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CHANGING PATTERNS OF LAND USE IN THE TRB CULTURE OF SOUTH SCANDINAVIA

Towards the end of the Athlantic period most of South Scandinavia was covered by dense forest. Only the central and western parts of Jutland had a more open vegetation. This is the traditional view, and further this environment has been considered to be hostile to the early farming communities. Hence the forest is often reffered to as the enemy, and the axe and the fire as the friend of the farmer.

A more varied view on the Late Atlantic forest environment is held today. The vegetation cover is now assumed to have been more diverse. Although well drained soils were dominated by a rather dense lime forest [Aaby 1985; Iversen 1960], local environmental factors at the same time created more open patches of forest in between [Rowley-Conwy 1982].

The views on the early farming society are also changing. Our knowledge of the societies has grown considerably in recent years, and at the same time our basic theoretical standing has changed towards a more ecological perspective. We are now more apt to see subsistence economies in low level technology societies as adaptive rather than manipulative in relation to the natural environment.

It is the purpose of this paper to review our current knowledge and attitude towards the evidence for the man-land relationships during the first 1000 years of farming in South Scandinavia. Special emphasis will be placed upon changes in these relationships, and the correlation that these changes may be seen to have had with changes in the social organisation of society.

THE POLLEN ANALYTICAL EVIDENCE.

Our main source for the man-land relationship in the early farming communities is the pollen record. Two phenomena – the Elm decline and Iversen's Landnam – have been considered essential to our understanding of the pattern of farming.

The Elm decline. A sudden and pronounced drop in the frequency of Elm pollen around 3900 bc. (all dates are given in calendar years to allow comparisons of length of periods) was acknowledged early in the history of pollen analysis and was originally considered to be the result of a climatic change. Fægri [1944] and later J. Troels-Smith [1954, 1960] suggested that the Elm decline had to be seen as the result of human interference with nature. By pollarding or shredding (fig. 1), to obtain leaf fodder for cattle that were held permanently in stables or at least in corrals, the Elm

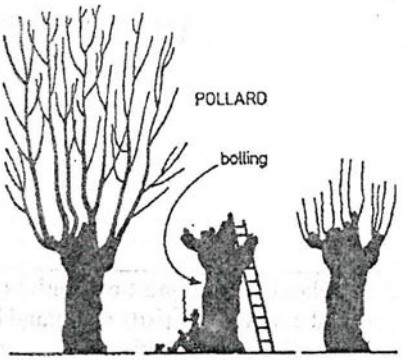

Fig. 1. Pollarded trees. After Rackham 1976.

was kept from flowering and hence dispersing pollen. This interpretation of the Elm decline found broad acceptance, especially in Denmark where it turned out to coincide with the beginning of the TRB culture.

Today many palynologists and archaeologists have discarded the view that the Elm decline was caused by human interference with nature. There are several reasons for this change in attitude.

First of all archaeologists have for many years found it rather peculiar that the Elm decline should appear silmutaneously across all of North and Central Europe, and as it was crosscutting all cultural units in the area without any significant changes to be seen in the material culture [Groenman-van Waateringe 1983]. Only in South Scandinavia does the Elm decline co-occur with a major cultural change – the transition from the Mesolithic to the Neolithic.

Secondly, if one calculates the minimum size of a cattle herd in any one area, from the assumption that the Elm decline reflected a fodder gaining activity, the result becomes unrealistically high. For Denmark it would mean that within a hundred year period a herd totaling one million heads had been established [Rowley-Conwy 1982]. Futher, this calculation is based on the assumption that cattle were fed exclusively with leaf fodder. However, one has to consider, that cattle is a grazer and not a browser. This means that cattle must have its major intake of food from grass. Leaves can only be used as a major food source for shorter periods of time, or be a minor supplement to the food obtained on a permanent basis [Groenman-van Waateringe 1986, p.188]. Thus, no doubt leaves were used as a supplementary source of fodder during the lean periods of the year, and may have been used as the main source of fodder during the harshest periods of the winter and early spring. It is inconceivable, however, that it would have been used to a degree, where it could have made a noticeable impact on environment, and not at all to a degree, where drastic alterations in pollen frequencies like the Elm decline, would occur.

