

## **Prehistoric Maritime Adaptations of the Circumpolar Zone**

# World Anthropology

*General Editor*

SOL TAX

*Patrons*

CLAUDE LÉVI-STRAUSS

MARGARET MEAD

LAILA SHUKRY EL HAMAMSY

M. N. SRINIVAS

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*Editor*

WILLIAM FITZHUGH

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## *General Editor's Preface*

Students of the Arctic are an interdisciplinary and international circle of colleagues who have for forty years increasingly worked together on common problems. The present book is a unique summation of what specialists know of the archaeological and historical adaptations of our species to the interesting complex of environments which surround the North Pole. The Editor's Introduction not only excellently assesses the results but also described the history of theory concerning the area, this latest phase being inspired by a unique Congress which brought together for such summations an assemblage of scholars from every part of the world.

Like most contemporary sciences, anthropology is a product of the European tradition. Some argue that it is a product of colonialism, with one small and self-interested part of the species dominating the study of the whole. If we are to understand the species, our science needs substantial input from scholars who represent a variety of the world's cultures. It was a deliberate purpose of the IXth International Congress of Anthropological and Ethnological Sciences to provide impetus in this direction. The *World Anthropology* volumes, therefore, offer a first glimpse of a human science in which members from all societies have played an active role. Each of the books is designed to be self-contained; each is an attempt to update its particular sector of scientific knowledge and is written by specialists from all parts of the world. Each volume should be read and reviewed individually as a separate volume on its own given subject. The set as a whole will indicate what changes are in store for anthropology as scholars from the developing countries join in studying the species of which we are all a part.

The IXth Congress was planned from the beginning not only to include as many of the scholars from every part of the world as possible, but also with a view toward the eventual publication of the papers in high-quality volumes. At previous Congresses scholars were invited to bring papers which were then read out loud. They were necessarily limited in length; many were only summarized; there was little time for discussion; and the sparse discussion could only be in one language. The IXth Congress was an experiment aimed at changing this. Papers were written with the intention of exchanging them before the Congress, particularly in extensive pre-Congress sessions; they were not intended to be read at the Congress, that time being devoted to discussions — discussions which were simultaneously and professionally translated into five languages. The method for eliciting the papers was structured to make as representative a sample as was allowable when scholarly creativity — hence self-selection — was critically important. Scholars were asked both to propose papers of their own and to suggest topics for sessions of the Congress which they might edit into volumes. All were then informed of the suggestions and encouraged to re-think their own papers and the topics. The process, therefore, was a continuous one of feedback and exchange and it has continued to be so even after the Congress. The some two thousand papers comprising *World Anthropology* certainly then offer a substantial sample of world anthropology. It has been said that anthropology is at a turning point; if this is so, these volumes will be the historical direction-markers.

As might have been foreseen in the first post-colonial generation, the large majority of the Congress papers (82 percent) are the work of scholars identified with the industrialized world which fathered our traditional discipline and the institution of the Congress itself: Eastern Europe (15 percent); Western Europe (16 percent); North America (47 percent); Japan, South Africa, Australia, and New Zealand (4 percent). Only 18 percent of the papers are from developing areas: Africa (4 percent); Asia-Oceania (9 percent); Latin America (5 percent). Aside from the substantial representation from the U.S.S.R. and the nations of Eastern Europe, a significant difference between this corpus of written material and that of other Congresses is the addition of the large proportion of contributions from Africa, Asia, and Latin America. "Only 18 percent" is two to four times as great a proportion as that of other Congresses; moreover, 18 percent of 2,000 papers is 360 papers, 10 times the number of "Third World" papers presented at previous Congresses. In fact, these 360 papers are more than the total of ALL papers published after the last International Congress of Anthropological and Ethnological

Sciences which was held in the United States (Philadelphia, 1956). Even in the beautifully organized Tokyo Congress in 1968 less than a third as many members from developing nations, including those of Asia, participated.

The significance of the increase is not simply quantitative. The input of scholars from areas which have until recently been no more than subject matter for anthropology represents both feedback and also long-awaited theoretical contributions from the perspectives of very different cultural, social and historical traditions. Many who attended the IXth Congress were convinced that anthropology would not be the same in the future. The fact that the next Congress (India, 1978) will be our first in the "Third World" may be symbolic of the change. Meanwhile, sober consideration of the present set of books will show how much, and just where and how, our discipline is being revolutionized.

Readers of this volume will be interested in a number of others in this series on maritime anthropology in other contexts; archaeological and population studies of areas adjacent to the Arctic; and studies of early man, population biology, and migration as a continuing species phenomenon.

*Chicago, Illinois*  
*September 3, 1975*

SOL TAX





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# *Introduction*

WILLIAM FITZHUGH

The occasion of the IXth International Congress of Anthropological and Ethnological Sciences, held in Chicago in 1973 under the direction of Dr. Sol Tax, offered a unique opportunity to explore global anthropological issues. Formerly, works contributed to the Congress varied widely, and it was rare to assemble a group of specialists who had agreed beforehand to apply themselves to a single topic. The decision that the 1973 Congress would be organized around topical symposia and would publish volumes with substantive papers of general as well as specialized interest provided a structure by which the Congress could serve more usefully as an educational forum for focused scholarly discussion while also making available to the public a synopsis of the current state of knowledge in a given field.

These changes in Congress format provided the impetus for a new departure in the traditional quintennial colloquy of circumpolar archaeologists. The existence of this fraternity of northern specialists has been a distinctive feature of circumpolar studies, and one wonders if their solidarity accrues from a combination of common historical and methodological problems or from a huddling effect instilled by inurement from mosquitos and common tastes for bakeapple (*Rubus chamaemorus*) and fresh fish. Aside from these proclivities, however, there is no doubt that Marshall and Fulbright fellowships and the history of Danish research in the North American Arctic, together with exchanges of Russo-American research in Alaska and Siberia, have resulted in an unusual kinship of scholarly enterprises and associations which has promoted the development of crossties in circumpolar anthropology. The reasons, of course, go far beyond this and include both scholarly traditions and

the continuity of arctic and subarctic environments around the Arctic Basin.

The decision to prepare a Congress session on circumpolar maritime adaptations grew from developments in the general field of northern anthropological research over the past century. These trends are useful to note, for they document the intertwined nature of ethnological and archaeological theory in arctic studies. Besides the obvious environmental similarities, three factors seem to have been predominant influences: speculation on the relationship between ethnographic Eskimos and Paleolithic cultures of Western Europe, the diffusion of cultural elements within the circumpolar tundra-taiga zone, and the functional question of cultural and biological adaptations. Cross-cutting each of these research topics was the fundamental question of whether the basis of circumpolar anthropological theory is the result of environmental reductionism and cultural simplification or whether observed similarities result from a basic historical relationship linking Scandinavia with Eurasia and the American Arctic.

Present circumpolar theory can be traced to the nineteenth-century discovery of Ice Age man and his hypothesized relationship to Eskimo culture. The knowledge that man was once adapted in Western Europe in the height of the last glaciation, surrounded by animals now either extinct or restricted to northern environments, posed a major interpretive problem at that time. Contemporary acculturated or economically transformed cultures of northern Scandinavia and those of northern Asia did not provide useful analogy to this problem, and it was not until the availability of information on Eskimo culture that a suitable model of Pleistocene human existence was found. Thus, it was just a century ago that Dawkins (1874) established the first link in circumpolar research by proposing a direct genetic link between the ethnographic Eskimos and European Paleolithic cultures. This idea, later developed by Sollas (1915), suggested that Eskimo culture represented a living relic of these early hunters who had followed the retreating reindeer herds north at the end of the Ice Age. Since that time, the origins and antiquity of the Eskimo have been closely associated to (as well as modified by) conceptions of European and Asiatic prehistory. This theme, after a period of eclipse by Birket-Smith's inland North American origin of Eskimo culture, is still very much alive in current interpretations of Paleo-Eskimo origins (cf. Irving 1968; Laughlin 1963, 1967).

