numerous lakes, many of which, as a result of the east–west orientation of the geological structures and weakness zones, are oblong in shape. Several lakes often lie connected end to end by rivers, to form systems of unbroken waterways from the Ice Cap out to the fjords. A few large rivers, among them Isortoq and Ørkendalen, carry large amounts of suspended material from the Ice Cap, and some of this is deposited to form extensive flats in the rivers, from which the finer material is picked up and transported by the wind over quite large areas (Fig. 2). Everywhere in the inland area, this silt is deposited in fine layers, in the course of time evening out the contours of the landscape.

Climate

The climate of the inland area may be described as arid, low-arctic and continental, the temperature difference between the hottest and coldest months of the year being over 20°C, and the annual precipitation not exceeding 200 mm (Fig. 3) (Bøcher et al. 1980).

The Ice Cap of the interior exerts a considerable influence on the climate of the inland area, being among other things responsible for the frequently occurring *nunasarneq* (chinook) storms. In winter especially, these warm winds can have a marked effect, melting the snow completely or partially. When the wind dies down and the frost returns, layers of ice may be formed over the vegetation or over the remaining snow. For animals which have to grub for their food through the snow, these ice layers can have a catastrophic effect.

Usually the first snow falls inland at the end of September or beginning of October, and does not thaw until the beginning of May. But on account of the low precipitation and frequent chinook storms, there will in winter nevertheless usually be periods when the land is more or less snow-free.

Flora

One of the most characteristic vegetation types in the inland areas is the dwarf scrub heath dominated by species such as bog whortleberry (*Vaccinium uliginosum*), dwarf birch (*Betula nana*), the willow *Salix glauca* and bearberry (*Arctostaphylos uva-ursi*). Dwarf scrub heath normally occurs on the north-facing slopes and in the valleys. In the moist valley bottoms one may encounter willow scrub where the individual shrubs may have stems up to 2–3 metres high.

Especially on south-facing slopes liable to strong dessication in summer, the vegetation has steppe character. Here plants like the sedge *Carex supina,* Balfour's meadow grass (*Poa glauca*) and the wormwood *Artemesia borealis* are predominant.

The large alluvial areas are typically rather damp, and with their verdant and strongly growing vegetation give a very lush impression. Among other plants, the wood reeds (*Calamagrostis spp.*) and meadow grasses (*Poa spp.*) are common.

Fauna

Most of the birds of the inland area arrive some time in May, when the snow has practically vanished and the ice on the small lakes has begun to melt: species like white-fronted goose (*Anser albifrons flavirostris*), Greenland mallard (*Anas platyrhynchos conboschas*), long-tailed duck (*Clangula hyemalis*), great northern diver (*Gavia immer*), red-throated diver (*Gavia stellata*) and red-breasted merganser (*Mergus serrator*). The small and shallow lakes in particular are favoured breeding places, being ice-free early in the year and often having well developed plant growth affording cover in the shallower water. Among other birds, white-fronted goose and mallard favour these small lakes, whereas the great northern diver, for instance, prefers the more exposed ones. At the onset of ice formation in September and October, the migratory birds leave the inland areas again. The ptarmigan (*Lagopus mutus*) is resident and winters in large flocks in the sheltered valleys of the inland area. In summer, it is found breeding in most biotopes, but particularly large numbers are found in and around the dense willow scrub clothing the damp valley bottoms. In addition to the species mentioned, there are birds of less impor-

tance as game: gyrfalcon (*Falco rusticolus*) and peregrine falcon (*Falco peregrinus anatum*), both of which breed quite commonly in the inland tracts, and raven (*Corvus corax*), a very common breeding bird which is also, though in smaller numbers, found inland in winter.

A landlocked population of char (*Salvinellus alpinus*) is found in some of the inland lakes. These sedentary fish never become so large and well nourished as those char which have access to the sea. Strangely enough, there are no char in Aasivissuit Tasiat, at the eastern end of which the excavated Aasivissuit site is located.

Arctic hare (*Lepus arcticus*) and arctic fox (*Alopex lagopus*), especially the blue phase, are common inland throughout the year.

The caribou

The Greenland caribou (*Rangifer tarandus groenlandicus*)[1], or in Greenlandic *tuttu* is today spread over most of West Greenland from the Svartenhuk peninsula in the north to Paamiut (Frederikshåb) in the south, but by far the most important areas are situated in the districts of Nuuk (Godthåb), Maniitsoq (Sukkertoppen) and Sisimiut (Holsteinsborg) (Fig. 1). The West Greenland caribou population was in 1980 estimated to number 7 000 to 9 000 animals (Thing 1981:2).

The annual cycle of the caribou

The following is a description of the annual cycle of the caribou (in particular their seasonal migrations) in Sisimiut district (Fig. 4). It builds on three years' game-biological investigations carried out in the period 1977–1979 (Holt 1980, Strandgaard 1980, Thing & Clausen 1980, Thing 1981).

Among the local caribou-hunters it is the common opinion that caribou behaviour changes according to the size of the herd (Robert Petersen & Jens Rosing pers. comm.) and it is difficult, even for people who have hunted them all their lives, to give a detailed account of their migration patterns. The main features of the seasonal migrations, *i.a.* the east–west migration to and from the calving areas, seem, however, to be unchanged (H. C. Petersen pers. comm.) One may therefore expect a description of the caribou annual cycle at the end of the 1970's in general to apply to prehistoric populations, too.

Winter (*beginning of November to end of April*). – The winter period is passed by the does, calves, young animals and younger bucks mainly in the sheltered valleys near the coast. Here the snow cover is both thicker and more permanent than inland, but this complete blanket is the very prerequisite for the presence of the lichen heath which the animals are to a high degree dependent on in winter. Many older bucks and a few younger animals, does and calves stay inland where the snow cover – but also the vegetation, is poorer.

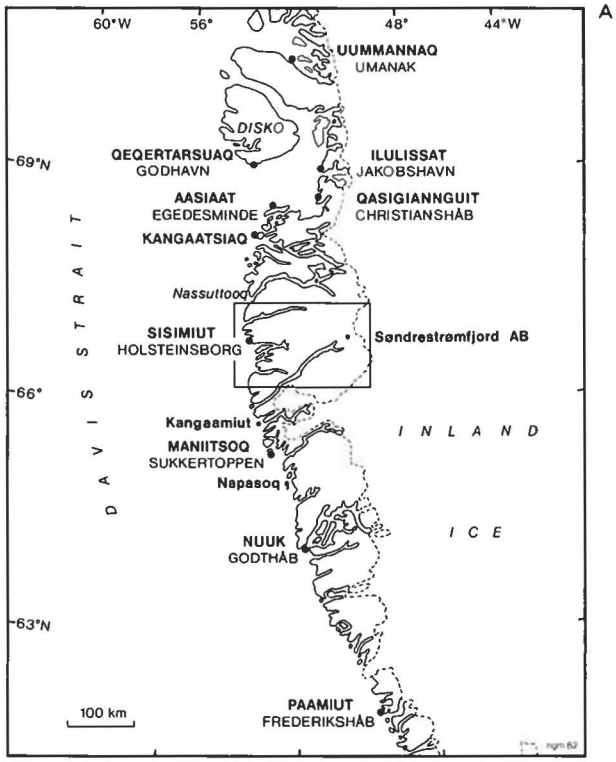
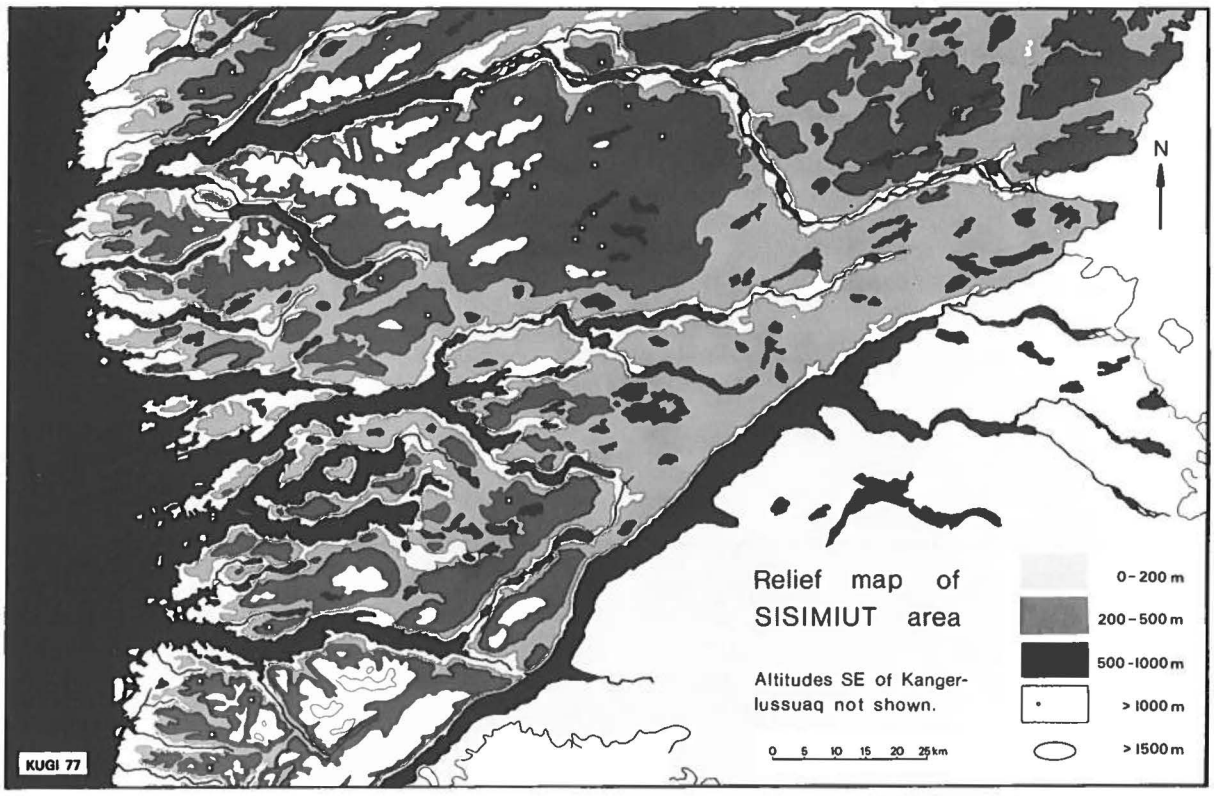


Fig. 1. General map of the area of study. A: West Greenland. B: Topography of the Sisimiut area. (Altitudes south-east of Kangerlussuaq are not shown). C: Place names used in the publication. (Niels Gylling Mortensen, *Københavns Universitets Geografiske Institut*).

All the animals use up their reserves of fat in the course of the winter and at the end of the season may have lost as much as 30% of their autumn weight. Those animals which are not fully grown practically cease to grow during the winter period, since all available energy is used to get through it. The winter months, especially February, March and April, are those in which natural losses among caribou are greatest. It is lack of food (or strictly speaking difficult access to food), which makes itself felt. The bucks, in particular, are severely affected, having already during the November rutting season expended most of the energy stored from the summer. The result of this selective mortality is seen in the sexual composition of the population as a distinct deficiency of adult bucks: about 66 bucks per 100 does (H. Thing unpublished data).

Spring (*middle of April to end of May*). – Inland, the continental climate causes the snow to melt earlier than in the coastal areas. As a consequence, the vegetation there is also earlier in evidence, and this is probably one of the factors which starts the spring migrations of the caribou towards the ice. The great majority of animals are at this stage very weak, and mortality is, as in late winter, high.

B


N
Relief map of
SISIMIUT area
Altitudes SE of Kanger-
lussuaq not shown.
0 5 10 15 20 25km
0-200 m
200-500 m
500-1000 m
> 1000 m
> 1500 m
KUGI 77

C

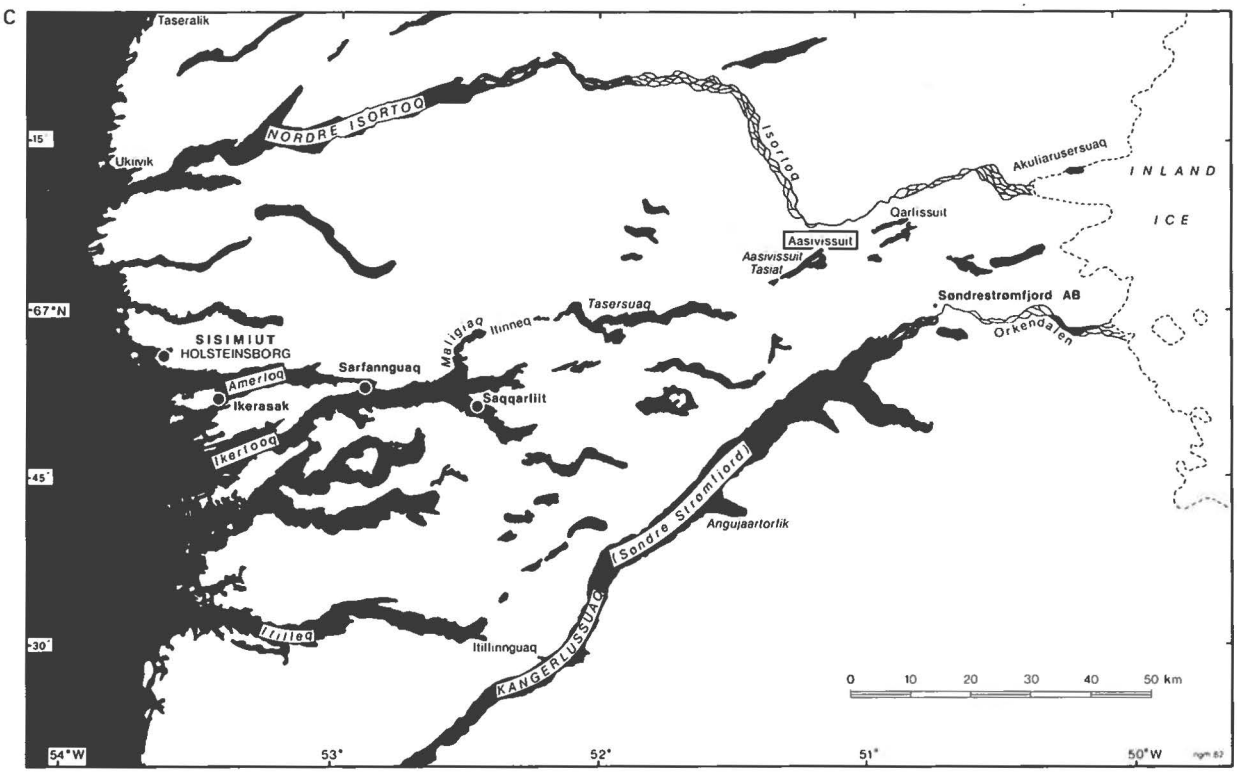

Taseralik
Ukiivik
NORDRE ISORTOQ
Isortoq
Akuliarusersuaq
INLAND
ICE
Qarlissuit
Aasivissuit
Aasivissuit
Tasiat
Søndrestrømfjord AB
Orkendalen
Tasersuaq
Maligiaq
Itinneq
SISIMIUT
HOLSTEINSBORG
Sarfannguaq
Amerloq
Ikerasak
Saqqarliit
Ikerfooq
Sondre Strømfjord
Angujaartorlik
Itrilleq
Itillinnguaq
KANGERLUSSUAQ
0 10 20 30 40 50 km
54°W
53°
52°
51°
50°W
-15
-67°N
-45
-30

Fig. 2. The river Isortoq, about 3 km north of Aasivissuit. A meltwater river, from which large amounts of silt are carried away by the wind. Aug. 1978.

Summer (end of May to end of August). – The does arrive at the calving areas at the end of May, and calving starts in late May and ends in late June, with a peak in the first half of June (Thing 1981: 14). Most of the does calve on the large, flat meadows near the ice and in the slightly hilly terrain surrounding them. Some do so in the area around and north-west of Aasivissuit.

Immediately after calving, the majority of the does with their new-born calves gather in the so-called "post-calving aggregations", which can comprise over a thousand animals. After this, the animals disperse in June and July over the inland summer grazing area, where they endeavour to replenish the fat reserves depleted during the winter.

Usually about 50% of the calves die in the course of the summer, but those which do live through to the autumn have, on the other hand, in consequence a good chance of getting through the winter (only 20% of calves alive in autumn die in the course of the winter (Thing & Clausen 1980)).

The summer grazing areas are strongly affected by the foraging of the caribou and often appear as cropped-down sward, so-called "golf courses". Year after year the caribou return to the same patches and thus

themselves create dense populations of fast-growing plants like smooth meadow grass (*Poa pratensis*) (Holt 1980). Slower-growing plants such as the willow *Salix glauca,* which otherwise belong "naturally" to these areas, are ousted by the competition, their regeneration rates after cropping-down being very slow.

Autumn (end of August to beginning of November). – From the end of August to the middle of October, does, calves and young animals move in large groups towards the coast. The rutting period lasts from 10th October to 4th November (Thing 1981: 14) (Figs 5 and 6).

It is in particular during these autumn (and spring) migrations that the caribou leave their mark on the terrain (Fig. 7). Especially where the topography creates natural "bottlenecks", the east-west, hard-trodden and deeply worn trails, often several hundreds of years old, may be seen lying side by side. The Aasivissuit area is a good example of a bottleneck of this kind. It is characteristic of caribou trails that they always follow those lines in the landscape which offer least "topographical resistance". For instance, they often follow the east–west valley floors, lake sides or even the surface of lateral moraines. In winter, the ice of the lakes is often the preferred surface.

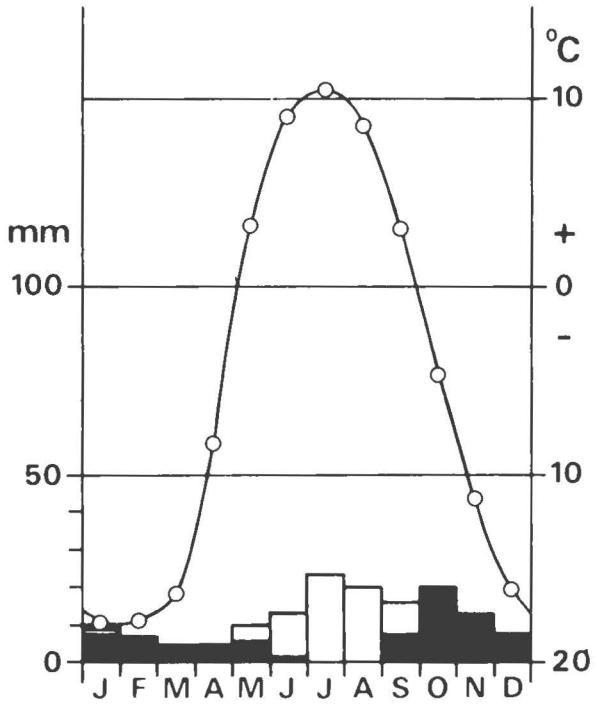


Fig. 3. Temperature and precipitation graph for Søndrestrømfjord Air Base (Bøcher et al. 1980: 27).

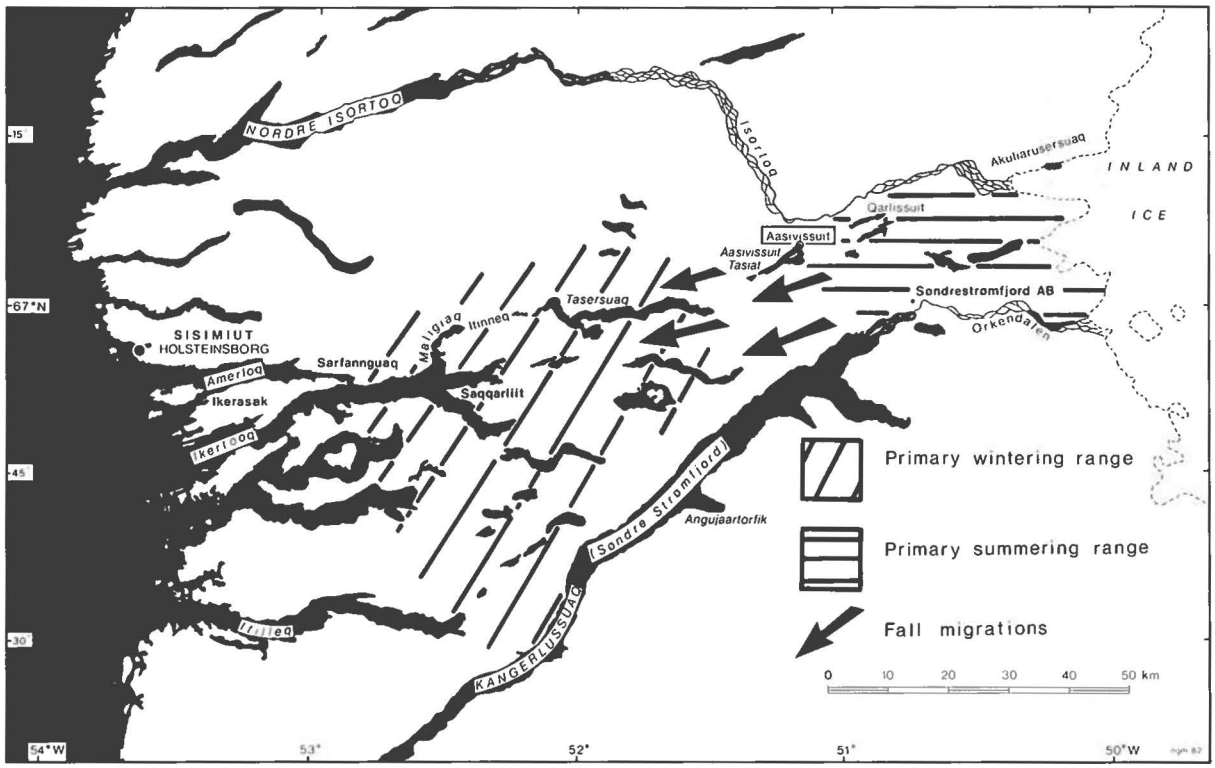


Fig. 4. Map of the Sisimiut-Kangerlussuaq area, showing winter and summer ranges and autumn migration routes of the caribou (after Thing 1981: 16).

Fig. 5. Caribou buck, August.

The game around Aasivissuit – a survey

The following faunistic conditions are of especial interest for the utilization and position of the Aasivissuit site.

1a. From the beginning of November to the middle of April there are only a few chasable species represented in the area around Aasivissuit: ptarmigan, hare, fox and a few caribou, in particular weak bucks.

1b. From the middle of April to the end of May, does and young animals pass by Aasivissuit. They are thin, like those bucks which have stayed in the area over the winter.

1c. From the end of May to the end of August, many small groups of foraging caribou are encountered in the environs of Aasivissuit. White-fronted goose, mallard, great northern diver, etc., arrive in the area some time in May.

1d. From the end of August to the beginning of November, caribou does, young animals and calves in good condition, and some bucks, pass Aasivissuit in flocks. In September and October, the migrant birds depart.

Aasivissuit lies centrally in the caribou's summer grazing area and on their migration routes, which means that it is a potential base camp for caribou-hunting throughout the summer.

2. In the area between the Isortoq river and Kangerlussuaq, there are several natural bottlenecks, where constrictions in the landscape formed by lakes, rivers and mountain crests compel the caribou to follow well defined tongues of land and valleys. Aasivissuit is situated in just such a constriction, where the caribou are compelled by the great Isortoq river and Aasivissuit

Fig. 6. Doe with 2½-month-old calf, August (photo. H. Thing).

Tasiat to pass the camp-site and through its catchment area (Fig. 8). It must be emphasized that the Aasivissuit bottleneck is situated in a part of the country where both spring and autumn migrations of caribou are massive.

Fluctuations in food resources

The previous section gives a picture of the natural conditions as they are today. But a prerequisite for understanding the changes in subsistence af Aasivissuit is the recognition that nature is dynamic and resources unstable.

It is widely recognized that there are variations in the occurrence of marine invertebrates, fish and marine mammals along the coasts of West Greenland (Jensen 1939, Vibe 1967, Dunbar & Thomson 1979). The explanation for by far the greater part of these variations should be sought in changes in the physical conditions of the sea (op. cit.). It is characteristic of the population fluctuations of a given area that they are very drastic. The fluctuations of cod and ringed seal are good examples of this (Jensen 1939, Vibe 1967). It should be emphasized, however, that these fluctuations do not necessarily mean that areas of the sea are emptied of resources: the resources as a rule merely change character – boreal being replaced by arctic or vice-versa.

The animal populations of the West Greenland land areas, too, fluctuate (Braestrup 1941, Vibe 1967) and one usually sees fluctuations in the climatic conditions cited as the primary cause (op. cit.). But for some species, emphasis is placed on other models for the explanation of population fluctuations. This applies in particular to the caribou, which is a central resource in inland West Greenland (Holt 1980, Strandgaard 1980, Thing 1981).

Fluctuations in the caribou populations

From a number of historical sources (N. Egede 1939 [1770], Mikiassen 1864, Müller 1906, Jak. Rosing 1926/1927, and others) and from information in game statistics, it is possible to gain an insight into the fluctuations in the caribou population back to the beginning of the 18th century (Vibe 1967: 163–180). With a starting point in the sources mentioned, it is possible to decide whether there have been relatively many or relatively few caribou in a given period (Fig. 9).

It is characteristic of the population fluctuations that they are very dramatic. Rasmus Müller gives a very good account of this (Müller 1906: 370): "Whatever the reason for this, it is a fact that caribou-hunting and the occurrence of caribou now [1898] and 50 years ago relate to each other as a mouse to an elephant." The caribou-hunter Jakob Rosing gives a corresponding account of the decline in the population around 1860: "In their time [the 1860's] the caribou population declined drastically in Kangerdlugssuaq. The superabundance of caribou some years previously was just a thing of the past ..." (Jak. Rosing 1926/1927: col. 90). The game statistics, too, reveal this drastic decline in caribou numbers. During the 17-year period 1838–1855, 228 565 hides were bought in and exported from Greenland (i.e. West Greenland), whereas the corresponding figure for the 17-year period 1863–1890 was 203 hides (Müller 1906: 372–373). The population fluctuation we are at present witness to is also very drastic. In this case we are able to obtain a more precise quantitative impression, because *Vildbiologisk Station, Kalø,* in the period 1976–1979 has carried out an aerial census of the West Greenland caribu population. The population at the end of the 1960's has thus been estimated at 100 000 animals, and an aerial count made in 1980 showed that numbers had fallen to about 9000 animals (Thing & Clausen 1980), a reduction of more than 90% in just over 10 years.

The time interval from one population maximum to another can from accessible sources (Fig. 9) be placed at about 120 years (Vibe 1982). Similar periodicity is also known from the Western Brooks Caribou Herd in Alaska (Burch 1972: 357) and from the Québec-Labrador caribou population (Audet 1979: 25), a circumstance which suggests that the fluctuations have their origin in factors of a general nature.

Fig. 7. East-west oriented caribou trails in the inland area near Aasivissuit. Aug. 1978.

Fig. 8. Oblique aerial photograph looking east at an altitude of about 3 000 m. The excavated caribou-hunting camp Aasivissuit is seen to be strategically placed at a "topographical constriction", where caribou on migration are naturally concentrated. (Geodetic Institute, Copenhagen, route 64 509 Al-Ø, 1948).

Reasons for fluctuations in the caribou population

Climate. – Climate is of fundamental importance for the quality, quantity and accessibility of the vegetation and thereby also of fundamental importance for the size of individuals and of the whole populations of caribou. It follows from this that a climatic change will bring about changes in both these quantities. In certain situations, other phenomena, such as hunting pressure and overgrazing, will to a greater or lesser degree be superimposed on the effects of climate.

From examinations of drilling cores from the Ice Cap, from geomorphological studies and from palynological investigations, one may obtain a more general picture of the climatic development during the last 1000 years in West Greenland (Fredskild 1973, Brink 1975, Dansgaard et al. 1975). These long-term fluctuations are naturally of vital importance to animals and man in West Greenland, but they are relatively intangible and loosely defined, and therefore difficult to correlate directly with shorter population fluctuations. The meteorological records of the last one hundred years nevertheless afford an approach to a more detailed understanding of the character of climatic changes.

One may generally conceive the major and minor changes in West Greenland as an oscillation between an

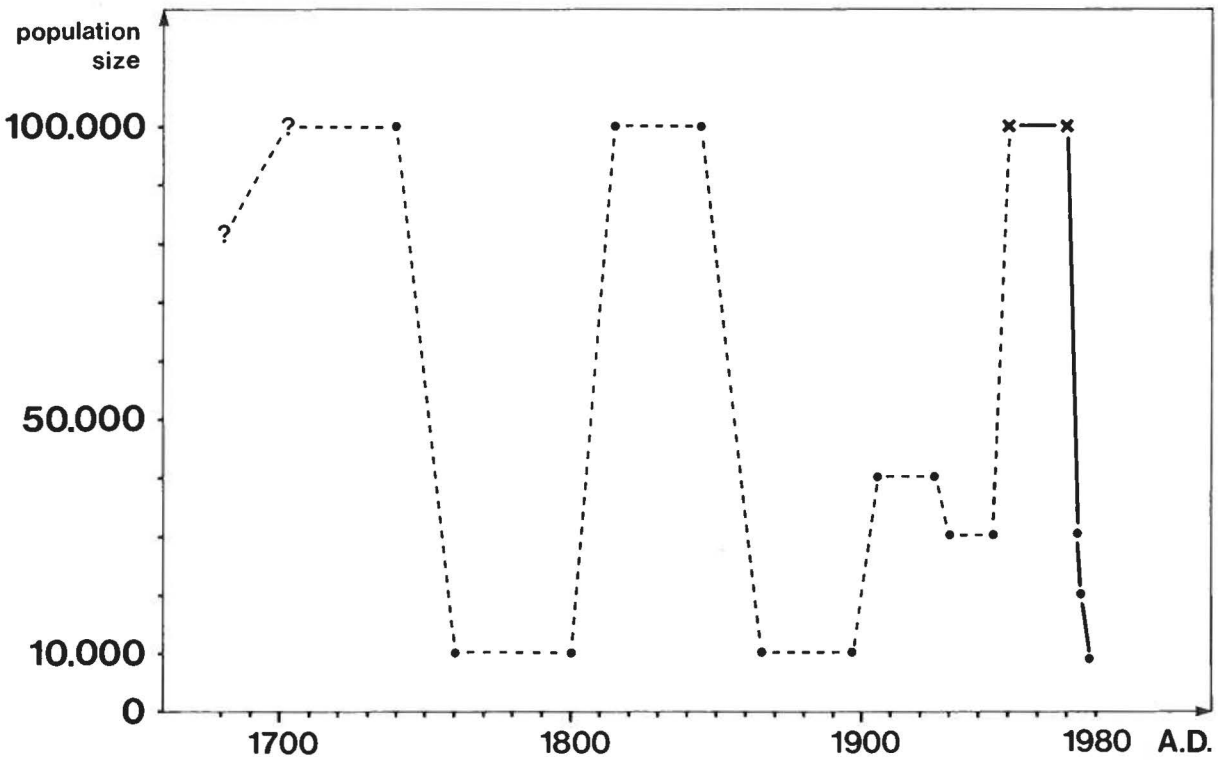


Fig. 9. Graph showing fluctuations in the West Greenland caribou population, 1721–1980. The continuous line has been drawn on the basis of estimates (x —— x) or counts (• —— •) (Thing 1980: 81), the broken line on the basis of historical/ethnohistorical sources (Dalager 1915 [1752]: 80, N. Egede 1939 [1770], Mikiassen 1864, Rink 1974 [1877], Jakob Rosing 1926/1927, Vibe 1967) and game statistics (Müller 1906, Vibe 1967). The caribou maxima and minima of this part of the curve are assumed to have been of the same magnitude as the 1950 maximum and 1980 minimum respectively.

oceanic and continental climate (Vibe 1967, Weidick 1968, Hasholt & Søgaard 1979). In the last century, the degree of continentality (defined as the difference in mean temperature between the hottest and the coldest month of the year) in Sisimiut municipality has fallen from 25.2°C in the period 1889–1925 to 20.6°C in the period 1961–1976 (Bøcher et al. 1980). A change from a more continental climate to a more oceanic one is reflected *i.a.* in a rather strongly falling summer temperature, a more slowly increasing winter temperature (more frequent frost/thaw periods) and an increased precipitation. In general the climate becomes more unstable.

Chr. Vibe summarizes the relationship between climatic changes and fluctuations in the caribou population as follows: "In stable and dry climatic periods ... [continental climate], e.g. 1810–1860, the Reindeer was very abundant in West Greenland (north of Frederikshåb), while in unstable and wet periods ... [atlantic climate], e.g. 1860–1910, it was scarce." (Vibe 1967: 198.)

One of the reasons why an atlantic climate leads to a decline in the caribou populations is the increased amount of snow and the more frequent icing up, which hampers the caribou's access to winter food. Several examples are known of snow and ice wiping out or strongly decimating local populations of caribou: NE Greenland (Degerbøl 1957: 53), Thule (Freuchen 1915), Parry Islands (Parker et al. 1975), Belcher Islands (Piérard 1979), Labrador (Susan Kaplan pers. comm.), Disko (Reinhardt Møbjerg-Christensen pers. comm.). The influence of climatic changes on the rise and decline of caribou populations is recognized by the Greenland caribou-hunters themselves. Thus Jakob Rosing: "It was around 1860 that the great flocks disappeared. In the following years there were hard winters at Kangerdlugssuaq with much snow, and the number of caribou got smaller and smaller." (Jak. Rosing 1926/1927: col. 90.)

Predation. – There has probably never been a permanent population of wolves in West Greenland. A few strays from Ellesmere Island are shot from time to time, but they cannot have played any important role in regulating the numbers of the caribou herd. The caribou-hunter Jakob Rosing suggests on the other hand that wild dogs may have been a contributory cause to the decline of caribou in the 1860's (Jak. Rosing 1926/1927: col. 115), but if that is the case, it is an isolated phenomenon, for wild dogs cannot be con-

nected with the other known fluctuations. The declines in the caribou populations have also been explained as the result of too great a hunting pressure (Dalager 1915 [1752]: 80, Thorhallesen 1914 [1775]: 62–63, Rink 1974 [1877]: 103, Müller 1906: 369). The introduction of the flint-lock gun to West Greenland in the mid-18th century was thus held responsible for the drastic decline in the 1740's and 1750's (Dalager 1915 [1752], Thorhallesen 1914 [1775]). Hunting pressure may possibly have had a secondary importance in the 1740–1750 and 1860 declines, but the violent fall in the 1970's shows that the cause of the fluctuations should be primarily sought elsewhere. The same conclusion is reached by Burch by another route in connection with fluctuations of the caribou population of Alaska: "On a local level, some of the most striking increases occurred in herds [of caribou] that were among the most heavily hunted (Skoog 1968: 307). Such trends constitute the single most important evidence we have that caribou populations experience long-term fluctuations independently of factors of human predation." (Burch 1972: 356.)

Overgrazing. – Game-biologists have demonstrated overgrazing of foraging areas in Sisimiut municipality in the years 1977–1979, and hold it primarily responsible for the population fluctuations (Holt 1980, Strandgaard 1980, Thing 1981). One should, though, probably be cautious about drawing conclusions, on the basis of this single instance, on the general importance of overgrazing for the size of the caribou population. The relation between vegetation and caribou numbers is a complex one, varying considerably from one climatic situation to another; accessibility, quantity and quality of food are all affected by climate. It will first be possible to evaluate the total effect of a possible overgrazing when data have been collected from periods both of increase and decrease.

The importance of fluctuations in the caribou population for subsistence at Aasivissuit

The West Greenland caribou population is a highly unstable source of food. Periodically, it is large and can support intensive hunting, but the maximum is always followed by a drastic decline in the population and a caribou minimum. That is to say that the caribou-hunters of Greenland will each second or third generation experience a caribou minimum and a consequent fall in the caribou kill. (The same interval – 2–3 generations – between declines in the caribou population is experienced by the Nunamiut Eskimos of North Alaska (Burch 1972: 356).[2])

The constantly changing ecological circumstances affecting inland hunting naturally have a bearing on hunting strategy, which, itself influenced by cultural factors, will constantly be changed and modified. This is discussed further in the Conclusions.

III Aasivissuit – ethnohistory and ethnography

In West Greenland, summer has a special place in the annual cycles of life and hunting. Life at the summer settlements, inland or on the coast, afforded the opportunity for people from the scattered and isolated winter settlements to meet, and "an opportunity for journeys and sports equally favourable to their health and stimulating to their mental powers" (Rink 1974: 101). The summer camps arose especially where resources were plentiful, for instance on the migration routes of seal and caribou, at particularly good fishing places or nesting areas, or at places where these opportunities were combined. Inland, the caribou were the main foundation for the summer camps. The aim of the following examination of the ethnohistorical, historical and ethnographical sources is to elicit an understanding of the use of the inland caribou-hunting camp Aasivissuit[3].

Prehistoric caribou-hunting in the oral tradition

Among inuit, oral tradition has always been of the greatest importance. It embodies a whole outlook on life and communicates ancestral knowledge, often in a highly artistic form. But the advent of foreign culture has been to the detriment of the original traditions, and now only a few people are able to hand down the ancestral wisdom in narrative form. Far-sighted people, first Henry Rink, later Knud Rasmussen, Hans Lynge and others, in recognition of this unfortunate development, initiated the collection and writing down of these traditions in West Greenland. For the historian, archaeologist and ethnographer, the narratives, in particular, are a source material of especial value. Although for the most part they go back to pre-colonial times, they have lived on well into the 20th century and therefore constitute an invaluable source for the elucidation of the cultural history of Greenland. It may therefore cause surprise to learn that these sources have been used only sparingly in presentations dealing with the history of Greenland (Gulløv 1980: 426). The narrative art of the inuit falls into two main folkloristic groups: *oqaluttuat,* 'myths', *and oqalualaarutit,* 'stories'. The first group, the myths, are set in a remote past. The other group, the legends, are closer to the time of relation, dealing with real-life situations, directly or indi-

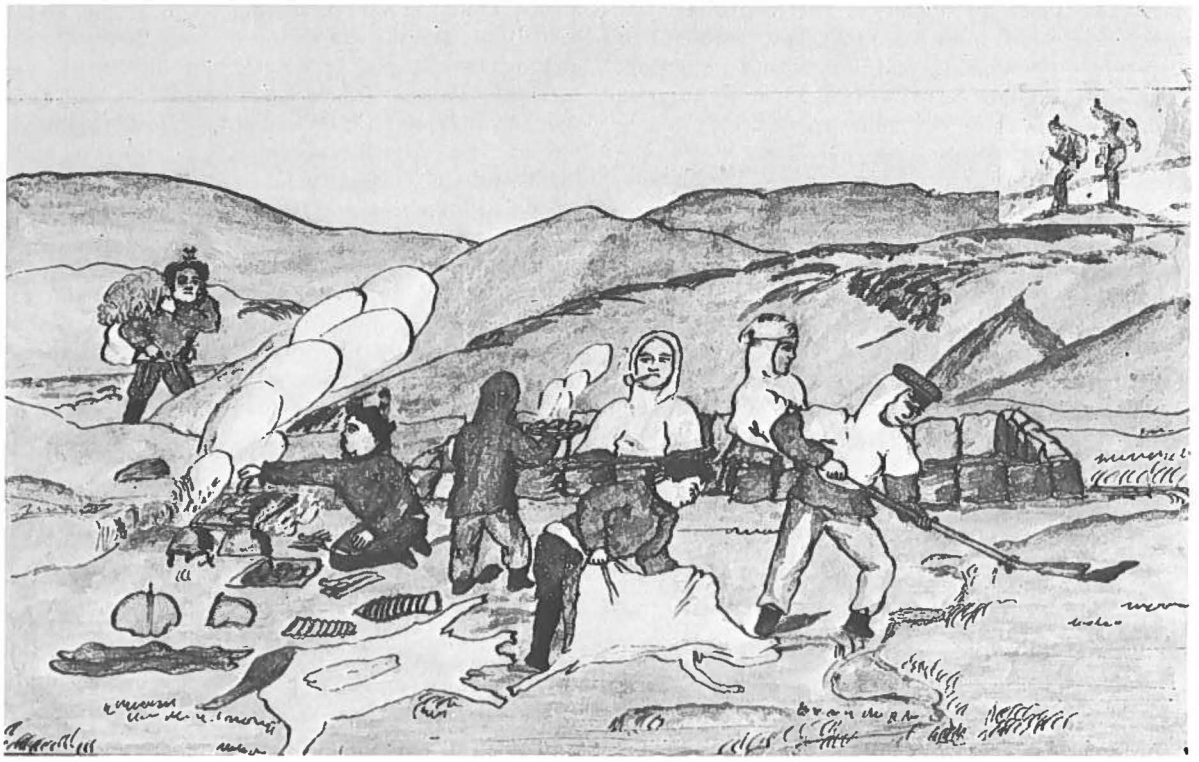


Fig. 10. Caribou-hunters preparing quarters for the night (hunters' bed). (Aron of Kangeq 1858, no. 1 of a series of 2).[4]

rectly experienced. Their purpose is first and foremost to entertain, but they are often also edifying. In the following, excerpts of two legends in which caribou-hunting plays a part are presented. Both are from central West Greenland, in consideration of parallelism with Aasivissuit. The object is partly to adduce information on the prehistoric and early colonial forms of caribou-hunting, and partly to give a picture of folk life which can vitalize the description of the environment of Aasivissuit.

"Singajik's Family Saga"
(K. Rasmussen 1924: 276–354 (told by Esaia, Nuuk))

The legend about the southerner Sinngajik gives exact information on persons, events, hunting methods and a great deal besides (Gulløv & Kapel 1979/80: 347ff). In a passage on Sinngajik's caribou-hunting at Niaqunngunaq near Nuuk, hunting with bow and arrow using shooting-hides is mentioned:

"Singajik, who had never before hunted caribou, did the same as all the others. Impatiently, he waited until the next day, when they set out and went far inland, and kept on going further and further in, until they came to a long row of stone settings, raised by caribou-hunters. But neither on the way in nor at the settings did they see animals, so they had to go even further inland, until they caught site of a large herd of caribou.

Immediately, the men spread out, and Singajik was posted at the setting next to the northernmost, so there was only one man to the north of him. Then the women were sent out to drive the caribou down towards them, and soon a herd of caribou came in sight, fleeing northwards. They passed the settings from the south, going north, and one animal after another was now shot down with an arrow. Some animals fell immediately they were struck, others ran a long way with the arrow in their body and did not fall until they had covered a large distance. In this way the herd became smaller and smaller, as it came nearer and nearer to Singajik's post. When they reached him, he sought out the largest in the herd and let fly his arrow at it. The caribou ran a short way and then fell dead. This was the end of the hunt, and the caribou-hunters arranged a shelter, where they could sleep for the night. [Fig. 10] The following day they once more went out hunting caribou and got even more animals than on the day before. Then they gathered around a big fire and cooked meat and when they had eaten, agreed in the first instance to go back to the coast; after a brief visit to the tents they would once more take up the hunting."

The form of hunting described in the legend about Sinngajik's is characterized by joint hunting or battue on a large scale using bows and arrows, and in this connection it is worth noting how effectively the caribou are shot. As it further emerges from the story, the caribou

hunt was not casually organized. The men spread out *immediately,* which must mean that their positions had been agreed upon beforehand. Furthermore, Sinngajik was *posted,* and the women were sent out to *drive* the caribou. All these elements suggest a high degree of organization. Who took the initiative in the organization we are unfortunately not told. Presumably, at that time, too, people received their instructions from a leader who was recognized as such for the duration of the hunt, on the strength of his abilities and experience as a caribou-hunter, as is known from more recent ethnographical information on this matter (cf. p. 32 with respect to leadership).

It is also seen in the story that several families must have been involved in the hunt. Even after two successful days, they had not enough and after a brief visit to the base camp on the coast would resume the hunt. The interruption of the hunt occurred by agreement reached at some kind of meeting, gathered around a large fire where meat was cooked.

"The Reindeer-hunt of Merkisalik"
(Rink 1975: 197–201)

"Merkisalik had only one son to assist him in providing for his family. In the summer-time they always used to hunt along the shores of the same fjord without any other company. Growing old and infirm, Merkisalik at length had to give up hunting and leave the providing to his son. Once when they had again taken up their abode at the fjord, and the son, as was his wont, had gone out hunting, the old people were left by themselves, expecting no visitors. Taking a turn outside the tent, they suddenly observed a boat sailing up the inlet right before the wind, accompanied by several kayakers. Merkisalik was much pleased at this sight ... He rejoiced to think that his son should henceforth have companions on his hunting excursions. There were a great number of men among the visitors, some of whom were old and rather talkative and entertaining. When the son returned from the mountains, he was likewise very glad of the company they had got. He treated them with the utmost hospitality, and invited them to partake of the meal as soon as it was boiled and ready. Meanwhile they all conversed very politely, and soon agreed in going out together the next day. They did so, and before long came in sight of a number of animals feeding on the grass down in the valleys. When the drivers were all sent out, the hunters proceeded to make walls of earth, furnished with loopholes. The visitors now proposed that Merkisalik's son should be the last to shoot, and he agreed; but when the drivers had surrounded the animals, and began to drive them on towards the loopholed walls, the thought struck him, 'What if they are too greedy to leave me any chance at all?' [Fig. 11] Meanwhile the others took aim, and shot all that were to be got. He afterwards assisted them in stripping off the skins; but on their descending the hills towards the

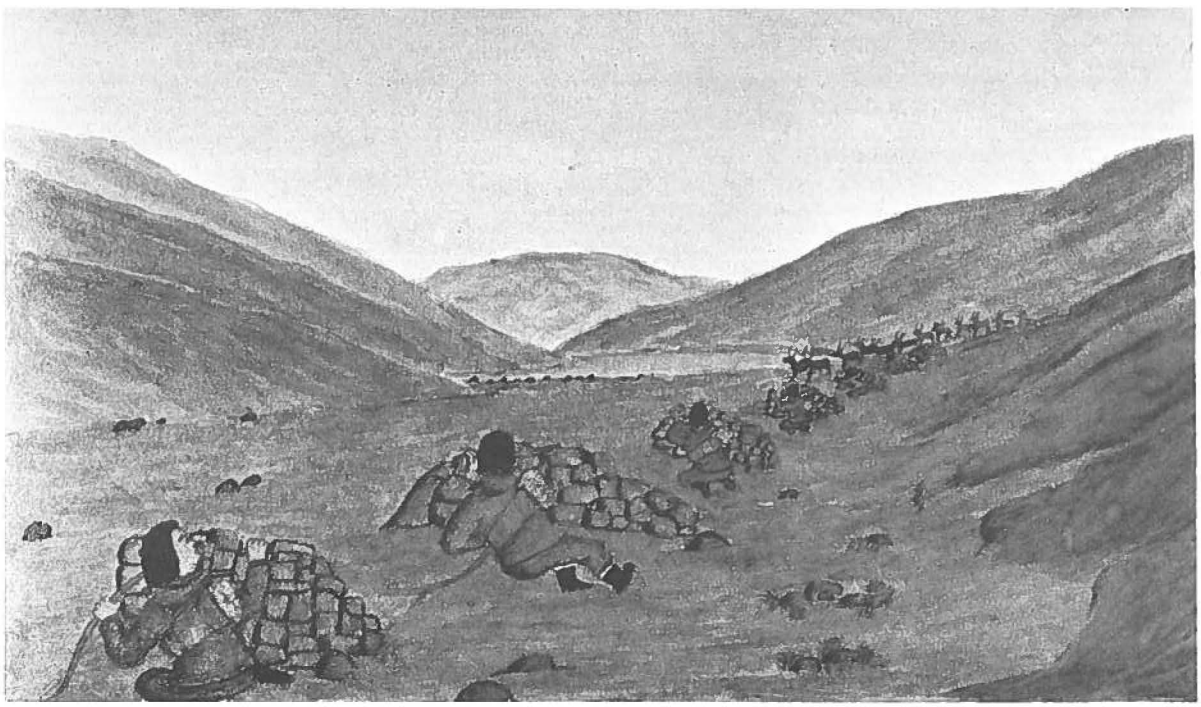


Fig. 11. Meqqisaalik's son lying in wait in the last shooting-covert during a joint hunt with visitors. (Aron of Kangeq 1859, no. 1 of a series of 4).

