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Contents

Debate

Where did all the Hunters go?

An Assessment of an Epoch-Making Episode in Danish Prehistory

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Traditionally, the explanation of culture change within European archaeology, and hence Danish archaeology, has been a dichotomy between slow, internal cultural development, and abrupt cultural breaks caused by migrations of people. Some scholars systematically used invations to explain any change that looked abrupt in the archaeological record. Thus Brøndsted (1962: 491) claimed no less than 10 invations in Danish prehistory. Others tried, and still try, to create transition phases to explain the changes as internal development.

The question that should be asked today is, whether abrupt change cannot take place where invations of people did not occur, or were negligible? Indeed, cannot abrupt breaks in the cultural record be caused by slow, ordinary, everyday changes in local society? Increasingly, scolars have begun to believe this quite possible and even uncontroversal (Friedman 1982, Renfrew 1978, 1979, Renfrew and Poston 1979, Zeeman 1982). In doing so they draw heavily on recent trends in Natural Sciences that allow for sudden breaks in a continuous development, called a catastrophe, caused by the interplay of ordinary, well defined, continuous variables. As expressed by Zeeman:

> By the word catastrophe in this context we mean some discontinuity in the structure of society brought about by gradually changing circumstances. At first sight it is not clear why gradually changing circumstances should produce a discontinuous effect – indeed it violates the intuition, since continuous causes normally produce continuous effects. However, there has been a considerable advance in the mathematical understanding of such phenomena during the last decade, and the method of modeling them is called catastrophe theory. (1982: 316).

Catastrophe theory is foremost used in the study of biological evolution, where it supplements the more traditional systems theory, but it is also applied to the study of thermodynamics and the life cycles of the universe.

The application of catastrophe theory on the development of sociocultural systems is not straightforward and uncomplicated. Of course it is not difficult to conceive of a society drifting towards some impending "abyss" (recent political jargon in Denmark), with the individuals in that society aware, yet apparently powerless to prevent it. But it is very difficult to imagine how, if at all, such a society can switch over and restructure itself in a completely new way, as would be assumed from the application of catastrophe theory. We could speak in terms of a revolution, of the decision making capability of human beings, of mans free will, etc., but that would only serve to cover up for a profound lack in understanding of the nature of the human elements in such a process.

Another point to make is that the archaeological record cannot be taken to represent the knowledge and possible choices present in a society. It merely reflects its habitual and chosen ways. This implies that a vast amount of ideas and factual knowledge may be latently present, but perhaps never used, as it cannot be fitted into the established ways of the society. We may speak of an "information bank" (expression coined by Binford in another context (1983: 208)) that plays only a small role in the everyday life of a smoothly operating society, but which in case of malfunction or inflicted change may play a vital role in the subsequent restructuring of society.

Much of the knowledge in this "bank" stemed from the life experience of the members of the society themselves, obtained within their own cultural setting. Other parts of the "information bank" definitely came from contacts with other societies. Very often we can acknowledge these contacts through the spread of artifacts (whether as exchange goods, or copies of such goods), but very seldom we are given even the faintest clue as to what knowledge and what ideas were communicated through these exchange networks. Only occasionally, during periods of change and restructuring of society, may these ideas surface, and all of a sudden we may find ourselves confronted with phenomena that have no visible internal background, but for which we may indeed find parallels quite far away.

A third point to make, concerns the conditions for a change from the life way of the hunter-gatherers to that of the farmers. Some years ago it was established that the life of hunter-gatherers is not a harsh one. Indeed, it sems to be a far more easy going one than that of the farmers (Binford 1968: 328, Flannery 1969: 75–76, Cohen 1977: 140). Hence, it was considered necessary to establish a reasoning as to why at all a change from hunter-gatherer to farmer took place. And not only in the first place, but also in the following sequential spread of farming.

This "Garden of Eden" argument, as Binford termed it in a later critical assessment of his own and others writings (1983: 199), makes the origin and spread of agriculture very difficult to understand, and it has been used to explain why some hunter-gatherer societies lingered on for many centuries in potentially very good agricultural areas, opposing the "threats" of farming.

Most of the "Garden of Eden" argumentation is held within a systemic approach to culture, where the principle of homeostasis is the crucial element of system control. This makes explanation of abrupt change extremely difficult, and it calls for a cause external to the system, and hence beyond its control, to inflict the change. The cause preferred by most scholars in connection with the introduction of agriculture has been population pressure, either directly through uncontroled population growth, or indirectly through some unforeseen event like a change in the natural environment, creating a drop in the amount of food available.

Personally, I do find the ideas of general systems theory very useful when dealing with cultural systems, but if we are going to use systems theory for more than descriptions of, and explanations within basically stable cultural systems, and indeed if we try to incorporate catastrophe theory, we have to allow for other ways of looking at maintenance of stability than the homeostatic model. We could for instance accept a model of homeorhesis, which is a stability of directional change. That is, we allow for a directional change of the system, and yet maintain stability around the trajectory of change (Friedman 1982: 177). Indeed we may go as far as saying that many systems cannot be stable unless they change. An ultimate condition of system stability can thus be a directional change within the system that keeps it in constant nonequilibrium. This model gives us quite different possibilities of dealing with change within a systems theory framework, as the system may be attributed dynamic elements in its own right.