The Landnam. The second major change in the pollen diagrams is known as the Landnam (=taking of land), or „Iversen's Landnam" after the Danish palynologist Jhs. Iversen, who first described and interpreted this phenomenon. It appears as a marked drop in the curve of mixed deciduous forest, followed by a growth and maxima in the curve of birch, and subsequently a growth and stabilisation of the curve of hazel, before the mixed deciduous forest finally returnes to its stable equilibrium. Concurrent with the changes in the tree pollen spectra we see a marked increase in the curve of non-tree pollen.

The interpretation originally suggested by Iversen was based on the idea that the changes in the pollen diagrams mirrored short term clearings in the forest connected with slash and burn agriculture [Iversen 1949]. In the details of the pollen diagrams he found what he considered to be indications for the existence of slash and burn, and he suggested that the pollen diagrams displays the healing sequence after the cuts in the forest left by the slash and burn activity. Included in this healing sequence was an early stage where the cleared, slowly regenerating land was used for cattle grazing.

It was implicit in Iversen's ideas that in each individual diagram the Landnam represented a local term clearing in the forest. However, with a strongly enhanced knowledge of the way pollen are dispersed, and with a growing number of C-14 dates related to Pollen diagrams, it is now clear that the Landnam is a regional and not a local phenomenon. Further, it must be seen as a long term concurrent phenomenon across South Scandinavia [Rowley-Conwy 1981]. The beginning of the Landnam can be placed somewhere between 3450 and 3550 bc. Thus in the Fuglsø diagram it seems to start around 3450 bc. [Aaby 1985, p. 70], but in other diagrams the date for the beginning seems to be slightly later [Christensen 1980]. Its duration – that is until the forest appears to be fully regenerated – is as much as 500-550 years. Thus according the Fuglsø diagram the forest closes up again around 2900 bc, apparently rather quickly [Aaby 1985 p. 70].

Consequently the Landnam cannot be the result of a localised field cultivation strategy like slash and burn. It must represent a major regional change in the forest environment. This does not mean that slash and burn did not take place, only that the Landnam itself is not an indication thereof. Evidently the Landnam indicates some sort of manipulation with the forest environment on a major scale in order to create sufficient grazing areas for large herds of free roaming cattle. The means were to kill off trees systemtically by felling or more likely by girdling. As pointed out in several recent palynological studies the Landnam must indeed be considered as evidence of an extensive woodland cattle grazing phase [Aaby 1985; S. T. Andersen 1985], and not as evidence of a slash and burn agriculture.

Notably, the 'regeneration phase' is far from being the kind of feature that Iversen envisaged. With reference to the dominant role of hazel in this prolonged stage a much more likely explanation is that the 'regeneration phase' represents a woodland management based on coppicing of trees (Fig. 2) [Göransson 1982].

The idea that the Landnam represents forest management is to some extent supported by an indpendent source of information. Throughout the Neolithic we have

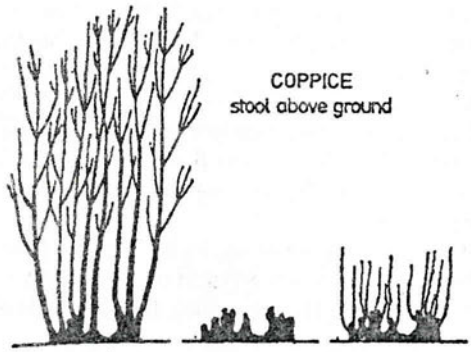

Fig. 2. Coppiced trees. After Rackham 1976.

many traces of timber constructins, and in some cases even preserved pieces of wood. During the Early Neolithic, before the Landnam, we normally see huge trunks in the timber constructions of the long barrows, with dimensions up to one meter [Madsen 1979]. The timber used for construction purposes during the EN II and the early MN A as seen in the mortuary houses [Becker 1969] and in the palisades of the causewayed enclosures [Andersen 1981; Madsen 1988] have diameters of between 20 and 40 cm, suggesting a forest of rather young trees. Also, within the time span of the Landnam we find rather slender pieces of wood, some of which definitely come from coppiced trees. This is true for the wood from the Tibirke track [Kunwald 1984], and possibly for the wood from the Spodsbjerg settlement [Skaarup 1985] from MN A V (Malmros, personal communication).