Fig. 12. When the visitors, from the foremost coverts, keep on shooting, without leaving any animals to Meqqisaalik's son, he runs after the caribou and kills several unaided. (Aron of Kangeq 1859, no. 2 of a series of 4).

tents, he remained a little behind. When the strangers returned they at once set their women to cook and prepare a meal, to which Merkisalik and his people were invited. During supper one of the men remarked, 'There must be any amount of animals in this place, since even Merkisalik's son is capable of getting at them.' ... The following day was spent in the same manner; they treated Merkisalik's son as they had done the day before, only allowing him to take up his position as far away as possible from the drivers: but on their way home he again kept back a little. ... However, they set out together the next day, and got to the entrance of a great valley, which appeared to be almost overcrowded with reindeer. As before, they ordered him to choose his hiding-place, and make his loop-hole behind them all, at which he murmured to himself, 'If this is to go on, I shall never be able to get anything. I think I will give the beasts the alarm, that they may all run away.' When the flock approached, driven by the drivers, he feigned to be busy about something or other. At last he was warned to be quiet, that the animals might not see him; but he only stopped a moment, and then began to move about again. In the mean time the flock was close by, when, all of a sudden, the leader stopped short, turned round, and bounded off as fast as possible. On perceiving this, the others began to follow him, but dropped short one after another, so that at the other end of the valley but one of them had kept up with him, and this one soon tired out; and when he was about to mount the slope he was left quite alone. Merkisalik's son shortly disappeared on the other side of the hills, pursuing the fast-running animals. [Fig. 12] Slowly the men followed in his traces: but when they got to the top of the hill, they beheld numbers of deer with white bellies ready killed in the valley on the other side. ... They at once set to work, stripping the deer; but while the others finished one, he stripped and cut up two, and packing his bundle, he said, 'Ye may all of you take as much as ye like.' ... Carrying his bundle on his back, and now and then resting himself a little [Merkisalik] got home first of all. When the others came without anything, the Merkisaliks had already all their pots and pans on the fire, and after their wont, invited the foreigners to join them. During the meal ... [the old father of the visitors] as if by chance, remarked, 'We want something that would do for a gimlet; would ye mind letting me have that knuckle?' Merkisalik gave it to him willingly, saying, 'We have got lots of them.' [Fig. 13] On the following morning ... they saw the visitors pulling down their tent and preparing to depart. Thus they were once more alone; and their son again went out hunting all by himself. One day, when he was still busy bringing down the deer he had stalked to their station, he told them that he had got a swelling at his knee. It grew in size, and was getting worse and worse. The parents were much distressed, and at length he died, but not till he had made known to them that his disease was solely caused by the father of their former visitors, who, in

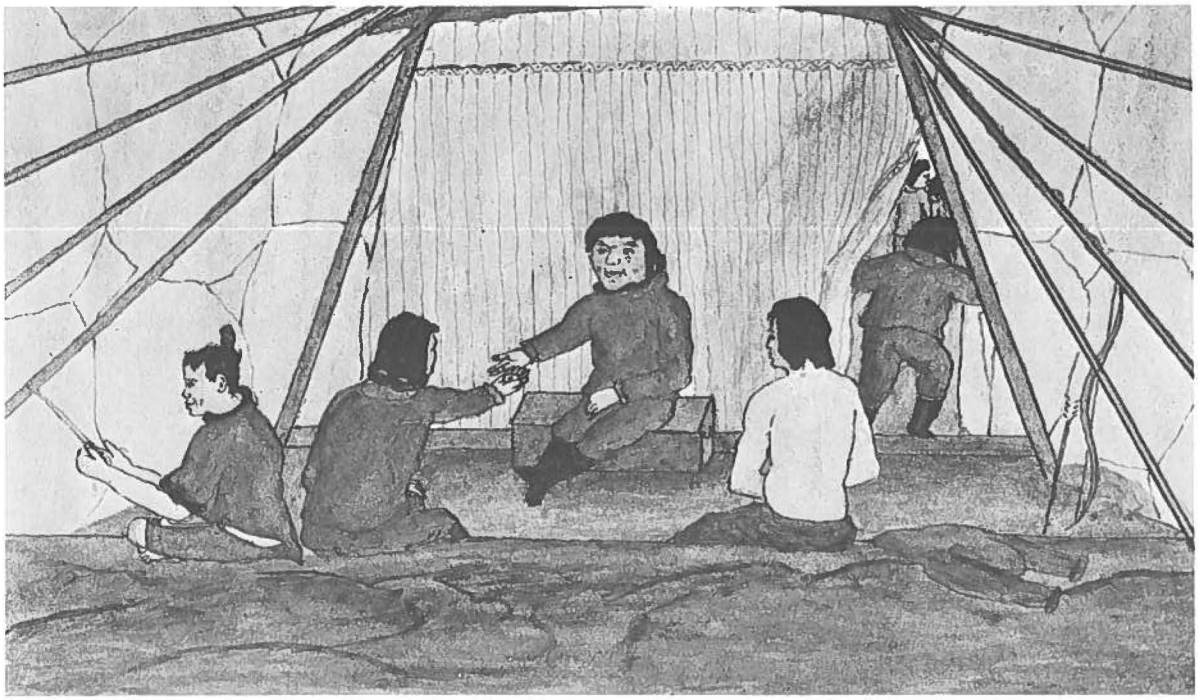


Fig. 13. Sitting in Meqqisaalik's tent, the visitors beg for a huckle bone (astragalus) needed for at bow drill. (Aron of Kangeq 1859, no. 3 of a series of 4).

order to hurt him, had bewitched the knee-joint he had asked of them, which had worked back upon him and killed him. ... It was now autumn; the little lakes began to be covered with ice, and it was time to leave the inland country for the sea-coast ..."

Meqqisaalik later avenges his son by sending a tupilak against the visitors, and after he has killed the "many brothers" (who seem to be three in number), Meqqisaalik's wrath is somewhat appeased.

In the legend of Meqqisaalik's caribou hunt, we learn that Meqqisaalik's son hunts alone. But visitors are welcome, because it thus becomes possible to arrange a battue. It is seen, too, that an individual form of hunting has existed side by side with joint battue. The battue employed, as in the legend of Singajik, employs shooting-hides (*talut*) and – implicitly – bow and arrow. For despite the fact that a joint form of hunting was employed in both instances, several details suggests individual claims on the bag. This is most evident in the story of Meqqisaalik. When the beaters had surrounded the animals and began to drive them towards the loopholed walls, and the first began to shoot, Meqqisaalik's son thought, "What if they are too greedy to leave me any chance at all?" Too true – the strangers shot and nothing was left to Meqqisaalik's son. In order to avoid dispute, the individual right of acquisition during joint hunts may have been secured by marking each arrow for identification. Such ownership marks are spoken of by informants in recent times (cf. the section on forms of hunting, p. 30–31).

In both stories, the social organization, in which more than one family work together, seems to increase the possibilities of battues, but this tendency is by no means clear, since other legends tell of single family units which also employ this form of hunting (e.g. the story of Manutôq (K. Rasmussen 1924: 185–193). In the story "Anarteq, who Turned into a Salmon" (K. Rasmussen 1924: 15–16), it is likewise a single family unit which carries out the battue, and moreover this story adds a further variant to the battues, the animals here being driven into a lake and killed from kayaks.

This variant of battue can hardly have been connected with individual claims on the bag, since it cannot have been possible to identify each animal killed, when it was killed from a kayak with a bird dart (*nuffit*) or lance (*anguiaq*). When the stories reveal that battues were organized both by single family units and by more than one acting in concert, a more subtle conception of battue is required, and we therefore have to speak of battues on a larger or smaller scale.

With these examples, we hope to have given an impression of the caribou-hunting of the early historic periods, and of the atmosphere it evoked. In a later section, the caribou hunts of these periods are illuminated by means of ethnographical and historical sources.

In order to give a broader impression of the importance of caribou-hunting in relation to other hunting and fishing, it is necessary to describe the annual hunting cycle. An example follows.

Hunting and fishing cycle in Holsteinsborg colonial district

The earliest thorough survey of hunting and fishing in the Holsteinsborg district was carried out by the missionary Eigil Thorhallesen, who in 1774–1775 carried out an inspection of the mission to South Greenland. His description thus applies to a period of caribou minimum (see p. 13–15). This, in conjunction with the fact that Thorhallesen himself hardly participated in caribou-hunting and mainly describes the conditions in relation to the mission station, can explain why caribou-hunting does not seem very important. On the basis of information on these conditions in Thorhallesen's report to the Missionary College, it is possible to establish a hunting cycle (Thorhallesen 1914 [1775]: 96–97).

April–May. – People are scattered throughout the district, catch bullhead, ringed seal, bladder-nose and common seal. At the end of May, they gather mainly at Amerloq, but also at Ikertooq, Itilleq and Isortoq near Sydbay. Here capelin, harp seal and porpoise are caught.

June–August. – When the capelin-fishing is over, some families go hunting caribou. Other families go to the outer coast and islands, to hunt seal, collect eggs and fish for char. Most families fish for halibut at Iffaat or Taseralik.

September–October. – In September, most people are in the colony to build a winter-house. At the end of September, they spread out again in the district and carry on sealing from land with a rifle.

November–March. – In November, people move into the winter-house, and live on their stores until they run out, among other things on frozen dried seal, dried halibut and capelin, and bullhead. After this, the diet is supplemented by European food until a whale may be caught in February or March.

The annual cycle is shown schematically in Fig. 14.

Even in a period with a paucity of caribou, caribou-hunting is part of the regular annual cycle – though with falling intensity (Thorhallesen 1914 [1775]: 96).

As a source of information on the circumstances obtaining during the subsequent caribou maximum of the mid-19th century, we have the diary of the priest C. E. Janssen for the period 1844–1849, when he was the incumbent at Holsteinsborg (Janssen 1913). Under 7th June, he writes, "... but all the inhabitants had gone out hunting caribou" (p. 16). That caribou in this period were numerous is seen from the same diary under 22nd June (p. 24): "There are not many Greenlanders at this place now. The great majority are wandering far and wide at this mild period and shoot with guns and arrows at the great herds of caribou. What carnage! During the last year since the ship was here, the traders here in South Greenland alone have collected 11,000 caribou skins, apart from the skins the Greenlanders and we Danes ourselves wear and use." On the conclusion of the caribou-hunting season we are given a hint in the entry for 28th August: "... the first women's boats arrived fully loaded" (p. 119) and 5th September: "... three women's boats arrived home from hunting caribou" (p. 49).

We see that at this period of abundance, caribou-hunting becomes more important, in this case also on account of the possibility of sale to the trading company. It is further remarked that bow and arrow are still in use right up to the middle of the 19th century in the Holsteinsborg district.

The same C. E. Janssen wrote around 1848, when he was principal of the teachers' training college in Nuuk, a little song to one of the tunes of the Danish composer Weyse.

It was a call to make the journey up to Nassuttooq, which in fact was happening about that time, people going from as far as Nuuk up to Taseralik and on to Nassuttooq (Fig. 1). This says something about the importance of caribou hunting, i.e. about its importance in the Nuuk, Maniitsoq and Sisimiut districts. Janssen mentions certain examples of the utilization of caribou antlers and thus hints at the importance of caribou-hunting for other kinds of hunting.

"Nassuttuumut aallarta
Nassuttarniarluta,
maanna Nuumi peerummat.
Tuukkaq, saaqqut ernannaq
saanertassaqanngillat.
Uuma, qaa taavunnarta
piffeqanngimmat tamaani.
Pilluarluta ata
saassaagut angerlamut."

(J. Petersen 1911: 14 (transcribed and translated by Robert Petersen)).

"Let's go to Nassuttooq
To gather antlers there,
For in Nuuk there are no more.
Point, shaft and winged harpoon
Are lacking their bone trimmings.
Hear, my friend, let us go north,
Here's nothing to obtain.
If we're in luck
We'll then wend our way home."

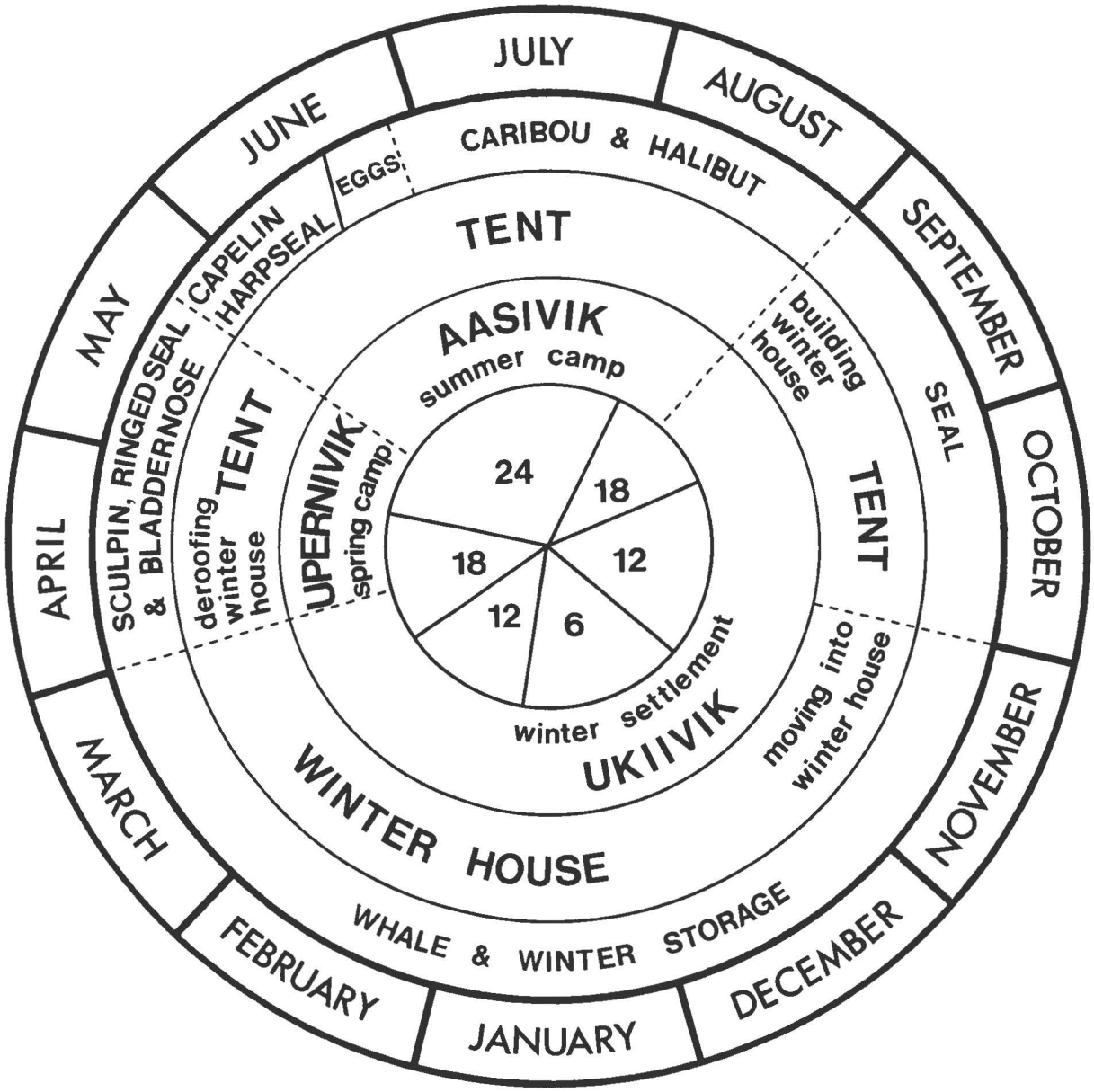


Fig. 14. Schematic annual cycle relating to the Holsteinsborg colony in the 1770's. Inner circle: approximate number of daylight hours; second circle: seasonal place of abode; third circle: type of dwelling occupied and approximate time of building and de-roofing the winter-house, which used to be opened to the air in summer; fourth circle: principal game. (After Thorhallesen 1914 [1775]).

Ethnography of Aasivissuit

Who used Aasivissuit?

With its location deep inland, in the summer grazing area of the caribou, and fortunate position in relation to the caribou migration routes, Aasivissuit has been an attractive site. The camp offered, situated as it was in the middle of the funnel formed by the Isortoq river and Kangerlussuaq fjord (Figs 1 and 8), optimal natural possibilities for caribou-hunting.

People from Saqqarliit, in the following called local informants[6], were former habitual users of Aasivissuit. They distinguish between *kangerlummiut,* 'fjord-dwellers', and *kitaamiut,* 'coast dwellers'. It was mainly fjord-dwellers who in summer came into the caribou-hunting areas by way of the Maligiaq fjord (Fig. 15), while coast-dwellers, especially, went north to Nassuttuup Nunaa to hunt caribou and fish for salmon, or went to Taseralik partly to trade and partly to catch halibut. The local informants also relate that they were the last

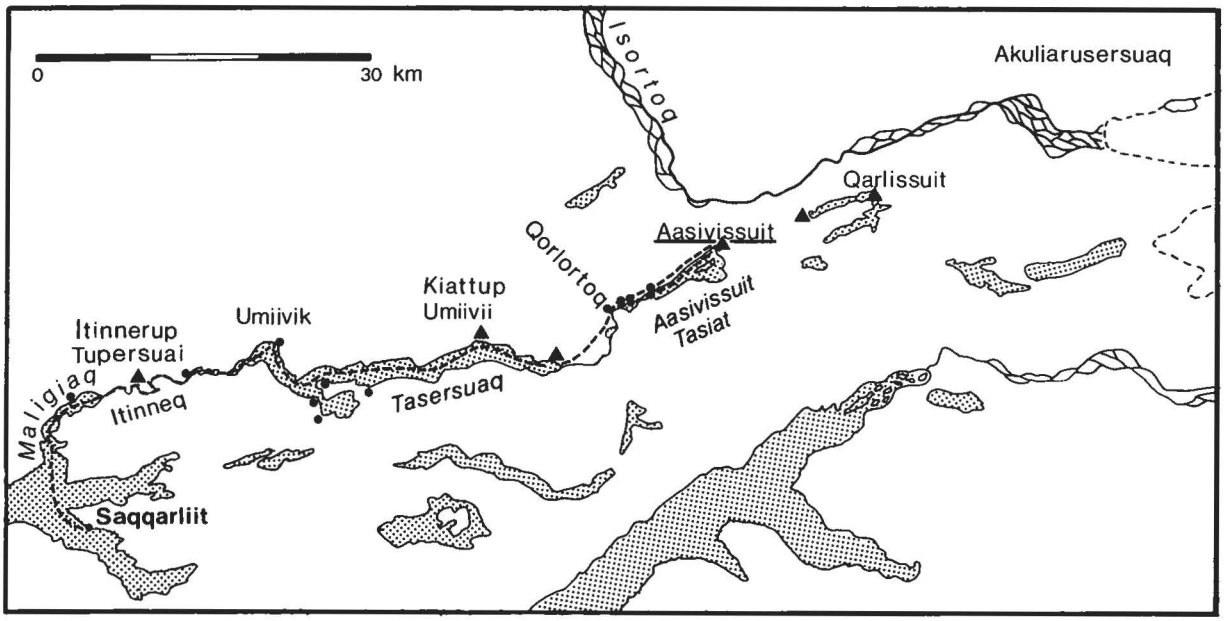


Fig. 15. Map showing the route (broken line) from Saqqarliit to Aasivissuit and the archaeologically registered camp sites along the route. (▲: camp sites showing many ruins (tent-houses, tent-rings); •: small camp sites/shelters).

to use Aasivissuit "in the old manner", in which families summer after summer returned to the same place, where they had first choice of the permanent dwelling places there.

The same distinction between fjord-dwellers and coast-dwellers was observed by K. Birket-Smith in the Egedesminde district, too: "As may be imagined it is mainly the fjord-dwellers who move inland, and the inhabitants of the island-belt who travel along the outer coast." (Birket-Smith 1924: 236.)

It has to be pointed out, however, that not everywhere where a distinction between archipelagic and fjord settlements obtains will such a sharp distinction between caribou-hunters and non-caribou-hunters be possible. In Nuuk municipality it was practically only Kangeq which did not have a permanent tradition of caribou-hunting. Other settlements of the archipelago, such as Narsaq and Utoqqarmiut and practically all those south to Qeqertarsuatsiaat, also hunted caribou. In Maniitsoq municipality it is not possible to distinguish between fjord-dwellers and coast-dwellers in that manner. In every village were families who went on the caribou hunt and families who did not. In Sisimiut municipality, the coast-dwellers at Itilleq crossed over Itillinnguaq to Kangerlussuaq for the caribou hunt, and folk from Sarfannguaq, Saqqarliit and similar villages were fjord-dwellers with a strong tradition of caribou-hunting (H. C. Petersen pers. comm.). The distinction between coast-dwellers and fjord-dwellers has presumably existed for a long time in central West Greenland, but has gradually been erased, as a consequence of the influence of colonization on employment and settlement patterns. With the closing down of Saqqarliit in 1963, the last people who had regularly used Aasivissuit before the Second World War moved.

The journey to Aasivissuit

Old people in Sisimiut district can still relate how they used to travel with their entire families to the inland summer camp to hunt caribou. Based on this oral information[6], it is possible to reconstruct and describe a journey from the fjord complex, for example from Saqqarliit, to Aasivissuit.

When the important capelin-fishing was well finished at the end of June or the beginning of July, it was at last time to start for the summer camp. Until regulation of caribou-hunting was introduced in the mid-1920's, it was a regular tradition for many families to travel inland together. The capelin had to be caught first and with them came the harp seal; this lasted until late June. The dried capelin and harp seal meat had then to be stored in *qimatuliviit,* meat caches, and not until this work was finished was a start made for Aasivissuit. On the way, there was the possibility of catching common seal at the head of the fjord and char in rivers and lakes. Departure was timed to take account of the quality of the caribou skin: the moult begins at the beginning of June and lasts until mid-July, and not until it is over are caribou sought after for their skins.

It was an occasion for joy when it was at last possible to set out for the summer camp, carrying only the most necessary gear like tent, ammunition, tobacco and coffee. From their kayaks, the hunters could hear the wo-

Fig. 16. Peter Rosing's women's boat crew on its way to the base camp at Ammalortoq, 1923. At the first oar Bolette Rosing and the daughter of the widow Ester, second oar young wife Bolette, third oar Karoline Rosing, fourth oar a widow. Note the accompanying kayaks. (Photo: Andreas Lund-Drosvad).[8]

men, children and old people filling the women's boats singing the praises of the juicy caribou-meat, which they all hoped would soon fill their stomachs. The journey itself should preferably be timed to exploit the tides, using them to get as far as possible into the mouth of the river in Maligiak fjord (Figs 15 and 16) and take advantage of the current.

On the first day, it was possible to reach the coastal end of Tasersuaq or the head of Maligiaq. From Maligiaq, the women's boat was pulled up the river to Tasersuaq (10 m above sea level) through Itinneq. Near the edge of the lake, camp was pitched. The women's boats were turned upside down to dry and at the same time provided shelter for the night. The following day's destination was in the first instance the far end of Tasersuaq, which with its 30 km lives up to its name of 'great lake'. At the north-western end of the lake, the women's boat was left behind and the journey continued on foot, carrying the kayaks and other gear, using headbands (Fig. 17). This is also the way in which the meat was carried on the way back. When there was too much to carry in one hike, further trips were made. The same technique is still used today for transporting gear and meat, cloth merely having replaced the skin of the headband.

The terrain between Tasersuaq and Aasivissuit Tasiat caused most parties to leave their women's boat at Tasersuaq, on account of the incline which forms Qorlortoq, the 'waterfall', just below Aasivissuit Tasiat. After spending the night either at Tasersuaq or at the waterfall, Aasivissuit Tasiat was arrived at on the third day. Here the kayaks were launched again, and while women and children followed the northern bank, the men carried the baggage on their kayaks. Aasivissuit could be reached at noon. Manifestations of these journeys may be seen in the place names and the archaeological remains deriving from camps on the way (Figs 15 and 18).

The informants also relate that the islet in the creek at Aasivissuit was at one time used as a dancing place, where people danced to the lively tunes of the violin. With the aid of kayaks bound together, the young hun-

Fig. 17. Caribou-hunters and their families on their way to the base camp inland behind Kangerlussuaq in the 1950's. (Photo: Chr. Vibe 1955).

ters carried the women to the islet, where some respite could be obtained from the mosquitoes which at that time of the year are insufferable in the inland regions.

Several factors determined when people went home: when they thought they had sufficient meat and first and foremost enough skins, when the women's boat could not carry more, or when night frost was too much of a problem and there was a fear that new ice would make the return journey difficult.

Dwelling forms at Aasivissuit

The dwellings at Aasivissuit have in the time of the informants been of tent type, but of a permanent nature; stone walls and turves, which can still be seen, were part of the construction (Fig. 60).

Rasmus Müller, who in 1898 was hunting caribou in the area around Aasivissuit with hunters from Saqqarliit and Sarfannguaq, describes the camp:

"At 3 o'clock we came to the head of the lake, where there was an old camp-site "Aussivigssuaq", which was easy to see, because there were numerous sleeping-places consisting of walls in horseshoe shape and many large heaps of caribou antlers, of bucks only, partly in pieces, partly with the skull still attached, which were used for drying clothes and meat on [Fig. 19]. These antlers are said to have been collected entirely from bucks which attempted to swim across the lake in the vicinity of the camp. It could also be seen to have been used much more in the old days than now, for most of the sleeping-places are dilapidated and over-

Fig. 18. Sleeping-place on the route to Aasivissuit, at the western end of Aasivissuit Tasiat.

Fig. 19. Stacks of caribou antlers at Aasivissuit, 1898. (Photo: Müller 1906: 495).

grown with grass, while only 5 or 6 were maintained; there were also old graves." (Müller 1906: 494; see also p. 396, 476 and 508.)

The Saqqarliit informants[6], who as mentioned earlier were the last to have used Aasivissuit regularly, call the type of dwellings described above *isersiutit*; we call it and its variants "tent-house". The informants describe the tent-house in the following manner.

For the tent-house, a skeleton of willow withes was used for the superstructure of the cooking recess, entrance and main room (Fig. 20). The recess was covered with turf and loose soil, allowing smoke to escape through it. The entrance passage was covered in a similar manner, and partly with stones, while the main room was covered with caribou skins or, in later years, canvas (Fig. 21). The cooking hearth was in the entrance; in this way mosquitoes could be kept away. At salmon-fishing places, salmon could be smoked in the cooking recess. There could also be a cooking hearth outside the house. The main room was bounded by a wall of stone or turf, like the entrance. As animals were killed, the walls became insulated with hides (Figs 22 and 23; H. C. Petersen pers. comm.).

Another group of informants from Sisimiut district, three elderly women[9], describe a variant of the tent-house, where a skin tent was furnished with an entrance: "In caribou country we lived in a tent of sealskin, which on account of the many mosquitoes was furnished with a house-passage in front of the opening, made of turf walls with a roof of branches (*isersiut*), in which the meat is also hung." This type of inland dwelling was presumably also used at Aasivissuit, but probably first and foremost at sites where it was normal to have used a women's boat all the way.

Other inland dwellings are known from the literature thanks to Eigil Knuth's inland reconnaissances, i.a. to Ataneq, Qallunaatsiaat and Ujarassuit at the head of the fjords behind Nuuk. Here regular stone-built houses, tent rings and caves are described (Knuth 1944: 88–90).

The tent-house is also mentioned by the Oxford University Expedition to West Greenland in 1936: "Behind the camp were a group of Eskimo houses, built with a low stone wall and an ingenious roof of willow branches to serve as a support for a waterproof decking. Near the encampment lay a burial ground full of skulls and bones of past hunters. The huts are still used by two Sukkertoppen families." (Mott et al. 1937: 319).

Methods of hunting caribou

In the following, different hunting forms will be discussed, with an especial view to providing a foundation for interpreting the hunting structures and excavated finds at Aasivissuit.

Traditional hunting forms

Ethnohistorical and ethnographical sources. – In the legends excerpted above, an impression could be gained of how caribou were hunted in pre-colonial and early

Fig. 20. Placed just inside the tent-house entrance made of withes and turf was a cooking recess. Viewed from within, 1923. (Photo: Andreas Lund-Drosvad).

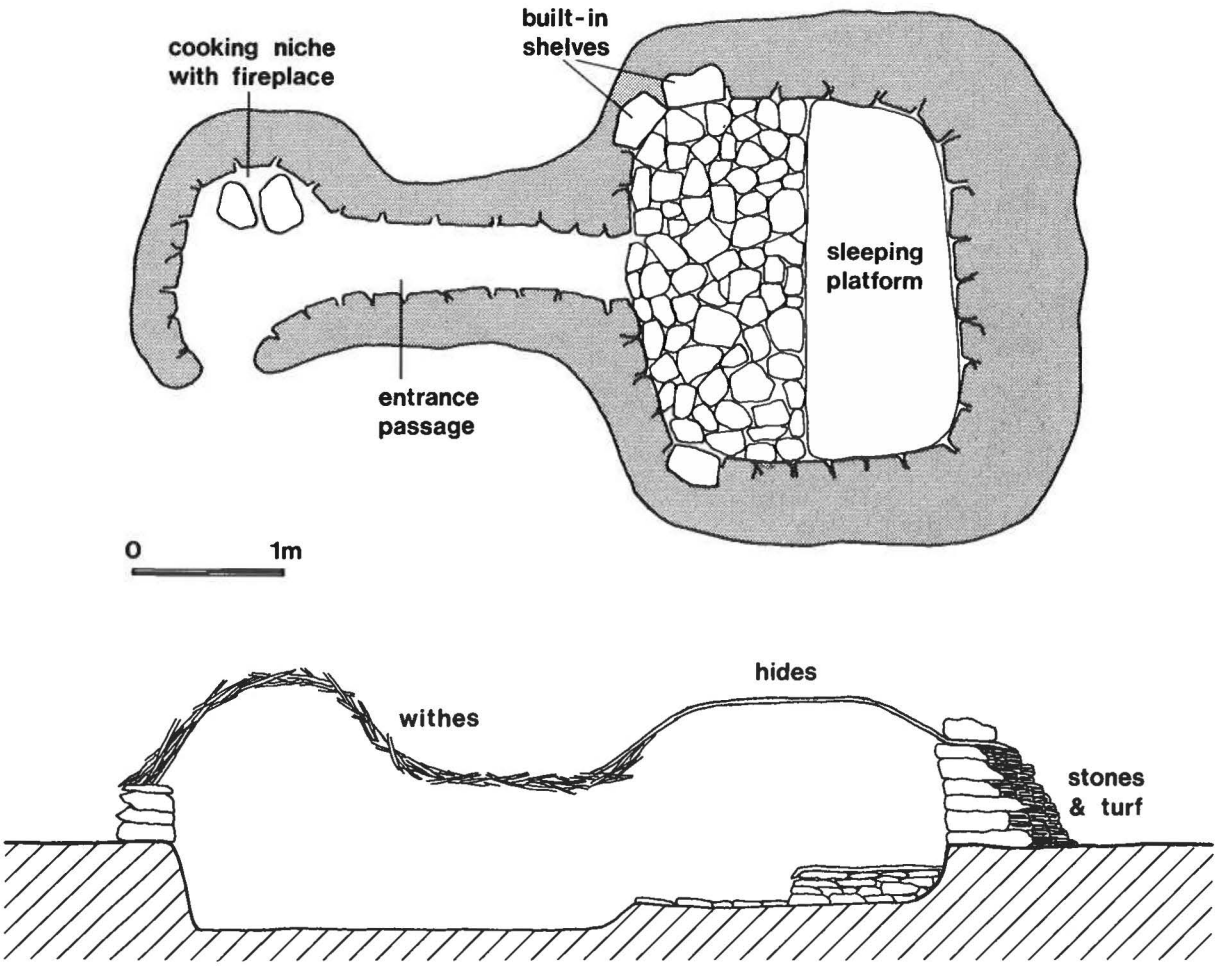


Fig. 21. Principles of tent-house construction.

colonial times. In the legend of "The Reindeer-hunt of Merkisalik", it emerges that the caribou were found by wandering through the terrain and then driven by beaters past several hides erected shortly after the beaters went out to surround the animals. In "Singajik's Family Saga" there is likewise mention of a battue with coverts, with women acting as beaters. It is also interesting to observe how effectively the caribou can be shot with a bow and arrow according to the story.

Information on traditional forms of hunting can also be obtained from the local informants[6] and from answers to the ethnographical questionnaires of the National Museum[7]. Things which can vaguely be remembered from the last days of the bow and arrow are considered extremely old (*itsapilorujussuaq*). As mentioned above, this means for the Sisimiut district the period up to the mid-1840's and for Maniitsoq district up to 1810.

Otto Abelsen from Aasiaat relates: "The bow was of red wood, called *ikkeq*. The wood was often slightly curved and from this the bows were made. This was hard wood without a single knot. The bows were three fingers wide and the back was strengthened with whalebone fibres, but only the strongest used whalebone reinforcement." (Fig. 24) (see also Birket-Smith 1918, Fabricius 1962 [1818]: 69–73.)

Further it is reported: "When the caribou followed their trails, the hunters lay in wait for them in talut ['hides'], built of stone. There they sat with the arrow, ready to shoot." (Otto Abelsen NES 2:3)[7]. The same informant also reports that the beaters were men and women but not children. "A hunt of this kind was naturally led by someone who knew what it was about. Escarpments bordering plateaus were the goal of the beaters and the animals were made to run over the edge – lots of animals – I have myself seen a cliff of this kind which is situated in the middle of the caribou district and is called Ungôriarfik ['battue place']."

We can thus add one further variant of the battue to those mentioned in the legends. This kind of hunting is also mentioned in an interesting article in the Greenlandic newspaper Atuagagdliutit/Grønlandsposten,

Fig. 22. The principal room of the tent-house had a stone and turf wall. Note the caribou skins insulating the wall. Each summer Peter Rosing and his family returned to these dwellings at Ammalortoq, on which they had first claim. (Photo: Andreas Lund-Drosvad, 1923).

Fig. 23. Peter Rosing in front of his tent-house, just returned with a caribou killed by stalking. The entrance passage is here built up to a large boulder. Note the caribou meat hanging to dry on an antler. (Photo: Andreas Lund-Drosvad, 1923).

Fig. 24. The hunter to the left is equipped for caribou-hunting. Painting of Poq and Qiperoq by B. Grodtschilling, 1724 (after Meldgaard 1979: 45).

1959, in which the retired district magistrate Andr. Lund-Drosvad replies in a debate on the old caribou-hunting methods:

"I can hardly be doing any harm by informing you that in the summer of 1923, when for nearly three months I was on a caribou hunt at the head of Sdr. Strømfjord, in boat company with the late Peter Rosing from Kangâmiut and his family, I had the opportunity of seeing a place where they used in the old days to drive the caribou across a plateau which suddenly sloped down to a steep face, where the terrified animals could not get their footing and therefore could not escape being dashed to death on a stone below." (Lund-Drosvad 1959.)

Lund-Drosvad relates in the same article that he was also shown where caribou flocks, before guns had come into use, had been driven through narrow defiles into a lake, so they could be pursued in kayaks and speared, before they could reach the other bank.

Otto Abelsen from Aasiaat has more to say on hunting with bow and arrow:

"I clearly remember hearing that strong men stood in their hides with their backs braced against big stones, with one foot planted on a stone in front of them while they waited for caribou. They did not let fly their arrows before the caribou was the length of a hunting line [about 9 arm-spans] away. They bent their bows so strongly that the point of the arrow stuck out through the other side of the animal. It was an immediately fatal shot. The hunters who were not so strong had arrows with several barbs. The arrowheads were called *pangaligtorsiutit* ['meant for running animals']. They could separate from the shaft and worked themselves in with the movements of the caribou." (Otto Abelsen NES 2:6).

Another informant, Jacob Nielsen from Qoornoq near Nuuk, confirms the description above: "The arrowheads of caribou antler were made with a whole row of barbs, and that type of arrowhead is said to have been called *pangaligissat* [sing. *pangaligiaq*], because the arrowhead worked itself into the running caribou. Other arrowheads had blades of stone." (Jacob Nielsen NES 2:6). On arrowheads, see also p. 30–31.

Nearly all the answers to questionnaires mention hunters' hides (talut): "A hide was constructed as a wall of quite small stones, not to the size of a man, but to that of a bow held horizontally." (Abraham Nikolajsen NES 2:5).

Few answers mention caribou barriers, cf. p. 45 and Birket-Smith 1924: 347. A form mentioned by several informants consists of a system of poles, often linked by a thong. Thus Abraham Nikolajsen, just quoted, goes on to say:

"The women divided up into teams and went to either side of the caribou at a good distance. They had slender sticks with them which they planted in the ground and put turves on top. The men followed the women and stopped one after another to build shooting-walls from which they shot with bow and arrow at the caribou which the women drove up." (Abraham Nikolajsen NES 2:11).

The answers to the questionnaires of the National Museum Ethnographical Enquiry have been scrutinized by George Nellemann who concludes as follows:

"[The caribou drive] is not entirely forgotten but presumably takes place only to a limited extent, and then only toward concealed hunters and toward water. Three out of 68 informants mention that the hunters deliberately drove the animals towards rivers and lakes (Ũmának and Kangâtsiaq municipalities) and two informants tell about driving caribou toward concealed hunters ... [There is] only one report of lying in wait for caribou at places they swim across. In killing swimming animals the hunters used the method – described from many Arctic people – of waiting to strike until they were close to shore, thereby avoiding the trouble of towing them in." (Nellemann 1969/70: 144–145.)

The historical sources. – Information on the traditional types of hunting described in the legends are verified by the first colony-historical sources. The early missionaries in Greenland, in particular Hans Egede and Otto Fabricius, have left good descriptions of the caribou-hunting of the time.

"When they find one or more caribou they surround them with people. The caribou cannot escape, and must either go out to the water or to some other place where they attack him with their bows and arrows." (H. Egede 1729: 33.)

"They chase them by battue, setting upon them from all sides and surrounding them with their women and children to force them into defiles and narrow passages, where the men lie in wait for them in order to kill them. And when they do not have people enough to surround them, they put up white poles with pieces of turf for heads, placing them in the path of the deer to frighten them and hinder them from escaping [Fig. 25]." (H. Egede 1925 [1741]: 335).

"With this bow they shot caribou and hares, either stalking them alone – and they were fairly certain of hitting at long distances – or, when there were many animals, organizing a battue, in which women and young people surrounded them; and at places where no people were posted they put up white sticks with a sod (on top) to scare the animals. Thus they were chased either to the men who lay concealed behind stone fences, called Tellut, i.e. 'shooting hides' (which are still pointed out here and there merely as memorials of this hunting, from which it may also be seen how near the water's edge the caribou must have been compared with the present day), from behind which they shot the arrows into them as they passed, or they were driven out into large freshwater lakes, where the men in their kayaks hunted them with their sea darts." (Fabricius 1962 [1818]: 73.)

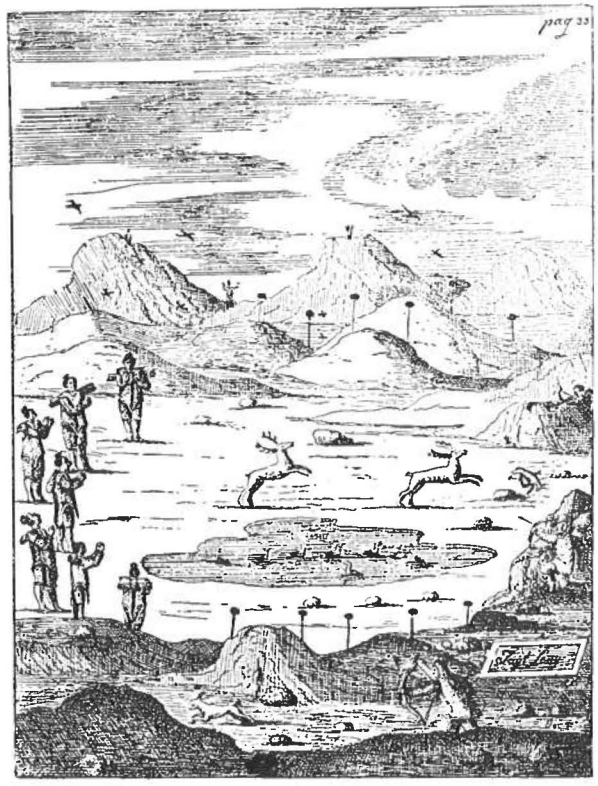


Fig. 25. Battue and other summer hunting, as conceived by Hans Egede at the beginning of the 18th century (drawn by Johanne Fosie (1726–64)) (here from a copy in Nellemann 1969/70: 134).

Summary. – Apart from differences in the information as to whether or not children took part in battues, a high degree of agreement may be discerned between the legends, the answers to NES, and the above-mentioned historical sources. The sources also show what possibilities there are of demonstrating the hunting forms mentioned archaeologically – through material remains in the landscape. It is mentioned how stone-built fences and rows of shooting-hides are made use of and that the beaters are supplemented by rows of wooden posts with turf heads. The sources do not actually mention the use of inussuit[12] with the same function as the posts, but as Nellemann (1969/70: 140, 142) and Jens Rosing (1958b) demonstrate, inussuit rows have also been used in Greenland in connection with caribou-hunting. Ethnographical parallels are known *i.a.* from the Caribou Eskimos and Netsilik Eskimos in Canada (Birket-Smith 1929: 110–111, Balikci 1964: 13–14). As it emerged from the legends, and historical sources from the first colonial period, and to a certain extent from the reports of the informants mentioned earlier, the "old" hunting mode, the battue, was used on both a large and a small scale and in different variants in the 18th century. Thereafter, forms of hunting change and we hear no more of the large-scale battues. This change is a result of coincident factors, see Conclusions, p. 87.

Hunting forms of the colonial period

Battues, on a small scale, in the form of shooting-hide hunts, are recalled to have been used in the beginning of the 19th century. The hunter Jakob Rosing from Kangaamiut describes in an article in Atuagagdliutit 1926/1927 caribou-hunting and among other things the use of bow and arrow.

"The caribou hunt was carried out by stretching out thongs, at those places where one would expect them to come – there were many caribou you know – and they let the women frighten the animals, so they could be shot with a bow and arrow. The arrowheads were furnished with a varying number of barbs, one hunter having points with a certain number of barbs, another with another number, so one could see who hit the animal. The arrowhead should be capable of detaching it-

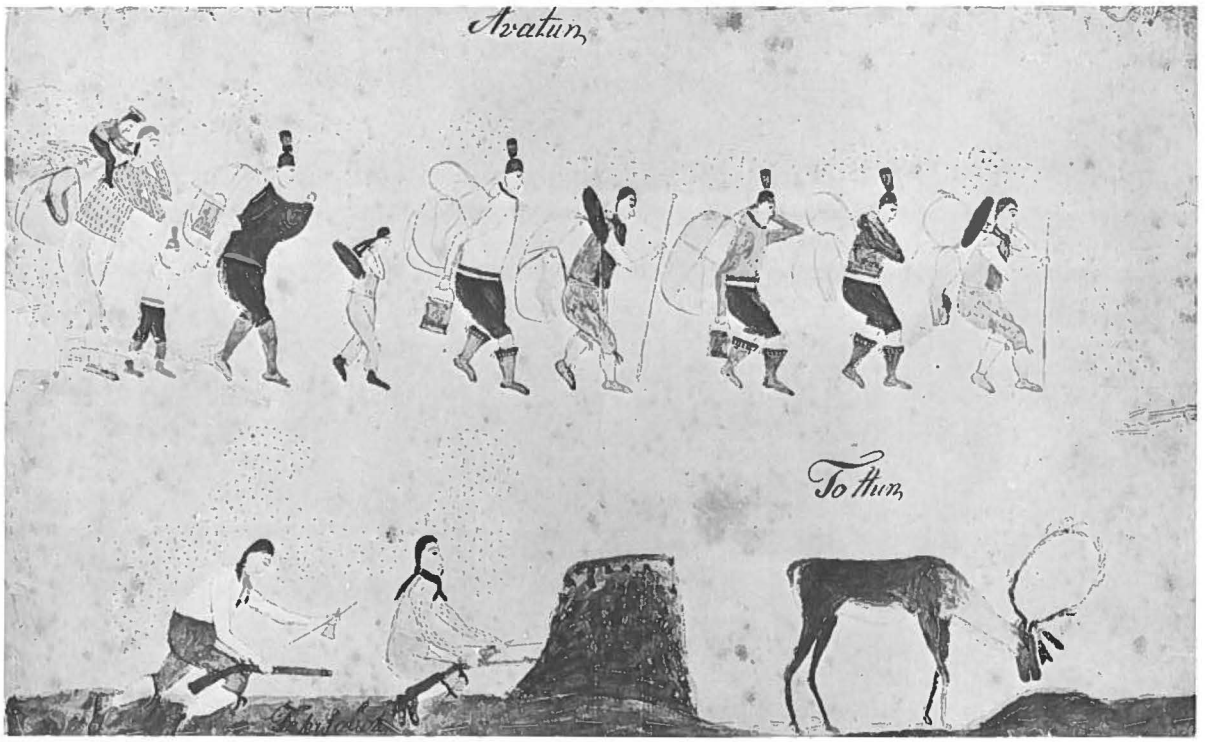


Fig. 26. Caribou-hunting in the 1840's with flint-lock guns from shooting-coverts (Israil Nicodemus Gormansen, here from Birket-Smith 1971: 19).

self from the shaft." (Jakob Rosing 1926/1927: col. 15.)

The different number of barbs on the arrowheads thus served as ownership marks, making it possible to identify the owner of every caribou shot with a bow and arrow. The statement that the arrowhead should be capable of detaching itself from the shaft can undoubtedly be referred to the attachment by means of a screw tang. The steering feathers apparently caused the arrow to rotate in the opposite direction to the screw thread; as the arrow struck the animal, the arrowhead would thereby screw itself free of the shaft (Robert Petersen pers. comm.).

Jakob Rosing continues, on the last people to use the bow and arrow:

"At the beginning of the 19th century it was said that there were very few caribou in Kangerdlugssuaĸ, and many suffered privation. Most of the hunters with women's boats went in to Kangerdlugssuaĸ, especially from Kangâmiut and Timerdlît. From Timerdlît they told the story of Dâniarssuaĸ, whose sons were the last to shoot caribou with bow and arrow." (Jakob Rosing 1926/1927: col. 58.)

After the introduction of the gun in the second half of the 18th century, stalking and hide hunting were the predominant forms of hunting. Whereas in former times, hunters had lain in wait for the animals at battue structures, the gun furthered the possibilities of a more individual hunting form (Fig. 26). The beaters, who were most often women, no longer took so active a part in the hunt itself, but still participated in the transport, skinning, kamik-sewing, cooking, etc. The use of the gun also removed the possibility of laying a claim to the animals shot, by means of the ownership marks on the arrowheads.

Stalking with a gun. – In stalking, the hunters move through the countryside, trying to steal up within shooting range of the animals (Fig. 27). When a hunter hunted on his own, he often had his wife with him. But stalking could also be carried out in conjunction with others, two, or as a rule three or four often hunting together, as happens today (Emil Lange, Ole Jørgensen, Rafael Jørgensen NES 2: 3). The most widespread mode of dividing the bag with stalking is pooling. But the form of apportionment varies from region to region and has undergone modifications, as will be apparent from the following report from Maniitsoq:

"Two hunters divide the bag so to speak lengthwise, and several hunters divide the bag as equally as possible, meat, sinews, skin, etc., but the rules have now [1959] changed. (Ole Jørgensen NES 2: 10.)