An outgrowth of the belief in historical continuities was the translation of speculative theory into the more scientific distributional studies based on early archaeological excavations in the north. The work of archaeolo-

gists such as Bøe, Brøgger, Schmidt, and others in north Scandinavia; of Dall, Hrdlička, and Collins in the Bering Strait and Aleutians; of Mathiassen in the Canadian Arctic and Greenland, and Ritchie and Wintenberg in the Northeast, together with distributional compendia, such as Leroi-Gourhan (1946) and de Laguna (1947), resulted in recognition of early Eskimo-like cultures throughout most areas of the North and raised most directly the problem of historical connections. Similar questions were being considered in ethnological studies of northern peoples (Cooper 1946).

The result of this trend was the crystallization of the Circumpolar Stone Age concept by Gjessing (1944). As envisioned by Gjessing, cultures adapted to the ice-bound fringe of the polar sea had existed for millennia with a stone age technology, maintaining low population densities and traveling widely in search of food. During these movements similar groups were encountered and ideas were exchanged which eventually resulted in a common pool of adaptive elements including the core features of sledges, skin boats, ground slate technology, semi-lunar knives, toggling and nontoggling harpoons, and oil lamps. These groups were thought to have extremely conservative cultural traditions, isolated from neolithic and other innovative developments to the south, and many of the adaptive traits in question seemed to be traceable from Mesolithic cultures of northern Europe to contemporary ethnographic peoples.

Gjessing's Circumpolar Stone Age was based on the belief that the ecological requirements of an arctic adaptation led to the need for similar technological and social solutions; hence, as these forms were developed — presumably in northern Europe — they spread by a combination of diffusion and population movements throughout the circumpolar region, eventually reaching Eskimo and Laurentian cultures by way of the arctic sea coast. Given the great distances, the lack of archaeological evidence from central Eurasia, and the impressive time differentials involved, one cannot help but be awed by Gjessing's faith in cultural transmission and retention. However, the less faithful were soon to appear, and archaeologists more concerned with documentation, such as Spaulding (1946), Rudenko (1961), Gebhard (1946), Møllenhuis (1958, this volume), and Moberg (1960), began to point out the significant gaps in distribution of many of the key complexes, especially of ground slate and toggling harpoons, between Scandinavia and the Pacific coast. Many of these problems are evident in the proceedings of the Circumpolar Conference of Copenhagen held in 1958 (Birket-Smith 1960).

By this time fragmentation of the diffusionist aspect of the circumpolar concept had become clearly evident. Continued regional documentation

and more refined dating pointed to further problems with historical explanations. By the end of the following decade we have the somewhat plaintive note:

Has more than a generation of research brought us no closer to a solution, than to the dispersal of too hastily formed theories about cultural Arctic Circumpolar contacts? Do we merely end up with a general picture of cultural convergence in which the same kinds of materials are used for similar purposes, the fashioning of implements into shapes rational to their use, ending up with a frame-constructed skin boat in two different Arctic areas? (Nordland 1968: 306).

Trying to revive interest in the comparative ethnological studies, Nordland noted the widespread complexes and similarities in shamanism, beliefs concerning the Aurora Borealis, rock art, and certain rituals concerned with the increase of game. These and other widespread forms, such as raven myths, have not been adequately studied by ethnologists, but their citation in support of a circumpolar culture base presently remains at the search-and-find level of isolated comparison similar to that found in early archaeological diffusion studies. Without utilizing new methods, perhaps based on structural and linguistic analyses (cf. Kleivan 1971), this approach does not appear to offer new hope for circumpolar ethnological theory.

However, during the past decade the intensification of archaeological research in many northern areas has produced information with which the question of historical diffusion can be more scientifically assessed, and at the same time has opened a number of new themes diversifying the web of circumpolar archaeology beyond its original conception. Several articles in this volume reflect these new concerns, such as questions of cross-cultural comparison and cross-economy contacts with technologically "advanced" societies south of the boreal-taiga zone.

## CIRCUMPOLAR DIFFUSION

As we have noted, the Circumpolar Stone Age concept was based on ethnological theory of northern hunting cultures and their distribution within a relatively homogeneous environment. Recently, the cultural basis for this formulation has been amplified in a provocative paper by Simonsen (1972) in which questions of general circumpolar research are approached by way of Simonsen's archaeological research in North Norway. Speaking from the local level, Simonsen points out the semi-

nomadic nature of these cultures and the lack of environmental boundaries throughout much of this area. Difficulty in defining ethnological cultures from archaeological complexes leads him to the belief that cultures adapted along an ecological continuum, such as found in North Norway, display gradual shifts in cultural elements and settlement patterns which make definition of specific regional groupings almost impossible. At the far end of an ecological continuum new elements appear while many of the dominant features at the other end will either be present or show minimal modification. Two factors modifying this tendency for cultural continuities are suggested: ecological breaks and population replacement. Significant ecological boundaries include the one between North and South Scandinavia discussed by Moberg (1960); the break between coastal and interior mountainous regions from which semi-nomadic occupation by coastal peoples is impossible; and the more dramatic winter ice boundary existing further east along the Kola peninsula, where open water winter fishing cannot be practiced and a settlement pattern reversal similar to Eskimo adaptations north and south of the Alaskan peninsula is found. The second factor of change is the replacement or amalgamation of peoples from across a transition zone. Under these general conditions Simonsen sees the north Scandinavian and adjacent regions as exhibiting diffusion of selective elements along gradual ecological transitions on an east-west axis while more substantial economic and cultural modifications or actual migrations occur along the north-south lines (1972: 166).

In Scandinavia, Simonsen suggests that contacts between stone age peoples and Neolithic or sub-Neolithic societies resulted in the dissemination of innovations into the epi-Mesolithic cultures of intellectually and materially starved northern peoples eager to add new and useful elements to their otherwise narrow form of adaptation. Further, he suggested that these innovations subsequently spread to the east on a basic circumpolar current largely as envisioned by Gjessing (Simonsen 1972: 168).

In terms of intercultural relationships within the Scandinavian area Simonsen's statement is supported generally, especially given the abundant evidence of northern diffusion and trade from northern Europe. However, Simonsen broadens this into a general theory of circumpolar diffusion in which a number of assumptions remain hypothetical, including (1) temporal priority for innovations in the west, (2) the inevitable flow of innovations from technologically advanced to technologically simple societies, (3) receptivity of innovations in hunting cultures, and (4) the lack of creative ability in hunting societies.

While there may be validity in these assumptions, they remain un-

proved and are part of the intellectual baggage from the early Dawkins time-slope hypothesis and our own relativistic ideas of the superior efficiency of a donor culture's technology in subsistence adaptations. There is no question about individual traits and sometimes technologies, such as metallurgy, being introduced, but it is questionable if significant adaptive elements were introduced into northern cultures independently from more advanced southern groups. Rather it seems likely that they developed in their northern contexts (Fitzhugh 1975). Of Gjessing's original list only the bone harpoon occurs in all northern complexes, and its history is certainly older than the other elements that comprise Gjessing's Arctic Stone Age complex.

By far the greatest problem is the continuing theoretical nature and lack of specificity of the circumpolar diffusion question. When proposed by Gjessing the concept was of necessity a collage of ethnological and archaeological facts unrelated in time and context. Subsequent research, however, has not produced a more culturally coherent formulation; nor has it produced new traits by which cross-cultural comparisons could be made. Distribution gaps, chronological gaps, lack of typological specificity, and other problems result in the present soft underbelly of circumpolar diffusion theory, where available evidence is either negative or inconclusive and where negative evidence is of assumed importance.