The altered interpretation of Iversen's Landnam is basically determined by a change of perspective. Originally the Landnam was considered to be the result of the actions of individual groups of farmers, who felled small parts of the forest in order to establish their garden plots, which they left in favour of new plots after a few years of cultivation. Now we have to realise that the Landnam should be understood as a long term development man-land relationships. The impact on the environment, as seen in the pollen diagrams was not caused by small local groups of farmers at certain points in time. It was a result of long term changes in the subsistence behaviour of the farmers in the TRB Culture as a whole.

The reinterpretation of the Landnam poses the question whether a slash and burn agriculture existed or not. Indeed, arguments have been launched to the effect that slash and burn was not a probable or even a possible agricultural activity in South Scandinavia [Rowly-Conwy 1981]. However, new evidence from beneath a barrow of passage grave seem to prove that slash and burn was practiced, and in fact it may have been the hazel coppice that were used as fire wood for the slash and burn activity [DGU Information Nr 2, August 1988, p. 2-3].

THE CULTURAL BACKGROUND

In its own right the changed view on the Landnam has far reaching implications for our assessment of the of the nature of TRB farming. However, it becomes even more important, when it is realised that the whole pattern of changing man-land relationships is closely correlated with changes in the overall cultural framework.

The beginning of the Neolithic in South Scandinavia is culturally much more complex than hitherto assumed. Becker's straight forward sequence of A,B and C groups has turned out to be far from correct. Instead we have to reckon with a much more complex regional patterning from the outset, where elements of all three groups are included [Madsen and Petersen 1984].

In short: northern and central Jutland is dominated by the Volling group comprising the material that Becker [1948] separated as B and as Jutlandic Non-megalithic C. In eastern South Scandinavia, mainly on Zealand and in Scania, we find Becker's A group or Oxie group, as it is now also termed. Also, on Zealand we find the Havnelev/Svaleklint group comprising material from Becker's B and Zealandic Non-megalithic C groups. A parallel group in Scania is termed the Svenstorp group [Larsson 1984]. In South-west Scandinavia the cultural groupings are less well established. We have some material from Stengade II [Skaarup 1975] and Siggeneben-Süd [Meurers-Balke 1983] that appears as a stylistic amalgamation of Becker's A and B groups, and further we have the Satrup material as a possible candidate for a regional group at this early stage [Schwabedissen 1979].

The dating of this diverse cultural complex is between 3940 bc and 3450 bc based on numerous C-14 dates, and so far there is none of the groupings mentioned above that can be singled out as earlier than the others. With regard to the pollen record, this first phase of the Neolithic clearly lies before the Landnam in the part of the diagram where next to nothing indictes the presence of farming systems in the landscape (disregarding the Elm decline).

Our knowledge of the man-land relationships of this period is indeed very meagre. We are only beginning to retrieve systematic information on the settlement pattern. Four regional studies, one in Jutland [Madsen 1982; Madsen and Jensen 1982] and three in Scania [Larsson 1984; Larsson and Larsson 1984, 1986; Strömberg 1988], do, however, offer some quite homogenous information. In all four cases the settlements uncovered are small and presumably short lived. Only one or a few extended families inhabited such a site, and to judge from the rather low density of material on these sites the inhabitants moved to new locations on a regular basis. All parts of the country, both the coastal tracts and the interior were settled. However, when we look at the settlements on a more detailed scale it appears that the location of the individual sites was carefully chosen. Thus, in eastern Jutland we find the sites on sandy soils, close to major tracts of wetland, a pattern that also seems to apply to Scania. Presumably the combination of light soils and rich ecotones between wet and dry land was carefully selected as a basis for the subsistence activities.

Unfortunately, the sites – lying as they do on sandy soil – have hardly left us any evidence of the basic subsistence activities. We know that wheat and barley were grown, and that cattle, pig and sheep/goat were present, but so far we do not have

any information as to the relative importance of these elements. We are thus left to speculate on the nature of the earliest farming system in South Scandinavia.