There are several ways of approaching the animals. For example, one could approach them by imitating

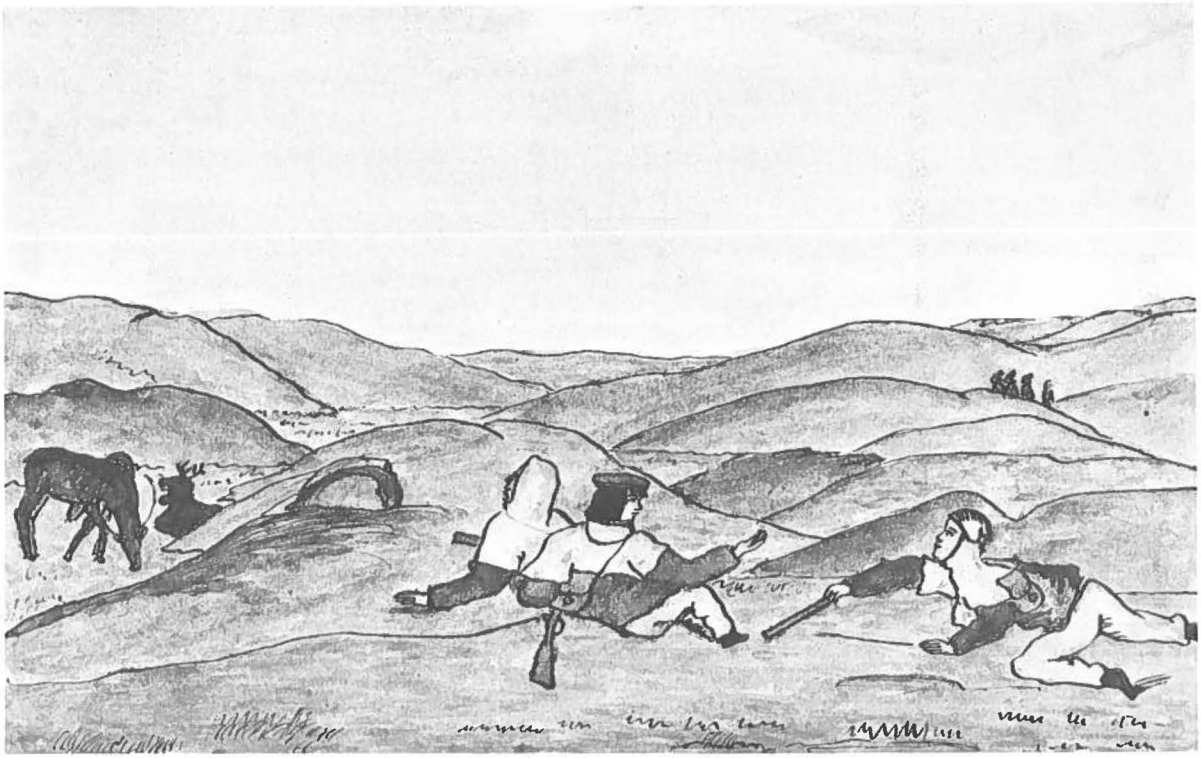


Fig. 27. Caribou-hunters stalking with flint-lock guns (Aron of Kangeq 1858, no. 2 of a series of 2).

antlers with gun and ramrod (Müller 1906: 496). It is said by several informants to be easy to deceive the animal in its rut. Caribou could be both lured and stopped in flight by imitating their calls – bucks, does and calves all having their own (Gerhardt Lybert, Malakias Møller, Peter Petrussen NES 2: 4). Dogs are not said in NES to have been employed in caribou-hunting, either as pack animals or in stalking, apart from winter hunting on the coast from a dog sledge (Nellemann 1969/70: 146–148). If caribou had, by one means or another, by a shot or clumsiness, been scared off, they were pursued, in particular the bucks. The buck is hardly as watchful as the doe and quickly loses its breath. In pursuit, hunters made use of the caribou's tendency to seek high ground and to stop and recover their wind (Robert Petersen pers. comm.).

This may describe one of the types of hunting described in NES. Caribou-hunters from, among other places, Maniitsoq, are said to have caught caribou by running them down and sticking them with a knife. For this kind of hunting a special running technique is described in which the weight of the body and a special take-off were employed. It must finally be remarked that the legendary folk *tornit,* presumably Dorset folk, are said to have used these techniques (H. C. Petersen pers. comm.).

Leadership in caribou-hunting

In the NES investigations, the same answers are found to the question of leadership during caribou hunts. Three things in particular were considered qualifications: general ability as a leader, and skill and experience as a caribou-hunter (Ole Jørgensen, Mikael Kleist, Malakias Møller NES 2: 3). A leader was accorded recognition on the strength of his abilities as a caribou-hunter, only so long as the hunt lasted (O. Petersen 1970).

Hunting garments

The informants from Sisimiut[9] tell about the hunting garments: "The caribou-hunters wear special clothing, made of material with the same colour as the terrain, often dirty clothes. In the old days, you used clothes of de-haired caribou skin for this purpose, now only shop clothes. The trousers have reinforcement patches on the knees and bottom. The kamiks are special, *kameĸĸat,* small kamiks, which can only reach the ankles, where they are tied with a string through a casing in the top edge [Fig. 24]. Skin stockings are not used in these kameĸĸat. The women go in kamiks reaching their knees, which are likewise tied tight round the leg and called *naitsut.*"

Fig. 28. For butchering, the caribou is laid on its back, head supported on antlers – amidst the hum of mosquitoes (Photo: Andreas Lund-Drosvad, 1923).

Caribou-butchering

The following is an example of the butchering of a caribou shot by stalking (Fig. 28). Mikael Jørgensen from Qoornoq near Nuuk gives the following account:

"When the entrails have been removed, the hind limb and loin are cut off in one piece. Each shoulder is removed separately. The head is cut off at the neck. The breast with the flank is cut separately. The neck is cut off as one piece or remains attached to the back. From the latter, the sinews are removed, and the ribs cut off at the backbone, so the back piece is divided into three parts: two rib pieces and a backbone piece. From the head, only the jaws and tongue are taken. The smaller pieces are packed in the skin, and the back pieces placed on top, if you do not have a bearer. On arrival at the camp, the hind legs are divided into two parts, and if the meat is to be dried for keeping, it is cut up further into flat pieces. But the breast, ribs, backs piece, neck and sometimes shoulder are eaten at the camp." (Mikael Jørgensen NES 2: 10.)

The treatment of the offal is described by Lars Egede from Saarloq near Nuuk:

"An incision is made on either side of the crutch, and the testicles are removed. The rectum is loosened, and before the fat on it congeals, cut off in suitable lengths, after which the pieces are turned inside out and blown up. When the stomach is then removed from the abdomen, the intestines are taken out. The intestines are removed before the fat congeals and this is done by simply pulling them out. ... The fourth stomach is cut out and washed well with water, after which it is filled with fat from around the kidneys and third stomach and the opening tied up. This fat sausage is called *angornârdluk*." (Lars Egede NES 2: 10.)

Both informants say that the toes are cut off and left. The sinews are also cut from the legs and dried, and kept with the sinews from the back. In only some cases are the antlers carried away, most often when the animal is shot near the camp.

Raw materials from the caribou

The skin

Caribou skin has always been sought after, especially for winter clothing. For this use, animals should preferably be killed in mid-July or later, since the summer coat is at that time fully grown. Only then can the skins give a maximum of insulation. Leopoldus Ringsted from Kapisillit relates:

"In the old days, caribou skin was used for women's clothes, and the hunt began while the coat was suitably short. This kind of skin was used for winter trousers for women. Trousers of this kind are simply called *sêrĸernit*, 'the knee-long'. The hunt started then around 15th July." (Leopoldus Ringsted NES 2: 2).

Johannes Filemonsen from Tununngasoq, born in 1886, relates that skin from caribou killed in spring was used for summer trousers. The spring hunt could in this case start at the end of March and end at the end of May. In this period the caribou begin to moult and the hairs can then be rubbed off with the hand before skinning. The hairs of the head are rubbed off, from the head and out, while the animal is still warm. The depilated skin is dried on the ground, flesh side up, using the ribs as stretchers. After drying it is rubbed and lubricated with blubber. This kind of skin is called *unnerit*. Filemonsen goes on to say that people also went out in the summer, though for the two months of July and August at the most. Later in October, the young men went inland to obtain skins when they were best, for winter use. (H. C. Petersen pers. comm.).

One of the local informants says that skins from caribou calves were considered fine for summer use. The were not so close and therefore not so warm. The colour of calfskin was also as a rule very beautiful, and it was regarded as fine for best clothes for children (H. C. Petersen pers. comm.).

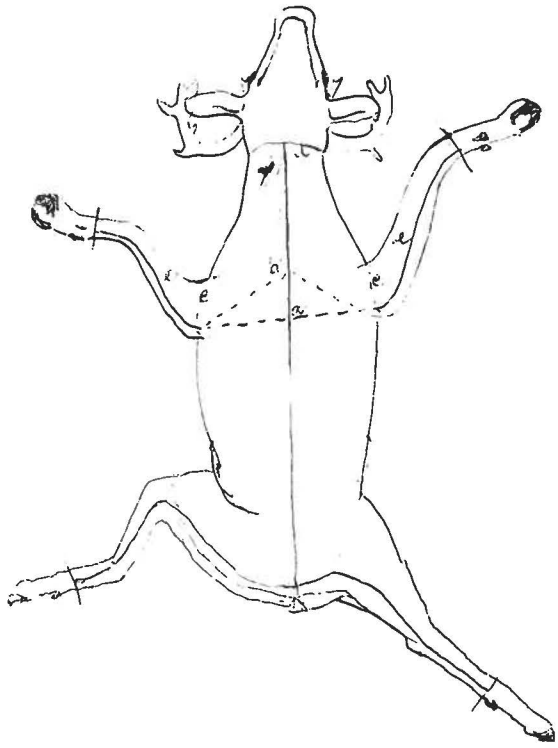


Fig. 29. Sketch made under Malakias Møller's direction, showing how to skin a caribou and cut the skin for clothing and bed-covers, respectively (NES 2:10).[7]

Skinning

Lars Egede from Saarloq near Nuuk gives an account of caribou-skinning:

"You make a cut from the hocks along the front edge of the foreleg to the body. You continue on the body so the cuts meet at the groin. Corresponding cuts are made on the back edges of the hind legs, and the cuts meet in the groin. From the lower jaw, a cut is made along the middle of the breast to the anus. With clenched fist, the skin is then loosened from the body. On the legs, the skin is cut away at the joint between the cannon bone and the toes. In big animals, you make the cuts along the front edge of the forelegs and continue on the body obliquely back to the mid-line. This is a cut for bed under-sheets." (Lars Egede NES 2: 10).

Malakias Møller from Ikerasak near Napasoq relates that in skinning caribou, account is taken of whether the skin is to be used for clothing or bedclothes (Malakias Møller NES 2: 10), and sketches were made under his direction (Fig. 29 and 30).

Skin cutting and treatment

The informants from Sisimiut district[9] describe skin cutting and dressing in greater detail, probably largely because they are women:

"The skins are treated in two different ways, according to what they are to be used for. If they are to be bed skins, part of the legs is first cut off and sewn to the head, so it [the skin] is rectangular. The fat and things are scraped off with an *ulo* [woman's knife], if that has not been done before. It [the skin] is stretched out and washed. One day when it is dry, it is moistened and

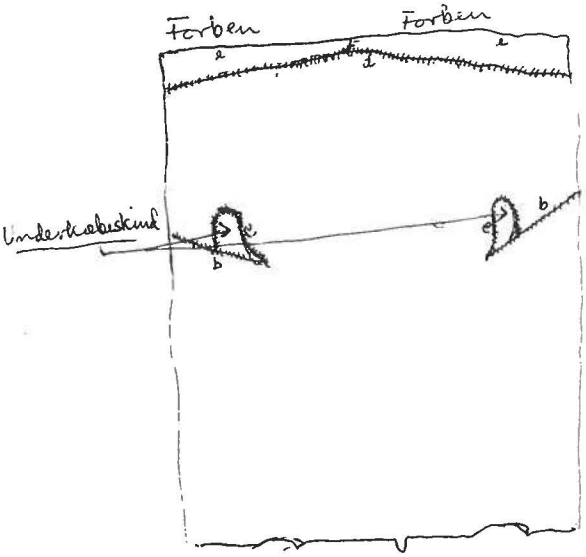


Fig. 30. Bed-cover of caribou skin (Forben: foreleg, Underkæbeskind: skin from jaws) (Malakias Møller NES 2:10).

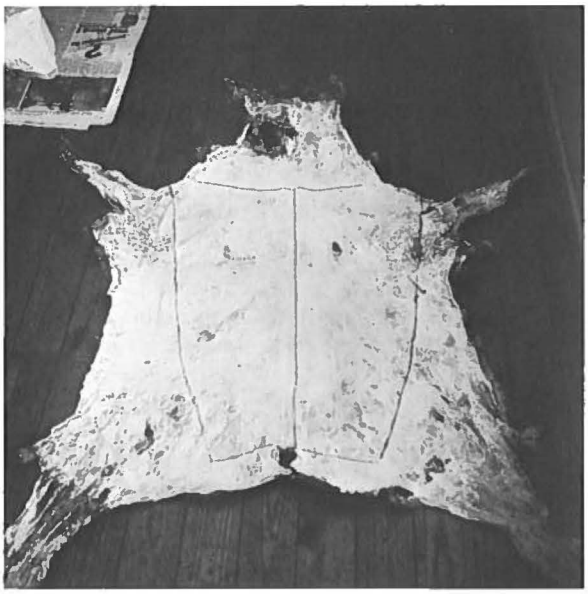


Fig. 31. Caribou skin being scraped with a stone by Ane Lynge, Qaarusulik. The skin is to be used for a fur coat, see Fig. 32–35. (Photo: G. Nellemann, Ilulissat/Jakobshavn 1958).

folded. It is then scraped with a blunt ulo and when it is quite dry, rubbed and scraped with a stone [Fig. 31]. If the clothes are to be made from caribou skin, you do not sew onto the head. It [the skin] is stretched out and washed. When it is dry, it is rubbed in the hands and treated with fine sand and a stone, without moisture. One can make fur coats [Fig. 32–35], trousers (for both sexes), and stockings (used instead of dog's skin) and the skin from the lower part of the legs can be used for kamik shafts."

Fig. 32. Front-piece of fur coat, cut from caribou calfskin (Photo: G. Nellemann, Ilulissat 1958).

Fig. 33. Sleeve of fur coat, cut from caribou calfskin. (Photo: G. Nellemann, Ilulissat 1958).

Antler

Several informants relate that the antlers of caribou were the toughest material obtainable. From the finest part, arrowheads, harpoon points and foreshafts of lances and harpoons were made. Antler was also used for harpoon end-fittings, holders for towing-lines and many other small items. The thinnest of the hard parts of the antler were used among other things for the ring on the kayak seat. Of that part where the porous mat-

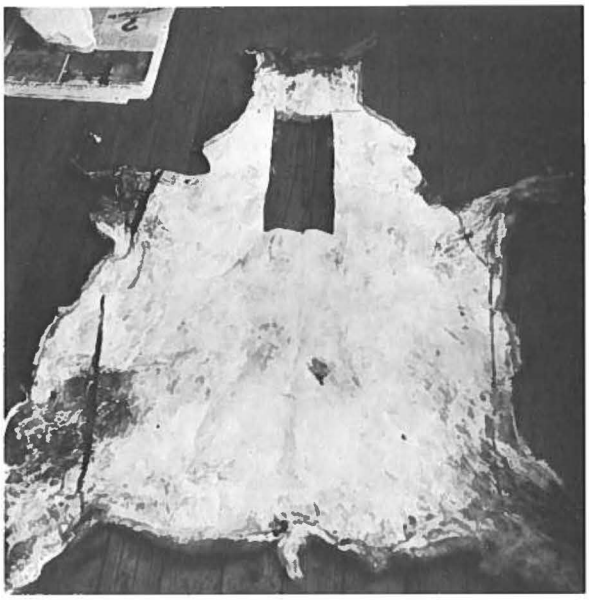


Fig. 34. Back-piece of fur coat, cut from small adult caribou skin. (Photo: G. Nellemann, Ilulissat 1958).

Fig. 35. The different parts are sewn together into a fur coat. (Photo: G. Nellemann, Ilulissat 1958).

erial is nearer the surface, buckles and toggles for dog harness were some of the things which could be made (Julius Brønlund, Ole Sandgren NES 2: 10). Asser Bertels from Kangerluarsussuaq (Grædefjord) near Nuuk says, on the subject of apportioning the kill, "The antlers are not much bothered about. People prefer to use the shed antlers, which are the hardest." (Asser Bertels NES 2: 10).

The importance of caribou antler as raw material is also evident from C. E. Janssen's song, p. 21.

Bone

The bones of caribou have probably never played any important part as raw material, probably on account of the plentiful supply of antler. The knuckle bone did find a use as a mouthpiece in the bow drill, however, as mentioned in the story of Merkisalik. Some bones have also been used as children's toys. The big ribs serve as bows, and all bones with holes could be used in *ajagaq*, 'catching game'. As a curiosity it should be remarked that the cannon bone of the hind limb with attached heel and knuckle bone, after the introduction of the gun, has been used as a toy gun (H. C. Petersen pers. comm.).

Preparation of food based on caribou

Local informants relate that when a caribou (killed by stalking) had been transported to the camp, the first to be eaten was the heart, and blood soup, and then the head, if it had not been left behind. Only the tongue and lower jaw were carried away. The commonest preparation was boiling, but broiling (*saattuliaq*) was also used. For this purpose, a flat stone was heated, and the meat basted with melted tallow or bone marrow. Another method was to cover it with damp moss.

A favourite dish was *qajoq assigaq*, 'blood soup'. The blood of a recently killed animal is brought home in one of its stomachs, closed tightly with a string, and beaten in a cooled meat soup until it reaches the right consistency. It takes long practice to be able to make this dish. For spoons, pieces of windpipe with the ends squeezed together to form a scoop were used (Fig. 36). You could also cut off the ears and remove the skin to make a cartilage spoon. Another favourite dish was *nerukkaq*. The liver was cut into pieces, added to the contents of the stomach, and allowed to ferment. Properly fermented, this delicacy burnt the tongue. The bones were crushed and boiled in the saucepans and the bone fat collected on the surface and then transferred to the pericardium. Other fat sausages (*angornaarluk*) were made from the tripes, as described earlier.

As much as possible of the meat was dried. Large pieces of flesh were cut into slices and hung on drying frames (H. C. Petersen pers. comm.). From Aasivissuit we know from Rasmus Müller's descriptions that the antlers were also used as drying frames (Müller 1906: 444).

The female informants from Sisimiut district[9] provided more information. *Sungarnii*, the bitter fibres between the intestines, are not consumed. The brain is eaten raw, often mixed in the skull with bone marrow. Milk is sucked out and said to be good for fatigue. It can also be carried home in the udder. The fat is used to

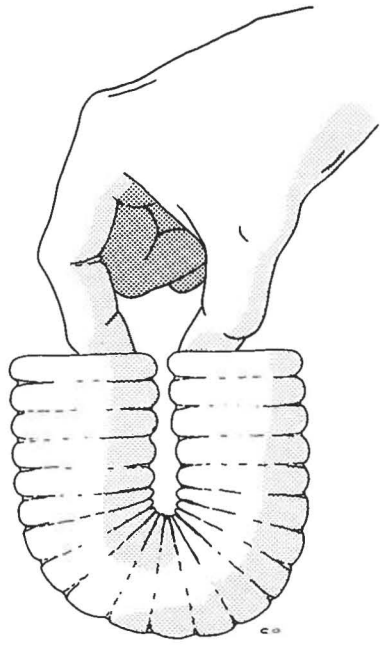


Fig. 36. The caribou's windpipe could serve as a spoon.

make tapers, among other things. It is chewed until serviceable and "all the juice has gone" and formed by hand into a taper. But no form of lamp is known in which caribou fat has been used as a fuel.

Maligiaq caribou-hunting camp system

In the investigations of the area around Aasivissuit and in reconnaissances, i.a. along the former route to the camp, several other caribou-hunting camps and structures connected with hunting were found. Supplemented by information from local informants, the sketches of old caribou-hunters of the area, and information from the Sisimiut conservation investigations (Bøcher et al. 1980), they give an overall view of the pattern of exploitation of the inland area. From the head of the Maligiaq fjord and towards the Ice Cap is a system of caribou-hunting encampments, of which Aasivissuit is one, which we call the Maligiaq caribou-hunting camp system (Fig. 15). This borders on similar systems, which to the north have Nassuttooq and to the south Kangerlussuaq as approach routes.

Local and regional summer camps

The summer camps can be classified according to the number of people using them and where they came from.

Most of the summer camps in the Maligiaq system have within living memory been used mainly by smaller groups of people from the fjord complex inside Ikertooq and can thus be said primarily to have had a *local* function. But some have also been used by people from a larger area and can be said to have had a *regional* function. This applies, for instance, to the base camp at Itinnerup Tuperssuai, which apart from being a starting point for caribou-hunting and char-fishing, also served as an assembly camp, i.e. a jumping-off point for hunting parties who were going further inland towards the Ice Cap.

The summer camp Angujaartorfik in the Kangerlussuaq caribou-hunting camp system is another example of a camp with a regional function; in the lifetime of informants it has been a meeting place for people from among other places Kangaamiut, Itilleq, Timerliit, Maniitsoq, Ikerasaarsuk, Appamiut and Saqqaq. People met there and engaged in various festivities marking the end of the caribou-hunting season (Robert Petersen pers. comm., Jens Rosing 1958a: 328–329).

In periods when the incitement to exploit the resources of the inland tracts is particularly strong (for instance in periods with a large caribou herd), summer places such as Angujaartorfik can be said to have had *interregional* function. A corresponding interregional function has been exercised by the famous coastal summer camp Taseralik (Birket-Smith 1924: 237, Glahn 1921 [1768]: 42, Thorhallesen 1914 [1775]: 97, H.-E. Rasmussen 1979).

Aasivissuit, an inland camp in the caribou-hunting camp system

Aasivissuit has, with its central position, covered a very large hunting area. The local informants report that they used Aasivissuit as a base camp from which they made shorter or longer hunting excursions. Aasivissuit can therefore be classified as an inland base camp.

The local informants also say that when the hunting at Aasivissuit was poor, people went further inland towards the Ice Cap, to a base camp at either Qarlissuit or Sangujalluk. The latter also served as an assembly camp for those who were going over to Akuliarusersuaq (Müller 1906) on the north side of the Isortoq river. A 65-year-old hunter told H. C. Petersen that his father from Maniitsoq went on hunting expeditions in this area. These journeys are further confirmed by J. A. D. Jensen (1879: 123–125).

It is said that Aasivissuit was used mainly by folk who came inland by way of the above-described route from the Maligiaq fjord, hence its local importance. But now and again, people also came from more southerly districts (e.g. Nuuk) via Kangerlussuaq over Tarajornitsut Ataat. Aasivissuit has thus in the lifetime of the informants had regional importance. Formerly, when caribou-hunting was of greater economic importance, especially during caribou maxima, Aasivissuit was presumably also used by folk who came from even more southerly areas, giving it interregional importance.

Of Aasivissuit, it can thus be said that it has had varying importance at different times, depending both on the caribou population and on socio-cultural circumstances. In recent times, during the latest caribou maximum, the site has not been used regularly, and during our field season 1978, we met only a small group of antler-collectors from Sarfannguaq, who left again on the same day, after searching the neighbouring area for antlers.

IV The archaeology of Aasivissuit

The archaeological source material in connection with Aasivissuit is copious and varied. Many stone-built structures are found in the surrounding "catchment area", and at the camp-site itself, the source material comprises well preserved dwelling remains and midden layers. Before the archaeological material is treated, however, the site location and its catchment area will be briefly described.

The camp-site and its catchment area

The camp-site is situated on two flat areas (upper and lower Au[5]) on the little inlet "Tuullip Kangerlunngua"[10], in the north-eastern corner of Aasivissuit Tasiat. To the south, the lower part of the camp area is bordered by the scrub-covered stream delta, and to the north, behind the upper part, rises the southern slope of "Tulukkap Qaqqaa" (Fig. 37A–B). The camp area with its many tent-house remains and tent rings manifests itself as an open grass- and herb-covered area (about 4 000 sq.m), surrounded by scrub (Fig. 38). The site itself will be further described in connection with the presentation of the archaeological excavation, p. 54.

In the terrain around the site, stone-built structures have been mapped, and on this basis, the catchment area defined. The *main fold-out map*[11] covers this area, which has a north–south extent of 4–5 km and an east–west extent of 6–7 km. To the north it is sharply defined by the great ENE–WSW oriented meltwater river Isortoq. The valleys "Naanngisat Qoorua", "Igaq", and "Joorup Kissaataa" and the prominent mountain ridges "Tulukkap Qaqqaa" and "Inussuup Qaqqaa", in the area north-east of Aasivissuit, run parallel to the river Isortoq. "Naanngisat Qoorua" with its little stream opens into the inlet at the camp-site, while "Igaq" and "Joorup Kissaataa" open into the pass, "Tunnit Qooruat", which is the narrowest part of the "topographical bottleneck" at Aasivissuit. The pass connects Aasivissuit Tasiat with the Isortoq valley, at a point where the distance between them is least (3 km). West of the pass, Isortoq turns sharply NNW, and the bank of Aasivissuit Tasiat SW, and the landscape structures here, west of the bottleneck, are of less uniform orientation. The islet "Qitittarfiup Qeqertaa" at the mouth of "Tuullip Kangerlunngua" and the larger island "Pukkitsukujooq" at the eastern end of the lake are also assigned to the catchment area.

The structures at Aasivissuit

The numerous traces of stone-built structures in the catchment area of the Aasivissuit camp constitute an important archaeological source material for the illumination of subsistence conditions at the site. Most of the structures found reflect caribou-hunting and storage of the kill: systems of single upright stones and cairns (*inussuit*)[12], a fence, shooting-coverts, meat caches and repositories. Fox traps have also been found. A few other structures such as graves and a row of hopping-stones reflect activities unconnected with hunting itself. Finally, there is scattered evidence of occupation, in the form of tent rings, and of briefer stays, in the form of fireplaces and a hunters' bed, within the camp catchment area.

Registration and representativeness

By means of reconnaissance in the catchment area the structures were recorded, and investigated for dating material. The registration was carried out according to uniform principles. Each structure was plotted in the field on an aerial photograph (1:5 000 or 1:10 000, or 1:40 000 for the most distant structures) and allotted a number consisting of a letter designating the type of structure, and a consecutive cipher. The letter code will be apparent both from the main fold-out map and from the description of the various types of structures. Plotting can be carried out with great accuracy on the detailed aerial photographs: to ± 15 m in the terrain on the 1:40 000 photographs and ± 5 m on the enlargements. The transfer to the main map has been performed with a photogrammetric plotting instrument and should thus involve no inaccuracy.

For each structure, a note was made of type, condition and position (situation in the terrain, distance to any associated structures, distance to the camp (walking and as the crow flies)). Plans at a scale of 1:20 were made, and in most cases the structure was also photographed. A system of upright stones and cairns, and a fence, were marked and photographed from the air.

The mountain terrain which makes up the catchment area is extensive and variably accessible. We therefore arranged the survey in such a way that the final systematic registration built on the experiences gained from numerous smaller reconnaissances. We perambulated those landscape formations which were most likely to exhibit structures (mountain- and esker-tops, passes) and from there examined the intervening areas with binoculars. This method could easily lead to systematic distortions in the registered material, but we have sought to eliminate these by carrying out control perambulations (in 1980) of a selection of the areas which had otherwise been subjected to extensive reconnaissance (for instance the west side of "Tunnit Qooruat", the slopes facing Isortoq, and the north-western side of "Igaq"). Only two new structures were found – a meat cache (C8) and a shooting-covert (B35). A few structures may have been overlooked on reconnaissance, on account, for instance, of sand drift or overgrowth, or of

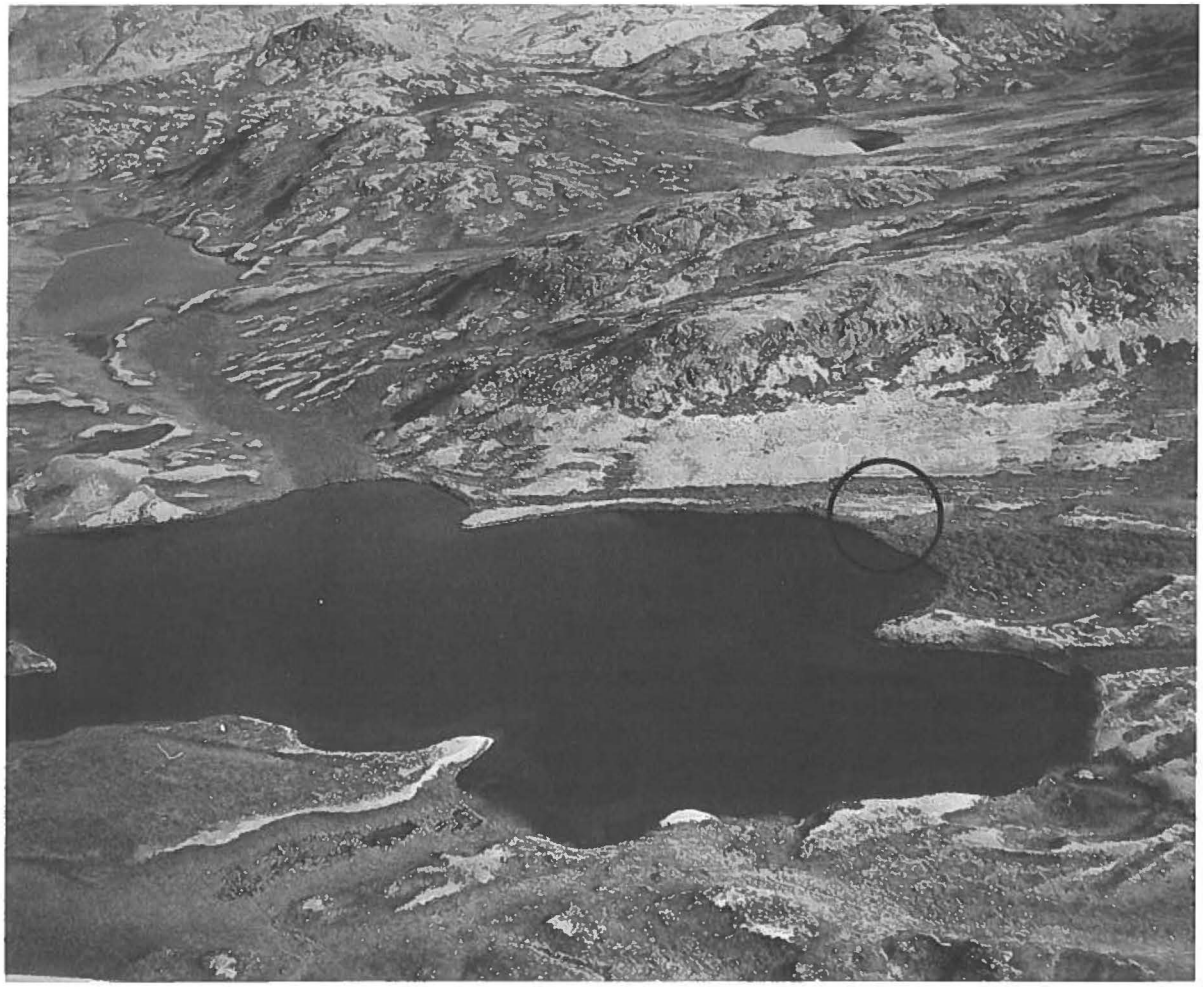


Fig. 37A. Aerial view north-east over Aasivissuit. The camp-site is marked with a circle. Sept. 1978.

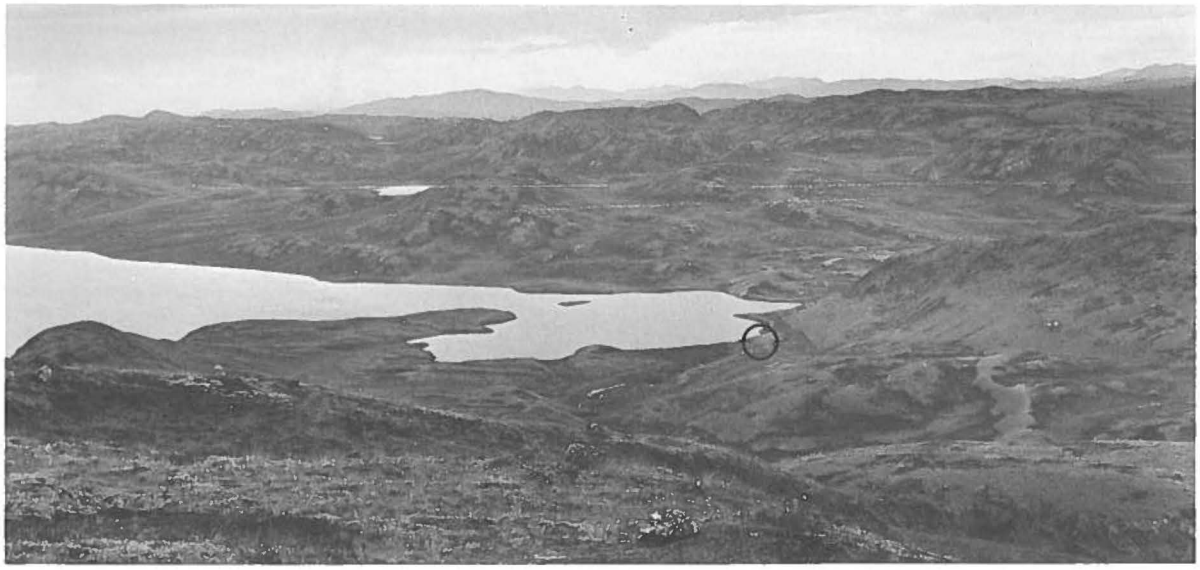


Fig. 37B. View north-west over Aasivissuit. The camp-site is marked with a circle. Aug. 1978

Fig. 38. The Aasivissuit site looking south from the slope of "Tulukkap Qaqqaa". Juli 1978.

similarity to natural features, but the above arguments should serve to show that the distribution of the recorded structures is representative of the actual conditions.

The dating of the periods of use of the various structures has followed several methods. Every structure has been examined for dating material (artefacts or organic material) in certain context with it. The extent to which the structure is silted up or overgrown also provides a crude measure of its age. A more indirect dating may be obtained by employing the ethnohistorical and historical sources. The results of dating are presented in the summary, p. 53.

In the following sections the different types of structures in Aasivissuit's catchment area are treated. Emphasis is placed on interpretation of function, based partly on our own observations of the caribou migration routes through the catchment area (Fig. 39) and partly on ethnohistorical sources. The fold-out map should be consulted.

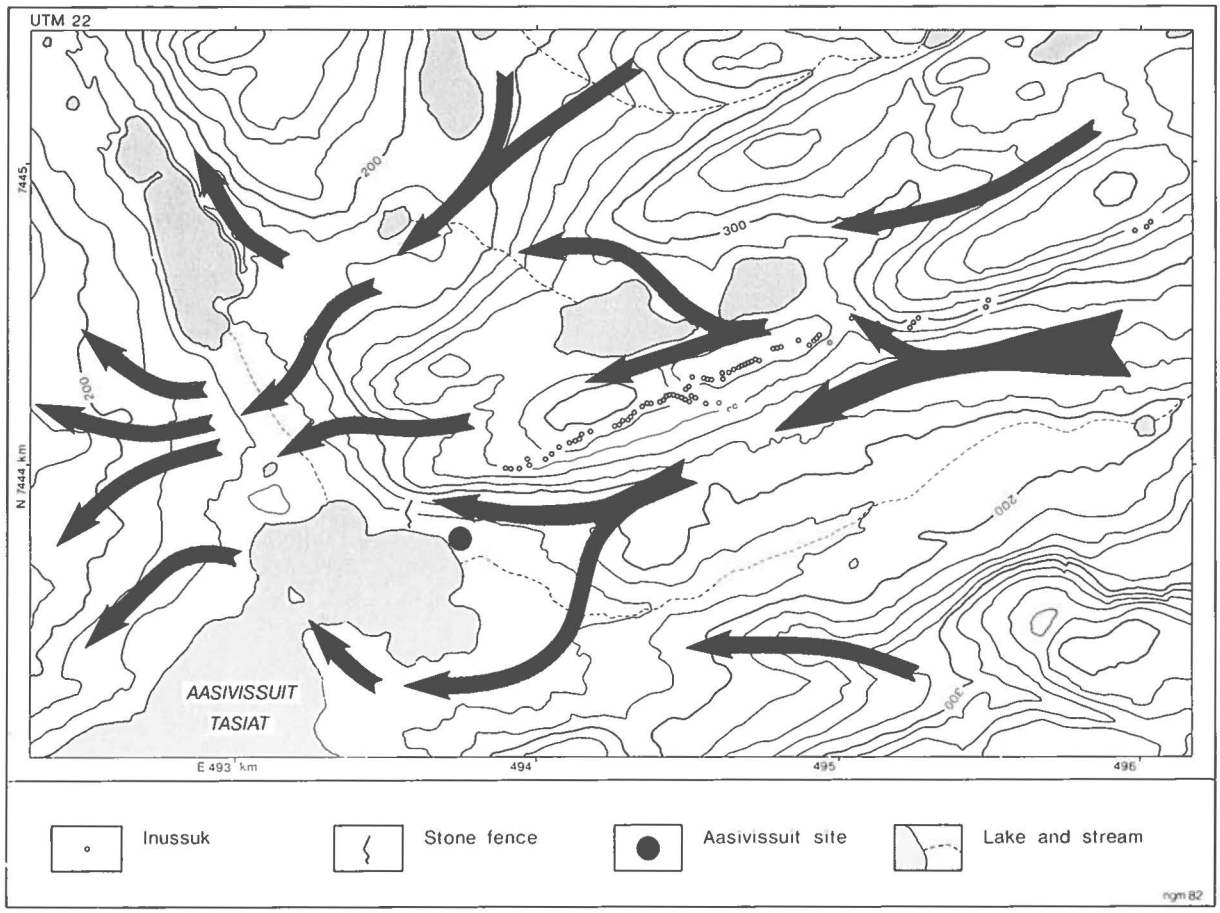


Fig. 39. Primary caribou migration routes through the Aasivissuit catchment area.

The inussuk system and fence

The inussuit

Along the tops of the mountains "Tulukkap Qaqqaa' and "Inussuup Qaqqaa", which form a continuous stretch inland from Aasivissuit, the most prominent complex of structures is found: over one hundred single stones and cairns at varying intervals form a row nearly 4 km long along the SSE aspect of the mountain slope. This chain of *inussuit* is interpreted as part of a hunting structure.

The row consists of a total of 104 recorded inussuit (plus 5 dubious) of different construction. 70% are "composite inussuit" and could be described as cairns, being usually constructed of 6–10 stones. The height of the cairns is now on average about 50 cm, but the majority have partially collapsed. 30% are "single-stone inussuit" consisting of one prominently placed large stone and including the types elsewhere called "headstones", "pillar stones" and "scraping-board stones" (Jens Rosing 1958b). The composite inussuit are in most instances (57 out of 76) erected on bedrock, whereas the large majority of single-stone inussuit are raised on in situ blocks (23 out of 28). Common to both types is the fact that they are easily distinguished from the naturally bedded stones and blocks, often forming conspicuous rows of silhouettes resembling human figures (Figs 40 and 41).

The inussuk row, as is apparent from the main map, consistently keeps to the SSE side of the highest parts of the mountain-tops. The distance between the two extremities, A180 and A72, is 3.9 km. The elevation of the inussuit is shown in Fig. 42, which also illustrates their closeness. It is apparent that the row can be divided into three sections, I–III, with different characteristics.

A180–A162 form Section III. The two extremities here turn NNE, almost parallel to the little valley, "Nerlerup Qoorua", down towards Isortoq. On this stretch, the inussuit are placed fairly close together (average distance in the terrain 39 m). Many ENE–WSW oriented caribou trails cross "Nerlerup Qoorua" and pass through this section of the row.

Between A162 and A139 is Section II. Characteristic

Fig. 40. "Single-stone *inussuk*" (left) and "composite *inussuk*" (right) from the *inussuit* row.

of this section is partly its course above the escarpment along the valley, "Naanngisat Qoorua", and partly its openness (average distance in the terrain 99 m). From the highest point A154 at about 400 m above sea level, Section II falls to A139 at about 280 m above sea level. Through the prominent pass between A141 and 139 run a large number of caribou trails from the side of the valley up towards the two lakes, "Issat".

Section I is the stretch between the pass and the escarpment bordering Aasivissuit Tasiat. This part of the row, A139–A72, is characterized by high density (average distance in the terrain 20 m, over the depressions varying between a mere 3 and 15 m) (Fig. 43). A110–A107 deviate from the line and form a wing down towards the valley. On the stretch A120–A94, the row is traversed by a few caribou trails.

It should be taken into account that certain stretches have been reconstructed in connection with later use. For example, the wing A110–A107 may have been built in association with the covert B34 (see below).

The fence

In continuation of the description of inussuit, the stone fence I1 will also be described, since one of the two interpretations of the former associates the two structures. I1 is situated about 150 m west of the camp-site and is a low fence constructed of stone blocks placed close together (Fig. 44). The present height is 20–60 cm. The fence begins at the talus below the escarpment and runs by way of three large rocks straight down the slope to the flat area near the lake shore. The total length is about 70 m. On the west side of the fence are remains of a probably older fence, the lowest part of which finishes just above a bank about 15 m from the lake shore. I1 crosses the numerous well-trodden caribou trails (about 30) on the slope.

Interpretation

An interpretation of the inussuk row and fence as structures related to hunting takes its starting point in the ethnohistorical/historical information on battues, presented on p. 30, and in our observations on caribou behaviour in the catchment area of the camp.

When the inussuit are activated, that is to say the individual structures are linked by means of seal-skin ropes and furnished with turf "heads" or fluttering birds' wings (Jakob Rosing 1926/1927: col. 15; Jens Rosing 1958b), the row functions as a hunting structure. It will guide the caribou coming from the east WSW down to Aasivissuit Tasiat in the following manner (Fig. 45). The moving caribou will first meet the activated inussuk row at the most easterly end of the complex (Section III). They will deviate in the direction offering least resistance to their natural westerly migration course, which means that they will move south-west, parallel to Section III. In this way all the animals will be channeled down into "Naanngisat Qoorua", to follow the system of trails below the relatively steep mountainside towards Section II of the row. Along this stretch only a few inussuit are required to ensure that the animals remain in the valley. Some caribou will constantly enter the WNW passes, but encounter the activated and now denser row of Section I. All the caribou are thus steered in a WSW-oriented route down towards the camp area near the lake.

The final dispatch of the caribou can have been ef-

Fig. 41. Inussuit from the western part of the row (A97–A105). Aug. 1978.

fected in a couple of different ways, since there are natural migration routes both along the slope north of the camp and east of it along the inlet, "Tuullip Kangerlunngua".

If the animals are directed east of the camp, they will pass down over the little river, traverse the flats along the inlet and finally turn west onto the promontory "Tuttup Nuua". Here is a natural place from which to swim, from the tip of the promontory across the islet "Qitittarfiup Qeqertaa" to the north-western shore of the lake[13] (see also Müller 1906: 494). Once the caribou are on the promontory, the mere presence of a few beaters at its base will be sufficient to drive them in one body into the water, where they are an easy target for the hunters in kayaks, who shoot forward from their concealment behind the 2 m high south-western shore to surround the swimming animals and slay them with lances. The dead caribou are then easily towed the short distance across the inlet to the camp.

If, on the other hand, it was the intention to turn the caribou along the slope north of the camp, it would be natural to include the fence I1 in the complex, and the following interpretation thus presupposes contemporaneity between the fence and the inussuk row. In this

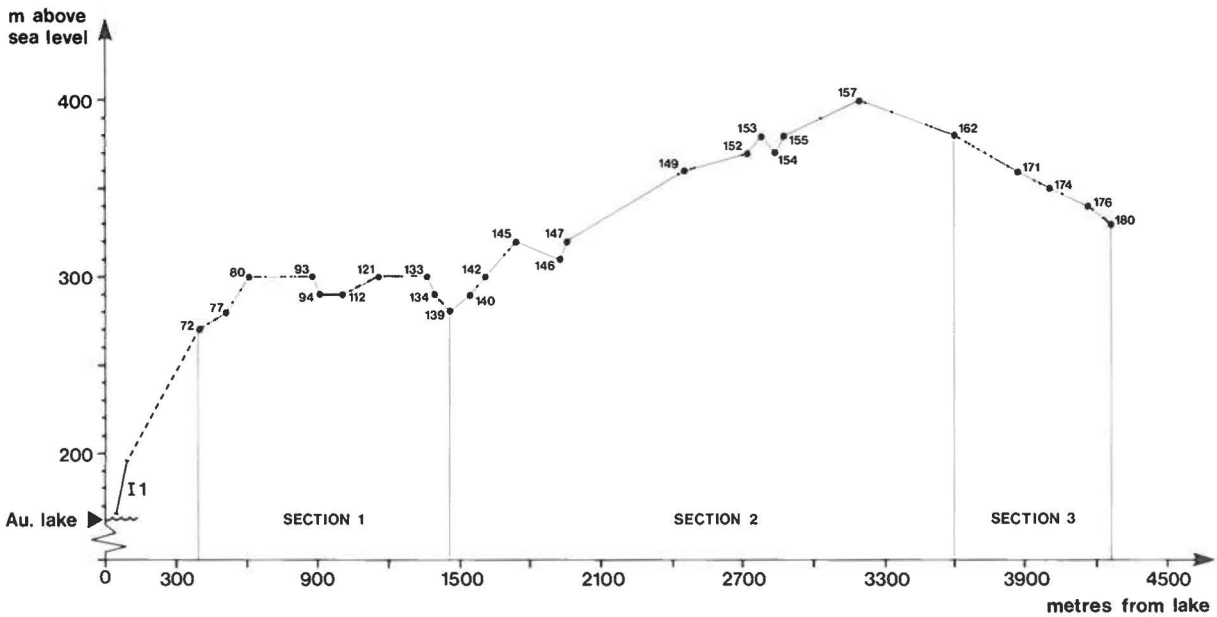


Fig. 42. Diagram showing elevation and density of the inussuit row. The position of each inussuk is projected onto a vertical section through the mountain ridge.

Fig. 43. Section I of the inussuit row (broken line), looking WSW with Aasivissuit Tasiat in the background. Aug. 1978.

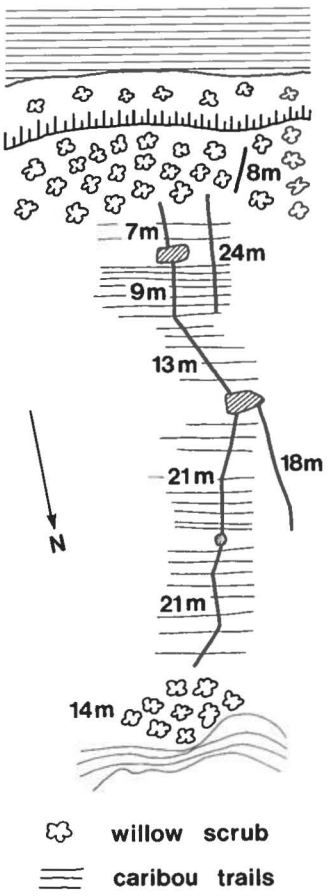


Fig. 44. Stone fence II.

case the animals are steered along the increasingly steep slope above the camp, until they are stopped abruptly by a row of bowmen, appearing from behind the fence across their path. Some beaters must be placed so that the caribou cannot avoid the hunters by running back along the slope or up the mountain-side above the fence.

Although the details of these interpretations should be accepted with certain reservations, there can hardly be any doubt about the main idea behind the structures. The activated inussuk row has prevented the majority of the migrating animals from passing by Aasivissuit through the extensive mountain terrain up towards Isortoq. It has steered them down towards a suitable place for dispatch very near the camp. A very intensive exploitation of caribou has thus been made possible.

The joint hunting of caribou has required a certain amount of work, and organization, of the people at Aasivissuit (the building and activation of the inussuit, strategically placed and co-ordinated beaters and bowmen/kayak-men). The large hunting structure must therefore have been in use in periods when the caribou passed Aasivissuit in large numbers. The yield of the joint hunts must have varied greatly, but must naturally have exceeded that which would have been forthcoming from individual modes of hunting. Characteristic of the joint hunts is that each hunter has the possibility of killing several animals at one time, as is evident, for example, from the story of Meqqisaalik (p. 18). It should also be mentioned that in the battue of the Copper Eskimoes, 6–8 caribou per hunter per day were killed, whereas the yield with individual hunting was at best 3 caribou per hunter per day (Stefànsson 1914: 57–58; se also Balikci 1964: 16).

Other inussuit and inussuk systems

Apart from the more than one hundred inussuit of the great system, 82 others were recorded in the catchment area. 36 of these must be supposed to have been built in connection with coverts and are described later. The remainder are found partly in connections which can be interpreted as remains of hunting structures or as individual "marker inussuit".

