Turf manuring on the Danish island of Læsø

Bjarne Stoklund

Abstract

Turf manuring as an element of "concentration agriculture" was practised in an extensive area around the North Sea. In Denmark turf manuring was used in West- and North Jutland before the great heath reclamations in the last half of the 19th century. In the island of Læsø, however, this manuring practise was used as late as in the first half of the 20th century. A description is given of the method used in the island, based on literature from the 19th century and oral tradition. With this as point of departure the form and function of turf manuring in the period 1500-1800 is discussed. It is likely that concentration agriculture with turf manuring has been practised since the commencement of cultivation in the middle ages, although the method can only be documented historically from the 16th century on. After the deforestation and the beginning of sand drift in the middle of the 17th century the intact humus layer of the island was in demand for not only manure but also for materials for dykes and fuel for fire places and stoves. It is quite obvious that these circumstances contributed considerably to the ecological crisis in Læsø, which reached its climax around 1700.

Keywords

Turf manuring, concentration agriculture, Denmark.

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The last few decades have seen an increasing interest in the study of plaggensoil and the role of turf manuring in the creation of the heathlands along the North Sea. In Denmark this has, among other initiatives, resulted in a project to reconstruct the traditional heathland agriculture in the Open Air Museum of Hjerl Hede, Jutland. The experiments were supervised by an interdisciplinary work group of geographers, geologists, botanists and ethnologists, a group which had Sofus Christiansen as prime mover and source of inspiration (Gormsen 1991 A & B).

This contribution to his Festschrift can be considered a by-product of that project. It examines the way in which turf manuring has been used in one locality, the island of Læsø (Figure1), starting with a description of the procedure in the 19th century and the beginning of the 20th and moving back in time to a reconstruction of turf manuring in the period c. 1500-1800. As an introduction a short survey is given of turf manuring in general, with special reference to the Danish heathlands in West Jutland.

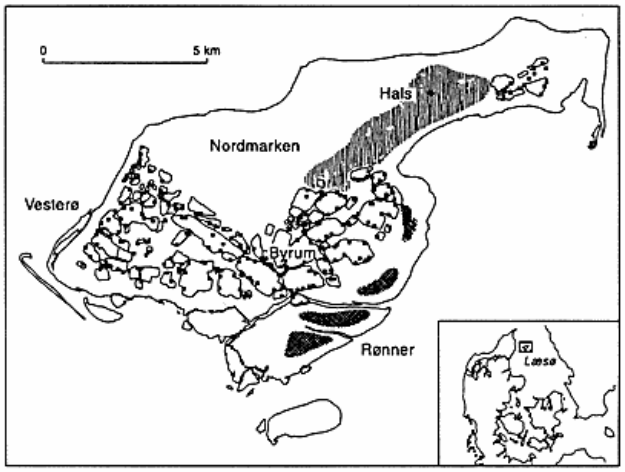

Figure 1: *Map of Læsø. The map shows settlements in about 1800 (the enclosures, "haver", with farm-houses placed near the boundaries between the arable and the common areas). The vertically shaded area was settled before it was devastated by sand drift. In the hatched areas the ruins can be found of the medieval salterns. Vesterø, Byrum and Hals are the names of the three medieval parishes. Nordmarken (the Northern Common) and Rønnerne were used for grazing and turf-digging.*

"Concentration agriculture"

In the introduction to his classical work on "The Agrarian History of Western Europe", the Dutch historian Slicher van Bath points out that the area available for cultivation in earlier periods was severely limited, its extent being dependent on the possibilities of manuring the ground. The fertility of the soil after cropping, according to van Bath, can be restored in one of the following three ways:

- By letting the arable lie fallow for a considerable time (= long-term fallow system);
- by periodically letting a part of the arable lie fallow for a year, after which it is manured with farmyard dung (= short term fallow system), and
- by turf manuring, i.e. putting on the land a layer of humus from uncultivated land (such as moors and wild pastures), mixed with farmyard manure (Slicher van Bath 1963: 9-10).

The latter method is known from an extensive area around the North Sea, including the Netherlands, North-West Germany, Jutland, South-West Norway and Scotland. The local agrarian systems may differ in detail, but they have in common that the fertility of a relatively small arable land is increased by transferring nutrients in the form of turf, peat or soil from a more extensive waste land. In general it can be estimated that to employ this method - which we will call "concentration agriculture" - the amount of waste land needed is between three and ten times that of the arable.

An extreme form of "concentration agriculture" existed in the borderland between the Netherlands and Germany. In this area a small part of the ground, the so-called "Esch", was used continually for the cultivation of rye ("ewiger Roggenbau"). This was obtained by adding a huge amount of turf manure to the area. The layer of antropogene humus in an "Esch" could be up to one metre thick. In Ostfriesland, the bottom layer of such an "Esch" has been pollen-analytically dated to the middle of the 10th century, or simultaneous with the expansion of rye cultivation (Behre 1976, 1980).

In Denmark turf manuring has been used in the western and northern predominantly infertile parts of Jutland. It was, however, given up during the great reclamation of heathland, which took place from the middle of the 19th century and was connected with the use of marl and later also imported fertilizers. Our knowledge of this manuring method, which in Jutland is supposed to go back to at least the Middle Ages, is therefore predominantly derived from agricultural and topographical literature from the end of the 18th and the beginning of the 19th century.