Personally [1982], I belive that the dominating feture of the earliest farming system was an adaptation to existing evironmental conditions. This would mean that the growing of crops would be of minor importance, whereas domestic animals would be the more important economic element. Especially the pig is well suited to an economy adapting to a forest environment, but cattle could also have been kept successfully especially in damp areas, where natural grazing would have been available. In addition, it is to be expected that hunting, fishing and gathering still was a central element in the economy. [Madsen 1982; Madsen and Jensen 1982; Skaarup 1973].

In the second period of the Early Neolithic from 3450 to 3350 bc, and, as it seems, parallel to the beginning of Iversen's Landnam, a series of changes took place, which significantly altered the cultural system in South Scandinvia. This development continued in MN A I, between 3350 and 3070 bc, contemporary with the central part of Iversen's Landnam. Changes occured in many parts of the cultural system, and there can be no doubt that they were all closely interlinked. It is my argument here that Iversen's Landnam was just one of these interlinked cultural changes.

The EN II sees a partial obliteration of the many regional groupings found in the EN I. It was the vertical incised pottery together with rich cord-decorated pottery that became dominant. In South-west Denmark it was the Fuchsberg group, and in eastern South Scandinavia the Virum group that appeared, the only major difference between the two being the way cord decorations were patterned. In North Jutland the Volling group seems to have lingered on for some time, but on the whole we see a much more homogeneous pottery assemblage all across the area.

At the beginning of MN A I we find all of South Scandinavia covered by uniform pottery assemblages. New forms like the pedestalled bowl and the carrinated wessel turned up. At the same time entirely new decoration styles appeared. There is a very strict correlation between form and decoration, delimiting not only specific decoration compositions to specific pot forms, but also specific decoration elements to particular zones on the pots. Interestingly, it seems more or less to be same rules that govern the composition all over South Scandinavia. Naturally, local style variation is present both in form and decoration, but considering the complexity of the pottery it is a surprisingly homogeneous material for such a large region.

The most marked and spectacular changes for us to see are associated with the ritual aspects of society. They are reflected in burials, bog offerings and intriguing causewayed enclosures.

The most obvious change associated with the burial customs was the substitution of timber with stones as a building material. This change happened first in the eastern parts of the country, and slightly later and more gradually in the western parts. It seems to have been of a more architectural than functional nature [Madsen 1979, p. 315-317], and seen from this point of view, it does not indicate a major change in cultural system. However, it did mean that the monuments became more visible, and as such possibly attained a more permanent and important position in the cultural framework. What is more to the point, is that the number of tombs grew drastically.

Indeed all magalithic tombs (an estimate of 25000 may not be far off the mark [Ebbesen 1985, p. 40]) were built within the approximately 380 years covered by EN II and MN A I. Even if we assume a marked increase in population, and that far more megalithic tombs are preserved and known to us than their timber built predecessors, we are left with a clear impression of literally a boom in the building of tombs.

During the period where megalithic tombs were built, a general shift from dolmen types to passage grave types can be seen. At the same time the activities associated with burials in tombs became much more lavish in terms of consumption of material wealth. Huge amounts of beautifully decorated pottery were broken up and offered in front of the tombs during MN A I.

Bog offerings were notable throughout the TRB culture [Becker 1948]. However, they were especially important during EN II and MN A I. More than two thirds of the offerings can be dated to one of these two periods [Bennike and Ebbesen 1987], and if one compensates for the duration of the various periods, this dominance becomes even more pronounced. The material associated with bog offerings consists of pottery, various tools (first of all flint axes), amber, animal bones and occasionally human skeletal remains. Generally the find circumstances are badly substantiated, but we do have evidence for the existence of regular ceremonial sites with platforms of timber built into the bogs for the offerings, and with a pattern of recurrent visits. In this connection the reinterpretation of the Alvastra „pile dwelling" is worth noting (Fig.3) [Malmer 1983, 1984; Browall 1986]. It is now no longer seen as a domestic site, but rather as a site with a function related to the mortuary cult.

The causewayed enclosures are a relatively new category of sites in the South Scandinavian Neolithic [Madsen 1988]. Yet, they have already established themselves as a key type of site for the understanding of the society in Late EN and Early MN A. Initially considered to be of a defensive nature, they are now generally held to be ceremonial sites.

The main area of activities seems to have been a palisaded and ditched perimeter of the sites (Fig.4). Thus, numerous offerings took place in the bottom of the ditches, which were deliberately covered up after the offerings. Subsequent recuts with new offerings followed by backfilling have been demonstrated, and as many as six recuts are noted in one ditch section [Madsen 1988].