In the pass "Tunnit Qooruat" between Aasivissuit Tasiat and Isortoq, 23 inussuit have been recorded on the eskers: A40–A46 and A54–A69 form, since they follow the course of the eskers, a row between the small lakes from the heights of the pass about 2.2 km from Aasivissuit Tasiat down to about 300 m from the lake shore. Nearly all the structures are poorly preserved. If they are contemporaneous, they possibly constitute a hunting system, but the function of such a system is not immediately clear.

The remaining 23 inussuit cannot be immediately placed in a wider connection. They may be remains of smaller inussuk systems or merely marker inussuit.

The shooting-coverts

A many-facetted ethnographical source material throws light on the use of shooting-coverts (= shooting-hides) in connection with caribou-hunting. There are also numerous archaeological traces of them around Aasivissuit. Altogether, 35 coverts (B-numbers on the main fold-out map) (plus 3 dubious) have been recorded in the camp catchment area.

The coverts consist for the most part (23 examples[14]) of small, curved stone walls, but they can vary in shape from a semi-circle to a straight line. They are usually constructed of about a dozen stones, each with a diameter of 20–40 cm, laid in a row supported by smaller stones. In height, they vary from 13 to 45 cm (average 25 cm), and in outside width, from 1.1 to 2.7 m; three, B7, B9 and B20, are over 2 m wide, but most are about 1.5 m wide (Figs 46 and 47). 8 hides consist of a straight stone wall (length 0.6–2.2 m) in 1–2 courses (height 20–60 cm), butting onto a large, naturally bedded rock[15], and in 2 hides, a small boulder is the central stone in the wall[16]. In 2 instances, old meat caches have apparently been converted into coverts[17].

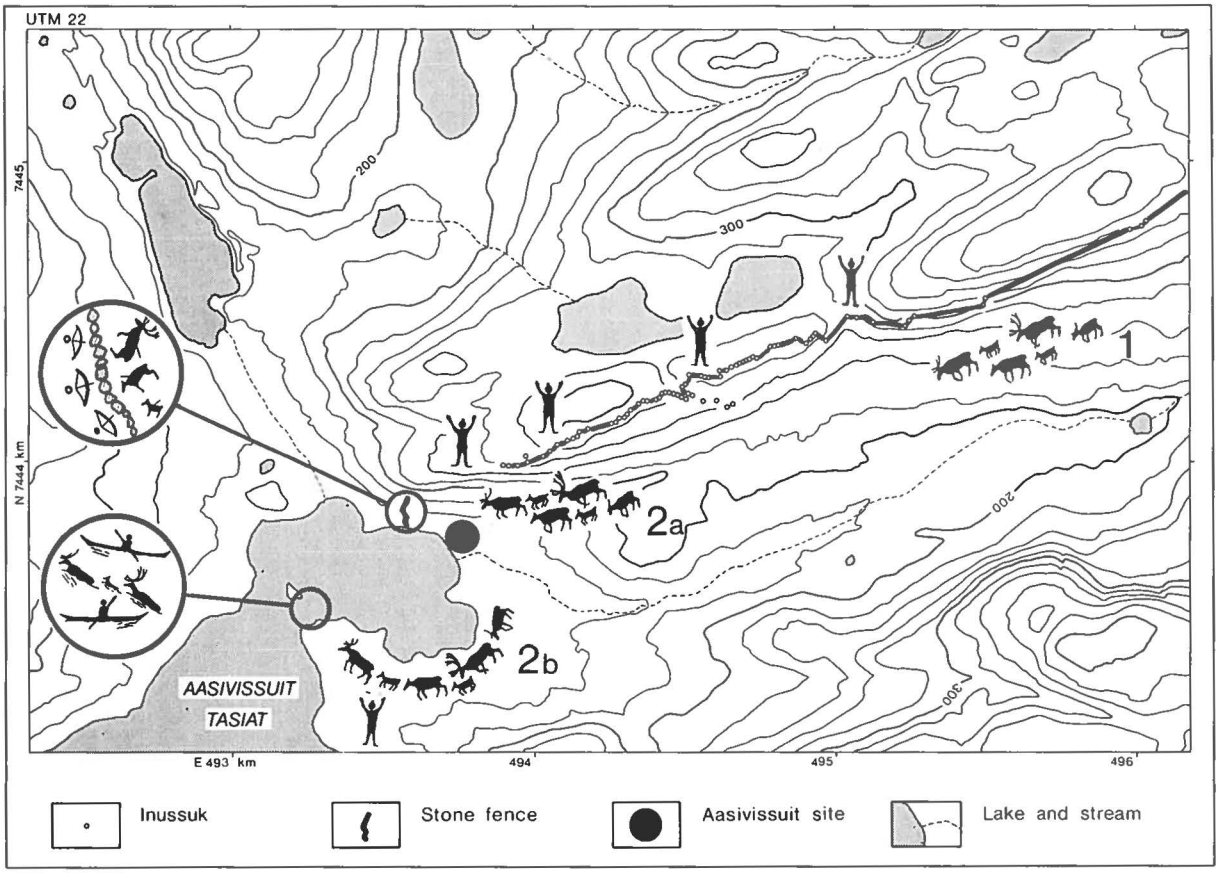


Fig. 45. Interpretation of the function of battue structures. 1: The caribou flock has been guided WSW and is now moving along Section II and I of the activated inussuk row (thick black line). Beaters could be placed along the row ensuring that the caribou follow the trails towards the lake. According to the direction of the trails (see Fig. 39) two alternative ways of the final kill are proposed (2a and 2b). 2a: the caribou are killed by bowmen hidden behind the stone fence. 2b: the caribou follow the trails to the swimming place and are killed by hunters in kayaks.

Orientation and placement

From the shape and position of a covert it is possible to calculate the line of sight, i.e. the direction of a vector radiating from the centre of the wall. The lines of sight are as shown in Fig. 48. It will be seen that by far the majority of hides are oriented towards animals approaching from the east (23 out of 34). The remainder (11) must also be presumed to be directed at these animals, local topographical circumstances determining the deviant orientation.

The placement of coverts is closely related to topography. Nearly all are associated with (N)E–(S)W oriented landscape features (eskers, mountains, valley mouths).

Single coverts

With inussuit. – Systems of inussuit are often found in connection with the individual coverts. They will, in an activated state – for instance joined by seal-skin thongs – intensify the effect of local topography on the direction followed by the caribou on their migrations and thus lead the animals close by the coverts. In the area west of Aasivissuit are found at least 4 covert-and-inussuit structures of this kind: B13 (A10–A16), B15 (A28–A29), B16 (A30–A33), B17 (A34–A36 (A39)). Three examples will be described in greater detail.

B16 with the four inussuit A30–A33 is a characteristic example (Fig. 49). It is a covert consisting of a small wall built out from a larger rock and is situated on a small NE–SW oriented ridge originating in "Tunnit Qooruat". The inussuit A30–A33 form a row on the south side of the ridge, the most distant lying about 60 m from the hide. The hunter can from this covert observe at a distance the caribou approaching from the ENE. If the inussuit are activated, they will deflect the animals from the normal route and lead them up just past the hide at a distance of about 5 m, with their right flank exposed.

Fig. 46. Shooting-covert B20. Aug. 1979.

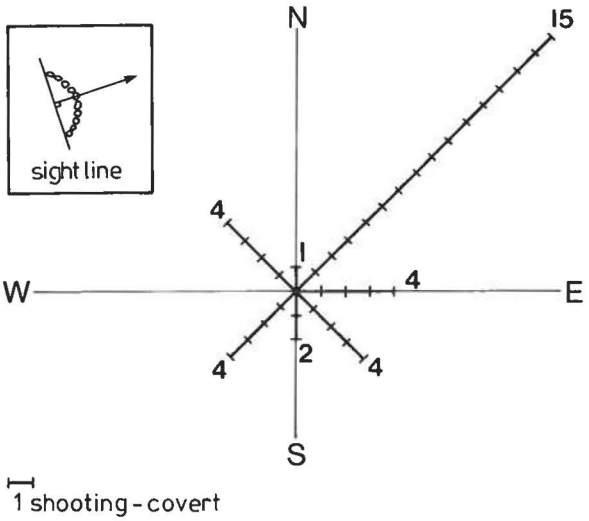


Fig. 48. Diagram showing sight line orientation of shooting-covert.

The covert B13 is placed about 150 m from Aasivissuit Tasiat's north-western shore and is oriented towards the north-east. It lies at the end of a low mountain ridge running parallel to the lake shore. The inussuit A10–A16 are placed in a row along this ridge and are very prominent, A11 and A16, for example, being 65 cm and 130 cm high respectively. The activated inussuit will presumably direct the caribou down along the north-west side of the ridge and eventually past the covert. Possibly the inussuk row A17–A24, which runs parallel to A10–A16, should be regarded as part of a system complementing B13.

On the mountain ridge forming the south side of the vally "Naanngisat Qoorua", 8 inussuit have been registered, A2–A9, of which the majority are single-stone inussuit. These must be assumed to have been erected in connection with the coverts lying either on the ridge itself (B7) or on the system of eskers below this (B5 and B6). The coverts are all oriented east to north-east. In the activated state, they will channel the caribou in towards the central trail of the ridge and thus close by the coverts at a distance of 4–5 m.

A110–A91 of the large complex have probably served (rebuilt) B34 near the top of "Tulukkap Qaqqaa".

Without inussuit. – Many single coverts are without associated inussuit. As will be apparent from the following examples, the local topography is in this case decisive for their placement.

In the area west of Aasivissuit are the single coverts B12, B14 and B18 – all with a good view east. Slightly north-east of the two small lakes, "Issat", is a covert, B33, from which the hunter commands a fine view of the caribou trails parallel to the valley. In the valley "Naanngisat Qoorua" are the coverts B8, B9 and B10. They all exploit a ridge stretching from the valley bottom up towards the south side of "Tulukkap Qaqqaa".

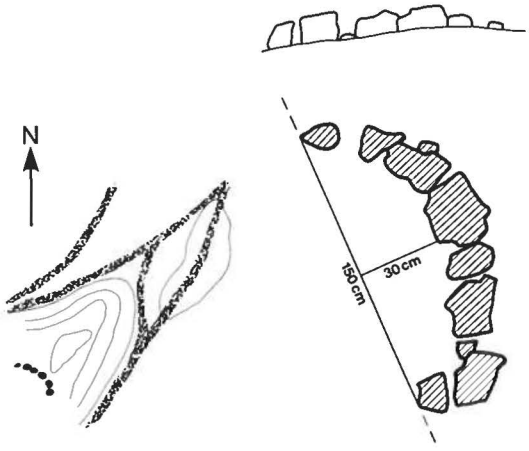


Fig. 47. Shooting-covert B3.

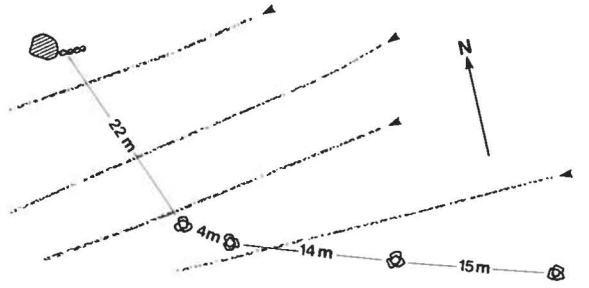


Fig. 49. Shooting-covert B16 with inussuit.

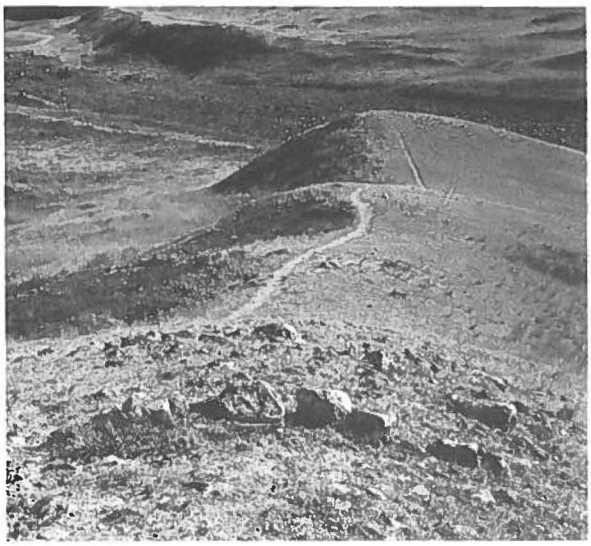


Fig. 50. The view from shooting-covert B9 (in the foreground). Note the well-trodden caribou trails along the ridge. Aug. 1978.

A well-trodden caribou trail follows the top of this ridge. Common to these coverts is the placement just behind the crown of the ridge – the hunter lying down one side – and the fact that each line of sight meets the trail further down the ridge a couple of metres below the level of the hide. The hunter has from B9 and B10 been able to shoot the caribou from in front at an oblique angle, at a range of 7–8 m (Fig. 50). From B8 the distance to the nearest caribou trail is 5 m.

Covert pairs

3 paired coverts have been registered. The designation "covert pair" is applied to two hides placed close together and aimed at the same caribou trail, a phenomenon often seen during reconnaissances in the inland area.

South-east of Aasivissuit are B1 and B2, and from this pair there is a perfect view across the small pass. In the vicinity are also found the pair B3 and B4 on the crown of a ridge. The line of sight is in this instance down towards a small passage between two eskers at a distance of 8–10 m and 4–5 m below the coverts. The pair B31–B32 is situated on a short ridge in the centre of the "Igaq" valley (Fig. 51). The two structures are placed one on each side of a well-trodden caribou trail following the crown, about 8 m in front of B32. Both sight lines are directed at this spot.

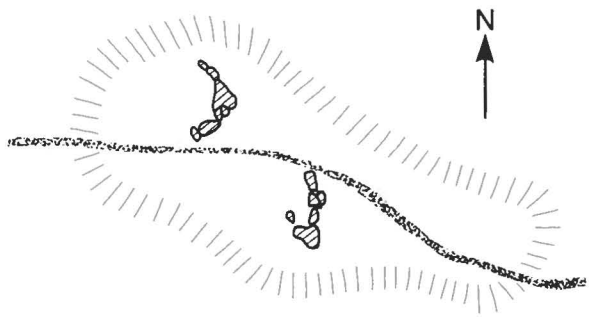


Fig. 51. Covert pair B31 and B32.

Covert groups

By a group of coverts is understood three or more hides close together and making use of the same topographical features. Covert groups have, as is apparent from the story material, been used simultaneously – manned by at least one hunter to each covert – but this does not, of course, rule out the possibility of a solitary hunter employing a hide of an older group.

At Aasivissuit, 2 covert groups, B20–B27 and B28–B30, were recorded.

At the very mouth of "Igaq" a low ridge of gravel runs down the south slope. The caribou trails, which are strongly concentrated there, run across the ridge and out into the pass. Just below the crown of this ridge are the eight hides B20–B27 (Fig. 52). The uppermost all have line of sight to the north-east and east at an acute angle to the lower trails, so that a hunter can shoot from in front at an oblique angle, and at a range of 8 m. The lowest coverts B25 and B26 are aimed at a passage in the esker, and above this is B27.

On a small system of eskers at the mouth of the "Joorup Kissaataa" valley are three small hides, B28–B30. B28 is situated on the north-west side of the valley mouth and B29 and B30 on the opposite side. The sight lines aim from either side at the many caribou trails along the valley bottom. The range is 8–10 m.

Both covert groups thus cover a rather narrow valley mouth, which the caribou will naturally pass on their way through the "Tunnit Qooruat" bottleneck.

Coverts – survey, hunting methods

The 35 registered coverts of the catchment area function, despite variations in their form, in the same manner: a small stone wall conceals the hunter from the passing caribou. All the hides are directed at animals coming from an easterly direction. They are placed in relation to NE–SW oriented landscape features and exploit the natural channeling effect of the topography on the migrating caribou. In connection with 8 single coverts, it has been desired to enhance this effect by means of small systems of inussuit guiding the caribou up past the hides. 10 single coverts are placed at spots where trails are naturally concentrated, mainly along the tops of eskers and in valleys, and these hides have not made use of inussuit. 3 covert pairs – one located in a pass, the two others on eskertops – and 2 covert groups situated in valley mouths, have been registered. Their sight lines are in all cases aimed obliquely down at

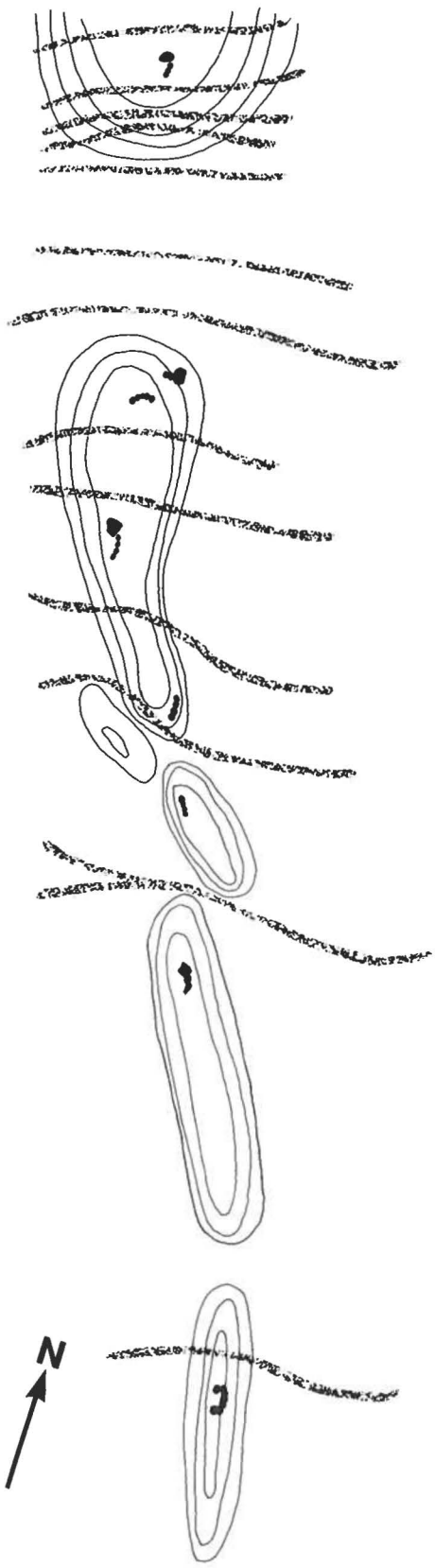


Fig. 52. Covert group B20–B27 at the mouth of the "Igaq" valley.

the approaching caribou, and the hunter has most often shot the animal obliquely from in front, at a range of 4–10 m.

Several variations in hunting methods and in the organization behind the hunt are manifest in the recorded structures: 1) individual hunting, 2) companion hunting and 3) joint hunting.

1) *Individual hunting* can, of course, be employed from all the hides. The solitary hunter, having located his quarry from a good vantage point, will place himself in that hide which will, on account either of an activated system of inussuit or of a local topography tending to canalize caribou movement, give the best chance that the migrating animals will pass within shooting range.

2) *Companion hunting* covers a situation in which two men hunt together, and finds its archaeological expression in the paired hides and perhaps in the largest single hides. A couple of hunting companions thus have the opportunity of firing together, and this is, of course, an advantage, if several animals approach the hide together.

3) The covert groups are manifestations of *joint hunting,* i.e. co-operation between beaters and concealed hunters. In the stories of Meqqisaalik and Sinngajik (p. 17–20), there is a lively description of how hunts of this kind took place. In the "Igaq" valley near Aasivissuit, the beaters have been able to surround a foraging group of caribou and set it in motion towards the many hunters concealed at the mouth of the valley.

Other structures

Meat caches

In the Aasivissuit catchment area, a total of 20 meat caches have been recorded. They are constructed of from ten to a couple of hundred stacked stones, to form a central chamber. The eight measurable chambers vary in inner diameter from 0.5 m to 1.1 m (mean 0.9 m) and in height from 0.3 m to 0.6 m (mean 0.4 m). The outside diameter of the caches in their present "dismantled" state varies from 0.5 m to 3.5 m.

The two large meat caches, C16 and C17 (Fig. 53), have been in recent use. The floors are covered with birch branches and twigs and on these lie the remains of the contents of the caches: a few limb-bones of caribou with dessicated flesh.

The placement of the meat caches is very characteristic: particularly windy spots have been chosen, 6 lying on wind-battered mountains (C6–C10 and C20), 3 on

Fig. 53. Meat caches C16 and C17. (Photo I. Silis, Aug. 1978).

smaller mountain ridges (C1–C3), 3 on the slope north of the camp (C4–C5 and C18) (four if the rebuilt B19 is included) and 7 on or above the promontory west of the camp-site (C11–C17). C19 is situated at the highest point of the island "Pukkitsukujoo". This distribution is not fortuitous: there is a clear concentration within a radius of about 300 m north and west of the camp – 10 of the 20 meat caches are placed there. The remaining 10 are spread over a large area – the most distant, C1, being about 1.7 km away in direct line from Aasivissuit and the nearest, C2, about 0.9 km distant. These caches, peripheral in relation to the camp, must have been built and used by hunters stalking in the area, or by hunters who, from a base at Aasivissuit or single tent-places in the vicinity (see below), carried on covert-hunting (C1 and C3).

The many meat caches found west of the camp-site must originally have been built for the storage of dried meat from caribou butchered at the camp itself. Although they can have been used for the storage of fresh cuts at the end of the season, only dried meat can, if it is packed together in the proper manner, be stored for a longer period in the summer in meat caches (Jens Rosing pers. comm.).

Repositories

In the steep talus above the silt-covered slope behind the camp-site, 4 so-called repositories (D1–D4) have been recorded. A repository is defined as a hollow under a large boulder, in which all the openings have been closed with smaller stones, so foxes and ravens cannot get at the chamber. Those recorded have chambers with a height of 30–50 cm and a depth of 70–80 cm, but D1 differs in being about 2 m deep. In the repositories it has been possible to store such things as dried meat, clothing and various gear, such as seal-skin thongs for the activation of the inussuit system.

Fox traps

In the little defile south-west of the "Issat" lakes, 3 fox traps, E1–E3, were found. They are placed on rocky eminences and lie quite close together, only 16–20 m apart. They are of the so-called "trapdoor type".

The hopping-stone row

To quote from a letter from H. C. Petersen (10.1.1980):

"A woman who had been at the summer camps in Aussivigssuit told me about *naanngisat* (hopping-game stones), how it was back in 1920. – In the evening people collected at naanngissat for a contest. You hopped singly or double (two persons) side by side or towards each other, either downwards or upwards. Sometimes prizes were offered, as a rule in the form of *tunnoq* (caribou fat). Contests were arranged for children and adults."

The hopping-stone row mentioned in the letter lies at the top of the ridge running up from the bottom of "Naanngisat Qoorua", about 650 m east of the camp (Fig. 54). It is about 24 m long and consists of about 40 stones. The ridge slopes down to the ESE, so that the lower end is 2–3 m below the upper.

Naanngisat form as apparent from the quotation, a kind of playground for both children and adults, and here we touch on a facet of life inland, which is otherwise difficult to discern in an archaeological material (see further Gripp 1942: 48 and Mathiassen 1934: 24).

Graves

On the terrace surface just east of the camp are 6 putative human graves. The structures are round, low heaps (diameter about 1.0–1.6 m) of stones and turf (hereby differing from the meat caches) (Fig. 55). On a gravel ridge in the southern part of the valley "Tunnit Qooruat" is grave F7 – an oval heap of stones (c. 2.0 × 2.7 m) oriented roughly E–W.

No graves with stone-built chambers were found in the catchment area.

Tent rings

In the catchment area are occasional traces of habitation in the form of tent rings: altogether, 7 of these have been recorded. J6 lies a mere couple of metres from the shore of Aasivissuit Tasiat on a little point. It is much overgrown, but the opening seems to face the lake. The distance from the opening to the rear wall is 5 m, the greatest width 3.5 m. J1 is likewise located on the north-west shore. It consists of about 15 stones in an oval, about 4 × 6 m. J2 and J7 are of roughly the same dimensions as J1. They lie a few metres apart at the head of "Tuullip Kangerlunngua". J3–J5 are situated at

Fig. 54. Row of hopping-stones H1 (A and B). Aug. 1978.

the base of the point "Qimatut Nuua", and in this case consist of some poorly defined overgrown stone rings with a diameter of 4–5 m and 8–9 visible stones in each. Half of J3 has slipped down the slope.

Fireplaces

On "Qimatut Nuua" were recorded 2 small stone-built fireplaces, K1 and K2, the first of which is recent and the other of older date (overgrown with crowberry). A small fireplace, K3, consisting of three stones on edge, is found in "Tunnit Qooruat" about 200 m from Aasivissuit Tasiat's shore.

Fig. 55. Grave F1. Aug. 1978.

A

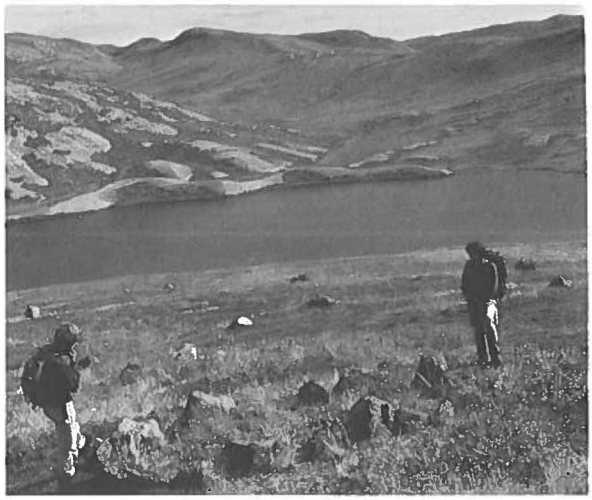
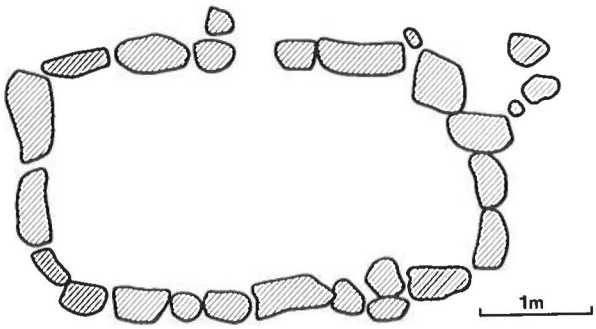


Fig. 56. Hunters' bed G1. July 1978.

B



The hunters' bed

About 170 m west of the lake "Aliip Tasia" is a rectangular stone setting, G1 (Fig. 56). This structure consists of 27 large stones set on edge to form a rectangle with slightly rounded corners (inside dimensions about 1.8 × 3.7). The long sides are oriented NNE–SSW. In the eastern long side is an opening about 40 cm wide.

This structure must be a so-called "hunters' bed". The designation is found in a schematically drawn, rectangular structure in the illustration of battue in Egede 1974 [1741] (Fig. 25 here). A description of the construction of a hunters' bed is found in Rink 1877: 272: "For want of shelter they used to build up low walls of stones or sod to protect them against wind whilst sleeping".

Further, H. C. Petersen has related how as a child (in the 1920's) he spent the night in a hunters' bed with some caribou hunters. They filled the bed with heather and twigs and snuggled down.

Unidentified structures

The function of 2 stone-built structures, Z1 and Z2, could not be determined. Z1 is a paving of large, flat stones, half slipped into the lake, while Z2 north-west of the camp-site is an irregular oval of head-sized stones (ca. 1.5 × 1.2 m).

The structures – summary, dating and conclusions

Summary

The 272 structures recorded in the Aasivissuit catchment area (see fold-out map) may be classified by function into three main groups: 1. structures built in connection with hunting and the storage of game, 2. structures connected with the social and spiritual activities of the inhabitants and 3. structures manifesting habitation or shorter stays outside the camp itself. By far the most part of groups 1 and 2 are presumed to have been built and used by people living at Aasivissuit itself.

Group 1 comprises: 1 battue system (104 inussuit and 1 fence), 35 shooting-coverts (8 single with inussuit, 10 single without inussuit, 3 pairs and 2 groups), 20 meat caches, 4 repositories and 3 fox traps. The 82 "other inussuit" may also be allocated to this category. It emerges that the function of these structures is based primarily on caribou approaching from an easterly direction – animals on autumn migration from the breeding areas near the ice to western wintering areas.

The individual hunting forms are expressed in the single coverts, and the covert pairs may be the result of companion hunting, in which a couple of hunters work together. The joint hunting, which requires the coordination of the efforts of many beaters and hunters, is manifest in the archaeological material in the form of the great battue system (inussuk row and fence). The activated inussuit and the beaters have steered the caribou towards bowmen behind the fence, or have driven them out into Aasivissuit Tasiat at the swimming-place across the mouth of the inlet. Here hunters in kayaks have killed the swimming animals and towed them over to the camp. The joint hunt is also manifested in the groups of coverts. The beaters have driven the caribou out towards the bowmen behind their hides in the valley mouths at "Tunnit Qooruat". Joint hunting gives a considerably greater bag per hunter than individual hunting.

The meat caches and repositories grouped close to the camp must have contained flesh and dried meat from the animals butchered at the camp itself. The more peripheral meat caches have been built in connection with hunting from the most remote coverts or by stalking. The trapping of foxes has most likely served to remove the boldest scavengers – the few traps certainly do not point to any intensive exploitation of foxes.

Group 2 comprises a row of hopping-stones situated north-east of the camp and 7 possible graves – 6 lying near the camp. *Group 3* comprises 7 tent rings, 3 fireplaces and a so-called hunters' bed. These structures show that Aasivissuit Tasiat's north-eastern shore and the base of the point "Qimatut Nuua" have been the

preferred places of sojourn for hunters who did not stay at the large camp.

Dating

The structures are so numerous and of such varied character and state of preservation that they must represent human activities stretching over a long period – they cannot be the result of one simultaneous activity. The finding of datable artefacts or organic material in certain context with the structures yields the most direct dating of the period of use, but the method is only applicable in the fewest of cases – partly because the activities around the building and utilization of hunting structures cannot always be expected to result in a deposition of datable material and partly because a connection between structures and any small finds around them is not always easy to demonstrate.

It was endeavoured to date all registered structures. In most instances this involved a thorough examination of the surface around the structure, but no dating was forthcoming using this method. Twelve coverts were examined more closely, the layers of silt drift behind them being excavated with a trowel, and in five cases also sieved through a 3 mm mesh sieve (B4, B7, B16, B23, B30). In two of these hides, B23 and B30, dating material was recovered.

In B23, 27 flakes comprising 6 different flint and chalcedony types were found (Fig. 57 and Appendix I), thus demonstrating archaeologically six different events – 5 re-uses of the covert. 3 flakes, which fit together, derive with certainty from European gun-flint, 17 are of Greenland raw material, chalcedony, and 5 cannot be referred with certainty to flint or chalcedony. The pieces of gun-flint were all encapsulated in the superficial 7 cm of the 10 cm thick drift layer just behind the stone wall. B30 contained 4 small secondary flakes of one kind of chalcedony (Appendix I).

These dating investigations show, then, that it is in certain circumstances possible archaeologically to demonstrate several use phases of the same structure. B23 must have been in use at least during the period when flint-lock guns were among the weapons of Greenlandic hunters – primarily from the mid-18th century to the mid-19th (Gad 1969: 269–270, Gulløv & Kapel 1979: 110, Hess 1968: 13). Chalcedony flakes may derive from the trimming of locally-produced gun-flint or from the resharpening of arrow- or lance-heads. A chalcedony flake struck from a very steeply trimmed piece like known gun-flint suggests the former, a 10 mm long flake with surface-chipping scars on the back, the latter. Both these pieces were recovered from the same 3 cm thick sieved layer as the gun-flint. Under this lay 6 of the small chalcedony flakes. These circumstances indicate that B23 was built during the paleo-Eskimo period. To a dating of the small chalcedony flakes from B30, the same considerations apply.

The hunters' bed G1 was examined by means of a small excavation (¼ sq.m). Under a ca 8 cm thick silt drift layer in the north-west corner of the structure, at the same level as the base of its stone wall, a marrow-split limb-bone of caribou was found. A C^{14} dating of this (K 3514) yielded information on the time of building of the structure: 950 ± 70 B.P. (1030 A.D. cal.).

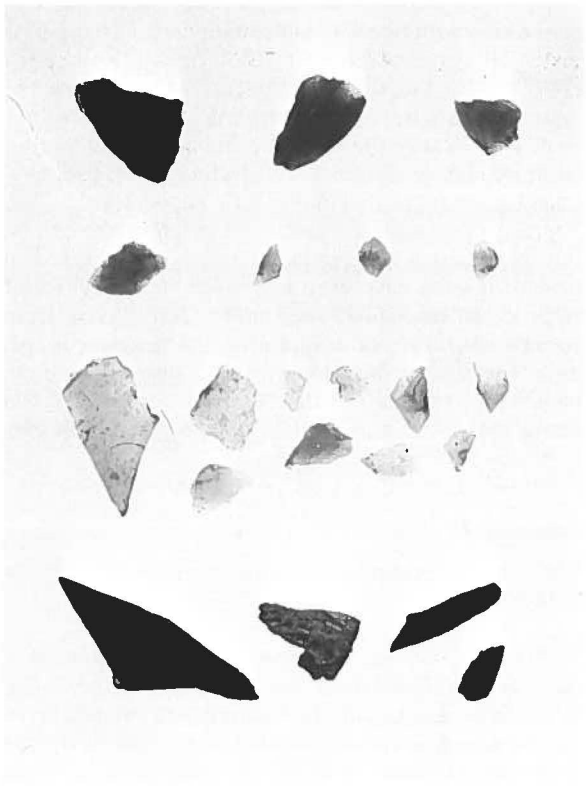


Fig. 57. Flakes of chalcedony and flint and bone fragments from the excavated drift behind shooting-covert B23.

After these relatively sparse results from the "direct" dating methods, we must turn to the ethnographical/historical sources, which can yield information on which hunting methods have been employed within the last two hundred years. As far as the inussuk row, fence and covert groups are concerned, an upper date can be assigned. On the basis of missionary reports, joint hunts of the first half of the 18th century can be documented, and Nellemann (1969/70: 148) concludes, "organized battues on a large scale unquestionably came to an end before 1800 and were not revived".

The last period of use of the coverts can also be determined. Thus it is recalled in Maniitsoq that the simple kind of covert-hunting was in use during the great caribou maximum of the first half of the 19th century (H. C. Petersen pers. comm. 1980).

Of meat caches and repositories it can merely be said that they have surely been built and used as long as there have been caribou-hunters at Aasivissuit. The fox

traps, which are of trapdoor type, occur everywhere in connection with neo-Eskimo settlements. Fox-trapping increased enormously after colonization (Rink 1974 [1877]: 104) but there is no reason to associate the Aasivissuit fox traps with that particular activity or period. The putative graves in the catchment area cannot be more closely dated without further investigations – inland grave types are still too little known for this. The hopping-stone row has been in use as late as the 1920's, but as the stones are quite silted up and covered in lichens, it must have been laid much earlier. The tent rings in the catchment area must mainly derive from periods when the Aasivissuit area was merely a transit area. The hunters' bed is known from historical sources back to the first part of the 18th century, and the C^{14} dating of this structure to 1030 A.D. is remarkably early[18].

Conclusions

The hunting structures have primary source value in two fields:

1. They permit the *archaeological* delimitation of a *hunting area* (catchment area) related to the camp. NNW from Aasivissuit, the hunting area extends up to the river Isortoq (about 3.5 km), and to the ENE, the inussuk row shows that the hunting area in those periods when the joint hunts flourished extended over 4 km from Aasivissuit to the valley "Nerlerup Qoorua".

2. They give information on *hunting forms* which have been employed by the occupants of Aasivissuit. A dating of the different forms can, as will be apparent from the above, in some cases be based on find contexts and in others on ethnohistorical and historical sources. We can hereby survey the period from the beginning of the 18th century to the present, within which we are told of numerous forms of hunting which both involve special structures and include several variations of stalking. A fundamental change within the historical period occurs, however, when the large-scale battues come to an end in the course of the last half of the 18th century. After this, hunting forms of more individual character prevail (covert-hunting, stalking). Such radical alteration in hunting forms and thereby of hunting structures is reflected in the archaeological material from the Aasivissuit camp.

Excavations at the Aasivissuit camp-site

The previous section has surveyed the various methods of hunting employed by caribou-hunters from Aasivissuit. Based on a comprehensive source material, it could be concluded that these methods have undergone considerable changes in the course of time. In order to obtain a more detailed and ordered picture of how resources had been exploited, we carried out archaeological excavations at the camp-site itself, endeavouring to adduce a source material yielding information primarily on the following aspects:

1. Dating of occupation phases.
2. Make-up and character of food resources (game).
3. Utilization of game.

The archaeological source material had therefore to comprise a datable bone material, and we therefore decided to concentrate investigation on stratified midden deposits.

The excavations revealed, among other things, a horizontal distribution of midden layers within the camp area. The midden layers have been deposited within an undisturbed series of strata, the formation of which is illuminated in section studies. The structures of the individual ossiferous horizons provides, with the dating of the recovered artefacts (and C^{14} dating), a basis for interpreting the genesis of the midden layers. The extensive bone material from the various midden layers is analysed and yields information on, *i.a.*, season, hunting intensity and methods of treatment of the kill on the site.

The camp area and excavation strategy are first described, knowledge of these being of importance in the understanding of the excavation results.

The camp area

The site is located below the south-western slope of the mountain "Tulukkap Qaqqaa" in two flat areas up to the little inlet "Tuullip Kangerlunngua" (Fig. 58 and fold-out map). That part of the site which we call upper Au[5] is situated in an almost flat area of gravel and silt 6–8 m above the level of the lake. This terrace falls gently to the north and very markedly to the south-west down to the lake shore, and to the south down to lower Au (Fig. 59). Lower Au is the designation for that part of the site which abuts on the river delta. Here the soil consists of turf and silt.

The camp-site covers an area of about 3 900 sq.m (of which upper Au comprises about 3 025 sq.m and lower Au about 875 sq.m), and is surrounded by willow scrub which is thickest on the damp soil near the delta. At upper Au, there is only a sparse growth of grass, and patches bared by the wind in the highest parts. Lower Au, in contrast, has a more luxuriant growth of grass and other plants, mainly horsetails. Seen from "Tulukkap Qaqqaa", this part of the site is truly verdant. Several well-trodden caribou trails cross the site.

Upper Au exhibits the largest number of dwelling remains. On the surface, 12 well-preserved tent-house remains (nos 1–7, 9, 12 and 14–16) and 4 tent rings (nos 8, 10, 11 and 13) have been recorded. The location, shape and size of the tent-house remains will be appar-

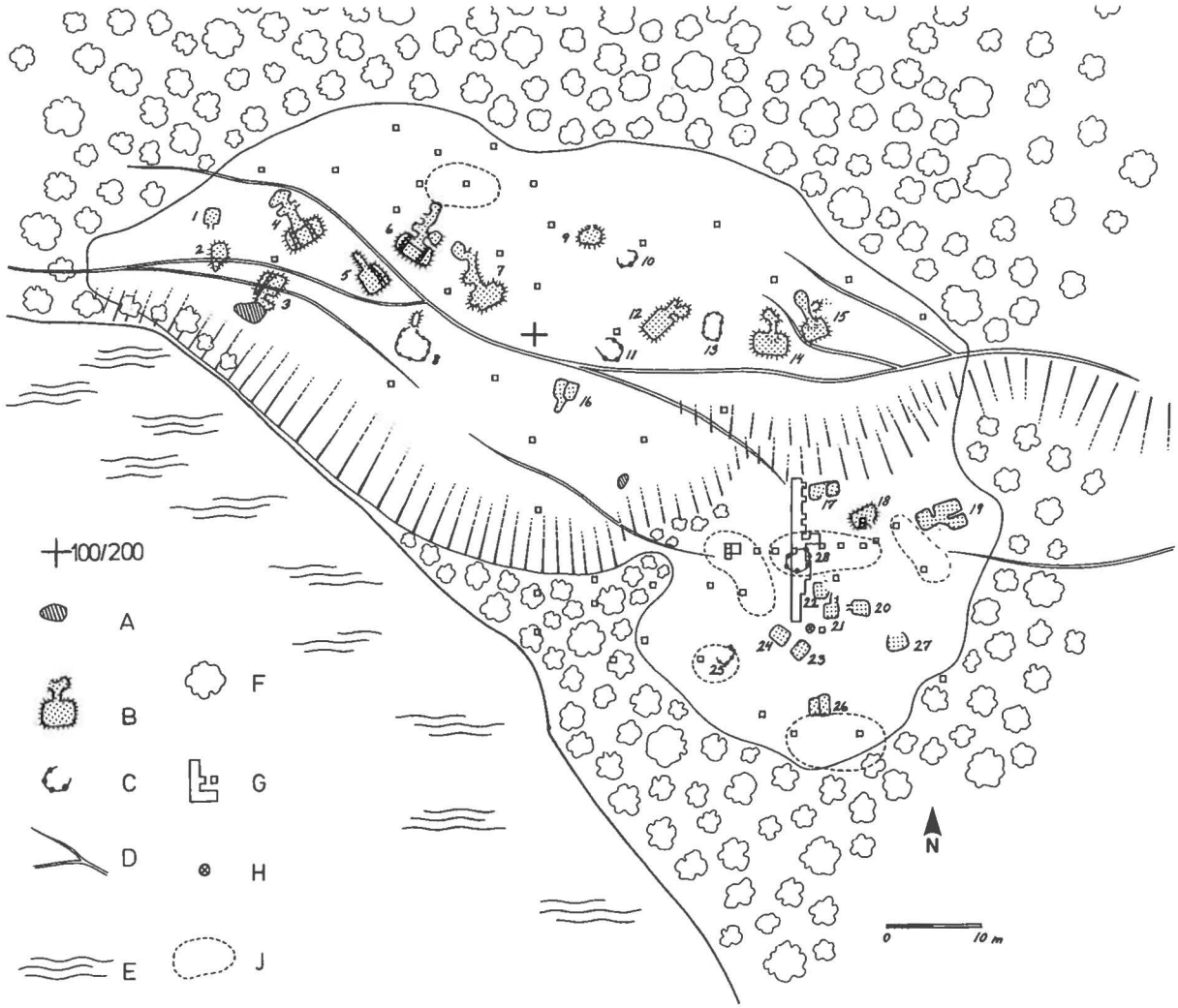
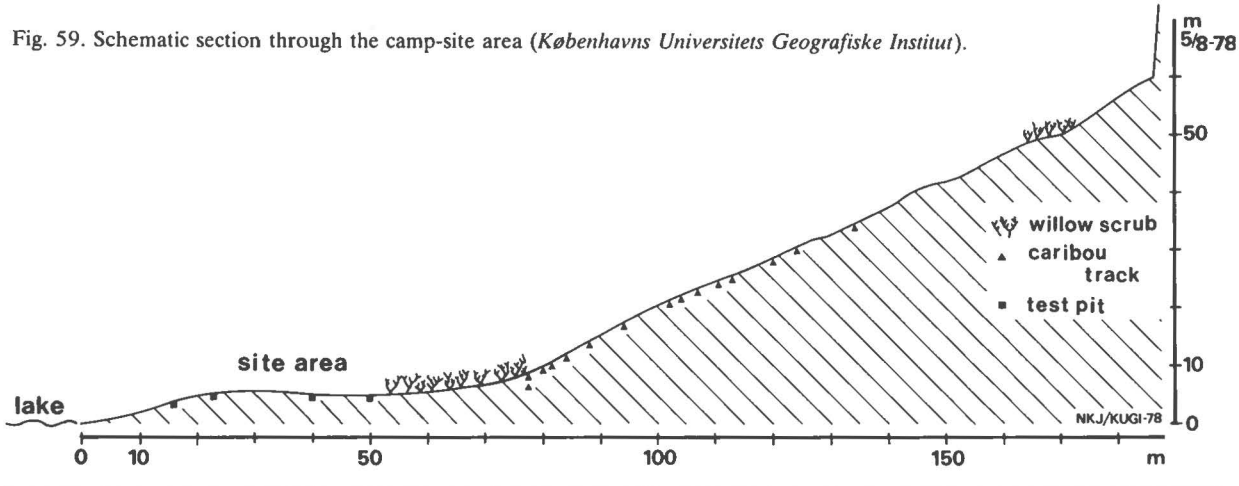


Fig. 58. Plan of the Aasivissuit site (based on a field survey by J. Meldgaard). A: boulder, B: tent-house, C: tent-ring, D: caribou trail, E: lake, F: willow scrub, G: excavation area and test pits, H: whet-stone, J: bone heap (more than 1 kg bone fragments per 1/4 sq. m).

Fig. 59. Schematic section through the camp-site area (*Københavns Universitets Geografiske Institut*).



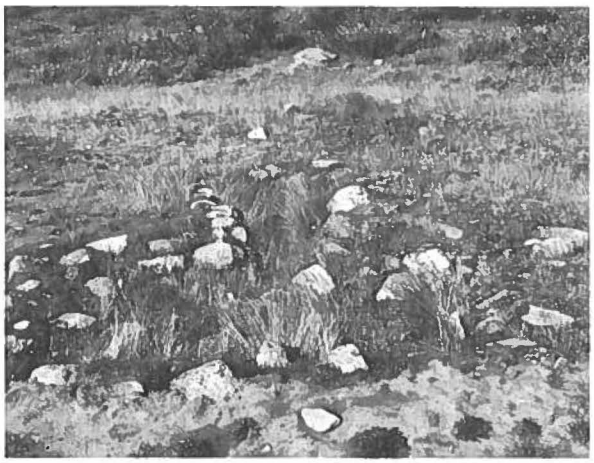


Fig. 60. Tent-house remains no. 14 on the upper Au surface.

ent from the survey plan Fig. 58. Here it will merely be remarked that the entrance passage and dwelling room are sunk 20–40 cm into the surface and surrounded by a low (15–20 cm) wall of turf and stones (Fig. 60). A description of the construction of a tent-house and its function is given on p. 27. 4 of the tent-houses have clearly been rebuilt (nos 3–6), the size of the dwelling room having been reduced with a transverse wall of stone and turf. One tent-house has in recent times been rebuilt as a meat cache or depot (no. 16). The entrances face mainly towards the southern slope of "Tulukkap Qaqqaa".

In lower Au, the traces of 10 tent-houses (nos 17–24, 26–27) and 2 tent rings (nos 25 and 28) are found on the surface. The tent-houses are here generally smaller than, and with a different ground-plan to, the tent-houses of upper Au. For instance, the long entrance passage and well-defined sleeping-platform are lacking here. In structures 26 and 27, caribou antlers have presumably been a part of the tent construction – several antlers were at least stuck into the stone and turf walls. It should also be remarked that the whetstone described by R. Müller (1906: 494) is found in the centre of lower Au. Many bleached antler and bone remains are scattered over the surface of the camp-site and especially in lower Au, several antlers stick up through the grass around the central tent-house remains.

Excavation strategy

A perpendicular system of coordinates with east-oriented X-axis and north-oriented Y-axis was established, with origin X = 100.0 m and Y = 200.0 m at the centre of upper Au. The site was divided up into a grid reference system of 0.5 × 0.5 m squares, each square being designated with the coordinate of the SW corner.

Sampling carried out with a drill and spade showed that the outer limit of the ossiferous layers was largely coincident with the edge of the surrounding willow scrub. Within this area – the camp-site area – general information on the geological conditions and the location, preservation and stratigraphy of the midden layers was sought by digging a number of 1/4 sq.m test pits. In this manner the best-preserved and most clearly stratified midden layers were found to be present at lower Au, and a N–S profile trench, Trench A, with a length of 15.5 m and a width of 1 m, was established. This trench was excavated with a shovel in segments of 1 sq.m. The larger part of the bones and artefacts found there were collected by square. The eastern wall of Trench A is designated Section A.

After a detailed registration of Section A, a series of 1/4 sq. m squares (and one 1/2 sq. m segment) was excavated behind the section (Fig. 61). In this systematic excavation, the position of all artefacts was plotted in three dimensions and the bones recovered by layer, square by square. The soil from each layer and square was sieved (4 mm mesh). As an experiment, a surface

Fig. 61. The main excavation area, seen from the north, and preparation of Section A.