Returning to the "Garden of Eden" argument, we may now realize that the problem is falsly stated. The claim is that hunter-gatherers live a secure life, and that stable equilibrium is the hallmark of their cultural system. Hence a change to a farming system is a paradox that needs an external cause to explain it. The flaw is the acceptance of cultural systems as unvariably regulated by homeostasis in order to maintain equilibrium. The way around the problem is to realize that important parts of the system, especially within the social sphere, need not be homeostatically controled, but can be homeorhetically controled. Change is then an inherent part of the system, and not something to be inflicted upon it.

Abrupt change is this connection is only a special condition of the general pattern of change. It occurs when a treshold of some kind is created by the interplay of various factors, including elements inherent to the system, historical events, and regionally determined differencies. A sudden abrupt change is thus basically a historical event that given the time and the place can be understood in terms of the operations of the system itself in its total cultural setting.

REVIEW OF OPINIONS

The research on the origin of agriculture in South Scandinavia was for long completely side-tracked by the opinion that the Late Mesolithic Ertebølle Culture (EBK) and the Early Neolithic Funnel Beaker Culture (TRB) ran parallel for a considerable period of time. It was a perception reached and "proved" by archaeology and by natural science during the thirties and early fourties (Becker 1939, Iversen 1937, Jessen 1937, Mathiassen 1940, Rydbeck 1928; 1930; 1938, Troels-Smith 1937; 1943), and it was firmly maintained into the sixties (Becker 1948: 75; 1954: 124; 1955: 79, Brøndsted 1957: 161; 1962: 103), although Troels-Smith complicated the issue somewhat by speaking of a part of the TRB evolved from the EBK (and considered by him to be EBK), and another part of the TRB as invaded (1953). No proper discussion as to the origin of agriculture was possible under these circumstances. Agriculture simply had to be the result of an invasion. Only when it was realized from a new evaluation of the archaeological material (Skaarup 1973a), and foremost from the rising number of C-14 dates available (Skaarup 1973b, Tauber 1972, Pape 1979: 24) that the TRB followed the EBK, a basis for a renewed and more qualified discussion was reached.

Two of the Old-timers in the discussions have maintained their points of view unchanged. Becker still hold an invaded TRB population responsible for the beginning of agriculture in Denmark (1973), and Troels-Smith still refers to a late EBK of a semiagrarian type as well as a contemporary invaded neolithic culture (1982).

All other authors with a research base in South Scandinavia, and who have delt with the problem since the beginning of the seventies, have more or less clearly expressed the opinion that it was the EBK that through a shorter or longer period of time, and with greater or minor influences from the south was transformed into the TRB (Andersen 1973; 1981: 154, Fischer 1982, Horwitz 1973, Jarman et al. 1982: 81, Jennbert 1984; 1985, Jennbert Spång 1982, Jensen 1979: 52, Madsen and Petersen 1984: 103, Mahler et al. 1983: 58, Nielsen 1981: 13; 1985, Paludan-Müller 1978, Rowley-Conwy 1983; 1984; 1985, Zvelebil and Rowley-Conwy 1984).

Naturally, all these authors do not share the same view on how the transition took place, and what caused it. Yet, on two points there is a high degree of mutual agreement. Almost everyone accepts that the transition can be understood as a continuous one. This is first of all true with Jennbert (1984; 1985 and Jennbert Spång 1982), who tries to demonstrate archaeologically the gradual change in the Scanian material. Others like Mahler et al. (1983) and Paludan-Müller (1978) implicitly assumes a gradual change without actually trying to demonstrate it. Others again acknowledge a very quick transition, but maintains that it was of a continuous nature (Rowley-Conwy 1983; 1984; 1985, Zvelebil and Rowley-Conwy 1984).

The other point of considerable mutual agreement concerns surprisingly enough the reason for the change. Almost all authors end up with population pressure as the ultimate cause. The influence from "new archaeology" and the "systemic view" of culture certainly can be felt here.

In agreement with the normally held position in New Archaeology since Binfords "Post-Pleistocene Adaptations" (1968), population pressure is not taken to be a direct cause. Population size is considered to be a factor that is fully controled by homeostatic mechanisms in the system. This means that population pressure cannot arise by itself. Some unexpected change in the equilibrium level of the system has to take place, and take the system aback, so to speak. Thus almost all the explanations using population pressure, do not refer to this cause directly, but argue by the help of some unforeseen event or sequence of events.

Some authors points to an assumed drop in biomass during the Atlantic period (Andersen 1973; 1981: 154, Jensen 1979: 52), others to the change in climate between the Atlantic and the Subboreal periods (Jarman et al. 1982: 81, Rowley-Conwy 1983; 1984; 1985, Zvelebil and Rowley-Conwy 1984), as elements that caused an instability between population level and available food, and hence kicked the society into a change.

Others again used Binfords (1968) much more complex, but indeed very elegant model, of an interplay between "Open Donor Type Systems" in optimal settings, and "Open Recipient Type Systems" in marginal settings. The dynamics in this model is created by the budding off of groups of people from the donor systems to the recipient systems. Due to their marginal settings the latter very quickly ends up with population pressure. Thus change takes place in the open recipient systems of marginal areas, and not in the optimal key areas. Such a model is used very directly by Paludan-Müller (1978).