Despite the absence of substantiating data, however, the circumpolar diffusion concept shows no sign of drifting into anthropological oblivion. There is some possibility that development and cross-correlation of regional prehistories will provide the necessary data for documenting contacts through the circumpolar region. Both the boreal and arctic coastal routes should probably be maintained as possible conduits despite the ecological and ethnological bias currently favoring the former (cf. Spaulding 1946; Clark 1952). Further research along the Eurasian arctic coast may indicate alternatives to the present understanding of exclusively north-south riverine adaptations in this area, and the possibility that coastal ice conditions and ecology may have been significantly different during the Hypsithermal should be considered. Finally, the current tendency toward independent origins of circumpolar cultures does not necessarily invalidate Gjessing's entire thesis; rather, it suggests that contacts may have been significant at a much earlier time period and that if the individual elements suggested by Gjessing were never linked in a single donor culture, at least some aspect of the adaptive complex, such as bone harpoons, may well be the only surviving element of an original circumpolar dispersion. This idea had considerable support among the conference participants.



## CROSS-ECONOMY TRANSFORMATIONS

In the face of negative evidence for east-west diffusion it is natural that north-south contacts should be more intensively studied. This second theme of circumpolar research has been developing gradually over the past twenty years and was initiated in Scandinavia by Moberg's (1960) paper on the boundary between hunting and farming cultures. The isolated study of northern hunting and fishing peoples is no longer considered a valid basis for research since there is abundant evidence that they participated to varying extents in other social and economic systems. In southern Scandinavia the incorporation of neolithic elements was made selectively and did not greatly alter the hunting and fishing basis for society in the Younger Stone Age for many years. Increased trade and communication seem to have been the result of these changes which eventually brought new ideas and produced economic markets even in the Arctic cultures (cf. Simonsen, Christiansson and Broadbent, Malmer, this volume). The investigation of these cross-economy contacts has raised new problems of wide anthropological interest, such as its relation to Marxist theory; and the varying degrees of Neolithic influence in northern societies has also stimulated discussion about taxonomic units and description, such as whether a northern culture should be termed "Neolithic," "sub-Neolithic," "epi-Mesolithic," or "Mesolithic," (cf. Meinander 1961 as quoted in Simonsen 1972).

Further study of these north-south linkages is needed to determine if they demonstrate population movements or routes of massive cultural introductions to the north, as suggested by Simonsen. The methods of modern archaeology will serve to enhance cross-economy linkages which have been eclipsed for so long by the isolationist view of northern cultures and the question of east-west diffusion. Faunal analyses and settlement pattern approaches will be especially important additions together with the social and economic implications of trade nets now becoming documented in Scandinavia. The former emphasis on isolation in northern cultures is being replaced by a more dynamic set of explanatory models. The importance of these cross-economic, north-south contacts is not only evident in Scandinavia, but in the central Soviet Union north of Ust'-Poluj (Moberg, this volume; Cernetsov 1953; Moshinskaya 1970) and also in the Far East, as for example in the role of domestic animals in the Okhotsk culture (Ohyi, this volume). Characteristically, these contacts run along north-south coastlines from temperate to arctic zones at the edges of the northern continental margins, or along major river systems transecting taiga and tundra zones in the Soviet Union.

Few natural barriers are noted along these routes. In fact, they tend to follow ecological gradients through which cultural transmission might occur among groups sharing elements at a basic adaptation type, be it taiga or maritime hunting. These socioeconomic trendlines, providing communication routes between more developed southern societies and markets and natural resources of northern peoples, often through a water-transport medium, are as important as east-west environmental and cultural continuities. Together they constitute the warp and weft of circumpolar cultural relations.

## COMPARATIVE STUDIES

The third theme of circumpolar research evident in recent literature and in the articles of this conference relates to comparative studies of archaeological and ethnological cultures of the North. While the nature of these comparative projects varies from the investigations of functional parallels, evolutionary development, and questions of cross-cultural generalization, they all depend to some extent on Gjessing's idea of an adaptive technological complex including his core elements and the leveling effect of harsh environmental conditions on social organization, settlement patterns, and other aspects of northern cultural adaptations. Regardless of the fate of circumpolar diffusion, Gjessing has advanced a more fundamental problem which deserves careful attention by archaeologists concerned with cultural processes. Such an approach is particularly germane in the north where environmental conditions are more homogeneous and where complicating historical and acculturation questions are at a minimum.

An initial approach to these comparative studies is to ask how similar two cultures or complexes are, whether they are independent developments or the result of diffusion or other historically attributed causes; and, if independent, why have they developed similar forms or structures within their respective adaptations? Once independent origins are established for two or more cultures, responses to environmentally-related problems and the corresponding adaptation types are emphasized in the comparative approach.

Several factors have contributed to the interest in comparative studies in northern archaeology. Foremost among these is the lack of evident historical contact between those cultures of Scandinavia, the North Pacific, and northeast North America which were presumed to share Gjessing's circumpolar adaptive complex. If this current view is correct

we must then begin to consider convergent development as similar adaptive responses. Secondly, as previously noted, the relative simplicity of these cultural systems offers more chance of isolating common features of an evolutionary or functional type. Finally, this process involves a systematic approach by which one can assess the relative merits of explanation across cultural boundaries within ecosystems which share common structural features.

Two adaptation types are commonly encountered in the circumpolar region. The most conspicuous of these is the taiga-steppe variety which was found ethnographically in the Tungus, Yukaghir, and Chukchi of the central and eastern Soviet North. These groups had, however, been substantially altered economically by metallurgical introductions from the south and by reindeer domestication presumably spreading during the last 2,000 years through the taiga from Scandinavia and northwestern Russia. Less acculturated interior hunting economies are found in the Alaskan and Canadian boreal forest among the Tularumiut, Kutchin, Chipewyan, Cree, and Montagnais-Naskapi. These eastern hunters had an adaptation which is presumed to be closer to that of Paleolithic man in the Old World than other groups for which ethnographic documentation is known and consequently have been used as models for cultural reconstruction and analogy (cf. MacDonald 1968; Campbell 1968; Nelson 1973). Very little is known of the cultural ecology of these groups, and yet they are frequently used as models of adaptations in other environmental zones and eras. Unfortunately, economic and social changes have nearly completely transformed these societies today so that we shall now have to investigate these problems through historical documentation.

Archaeologically, the peoples of the northern forests and tundra ecotones are poorly known largely because of their low population density, their dispersed and transient settlement pattern, and the insatiable appetite of podzols for organic cultural and faunal remains. Geographically, the boreal corridor has presented barriers to archaeological investigations which are only recently beginning to erode with the discovery of stratified sites in eastern Asia and Alaska. Heretofore, the problems of interpreting relatively undifferentiated lithic industries, often of mixed components and in shallow deposits, have not stimulated research compared to the more productive sites of the northern coastal margins. The coastal cultures have always been better known ethnographically and archaeologically, and it is ironic that most of Gjessing's circumpolar complex was drawn from northern maritime cultures, not from the taiga and boreal hunting cultures which, according to

Spaulding, were the more likely conduits for circumpolar diffusion throughout the vast continental interiors.