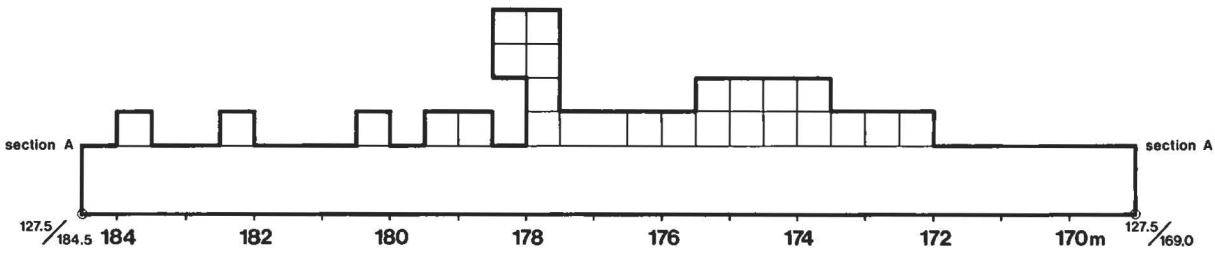


Fig. 62. Plan showing the systematically excavated squares, Trench A, and Section A.

preparation of the most compact layer of bones in a couple of squares was made to document bone articulations (Fig. 67B). Altogether, 6¾ sq.m. (= 27¼-sq.m. squares) were excavated in connection with Section A (Fig. 62).

In the systematic excavation, the greatest possible account was taken of the fact that frost and dehydration phenomena (cryoturbations, cracks) had in several places complicated the stratigraphy. Thus find material from cracks, where younger and older finds could be mixed, was kept separate from the securely stratified material.

The midden layers

Distribution

The test pits serve, *i.a.*, to indicate the distribution of ossiferous midden layers at the site, but the number and distribution taken into consideration, only more general

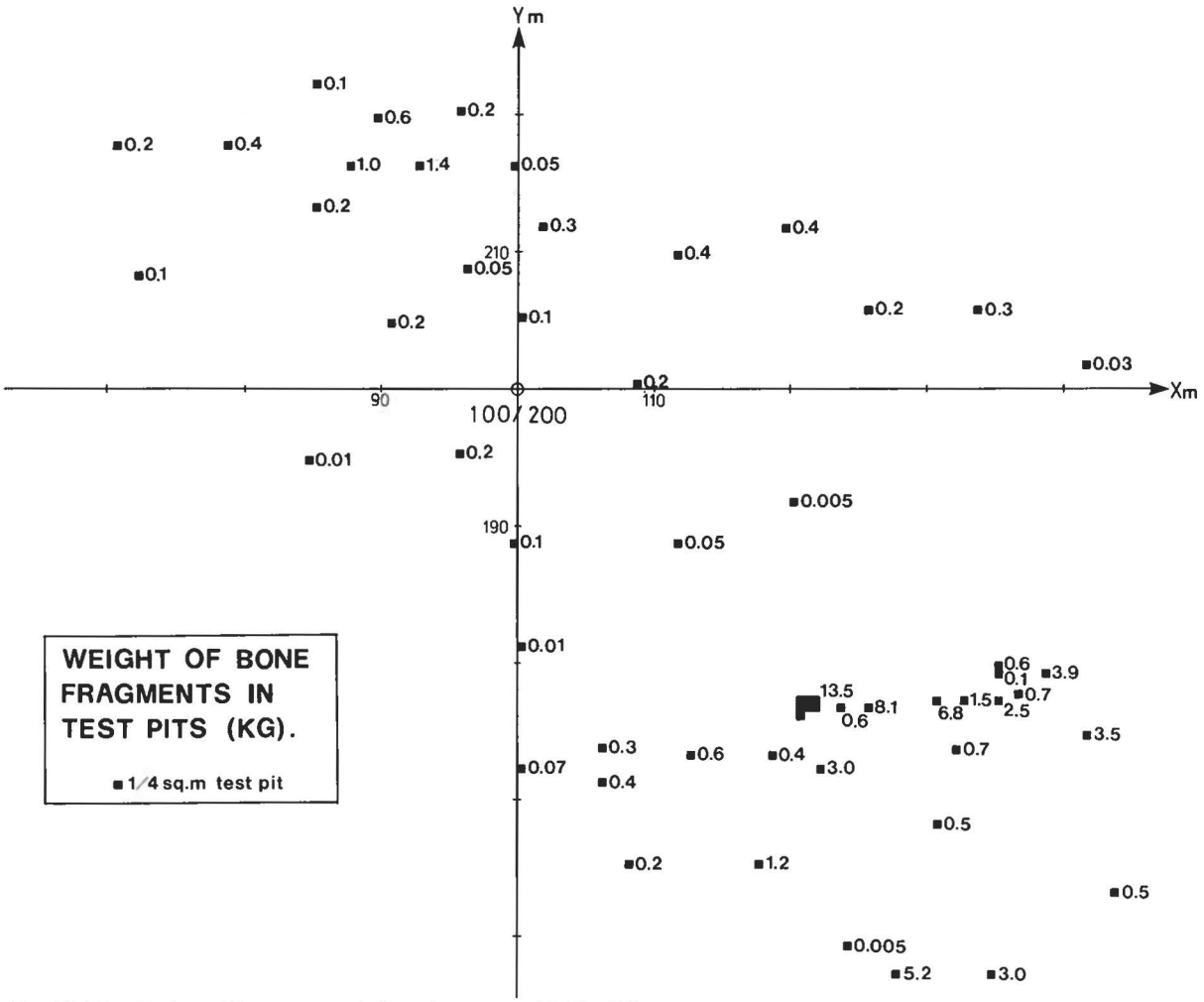


Fig. 63. Distribution of bone accumulations (compare with Fig. 58).

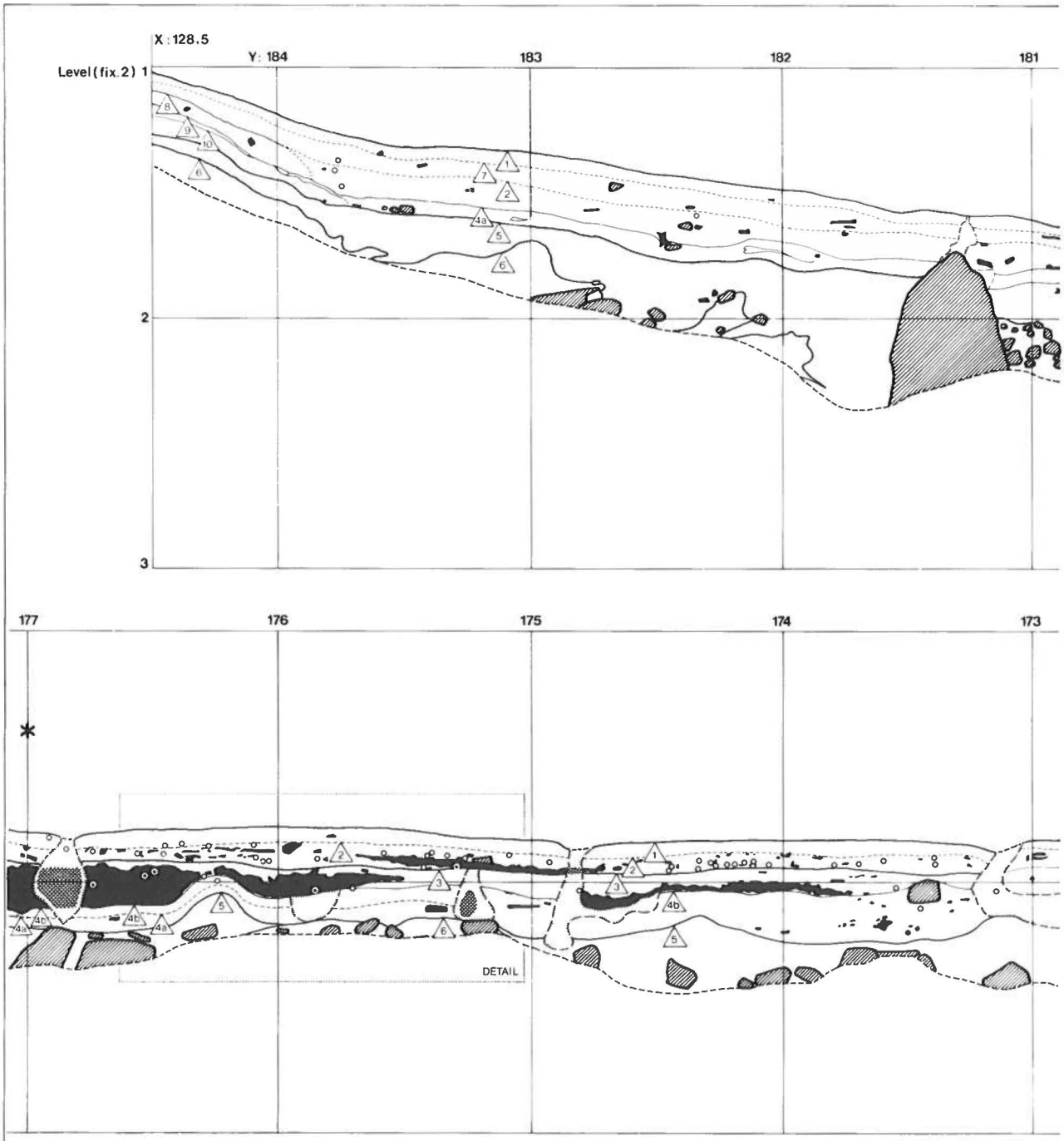
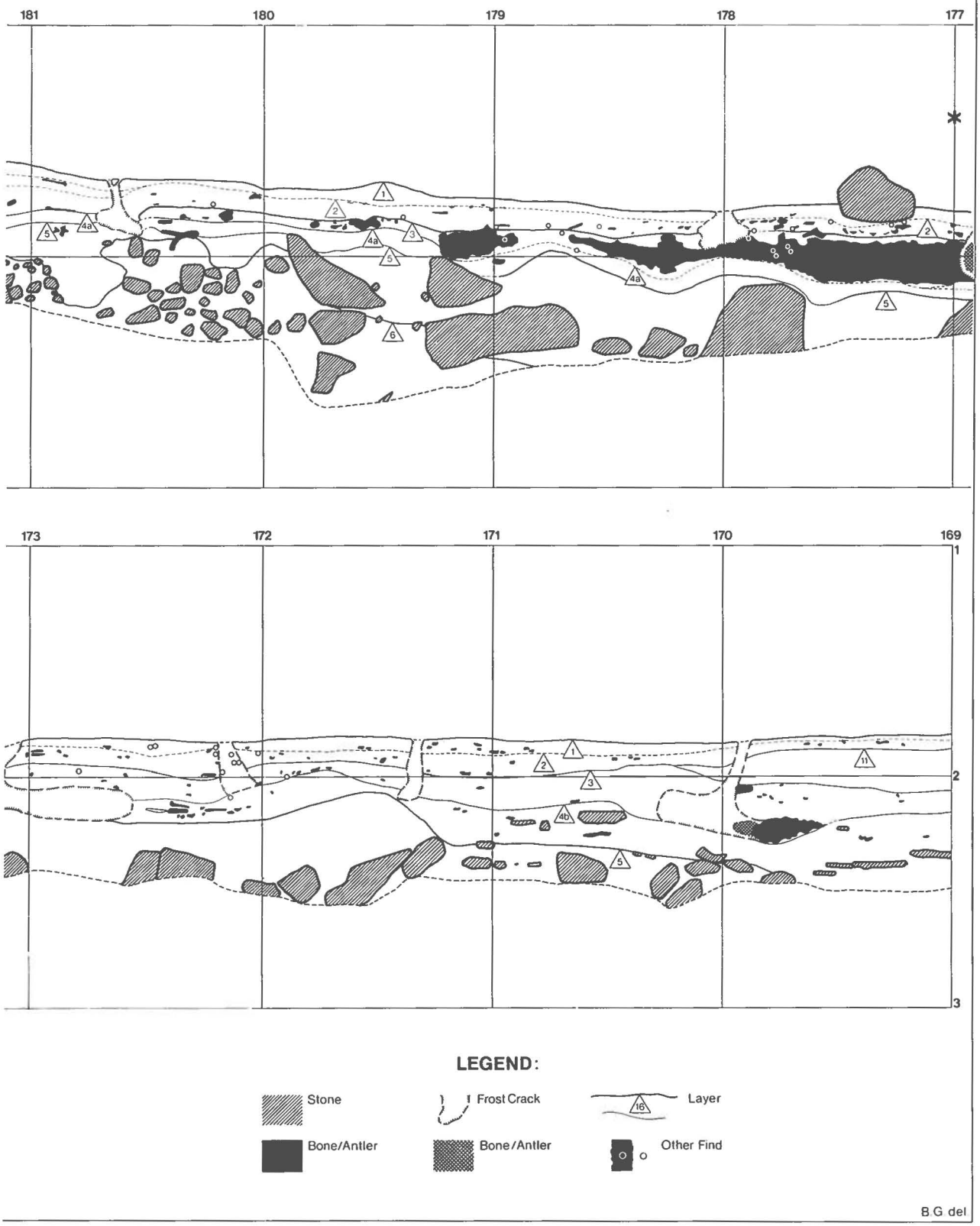


Fig. 64. Section A.


181
180
179
178
177
173
172
171
170
169
1
2
3
LEGEND:
Stone
Frost Crack
Layer
Bone/Antler
Bone/Antler
Other Find
B.G. del

conclusions are justified. Fig. 63 shows the total weight of bones for each test pit, and it is apparent that midden layers are found over most of the site, but that they are by no means evenly distributed. The bone weight per 1/4 sq.m varies from a mere 5 g to over 8000 g. The midden layers are clearly scattered accumulations of varying extent and thickness.

At upper Au, the midden layers are found in the northern part, between the remains of the tent-houses and the willow scrub. North-east of Au, there is an accumulation with a diameter of 6–8 m, with bone quantities amounting to a maximum 1.4 kg per square. Lower Au generally contains greater quantities of bone than upper Au. The area between the incline to upper Au and the central houses contains a strong accumulation of bones divided into three parts. The central part has a concentration of up to 8100 g per square and the other two parts a maximum of 4000 g per square. A large accumulation of bones is also found in the southernmost part of the site out towards the river delta. This accumulation is sharply delimited to the west, where the concentration falls within 3.5 m from 5200 g per square to 5 g per square. This accumulation measures at least 10 m in an east-west direction.

It must also be mentioned that a good deal of bones are found on the bottom of the lake and in the lake sediments in front of the site. Bone and antlers can here be observed in a 6–8 m wide belt along the bank opposite upper and lower Au.

Stratigraphy

The profile Trench A transects the area between the incline to upper Au and the central group of dwelling remains in lower Au. Section A (Fig. 64) runs in the line 128.5/169.0 – 128.5/184.5, cf. Fig. 59. The natural stratigraphy was here carefully recorded. The soils were characterized according to Troels-Smith's system (1955), and the section measured and drawn. Soil samples were also taken.

Section A shows that the natural layer series can be divided into three horizons of greatly different appearance and structure (Fig. 65)[19]. The lowest horizon comprising Layer 6 is present in most of the section to about Y 179, and between Y 176 and Y 175, and is very sharply separated from the superjacent layers. Layer 6 is a purely mineral soil composed of silt, sand and gravel (Troels-Smith Ga 2, Gs 1, Gg 1), containing many stones of all sizes. It exhibits typical frost phenomena: solifluction and cryoturbation (Embleton & King 1975: 45–47).

The intermediate horizon, Layer 5, is relatively sharply defined and can be followed throughout the section. Its main component is silt, stained black to blackish-grey by humus (Ga 3 1/2 Sh 1/2). In this matrix are a few traces of peat (Tl and Th), a number of large stones, and pale lenses of silt. The composition of Layer 5 is otherwise homogeneous, and only the silt inclusions show that it has been subjected to very strong cryoturbation. It is by far the wettest in the section and permafrost is found in this stratum 60–70 cm below the surface.

The uppermost of the three horizons mainly comprises millimetre-thin horizontal lamellae with varying silt and peat dominance (lamella structure) (Fig. 66). Series of lamellae of different character have been separated as the individual strata 1–4.

Layer 4 (A and B) is the lowest in this horizon. It is a silt and herb-peat layer with a large content of peat (Ga 2 1/2, Th 1 1/2), of strongly compacted lamella structure. The herb peat consists mainly of parts of grasses, but twigs of birch and willow are also sporadically present. Layer 4 can be divided by colour into 4A and 4B, where the grey-black 4A can be followed in the northern part of the section and the brown 4B in the southern part from Y 177. These two sub-layers overlap between Y 177 and Y 175.25.

Layer 3 is a silt and herb-peat lamellated layer with a strong dominance of silt (Ga 3 1/2, Th 1/2), which has imparted a light greyish-brown colour. The peat consists of grasses with a few traces of moss. Especially in the lowest part, there is an admixture of small twigs of dwarf birch. Layer 3 is very sharply defined above and can be followed in the section from about Y 180.5.

In Layer 2, the silt and herb-peat lamellation is likewise dominated by silt (Ga 3 1/2, Th 1/2), while the dark-grey colour and more filted structure separate it from Layer 3. The lamellae are very distinct. Layer 2 can be followed throughout the section, but the boundary between it and Layer 1 is diffuse.

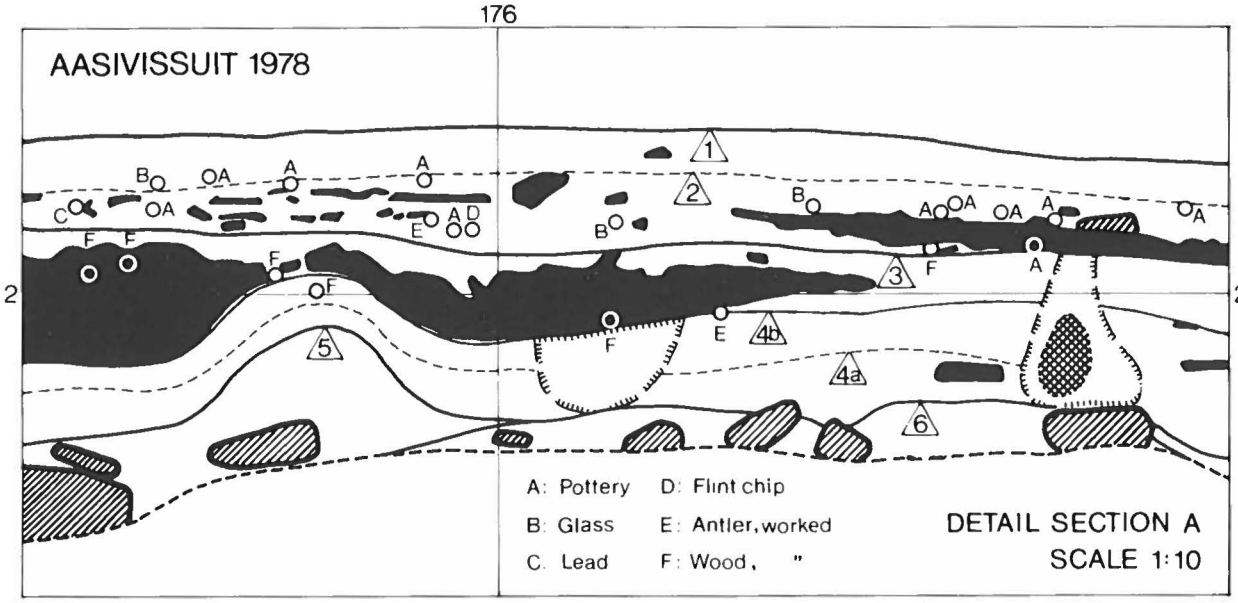
Layer 1 is the uppermost layer in the section. The recent grass here forms a strong filt. Layer 1 consists of lamellae of silt and herb peat (Ga 2, Th 2). The colour is light brownish-grey.

The structure of the layer series in Section A is the result of a great number of complex processes, and any interpretation of its formation on the basis of the extant data can only be sketchy. The interpretation builds on general works on periglacial phenomena (Embleton & King 1975), Greenland's quaternary geology (Weidick 1968, 1972 and 1976) and discussions with cand. scient. O. Humlum, Geografisk Centralinstitut, University of Copenhagen.

Section A must be considered in the context of the geomorphology around Aasivissuit. The mouth of the valley "Naanngisat Qoorua" down towards Aasivissuit Tasiat is today crossed by the many small tributaries of the river. The landscape around this little delta consists of long, flat, isolated, silt-covered terraces, divided by small valleys. This suggests that we are here confronted with a meltwater-deposited delta.

Layer 6 represents moraine deposits (bottom till) from the last glaciation of West Greenland. In the course of the ablation phase, Aasivissuit Tasiat is formed; its level must have been at least 5–10 m higher

Fig. 65. The central part of Section A. (A: Y = 175.0 – Y = 178.4, B: Y = 175.0 – Y = 176.6).



than at present. But as the ice gradually receded, considerable quantities of meltwater sediment (the silt fraction) are deposited to cover the now submerged bottom till. When the ice edge reaches the "Fjord Stage" (around 8000 B.C.), the supply of meltwater to Aasivissuit Tasiat stops, and the water level gradually sinks to the present level. New, smaller rivers, draining the areas north-east of Aasivissuit, gradually wear down a course into the meltwater deposits, and Layer 5 must originally have been the remains of a terrace situated at a low level and eroded from these sediments. This terrace gradually assumes a vegetational cover of herbs and scrub (grasses and willow), and silt is deposited there by the action of the wind. This happens in such a way that a lamellar structure develops – thin silt-dominated lamellae alternate with thin peat-dominated lamellae – and this mechanism continues up to the present.

The present character of the strata has, however, also been affected by frost phenomena. Layer 5 is situated in the zone just around the upper limit of the permafrost and has also a high moisture content; it is thus liable to cryoturbation. This blends silt and humus to the characteristic Layer 5 we now see in the section. Large stones from the underlying moraine deposits work their way up into Layer 5. In the uppermost horizon the silt-peat lamellation is retained, although it is strongly compressed onto Layer 5. Frost and drought cracks form a network in this horizon.

It must be assumed that each millimetre-thin silt or peat lamella which can be followed continuously through the section represents a synchronous horizon. The lamellae can be regarded as cyclical deposits and thus furnish the uppermost layers, 1–4, with a kind of "calendar". As yet, insufficient is known about the process behind silt deposition to decide whether the lamella can be a kind of annual varves and whether there is a correlation between climate and lamella formation.

This interpretation of the geological phenomena implies that the landscape around Aasivissuit has in essentials assumed its character during and immediately after the "Fjord Stage" of the inland ice. The topographical conditions at the camp have been the same for the first and the last caribou-hunters who chose to stay there.

Cultural remains, structure of midden layers

Numerous traces of human activity are found in the natural strata. The most obvious are the compact accumulations of bones in Layer 3 and Layer 2, but all strata from Layer 5 and up contain artefacts or bones, or both. In the excavations in connection with Section

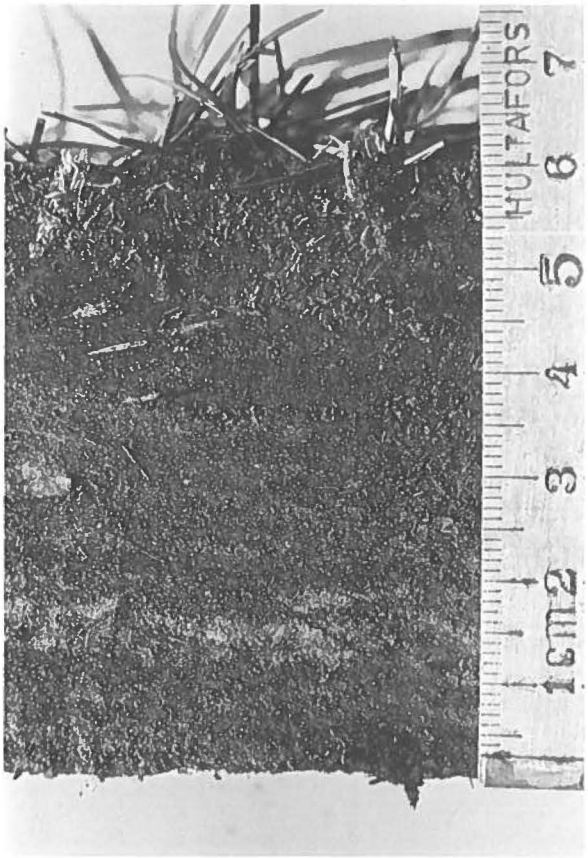


Fig. 66. Section of the lamellar horizon.

A, traces of dwelling structures were encountered at only two places: a tent ring on the surface and possible floor flags in Layer 4B in the southernmost part of the section. The section thus transects an area of the camp which lies outside the dwellings themselves, and the culture layers in Section A are called *midden layers*. Taking due account of secondary, cryoturbic disturbances in the strata, Section A can yield information on the structure of the midden layers at various times.

On account of the cryoturbation, the few bones from Layer 5 permit no conclusions as to structure, but in the superjacent Layer 4, a slight tendency to aggregation of bones in the middle of the layer is seen. But heap formation is marked in Layer 3, where the section transects a couple of compact bone accumulations, one between Y 179.5 and Y 175.5 (Fig.65) and the other – which can be merely an outliner of the first – between Y 174.75 and Y 173.75. (Fig. 67).

The large heap in Layer 3 was followed by means of test pits on both sides of the profile trench. It extends in an east-west direction from about X 124.5 to X 132.5. But, as has been shown earlier, this heap is merely part of a very large concentration at the level of Layer 3 in this part of the site.

In Layer 2 also, there are piles of bones, although much smaller than in Layer 3 (Y 175.5–Y 174.75 and Y 176.0–Y 176.5). Layer 2 is furthermore ossiferous throughout its entire thickness and extent in the section. The uppermost Layer 1 contains only a few scattered bone fragments.

The layers of Section A thus exhibit quite large differences in the structure of the midden layers: Layer 4, scattered bone fragments throughout the thickness with a tendency to accumulate in the middle; Layer 3, large compact heaps of bones encased in the deposit; Layer 2, small accumulations and between these a fairly even distribution of fragments throughout the thickness and extent of the layer; Layer 1, scattered fragments throughout the thickness and extent of the layer.

The *structure* of the midden layers varies – direct discontinuities in the deposition of bones in the midden area can be observed. The material from the systematic

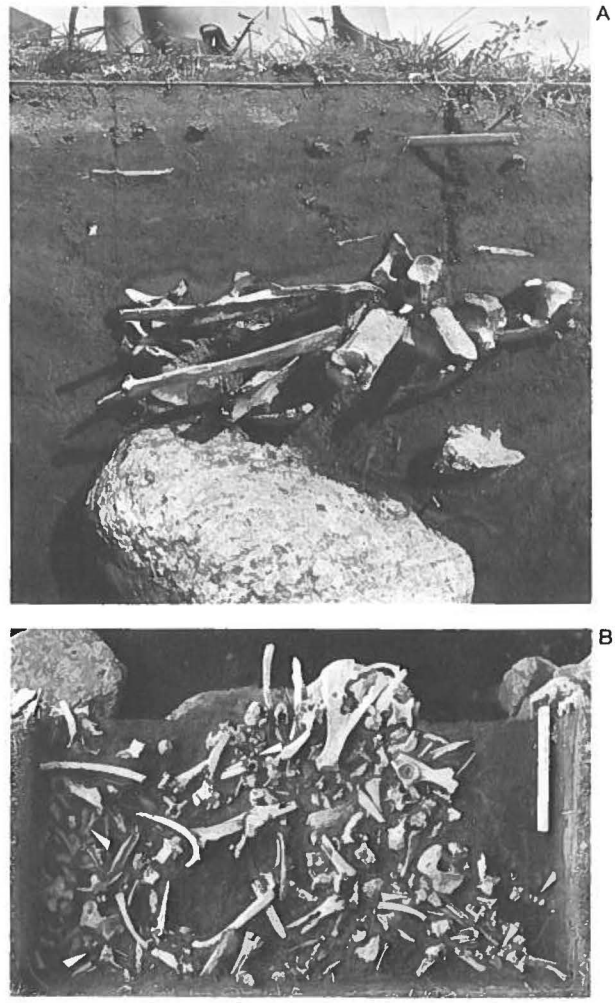


Fig. 67. A: Bone heap in Layer 3, sectioned. Note the pale silt-dominated lamellar series, sealing it. B: The same part of the heap, here surface-prepared. The arrows indicate articulated bones.

excavation, which will be treated in the following, will further show considerable variation in their *content*. By correlating structure with content, the changes in subsistence conditions at Aasivissuit can be illuminated.

The archaeological material

In relation to the large amounts of bone in the midden layers, the artefacts found are very few. They do give, however, a possibility of dating archaeologically the upper layers in Section A (1–3) and a limited insight into which tools and hunting weapons were used in the inland area (see lists of finds, Appendix I). The lower ossiferous layers, 4–5, yielded no datable artefacts, and the dating of these is based on C^{14} determinations.

Surface finds

About 150 m west of the site, a number of small flakes of *killiaq* (silicified slate) were collected (by Jens Rosing and Mads Lidegaard 1981). Killiaq is the preferred material of the Saqqaq culture, but is used to a smaller extent by the Dorset culture (Larsen & Meldgaard 1958: 47). These killiaq flakes can thus be the oldest traces of human presence at Aasivissuit.

Excavated finds from Section A

Layer 5. – The amount of bones from Layer 5 was so small that a C^{14} sample of sufficient size could not be taken in connection with the systematic excavation, but a C^{14} dating and archaeological dating from a small excavation segment 8 m west of Section A (120.5/176.5) gives an idea of the age of the earliest bones of the site. The C^{14} sample consisted of 5 bone fragments (*Rangifer tarandus*) extracted from a small pocket in the upper part of Layer 5. Between the bones was charcoal and 15 chalcedony flakes (Fig. 68). The core edge preparation of the flakes and a fragment of a microblade indicate the Dorset culture (Larsen & Meldgaard 1958: 64) and the C^{14} dating (K3152) is 2155 ± 75 B.P. (= 205 B.C. cal.), which is among the earliest datings of the Dorset culture in West Greenland.

Layer 4. – Layer 4 can, as mentioned above, be subdivided into 4A and 4B, based on differences in colour. Where these sublayers overlap (between Y 175.0 and Y 177.0), Layer 4A is below Layer 4B.

Layer 4A contained no artefacts, but sufficient bone material for a C^{14} dating (K 3153). This was performed on an antler shaft encased in the layer (at 128.5/175.5, level 211) and yielded 730 ± 70 B.P. (= 1280 A.D. cal.). With this dating, the sample is ascribed to the earliest part of the Thule culture (neo-Eskimo culture) of West Greenland (J. Meldgaard 1977: 38, Jordan 1979: 162). The few bones are found throughout Layer 4A and the C^{14} dating must be taken as a kind of mean for their age; small amounts of bones have ended up in the midden layers in the course of the 13th and 14th centuries A.D.

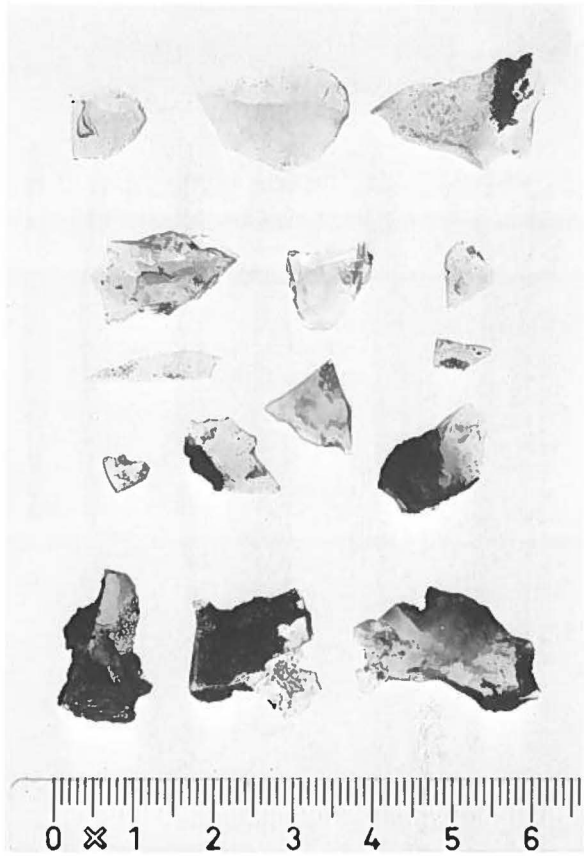


Fig. 68. Chalcedony flakes from Layer 5.

Layer 4B contained no artefacts either and a C^{14} dating must be relied on to give an indication of the time of formation. Here there is a distinct tendency towards a concentration of bones in the lowest part of the layer (i.e. the middle of Layer 4), and sufficient material could be collected from there for a C^{14} determination. This was taken at 128.5/176.0 and comprised 21 bone fragments of *Rangifer tarandus*. The C^{14} dating (K 3154) yielded 380 ± 65 B.P. (= 1480 A.D. cal.). It can thus be established that the bones in Layer 4 were deposited over a period from the 13th century to at least the 16th century. Bones are found throughout the layer, but with a tendency to concentrate at a level dated to the end of the 15th century.

Layer 3 (see list of finds, Appendix I). – The Eskimo artefacts from this layer indicate a late part of the West Greenland Thule culture, "Inugsuk phase", (Mathiassen 1930, 1931). The two antler arrowheads with screw tang (Fig. 69) give a broad dating, being placed chronologically in the period from the end of the 16th century to the first half of the 17th (Mathiassen 1934: 119, Gulløv & Kapel 1979/80: 372, see also Porsild

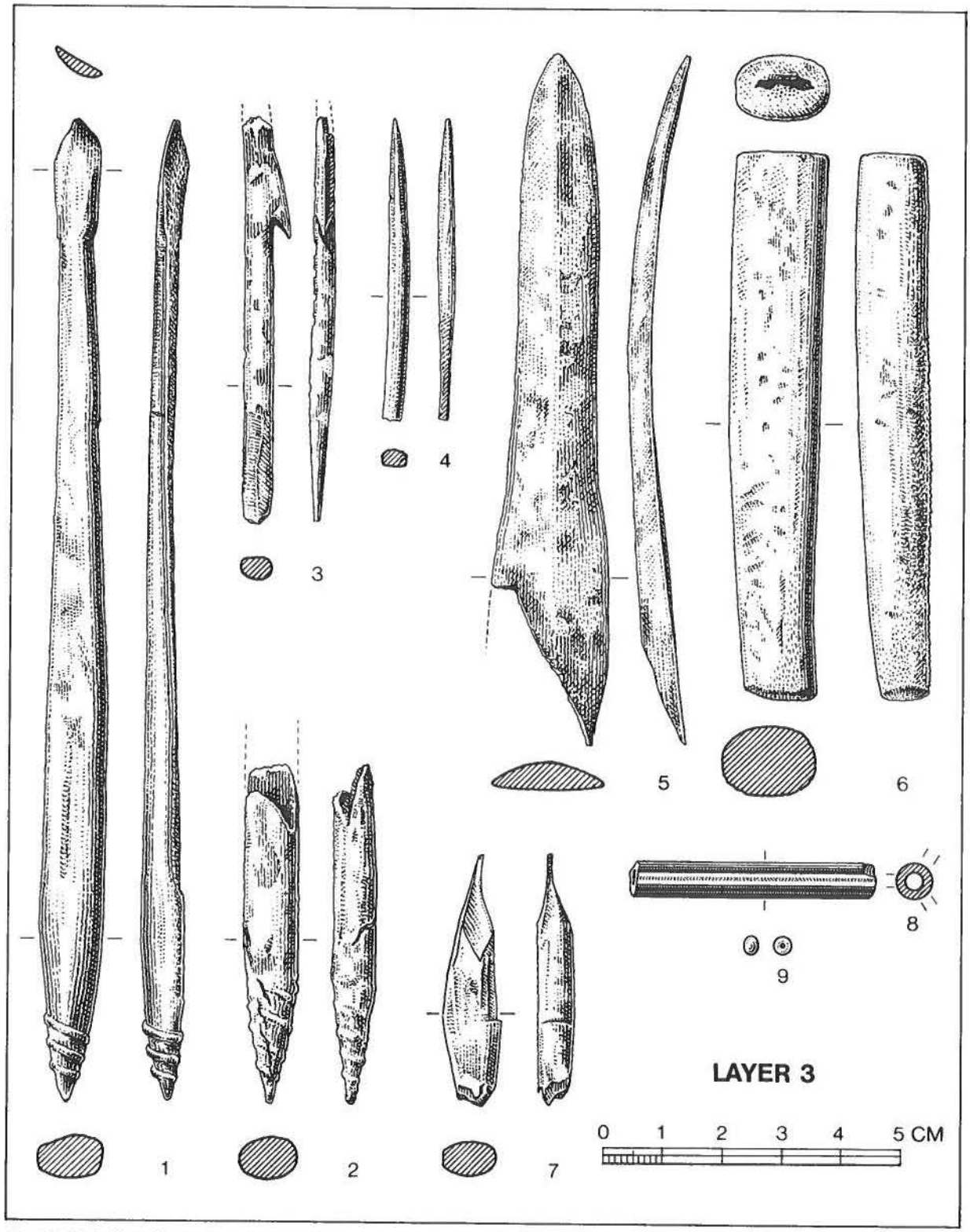


Fig. 69. Finds from Layer 3. 1–2: arrowheads with screw tang (antler); 3: fragment of distal end of arrowhead (antler); 4: awl (bone or antler); 5: point of arrowhead (antler); 6: knife handle (antler); 7: basal end of lateral branch of fishing spear or bird dart with secondary working (antler); 8, 9: glass beads.

1915). The Eskimo find material does not permit a closer dating and we must turn to the objects of European origin, the glass beads, for this.

Layer 3 contained a large cylindrical black bead with red and white stripes and a small white wound bead (Fig. 69). An almost identical bead made in 17th century Amsterdam parallels the first specimen (van der Sleen 1967: 54–55, 11th row, no. 1), and also the white bead finds a parallel there (5th row). This more "advanced" bead production in Amsterdam did not begin until after 1613 (immigrated Venetian glassmakers) and was intensified during the 17th century (ibid: 113–115). The two beads must, then, have been brought to Greenland with the numerous whaling and bartering ships, mainly Dutch, which frequented the West Greenland coast through the 17th century and the first half of the 18th (Gad 1969: 16f, Vibe 1967: 89). The time of deposition of the beads in Layer 3 can thus confidently be placed some time in the period from the latter half of the 17th century to the first half of the 18th (also taking into account the dating of the arrowheads).

The structure of the bone heap in Layer 3 (compact, without horizontal stratification, Fig. 67A) and the position of the datable beads (the cylindrical bead and the wound bead were found in the lower and upper parts of the central bone mass respectively) indicate that the heap must have been accumulated over a few years without major interruptions in deposition. The large accumulations of bones which literally filled the depression cut by the section are covered by a pale stripe of silt, which is almost devoid of finds (Fig. 67A). This discontinuity in the deposition of midden layers can also be demonstrated in the dating.

Layer 2 (see list of finds, Appendix I). – The archaeological find material from Layer 2 contains only a few artefacts of Greenlandic origin (Fig. 70) and dating must be made on trade goods. Quantitatively, faience fragments, all of the so-called Cream Ware (Godden 1966: XV, Towner 1957: 3) dominate. Some sherds are decorated with painted motifs, but the majority have been ornamented by transfer printing. 5 pieces of the latter are decorated with bat-printed underglaze blue and 5 are furnished with pink and purple lustre. The motifs are for the most part stylized flowers, but also naturalistic scenes are seen.

Cream Ware was produced in England from the mid-18th century, and ousted the so-called Delft Ware completely towards the end of the century (Godden 1966: XV). The decoration yielded further information on dating: the printing technique was introduced in the 1750's and early in the 19th century was improved so that very complicated designs could be mass-produced (Coysh 1970: 7). Blue and White Transfer Ware (Underglaze Blue) was first produced after the 1780's and the bat printing technique first used from the beginning of the 19th century (Godden 1966: XVII). Likewise, lustre decoration was not introduced into the ordinary faience market until the early 19th century (Godden 1966: XXIV).

In Layer 2, lustre-decorated faience was found throughout the deposit (Fig. 65), which can thus be shown to have been deposited after the early 19th century. The dating of the rest of the faience in the layer harmonizes well with this, cf. the above information on decoration technique. Parallels to the painted flower motifs on the sherds from Layer 2 (Fig. 70,1) are found in an English pattern book of 1820 (Godden 1966: 196).

The other European trade goods from Layer 2 comprise porcelain sherds (all of the so-called "soft paste" (Godden 1966: XVII), red, lead-glazed earthenware with yellow wavy ornament (Mathiassen 1930: 319), clay pipe fragments (Gulløv & Kapel 1979: 146), a porcelain pipe fragment, glass sherds, gun-flint (Hess 1968: 13), pieces of lead and iron, a pewter button, a metal ring and glass beads (Hansen 1979). These are typical goods from the *Kongelige Grønlandske Handels* (Royal Greenland Trading Company's) former trade assortment, and some possibly English "illegal trade goods" (Gad 1976: 304f, 313). Their date is thus in excellent agreement with the faience. Despite problems with an upper date – for example many English faiences have a lengthy period of production – it must be held likely that cultural remains in Layer 2 date to the first half of the 19th century. Matthiassen (1930: 318–319) assigns a similar combination of finds to the period 1820–1850.

The datings, in conjunction with the structure, of Layer 2 show that we are dealing with a varied deposition of rubbish through the 19th century, with the strongest activity in the first half of the century.

Layer 1 (see list of finds, Appendix I). – In Layer 1, the archaeological material is so sparse and uncharacteristic that a dating based on the objects alone is not possible. As the few artefacts and bones are found scattered throughout the layer, it can be established that it represents the remains of very sporadic visits by few people from the end of the last century until the traditional use of Aasivissuit ceased in the middle of the present century.

Dating – evaluation and summary

The characteristic features in the stratigraphy of Section A are found again in the test pits in lower Au. Particularly well defined is the succession corresponding to Layers 1–3, the pale lamella sequence sealing the compact accumulations of bones being traceable over most of lower Au. The find material from the test pits and Trench A (Fig. 71) harmonizes chronologically with the finds from the systematic excavation. Characteristically enough, only the late Cream Ware is found among the faience, and not a single piece of Delft Ware, a coarser, older type of faience, brought to Greenland by colonizers and whalers in the course of the 18th century (Gad

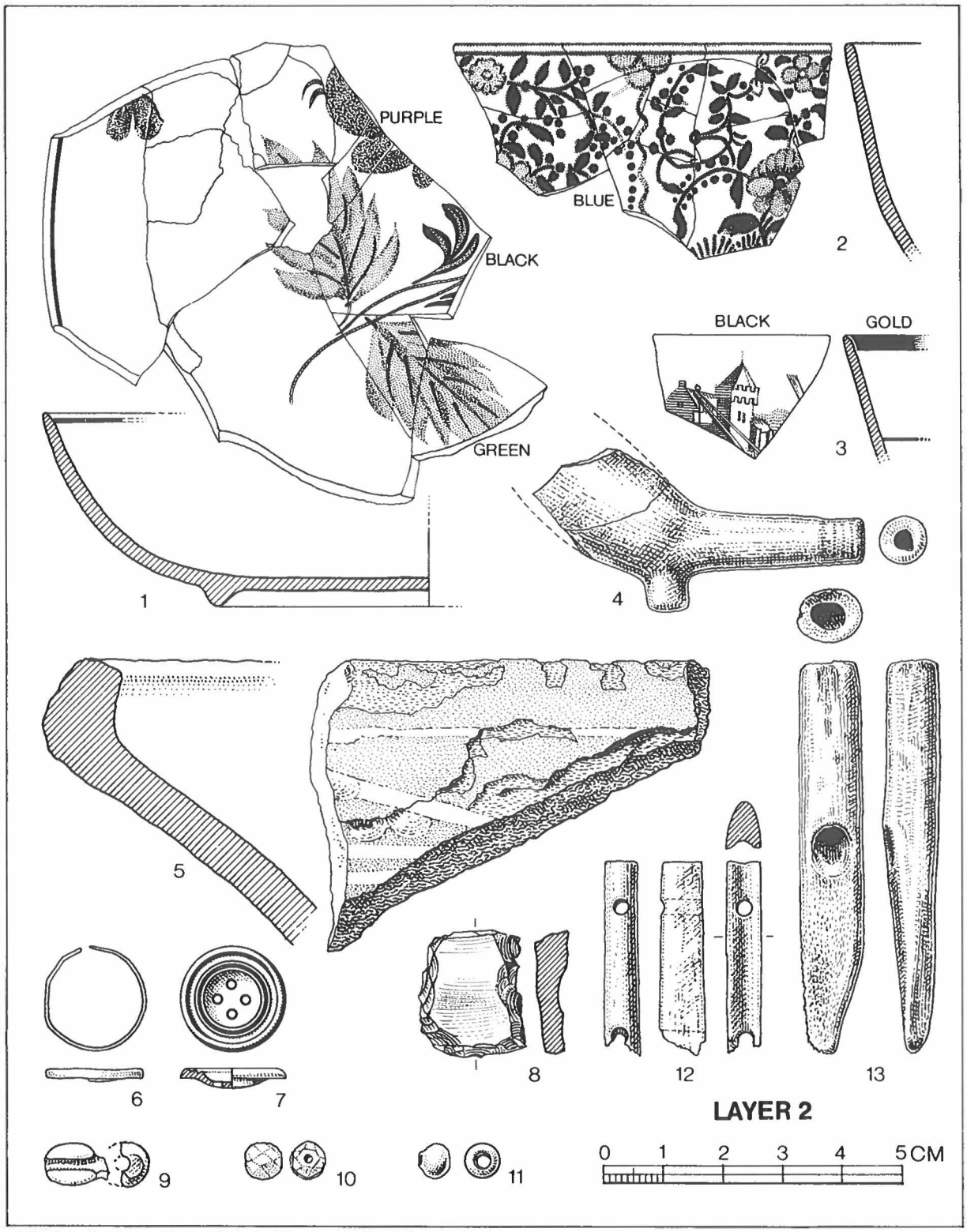


Fig. 70. Finds from Layer 2. 1–3: faience sherds; 4: fragment of porcelain pipe; 5: earthenware sherds; 6: metal ring; 7: pewter button; 8: gun-flint; 9–11: glass beads; 12: edge-trimming fragment (antler or bone); 13: line terminal (antler).