A few (Mahler et al. 1983: 77) leaves the neo-positivist jargon behind in preference of a more modal, marxist one. It is difficult, however, to find much renewal in their actual explanation of the transition. They claim that an imbalance between population level and food resources created a growing sedentism based on seasonal resources (fish) that could be stored. The sedentism, then, resulted in a growing population, whose demands for food led to a perfection of the catching and storing technology, so that more fish could be "harvested". Subsequently, this development led to a depletion (over-fishing) of resources. The only possible answer to this was to adopt agriculture. In spite of the authors claim of a truer view of prehistoric changes, it is difficult to see that this proposition is basically different from those that they critisize.

The "New Archaeology" with its functional, systemic view of culture, then, certainly have had a marked impact on South Scandinavian archaeology, at least where the explanation of the advent of agriculture is concerned. Recently, however, a few alternative types of explanations have also been published.

Jennbert (1984; 1985 and Jennbert Spång 1982) does not use population pressure, or any other such type of conflict. Her explanation is based on the exchange relationships between the late EBK and the neolithic cultures of Central Europe. She considers grain and domestic animals to be part of the prestige, exchange network, and the first tender use of domesticates to be no more than a prestige undertaking. Domesticates would then slowly gain in importance, until, after many generations, they dominated the economy. An adjustment of the social institutions also took place parallel to this slow change. Consequently, she finds that the best description that can be given of the introduction of agriculture in Southern Scandinavia is as the "Fertile Gift".

Fischer (1982) holds a somewhat similar view, but he seems to speak mainly of a knowledge aquired through exchange, and he sets up two preconditions for this knowledge to be invoked. One is that the new form of production was economically advantageous. The other that the local societies were at a stage of social development that made an organization of food production possible. He specifically states that it should be at least a big-man society.

A survey of opinions thus shows that even though many authors have occupied themselves with the transition from the Mesolithic to the Neolithic, only limited variation in the approaches and the explanations offered can be found. It is symptomatic for many of the newer contributions that they base themselves to a wide extent on theoretical considerations, and make little or no reference to the actual archaeological record. Those who deal excessively with the archaeological record do this rather one sidedly, or they either work from an EBK point of view (Andersen 1973, Jennbert 1984), or from a TRB point of view (Madsen and Petersen 1984, Nielsen 1985).

Idealy a concern with the transition from the Mesolithic to the Neolithic, and an attempt to explain this transition, should base itself on both the Late Mesolithic and the Early Neolithic record, and these should be carefully compared in the light of what we know of the nature of the transition itself.

THE EBK RECORD

Some years back Troels-Smith (1960) gave a very vivid description of how he imagined the realities of EBK life. It was a picture that showed hunter-gatherers living in very small groups, moving along the coast from shell midden to shell midden in order to secure sufficient amounts of food on a year round basis. He found that the population density would have been extremely low, with only some 30 people living in Denmark as a whole at the beginning of the EBK period, but growing somewhat during its course.

Today our picture of EBK society is very different. It is now evident that the EBK population lived in relatively large groups along the coast and in the inland (Andersen 1975: 1981: 89, Jarman et al. 1982: 81, Jennbert 1984, 1985, Rowley-Conwy 1983; 1984; 1985, Zvelebil and Rowley-Conwy 1984). There has, however, been disagreement concerning the degree of movement between the settlement sites. Some have favoured a model of movements from site to site along the coast, and specifically between the coast and the inland (Andersen 1975; 1981, Jarman et al. 1982). More recently it has become clear that the settlement pattern was even more stable than believed earlier. We may probably speak of large base camps occupied most of the year, with a radial exploitation pattern of the surrounding area by the help of specialized satelite extraction camps (Andersen 1984, Jennbert 1984, Rowley-Conwy 1983, Vang Petersen 1984). This assumption has been reinforced by the C-13 investigations of human skeletal material from

coastal sites (Tauber 1981a; 1981b; 1983). It turns out that the individuals examined almost exclusively have lived on a marine diet, and it is highly unlikely that they periodically moved inland for major exploitations of resources. The opposite, that the occupants of the inland sites almost exclusively lived from terrestial food seems also to be true, as C-13 investigations of dogs from inland sites on Zealand shows a clear terrestial pattern (Noe-Nygaard 1983).

The dietary habits of the EBK population becomes no less interesting with the realization of the sedentary nature of the society. It has been a commonly held opinion that the EBK had a broad-specter economy that optimized the exploitation of the available resources. This clearly was the guiding line of the ecologically orientated work of Paludan-Müller (1978), and even more so of the study of Jarman et al. (1982: 81). Based on a thorough analysis of a series of shell middens, the latter authors found that between 50% and 70% of the food-resources were marine. Yet, due to their bend towards economic determinism, they did not believe in these figures. Their site catchment analyses suggested quite different figures, and they came to the conclusion that the caloric importance of seefoods, perhaps with the exception of seals, were quite negligible. With the hindsight given by C-13 measurements, all their attempts to disclaim the archaeological record may be found a little peculiar, but it does, if anything, demonstrate the weakness of site-catchment analyses. The C-13 measurements leaves us no doubt that the predominant food source of the coastal population was marine (Tauber 1981a; 1981b; 1983). However, they do not in detail answer the question of, how large a part of the diet that came from marine sources, even though comparisons with C-13 levels in present day Eskimoes suggest that the percentage may have been as high as 70–90. In some newer studies (Rowley-Conwy 1983; 1984) the importance of seafoods – especially fish – has also been acknowledged independently of the C-13 analysis.