Attention to the coastal aspect of circumpolar theory drew support from Clark's (1952) analysis of Mesolithic seasonal coastal adaptations in northern Europe and from Bryan's (1957) suggestion that, as a global phenomenon, the circumpolar distribution of ground slate industries was associated more with maritime adaptations than with interior hunting patterns. However, Bryan felt that many of the circumpolar traits noted by Gjessing and Spaulding must once have been historically related and that their lack of association as a single complex was due to selective diffusion and acceptance at an early time. This diffusionist cast, attributable to current beliefs, should not diminish Bryan's reaffirmation of Gjessing's coastal association of circumpolar Stone Age complexes, which, following Spaulding's boreal thesis, represented an important clarification. If, in fact, these complexes were associated with historically independent northern maritime adaptations along the continental margins, this opened a new query in circumpolar research: to what extent were they attributable to evolutionary processes and adaptive efficiency in these zones? Do northern maritime adaptations evolve through time toward the use of skin boats, oil heating, ground slate and bone technologies, harpoon complexes, and the use of semi-lunar knives? If so, what could be the causal trends and how have they operated in producing similarity and diversity in northern cultures? What is the time frame of these developments, and how do they reticulate with local environmental and regional historical conditions? Do these phenomena represent purely regional trajectories or are they interrelated perhaps as the result of global climatic conditions or culturally-achieved plateaus? In short, the possibility that maritime adaptations have common functionally-related similarities in Scandinavia, Northeast Asia, Bering Sea and the North American Arctic, the Northwest Coast, and the American Northeast presented archaeologists with a new problem of more theoretical interest than in proving or disproving circumpolar diffusion. It introduced environmental and adaptive variables of more general anthropological significance than the mechanical transmission of ideas assumed under historical explanations (Fitzhugh 1975). Ethnological and archaeological cross-cultural studies of arctic and subarctic maritime adaptations, and of adaptation types not restricted to the circumpolar area (Fitzhugh, McCartney, this volume), provided a method of determining the variables and causal factors involved in the development and testing of anthropological theory. Initial attempts in this direction should promote further interest in comparative archaeology

and will produce insight into the very real needs for methodological refinements in definitions and the comparability of cultural complexes, adaptations, and units of reference in general. The wealth of time depth available in archaeological studies suggests that greater scientific rigor can be applied to comparative studies of this type and that the use of the method of cross-cultural comparison should not be restricted to historical periods. Further, by the use of adaptation types it permits comparative studies beyond similar environmental zones to more diverse ecosystems of the temperate and tropical regions, and an investigation of the influence of environmental and historical diversity on functional adaptations, and religious, demographic, and other cultural subsystems. The growing recognition of a discrete field of maritime anthropology is signal to the potential future of archaeological and evolutionary studies of this economic adaptation type and its relationship to agricultural adaptations in anthropology.

The Chicago Congress seemed to be an ideal forum to reopen discussion of circumpolar issues with specialists from all segments of arctic anthropology. The decision to focus on northern maritime adaptations grew from my own research in coastal Labrador which, with new information on the Moorehead and Maritime Archaic cultures of the Northeast (cf. Tuck 1971, this volume), gave a more complete view of this maritime adaptation type than that previously available. Further, the research of the past decade, principally by Simonsen (1961, 1963), into Stone Age cultures of northern Scandinavia provided the basis for comparative study of these two similar environments, their respective culture histories, and possibilities of historical contacts across the North Atlantic (cf. Ridley 1960; Kehoe 1962, 1971). The results of this work suggested no concrete evidence for such contacts, and for this reason the importance of convergent development and functional equivalency in northern sea mammal hunting and fishing cultures needed investigation. The symposium was called, therefore, to reassess the circumpolar diffusion question from the new perspective of maritime adaptations from both a historical and comparative basis.

Several definitional problems beset this approach. As used here, northern maritime adaptations are generally restricted to the subarctic and arctic coasts and archipelagoes where marine productivity and concentration is high and is seasonally available with aboriginal exploitative techniques. Sea mammals, available anadromous and demersal fishes, and estuarine vertebrate and invertebrate resources are important in these northern adaptations. Questions about the proportion of marine and interior resources, of sea mammal hunting ("catching") versus fishing,

of the duration and season of coastal settlement, and of the dispersed or nondispersed nature of coastal settlements provide other problems in the definition of this adaptation type. For the present, these have been avoided in favor of a broader preliminary approach to northern maritime adaptations. The point, however, must be stressed, that the topical restriction of the conference imposed an arbitrary isolation of maritime from interior economies, which, in most areas, is not a self-sufficient economic pattern. Only in the Aleutians and possibly the Kurils are maritime and coastal adaptations of almost exclusive importance. In all other areas settlement patterns include interior hunting and fishing adaptations as a vital supplement to coastal resources, either through direct exploitation or by indirect means of trade and exchange. In southern Scandinavia and the Baltic, maritime economies for the past 6,000 years have been seasonal activities and cannot be considered apart from farming and animal husbandry, as noted by Clark (1952), Moberg (1960), and Welinder (this volume). A similar dual economy is present in the Okhotsk culture (Ohyi, this volume).

Despite these caveats, the widespread distribution and similarities in northern maritime adaptations suggest that it is methodologically sound to investigate their origins and function as a separate adaptation type, and to determine their evolutionary roles, as a self-sufficient economic strategy, as a subsystem within both mixed Neolithic and maritime economies, and as a seasonal partner to coastal-interior adaptations of the northern seacoasts and forests. Such an approach should not and cannot be confined to prehistoric times. Although much of the emphasis on circumpolar diffusion has been confined to the prehistoric period, historic and demographic data is becoming more important in analogic and functional studies (cf. Taylor, this volume).

The articles presented here demonstrate the variety of problems under consideration in the circumpolar area. All of these are original contributions to the Congress with the exception of the translation of Møllenhuis' original paper of 1958 which reflects the concern at that time with the diffusional aspect of Gjessing's hypothesis and which is not generally known outside Scandinavia. The content of the other articles shows a movement away from problems of circumpolar diffusion to diverse regional issues. For this reason the presentation of the articles here is organized by geographic groups rather than by thematic content. Each group reflects the problems which have dominated research in its areas, as well as the state of archaeological information. The articles of Part One concern Scandinavia and northern Russia and demonstrate the importance of trade, cross-economic and social ties with Neolithic

societies, of rock art and cultural reconstruction, and exhibit a relatively advanced understanding of culture history and environmental relationships. This is compared with, for instance, the dominance of culture-historical questions in the articles of Part Two, the North Pacific-Bering Sea, or Part Three, the Northwest Atlantic regions where, except for later Eskimo development, very little information is available for studying cultural transformations. The final section, Part Four, contains articles of a more general nature not confined to specific geographic regions. Unfortunately, the balance in these sections is uneven, with underrepresentation of current work in the Bering Sea and northern Eskimo cultures.

This introduction has presented the background and development of circumpolar archaeology and the major issues which were of concern to the conference participants. While I will not attempt to summarize the contributions and new ideas which are better presented by the authors herein, I do feel it is useful to conclude with a brief enumeration of salient points about which a consensus now seems to exist. There are also several areas of disagreement especially noted in a post-Congress communication by Aigner on the rigor of explanation and the admissibility of certain cross-cultural procedures which unfortunately could not be included here. I must emphasize that these are my understandings and are not necessarily shared by the conference members, whose opinions, however, I hope to have reflected accurately.

1. It is evident that Gjessing's circumpolar diffusion hypothesis as initially proposed and as modified by Spaulding is not supported by present evidence; nor does it seem likely that confirmation of diffusion will be forthcoming even from the poorly-known regions of Eurasia and North America.
2. Gjessing's constellation of traits (ground slate tools, oil heating, skin boats, ulu-type knives, toggling harpoons) is not found in interior taiga of boreal regions but does occur in subarctic and arctic maritime hunting and fishing cultures.
3. These similarities appear to develop independently in maritime settings in Scandinavia, the Northern Pacific-Bering Sea zone, and the northwestern Atlantic. In Scandinavia, the Northwest Coast and the Northeast, these trends converge during the Hypsithermal and reach their greatest point of similarity during the temperature peak circa 4000 to 5000 B.P.
4. Blade and burin industries are not usually associated with ground slate technology of the maritime zones.
5. In accordance with the traditional hypothesis, ground slate tools

appear to have their most likely prototypes in ground and honed bone, or possibly shell industries.

6. An early wave of diffusion, perhaps by an original population spread west to east, may have carried the prototype bone industries into North America at a Paleolithic or Mesolithic cultural level, preceding the convergent development noted in northern maritime regions.

7. The role of maritime adaptations cannot be understood in isolation from other economic types; however, as a group they form a distinct class of subsistence strategies which share a number of common features and have similar social and cultural implications which facilitate cross-cultural examination.

8. Common solutions to problems of northern maritime adaptations, rather than common histories, are the most likely causes of cultural convergences in these areas.