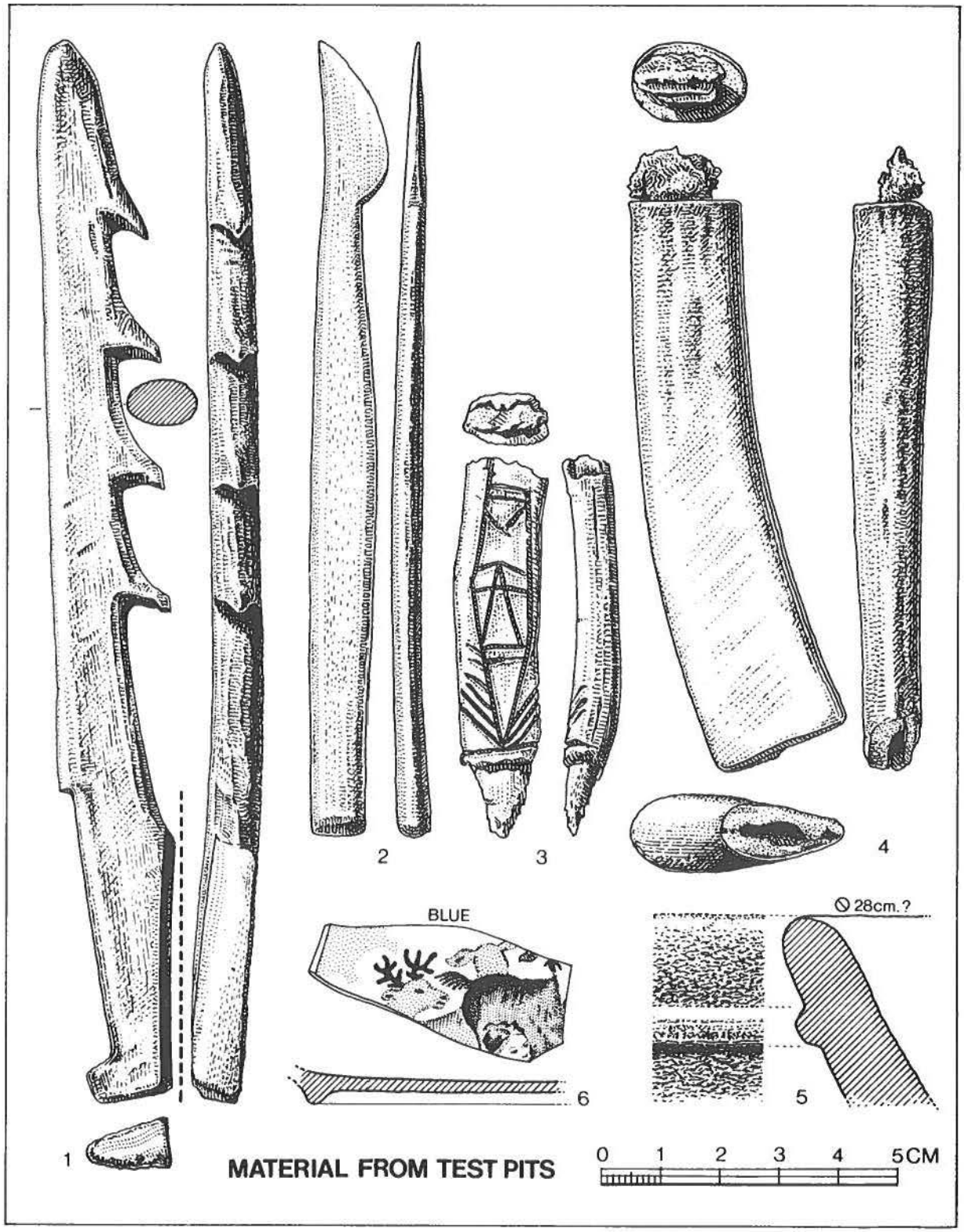


Fig. 71. Selection of finds from test pits. 1: lateral branch of bird dart (antler); 2: "boot creaser" (antler); 3: decorated handle (antler); 4: knife (antler handle, iron blade); 5: rim sherd of pot or lamp (soapstone); 6: faience sherd with printed reindeer or caribou motif.

1967: 372, Godden 1966: XI, Gulløv & Kapel 1979: 156–159).

In upper Au, test pits in the rubbish areas generally show a uniform stratigraphy. Here 5 layers can be distinguished, the 3 uppermost bearing artefacts. The datable finds are few, but faience of the same kind as that found in Layers 1 and 2 is found in the two uppermost layers. In the test pits from upper Au, no finds have been recovered which fall outside the chronological framework established for lower Au.

Observations from the test pits thus render it probable that the systematic excavation has not overlooked any important phase of occupation of the camp's more recent history – at least not so far as the neo-Eskimo phases are concerned. We consider the datings which can be read in the systematically excavated material to be generally applicable to Aasivissuit.

The small flakes of killiaq which were collected west of the camp, possibly represent the presence of the Saqqaq culture at Aasivissuit, but so far the oldest bone finds from the camp itself derive from an early part of the Dorset culture in West Greenland (C^{14} dating to 2155 ± 75 B.P. = 205 B.C. cal.). This paleo-Eskimo phase from Aasivissuit is represented by only a few bones from Layer 5. Overlying these Dorset finds are in Layer 4 traces of the neo-Eskimos, the Thule culture, which at varying intervals and intensities have visited the site over a period of time stretching from the 13th to at least the 15th or 16th centuries (C^{14} dating of Layer 4A to 730 ± 70 B.P. = 1280 A.D. cal. and of 4B to 380 ± 65 B.P. = 1480 A.D. cal.). The greatest quantities of rubbish reached the midden at the end of the 15th century. Only a few bone finds show sporadic visits in the subsequent period.

On the other hand, the camp experiences a period of intense use some time in the interval from the latter half of the 17th century to the first half of the 18th (Layer 3, dated by means of arrowheads with screw tang, and Dutch whaler beads). Within this, apparently brief, continuous period of use, enormous quantities of bones accumulate in the midden. But as abruptly as this period at the camp starts, just as abruptly does it stop – the big heaps of bones silt up. A very few bones from this layer may derive from specific visits in the following decades, but not until the first half of the 19th century is increased use of the camp seen again in the form of small concentrations of bones in Layer 2 (dated primarily by faience). The finds in the uppermost layer, Layer 1, show that the site was subsequently used with variable, gradually falling, intensity up to the present century.

Tools and traces of working

The artefacts and bone and antler pieces with traces of working testify, despite their limited numbers, to some of the activities which have taken place at the camp and to the weapons used in hunting.

In the lower layers, 4–5, as mentioned above, no artefacts were found, but traces of working show that chopping tools (transverse chopping mark on one piece of antler from each layer) and burins (burin grooves in three pieces of antler from Layer 4) have been used. A bird bone (ulna, *Anser albifrons*) from Layer 4 has been finely smoothed with a sharp edge.

In Layer 3, 16 bone and antler fragments with traces of working were found. Burin technique predominates, but there are distinct, very fine saw marks on two pieces of antler and a metatarsal. The remainder of the worked pieces have been worked with a knife. The artefacts reveal activities like sewing (bone needle), cutting (knife shaft) and fire drilling (fire drill). The two gull hooks or barbs of fish spears and the four arrowheads bear witness to the fishing and hunting methods. Hunting with bow and arrow is also confirmed by the fragment of a bow of driftwood which was found in the bone heap during the excavation of Trench A. It should also be remarked that gun-flint was nowhere found at the level of Layer 3.

In Layer 2, saw technique dominates completely. No less than 10 pieces out of 14 worked antler and bone pieces are exclusively worked with a saw. The remainder have been cut, chopped, or in one case worked with a burin. The objects which from the beginning of the 19th century have been carried to the site are for the large part European trade goods. It is quite astonishing to see how much smallware has been carried inland to Aasivissuit – faience, porcelain, earthenware, glass, beads, pipes. The finding of gun-flint and the numerous chips from it manifest an abrupt change in weapons. The flint-lock gun has replaced bow and arrow. Lead is carried to the camp and projectiles cast there (4 casting drops of lead, see also Vibe 1967: 100).

The artefact material from Layer 1 is too sparse to tell us much about crafts activities, but the hunting history can be rounded off. On the surface, a couple of cartridge cases fitting the more modern breech loaders were found.

The bone material

The bone material from the Aasivissuit caribou-hunting camp derives entirely from the midden layers, great care having been taken to avoid dwelling remains in the placement of the excavation segments. Six ossiferous layers were excavated in the midden deposits, five representing the Thule culture and colonial period (ca 1200 A.D.–1950 A.D.) and the sixth the Dorset culture (ca 200 B.C.) (Fig. 72). A total 374 kg of bones from test pits, trench and systematically excavated main area, with 68, 177 and 126 kg respectively, were recovered. The 126 kg of systematically excavated bones, comprising 19 747 fragments, have been sorted and identified in the laboratory. The number of fragments being so large and the amount of information desired from each fragment so great, a computer was considered

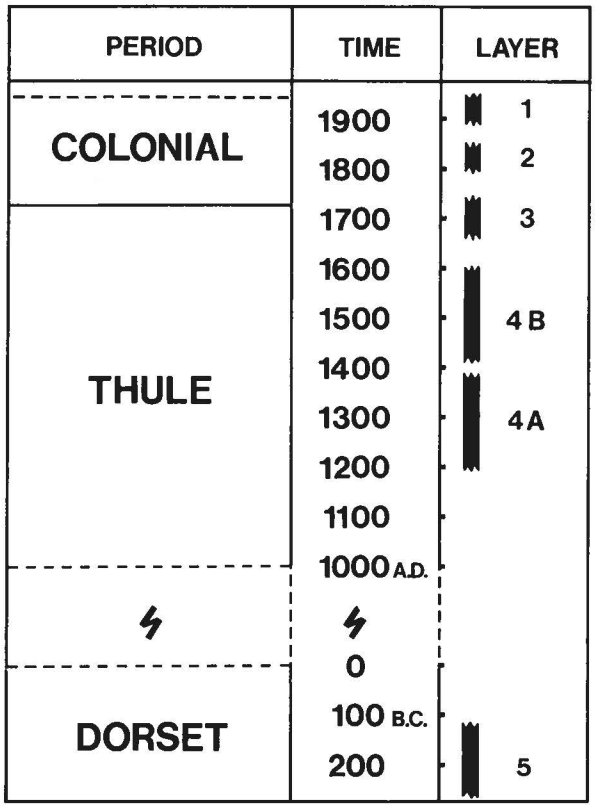


Fig. 72. Key to the ossiferous midden layers.

necessary in the processing of the material. The computer programme itself – "The Arcady Program Package" – and the zoological classification code employed have been developed with special reference to the analysis of archaeological data (Aaris-Sørensen 1983, Fisher & Mortensen 1979)[20].

The results of the bone identification are presented in Table 1, where the fragments are distributed according to layer and species. Appendix II goes into greater detail, giving distribution of fragments by layer, species and skeletal part.

The composition of the game

By and large, all the game animals of the inland area are represented in every midden layer (Table 1). The quantitative relationship between species is also very uniform down through the different layers (Table 2). Generally, caribou bones dominate completely, comprising in nearly all layers more than 90% of the total of species-identified fragments. It should be remarked, however, that fragments of identified avian bones (mainly white-fronted goose) comprise almost one third of the total number of identified fragments in Layer 4B (15th–16th century), which is in sharp contrast to the other layers, in which avian bones never constitute more than 5%. It seems that great emphasis was placed at that period on fowling. Perhaps the high figure reflects battue on moulting birds in the lakes of the catchment

Table 1. The distribution of 19 747 bone fragments according to species and midden layer. The distribution by bone element is presented in Appendix II.

Species	Layer 1 1900–1950	2 1800–1850	3 1650–1750	4B 1400–1600	4A 1200–1400	5 ca 200 B.C.
Common mussel (*Mytilus edulis* L.)		4	4			
Bivalves *Bivalvia*)	1	6	9		1	
Char (*Salvinellus alpinus* L.)		11	3			
Cod (*Gadus morhua* L.) or uuvak (*G. ogak* RICHARDSON)		1				
Fish (*Pisces spp.*)		9				
Great northern diver (*Gavia immer* (BRÜNNICH)	3	5	2			
White-fronted goose (*Anser albifrons flavirostris* DALGETY and SCOTT)	9	16	16	102	3	
Mallard (*Anas platyrhynchos conboschas* BREHM)	5	10	40	23		
Long-tailed duck (*Clangula hyemalis* (L.))		1		2		
Red-breasted merganser (*Mergus serrator* L.)		2	2	2		
Peregrine falcon (*Falco peregrinus anatum* TUNSTALL)	2	1				
Ptarmigan (*Lagopus mutus* (MONTIN))	1	11	10	11		
Birds (*Aves spp.*)	17	51	55	251	7	
Artic hare (*Lepus arcticus* L.)	10	11	4	6		
Artic fox (*Alopex lagopus* (L.))		2		1		
Common seal (*Phoca vitulina* (L.))			1			
Harp seal (*Phoca groenlandica* ERXLEBEN)	1			1		
Seals (*Phoca spp.*)	2	16	21	52	15	
Caribou (*Rangifer tarandus groenlandicus* GMELIN)	345	2884	7776	287	69	6
Mammals (*Mammalia spp.*)	216	3528	2841	822	121	
Total fragments	612	6569	10784	1560	216	6

Table 2. The distribution of bone fragments by kind and midden layer. Only fragments for which the species could be determined have been included.

Kind	Layer 1 1900–1950		Layer 2 1800–1850		Layer 3 1650–1750		Layer 4B 1400–1500		Layer 4A 1200–1300 A.D.		Layer 5 ca 200 B.C.	
	Absolute number	% of total	Absolute number	% of total	Absolute number	% of total	Absolute number	% of total	Absolute number	% of total	Absolute number	% of total
Invertebrates			4	0.1	4	0.1						
Fish			12	0.4	3	0.1						
Birds	20	5.3	46	1.6	70	0.9	140	32.2	3	4.2		
Mammals (less caribou)	11	2.9	13	0.4	5	0.1	8	1.8				
Caribou	345	91.8	2884	97.5	7776	99.0	287	66.0	69	95.8	6	100.0
Total	376	100.0	2959	100.0	7858	100.0	435	100.0	72	100.0	6	100.0

area (Bertelsen 1921: 152). The small populations of white-fronted geese and ducks must, however, have placed natural restraints on fowling.

There is an interesting inclusion of marine animals in the bone material, in spite of the location of the camp more than 30 km from the nearest salt water. Seal bones are found in practically all ossiferous midden layers and probably represent the remains of provisions carried to the camp on the journey from the coast. The only certain find of common seal was in Layer 3 (1650–1750 A.D.), suggesting the possibility of a caribou-hunters' route from the base of Kangerlussuaq to the camp (Fig. 1), the great river deltas at the base of this fjord providing one of the few larger breeding areas for the common seal in West Greenland.

The common mussel shells probably stem from the fjords to the west of the site and not from Kangerlussuaq, which is very muddy and unsuitable for mussels (G. Høpner Petersen pers. comm.). The shells have possibly been used as soup spoons (Birket Smith 1924: 387, Lynge 1981: 85) and as scrapers for bird skins (Nansen 1891: 117).

The solitary skull-bone of cod or uuvaq is probably the remains of dried fish which, like the seal meat, must have been used as a provision for the journey. The char bones do not derive from fish caught in the immediate environs of the camp, since they do not occur in Aasivissuit Tasiat or other lakes in the vicinity. The nearest localities where running char can be caught are the rivers flowing into and from the great lake Tasersuaq (Fig. 15), about 15 km west of the camp. Here there are also several large camp-sites where char fishing has been and still is of importance. It is probably char from these sites which have been brought to Aasivissuit.

Hunting season determined from osteological indicators

The rate at which arctic land animals develop is considerably greater in the summer than in winter. In summer, where food is available in plenty, the juvenile animals develop quickly and build up reserves of fat. In winter, shortage of food hampers growth, and energy reserves are drawn upon. This circumstance is of vital importance for osteological dating of season of occupation. For example, the development of the dentition of the juvenile caribou is retarded in the winter period (Edland 1969: 7) and the tooth eruption which can be employed in the context of season determination occurs primarily in the summer half of the year. It is therefore difficult to establish possible winter occupation by employing the ontogenetic development of caribou jaws. Neither can birds be employed in the establishment of winter occupation, the migrants flying south for the winter and the resident birds having retarded growth, like the caribou.

Determination of season from growth layers in teeth has been described (Spiess 1976, Bourque et al. 1978), and the method opens the possibility of demonstrating winter occupation, but it is difficult and requires further refinement and confirmation.

We must, then, regrettably note that osteological season indicators are practically synonymous with osteological summer indicators, and the chance of demonstrating summer occupation are thus *much* greater than the chances of establishing a winter presence.

In the following, the season indications for each of the midden layers containing bones are presented, and Fig. 73 indicates the most probable hunting season for the different periods.

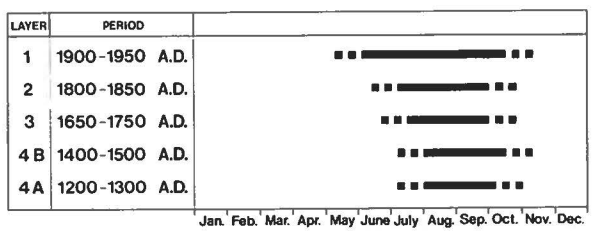


Fig. 73. Osteological season-dating for the different occupation phases.

Layer 1 (end of 19th century to about 1950). – Bones of a number of migratory birds (great northern diver, white-fronted goose, mallard, peregrine falcon) have been found in this midden layer. The migrants are found inland from the end of May to the end of October and can therefore have been killed only in that period.

Layer 2 (1800–1850 A.D.). – This layer yielded 8 caribou mandibles with M_1 erupting, 4 with M_2 erupting, and 2 with premolars erupting. These eruptions occur when the animals are respectively 2–5 months, 10–15 months and 22–29 months old. (The method of determining age is discussed on p. 73–74). With a calving period corresponding to the present one, these caribou must have been killed some time in the period between the beginning of July and the end of September (compare with Layer 3, Fig. 74).

A distal end of tibia from a ca 1-month-old white-fronted goose was also found in the layer. Goslings of this species are particularly appropriate season indicators, the breeding period being well defined. On arrival at the nesting site, the geese have energy enough to lay only one clutch of eggs. If this clutch fails, the scanty vegetation at this early time of the year does not provide enough food to permit the building up of new energy reserves sufficiently quickly, so that a replacement clutch can be laid (N. O. Preuss pers. comm.).

The eggs are laid at the end of May (Salomonsen & Johansen 1950: 61), and with an incubation period of about 28 days, hatch at the end of June. The ca 1-month-old gosling must have been killed at the end of July.

The ulna of a ca 2-month-old leveret killed some time between mid-August and mid-October provides further evidence of season. In the Kangerlussuaq area, the first brood of ptarmigan chicks hatches in the beginning of July, and newly hatched chicks are seen as late as the middle of August (Müller 1906: 48). Thus a ca 10-day-old ptarmigan chick, represented by a scapula fragment, was killed some time in the period from the end of July to the end of August.

The most likely hunting season as it is manifested in the season indications for Layer 2 is the period from the beginning of July to the end of September (Fig. 73).

Layer 3 (brief period between 1650 and 1750 A.D.). – This layer yielded 8 caribou mandibles with M_1 erupting, 11 with M_2 erupting, and 7 with premolars erupting. The mandibles represent, exactly as those from Layer 2 (1800–1850), animals aged 2–5 months, 10–15 months and 22–29 months respectively (age determination p. 73–74). The hunting season has, according to this evidence, extended from the beginning of July to the end of September (Fig. 74).

Observations at a recent caribou-hunting camp in an inland situation south of Kangerlussuaq confirm the evidence on season of the mandibles from Layers 2 and 3. This site had been used from the middle of July to the beginning of August 1981, and the caribou mandibles could be divided into three age categories identical to those of the excavated mandibles (Fig. 75).

The other season indications, a ca 1-month-old chick (1 dist. humerus), a ca 2-month-old leveret (1 scapula, 1 humerus, 1 prox. costa), and migratory birds, and their testimony on hunting season are illustrated in Fig. 74. The biological data on which the season determination is based are described under Layer 2.

Layer 4B (15th–16th century A.D.). – The season dating of Layer 4B has been based on a) a ca 2-month-old leveret (1 fragm. scapula, 1 prox. radius, 1 dist. femur), killed some time in the period from mid-August to mid-October, b) a ca 1-month-old gosling (1 diaph. tibia), killed at the end of July, c) a 1–2-month-old ptarmigan chick (2 humeri, 2 coracoidae), killed in the period from the beginning of August to the middle of October, and d) migratory birds (white-fronted goose, mallard, long-tailed duck and red-breasted merganser), killed some time during the period from the end of May to the end of October. These indications provide evidence that the hunting season most probably extended from the end of July to the middle of October (Fig. 73).

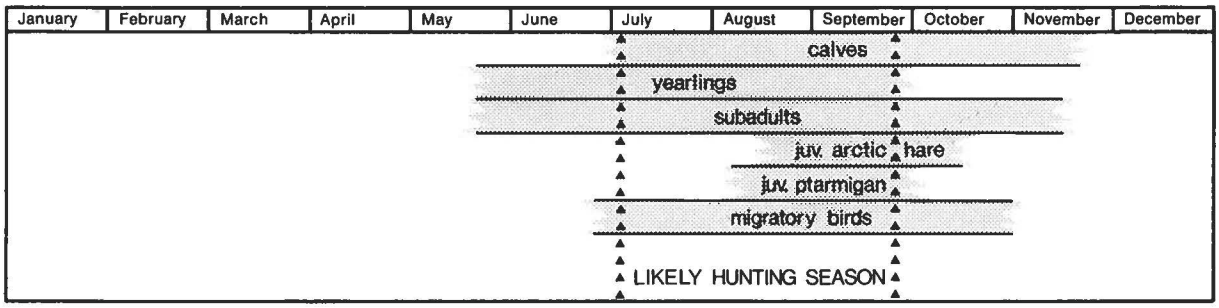


Fig. 74. Season dating of Layer 3 on the basis of osteological season-indicators. Caribou calves in particular are good indicators for the start of the probable hunting season and the ca 1-year-old animals for the end of it, both groups being characterized by exhibiting a) tooth eruption well defined in time, b) many mandibles with the same evidence and c) other season-indicators supporting the mandibular indications.

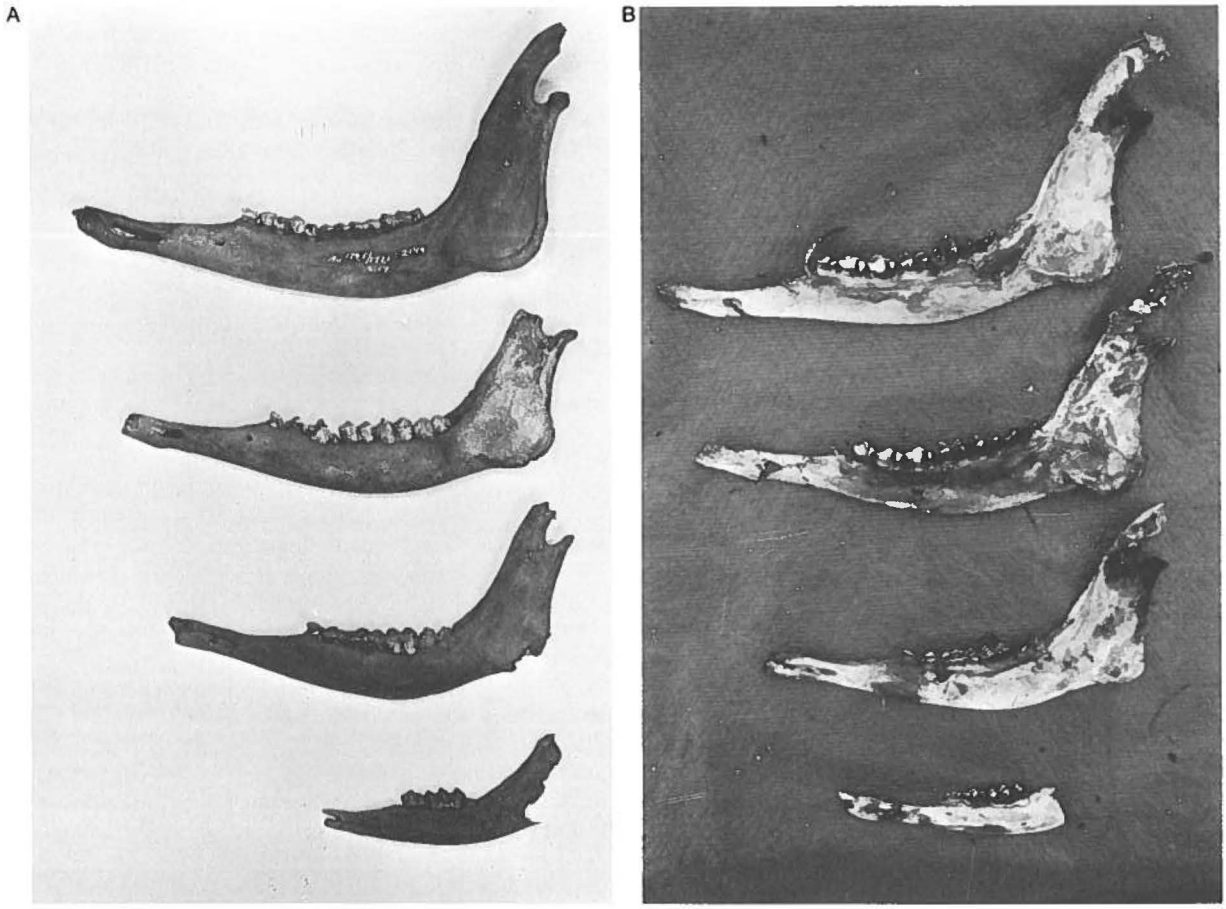


Fig. 75. Caribou mandibles from Layer 3 (A) compared with mandibles from a recent caribou-hunting site in the Kangerlussuaq area (B). The recent camp was in use from about 15th July to 10th August 1981. From bottom up: calves 2–5 months; yearlings 10–15 months; 2-year-olds 22–29 months; adults.

Layer 4A (13th–14th century A.D.). – From this layer the following season indicators were recovered: a) a juvenile, probably unfledged goose (1 coracoid, 1 fragm. scapula), killed some time in August, b) an adult white-fronted goose, killed some time in the period from the end of May to the middle of October. The most probable hunting season is August (Fig. 73).

Hunting season – summary. – The osteological evidence for the hunting season of the various occupation phases is quite uniform (Fig. 73). The camp has clearly always been used in the summer and autumn months (June to October), but it should be emphasized that the indicators employed cannot exclude winter visits, because the chances of finding a winter indicator are so extremely remote. The absence of osteological indications for spring occupation, and ethnographical sources, confirm, however, that summer-autumn is a reasonable season dating.

Fragmentation of bone material as an expression of subsistence changes

Degree of fragmentation, expressed in the number of bone fragments per kg bone, differs greatly from layer to layer (Fig. 76). The sample size for some of the layers is not large, but in general, the difference in degree of fragmentation between Layer 3 and the other layers is so large that it can hardly be fortuitous. The fragments from Layer 3 are on average twice as large as those from the other layers. This observation is confirmed if the fragment size of the individual bones from, for example, Layers 2 and 3 are compared[21]. The rib fragments from Layer 3 have a mean length of 14.5 cm (n = 363), whereas corresponding fragments from Layer 2 have a mean length of 7.9 cm (n = 90). The same applies to the limb-bones, the mean length of fragments from Layer 3 being 7.6 cm (n = 160) and that of fragments from Layer 2, 5.4 cm (n = 162).

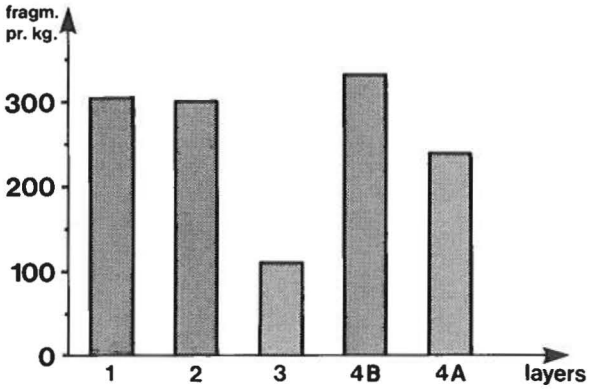


Fig. 76. Degree of fragmentation of the bone material. Layer 1: 2 kg; Layer 2: 21½ kg; Layer 3: 97 kg; Layer 4B: 4½ kg; Layer 4A: 0.9 kg.

Degree of fragmentation can be considered a function of the number of different working processes (butchering, marrow splitting, etc.) undergone by each caribou and as a function of the intensity with which these processes have been used. It can thus be concluded that the large bone fragments from Layer 3 derive from a period in which the utilization of the carcase has been relatively extensive. The small fragments from the other layers, in contrast, stem from periods where exploitation has been highly intensive. It must be emphasized that both Layer 3 and Layer 2 were deposited in periods of caribou maxima and that differences in fragmentation degree therefore do not reflect different resource levels. Layer 3 (short period between 1650 and 1750 A.D.) differs from both older and younger midden layers in its expression of "surplus conditions", a surplus which was probably created by the particularly effective hunting methods of the period (p. 83).

Articulated bones as an expression of subsistence changes

Bones which are articulated, i.e. bones lying in correct anatomical position, were often found during the excavation (Fig. 67b), in particular whole foot and hand joints and articulated hooves and vertebrae. These articulated parts were thrown onto the midden, held together by sinews and muscles. A large representation of articulated bones should probably, like the large bone fragments, be seen as an expression of a situation of abundance. Table 3 shows the number of articulated anatomical parts distributed by layer. The amount of bone material varies from layer to layer and this circumstance can partly explain the absence or deficiency of articulated anatomical parts in Layers 1, 4B and 4A in relation to Layer 3. Layers 2 and 3 are quite comparable. It is clearly seen that by far the largest number of articulated parts is found in Layer 3. Once more this horizon differs by supplying evidence of a period of abundance.

Selective hunting, yield, and selective treatment of the different parts of the caribou – an example from Layer 3 (brief period between 1650 and 1750 A.D.)

Sex and age determination of the caribou bone material can provide interesting information on any selective hunting. Likewise, a detailed analysis of the distribution of caribou bones by part can testify to any selective transport to and from the camp and to the various "food processing activities" within the camp itself. The bone material from Layer 3 only is sufficiently large to warrant so detailed an analysis, and the following description and interpretation therefore takes its starting point in this midden layer.

Selective hunting of calves and yearlings

Age determination of juvenile caribou. – The age determination has been performed on mandibles and on the basis of tooth eruption tables prepared by Frank Miller in connection with game studies in Canada (Miller 1974). A direct application of Canadian data to a Greenland caribou population could be open to criticism, but according to Miller there is nice agreement between tooth eruption dates of Canadian, Scandinavian and Soviet caribou, and it will be reasonable to assume that the tooth eruption pattern of Greenland caribou, too, will fit the Canadian pattern.

Table 3. Distribution of articulated bones by layer.

Anatomical part	Layer 1 (1900–1950)	2 (1800–1850)	3 (1650–1750)	4B (1400–1500)	4A (1200–1300)
Hand joints	–	–	11	–	–
Foot joints	–	–	9	–	–
Vertebrae	–	–	8	–	–
Hooves	–	–	4	1	–
Total	–	–	32	1	–
Total number of caribou bone fragments	345	2884	7776	287	69

Table 4. Tooth eruption and age in recent caribou (after Miller 1974), with age distribution of the bone material from Layer 3.

Indication	Ages	Number of mandibles
m_1 absent	0–ca 2 months	1
m_1 erupting	ca 2–5 months	8
Tooth wear and general ontogenetic development	calf	2
m_2 erupting	10–15 months	11
Tooth wear and general ontogenetic development	yearling	2
Premolars erupting	22–29 months	7
Tooth wear and general ontogenetic development	2-year-old	2

Based on Miller's data, one can establish a well defined series of chronological stages in the eruption process. Table 4 shows how the mandibles found are distributed according to different age groups.

Age determination of adult caribou. – The age of mandibles of animals older than 29 months has been determined on the basis of the degree of wear of the teeth. Miller has for a population of Canadian caribou adduced a series of tooth wear criteria characterizing different age groups (Miller 1974). It is these criteria which have been used in the age determination of the mandibles recovered from Layer 3.

One should generally exercise caution in applying the same tooth-wear/age relationships to two geographically separate caribou populations, since tooth wear is a function of the quality of the food and of the amount of dirt present – elements which vary from one region to another. It is thus not certain that the absolute ages corresponding to the tooth wear criteria are exactly the same for West Greenland and Canadian caribou, but if relatively broad age categories are employed in grouping the archaeological material, it is nevertheless possible to obtain a good picture of the relative age distribution of the caribou killed (Table 5).

If the number of mandibles from each age category is calculated as a percentage of the total number of mandibles from midden Layer 3, an age pyramid can be constructed (Fig. 77). By way of comparison, Fig. 78 shows the distribution for a caribou assemblage in the Aasivissuit catchment area in July/August (season dating of Layer 3 p. 71).

As will be apparent from the two figures, a selective hunting of calves and yearlings seems to have been practised, a situation which can be explained in two ways: 1) the selection has been intentional, calves and yearlings being particularly prized, or 2) it has been unintentional, special features of their behaviour making juveniles easy to kill.

With regard to the calves, both explanations are plausible. Calves are particularly prized because their short-haired soft hide is especially suitable for inner furs, summer clothing and children's clothing. At the same time, they are considerably easier to kill than the older animals, because they have still to develop their flight reactions. This means among other things that they are very inquisitive and that a calf is easy to lure by imitating the call of the mother.

Yearlings do not have so fine a coat as calves, so it is hardly for this they have been killed in relatively large numbers. It is more likely their lack of experience which makes them an easy prey to the hunter: they have not fully learned to react quickly and appropriately in unfamiliar situations.

This overrepresentation of young animals in relation to adults is also known from the majority of modern game statistics, and here it is not a question of the hunter's quality-appraisal, but simply of young animals being easier to bag than adults.

Selective hunting of bucks

The sex determination of adult caribou employing metatarsal dimensions. – Metatarsi are known to exhibit dimensional sex differences (bison: Bedord 1974; au-

Table 5. Tooth wear and age in recent caribou (after Miller 1974 and Spiess 1979: 78–80), with age distribution of the bone material from Layer 3.

Tooth wear criteria	Age in years	Number of mandibles
Wear on the premolars advances to the point where dentin exposed on each cusp is wider than each bordering piece of enamel, while the molars still retain sharp lingual cusps that are noticeably higher than the buccal cusps.	2,3 to 5	9
The high lingual points on premolars are worn and blunted, and all the molars have buccal and lingual cusps worn to even height. The exposed dentin on each molar has widened to a broad quarter or halfmoon. There is still some up and down wave-form going from front to back along each tooth.	6 to 9	4
The occlusal surfaces are flat buccolingually and anterior-posteriorly. The white cementum layer that originally separated the buccal from lingual cusps has been worn to a small oval or circle. In very old caribou m_1 may be worn down to its roots and resemble two peglike teeth.	over 10	2

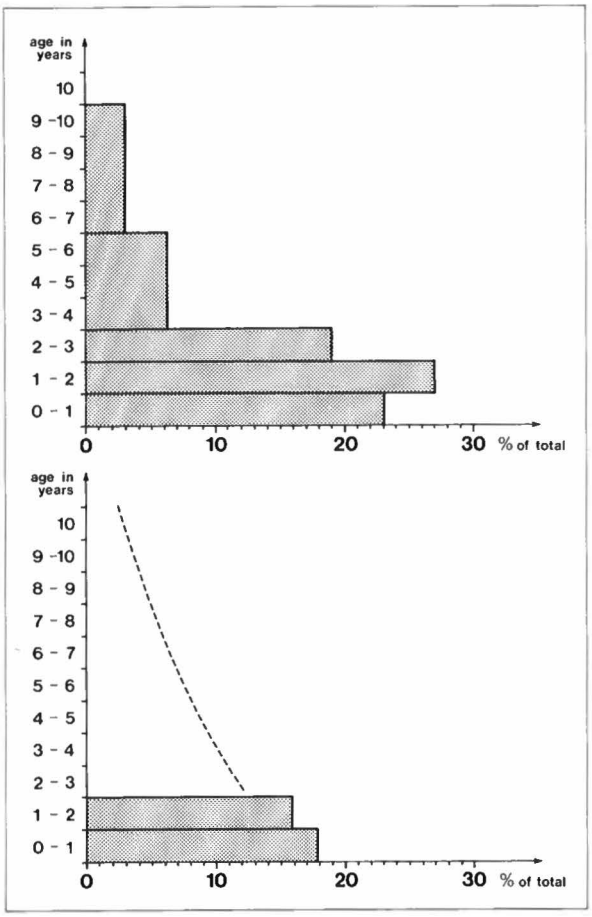


Fig. 77. Age distribution for caribou bones from Layer 3 based on age determination of mandibles (n = 48).

Fig. 78. Age distribution for caribou found in the Aasivissuit catchment area in July/August. The count distinguished between calves, yearlings and older animals (n = 3000), and was carried out by *Vildtbiologisk Station, Kalø*, in 1977–1979 (H. Thing pers. comm.).

roch: Degerbøl & Fredskild 1970: 95–105; caribou: Møhl 1972). On the excavated metatarsals (distal ends) were measured: 1) maximal width of the distal epiphysis and 2) maximal anterior-posterior thickness of the distal epiphysis. Only fully grown individuals were measured, i.e. metatarsals with the epiphysis completely fused to the diaphysis. The result (Fig. 79) is a proportion of bucks to does of about 1:1.

The sex determination of adult caribou employing pubic dimensions. – It has been found that the dimensions of the pubis are significantly different for does and bucks (Lie 1973). Only fully grown animals have been measured, i.e. only pubes in which the sutures separating the ischium, illium and pubis have completely fused. The measured dimensions are 1) minimal width and 2) minimal thickness. The pubis length defined by Lie has not been included, being very difficult to measure on archaeological material. It is seen from Fig. 80 that the 27 pubis halves fall into two groups, those with the largest measurements being bucks and those with the smallest, does. The proportion of bucks to does is once again about 1:1.

If the sex composition found is compared with that of the groups of caribou now frequenting the Aasivissuit area in July-August (Fig. 81), there is seen to be a relatively greater number of bucks in the bone material. A selective hunting of bucks has taken place.

Bucks are easier to get within shooting range of than does with calves and the relative predominance of killed bucks can thus be partly regarded as the result of unintentionally selective hunting. But there is also, from the point of view of the hunter, good reason to kill the autumn bucks in particular, and thus carry on an intentionally selective hunting, bucks being both larger and fatter than does in the autumn. The fat reserves of an August buck make up 20% of its total weight, whereas a doe from the same month has fat reserves corresponding to about 5–10% of her body weight (Fig. 82). The great advantage of killing a buck in the summer months rather than a doe is common knowledge among caribou hunters.

Hunting yield

In the $6^{3}/_{4}$ sq.m systemetically excavated, at least 71 caribou are represented in Layer 3 (353 lumbar vertebrae divided by 5 = 71 (Appendix II)). The excavated bones derive from a heap of considerably greater extent (about 30 sq.m). Based on the figures just given, one would expect the remains of at least 315 caribou to be present in this heap, but it should be emphasized that several corresponding heaps are found elsewhere on the site, so the number of caribou in Layer 3 in its full extent should probably be counted in the thousands.

Selective treatment of the different parts of the caribou

As will be apparent from Table 8, there are considerable variations in the frequency with which the different parts of the skeleton are represented. To facilitate a comparison of the representation of these different parts in the material, the frequency of individual bones has been calculated as a percentage of the most frequently occurring bone (Table 6 and Fig. 83).

Before variations in the incidence of the different bones are related to human activities, it is essential to evaluate the influence of the following factors on the bone distribution: a) excavation technique and method, b) physical/chemical environment and c) scavenger activity. In the following, an evaluation is given of the effect of these factors on the composition of the bone material.

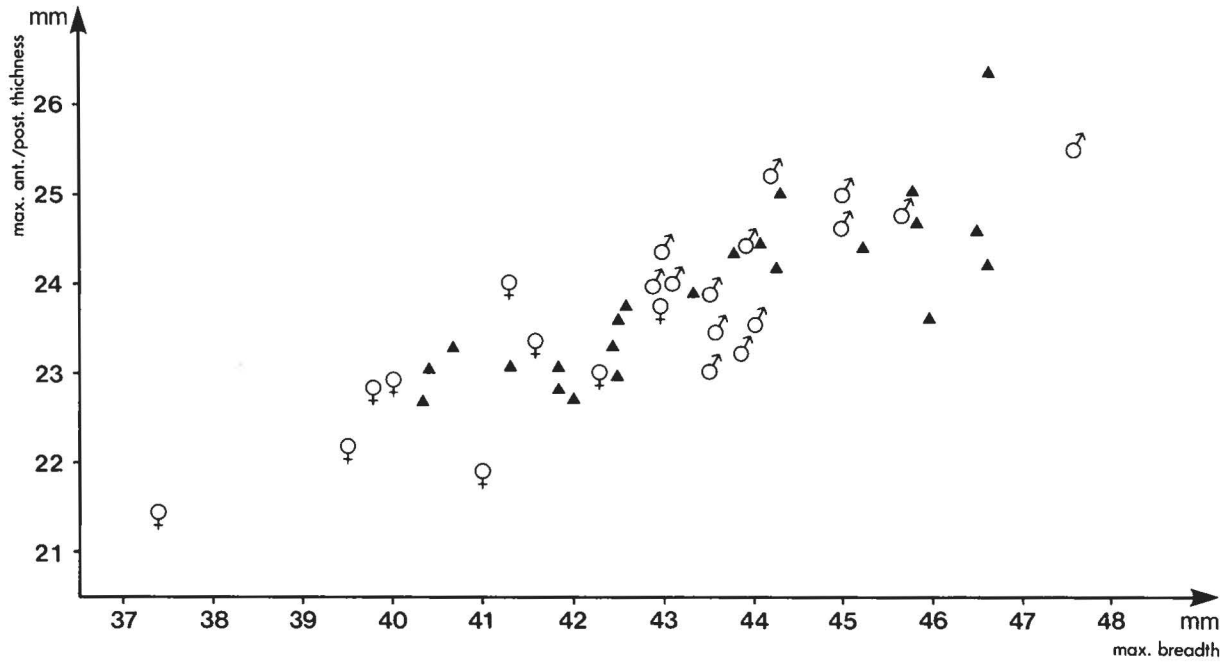
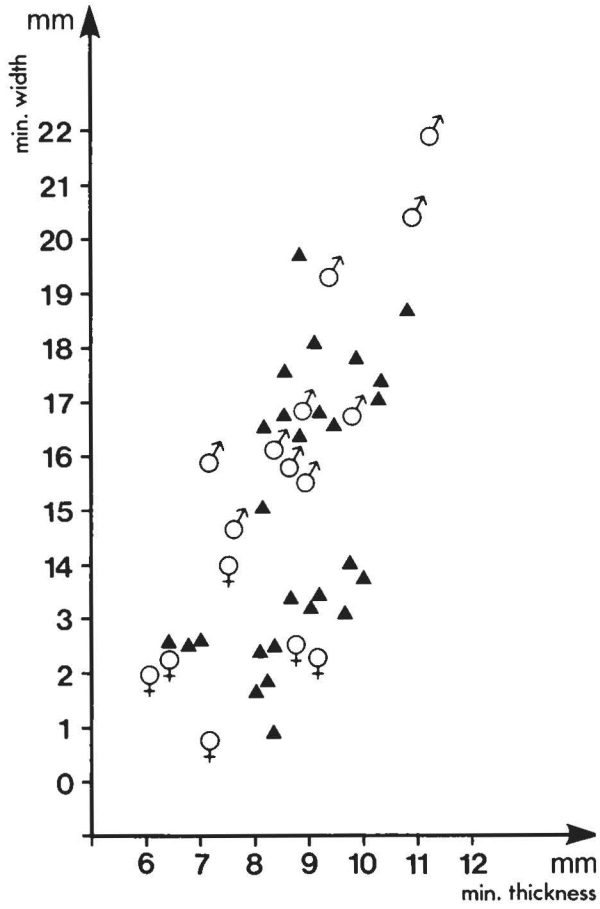


Fig. 79. Sex distribution for caribou from Layer 3, based on dimensions of the metatarsal distal epiphysis. For comparison, metatarsal dimensions for recent caribou of known sex from the Kangerlussuaq area are shown. ♂ and ♀ = recent caribou, Kangerlussuaq (♂: n = 14, ♀: n = 9). ▲ = caribou from Layer 3 (n = 23).



Variations deriving from excavation technique. – As stated earlier, the systematic material was sieved using a mesh size of 4 mm. Only the smallest sesamoid bones, the smallest rudimentary toes, and incisors have a chance of passing this mesh. The underrepresentation of these specific bones can at least partly be due to this circumstance.

The excavated bone material from Layer 3 comprises, as described, about 25% of a larger heap. The extent and thickness of this heap was established by means of test pits. It is well defined and forms a structural entity, so it is reasonable to assume that the heap as such was formed by uniform natural and cultural processes, and that the excavated bone material is representative of the whole.

Variations deriving from the physical/chemical environment. – In order to gain an impression of the effect of physical and chemical erosion on the state of preservation of the bone material, each of the 10784 fragments from Layer 3 has been allotted to one of four preservation categories: 1) no desquamation of the bone surface, 2) local desquamation, 3) widespread desquamation, or 4) total desquamation. To exemplify state of preservation, the state of limb-bone fragments,

Fig. 80. Sex distribution for caribou from Layer 3, based on pubic dimensions. For comparison, pubic dimensions for recent caribou of known sex from the Kangerlussuaq area are shown. ♂ and ♀ = recent caribou, Kangerlussuaq (♂: n = 10, ♀: n = 6). ▲ = caribou from Layer 3 (n = 27).

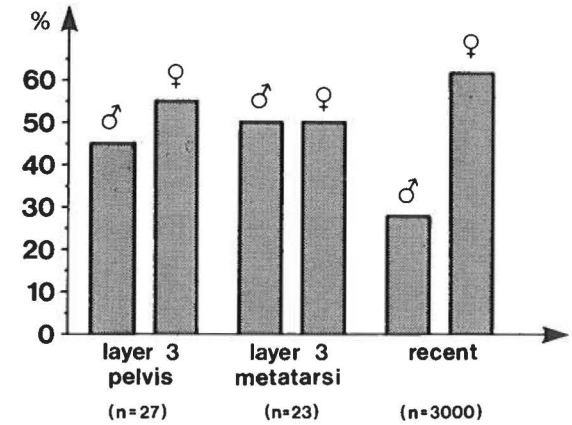


Fig. 81. Sex distribution for caribou from Layer 3 compared with that for caribou frequenting the Aasivissuit catchment area in July/August (recent counts by *Vildtbiologisk Station, Kalø* (H. Thing pers. comm.)).

ribs and vertebrae is shown for four of the midden layers (Fig. 84).

As might have been expected, preservation is generally poorer, the longer the bones have been buried. But it also emerges that only extremely few bones, and then those from the oldest layer, are so poorly preserved that they can be assigned to category 4. It may therefore reasonably be concluded that no bones of any consequence have escaped analysis as a result of physical or chemical erosion processes.

If one turns to examine the state of preservation of antler fragments, they seem to be generally more poorly preserved than the bones from the body skeleton, a circumstance which can be explained by the very spongy nature of the antler, which makes it more susceptible to the effects of the weather. Furthermore, its natural shape means that parts of the antler are raised above the ground and are thus more exposed. Nevertheless, only a few fragments are very poorly preserved, so antler cannot to any extent be expected to have disappeared either, as a result of physical/chemical erosion processes.

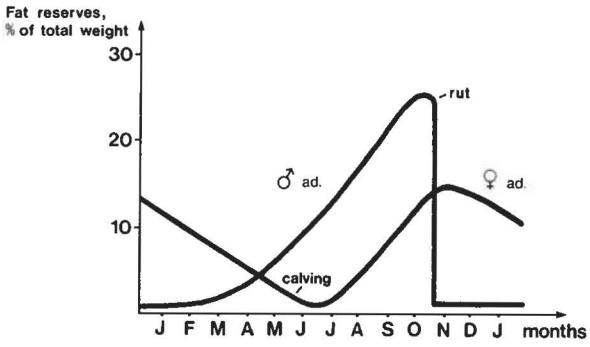


Fig. 82. Seasonal variation in fat reserves among adult caribou bucks and does (after Dauphiné 1976 and Spiess 1979: 28). The October weight of a buck is about 120 kg and that of a doe about 80 kg.

Table 6. Minimum number of individuals (MNI) in Layer 3, represented by each bone (part) (data from Appendix II, cf. Table 8), and the relative bone frequencies derived from these figures.

	MNI			%		
	-sym.	dex.	sin.	-sym.	dex.	sin.
Mandibula		18	18		25	25
Inciciva	1			1		
Molar	3			4		
Calvarium	9			13		
V. cervicalis	47			66		
V. thoracica	47			66		
V. lumbalis	71			100		
V. sacralis	6			8		
V. caudalis	1			1		
Costa	40			56		
Sternum	8			11		
Scapula		12	10		17	14
Humerus prox.		4	3		6	4
dist.		18	21		25	30
Radius prox.		16	15		23	21
dist.		24	19		34	27
Ulna		7	10		10	14
Os carpale	14			20		
Metacarpus prox.		17	8		24	11
dist.		16	5		23	7
rudim.	4			6		
Pelvis		22	21		31	30
Femur prox.		22	23		31	32
dist.		8	10		11	14
Tibia prox.		5	13		7	18
dist.		14	24		20	34
Fibula		11	15		15	21
Calcaneus		17	15		24	21
Astragalus		10	17		14	24
Os tarsale	4			6		
Metatarsus prox.		15	9		21	13
dist.		17	13		24	18
Phalanx I	4			6		
II	4			6		
III	3			4		
rudium.	2			3		
Patella	5			7		
Os sesamoida	3			4		

Variations deriving from scavenger activity. – Foxes and ravens commonly occur inland and one would therefore perhaps expect to find many bones with bite marks. But bite marks have been found in only 9 out of more than 10 000 bone fragments. This is probably due to the fact that the bones are the remains of meals and thus already of little food value when they land on the midden, so they have not been tempting to scavengers. The disturbance which these animals must nevertheless have imparted to the bone distribution pattern can therefore be regarded as sporadic: although the pattern might be slightly slurred, the main features will still remain as an expression of human activity.