The dependence on marine foods of the EBK coastal population once more turn our attention to the settlement pattern. Paludan-Müller (1978), in his study of the ecological conditions of high atlantic food gathering, stressed the estuaries as those resource spaces that had the highest food capacities, mainly of a marine nature. And indeed, it is here we find the main clusters of settlement sites (Knudsen 1982, Vang Petersen 1984, Rowley-Conwy 1983). It is also in the estuaries that we find far the largest sites with evidence of an all year occupation constituting the base of a sedentary life. However, a full sedentism with a year round, steady life on the same site for all of the population cannot have been. There is a variety of sites spread all over the coastal area that represents specialized resource exploitations carried out at certain times of the year by task groups radiating from a base camp area (Rowley-Conwy 1983).

Such a settlement pattern must have led to a marked degree of territorial behaviour, and as the EBK wears on, it is indeed possible to see, not only a broad regional division of the culture, but also small groupings that can be spatially separated on a local level based on the style of artifacts (Vang Petersen 1984, Jennbert 1984).

The territorial behavior is also mirrored in quite a different and more tangible way. Of the growing number of human skeletons from the EBK, surprisingly many shows signs of violence, and some have also died from this violence (Andersen 1981, Bennike 1985: 98, Persson and Persson 1984: 48). A frequent type of injury is lesions of the skull probably caused by blows with heavy striking weapons (Bennike 1985: 98). Probably, this can be understood as evidence for a state of war between local groups. The same may also apply to the evidence for cannibalism known from the EBK (Andersen 1981, Vang Petersen 1982: 143).

The realization that the EBK had a large permanent coastal population with a well defined territorial structure that was maintained with a good deal of violence, is one of the major unveilings concerning the EBK in recent years. This place into focus the social structure of EBK society, as there seems to be a discrepancy between these findings, and the standard perception of the structure of a hunter-gatherer society (Service 1966). This impression is reinforced if we turn to other sources. By and by it emerges that if at all we should speak in idealized categories, we had better use the term "Tribesmen" (Sahlins 1968).

One such source is the EBK cemetaries that has been unearthed over the last decade (Albrethsen and Brinch Petersen 1976, Larsson 1984a; 1984b). These "Formal disposal areas" may in themselves be seen as an indication of a strong territorial behaviour in society (Chapman 1981, Larsson 1984a: 34), and they may also be seen as evidence for the existence of some form of corporate groups, most likely with a lineal descent pattern (Chapman 1981).

The pattern of age, sex and burial gifts in the graves of the Vedbæk cemetary seems to indicate that a persons role was determined primarily by age with three major age grades of under 18s, the 18–40 year olds and the over 40s. Sex differentiations seems to be less important, and there is no evidence of differentiations due to attained status (Orme 1981: 244).

Another source gives perhaps an even clearer indication of the "non-band" character of EBK Society. This is the extremely long exchange lines with which the EBK people were involved. Already Andersen (1973) expressed that contacts to neolithic cultures in Central Europe were of importance for some emerging elements in the EBK (T-shaped antler axes, shoulder blades with holes, and some aspects of the pottery), but he did not come to the point of stressing the importance of exchange in this connection.

The realization that the "Danubian Shaft-Hole Axes" ("Schuhleistenkeilen"), not unfrequently found in Southern Scandinavia, belonged to the EBK (Fischer 1982; 1983) suddenly made it clear that this culture was involved in an extensive exchange network that took items of prestige over hundreds of kilometers. The importance of this is twofold (Fischer 1982, Jennbert 1984). Firstly, we are here given very good evidence that the EBK had a social structure in which the acquisition of prestige was somehow important, whether by individuals or on a group level, and further that they took part in an exchange network on equal terms with neolithic groups to the south, which indicates that their social structure was not very much different from that found among these groups. Secondly, the exchange links established, probably were the

"data bases" of an infinite variety of information that was layered in the society, even though it did not surface in those aspects that are visible to the archaeologist. Certainly, we can claim that the EBK became "loaded" with latent possibilities for change.

The outline given here is to a wide extent based on evidence from the coastal zone. How much of this do also apply to the inland? Indeed is the inland at all comparable with the coastal zone?

Naturally, one major difference was the resources. We have seen that the coastal population almost exclusively exploited marine resources, and as this more or less precludes transhumance between cost and inland, it can be of little surprise that we find evidence for a clear predominance of terrestial food in the diet of the inland population (Noe-Nygaard 1983). However, when it comes to an outline of the actual exploitation and settlement system of the inland population, we are not very well off. We do find clear evidence for inland populations in all areas: Scania (Jennbert 1984: 101), Zealand (Noe-Nygaard 1983, Andersen 1983), Fyn (Andersen 1984) and Jylland (Andersen 1975). Yet, our knowledge of their way of life is still very limited. Two important investigations do, however, shed some light on this problem. One is Noe-Nygaard's (1983) investigation of the Præstelyngen site on Zealand, the other is Andersen's (1975) investigations of the Ringkloster site in central Jutland.