To judge from the material of the bottom of the ditches, there seem to have been a great variety in the activities and ceremonies took place along the perimeter of the sites. We find depositions of pots and small heaps of artifacts, sometimes associated with fires and sometimes with more special items like in one case three or four dog skulls. In addition, and despite poor conditions of preservation, we find the remains of dense layers of animal bones as well as a few pieces of human skulls. In many ways the offerings in the ditches seem directly comparable to the offerings in the bogs.

Together, the tombs, the bog offerings and the causewayed enclosures display evidence of a society apparently frantically obsessed with rituals and ceremonial life. Of course we cannot measure the importance of the rituals let alone describe or understand their contents. However, when we consider the amount of labour put into the building of megalithic tombs and into the construction of causewayed enclosures,

Fig. 3. Section of the Alvastra site plan. After Browall 1986.

and when further we add all the labour invested in the rich and varied material that went into the offerings, it seem reasonable to claim that rituals were a very central feature indeed in the life of the TRB farmer.

In the later part of MN A this complex, elaborate system broke down. In MN A II the pottery was still of a high quality with an obvious symbolic meaning to its decoration. Yet, at the same time the megalithic tombs ceased to be built although offerings of pottery in front of the older tombs still took place. Further, the number of offerings in the bogs decreased drastically, and the construction of causewayed en-

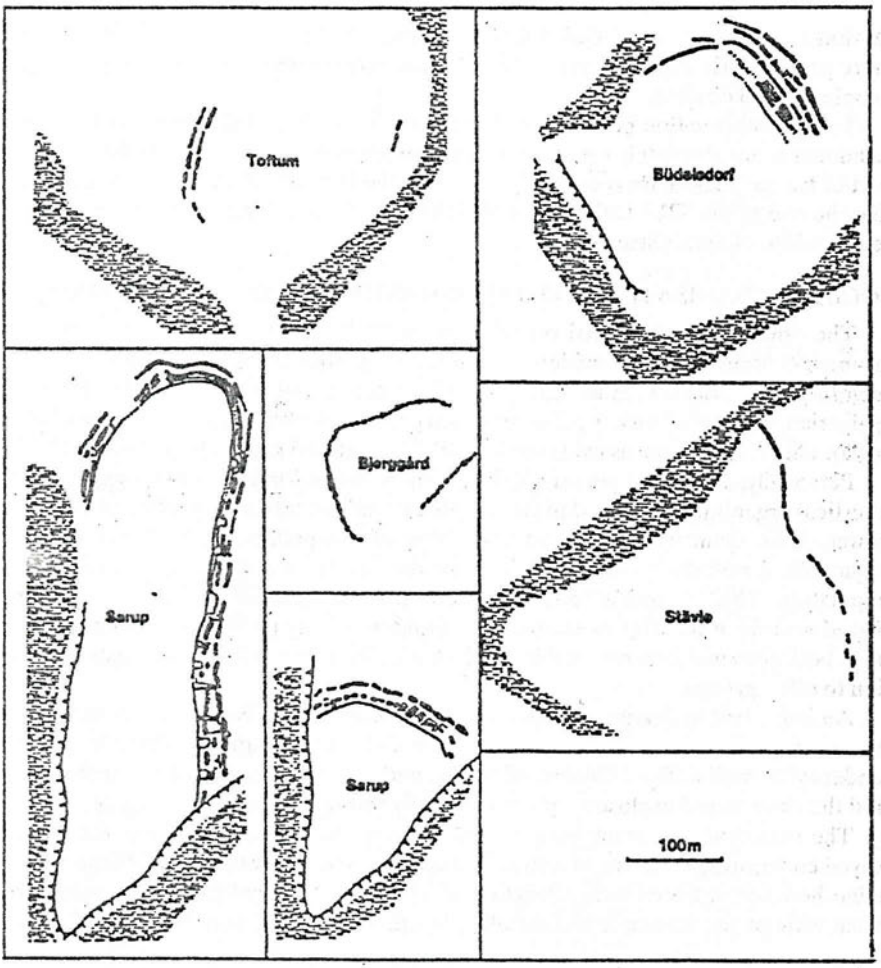

Fig. 4. Examples of causewayed enclosure site plans from South Scandinavia. After Madsen 1988.

closures seemingly stopped, although ritual activities still occured [Andersen 1981; Madsen 1988]. In the following periods (MN A II-V) this degeneration process continued, and only few traces of the once so dominant ritualisation of society can be found in the material from MN A V.