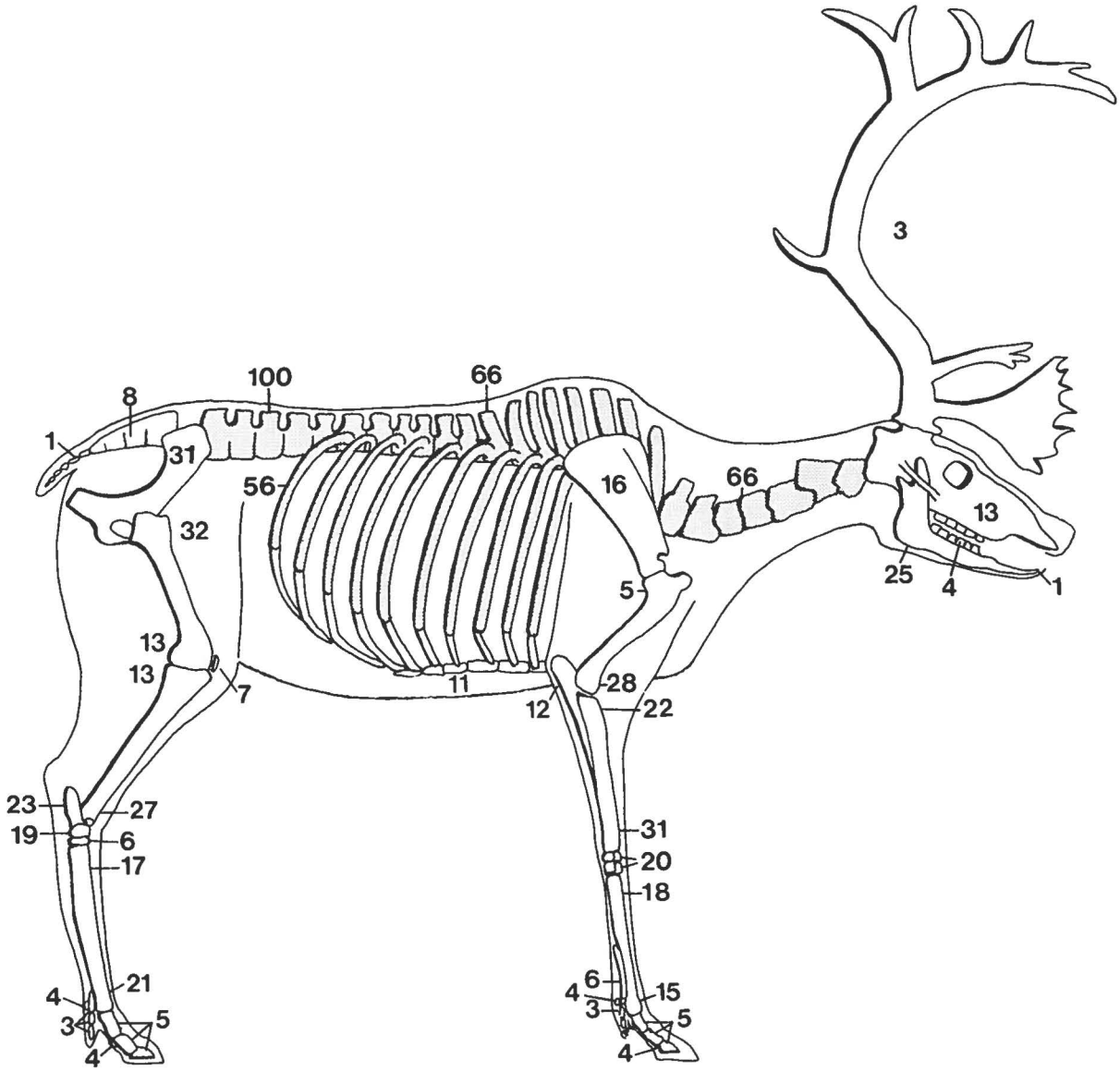


Fig. 83. Relative caribou bone frequencies in Layer 3 (right and left frequencies (Table 6) amalgamated). Bones with frequencies of more than 50 are grey.

Variations in bone distribution as a result of hunters' selective treatment of the caribou carcase. – It has been argued above that excavation technique, physical/chemical destruction and scavenger activity have not had any appreciable effect on bone distribution. It is therefore reasonable to assume that the variation we see in the frequency of different bones is primarily the result of human activity. The nature of this activity will be discussed in the following.

On the basis of the bone frequencies found, the caribou skeleton can by and large be divided into 5 anatomical parts, each having bones exhibiting approximately the same incidence (Fig. 83). They are 1) skull and lower jaw, which are strongly underrepresented (mean relative frequency 18), 2) vertebral column and ribs, which are well represented (mean relative frequency 72), breastbone, which is strongly underrepresented (mean relative frequency 11), 4) foreleg, which is strongly underrepresented (mean relative frequency 19) and 5) hind leg, which is strongly underrepresented (mean relative frequency 21). The underrepresentation of the skull can be attributed to two circumstances. When caribou were killed by stalking or from hides some way from the settlement, the burden was as a rule eased by leaving the head behind. Moreover skulls with antlers attached or shed antlers were com-

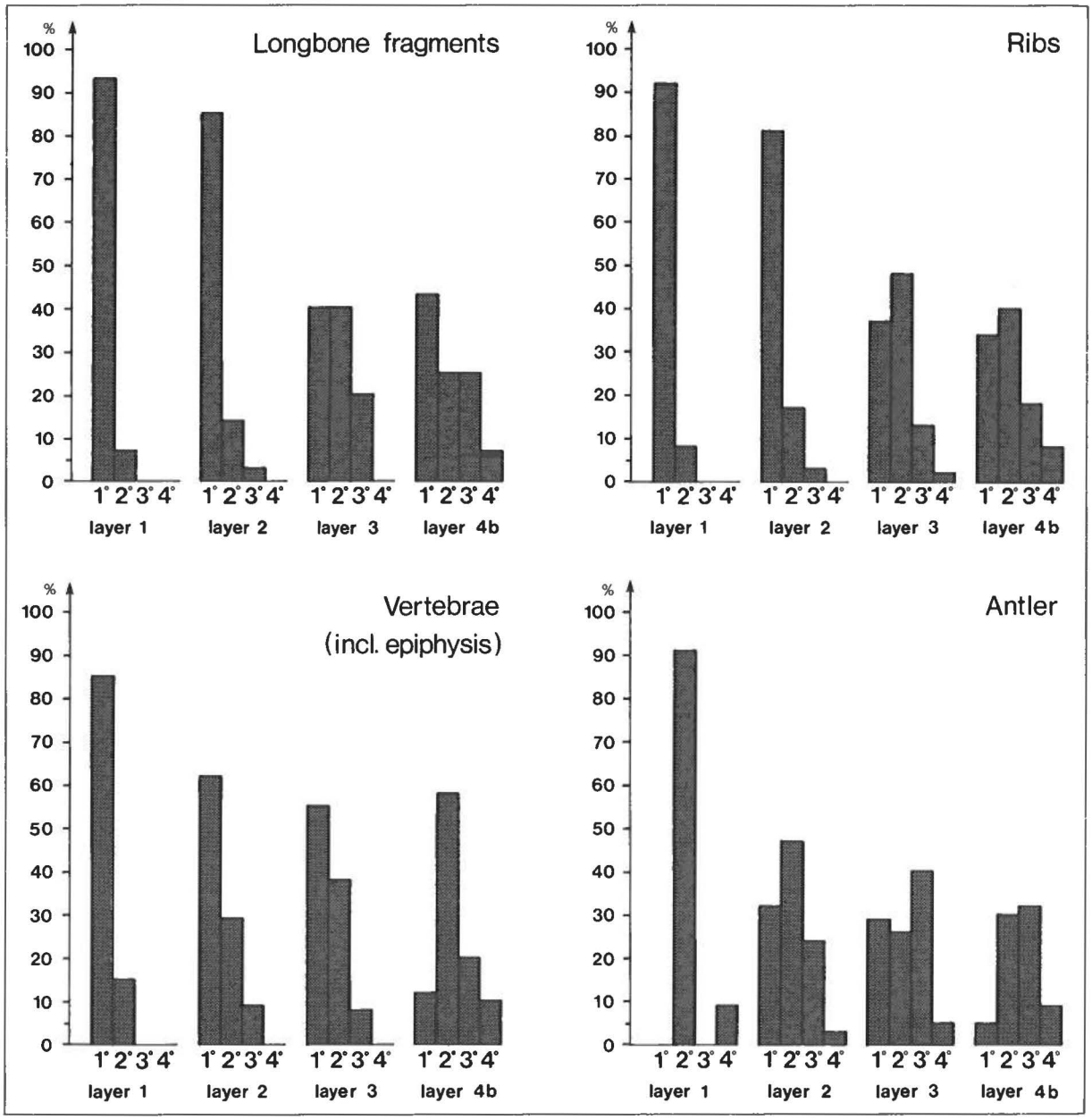


Fig. 84. State of preservation of all bones from four different layers. 1°: no desquamation of the surface; 2°: local desquamation; 3°: extensive desquamation; 4°: total desquamation. The bones have been exposed to decomposition for Layer 1: 50 years, Layer 2: 150 years, Layer 3: 250 years, Layer 4B: 500 years.

monly used as drying frames for meat, in house construction, and for tool making. There is, on the whole, a tendency to leave skulls with antlers in heaps around the camp-site (Fig. 19). The underrepresentation of the skull and antler can thus also be explained by the excavation area "missing" these concentrations. It can be remarked parenthetically that the absence of lower incisors in the bone heaps can perhaps to some extent be attributed to the use of these for long decorative belts (maybe amulets) (J. Meldgaard 1979, 12–13).

Forelegs, hind legs and breastbone are all strongly underrepresented in the bone material (relative frequency 19, 21, 11). The breastbone is characterized by having much fat and flesh. Forelegs and hind legs are, apart from the hooves, both meaty and rich in marrow, besides having a high quality bone fat (Binford 1978: 15–45). The high food value of these three parts has also led to their often having been carried entire out to the coast. Most frequently, however, they have been subjected to further treatment (drying, extraction of

bone fat, etc.) at the camp itself and especially at airy drying places and around the cooking places. Underrepresentation of these parts taken into account, the excavated area must be assumed to cover an area where these activities have not been the predominant ones.

The underrepresentation of hooves has a special cause. Hooves have very poor food value (Binford 1978: 15–45) and they have therefore often been left behind where the animal was killed to make the transport home easier (Fig. 85).

Vertebrae and ribs are much more frequent in the excavated material (relative frequency 72) than the four other parts. This may be due to the fact that after butchering (including the removal of fillets and tenderloin) they have a low food value (only a little meat, no bone marrow and poor bone fat) (Binford 1978: 15–45). The backbone and ribs will therefore more frequently than any other part be left at or near the place of butchering.

In conclusion, a reasonable explanation for the large number of backbones and rib sides seen in relation to the underrepresentation of parts with high food value will be that the dominant activity at and around the excavated area has been the coarse butchering of the caribou.

Fig. 85. Caribou hooves cut off during butchering procedures, with attached sesamoid bones (butchered by a hunter from Kangaamiut, 1981).

V Conclusions

A comprehensive source material – natural historical, ethnographical/ethnohistorical, archaeological and zoo-archaeological – has been presented. In this chapter, the numerous conclusions from each field will be collected to give an overall picture of the exploitation of the game resources at Aasivissuit over the years. The source material permits us to demonstrate and illuminate the changes in subsistence conditions, and an attempt will finally be made to put these changes in perspective.

Subsistence at Aasivissuit – an overall view

Background

Situation, resources. – The Aasivissuit camp-site is situated in an arctic inland environment, the central West Greenland inland region north of Kangerlussuaq (Søndre Strømfjord) in the municipality of Sisimiut (Holsteinsborg). It is located near the lake Aasivissuit Tasiat, about 40 km west of the edge of the inland Ice Cap (Fig. 1). The landscape here is characterized by low rounded mountain ridges with an east–west orientation, alternating with extensive flats and valleys. In the arid inland climate, dwarf scrub heath and steppe vegetation dominate over large areas, while the slightly damper lower plains and valleys are grass-covered.

The position of the site makes it a perfect starting-point for caribou-hunting in the summer and autumn months: it lies in the western part of the caribou summer grazing area, and flocks of foraging caribou are found throughout the summer in the camp catchment area. But most important is the fact that the site lies near a constriction in the landscape – a "topographical bottleneck" – which the caribou have to pass on their autumn migration from the calving and foraging areas along the Ice Cap out to the winter grazing areas at the

coast. This ca 3 km wide bottleneck is to the north bordered by the great meltwater river Isortoq and to the south by the lake Aasivissuit Tasiat, at the north-eastern inlet of which the camp-site is placed. All topographical structures – mountain ridges, valleys, eskers – direct the caribou coming from the east through the constriction and thus through the catchment area (hunting area) of the camp. A concentration of caribou trails here testifies to large numbers of animals in the autumn months. In the catchments area, there are possibilities for fowling in the numerous small lakes (great northern diver, white-fronted goose, mallard, long-tailed duck, etc.) and willow scrub (ptarmigan); and arctic hare and fox are also found in the area, whereas it does not offer the opportunity of fishing.

The ethnographical/ethnohistorical context. – Legends, the information of local informants, and historical records mentioning caribou-hunting in Sisimiut municipality and central West Greenland permit us to picture life at Aasivissuit and to place the use of the site in a cultural context within the time of the informants.

Caribou-hunting is part of an annual hunting cycle. Occasionally, a few caribou are killed during winter hunting in the coast- and fjordlands, but by far the most important caribou-hunting occurs during the summer or autumn or both in the inland area. The start of the hunting season for caribou is timed in relation to the occurrence of the marine resources (the hunt for migrating harp seal, capelin fishing) and in relation to the quality of the caribou products (skin, tallow), so that people usually go hunting caribou in June or July. The end of the season is primarily determined by whether the bag is considered adequate and by the weather (severity of night frost). Typically, caribou-hunting ends in September, and people then move to the coast to exploit the game there. During the time of the informants it has in particular been fjord-dwellers from the settlements of Sarfannguaq and Saqqarliit who travelled inland to Aasivissuit. With women's boats accompanied by kayaks passage is made up the fjord to the base of the Maligiaq fjord arm. From here the boats are towed up to the lake Tasersuaq, from where they are paddled and rowed to the eastern end, perhaps with an overnight stop on the way. The women's boats are left here and the kayaks and gear are carried up via the pass at Qorlortoq to Aasivissuit Tasiat. While women and children follow the northern shore on foot, the men sail on to the camp, which is situated on the small sheltered inlet at the north-eastern end of the lake. This journey inland takes 2–3 days. At the camp site, people erect tents or move into the characteristic tent-house. The tent-houses consist of a low turf and stone wall built around a living-room with a sleeping-platform and an entrance with cooking recess. The entrance passage is covered with a skeleton of willow withes and loose soil, and the main room with a construction of withes and caribou hides (or canvas).

The camp now forms a starting point for the caribou hunt. In the informants' time i.e. the last 100–150 years, use was made of a great number of stalking and hunting techniques. With his rifle and other hunting weapons the hunter can in various manners sneak up to the animals, lure them to him, or anticipate their movements and place himself so that they pass within range. The informants can also describe hunting forms from the period around the introduction of the gun. Then shooting-coverts (*talut*), placed very close to the caribou trails, were employed. Behind the hide, the hunter lurked with flint-lock gun or bow and arrow at the ready. To ensure that the caribou came near enough to the hide, a number of *inussuit* (single stones or cairns) could be placed in front of it and linked with seal-skin thongs. The sources also speak of even earlier hunting forms. The joint battues were organized. Women acted as beaters and by means of rows of inussuit linked together with thongs, or rows of sticks with turf heads, the caribou were steered towards the hunters, who lay either behind rows of shooting-coverts or behind a long shooting-wall, from which they shot the animals with bow and arrow. Caribou were also driven out into lakes where the swimming animals were killed from kayaks.

The informants give detailed information on butchering of animals killed by stalking. Which parts are left behind at the kill site depend on needs and the distance from the camp. Typically, the hooves and head are left behind there (brain mass is eaten on the spot), while the remainder of the carcase is packed together in a special manner for transport. At the camp, the food is prepared on the basis of flesh, tallow, bone fat, bone marrow, stomach contents, blood and entrails. At the inland camp, people usually eat cooked meat, while meat which is to be taken away in the form of winter provisions is dried on frames. Rendered tallow and bone grease kept in pericardium or stomach are also a part of the provisions. The caribou also supplies people with a number of raw materials, which are difficult to replace from other sources, in particular skin, antler and sinews.

Within the time of the informants, primarily the present century, we have the possibility of placing Aasivissuit as a link in a chain of caribou-hunting camps and overnight camps which were mainly used by people from the Ikertooq fjord complex (Maligiaq caribou-hunting camp system p. 37, and map Fig. 15). The approach to the caribou-hunting camps of the hinterland passed through the fjord arm Maligiaq and the great lake Tasersuaq, and Aasivissuit was one of the innermost camps in the system. Along the approach lay the overnight camp-sites. Informants also relate that if there were very few caribou in the district, it was necessary to go further inland from Aasivissuit, which otherwise served as a base camp. In this case they went to the camp at Sangujalluk or went stalking near the Ice Cap in the Akuliarusersuaq area.

Other complex caribou-hunting camp systems sur-

round the Maligiaq system. To the north, the camps form one system with Nordre Isortoq as approach, and to the south, people from the Kangaamiut district use Kangerlussuaq as approach.

The archaeological results

The archaeological investigations in connection with Aasivissuit primarily consisted of the registration of stone-built structures in the catchment area of the camp and excavations in the midden layers of the camp itself. Registration of structures gave an impression of the extent and character of the catchment area and revealed the various modes of hunting which have been practised at various times to exploit the caribou population of the area. The excavations revealed 6 occupation phases of varying character at Aasivissuit. These manifest themselves in sections through the midden layers as ossiferous horizons, which on account of the special conditions of deposition (silt, peat lamellation) are stratigraphically distinct. In combination with C^{14} datings and archaeological datings, this circumstance affords the possibility of determining the intensity and duration of the individual occupation phase (Fig. 72). The osteological analyses of the bone material from each phase yield a quantity of information on the utilization of the game, and this information can be quite detailed in the "bone-rich" and chronologically well defined phases.

In the following, the investigation results will be summarized to characterize the subsistence conditions at Aasivissuit in the various phases of occupation. The archaeological/osteological source material yields, especially for the period around 1700 A.D., the possibility of a detailed picture.

The paleo-Eskimo use phases. – The oldest traces so far of human activity at Aasivissuit can be assigned to an early part of the West Greenland Dorset culture (C^{14} dating 2150 ± 74 B.P. = 205 B. C. cal.). It should, however, also be remarked that a number of small flakes of *killiaq* have been collected to the west of the actual camp area. Killiaq is the preferred raw material of the Saqqaq culture (Larsen & Meldgaard 1958: 47), and these flakes could be traces of the first caribou-hunters at Aasivissuit (the Saqqaq culture in West Greenland has been tentatively dated to ca 2200–1000 B.C.).

The bone material from the midden area which can be referred to the Dorset period is very small (Layer 5) and cannot give further information on hunting methods or other things. Finds of chalcedony flakes in the drift layers behind a shooting-hide testify that the Dorset people must have employed covert-hunting.

The early neo-Eskimo occupation phases. – The presumably earliest traces of the Thule culture in the inland area are found in the Aasivissuit catchment area, where a hunters' bed is dated to 1030 ± 75 A.D. The hunters' bed has been an overnight sleeping place for hunters who were only hunting in the area for a brief period, and so far, no traces of these earliest neo-Eskimo hunters have been found in the midden layers at Aasivissuit.

The oldest neo-Eskimo rubbish layers in the midden can be assigned to the period 13th to 15th century (C^{14} dating). Through this period, occupation of the site has resulted in only a few, vertically scattered bone finds in the midden. These show that caribou meat was to a certain extent supplemented by wildfowl, and traces of provisions brought to the site from the coast (seal) are also found. The find picture may be interpreted as follows.

In the course of the 13th to 15th centuries, Aasivissuit is visited at intervals of several years by small groups of hunters trekking inland from the coast in the autumn. Hunting forms have been of individual character, probably variants of stalking and covert-hunting.

In a period of the 15th–16th centuries, the use of the site is intensified, the concentration of cultural traces in the midden increasing. To a much greater degree than formerly and later, the diet of caribou is supplemented by wildfowl.

The high incidence of white-fronted goose bones could be taken as an expression of battue on the moulting birds in the lakes of the catchment area. The great vertical concentration of finds in the midden suggests a much more frequent use of the site than formerly; perhaps it was visited every year on late summer and autumn hunts.

In the midden stratigraphy, the concentration of finds decreases rapidly after this period. The frequent use of the camp must have stopped some time during the 16th century.

The main impression of the hunting from Aasivissuit in the earliest neo-Eskimo occupation phases is, then, as follows. The site is used in the late summer and autumn season by small groups of hunters with increasing frequency regularly from the 13th century until the 15th–16th centuries. After this it is only sporadically visited during the next couple of hundred years. The individual methods of hunting – stalking and perhaps covert-hunting – have been the primary forms.

It must be emphasized that the find material from this period of over 400 years is relatively sparse. At present it permits, as attempted above, an interpretation of only the more general tendencies of the period.

The late neo-Eskimo occupation phase – an archaeological picture from around 1700 A.D. – The find material from a period in the 17th–18th centuries is so well-defined chronologically and provides such a wealth of information that we can now begin to paint a more detailed picture of the caribou-hunting as it was carried out at Aasivissuit. Archaeological source material of different kinds – structures and midden layers – and

other culture-historical and natural-historical sources can now be correlated to illuminate the subsistence conditions at the site.

The use of battue and inussuk systems was documented from the legends, and historical sources of the 18th century, and it is natural to conclude that it was primarily the exercise of the battues which has resulted in the great accumulations of bones in the Aasivissuit middens (Layer 3). These have also been dated by means of stratigraphy and archaeological finds (arrowheads, whalers' beads etc.) to a brief period within the period 1650–1750. It can now be surmised that the heaps of bones were formed during the caribou maximum at the beginning of the 18th century, a marked decline in the caribou population occurring in the 1750's.

The joint hunts have in the first half of the 18th century resulted in the construction of the great inussuk system, the fence, and the groups of shooting-coverts. The special topographical features of the landscape were exploited, beaters and hunters having been placed where the animals are naturally concentrated on their autumn migrations. The course of the battues is interpreted as follows. By activating the great inussuk row at "Inussuup Qaqqaa" and "Tulukkap Qaqqaa", it was possible to guide the caribou coming from the east down into and along the valley system "Naanngisat Qoorua" and down towards the inlet "Tuullip Kangerlunngua" (Fig. 39 and 45). Here it has, with the aid of beaters, been possible to drive the caribou along the slope north of the camp, after which they were shot by bowmen concealed behind the transverse shooting-wall (the stone fence, I1). If the flock was, on the other hand, steered east of the camp, it would move along the inlet towards the natural swimming place from the tip of the point "Tuttup Nuua" via the islet in the mouth of the inlet to the north-west shore of Aasivissuit Tasiat. This frequently occurring situation has been exploited by placing hunters in kayaks, concealed behind the point. Beaters along the shores and at the base of the point have ensured that the animals were driven into the water in one body, so that the kayak-men with lances have been able to kill them all. The killed animals were towed across the inlet and landed at the lower part of the camp (lower Au) (Fig. 58) at the river delta.

At the mouths of the major valleys ("Joorup Kissaataa" and "Igaq"), NNW of the camp-site, beaters have driven the animals towards the bowmen concealed behind groups of shooting-hides. The bag from these hunts was also carried to the camp.

The large quantities of bones in the midden, which represent hundreds, perhaps thousands, of animals, show that the bag has been heavy. Other circumstances also indicate great abundance of meat and thus effective methods of hunting in this period: the low degree of fragmentation and the large number of articulated bones show, for example, that it has not been necessary to utilize the individual animals to the fullest possible extent.

Side by side with the joint hunts, there have also been other, more selective methods of hunting. This is apparent from the sex and age distribution of the killed caribou. The hunters have clearly seen an advantage in going after the adult bucks in particular, who are very fat in the autumn. Likewise selective hunting is pronounced in the overrepresentation of calves and yearlings in relation to the natural composition of the autumn herd. The skin of calves is especially sought after for clothing, whereas the yearlings do not seem to have qualitative advantages. The overrepresentation of these animals may be due to the effect of unintentionally selective hunting, their behaviour making them an easier target than the adult animals. The selective hunting methods comprise first and foremost different variants of stalking, but covert-hunting can also be practised selectively.

Of the hunting modes of the period, the following summary can be given. Within the topographical bottleneck, caribou-hunters have both organized profitable joint hunts and practised stalking and hide-hunting to ensure a particular selection of the caribou population. The hunting area of the camp has extended at least 4 km out in an ENE direction parallel to Isortoq. On the hunting trips, a little wildfowl and hare have also been bagged and a little seal meat has been carried from the coast as a supplement.

Those caribou which were killed within the hunting area at Aasivissuit have been brought to the camp for butchering and further treatment. The analyses show that the large bone accumulations in Layer 3 at lower Au mainly consist of bones from parts of the animals with poor food value – primarily vertebrae and ribs. The limb-bones and breast-bones, which derive from the parts with greatest food value, are strongly underrepresented. The composition of the bone heaps suggests that the coarse butchering has occurred here at the northern part of lower Au (Fig. 83). The parts of the carcase which have been removed from here have undergone several treatments at other parts of the site, probably especially in the area around the tent-houses (and drying places) of upper Au. A large part of the meat has been cut up, dried (probably on wooden or antler frames erected at upper Au and on "Qimatut Nuua"), and stored in the meat caches, and perhaps the mountain repositories just by the camp. The big meat caches on the windy point must have bulged with provisions at the end of the season!

The antlers and to a lesser degree the bones have been the raw material for many implements, but the find material from the bone heaps yields only limited information in this respect. Arrowheads, knife shafts and lateral branches of bird darts of caribou antler have been found there, however. By far the most favoured implement for working this material has been the burin.

The great battues at Aasivissuit during these first decades of the 18th century have required the participation of many people. Numerous families must each

summer have joined company on caribou hunts. In women's boats and kayaks, people travelled inland along various approaches – in our case the Maligiaq caribou-hunting camp system – to move for a brief period into tents and tent-houses at Aasivissuit. Right from the beginning of July and on into September, they lived abundantly and well on the many caribou and participated in many social activities. Loaded up with provisions (bone fat, tallow, dried meat) and raw materials (antlers, sinews), and skins, they started in autumn on the long way back to their coastal and fjord settlements.

Over some few decades, probably 25–50 years, the caribou hunts must have been as described. But then apparently abruptly, people stopped coming to Aasivissuit. In the midden, it is seen how one thin layer of silt and peat after another cover the heaps of bones. The dating of the finds reveals that three-quarters of a century elapse before the camp-site begins to be used regularly again.

The occupation phases of the colonial period. – In the course of the first half of the 19th century, cultural remains are again deposited in the midden area at Aasivissuit (Layer 2, dated on faience). The ethnohistorical/historical sources show that hunting with flint-lock guns from shooting-hides has then been a widespread hunting mode. In agreement with this, we can also, based on the presence of gun-flint, date the younger phases of a couple of coverts to this period. Several kinds of gun-flint from one hide show frequent re-use.

In hunting from shooting-coverts, the quarry is located from a good vantage point. A thorough knowledge of caribou behaviour makes it possible for the hunter to anticipate which trails the animals will follow through the hunting area, and he can then place himself in a hide with its line of sight facing this path. The hide is typically placed in such a way that the hunter is concealed from the caribou outside a range of 5–10 m. With the flint-lock gun (or in earlier times with the bow), the fatal shot was fired obliquely from in front and down towards the animal. A system of activated inussuit, possibly linked by seal-skin thongs, can in connection with the covert in certain circumstances be necessary to guide the caribou past it within easy range.

The bone material from midden Layer 2 is too sparse to show to how great a degree the hunt has been selective as to sex and age (although there is a tendency to overrepresentation of caribou calves), which might show something of the importance of stalking in relation to hide-hunting.

Through these more individual methods of hunting, the hunters have culled the then large caribou population and brought a considerable amount of game to the camp, where the waste has piled up in the midden. But there is nowhere near the same quantity as in the 18th century layer, and the ethnohistorical/historical sources also show that the particularly profitable large-scale joint hunt is no longer organized.

From the coast and fjord settlements, a few provisions have been carried to the site in the form of seal meat and dried fish (codfish) and, as mentioned above, the diet of caribou has been supplemented by wildfowl, arctic hare and a little char.

The bone material from this period also shows relatively larger amounts of waste from the less nutritious parts of the caribou, but these parts are considerably more intensively utilized than previously (the 18th century layer). The bones, even from the parts relatively lacking in fat, for example rib-sides, are remarkably unarticulated and fragmented. The bag is fully utilized, which may reflect a situation in which hunting methods are not so effective and do not yield the same surplus as previously.

In the bone accumulations, there are traces of the hunting weapons of the time (the flint-lock gun: gun-flint and lead), and a quantity of European trade goods, for example faience, glass beads, porcelain and earthenware.

A good deal of caribou meat must, as earlier, have been cut into strips, dried, and stored in meat caches at the camp for winter stores. Tallow and bone fat have also been collected. The skins were important partly for clothes and bed and sledge covers and partly as trade goods for the Royal Greenland Trading Company.

Aasivissuit were now used by the Greenlanders of the Holsteinsborg colonial district. The families from the district followed the old route up through Maligiaq, Tasersuaq and Aasivissuit Tasiat, and tents and tent-houses were erected there. The hunting season at Aasivissuit was from the middle of July to October.

After the mid-19th century, those hunters who frequented Aasivissuit have left only a few traces in the midden area. There are scattered bones of caribou and also most game birds and arctic hare are represented. Seal meat was carried as usual as a provision for the journey. From the mid-19th century to the present century, the site was used mainly for brief visits by hunters going after game further inland. With further improved hunting weapons – the breech-loading rifle was adopted – stalking of the now very limited numbers of caribou was carried on.

In the period of caribou increase after the turn of the century, families from the settlements in the Ikertooq fjord again visited Aasivissuit for some decades and used it as a base camp. But this last phase of use has not been so intensive that it has been possible to delimit it in the archaeological material from the midden area. It is from this period, on the other hand, that the ethnographical material constitutes the main source for describing life and hunting in the inland area.

After 1950, the traditional use of Aasivissuit ceased, the area from the camp into the Ice Cap being declared a caribou conservation area by the Council of Sisimiut municipality.

Subsistence changes in the natural-historical and culture-historical context

The investigation has shown that hunting modes, yield, treatment of the kill, et cetera, differ from phase to phase – the subsistence at Aasivissuit is dynamic. We will in the following endeavour to explain these changes and set them in a wider perspective, by analysing the natural-historical and culture-historical circumstances which determine the intensity and character of caribou-hunting.

Ecological circumstances – resource dynamics

As demonstrated in the section Fluctuations in food resources, p. 13–16, the inland caribou population has undergone violent quantitative fluctuations through the ages. These, in the final instance climatically determined oscillations, are historically documented to the beginning of the 18th century, so that population maxima and minima can be dated. The major maxima are placed for central West Greenland in the periods ca 1700–1750, ca 1810–1850, ca 1910–1930 (not so conspicuous) and ca 1950–1970 (Fig. 9). In the intervening periods, the caribou are down to under 1/10 of the maximum population. It is obvious that such violent fluctuations in the amount and accessibility of game are of vital importance for the exploitation of the inland area. The varying ecological conditions affect hunting strategy, which must be changed and harmonized with the cultural conditions.

Cultural conditions affecting caribou-hunting

The ethnographical and ethnohistorical sources permit a summary of the cultural conditions which determine the character and intensity of the inland hunting in West Greenland. These considerations take their starting point in the conditions of the Thule culture, but are of such general nature that it is reasonable to infer that similar "cultural determinants" also applied to a paleo-Eskimo community. The motivation for caribou-hunting is governed by a number of needs which at different times operate with varying strength.

To how great an extent *physiological* needs motivated the summer caribou hunts depended on the amount and accessibility of marine game. The need for caribou meat in the summer and autumn months and for tallow, fat, and dried caribou meat in winter was – still from a purely physiological point of view – not so pressing if the marine resources were plentiful and the meat caches and frames at the coastal settlements could be kept full with capelin, whale meat and seal meat, and the like, during the winter.

The different *products* obtained from the caribou – antlers, skins, sinews – are essential components in the technology of the Thule culture. The need for these products is partly governed by access to other materials with similar properties, for instance sinews of white whale, and walrus tusk. Generally, however, the products of the caribou are difficult to find substitutes for, especially the skin.

A great number of *immaterial needs* have also motivated the inland hunt. After months on a diet of marine mammals and fish, which often fully fulfilled their purely physiological needs, people could long for a taste of caribou tallow, marrow and meat. Even at times when there was a dearth of caribou, they would make extra efforts for the sake of a change of diet. The prospect of moving around in the verdant inland area for a change has always attracted the otherwise maritime Greenlanders. Inland life has also with varying importance satisfied a number of social needs. In periods when many families took part in the caribou hunt, they could stay with other people than their own neighbours of the winter settlements and thus start new relationships through the exchange of news, gifts or marriage partners. Furthermore, the caribou hunt was always an opportunity of building up one's prestige in relation to the other hunters (cf. the story of "The reindeer-hunt of Merkisalik", p. 18–20).

Also the need for *trading and bartering* has motivated the caribou hunt. How far this need has been manifested in hunting intensity depends on the degree to which hunting is carried on for the sake of a surplus which can contribute to exchange.

The above-mentioned motivating needs are, apart from the purely physiological, governed by and interactive with the culture's *traditions* and *technology*. Tradition prescribes, for instance, certain methods of hunting and certain hunting cycles and is with the nature of the hunting weapons, the technology, decisive in determining whether a potential food resource is utilized and how it is utilized (cf. the example from the Thule district where caribou-hunting was for a period simply forgotten, although there were plenty of caribou (Steensby 1910: 261)). The social organization of a community will also affect hunting forms. Fundamentally the same form of hunting can occur in different social systems, but in type of leadership and distribution of spoils in, for instance, joint battue, aspects of the social organization will be reflected.

Finally, the *demography* of an area will affect caribou-hunting. It is, for instance, of importance how many people are present in the area at the beginning of the caribou season and how far away they are from the hunting area.

The location in the actual summer grazing area of the caribou and not least in the most conspicuous bottleneck for their autumn migrations must at all times have made it advantageous for the caribou-hunters to stay at Aasivissuit or at least pass it. This speaks for the validity of a more general hypothesis, a fundamental assumption for the following, that those discontinuities and changes in subsistence conditions which can be read in the archaeological material at Aasivissuit also apply

to the Sisimiut district *as a whole,* and that these changes are rooted in an interaction between shifting ecological and cultural conditions as presented above.

Caribou-hunting in paleo-Eskimo perspective

The discovery of traces of the Saqqaq (?) and Dorset cultures at Aasivissuit, however exiguous, presents a new perspective. It will in future be necessary to include caribou-hunting from inland occupation sites proper in any consideration of paleo-Eskimo resource utilization in West Greenland. So far only fjord-related caribou camps like the Saqqaq settlement Itinnera in the Godthåbsfjord (J. Meldgaard 1961 and Møhl 1972) and the Dorset settlement "Malmquist Site" in Kangerlussuaq (J. Meldgaard pers. comm.) have been known, but now paleo-Eskimo inland occupation and inland hunting (by means of shooting-hides) have been demonstrated. It should be further remarked that certain traces of the Saqqaq culture – a burin – have also been found during reconnaissance at an inland settlement in the Sarfartoq valley south of Kangerlussuaq (Grønnow in press).

Subsistence changes in neo-Eskimo perspective

The early neo-Eskimo traces starting at Aasivissuit itself in the 13th century seem to reflect an increasingly frequent and more regular hunting in the inland region up to and during the 15th–16th centuries. An increased population and consolidation of hunting areas and cycles in the district could explain this very general feature, but also the fluctuations in the caribou population in this 200–300-year-long period have naturally affected the intensity of hunting. The find material does not permit further conclusions on this matter, and future archaeological investigations will have to concern themselves with the many culture-historical and natural-historical aspects which influenced the use of the inland area as a resource and settlement area in this period.

Up to and in the 17th century, the importance of the inland area for hunting wanes – caribou-hunting from Aasivissuit almost ceases. The caribou population must in the latter half of the 17th century be assumed to have been minimal, which can be concluded by extrapolation back in time from the caribou maximum at the beginning of the 18th century (Fig. 9). This circumstance will naturally in itself make the area less attractive to hunters. However, also in the course of the 17th century, strong demographic and social changes affected the entire eastern Arctic (Burch 1978, Jordan 1978), and as far as West Greenland is concerned, the ethnohistorical source material can demonstrate population movements: "southerners" from the Kap Farvel area migrate up along the west coast (Gulløv in press). Just in this period, settlement is displaced towards the littoral and archipelagic areas and several families move together into shared long-houses. The hunting cycles also undergo considerable changes (R. Petersen 1974/75: 174).

In the course of the 17th century and into the 18th, there is lively contact between north-west and south-west Greenlanders. In summer, people come sailing in women's boats and kayaks from Disko Bugt and South-West Greenland to particular *aasivik,* 'summer camp', places in the Sisimiut district (Birket-Smith 1924: 237). At these sites – Ukiivik (Sydbay) and Taseralik – an important exchange of raw materials and finished commodities occurs, among other activities. From the northern areas people mainly bring whale products (whalebone, tusk), and from the southern, soapstone lamps and pots. Significantly, it is apparent from the written sources from the beginning of colonization that caribou skins are included in this exchange:

"Those kettles and lamps which the Greenlanders from the south make from this stone, are kept very rare and dear, so that those who live in the north (where such stone is not found) must pay for a small kettle 8 to 10 caribou skins and for a lamp 2, 3 or 4 whalebones or just as many caribou skins." (H. Egede 1925[1741]: 329.)

The Dutch whalers, too, who in the course of the 17th century begin to call in at these aasivik sites or at natural harbours in the neighbourhood to barter, want caribou skins for, for example, glass beads (Gad 1969: 129). In this period there naturally also exists a need for good winter stores of tallow, fat and dried caribou meat and for caribou products in technology (antlers, sinews, skins), but, as we have seen, the need for caribou skins as a trade and barter ware comes into increasing effect.

When the caribou population around 1700 again increases, there is thus a strong motivation present to exploit this resource to the full. The demographic basis is present for carrying out large-scale joint hunts in inland Sisimiut, families from several regions of West Greenland having collected in the area in the caribou season. The social organization of the 17th–18th centuries, which is, for example, manifested in the new dwelling form, the long-house, may have given added impetus to the organization of joint hunts, but too much importance should not be placed on this factor. (Moreover, the literature contains very different opinions about the social structure of this period, see, for example, Eriksen 1975: F3–7, Gulløv & Kapel 1979/80 and R. Petersen 1965 and 1974/75.) It is significant that the joint hunt seems to be a generally known hunting mode in the Thule culture in connection with marine resources, such as large whales (H. Egede 1925 [1741]: 359), common seal (Birket-Smith 1924: 320, Jens Rosing 1958a: 330), guillemot, char and eider duck (Fabricius 1962 [1818]: 79, 96, 105–107, 127–128), and the principle can therefore, when the motivation and resources are present, be transferred to the inland caribou hunts.

During some decades at the beginning of the 18th century, when a population of probably more than

100 000 caribou flourish in the inland areas of West Greenland, families from many districts gather each summer at Aasivissuit and similar large inland encampments. From here, large quantities of provisions and caribou products are carried away every autumn to the coastal settlements, where some of the products, especially the skins, can later form an object of barter and trade. Aasivissuit is in this period of great importance in an interregional connection.

This picture changes radically in the mid-18th century. To judge by the finds at Aasivissuit, people practically stop using the site, or come here only seldom for the rest of the century. The reason for this change being so pronounced must be sought in the drastic fall in the course of the 1750's in the West Greenland caribou population, which is at minimum right up to the beginning of the 19th century. In this manner, there ceases to be a basis in the available resources for many families to stay at Aasivissuit. That there really has been privation in the district due to the small rewards from caribou-hunting in this period is apparent from Thorhallesen's account of the terrible lack of warm caribou skins in the winter-houses (Thorhallesen 1914 [1775]: 108). The Royal Greenland Trading Company, which now comes into the picture, had even to import "Finnmark covers" (Lapland reindeer skins) to Greenland to alleviate matters somewhat (ibid: 107).

In the early 19th century, people begin to use Aasivissuit again, and up to the middle of the century, the activity level is quite high. The site is again drawn into a regular annual cycle. The resource basis for a resumption of more systematic caribou-hunting in the 19th century colonial period is to be found in the caribou population, which is now once again large. The demographic factors have apparently stabilized themselves in the colonial district, and this, together with the use of flint-lock guns for hunting, makes it possible to exploit the large caribou population. The written sources also speak of large returns from caribou-hunting in the years 1825–1850. The culmination occurred in 1839, when over 7500 hides were bought in (Bendixen 1921: 36).

The forms of hunting have, however, undergone changes in technological and to a certain degree organizational respects: stalking and covert-hunting with flint-lock gun are the predominant forms, and the large-scale joint battues, as they were previously known, are replaced by small battues towards a shooting-covert, based on collaboration between family members or between a couple of families. The background for the marked change in the caribou hunt must be sought in the radical intervention in Greenland society by the colonial powers in the early colonial period. By means of a deliberate policy of administrative regionalization, whereby the Greenlanders are gradually "tied" to the trade and mission of the individual districts, the basis for the traditional women's boat expeditions to the aasivik places in Sisimiut district falls away during the last half of the 18th century (Thorhallesen 1914 [1775]: 65). As the district is moreover repeatedly stricken by epidemics (Gad 1969: 393, 396, 436, 507, Gad 1976: 97–105), the demographic basis for the joint hunts has ceased to exist. The persistent efforts of the Company and Mission to curb the caribou-hunting tradition must also be taken into account (Gad 1969: 402–403, Gad 1976: 211–212).

The changes in social organization brought about by colonization, for instance the elimination of the angakkoq (shaman) institution, are also held partly responsible for the fact that the large-scale organized battues no longer occur in the 19th century (Nellemann 1969/70: 151). This touches on the question of leadership. The ethnographical sources rather suggest that the joint hunts were led from situation to situation according to the principle "primus inter pares" and not necessarily by the angakkoq.

The weapon-technological transition from bow and arrow to flint-lock gun also contributes to the change in hunting methods from the early 18th century till now in the 19th. The advantages of the flint-lock gun – great effect, and accuracy at short range – are particularly suited to covert-hunting, and with the gun, the efficiency of the individual hunter is increased (Nellemann 1970: 151).

The caribou population falls again in the last half of the 19th century, and, as may be traced in the archaeological material from Aasivissuit, hunting intensity likewise. The forms of hunting also change, shooting-coverts gradually falling into disuse. Covert-hunting becomes "something still remembered from the great caribou population" (H. C. Petersen, letter 20.1.1980) of the first half of the century. The change to exclusively stalking techniques must be seen as a result partly of the small caribou population in which the individual animals have to be found (this is in a period when hunters in the Sisimiut district have to go right to the Ice Cap to find a few animals (Mikiassen 1864: col. 456–457, Jakob Rosing 1926/1927: col. 90)), and partly of the technological development in weapons: the accuracy and range of rifles increases. Flint-lock guns are superseded by muzzle-loaders with percussion caps, which again up towards our century are replaced by breech-loaders with a magazine for several cartridges.

Around 1910, the caribou population increases again to a certain extent, and some families from the fjord settlement in Ikertooq use Aasivissuit again as a base camp. But far fewer families than in the previous period are involved – the caribou are not present in such large numbers as before and the new occupations of fishing, et cetera (Bendixen 1921: 36), gradually keep more people on the coast through the summer. The hunting forms of our century are all variants of stalking.

General information from the Aasivissuit investigation

The Aasivissuit investigation has had the character of a "case-study" and has been directed at the illumination of one aspect – subsistence – of the history of an inland settlement. As argued in the previous section, the development at Aasivissuit must reflect general changes in caribou-hunting in the Sisimiut district, and information of more general character can therefore be derived from it. This will now be briefly summarized.

The investigations at the site have shown that the structure and content of the midden layers testify to varying abundance of food and thereby to varying intensity of hunting. Osteologically, this relationship can be illuminated by means of analyses of the degree of fragmentation of the bones and articulation frequency in the various midden layers. The intensity of occupation of the site is also reflected stratigraphically – great heaps of bones are encapsulated as lenses in the natural succession of layers at periods when the site has been used intensely and regularly. It emerges that discontinuities in caribou-hunting can be discerned, as regards both methods and intensity. Such discontinuities must be expected to be observable at all "specialized" settlements, where the basis of subsistence is a single game resource (see also Amsden 1979). The discontinuity is determined both by the strong fluctuations in population and by social changes.

The Aasivissuit investigation has clearly shown that the archaeological source material is to be found both at the caribou-hunting camp-site itself and in its catchment area. An overall picture of the function of the camp is obtained by also including the catchment area structures (inussuit, shooting-hides, traps, meat caches, etc.) in the study. The structures reveal the nature of the activities carried on around the camp (especially as regards hunting) and tangible indications of the localization and extent of the camp's hunting area. As far as Aasivissuit is concerned, we have seen that the hunting area is centred on a "topographical bottleneck", and that structures are found over an area of 35 sq.km around and in front of this.

The ethnographical/ethnohistorical source material shows that a caribou-hunting site must be seen as part of a system of caribou-hunting camps, which are primarily linked to a particular approach route (in our case the Maligiaq caribou-hunting camp system). The different sites in the system have varying importance as overnight camps or various types of base camps. A series of transit camps leads to the base camps of the hinterland. Aasivissuit serves in periods of heavy caribou population as a base camp and in periods with a caribou minimum more as an overnight camp. Future research should examine more intensively the problems pertaining to the function of the various inland settlements (see below). The caribou-hunting site must also be seen as part of an annual hunting cycle. It is demonstrated that the site has been used for a maximum of ca 3 months (summer and autumn) a year, so that the hunting cycle of the users includes at least 9 months in coastal and fjord regions. It is thought-provoking that the archaeological material from the Aasivissuit midden gives only a hint of the "contact with the coast" (very few seal bones, codfish bones and mussel shells) and does not in itself show that it is a highly "sea-oriented" culture that has made use of the site.

At the hypothetical level, there has also been argued for an alternation between local, regional and interregional importance for Aasivissuit. The site attains its interregional importance in periods when the caribou population is at a maximum and the cultural prerequisites for great communal camps are present.

The exchange, on both the material and the ideological plane, which occurred in the meeting between north and south Greenlanders, was a mainspring of cultural development. At periods, caribou-hunting camps like Aasivissuit in inland West Greenland played a central role in this development.

The inland area – a future field of enquiry

With the Aasivissuit project, a new field of enquiry for culture-historical and socio-historical research in Greenland is opened up. In the wake of the project, a number of new questions have been raised, in respect of both research and conservation (Grønnow in press, M. Meldgaard 1983), and in conclusion, some of these future objectives will be pointed out.

Caribou-hunting camp structures. – We know far too little about so fundamental a thing as the inland forms of dwellings of the various periods. Archaeological investigations are here necessary in order to elucidate developments in the construction and arrangement of dwellings.

The caribou-hunting sites in context. – Future ethnographical research must aim at a clarification and closer understanding of the caribou-hunting systems, and in connection with this, archaeological registrations of former hunting structures and occupation sites should be carried out over large geographical areas. It is important in future work to consider the inland sites in context with the coastal settlements. By this means we can test and extend our ideas on the background for the discontinuous development of caribou-hunting sites.

The paleo-Eskimo perspective. – At the present juncture, it is true to say that we have only a hint of the paleo-Eskimo cultures inland. To overcome this methodologically determined lack of knowledge of over three millennia of inland settlement presents a challenge to future workers. The find material from the inland region will, state of preservation permitting, besides its culture-historical value, also have importance for research into the faunistic development of West Greenland.