The former demonstrates that the Præstelyngen site was a summer camp inhabited between March/April and September. She further demonstrates that aquatic resources taken from the lake were of great importance during this period. The latter demonstrates that the Ringkloster site primarily was a winter camp used between October and April, although a few summer indicators shows that it was also used at other times of the year. Fish is quite unimportant at Ringkloster even though the site is situated directly on the shores of a large lake. The resource of overhelming importance was the wild boar. If we compare with the Præstelyngen site, we may tentatively suggest that the winter and summer strategies of food acquisition for inland populations were far from being the same, and that the nature of the inland resources forced a somewhat greater variability on inland economy than it did on coastal economy. the Ringkloster site on the other hand is certainly not a small unimportant site. The settlement area itself covers 200 by 75 meters and includes numerous evidence for permanent structures, perhaps even timber built houses (Andersen 1979). One may see this as a discrepancy between what could be expected from an ecological point of view, and what really happened culturally. Indeed, the site seems to have held a rather large population on a quite permanent basis.

The presence of a rib of a bottle-nosed dolphin is another interesting element of Ringkloster. This find was interpreted by Andersen (1975; 1979) as evidence of transhumance between the coast and the inland. Based on our present knowledge, it may perhaps better be viewed as evidence for the existence of an exchange system between the coastal and the inland populations, and on a wider scale it indicates that the inland population also participated in the long distance, exchange networks with the south. The latter point is further supported by the finding of "Danubian Shaft-Hole axes" in clearly inland positions (Fischer 1982: Fig 3).

THE TRB RECORD

The assessment of the nature and development of the Early Neolithic period given by Becker (1948) had a great influence on European neolithic archaeology, and naturally especially on Scandinavian archaeology. So profound was the impact that except for his controversy with Troels-Smith (1953 and Becker 1955) nothing important happened, before Skaarup (1973b) noted that the C-14 evidence did not support the chronology that Becker suggested for his various Early Neolithic groups. Since then a series of works have added new information and new thoughts to this research area (Ebbesen and Mahler 1980, Koch Nielsen 1983, Larsson 1984c, Liversage 1981, Madsen 1979, Madsen and Juel Jensen 1982, Madsen and Petersen 1982, Nielsen 1985, Skaarup 1973a; 1975). Agreement, however, has only been reached on a few issues, and being a participant in the discussions myself, it is very difficult for me to present a balanced outline of our current knowledge. Consequently, the following represents a most personal view.

Beckers division of the Early neolithic pottery into A, B and C pottery, and the C into megalithic and non-megalithic pottery was a purely stylistical decomposition, which he found to have chronological and historical significance. However, the investigations during the last few years have indicated differently, and the situation seems to be even more complex than Becker envisaged. An outline of the oldest part of the Early Neolithic between apr. 3100 and 2800, as I would give it today (Madsen and Petersen 1984) has the following form:

What I prefer to call the Oxie group (Madsen and Petersen 1984), following a suggestion from Larsson (1984c), is the sole part (A group) of Becker's system that has survived more or less intact. Yet there are discrepancies between Becker's original descriptions (1948), and those forewarded in the most recent publications (Koch Nielsen 1983, Nielsen 1985). In order not to let the use of Becker's terms bring ideas to mind of relations and conditions that are no longer warranted, I find it better to use a new "unloaded" term for this group.

Clearly, the Oxie group has an eastern distribution in South Scandinavia. This can be seen from its defining pottery (Nielsen 1985: Fig 14), and from the pointed butted flint axes that exclusively seems to belong to this group (Nielsen 1977: 69). The main concentration is found in Scania and on Zealand, while only a minor scatter of finds are seen in the eastern parts of Jutland and around the Limfjord.

Becker considered the material from this group to be chronologically older than any other neolithic material in South Scandinavia. The associated C-14 dates do not support this view. They do place it in the older part of the Early Neolithic between 3000 and 2800, but there are other groups that are just as old, and the oldest dates do not even come from the Oxie group (Madsen and Petersen 1984, Koch Nielsen 1983).

A comparison between the Oxie group and the late EBK shows several points of accordance. Thus, the pointed butted

flint axe may be viewed as a grounded version of the specialized core axe of the late EBK, and the flint inventory as a whole has much in common with that of the late EBK both technically and in its inclusion of flake axes in the inventory (Nielsen 1985: 112). Another resemblance that immediately catches the eye, is how close the only known Oxie grave – the one from Dragsholm (Brinch Petersen 1974) – is to the EBK graves. It is the same type of simple inhumation grave with the body lying on its back, associated with a series of personal items that indicates a hunter and a warrior rather than an agriculturalist.

On the other hand, there are very obvious differences too. Thus the diet of the Dragsholm man was completely dominated by terrestial food according to the C-13 evidence, even though he was burried at the coast in connection with a shell midden (Tauber 1981a; 1981b; 1983), and of course both cereals and domestic animals are attested. Further, we find a scatter of small, agricultural sites on sandy stretches in the inland of Scania in a region where there are no EBK sites (Larsson 1984c). Finally, the resemblance one might see between the EBK pottery and the Oxie pottery is overshadowed by the almost identity between the Oxie pottery and pottery from the Sarnowo group in Poland (Kosko 1982, Wislanski 1973). Yet the Sarnowo group is clearly older than the Oxie group, and there is no way the two can be paralleled chronologically (Madsen and Petersen 1984, Midgley 1985: 7–9).

Another Early Neolithic group is the Volling group. It has a clearly western distribution, as it is known only from Jutland. In terms of Beckers divisions, the Volling group is an amalgation of B and North Jutish Non-megalithic C. Unjustly he claimed them to be two separate entities in that area. In fact, it was the richer decorated, and the lesser decorated pottery of the same group that lay behind his distinction.