9. Considering the limited evidence of east-west cultural contacts, the north-south contacts appear to have been more meaningful in terms of northern cultural developments; many of these contacts involve cross-economy exchanges which result in transformation of more isolated northern cultures.

10. Seasonality, especially utilization of interior resources, is an almost universal feature of northern maritime adaptations. Economic transformations of northern cultures often proceed along lines of least resistance, replacing mobile interior adaptations with more intensive maritime exploitation or substitution by seasonal farming or animal husbandry.

11. Northern maritime adaptations often provide greater demographic stability and seasonal permanence of settlement not encountered in post-Pleistocene interior hunting cultures. Riverine exploitation may provide similar stability, although riverine adaptations are not necessarily a precursor to coastal or maritime adaptations.

12. Although sea mammal products are important sources of food, heat, and technological materials in northern maritime societies, the presence of dependable supplies of fish protein and carbohydrates is the sustaining element in most of these economies.

13. Northern maritime adaptations tend to exhibit recognizable cultural continuities over long periods of time. In most of these areas population stability is suspected for many millennia, and persistence of the cultural system is noted.

14. Cultural stability, seasonal sedentariness and productive economies have permitted a greater elaboration of artistic, social, and economic systems as compared to interior hunting cultures. There is a tendency



toward increased trade and perhaps craft specialization.

15. The development of intensive maritime adaptations as early as 5000 to 6000 B.P. has resulted in a great loss of data due to the submergence of coastal sites under rising sea levels (cf. Grabert and Larsen, this volume). Local geological conditions vary, but extensive inundation is evident especially at the margin of isostatic rebound. Site destruction will have to be considered when comparing the apparent boundary between northern coastal regions with large semi-permanent settlements and more southernly zones, where large coastal populations are less frequently encountered archaeologically.

In conclusion, the study of circumpolar anthropological problems has evolved through a number of stages over the past hundred years since Dawkins first proposed a link between Paleolithic and ethnographic Eskimo cultures. In tracing these developments we have noted the importance of a number of studies initiated by Gjessing, Spaulding, Bryan, Moberg, Møllenhuis, Simonsen, and others which bring this field of research to the present day. The concern of this volume with northern maritime rather than interior adaptations is due to the occurrence of many of the traditional circumpolar trait complexes within coastal contexts. Unfortunately, it was not possible to include works which would have provided a more balanced geographic coverage. Even so this collection demonstrates many of the kinds of research that are now being conducted within the circumpolar areas. While concern with northern diffusion routes has waned, a number of new research problems has emerged dealing especially with local culture history, environmental relationships, acculturation phenomena across economic and ecological boundaries, and cross-cultural comparisons. Though often regional in scope, the implications of these studies generally transcend local problems and demonstrate the continuing usefulness of a widely disseminated circumpolar dialogue combining anthropological, archaeological, and environmental interests. The future development of circumpolar theory and the testing of hypotheses on northern cultural development will depend on our ability to integrate these fields and to define problems for future investigations. These articles identify a number of problem areas, such as the need for field research in northern Eurasia, the origin of the early North Pacific maritime adaptations including the more restricted problem of Eskimo and Aleut origins, relationships between maritime and interior adaptations within cultural systems, and the establishment of baselines for cross-cultural research in northern maritime adaptations. More important than all others, however, is the need for rapid expansion of the data base of northern archaeology by new scien-

tifically adequate excavations and thorough analysis and publication. It is remarkable that so many totally unknown regions still exist, while others, like the Bering Sea area, are becoming well known. Finally, we must confront the important question of evolutionary developments in maritime adaptations both as they relate to explainable diversity in cultural and environmental settings and to the causes and extent of convergence. The northern regions offer excellent testing ground for developing evolutionary theory, and it is beginning to appear as though maritime adaptations have played a central role in cultural development by virtue of providing a more stable economic base for reduced seasonal nomadism and maintenance of larger, more permanent seasonal settlements than possible in the northern interior. Such problems have only begun to be explored. It is hoped that these articles will contribute to this end.

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## PART ONE

### *Scandinavia*



# *Agriculture, Inland Hunting, and Sea Hunting in the Western and Northern Region of the Baltic, 6000-2000 B.C.*

STIG WELINDER

## ENVIRONMENTAL BACKGROUND

The development of land forms in the Baltic region (see Figure 1) is complicated because of the isostatic land upheaval, the eustatic rise of the sea, and the succession of plants after the melting of the ice sheet. These factors must be considered when dealing with the Stone Age.

### *Geological History of the Baltic*

Immediately following the ice sheet, the Baltic depression was filled with meltwater, forming the Baltic Ice Lake by 8200 B.C. When the ice sheet left the Middle Sweden Lowlands, the ice lake was connected with the sea across the Scandinavian peninsula. There was salt water, known as the Yoldia Sea, at least in the northern part of the Baltic depression, for some hundreds of years, from 8200 to 7800 B.C. Because of the isostatic land upheaval, the Yoldia Sea was cut off and the Ancylus Lake was formed where the Baltic is now situated. This important fresh water stage lasted from 7800–6500 B.C.

By 6500 B.C. the eustatically rising sea reached the edge of the Ancylus Lake and the Baltic depression became the Littorina Sea. During the first stage of the Littorina Sea, called the Mastogloia Sea, the Baltic depression was connected with the ocean through narrow sounds and the water was only slightly brackish with a salinity of less than 0.5 percent.

The sea level rose in a series of transgressions, the first of which occurred in 5000 B.C. in the Littorina Sea. From then on the salinity of the Littorina Sea was higher than today, probably above 0.7 percent, and the water was