Parallel to this development another important change occured. During EN II and MN A I we find a marked growth in the size of settlement sites, but especially during the later part of MN A the settlements reached considerable sizes. In MN A V many settlements cover vast areas and have very high concentrations of cultural remains. Some sites from MN A V reach a size of 20-30 ha [Skaarup 1985, p. 367].

Obviously, there was a directional change through the MN A towards larger and more permanently inhabited sites. This resulted in quite impressive accumulations of people on the late sites.

To exact correlation between the later part of MN A and the stages in Iversen's Landnam is not absolutely clear, but there is much in favour of the view that the last part of Iversn's Landnam is contemporary with the last part of the TRB Culture, and that the end of the TRB Culture was also the end of a notable stage in the man-land relationships of South Scandinavia.

SOCIAL ORGANISATION, RITUAL BEHAVIOUR AND THE LANDNAM

The opinions on the social organisation of TRB society vary considerably, and are mainly founded on the evidence from the megalithic tombs. Some authors have seen these as burial places for family based segments, and hence as evidence for an egalitarian, segmented society [Chapman 1981]. Others have viewed them as burial places for chiefs, and hence as evidence for a highly stratified society [Kristiansen 1984].

Personally, I feel that we are dealing with evidence for a horizontal rather than a vertical organisation. Instead of viewing the megalithic tombs as a token of ascribed power, I see them basically as an expression of competition between groups and a symbolic manifestation of group rights on the hand of a segmented, lineage based population. This, of course, does not mean that the questions of personal power played no role at all. The motives for the building of any particular tomb may stem from both personal interests within the group as from group based interests in relation to other groups.

An important indication for the megalithic tombs as functioning in a horizontally organised social system can be seen in their distribution pattern. There is a clear tendency for well defined clusters of tombs, and as a ramification of this pattern we find the causewayed enclosures placed centrally within these clusters (Fig. 5).

The reason why so many have wieved the megalithic tombs, and now the causewayed enclosures, as tokens of a stratified society, is basically that it is difficult to imagine how this extraordinary allocation of resources to ritual purposes could take place without the existence of centrally placed, powerful persons, who could order things to happen. Personally, I believe we ought to concentrate more on the obvious saturation of all aspects of society with ritual. Indeed, we may hold it to be true that it was the rites that were the prime organising factor in society, and that the relationships between people and groups of people were structured and maintained through rites. The rites would then possibly be a sufficient power to organise the rigorous energy discharges of which the megalithic tombs and the causewayed enclosures are direct manifestations.

Seen from this viewpoint the historical development of the TRB society becomes clearer. In EN I we find a cultural pattern comprising ritual activities on a moderate level. During EN II and MN A I the ritual activities expand and dvelop immensely, only to disappear totally within the next couple of periods. Thus a ritualised organisation of society escalated in order to keep equilibrium in a socially and economically expanding society, where the intra and inter group relationships became a more and

Fig. 5. Distribution of megalithic tombs, known causewayed enclosures, and possible causewayed enclosures in East Central Jutland. After Madsen 1988.

more delicate matter. In the long run this type of „costly" organisation could not be maintained, and a breakdown with subsequent profound organisational changes took place.

The key issue in this paper is the correlation of the social development and the changes in the economic pattern as evidenced by Iversen's Landnam. With regard to

EN I we are led to believe that the economy was adaptive to the environment, resulting in only a minor interference with nature. It was a system that demanded a dispersed and mobile society, and many aspects of intra and inter community organisation were handled through ritualisation.