The Volling group covers all of the Early Neolithic period and the associated C-14 dates point to a begining around 3100, suggesting an even earlier start than the Oxie group (Madsen and Petersen 1984). This means that to the extent the Oxie group is present in Jutland, there was an overlap in distribution between the two groups.

Unlike the Oxie group there is little to suggest a link between the Volling group and the late EBK, even in its earliest appearance as on the Mosegården site (Madsen and Petersen 1984). The pottery is elaborate, especially in its decoration, and constitutes a complete break with the EBK pottery. Despite this, it is not possible to come up with parallels to the South or elsewhere that convincingly can explain this pottery. Some weak parallels may be drawn to Rössen derivatives on sites like Hüde I and Boberg, but chronologically they are older than the Danish material (Madsen and Petersen 1984: 104).

The thin butted flint axe, characteristic of the Volling group had no morphological predecessors in the EBK in the same way as could be suggested in connection with the pointed butted axe. If it is not a unique innovation, the only possible "explanation" seems to be that it was a copy of flat-axes of copper (Randsborg 1979). The latter could for chronological reasons easily have been present already in the late EBK by way of the exchange network. We know for certain that the polygonal copper battle axes, like the stray find in Scania (Brøndsted 1957: 181), were here from the outset of the neolithic, as we have their stone immitations in the graves on a very early date, both in the Volling group (Fischer 1976) and in the Oxie group (Brinch Petersen 1974).

The remaining flint inventory is more flake dominated than that of the Oxie group, and it does not look as "mesolithic" as the latter. Also, flake axes are not common on Volling sites (Madsen and Petersen 1984).

The graves constitutes a very conspicious difference. From the outset of the Volling group we have very elaborate burial customs (Fischer 1976, Madsen 1979; 1980, Madsen and Petersen 1984). We find burials in wooden chambers situated in often huge earthen long barrows. The barrows may be surrounded by palisades, and in one end we may find heavy set transversal wooden structures that was the foci of rituals and offerings. There is quite clearly no local background to be found for these monuments so we have to turn our attension elsewhere.

In the northern parts of Poland and Germany just south of Denmark we find "unchambered long barrows" (Midgley 1985). However, when we start comparing details, they are far from being as good parallels as the partly older, partly contemporary British "unchambered long barrows" (Madsen 1979). From almost any point of view this is quite puzling, but the parallels are in part so close that they precludes any suggestions that the Danish long barrows are indigenous innovations.

The settlement system of the Volling group is also very different from that of the EBK. In the coastal zone we find small short lived agricultural sites on the sandy soil, often quite close to the coast, but situated very differently from the EBK sites, and not attracted by the rich coastal resources (Madsen and Juel Jensen 1982). However, some of the EBK shell middens are still in use as specialized, occasional hunting and gathering stations (Andersen n.d., Madsen 1982, Madsen and Juel Jensen 1982), but the TRB layers are clearly separated from the EBK ones by a series of differences that indicates a marked change in the exploitation patterns (Andersen n.d.).

The sites discussed by Madsen and Juel Jensen (1982) were all situated in the coastal zone, and thus in the generally same area that carried the main part of the EBK population. However, if we look at the distribution of the long barrows (Madsen 1979: Fig 1) as well as Early Neolithic earth graves in general (Thorvildsen 1941), we receive the very clear impression that a large part of the settled area was now truely inland.

A third TRB grouping found on Zealand, and dating to the first part of the Early Neolithic must also be taken into consideration. In terms of Beckers system it corresponds quite closely to the B group, but includes in my opinion also his Zealandic Non-megalithic C, as he made an artificial separation of the two components in exactly the same way as it happened in Jutland. I have previously suggested that the name Svaleklint group should be used for this Zealandic parallel to the Volling group (Madsen and Petersen 1984), but unfortunately I thereby violated the original contents of this concept given by Ebbesen and Mahler (1980). Consequently, in the following I shall refer to the Zealandic Svaleklint/B group, meaning the total of this complex, which I find to be basically one

group. In this connection I should not conceal that there are quite contrary opinions to both grouping and chronology of this material (Nielsen 1985).

In some aspects the Zealandic Svaleklint/B group pottery lies stylistically between that of the Oxie and the Volling groups. However, an all over consideration place it as a regionally differentiated parallel to the Volling group, even though some of the dominating features in its rim decoration is known only from the Oxie group (Madsen and Petersen 1984).

Chronologically the Zealandic Svaleklint/ B group is parallel to the Oxie group, and we might even see a hint in the C-14 dates of a slight antecedence, but this is rather uncertain (Koch Nielsen 1983, Madsen and Petersen 1984). The simultaneousness with the Oxie group is very intriguing, as it does not seem possible to find any distributional differences between the two. Both groups seems to be present in the very same areas of Zealand at the very same time (Koch Nielsen 1983).

The burial practise of the Zealandic Svaleklint/B group is as yet little known. The long barrow at Lindebjerg (Liversage 1981), however, belong in this group, and this suggest the burial practice to be parallel to the one found in the Volling group, and thus probably different from the one found in the Oxie group.