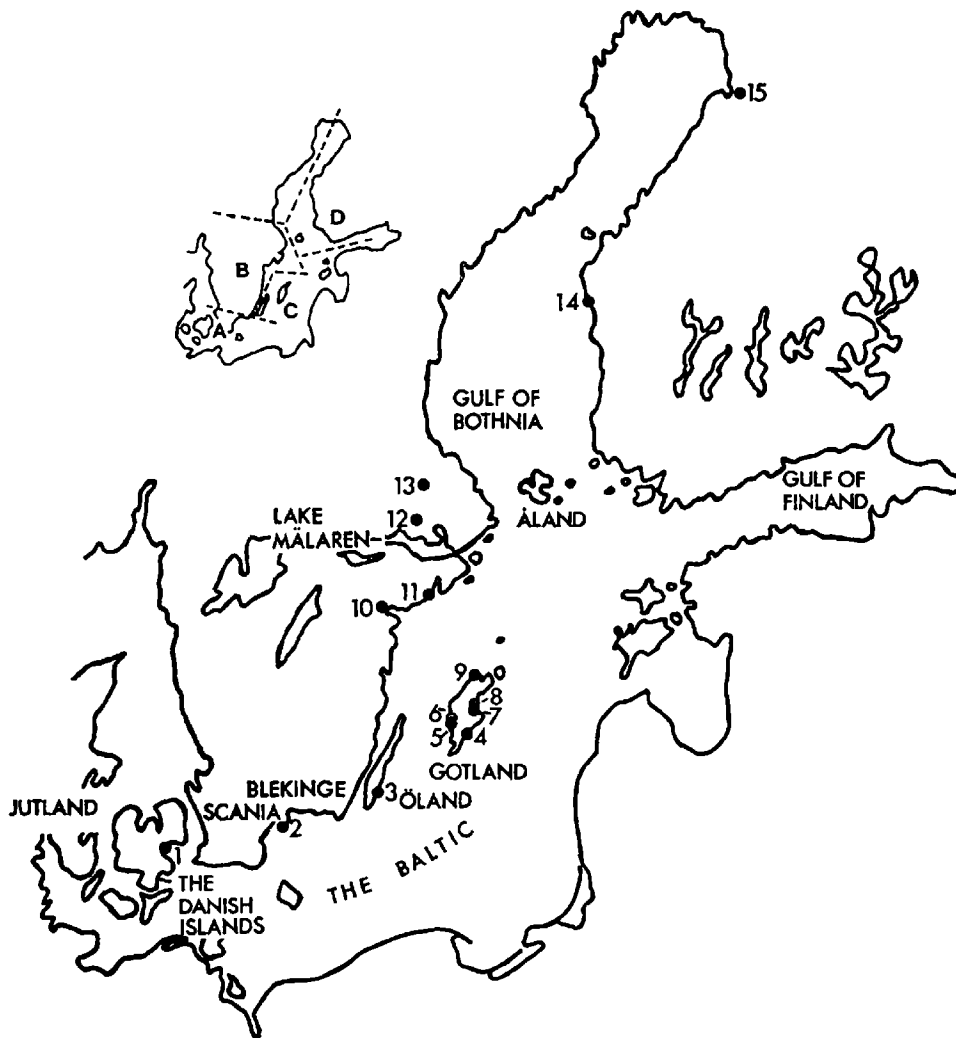


Figure 1. Map of the Baltic. A = the Scano-Danian area, B = Middle Sweden, C = the Baltic islands, D = Finland; 1 = Ølby Lyng, 2 = Siretorp, 3 = Alby, 4 = Hemmor, 5 = Visborgs Kungsladugård, 6 = Visby, 7 = Västerbjers, 8 = Svalings, 9 = Norrbuss, 10 = Norrköping, 11 = Överåda, 12 = Åloppe, 13 = Svartmyra, 14 = Närpes, 15 = Oulujoki

warmer. The last transgression maximum of the Littorina Sea occurred about 2000 B.C. From then on the salinity and the warmth of the water in the Baltic depression have decreased to today's levels (Fredén 1967; Königsson 1968; Nilsson 1968; Åse 1970; Mörner 1969; Berglund and Liljegren 1971).

#### *Vegetation Development*

About 8300 B.C., when the ice sheet still covered northern Scandinavia the first forest – with juniper, aspen, and birch – appeared in southern



Scandinavia. Vegetation development within the forest is less dependent on the climate than on rate of spread, competition among the species, and edaphic factors such as flooding. The first more or less stable forest on high grounds was boreal, dominated by pine, hazel, and elm. It was established in the Scano-Danian area by 7500 B.C. and in Middle Sweden and southern Finland as the land was raised above the Ancylus Lake and Mastogloia Sea.

The boreal forest was followed by the Atlantic climax forest with the introduction of linden. This dense type of wood was dominated by linden and elm. The climax forest was established in southern Scandinavia by 6000 B.C., in the northern part of the Swedish west coast by 5000 B.C., and in Middle Sweden around Lake Mälaren by 4500 B.C. It never played an important role in northern Sweden and Finland. During the Atlantic period, low, marshy grounds were occupied by alder, while pine and birch were to be found along the coast and at high altitudes inland.

After 4500 B.C. in south Scandinavia and after 4000 B.C. in Middle Sweden the frequency of oak increased and after 3300 B.C. in all of southern and middle Scandinavia, the frequency of elm decreased according to pollen profiles. There is still not absolute agreement about the reasons for this phenomenon. Several possibilities have been pointed out: the deterioration of the post-glacial climate; edaphic factors such as increasing acidity; forest clearance by Neolithic man; the establishment of the climax forest on marshy grounds.

From 3000 B.C. to 2000 B.C. the woods in Scano-Dania, the Middle Swedish plains, and other fertile areas were growing more open as a result of the introduction of agriculture and stock raising (Iversen 1960, 1967; Fries 1965; Berglund 1966; Ten Hove 1968; Digerfeldt 1971).

### *Fauna*

Associated with the boreal forest was a big game fauna with elk (moose) and aurochs. This fauna disappeared on the Danish islands and became less frequent in the southernmost part of the Scandinavian peninsula at the end of the boreal period – by 6500 B.C. North of this area the aurochs survived to the end of the prehistoric time and the elk well on to today.

The animals of the Atlantic period were red deer and wild boar. Reindeer are not known in southern and Middle Sweden during post-glacial times.

Today there are three species of seal in the Baltic: harbor seal, ringed seal, and gray seal. The harbor seal is most common in the southwestern

part of the Baltic. It is possible that it was present in the Ancylus Lake. From the Littorina Sea it is known to have been common further to the north than today, at least as far as the archipelago of Stockholm.

The ringed seal is the most common in all of the Baltic and in the Gulf of Bothnia. The ringed seals in the Baltic and the lakes Ladoga, Onega, Saimen, and others are local subspecies. The main species lives only in arctic water. The southern subspecies are interpreted as relics from the late glacial Baltic Ice Lake. They may have migrated through the outlets of the ice lake across Finland to the White Sea.

The gray seal today is most common in the northern part of the Baltic and in the Gulf of Bothnia. It is known as a fossil at least from early Littorina times.

It is of importance that during the time of the Littorina Sea a fourth species was common in the Baltic – the Greenland seal. Today it is present only in the Arctic Ocean. It is rare even on the coast of northern Norway. Subfossils of Greenland seal have been found in late glacial deposits from 10,000–8,200 B.C. on the Swedish west coast. It is probable that its occurrence in the Littorina Sea is to be looked upon as a relic from this time. Part of the year the Greenland seal wanders over extensive areas in herds of hundreds of animals, so another possibility is that a single herd may, by chance, have come to the Littorina Sea and adapted itself.

In any case it does seem curious that the Greenland seal was common in the warm Littorina Sea. This was, however, due to the higher salinity of the water which causes stratification with surface water of less salinity than today. This favored a greater ice formation than today, and this, in turn, was favorable for the Greenland seals (Ekman 1922; Degerbøhl and Krog 1959; Ahlén 1965; Degerbøhl and Fredskild 1970; Liljegren and Welinder 1971; Møhl 1971a, 1971b).



### *Summary*

The possibility of sea hunting has been present in the Baltic since 6000 B.C. – that is, since the ingression of salt water. After 5000 B.C. – the time of the maximum transgression – a rich maritime fauna including Greenland seal appeared in the warm and salty Littorina Sea. There have been seals in the Baltic depression during the entire post-glacial period. Whether this includes the Greenland seal, too, is problematic.

The establishment of the Atlantic climax forest resulted in a change in the big game fauna. Elk and auroch disappeared from the Danish islands and decreased in number in the southernmost part of the Scandinavian peninsula. North of this area there was no important change.

During the period from 6000 to 2000 B.C. the land fauna do not seem to have changed very much in the western and northern region of the Baltic, while the maritime fauna were affected by the transgression of the Littorina Sea in 5000 B.C.

## CULTURAL BACKGROUND

The following chronology is a trial use of a radiocarbon time-scale common to all of the Scandinavian area ( $T^{1/2}=5730$  years, no correction for the de Vries effect) (Siiriäinen 1969; Tauber 1971; Welinder 1973a).

### *Stages in the Expansion of Farming: 3400–2000 B.C.*

Farming here includes agriculture as well as stock raising. The conclusions presented are based solely on evidence from pollen analysis (M.-B. Florin 1958; Berglund 1969; Königsson 1970; Ahlönner 1970; Vuorela 1970; Welinder n.d.).

STAGE I: 3400–3100 B.C. The first expansion of farming was restricted to the Danish islands and Scania. It is connected with the Funnel Beaker culture Stage A. Barley and several kinds of wheat were cultivated. According to one theory the cattle were pollarded and kept in stable the whole year.

There is no agreement as to whether the first farmers were invaders or sedentary food gatherers adapting to a new economy (Becker 1947; Troel-Smith 1953; Salomonsson 1970).

STAGE II: 3100–2700 B.C. The second stage of expansion of farming is a continuation of the first – farming spread to the north, to southern Norway and the northern side of Lake Mälaren. It is connected with the Funnel Beaker culture Stage C. Extensive clearing to provide pasture is known to have occurred in the Atlantic climax forest during this stage. It was probably accomplished by burning (S. Florin 1958).