The beginning of Iversen's Landnam in EN II marks an expansion and alteration of the EN I economy in the sense that the adaptive strategy was changed to a manipulating one, where huge tracts of land were made suitable for cattle grazing by very simple means. Even though we find evidence of larger and more permanent settlements in EN II, and more so in MN A I, the economic system was still dispersed and extensive in nature. With this background the expanding economy must have resulted in a growing interchange and friction between the social segments. The expanding ritualisation of society must be seen as the means to cope with these changed social conditions, and consequently there is a tight interrelationship between the expanding economy as witnessed by Iversen's Landnam and the growing ritualisation of society as witnessed by the megalithic tombs, the causewayed enclosures and the bog offerings.

The breakdown and disintegration of the elaborate ritualisation of society need not cause too much speculation. In fact, it is incredible that a society could exist under conditions, where so many resources had to be allocated to a ritualised control of social behaviour. Whatever the historical causes that brought it down, the result appears to me inevitable.

More interesting aspects of the degeneration phase are obviously related to the occurence of other contemporary changes. The moving together of people in much larger and more permanent settlement units can be seen as one important element in this connection. It clearly reduced the possibility of inter group conflict and can be seen as a natural step in the process that followed the breakdown of ritualised control. On the other hand the moving together of people in larger and more permanent settlement units does also have clear indications for the economy. There must have been a change from an extensive to a more intensive economy, where the utilisation of the nearby resources was intensified, while more distant resources were dropped.

Again, if we compare it with the pollen diagrams, this may be what is reflected by the end of Iversen's Landnam, where forest is beginning to return to its natural equilibrium, but where hazel still plays an important role. That is, the extensive forest grazing phase is over, yet coppiced woods are still important. We may suspect that cattle grazing now took place on cleared land directly associated with the large settlement sites, and not so much in a forest meadow. This assumption is supported by the fact that the importance of cattle seems to grow rather than to diminish towards the end of MN A (fig.6) [Madsen 1982].

It has been the aim of this short essay to draw attention to some new developments in our assessment of: firstly, what the pollen diagrams tell us concerning the influence of man on nature during the first half of the Neolithic in South Scandinavia; secondly, what the basis of TRB social organisation was and how it shifted through time; and finally, how these two different issues can be seen as highly interrelated.

Most important is the acknowledgement that Iversen's Landnam was not the result of some short-term attack on the forrest carried out by small groups of farmers.

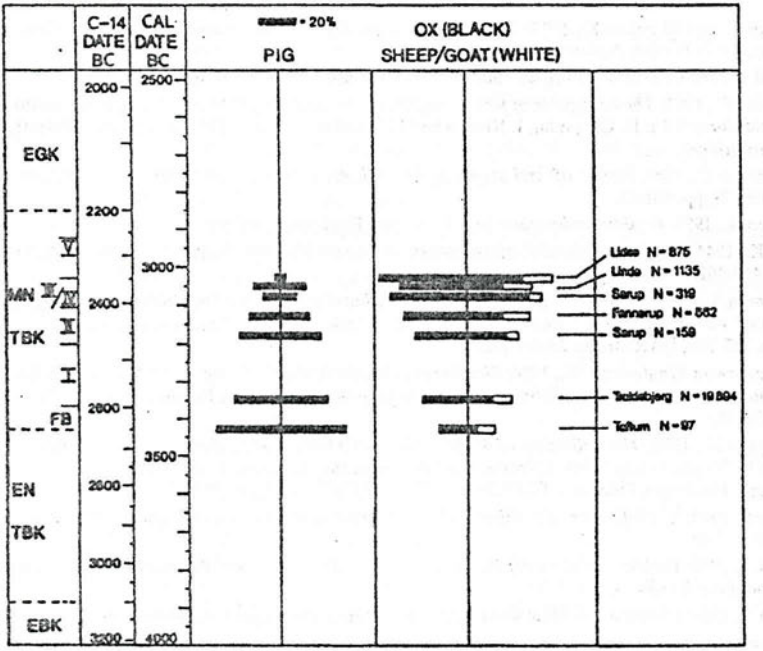

Fig. 6. The relative frequencies of pig, ox and sheep/goat in Danish MN A settelment sities. After Madsen 1982.

On the contrary, it was the result of long term changes in the economic pattern relative to the utilisation of the forest. Moreover, these changes are closely correlated with grand scale and spectacular changes in the over-all cultural pattern with special reference to the social organisation of society. This acknowledgement opens up new exiting questions concerning the interdependence of economy and social processes. Questions that we will have to address in the years to come.

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