FROM THE MESOLITHIC TO THE NEOLITHIC IN SOUTH SCANDINAVIA

The two most recent contributions to the discussion of the transition from the Mesolithic to the Neolithic were published side by side in the previous volume of this journal (Jennbert 1985, Rowley-Conwy 1985). They express almost completely contradicting views on the nature of the transition, and together with the two authors previous writings (Jennbert Spång 1982, Jennbert 1984, Rowley-Conwy 1983; 1984, Zvelebil and Rowley-Conwy 1984) they are good examples of the two major trends in current views on this epoch-making episode.

Jennbert on her side considers the transition to be a slow cultural build-up, where the formation of a growing social complexity within the EBK, combined with the access to agricultural goods through exchange networks, was of crucial importance. Her position is based on a theoretical attitude, where important agents for change primarily should be found within the social sphere, a point I agree with, but she also very explicitly (1984) tries to demonstrate the gradual nature of the transition, using the excavations at the Löddesborg settlement site. However, her use of the "stratigraphical sequence" at Löddesborg to show a gradual replacement of EBK elements with TRB elements is a very dangerous procedure at such a large and complex site. The possibility of undetected post depositional movements of materials between the levels is far too great. Apart from this, however, she certainly seems to have a strong case. The use in both the EBK and the TRB of the same very large, probably permanently settled site point to a high degree of cultural continuity. It is also a point in favour of her ideas that she – for the first time in Scandinavia – has found grain impressions in sherds that beyond doubt stems from EBK pots. On the other hand, it should not be forgotten that the study of Early Neolithic settlement patterns in Scania also shows a different picture, with a scatter of small agricultural sites over the inland at a quite early point in time (Larsson 1984c). This in some ways contradict Jennberts suggestions.

Rowley-Conwy in his explanation, on the other hand, stresses the importance of the economic conditions for the transition. He assumes that an imbalance between population and resources caused by the change in climate from the Atlantic to the Subboreal period was directly responsible for a change in the food strategy of the population. More directly he points to a decline in the availability of oysters as a triggering cause. He does this from the assumption that oysters were a crucial resource during the lean times of late winter and early spring.

Based on his knowledge of the EBK record in Jutland, and the conditions under which early TRB material is found on the EBK sites in this region, he also concludes that the transition was a very rapid one, although he more theoretically speaks of a series of stages in the transition (Zwelebil and Rowley-Conwy). Clearly, he has here an opposing view to Jennbert.

Personally, I am not happy with this explanation, and I find it hard to believe that no other immediate and less drastic means of rescheduling, than converting to agriculture, was not available in the face of a decline in a minor resource like the oyster. Storing techniques for fish would probably easily have been able to counter this problem. Also in this connection, it is relevant to mention that studies of shells from the Ertebølle midden itself shows that far the major part of the mussels were taken during the summer and autum, and only a minor part during the winter and early spring (Skalborg Jensen 1982). Further, it cannot be irrelevant that half of the coastal EBK population never had access to oysters due to low salinity in the south eastern parts of South Scandinavia.

Rowley-Conwy's statement of the rapid nature of the transition in Jutland, on the other hand, is unrefutable. The huge EBK base camps did not continue into the Neolithic (Rowley-Conwy 1983), and on those middens where there is a continuity into the Neolithic, there is a very sharp dividing line between the mesolithic and the neolithic components. The neolithic parts of the middens are dominated by ash layers and fire cracked boiling stones, never found in the mesolithic layers (Andersen n.d.) This implies a completely different exploitation pattern. Probably the coastal middens of the Early Neolithic were from the outset reduced to occasionally visited extraction camps, where food was conserved before it was carried away to the agricultural base camps placed in totally different ecological positions (Madsen 1982, Madsen and Juel Jensen 1984).

How, then, are we to perceive the transition? Was it a very rapid one, or was it a gradual element by element change? Personally, I have little doubt that it was an, archaeologically speaking, instant transformation that took South Scandinavia from a fisher-hunter-gatherer economy to a basically agricultural economy, and I doubt that we will ever be able to produce convincing assemblages that reveal the transition stage itself. This not only goes for Jutland, but also for Zealand and Scania, which means that I consider Löddesborg, and a

number of other sites mentioned by Jennbert to show mixed assemblages between EBK and TRB deposits. I also believe that the difference in C-13 content between the mesolithic and the neolithic graves at Dragsholm, showing a clear dichotomy of marine versus terrestial diet, is not to be considered as the result of two extreme examples of a gradual changing relationship between sea and land over the 300 years that separates the two sets of dates. Even if only 50 years separated the two dates, I would still expect the same discrepancy in the C-13 level to have been present.

An explanation of the transition from the Mesolithic to the Neolithic in South Scandinavia may of course take many different forms. Even a full acceptance of the evidence sketched in the preceding pages may lead to very different attitudes among various researchers. The model and explanation to be offered here in the concluding lines thus makes no claim at all of being the truth, if such ever can be found. It is put forward in order to make clear a sequence of possible relationships and conditions that is worthwhile having in mind for further research, and it draws heavily on the more general considerations outlined in the opening chapter.

The coastal EBK society was involved in a process that took it through an increasing resource specialization and towards an increasing formalized group structure. The process was nurished by the possibilities imbedded in a sedentary settlement structure around localized optimal resource spaces that also had sufficient headroom for a considerable growth in population. I do not see any need for assumptions of a devastating resource pressure on this system. It probably was ecologically stable, and there is no convincing reason why fluctuations in the resource base could not be countered by the cultural system on its own terms.