This second stage of expansion, which was the first one north of Scania, was of short duration except in the most fertile areas. After 2700 B.C. there are no traces of farming in the pollen profiles from most of the Scandinavian peninsula with the exception of Scania, parts of western Sweden, and the Island of Öland. The exceptions coincide with the area of distribution of passage graves. However, in these areas, there was less farming activity during the period 2500–2200 B.C.

STAGE III: 2200–2000 B.C. The third expansion stage was the one reaching farthest north. Farming was brought to western Norway, southern Finland, and the western coast of the Gulf of Bothnia. This stage is connected with the Battle-Axe culture. The people of the Battle-Axe culture have been said to be invaders with a more or less nomadic way of living. Probably they were farmers as sedentary as those of the Funnel Beaker culture. The same types of cereals were cultivated as before, but sheep and goats seem to have increased in comparison with cattle (Malmer 1962; Becker 1967; Edgren 1970).

*Expansion of Neolithic Technology (Manufacturing of Pottery):*  
3800–2000 B.C.

EXPANSION FROM THE SOUTH: 3800–2000 B.C. The oldest pottery in south Scandinavia is the Ertebølle pottery. It is known to come from all of Denmark, Scania, westernmost Blekinge, and the Island of Öland. It dates from 3800–2600 B.C. in the Danish islands, and may be 200 years older in Jutland. On the Scandinavian peninsula it is not known to be older than 3100 B.C. This pottery is connected with the food-gathering Ertebølle Culture.

On the Scandinavian peninsula north of the above-mentioned area, the oldest pottery is connected with the Funnel Beaker culture Stage C and Stage II of the expansion of farming. The Funnel Beaker culture disappeared when farming ceased to be practiced after 2700 B.C. but the manufacture of pottery continued within the food-gathering Pitted Ware culture datable to 2600–1900 B.C. Food-gathering sites with pottery contemporary with the Funnel Beaker Stage C farming sites are not known. However, from the period 2800–2600 B.C., hunting sites with pottery similar to both the older Funnel Beaker pottery and the younger Pitted Ware are known. The northern limit of the Pitted Ware culture extends from Dalarna to the southern part of the Gulf of Bothnia. It is remarkable that north of this limit pottery was not introduced until the Bronze Age except for a few sites with Battle-Axe culture pottery from the expansion Stage III of farming (Brinch Petersen 1971; Königsson, Königsson, and Lepiksaar 1971; Salomonsson 1971; Welinder 1971).

EXPANSION FROM THE EAST: 3500–2000 B.C. The Neolithic techniques spread to the eastern and northeastern coasts of the Baltic earlier than to the northwestern coast. After 3500 B.C. the southern and western coasts

of Finland were dominated by the food-gathering Comb-Ornamented Pottery culture. This extended in the west to the Island of Åland.

The expansion Stages I–II of farming never reached Finland, and Stage III was of short duration, 2200–1800 B.C. (Meinander 1961, 1964).

*Inland Hunting Sites: 6000–3000 B.C.*

The economy of a hunting site must be determined with the aid of the preserved bones. The possibilities of preservation are quite uneven in the area under discussion.

The bedrock in most of Denmark and Scania and in small areas around Lake Mälaren consists of chalk or limestone. The Baltic islands are built up completely of limestone. In northern Sweden, limestone occurs in several places along the foot of the mountains. Outside the areas mentioned the bedrock consists of very old rocks. Calcareous deposits of the Quaternary Age are found in large areas in the parts of the coastal regions submerged during early stages of the history of the Baltic.

At sites in the Scano-Danian area, bones are regularly preserved. The coastal sites with deposits in sand or gravel are an important exception.

In Middle Sweden, sites with preserved bones are extremely rare. Burned fragments of bones do occur regularly and occasionally they may be identified.

In the Baltic islands the possibilities for preservation of bones are the best in the Baltic region. Sites on beach ridges may be exceptions.

In Finland the situation is the same as in Middle Sweden, or perhaps even worse.

**SCANO-DANIAN AREA** Denmark and Scania were occupied by the Early Coastal culture (6000–4500 B.C.) and the Late Coastal culture (4500–2600 B.C.). From the Early Coastal culture, both inland and coastal sites are known. Both types of sites are dominated by red deer, roe deer, and boar.

From the Late Coastal culture (the late stage of which is called the Ertebølle culture), several types of sites are known. Both inland and coastal sites are dominated by the same fauna as the sites of the Early Coastal culture. The kitchen middens of the Late Coastal culture consist primarily of oyster shells. The mammal bones of the middens are dominated by the same species as the inland sites.

The presence of seal bones in Coastal culture sites will be discussed later (Althin 1954; Troel-Smith 1960; Jørgensen 1961; Kapel 1969).

**MIDDLE SWEDEN** In Middle Sweden no bones are preserved at sites from this period. A few burned fragments of bones are available from one site dating to 4000 B.C. at the northern side of Lake Mälaren, which in those days formed part of the Littorina Sea. Deer, elk, beaver, marten, boar, and seal have been identified.

The excavated sites are characterized by hearthpits with a thin charcoal layer at the bottom and large amounts of burned stone chips. The sites are datable to 5000–4000 B.C. The same features are seen at the inland hunting sites in northern Sweden.

These scanty indications suggest that inland hunting was dominant in Middle Sweden before the Neolithic Stone Age (Welinder 1973b).

**FINLAND** The faunal remains from the Finnish pre-Neolithic sites consist solely of burned bones which have not been examined (Luho 1967).

### *Summary*

In those areas where an estimate is possible, inland hunting seems to have been absolutely dominant in the western and northern region of the Baltic during the period 6000–3500 B.C., that is during the pre-Neolithic period.

Neolithic techniques spread to the coast area from the Danish islands to Finland by 3500 B.C. and to the coast area from Scania to the Island of Öland during the period 3500–3000 B.C.

Farming was introduced in the Scano-Danian area in 3400 B.C. and in the rest of southern and Middle Sweden in 3100–2700 B.C.

During the period 2700–2200 B.C. the area of farming was reduced to certain fertile locations. The coastal areas of the Baltic were inhabited by hunting people using Neolithic techniques.

A second expansion of farming, 2200 B.C., reached Middle Sweden, the coast of northern Sweden, and southern Finland.

## **OLDEST KNOWN SEAL-HUNTING SITES**

As seen in the preceding section, the fact that a site is located on the coast does not mean that seal hunting was important at that site. However, seal hunting sites ought to be located on the coast. Baltic coastal sites are available for scientific research with the following important exceptions: in the southern Danish islands the Stone Age coasts were submerged;

in the northern islands and in Scania the shorelines older than 5000 B.C. are submerged; sites from the period 5000-3000 B.C. are usually covered by sediments deposited during the transgression maximum of the Littorina Sea. North of the Scano-Danian area the coasts are raised and in this area the coastal sites regularly are available to research. Now and then sites covered by Littorina Sea deposits are found, mostly from the periods 6000-5000 B.C. and 3100-2700 B.C.

*Scano-Danian area: 3600-2000 B.C.*

At Danish inland and coastal sites of the period 7000-3600 B.C. seal bones are found now and then but never more than a few. Seal hunting seems to have been insignificant. The oldest known site with traces of a more intensified seal hunting is the late pottery-containing Ertebølle site, Ølby Lyng, datable to 3600-3400 B.C. Fragments of the fauna from Ølby Lyng have the following frequency:

Red deer	48 percent
Roe deer	24 percent
Seal	11 percent
Boar	10 percent
Tame dog	3 percent
Porpoise	2 percent
Other	3 percent

In addition, many bones of birds and fish, mostly cod, have been found. Among the seals, the Greenland seal was the most numerous. Gray seal was less common and ringed seal was identified with some uncertainty. The site has been interpreted as a hunting site inhabited in the months of November and December when the porpoise and Greenland seal are wandering northward through the Danish Sounds.