The Aasivissuit project has been concerned with the caribou as a resource through the ages – a subject of topical interest in these years, when, after a number of years of abundance, we are now experiencing a caribou decline. One is thereby directly confronted with a number of problems of strategy in the exploitation of Greenland's game resources – problems which cannot be solved without an understanding of the dynamics of nature in the Arctic and of the socio-historical circumstances which determine the exploitation of its resources. This perspective must be an important guideline for future research projects in Greenland.

Notes

1. Except where special context would indicate a different treatment, we have preferred to employ the word *caribou* rather than *reindeer,* since it is commonly applied to the North American caribou to which the Greenland wild caribou are both taxonomically and geographically close. This obviates confusion between the domesticated reindeer introduced into Greenland from Norway (1952) and the original Greenland caribou.
2. Burch now proposes 3–5 generations from one major resource crisis to the next (pers. comm. in Amsden 1979: 402).
3. Greenlandic *aasivik* (pl. *aasiviit*) means 'summer place', literally 'the place where one stays in summer', *Aasaq* means 'summer' and *aasivoq* 'stay somewhere in summer'. With the suffixes *-vik* and *ssuaq* (pl. *-ssuit*), meaning 'the place where' and 'the great' respectively, *aasivissuit,* 'the great summer camps' is formed. In the title of this publication we refer to Aasivissuit as a single archaeological site and accordingly: "Aasivissuit – The Great Summer Camp".
4. Aron of Kangeq, 1822–1869. Figs. 10–14 are watercolours from Signe Rink's collection. Kalaallit Nunaata Katersugaasivia.
5. Au: Abbreviation for Aussivigssuit (old orthography).
6. H. C. Petersen has, partly in connection with conservation investigations in Sisimiut district, partly in connection with a mapping of the resources and place names in the inland areas, interviewed elderly people in the district, among others: Nathaniel Sakæussen, born 20.4.1908 in Saqqarliit, moved to Sisimiut in 1961; Time Onisimussen, born 11.2.1923 in Saqqarliit, fosterchild of Peter Siilassen, also Saqqarliit (both moved to Sisimiut the year before the village was closed down in 1963); Augustinus Kajussen, also from Saqqarliit.
7. Ethnographic investigations in Greenland by the National Museum of Denmark. (NES). Questionnaires drawn up by K. Birket-Smith 1948. Written answers collected in the period 1948–1958 (unpublished) by among others C. L. Vebæk 1948–1951, G. Nellemann 1957–1958. 13 parts. Part 2 deals with caribou-hunting, divided into 11 main questions. Kept at *Etnografisk Samling, Nationalmuseet,* Copenhagen. Informants cited in this publication: Otto Abelsen, b. 1885 (Aasiaat distr.); Asser Bertels, b. 1885 (Nuuk distr.); Julius Brønlund, b. 1872 (Uummannaq distr.); Lars Egede, b. 1893 (Nuuk distr.); Mikael Jørgensen, b. 1886 (Nuuk distr.); Ole Jørgensen, b. 1911 (Maniitsoq distr.); Rafael Jørgensen, b. 1882 (Nuuk distr.); Mikael Kleist, b. 1885 (Nuuk distr.); Emil Lange, b. 1895 (Ilulissat distr.); Gerhardt Lyberth, b. approx. 1890 (Maniitsoq distr.); Malakias Møller, b. 1891 (Sisimiut distr.); Jacob Nielsen, b. 1887 (Nuuk distr.); Abraham Nikolajsen, b. 1872 (Uummannaq distr.); Peter Petrussen, b. 1894 (Maniitsoq distr.); Leopoldus Ringsted, b. 1885 (Nuuk distr.); Ole Sandgren, b. 1884 (Qasigiannguit distr.).
8. Figs. 16, 20, 22, 23 and 28 derive from a unique series of photographs taken by the Company superintendent and district magistrate Andreas Lund-Drosvad, also called Suko, in the summer of 1923 while he was taking part in Peter Rosing's caribou hunts (Lund-Drosvad 1974).
9. Informants from Sisimiut district, interviewed at the old people's home in Sisimiut: Marie Enoksen, from Sarfannguaq, 69 years old; Kristine Evaldsen, from Assaqutaq, 78 years old; Elisabeth Møller, from Narsarmiut, 78 years old. Collected 12.4.1958 by George Nellemann. Interpreter Alma Olsen, née Rosing.
10. Due to the lack of official place names for prominent landscape features in the vicinity of Aasivissuit, we have found it convenient to provide our own – unofficial – names. These will be furnished with inverted commas.
11. Niels Gylling Mortensen, *Københavns Universitets Geografiske Institut,* has worked up the topographical maps used in this publication.
12. As the description will show, the structures referred to may – also in their original state – consist equally well of a single stone as of several. It is therefore not always appropriate to render the more comprehensive Danish *varder* with Eng. *cairns,* which according to accepted usage applies only to several stones in a pile. Except in the previous chapter where structure is immaterial, or where the familiar term may be used with justification, Greenlandic *inussuk,* pl. *inussuit,* will be employed where a generic term is needed. -Translator.
13. While the excavation team was staying at Aasivissuit, we were witness to how small groups of caribou coming from the north-east sometimes, mainly with westerly winds, got wind of the camp and therefore went round the inlet and out onto the point "Tuttup Nuua". After a deal of hesitation, the animals entered the water one after another and swam out towards the islet. Even on this holm, which is a mere 50–60 m long, there are well-trodden caribou trails down its length. Jens Rosing is thanked for stimulating discussions on the behaviour of caribou at the swimming place.
14. B-numbers 1–10, 11 (recent?), 13–14, 17–18, 20, 22, 23, 25, 28–30, 35.
15. B-numbers 16, 21, 24, 26–27, 32–34.
16. B15 and B31.
17. B12 and B19.
18. The C^{14} dating of G1 to 1030 A.D. falls within a period from which no Dorset or Thule culture material has so far been recovered from West Greenland, and can thus refer to either culture. Here is an exciting perspective for future archaeological investigations in the area.
19. The description of the stratigraphy pertains to the central part of Section A, since the northern part (ca Y 181.5–184.5) has been augmented by sediments flowing from the slope between upper and lower Au, and the southern part (ca Y 169–170) engages the central tent-house remains of lower Au. The detailed description of all numbered layers in Section A is found in the excavation report filed at Kalaallit Nunaata Katersugaasivia and is accessible with the aid of the following conversion key.

Layer in publication				*Layer in report*			
1	4B	6	9	1	18B	15	12
2	4A	7	10	16	18A	10	13
3	5	8	11	17	14	11	19

20. Bjarne Mortensen, *Niels Bohr Instituttet,* is thanked for advice and practical assistance with computer processing.
21. Measurement was carried out on all limb-bones and rib fragments (including entire ribs) from Layers 2 and 3 from the segments 128.5/176.0 + 176.5. The greatest length of each fragment was measured, and the mean length of rib fragments and limb bone fragments, respectively, calculated.

Appendix I

List of finds

Shooting-covert B23

Flakes, greenish-grey flint (gun-flint)	3 pieces
Flake, greenish-grey flint (gun-flint?)	1 piece
Flake, matt light-grey flint	1 piece
Flakes, brownish-grey flint or chalcedony, with lustrous surface	2 pieces
Flakes, brownish-grey flint or chalcedony, but with matt surface	3 pieces
Flakes, semi-transparent to semi-opaque chalcedony	15 pieces
Flakes, semi-transparent to semi-opaque chalcedony, but with local impurities	2 pieces
Bone fragments, small (presumably introduced by foxes or ravens)	15 pieces

Shooting-covert B30

Flakes, semi-transparent to semi-opaque chalcedony	4 pieces
Bone fragments, small	2 pieces
Glass, thin (0.7 mm), modern	3 pieces

Trench A and test pits

Type of find	Trench A	Test pits
Faience sherds	21	21
Porcelain sherds	5	2
Earthenware sherds	14	
Clay and porcelain pipe fragments	3	1
Glass sherds	2	1
Gun-flint	2	1
Iron objects	3	
Buttons	1	1
Glass beads		1
Knife handles	2	
Bone needles	1	
Soapstone sherds	1	
Marrow extractor	1	1
Meat fork	1	
Fittings (antler)	3	
Lateral branches of fish spear/bird dart		1
Bow fragments (wood)	1	
Worked bone/antler	14	3
Worked wood	1	
Flakes (flint, chalcedony, jasper)		50
Mussel fragments	2	

Systematic excavation

Type of find	Layer 1	2	3	4	5	6	7	8	9	10	11
Faience sherds with ornament	2	28									
Faience sherds without ornament	2	12				1					
Glazed earthenware sherds	1	21				1					
Porcelain sherds	1	5									
Porcelain pipe fragments		1									
Clay pipe fragments	1	3						1			
Glass sherds		6									
Gun-flint							1	1			
Lumps of lead		4									
Pieces of iron							1				
Flint flakes		9									
Buttons (pewter and bone)		2									
Glass beads (round and barrel-shaped)		4	1								
Glass beads (tubular)			1								
Metal rings		1									
Knife handles (antler)		1	1								
Gull hooks/barbs			2								
Arrowheads with tang (antler)			2								
Diverse arrowhead fragments (antler)			2								
Bone needles			1								
Worked antler		7	14	2							
Worked bone		1									
Worked wood		2	9	1							
Flakes (chalcedony, jasper, etc.)		3	2								
Fire drill (wood)			1								
Edge trimming (antler or bone)		1									
Other		2									

Appendix II

Bone fragments distributed by skeletal part

Layer 1, 1900–1950 A.D.

Great northern diver: 1 prox. humerus, 1 prox. femur, 1 fibula.
White-fronted goose: 1 maxilare, 1 costa, 1 prox. humerus, 1 dist. humerus, 1 diaph. ulna, 1 pelvis, 2 diaph. tibiae, 1 phalanx I.
Mallard: 1 fragm. calvarium, 1 fragm. sternum, 1 fragm. coracoid, 1 prox. humerus, 1 diaph. ulna.
Peregrine falcon: 1 fragm. sternum, 1 coracoid.
Ptarmigan: 1 fragm. sternum.
Arctic hare: 1 mandibula, 2 vertebrae, 1 fragm. vertebrae, 1 dist. costa, 1 fragm. scapula, 1 prox. radius, 1 prox. femur, 1 dist. femur, 1 prox. tibia.
Harp seal: 1 fragm. maxilare.
Seal: 1 metatarsus, 1 phalanx III.
Caribou: MNI (minimum number of individuals) 2: 11 fragm. cornus, 18 fragm. calvarium, 2 prox. mandibulae, 1 dist. mandibula, 2 incisiva, 4 molares, 6 fragm. molar, 8 v. cervicales, 3 v. thoracicae, 1 fragm. v. thoracicae, 3 v. lumbales, 28 fragm. vertebra, 3 fragm. sternum, 3 costae, 4 prox. costae, 1 dist. costa, 82 fragm. costa, 5 fragm. scapula, 1 prox. epiph. radius, 1 diaph. radius, 6 ossa carpalis, 1 metacarpus rudim., 5 fragm. pelvis, 2 diaph. femur, 1 diaph. tibia, 3 dist. tibiae, 1 os tarsale, 1 prox. metatarsus, 1 dist. metatarsus, 1 phalanx II, 1 phalanx III, 2 ossa sesamoidea, 133 fragm. limb-bones.

Table 7. 2884 caribou bones from Layer 2 (1800–1850 A.D.) and their distribution by part.

	Complete bone			Fragment	Prox. end		Dist. end		Mid-piece		Prox. epiph.		Dist. diaph.		Complete	
	sym.	dex.	sin.		dex.	sin.	dex.	sin.	dex.	sin.	dex.	sin.	dex.	sin.	dex.	sin.
Cornus				39												
Hyale																
Mandibula		5		46	12	12	11	8		4						
Incisiva	51															
Molar/prem.	62			56												
Calvarium				6												
V. cervicalis	25			1												
V. thoracica	44			7												
V. lumbalis	34			1												
V. sacralis	1			8												
V. caudalis	11			12												
Epiph. vertebra	141															
Vertebra				185												
Costa	76			309		136		150								
Sternum	3			13												
Scapula		2	1	16												
Humerus					2		4	5				1				
Radius					3	2	2	2		1			2			
Ulna					2	1	1	1	1		1			4		
Os carpale	19	1	8													
Metacarpus			1		1	3	2	3					1			
Metacar. rudim.	3			1												
Sacrum		4	2	46												
Femur						1	1		1	1	1	2				
Tibia					1		1	4	2	3		2		2		
Fibula		5	5													
Calcaneus		2	1	4	1							1				
Astralagus		5	1	1												
Os tarsale	10	5	3		1											
Metatarsus		1			2	2	6	6		3		1	2	1		
Fragm. diaphysis				1121												
Phalanx I	9		3													
II	5															
III	10															
rudim.	14															
Patella	7															
Os sesamoida	6															

Layer 2, 1800–1850 A.D.

Common mussel: 4 fragm.
Char: 1 hyomandibulare, 1 operculum, 9 vertebrae.
Cod or uuvaq: 1 supracleithrum.
Great northern diver: 2 fragm. calvarium, 1 coracoid, 1 costa,
White-fronted goose: 1 fragm. calvarium, 1 fragm. mandibula, 1 fragm. sternum, 1 fragm. clavicula, 1 humerus, 2 dist. humeri, 2 fragm. humerus, 1 prox. ulna, 1 fragm. pelvis, 1 dist. femur, 1 dist. tibia, 1 fragm. fibula, 1 tarsometatarsus. 1 dist. tibia derives from a ca 1-month-old gosling.
Mallard: 4 fragm. calvarium, 1 scapula, 1 dist. humerus, 1 prox. radius, 2 dist. radii, 1 phalanx II.
Long-tailed duck: 1 fragm. scapula.
Red-breasted merganser: 1 mandibula, 1 fragm. mandibula.
Peregrine falcon: 1 fragm. scapula.
Ptarmigan: 4 fragm. sternum, 1 fragm. coracoid, 1 scapula, 1 fragm. scapula, 1 dist. humerus, 1 dist. ulna, 2 prox. femora. The scapula fragment derives from a ca 10-day-old chick.
Arctic hare: 1 mandibula, 1 molar, 1 vertebra, 1 epiph. vertebra, 1 dist. humerus, 2 prox radii, 2 ulnae, 1 prox. epiph. ulna, 1 pelvis. 1 ulna derives from a ca 2-month-old leveret.
Arctic fox: 1 v. caudalis, 1 ulna.
Seal: 1 vertebra, 4 costae, 1 prox. costa, 3 dist. costae, 2 fragm. costa, 1 prox. ulna, 4 phalanges indet.
Caribou. At least 20 caribou are represented in the bone material – 5 calves, 4 yearlings, 11 adults. The distribution of bones by part is shown in Table 7.

Layer 3, 1650–1750 A.D.

Common mussel: 4 fragm. representing 4 shells.
Char: 3 vertebrae.
Great northern diver. 2 fragments: 1 fragm. clavicula, 1 diaph. humerus; both adults.
White-fronted goose. 16 fragments (minimum 4 individuals, all adult): 1 fragm. sternum, 1 clavicula, 1 coracoid, 1 scapula, 1 prox. humerus, 1 diaph. ulna, 1 metacarpus, 1 femur, 1 diaph. femur, 4 diaph. tibiae, 1 dist. tibia, 1 metatarsus, 1 phalanx II.
Mallard. 40 fragments (minimum 4 individuals, all adult): 4 fragm. calvarium, 1 fragm. v. lumbalis, 1 fragm. v. sacralis, 4 fragm. sternum, 3 coracoidea, 3 fragm. coracoid, 1 scapula, 1 prox. scapula, 4 fragm. scapula, 2 humeri, 4 prox. humeri, 2 dist. humeri, 1 radius, 1 diaph. radius, 1 dist. ulna, 1 diaph. ulna, 1 femur, 1 tibia, 2 prox. tibiae, 1 dist. tibia, 1 metatarsus.
Red-breasted merganser. 2 fragments of adult birds: 1 maxilare, 1 coracoid.
Ptarmigan. 10 fragments from at least 2 adults and 1 juvenile bird: 5 fragm. sternum, 1 coracoid, 1 fragm. coracoid, 1 scapula, 1 fragm. scapula, 1 dist. humerus. The distal end of a humerus derives from a ca 1-month-old chick.
Common seal: 1 vertebra cervicalis.
Seal (unidentified). 21 fragments: 1 incisiva, 3 v. thoracicae, 10 fragm. costa, 2 fragm. pelvis, 1 fragm. femur, 1 fragm. metacarpus/tarsus, 3 phalanges.
Caribou. The age and sex distribution and MNI are shown on p. 75–76. The distribution of bone fragments according to part is shown in Table 8.

Layer 4B, 1400–1500 A.D.

White-fronted goose. – The 102 bones represent at least 5 individuals: 1 fragm. calvarium, 1 mandibula, 2 prox. mandibulae, 2 dist. mandibulae, 5 fragm. mandibula, 1 v. cervicalis, 3 v. lumbales, 4 fragm. sternum, 1 clavicula, 3 fragm. clavicula, 5 coracoidea, 1 fragm. coracoid, 1 costa, 5 scapulae, 2 prox. scapulae, 1 fragm. scapula, 3 humeri, 1 prox. humerus, 1 dist. humerus, 1 diaph. humerus, 3 fragm. humerus, 4 diaph. radii, 2 fragm. radius, 5 diaph. ulnae, 2 fragm. ulna, 4 metacarpi, 1 fragm. metacarpus, 1 fragm. pelvis, 2 prox. femora, 8 diaph. femora, 1 fragm. femur, 1 tibia, 1 prox. tibia, 7 diaph. tibiae, 3 fragm. tibia, 2 diaph. metatarsi, 2 fragm. metatarsus, 2 phalanges I, 4 phalanges indet. 1 diaph. tibia derives from a ca 1-month-old gosling.
Mallard: 2 fragm. calvarium, 1 fragm. sternum, 3 coracoidea, 1 prox. coracoid, 1 fragm. coracoid, 4 scapulae, 2 fragm. scapula, 2 humeri, 1 prox. humerus, 1 diaph. humerus, 1 fragm. humerus, 2 fragm. ulna, 1 prox. metacarpus, 1 prox. femur.
Long-tailed duck: 1 humerus, 1 radius.
Red-breasted merganser: 1 coracoid, 1 diaph. humerus.
Ptarmigan: 1 fragm. clavicula, 1 coracoid, 2 fragm. coracoid, 2 humeri, 1 diaph. ulna, 1 prox. metacarpus, 1 femur, 1 dist. femur, 1 dist. tibia. 2 coracoidea and 2 humeri derive from one (or more) 1–2-month-old chicks.
Arctic hare: 1 fragm. mandibula, 1 molar, 1 fragm. v. sacralis, 1 fragm. scapula, 1 prox. radius, 1 dist. femur. The scapula, vertebra and femur fragments derive from a leveret (or leverets), ca 2 months old.
Arctic fox: 1 metatarsus.
Harp seal: 1 femur.
Seal: 3 molares, 6 vertebrae, 1 ossa penis, 4 costae, 3 prox. costae, 17 fragm. costa, 1 femur, 3 metatarsi, 2 metacarpi/tarsi, 1 phalanx I, 3 phalanges III, 8 phalanges indet.
Caribou. Minimum 2 individuals: 12 fragm. cornus, 1 fragm. calvarium, 2 prox. mandibulae, 1 dist. mandibula, 3 fragm. mandibula, 1 incisiva, 9 molares, 6 fragm. molar, 3 v. cervicales, 6 v. thoracicae, 7 fragm. vertebra, 25 epiph. vertebrae, 13 fragm. v. sacrales, 8 costae, 11 prox. costae, 13 fragm. costa, 2 scapulae, 2 fragm. scapula, 1 dist. humerus, 2 prox. radii, 1 dist. radius, 1 diaph. ulna, 7 ossa carpalia, 3 dist. metacarpi, 1 dist. femur, 1 patella, 1 dist. tibia, 1 prox. epiph. tibia, 1 fibula, 1 calcaneus, 1 dist. metatarsus, 6 ossa

Table 8. 7776 caribou bones from Layer 3 (1650–1750 A.D.) and their distribution by part.

	Complete bone			Frag-ment	Prox. end		Dist. end		Mid-piece		Prox. epiph.		Dist. diaph.		Complete diaph.	
	sym.	dex.	sin.		dex.	sin.	dex.	sin.	dex.	sin.	dex.	sin.	dex.	sin.	dex.	sin.
Cornus				63												
Hyale	8			15												
Mandibula		7	10	23	8	8	11	6	2	2						
Incisiva	7															
Molar/prem.	49			14												
Calvarium				35												
V. cervicalis	326			13												
V. thoracica	659			28												
V. lumbalis	353															
V. sacralis	6			5												
V. caudalis	5															
Epiph. vertebra	1493															
Vertebra				254												
Costa	620			722	480		141									
Sternum	2			29												
Scapula		12	10	14												
Humerus			1		4	2	17	20	2	2			1	2	1	1
Radius					16	15	24	19	4	4			8	10		
Ulna		2	2		5	8	1							3		
Os carpale	167															
Metacarpus					17	8	16	5					6			
Metacar. rudim.	14			1												
Sacrum		22	21	77												
Femur					22	22	8	9	2	5	1	2		3		1
Tibia			1		5	12	14	23	9	8	1	7		1		
Fibula	1	11	15													
Calcaneus		16	13		1			2								
Astragalus		10	17													
Os tarsale	45															
Metatarsus					14	9	16	13	6	7			6			
Fragm. diaphysis				1240												
Phalanx I	33					1				1		3				
II	29							1		1		1				
III	20															
rudim.	44					1										
Patella	10															
Os sesamoida	65															

sesamoidea, 3 phalanges I, 3 prox. phalanges I, 3 dist. phalanges I, 3 phalanges II, 1 dist. phalanx II, 2 phalanges III, 1 prox. phalanx indet., 3 phalanges rudim., 115 fragm. limb-bones.

Layer 4A, 1200–1300 A.D.

White-fronted goose: 1 fragm. scapula, 1 fragm. coracoid, 1 diaph. humerus. The scapula and coracoid fragments derive from ca 2-month-old, unfledged, goslings.

Seal: 1 vertebra, 2 prox. costae, 1 dist. costa, 5 fragm. costa, 1 prox. fibula, 1 dist. fibula, 1 astragalus, 2 phalanges III, 1 phlanx indet.

Caribou. Minimum 2 individuals: 5 fragm. cornus, 6 molares, 4 fragm. molar, 3 v. cervicales, 4 v. thoracicae, 8 fragm. vertebra, 5 costae, 1 epiph. costa, 7 fragm. costa, 1 fragm. sternum, 2 fragm. scapula, 2 ossa carpalia, 1 metacarpus rudim., 1 diaph. tibia, 1 tarsus, 1 calcaneus, 1 astragalus, 2 prox. metatarsi, 1 dist. epiph. metatarsus, 4 ossa sesamoidea, 1 phalanx rudim., 8 fragm. limb-bones.

Layer 5, ca 200 B.C.

Caribou. 6 fragments: 1 fragm. costa, 1 fragm. radius (adult), 1 fragm. tibia (juvenile), 3 fragm. limb-bones.

Literature

Aaris-Sørensen, K. 1983. A classification code and computerized data-analysis for faunal materials from archaeological sites. – OSSA 8: 3–29.

Amsden, C. V. 1979. Hard times: A case study from Northern Alaska and implications for Arctic prehistory. – In: McCartney, A. P. (ed.), Thule Eskimo Culture: An Anthropoligical Retrospective. – National Museum of Man, Mercury Series. Archaeological Survey of Canada paper 88: 395–410.

Audet, R. 1979. Histoire de caribou de Québec-Labrador et évolution des populations. – In: Trudel, F. & Huot, J. (eds.), Dossier Caribou, Ecologie et Exploitation du Caribou au Québec-Labrador. – Recherches Amérindiennes au Québec 9 (1–2): 17–27.

Balikci, A. 1964. Development of basic socio-economic units in two Eskimo communities. – National Museum of Canada, Bulletin 202, Anthropological Series 69: 1–115.

Bedord, J. N. 1975. Morphological variation in Bison metacarpals and metatarsals. – In: Frison, G. C. (ed.), The Caspar Site: A Hell Gap Bison Kill on the High Plains. – Studies in Archaeology Series, Academic Press: 190–240.

Bendixen, O. 1921. Holsteinsborg Distrikt. – In: Amdrup, G. C. et al. (eds.) Grønland i Tohundredeåret for Hans Egedes Landing. – Meddr Grønland 61: 1–87.

Bertelsen, A. 1921. Fuglene i Umanaq Distriktet. – Meddr Grønland 62: 139–214.

Binford, L. R. 1978. Nunamiut ethnoarchaeology. – Studies in Archaeology, Academic Press, Inc., New York: 509 pp.

Birket-Smith, K. 1918. The Greenland bow. – Meddr Grønland 56 (1): 1–28.

– 1924. Ethnography of the Egedesminde district. With aspects of the general culture of West Greenland. – Meddr Grønland 66: 1–484.

– 1929. The Caribou Eskimos. Material and Social Life and their Cultural Position. Descriptive and Analytical Part, I and II. – Report of Fifth Thule Expedition 1921–24, Vol. V, Copenhagen: 416 pp.

– 1971. Eskimoerne. – Rhodos, Copenhagen: 278 pp.

Bourque, B. J. et al. 1978. Determining the season of death of mammal teeth from archaeological sites: A new sectioning technique. – Science 199: 530–531.

Braestrup, F. W. 1941. A study on the arctic fox in Greenland. Immigrations, fluctuations in numbers based mainly on trading statistics. – Meddr Grønland 131 (4): 1–102.

Brink, W. T. 1975. Holocene history of the Greenland ice sheet based on radiocarbon-dated moraines in West Greenland. – Meddr Grønland 201 (4): 1–44.

Burch, E. S., Jr. 1972. The caribou/wild reindeer as a human resource. – American Antiquity 37: 339–368.

– 1978. Caribou Eskimo origins: An old problem reconsidered. – Arctic Anthropology 15 (1): 1–35.

Bøcher, J. et al. 1980. Holsteinsborg. Sisimiut Kommune. Natur- og Kulturforhold. – Udvalget vedrørende fredningslov for Grønland 1980: 88 pp.

Coysh, A. W. 1970. Blue and White Tranfer Ware, 1780–1840. – Newton Abbot, David & Charles, London: 112 pp.

Dalager, L. 1915. Grønlandske Relationer: indeholdende Grønlændernes Liv og Levnet, deres Skikke og Vedtægter [1752]. – Bobé, L. (ed.), Det Grønlandske Selskabs Skrifter 2: 1–87.

Dansgaard, W. et al. 1975. Climatic change, Norsemen and modern man. – Nature 255 (5503): 24–28.

Dauphiné, T. C., Jr. 1976. Biology of the Kaminuriak population of barren-ground caribou. Part 4: Growth, reproduction and energy reserves. – Canadian Wildlife Service, Report Series 38: 69 pp.

Degerbøl, M. 1957. The extinct reindeer of East Greenland, Rangifer tarandus eogroenlandicus, subsp. nov., compared with reindeer from other arctic regions. – Acta Arctica 10: 1–57.

Degerbøl, M. & Fredskild, B. 1970. The Urus (Bos primigenius Bojanus) and neolithic domesticated cattle (Bostaurus domesticus Linné) in Denmark. With a revision of Bos-remains from the kitchen middens. Zoological and palynological investigations. – Kgl. danske Vidensk. Selsk. Skr. 17 (1): 1–225.

Dunbar, M. J. & Thomson, D. H. 1979. West Greenland salmon and climatic change. – Meddr Grønland 202 (4): 1–19.

Edland, H. 1969. Tenner hos Reinsdyr, Bedømmelse ved Tannskifte og Tannfrembrud. – Norges Veterinærhøgskole, Institutt for Anatomi, Oslo: 32 pp.

Egede, H. 1729. Det gamle Grønlands nye Perlustration: eller en kort Beskrivelse af de gamle Nordiske Coloniers Situation og Undergang i Grønland, Grønlands Situation etc. – Først Anno 1724 forfattet af Hr. Hans Egede, og efter Forfarenhed noget forandret af een der på nogen Tiid har været i Grønland. – Geelmuyden, J. (ed.), København: 58 pp.

– 1925. Relationer fra Grønland 1721–36 [1737] og Det gamle Grønlands ny Perlustration [1741]. – Bobé, L. (ed.) Meddr Grønland 54: 1–442.

Egede, N. 1939. Beskrivelse over Grønland [1770]. – Ostermann, H. (ed.). – Meddr Grønland 120: 221–269.

Embleton, C. & King, C. A. M. 1975. Periglacial Geomorphology. – Edward Arnold, London: 203 pp.

Eriksen, J. Drivsholm. 1975. Samfundsformer og Bosætning i Vestgrønland omkring 1700. En Analyse af »Det Oprindelige Grønlandske Samfund« ved den Dansk-Norske Kolonisations Begyndelse. – Afgangsopgave ved Arkitektskolen i Århus: 176 pp.

Fabricius, O. 1962. A Precise Description of the Hunting of Terrestrial Animals, of Fowling and Fishing by the Greenlanders [1818]. – In: Holtved. E. (ed.), Otto Fabricius' ethnographical works. – Meddr Grønland 140 (2): 1–137.

Fischer, A. & Mortensen, B. N. 1979. Report on the use of computers for description and analysis of palaeolithic and mesolithic occupation areas. – In: Kristiansen, K. & Paludan-Müller, C. (eds.), New Directions in Scandinavian Archaeology. – Studies in Scandinavian Prehistory and Early History 1: 7–22.

Fredskild, B. 1973. Studies in the vegetational history of Greenland. Meddr Grønland 198 (4): 1–245.

Freuchen, P. 1915. Report of the First Thule Expedition. Scientific work. – Meddr Grønland 51 (12): 387–412.

Gad, F. 1967. Grønlands Historie I. Indtil 1700. – Nyt Nordisk Forlag Arnold Busck, København: 461 pp.

– 1969. Grønlands Historie II. 1700–1782. – Nyt Nordisk Forlag Arnold Busck, København: 760 pp.

– 1976. Grønlands Historie III. 1782–1808. – Nyt Nordisk Forlag Arnold Busck, København: 615 pp.

Glahn, H. C. 1921. Missionær i Grønland Henric Christopher Glahns Dagbøger for Aarene 1763–64, 1766–67 og 1767–68. – Ostermann, H. (ed.), – Det Grønlandske Selskabs Skrifter 4: 1–247.

Godden, G. A. 1966. An Illustrated Encyclopedia of British Pottery and Porcelain. – Jenkins, London: 390 pp.

Gripp, K. 1942. Grönländische Rentierjäger. – Offa, 6/7, Neumünster 1941/42: 40–51.

Grønnow, B. In press. Kulturhistorisk forskning i det vestgrønlandske indland. – In: Andreasen, C. & Petersen, R. (eds.), Symp. Nuuk (Godthåb) 1981 (»Vort Sprog, Vor Kultur«).

Grønnow, B., Meldgaard, M. and Nielsen, J. B. 1978. Aussivigssuit Projektet 1978. – Unpublished report on file at Kalaallit Nunaata Katersugaasivia, Nuuk: 17 pp.

Gulløv, H. C. 1980. Ethnohistorie – metodeproblemet i Grønlands historie. – Fortid og Nutid, XXVIII (3): 425–435.

– In press. Straat Davids Grønlændernes og sydlændingenes bosætning og bebyggelse i Vestgrønland før kolonisationen. – In: Andreasen, C. & Petersen, R. (eds.), Symp. Nuuk (Godthåb) 1981 (»Vort Sprog, Vor Kultur«).
Gulløv, H. C. & Ilkjær, J. 1968. Beretning om udgravningerne på Tuapagssuit, Godthåb-distriktet. – Unpubl. manus. in the National Museum of Denmark (IV Dept.), Copenhagen.
Gulløv, H. C. & Kapel, H. 1979. Haabetz Colonie 1721–1728. A Historical-Archaeological Investigation of the Danish-Norwegian Colonization of Greenland. Ethnohistorical studies of the Meeting of Eskimo and European Cultures. – Publications of the National Museum Ethnographical Series, Vol. 16, Copenhagen: 245 pp.
– 1979/80. Legend, history and archaeology. A study of the art of Eskimo narratives. – Folk 21–22: 347–380.
Hansen, K. 1979. Perler i Grønland. – Nationalmuseet, København: 40 pp.
Hasholt, B. & Søgård, H. 1979. En klimatisk-hydrologisk regionsinddeling af Holsteinsborg Kommune (Sisimiut). – In: Jacobsen, N. K. (ed.), Natur- og Kulturforholdene i Sisimiut/Holsteinsborg Kommune. – Unpublished report from Udvalget Vedrørende Fredningslov for Grønland, København: 40–58.
Hess, C. 1968. De glemte flinthuggere fra Stevns. – Skalk 5: 9–15.
Holt, S. 1980. Vegetation patterns and effects of grazing on caribou ranges in the Søndre Strømfjord area, West Greenland. – In: Reimers, E., Gaare, E. & Skjenneberg, S. (eds.), Proc. 2nd Int. Reindeer/Caribou Symp., Røros, Norway 1979. Direktoratet for Vilt og Ferkvannsfisk, Trondheim: 57–63.
Janssen, C. E. 1913. En Grønlandspræsts Optegnelser 1844–49. – In: Clausen, J. and Rist, P. F. (eds.) Memoirer og Breve 19. – Nordisk Forlag, København: 223 pp.
Jensen, A. S. 1939. Concerning a change of climate during recent decades in the arctic and subarctic regions, from Greenland in the West to Euroasia in the East, and contemporary biological and geophysical changes. – Kgl. Danske Vidensk. Selsk., Biol. Medd. 14 (8): 1–75.
Jensen, J. A. D. 1879. Beretning om en Undersøgelse af Grønlands Vestkyst (en Del af Holsteinsborgs og Egedesmindes Distrikter) fra 66°55′–68°30′. – Meddr Grønland 2: 113–148.
Jordan, R. H. 1978. Archaeological investigations of Hamilton Inlet Labrador Eskimo: Social and economic responses to European contact. – Arctic Anthropology 15 (2): 175–185.
– 1979. Inugsuk revisited: An alternative view of Neo-Eskimo chronology and culture change in Greenland. – In: McCartney, A. P. (ed.), Thule Eskimo culture: An anthropological retrospective. – Archaeological Survey of Canada 88, Ottawa: 149–170.
Knuth, E. 1944. Bidrag til Vesterbygdens Topografi. – Det Grønlandske Selsk. Årsskr.: 81–124.
Larsen, H. & Meldgaard, J. 1958. Paleo-Eskimo cultures in Disko Bugt, West Greenland. – Meddr Grønland 161 (2): 1–75.
Lie, R. W. 1973. Sex-determination as a multivariate problem. – Norwegian Archaeological Review 6 (2): 79–83.
Lynge, F. 1981. Fugl og Sæl – og Menneskesjæl. Kalâtdlit Itsaĸ. Ússatait Ugperissaitdlo. – Nordiske Landes Bogforlag, Holsteinsborg: 161 pp.
Lund-Drosvad, A. 1959. Drivjagt på rensdyr. – Atuagagdliutit/Grønlandsposten, 7: 8.
– 1974. Jakob Rosing: min ungdoms ven. – Privat tryk, Skjern: 25 pp.
Mathiassen, Th. 1930. Inugsuk, a mediaeval Eskimo settlement in Upernavik district, West Greenland. – Meddr Grønland 77: 146–338.
– 1931. Ancient Eskimo settlements in the Kangâmiut area. – Meddr Grønland 91 (1): 1–147.
– 1934. Contributions to the archaeology of Disko Bay. – Meddr Grønland 93 (3): 1–188.
– 1958. The Sermermiut excavations, 1955. – Meddr Grønland 161 (3): 1–52.
Meldgaard, J. 1961. Sarqaq-folket ved Itivnera. Nationalmuseets undersøgelser i sommeren 1960. – Grønland 1: 15–23.
– 1979. The prehistoric cultures in Greenland: Discontinuities in a marginal area. – In: Danish-Netherland Symposium on Developments in Greenlandic Arctic Culture. – Arctic Centre, University of Groningen, Netherlands 1977: 19–52.
– 1980. Grønland. – In: Mikkelsen, B. D. & Lundbæk, T. (eds.), Etnografiske genstande i Det Kongelige Danske Kunstkammer 1650–1800/Ethnographical Objects in The Royal Danish Kunstkammer 1650–1800. – Nationalmuseet, København: 1–16.
Meldgaard, M. In press. Resource fluctuations and human subsistence. An archaeozoological and ethnographical investigation of a West Greenland caribou hunting camp. – British Archaeological Reports.
Mikiassen, N. 1864. Nûngme piniartut ilâta univkâliai 1864 me. – Atuagagdliutit 29 & 30: columns 447–457.
Miller, F. L. 1974. Biology of the Kaminuriak population of barren-ground caribou. Part 2: Dentition as an indicator of age and sex composition and socialization of the population. – Canadian Wildlife Service Report Series 31: 1–88.
Mott, P. G. et al. 1937. The Oxford Greenland Expedition, West Greenland, 1936. – Geographical Journal 90: 315–34.
Møhl, U. 1972. Animal bones from Itivnera, West Greenland. A reindeer hunting site of the Sarqaq culture. – Meddr Grønland 191 (6): 1–21.
Müller, R. 1906. Vildtet og Jagten i Sydgrønland. – Universitetets Bogtrykkeri, København: 519 pp.
Nansen, F. 1891. Eskimoliv. – H. Aschehoug & Co.'s Forlag, Kristiania: 293 pp.
Nellemann, G. 1955. Træk af rensdyrjagtens historie. – Grønland: 81–87.
– 1969/70. Caribou hunting in West Greenland. – Folk 11–12: 133–153.
Parker, G. R. et al. 1975. Crashes of musk ox and Peary's caribou in 1973–74 on the Parry Islands, Arctic Canada. – Canadian Wildlife Service, Progress Notes 56: 73–82.
Petersen, J. 1911. Erinarssûtit nûtigdlit I: 47 pp.
Petersen, O. 1970. Majorqaq. Med kommentar af Robert Petersen. – Grønland: 180–189.
Petersen, R. 1965. Some regulating factors in the hunting life of Greenlanders. – Folk 7: 107–124.
– 1974/75. Some considerations concerning the Greenland longhouse. – Folk 16–17: 171–188.
Piérard, J. 1979. Le caribou dans la préhistoire et la protohistoire du Québec. – In: Trudel, F. & Huot, J. (eds.), Dossier Caribou, Ecologie et Exploitation du Caribou au Québec-Labrador. – Recherches Amérindiennes au Québec 9 (1–2): 9–16.
Porsild, M. P. 1915. The principle of the screw in the technique of the Eskimo. – American Anthropologist, New Series 17: 1–16.
Rasmussen, H.-E. 1979. Aasiviit – de kulturelle og politiske sommerstævner i Grønland. – Jordens Folk 4: 360–371.
Rasmussen, K. 1924. Myter og Sagn fra Grønland, II. Vestgrønland. – Nordisk Forlag, København: 354 pp.
Rink, H. 1975. Tales and Traditions of the Eskimo [1875]. – AMS Press Inc., New York: 472 pp.
– 1974. Danish Greenland, its People and Products [1877]. – McGill-Queen's University Press, Montreal: 468 pp.
Rosing, Jakob. 1926/27. Kangâmiormiut asimiuisalo ingerdlausiánik. – Atuagagdliutit, Nos 1, 2, 4, 6, 8 & 10: columns 14–16, 30–32, 55–59, 87–91, 113–118 & 149–152.
Rosing, Jens. 1958a. Søndrestrømfjords Saga. – Grønland: 321–331.
– 1958b. Tanker ved et »viftested«. – Grønland: 385–392.

Rosing, O. 1976. Taseralik. Oqalugtualiaq 1845–50 migssâne pisimassûdlugo [1955]. – Det Grønlandske Forlag, Godthåb: 179 pp.
Salomonsen, F. & Johansen, G. 1950. Grønlands Fugle. (The Birds of Greenland). – Ejnar Munksgaard, København: 607 pp.
Spiess, A. E. 1976. Determining season of death of archaeological fauna by analysis of teeth. – Arctic 29 (1), 53–55.
– 1979. Reindeer and Caribou Hunters. An Archaeological Study. – Studies in Archaeology, Academic Press, Inc., New York: 312 pp.
Steensby, H. P. 1910. Contributions to the ethnology and anthropogeography of the Polar Eskimos. – Meddr Grønland 34: 255–405.
Stefànsson, V. 1914. The Stefànsson-Anderson arctic expedition of the American Museum of Natural History. Preliminary ethnological report. – Anthropological Papers of the American Museum of Natural History 14 (1): 1–395.
Strandgaard, H. 1977. Rensdyrundersøgelse i Vestgrønland. Kalâtdlit nunâta kitâne tugtunik misigssuinigssaq. – Forskning i Grønland/Ilisimatût Misigssuinerinik Kalâtdlit Nunâne Tusaut 1 (1): 7–9.
– 1980. Undersøgelser over Vestgrønlands rensdyr. – Grønland 5: 145–152.
Thing, H. 1981. Feeding Ecology of the West Greenland Caribou (Rangifer tarandus groenlandicus Gmlin) in the Holsteinsborg-Sdr. Strømfjord area. – Unpublished Ph.D. dissertation. Faculty of Natural Sciences, University of Aarhus: 111 pp.
Thing, H. & Clausen, B. 1980. Summer mortality among caribou calves in Greenland. – In: Reimers, E. et al. (eds.), Proc. 2nd Int. Reindeer/Caribou Symp., Røros, Norway, 1979. – Direktoratet for Vilt og Ferskvannsfisk, Trondheim: 734–737.
Thorhallesen, E. 1914. Beskrivelse over Missionerne i Grønlands Søndre Distrikt, Hvilke han som Vice-provst visiterede i Aarene 1774–1775. – Bobé (ed.), Det Grønlandske Selskabs Skrifter 1: 1–108.
Towner, D. C. 1957. English Cream-Coloured Earthenware. – Faber & Faber, London: 107 pp.
Troels-Smith, J. 1955. Characterization of unconsolidated sediments. – Geological Survey of Denmark. IV Series 3 (10): 1–73.
van der Sleen, W. G. N. 1963. Beadmaking in seventeenth century Amsterdam. – Archaeology 16 (4): 260–263.
– 1967. A Handbook on Beads. – Publication des "Journées Internationales du Verre", Liège: 142 pp.
Vibe, C. 1967. Arctic animals in relation to climatic fluctuations. – Meddr Grønland 170 (15): 1–227.
– 1982. Mikro-istider. – Naturens Verden 9: 297–320.
Weidick, A. 1968. Observations on some holocene glacier fluctuations. – Bull. Grønlands Geologiske Undersøgelse 73: 1–202.
– 1972. Holocene shorelines and glacial stages in Greenland – an attempt at correlation. – Rapp. Grønlands Geologiske Undersøgelse 41: 1–39.
– 1976. Glaciation and the Quaternary of Greenland. – In: Escher, A. & Watt, W. S. (eds.), Geology of Greenland. – Grønlands Geologiske Undersøgelse, København: 431–458.

UTM 22

7448
7447
7446
7445
7444
N 7443 km

E 491 km
492
493
494
495
496
497
498

ISORTOQ

»Tunit Qoorua«
»Joorup Kissaataa«
»Aliip Tasia«
»Igaaq«
»Issat«
»Tuulukkap Qaaqqaa«
»Inussuup Qaaqqaa«
»Nerlerup Qoorua«
»Naanngisat Qoorua«
»Qimatut Nuua«
»Tuullip Kangerlunngua«
»Qiterlerup Qeqertaa«
»Tulitup Nuua«
»Pukkitsukujooq«

AASIVISSUIT
TASIAT

LEGEND

- Inussuk
- Shooting-hide
- Meat cache
- Repository
- Foxtrap
- Grave
- Hunters' bed
- Hopping-stone row
- Stone fence
- Tent ring
- Fireplace
- Unidentified structure
- Aasivissuit camp
- » « Unofficial place-name

The

AASIVISSUIT

catchment area with stone-built structures

500 m. 0 1 km.

Contour interval: 20 metres.

Survey, photogrammetry, compilation and drawing by N. Gylling Mortensen, Institute of Geography, University of Copenhagen.

Instructions to authors

Manuscripts will be forwarded to referees for evaluation. Authors will be notified as quickly as possible about acceptance, rejection, or desired alterations. The final decision rests with the editor. Authors receive two page proofs. Prompt return to the editor is requested.

Alterations against the ms. will be charged to the author(s). Twenty five offprints are supplied free. Order form, quoting price, for additional copies accompanies 2nd proof. Manuscripts (including illustrations) are not returned to the author(s) after printing unless especially requested.

Manuscript

General. – Manuscripts corresponding to less than 16 printed pages (of 6100 type units), incl. illustrations, are not accepted. Two copies of the ms. (original and one good quality copy), each complete with illustrations should be sent to the Secretary.

All Greenland place names in text and illustrations must be those authorized. Therefore sketch-maps with all the required names should be forwarded to the Secretary for checking before the ms. is submitted.

Language. – Manuscripts should be in English (preferred language), French, or German. When appropriate, the language of the ms. must be revised before submission.

Title. – Titles should be kept as short as possible and with emphasis on words useful for indexing and information retrieval.

Abstract. – An English abstract should accompany the ms. It should be short, outline main features, and stress novel information and conclusions.

Typescript. – Page 1 should contain: (1) title, (2) name(s) of author(s), (3) abstract, and (4) author's full postal address(es). Large mss. should be accompanied by a Table of Contents, typed on separate sheet(s). The text should start on p. 2. Consult a recent issue of the series for general lay-out.

Double space throughout and leave a 4 cm left margin. Footnotes should be avoided. Desired position of illustrations and tables should be indicated with pencil in left margin.

Underlining should only be used in generic and species names. The use of italics in other connections is indicated by wavy line in pencil under appropriate words. The editor undertakes all other type selection.

Use three or fewer grades of headings, but do not underline. Avoid long headings.

References. – Reference to figures and tables in the text should have this form: Fig. 1; Figs 2–4, Table 3. Bibliographic references in the text are given as: Shergold (1975: 16) and (Jago & Daily 1974b).

In the list of references the following usage is adopted:

Journal: Macpherson, A. H. 1965. The origin of diversity in mammals of the Canadian arctic tundra. – System. Zool. 14: 153–173.

Book: Marsden, W. 1964. The lemming year. – Chatto & Windus, London: xxx pp.

Chapter (part): Wolfe, J. A. & Hopkins, D. M. 1967. Climatic changes recorded by Tertiary landfloras in northwestern North America. – In: Hatai, K. (ed.), Tertiary correlations and climatic changes in the Pacific. – 11th Pacific Sci. Congr. Tokyo 1966, Symp.: 67–76.

Title of journals should be abbreviated according to the last (4th) edition of the World List of Scientific Periodicals (1960) and supplementary lists issued by BUCOP (British Union-Catalogue of Periodicals). If in doubt, give the title in full.

Meddelelser om Grønland, Man & Society should be registered under *Meddelelser om Grønland.* Example (with authorized abbreviations): *Meddr Grønland, Man & Soc. 1,* 1979.

Illustrations

General. – Submit two copies of each graph, map, photograph, etc., all marked with number and author's name. Normally all illustrations will be placed within the text; this also applies to composite figures.

All figures (incl. line drawings) must be submitted as glossy photographic prints suitable for direct reproduction, i.e. having the format of the final figure. Do not submit original artwork. Where appropriate the scale should be indicated in the caption or in the illustration.

The size of the smallest letters in illustrations should not be less than 1.5 mm. Intricate tables are sometimes more easily reproduced from line drawings than by type-setting.

Colour plates may be included at the author's expense, but the editor should be consulted before such illustrations are submitted.

Size. – The width of figures must be that of a column (77 mm), 1½ column (120 mm) or of a page (160 mm). Remember to allow space for captions below full page figures. Maximum height of figures (incl. captions) is 217 mm. Horizontal figures are preferred.

If at all possible, fold-out figures and tables should be avoided.

Caption. – Captions (two copies) to figures should be typed on separate sheets.

Meddelelser om Grønland

Bioscience
Geoscience
Man & Society

Published by
The Commission
for Scientific
Research
in Greenland

AiO Tryk as, Odense