There is, however, reasons to believe that there were considerable dynamic changes in the social system towards a growing complexity, and a formalized, rigid group structure. This follows from the evidence of violence probably indicating inter group stress, from the use of formalized disposal areas for the dead, and from the acquisition of "exotic luxuary" goods through exchange. Whether the monopoly of control and power was placed with individuals or with age groups is difficult to say, and currently of less importance. What is important is that the spatially limited resource areas were benefitial to those in control. Any formalized system of group access to such localized resources would be an invitation to an exercise of power for those who could gain control. In terms of dynamics, it would mean that the social system continuously would press for a narrowing of the resource base in order to consolidate the power structure of the system, and it would immediately try to counteract any tendencies for the inclusion of supplementary resources that were outside the defined areas of control. In this way the system painted itself into a corner from where only a leap could bring about renewal. I find that this social development is the main reason why the EBK was so completely unimpressed economically by the contacts with agricultural societies to the south for a period of almost a 1000 years, and why the transition, when it took place, had the nature of a replacement rather than of a gradual change.

The situation in the inland was clearly different. There was no spatially limited resource base of a magnitude comparable to the coastal one, and from a purely ecological point of view we would certainly not expect to find the same development here as at the coast. Nevertheless, we do find acquired luxury goods in the inland, and the Ringkloster site is evidence of very large, quite permanent residence units towards the end of the EBK. The only reasonable explanation for this seems to be that despite the different ecological and economic situation, a social development comparable to that along the coast took place inland at a late stage of the EBK. The reason for this can probably only be attributed to an intense contact between coast and inland, with a continuous, dominating "center-peripheri" influence from the former to the latter. Such a development in the inland social system would have very different conditions from the coastal one. Whereas the coastal system was working itself into an impasse, the inland system would be working itself into a very unstable situation, where the social system kept up an economic exploitation and sedentary pattern for which there was no immediate ecological sense. A restructuring would in this case be an unavoidable outcome of the continuous development towards larger and more sedentary units. However, the logics of a leap into agriculture rather than a gradual change may here perhaps be disputed.

One thing is to offer a social explanation for the overspecialization of the EBK economy, and the inevitability of drastic change. Quite another thing is to explain the complexity, and even heterogenity of what followed in the early TRB.

From the point of view sketched earlier in this paper (also Madsen and Petersen 1984) there were two major contemporary, overlapping cultural trends at the beginning of the Neolithic in South Scandinavia. One is represented by the Volling group and its Zealandic counterpart, the other by the Oxie group. The only cultural dichotomy that covers all of Scandinavia in the EBK, and which is not just a regional difference, is the opposition between coast and inland. It is just possible that behind the two main traditions of the earliest neolithic is this cultural, economic difference in the EBK, where the Oxie group probably would stem from the coastal aspect, to judge from its distribution.

Naturally, it is futile to look for a coast-inland dichotomy in the Early Neolithic, as the agricultural component introduced ment quite new economic conditions for both traditions, removing the original differences in their economy. The reason for the existence of contemporary groups, sharing the same general settlement area, would then probably be that their roots in the EBK were still visible through some sort of ethnic manifestation (c.f. Hodder 1982 for discussions of ethnic expressions from an ethnoarchaeological point of view). In Jutland where the precense of the Oxie group is rather unimportant, and probably short lived, we can still see its original coastal distribution, before it was overruled by dominance from the Volling group.

From the current available C-14 dates, we may assume that the initial transition occurred in the inland EBK, possibly primarily in Jutland resulting in the Volling group, and spreading from here eastwards. This would seem reasonable

from the point of view that it was the inland EBK that moved itself into an unstable situation. The coastal EBK in its more stable impasse would probably be more inert. However, the filling of their backlands with farming people from a group of former "cultural relatives", may have constituted an initial kick to make also the coastal EBK change, possibly in the way that some people "rebelled", and moved away from the central settlement areas to form a new life on an entirely new base.

The Löddesborg site constitutes one major problem for this model. It is implicit in the model that the base camps of the late EBK should be deserted in connection with the transition, and that we should not find agricultural indicators (like grain impressions in pottery) in connection with EBK on these sites. Both of these non-fits, however, occur on the Löddesborg site, and the only way to escape this problem seems to be the assumption that Scania was so marginal to what was initiated in the west, that a partly different pattern of change evolved here. If, however, the "Löddesborg syndrome" irrefutably turns up further west, it will have a devastating effect on much of what is suggested here.

The transition itself: the rapid, discontinuous, morphogenetic change is not a concern of archaeological argument. If accepted, it is beyond the capabilities of archaeology to observe it, and its acceptance as a possible cultural process lies entirely within the realms of cultural theory. The same is true with the idea of a latently present "information bank", from which a system subject to restructuring can select new elements for its future structure.

Thus I consider the transition from the Mesolithic to the Neolithic to present a case of morphogenetic change, being to the achaeological point of view a true "black-box" problem. That is, we can observe and describe what goes in, and what comes out, but we cannot follow the process of creation itself. The people involved chose the contens of the system being formed from the "information bank" currently available to them. An agricultural economy, and a series of social, ideological, ritual, religious, etc. elements were picked up from surrounding, even far away, neolithic groups, and from their own past.

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