Thanks to the Ølby Lyng site, it is known that sea hunting by boat and harpoon late in the year may have been part of the annual cycle of the Ertebølle people. Seal bones are regularly found at the coast sites of the Ertebølle Culture but seldom more than a few. The seals were hunted partly because of the blubber. Blubber lamps like those of the Eskimos are found with the Ertebølle pottery.

Seal hunting on a large scale is known only since a somewhat advanced stage of the Neolithic period from 3100 B.C. Siretorp in westernmost Blekinge is a typical site from the period 3100-1900 B.C. Only burned

fragments of bones are preserved. Out of some tens of thousands, only 1,496 have been identified. It must be stressed that bones of seal are the easiest bones to identify in small fragments. The fauna of the site are distributed as shown in Table 1, divided according to the different cultures.

Table 1. Distribution of fauna at the sites

	Pitted Ware culture 2500–1900 B.C.	Funnel Beaker culture 3100–2800 B.C.	Ertebølle culture 3100–2800 B.C.
Seal	1202	26	7
Domesticated pig	83		
Cattle	77	2	
Sheep/goat	15		
Deer	10	2	
Others	39		

The people of the Funnel Beaker culture were the farmers of expansion Stages I–II of farming. Funnel Beaker pottery is regularly found at coastal sites. Thus one may assume that the economy of the Funnel Beaker culture was based upon farming as well as hunting, as seen, among others, at the Siretorp seal hunting site.

The Pitted Ware pottery is not found on farming sites. The people of that culture were food gatherers and pig herders. At the sites of the Pitted Ware culture around the Baltic coasts of Scania-Dania, bones of seals and pigs are dominant. From the inland sites of the Pitted Ware culture seal bones are known. Thus one may assume that the seal hunting sites of the Pitted Ware culture at the Baltic were seasonal in the annual cycle of the people (Bagge and Kjellmark 1939; Becker 1951; Brinch Petersen 1971; Møhl 1971b).

*Middle Sweden: 2500–2000 B.C.*

The oldest sites in Middle Sweden with preserved bones are a few Pitted Ware sites from the period 2500–1800 B.C. For example, there are Åloppe and Svartmyra at the inner part of the bay of the Littorina Sea formed by Lake Mälaren and Överåda in the outer archipelago south of Stockholm.

Seal bones dominate at these sites and a rough estimate of the quantity can be gained from the Överåda site. The bones found there were distributed among 142 find numbers. The number of finds with identified species was as follows:



Seal	90
Fish	42
Birds	3
Domesticated pig	1
Elk	1
Hare	1
Deer	1
Marten	1

Greenland seal has been identified in a couple of cases, and several of the seal bones were identified as coming from young animals. Some bones are split to get at the marrow. The site may be interpreted as a specialized seal hunting site inhabited part of the year when the hunting of Greenland seal was most favorable.

At the sites in the inner part of the bays ringed seals are dominant, but elk and boar are a considerable part of the game. These sites may have been inhabited for a longer part of the year. Domesticated pig occurs more or less regularly at the Pitted Ware sites, while cattle are rare. This is especially true for the late sites which are contemporary with the Battle-Axe culture and the expansion Stage III of farming.

Sites with Funnel Beaker pottery from the period 2800–2500 B.C. are found in the same terrain as the younger Pitted Ware sites. The fauna of these sites are, however, not known. Most probably seal hunting was carried out within the Funnel Beaker culture. This may also be true of the pre-pottery sites.

The complete skeleton of a ringed seal (Plate 1) found in Littorina deposits at Norrköping, Östergötland in 1907 together with a harpoon head is not precisely datable. Probably it belongs to the Neolithic Stone Age (Almgren 1906; Lönnberg 1908; Ekholm 1918; Welinder 1971).

#### *The Baltic Islands: 5500–2000 B.C.*

During the period 5500–2500 B.C. there are sporadic traces of seal hunting at the sites of the Island of Gotland. At the site Svalings on the eastern coast a few bones of gray seal were found together with a couple of flint flakes in a stratum below Littorina shore gravel. The site is older than the first transgression of the Littorina Sea about 5000 B.C.

At a big group of Gotlandic sites, which are hard to date more exactly than to the Late Mesolithic or Early Neolithic period 4000–2500 B.C., fragments of harpoons and some seal bones, mostly gray seal and ringed

seal are regularly found. These sites include Visborgs Kungsladugård, and Norrbus. It is remarkable that fish bones are never found at these sites. The site, Alby, on the eastern coast of the island Öland, dates from about the same period, 4500–2800 B.C. At this site Ertebølle pottery and early Funnel Beaker pottery are found. The fauna have the following distribution (number of finds):

Ringed seal	57
Gray seal	23
Greenland seal	4
Harbor seal	1
Seal, undetermined	846
Porpoise	19
Red deer	6
Elk	1
Boar	7
Fox	8
Bear	4
Other (Besides the mammal bones a great many fish bones are present, mostly cod) 37	

Thus there is clear evidence of seal hunting on the Baltic islands during the period 5500–2500 B.C. The site at Alby may be interpreted as a specialized seal hunting site inhabited in the late autumn and winter.

The fauna of the Pitted Ware sites from the period 2500–1800 B.C. on Gotland are well known. The sites Västerbjers and Visby on the eastern and western coasts respectively are typical and have percentages of species as shown in Table 2.

Table 2. Fauna from two Pitted Ware sites (in percent)

	Visby	Västerbjers
Ringed seal	20.8	
Gray seal	1.9	
Greenland seal	3.6	
Seal, undetermined	9.4	11.1
Porpoise	0.1	
Fox	0.9	0.8
Beaver	0.1	
Hare	0.1	0.2
Domesticated pig	51.6	73.1
Sheep/goat	1.1	3.4
Cattle	6.4	3.2
Domesticated dog	3.2	6.9

Fish and birds play an insignificant role at these sites. Domesticated pig is dominant, while seal are a minor part of the fauna. The seal hunting of the sites may be interpreted as part of an economy which has been based mainly on pig breeding. At other sites, for example Hemmor, the Greenland seal is the most common species among the seals. At the sites with Greenland seal considerable quantities of cod bones are found. Specialization of seal hunting seems to have been different at different sites (Nihlén 1927; Stenberger 1943; Königsson, Königsson, and Lepiksaar 1971).

*Finland: 6000–2000 B.C.*

At the Suomusjärvi culture sites along the coasts of the Gulf of Bothnia and the Gulf of Finland, roughly datable to 6000–3500 B.C., slate knives with broad blades and a few bone harpoons occur. This may be an indication of seal hunting. The broad-edged knives may have been used when cutting and flaying the seals.

From the Neolithic Period, 3500–2000 B.C., only a small quantity of burned bones have been identified at the Comb-Ornamented Pottery sites. Most common among the identified species are ringed seal, beaver, and elk. In addition to these, domesticated dog and maybe cattle occur. The economy of the Comb-Ornamented Pottery culture seems to have been based on seal hunting as well as inland hunting.

Two important finds of complete skeletons have been made: one of Greenland seal at Närpes and one of ringed seal at Oulujoki. A harpoon was found with each skeleton. Both skeletons have been dated by pollen analysis to the time of the Comb-Ornamented Pottery culture (Ailio 1909; Leppäaho 1937; Luho 1967).

## PROBLEM OF MARITIME ADAPTATION IN THE WESTERN AND NORTHERN REGION OF THE BALTIC

From the period 6000–3600 B.C. there is very little evidence of sea hunting in the Scano-Danian and Middle Swedish area. For Middle Sweden this is at least partly due to the lack of preserved bones at the sites, and for south Scandinavia it is at least partly due to the submergence of the coastal sites. However from the sites available with fauna remains it is seen that seals are an insignificant part of the game mammals.

The importance of sea hunting in Finland before 3500 B.C. is hard to