When, in 1951, the Ethnological Survey of the Danish National Museum (NEU) issued a questionnaire on manuring, the system of turf manuring had been forgotten in most of Jutland. Only in two areas were our informants still familiar with that old procedure: in a few parishes around the town of Herning in the central part of Jutland and on Læsø in Kattegat. As will appear later (cf. Figure 3), there was still a conservative smallholder in Læsø who practised turf manuring as late as in 1949.

Turf manuring in West Jutland

Characteristic of the turf manuring practised in West Jutland are particularly two procedures: Firstly, part of the manure mixing took place in the yard of the farm, which has to do with the fact that in this region the cattle were brought home for milking at noon and in the evening. The whole yard was covered by a layer of turfs or sods, set on edge, and during milking the turfs were trod into pieces by the cows, at the same time being mixed with the pats they were dropping. In that way a ready manure mixture was prepared.

The second procedure was to construct manure heaps by alternate layers of animal manure from the byre and layers of turf. Such dunghills were often constructed in some distance from the farmstead in the fields where they were going to be used. The content of such a manure heap was generally 5-6 times more turf or soil than animal manure.

The sods or turfs used in the mixed dunghills could not be brought directly from the grass- or heathlands to the dunghill but had to be decomposed first. To obtain this the West Jutland farmers practised a complicated recycling of turf. Old turf dykes were - when they were 6-8 years old - reused as fill in the dunghill. The same happened to the so-called "træk", which was heather turfs or sods piled up outside the clay walls of the dwelling house in order to protect and insulate the walls during winter. The word "træk", however, might also be used in general about the turf that was added to the animal manure (Schmidt 1939, Gormsen 1991 A,B, Stoklund 1990).

Turf manuring on Læsø in the 19th century.

On Læsø the turf manuring known from the oral tradition had a simpler form. Turf from the heathland or sods from the littoral meadows were cut and transported home (Fig. 2 A & B)). Near the dunghill they were piled up in a heap with vertical sides, measuring a few square metres and initially as tall as a man before it gradually collapsed. These sods or heather turfs were called "hakkemøg" ("chopping muck") and the heap ("pold") had to be left at least for a year to be decomposed. Occasionally a member of the household was sent up on the top of the "hakkemøgspold" with a spade to chop the sods by cutting vertical sections from the heap.

To start a new dunghill a thick layer of chopped sods was laid at the bottom. Then followed the first layer of manure from the byre, which was covered by a layer of "hakkemøg". Thus one continued until the dunghill was finished. The ready-made dunghill was expected to be nice and regular "as if it was made in a cheese form", to quote from an informant.

This method of turf manuring was in common use on the island around the turn of the century, and was continued by conservative farmers in the first decades of the 20th century. As mentioned earlier there is an example of this as late as 1949 (Fig. 3).

Figure 2A: *As "hakkemøg" could be used as well "hugne tørv" from the littoral meadows (A) and "flæktørv" from the heathlands (B). Photo B. Stoklund 1949 and 1963.*

Figure 2B

Figure 3: *A dunghill with "hakkemøg", made by a small-holder in Østerby, Læsø in 1949. To the left a little heap of ashes is found, also used as manure. Photo Ole Højrup 1949.*

Periods in the history of the island

But how old is this manuring practise on the island and can anything be said about changes in the procedures over time? In the following the rather sparse archival material will be mobilized in order to reconstruct earlier procedures. Before that, however, it will be necessary to sketch the main features in the history of the island and the geographical changes it has been subject to.

Læsø in the Kattegat is a low-lying island with sandy soil, 21 km long and c.10 km wide. The oldest part of the island is a triangular plateau to the north, now covered with plantations and natural woods. During the middle ages the plateau supported a pine forest, but throughout most of the post-medieval centuries the area was treeless, with heathland and shifting sand dunes. The cultivated fields form a broad belt in the lower and younger, southern part of the island, where they merge into littoral meadows and some small islands, "Rønner", which are now almost completely joined to the island (Cf. Fig. 1).

The earliest mentioned settlement on Læsø is from about 1200, and other evidence supports the hypothesis that the island was practically uninhabited until that period. The three medieval parishes, however, reveal that the population must have increased rapidly. The reason for that early demographic growth was not that the island offered particularly favourable conditions for primary occupations such as agriculture and fishing. Such occupations have only been able to meet part of the population's own consumption needs, and the economy of the islanders has therefore been based on other activities.

As this will be seen from the diagram (Fig. 4), there have been three phases in the economy of Læsø: From about 1200 to the early 16th century the main occupation was salt extraction on the low-lying coastal areas to the southeast, an industry that was initiated by two powerful ecclesiastical institutions: the Cistercian Monastery of Vitskøl and the Chapter of Viborg Cathedral. When for different reasons the salt industry had been given up, the main activity became timber trade from Norway to Denmark with a fleet of small vessels. This trade ended in the early decades of the 18th century, and was followed by the period of shipping-out (Cf. Fig. 4). In this period Læsø was one of many European islands or coastal communities that supplied seamen for the growing international trade on the Seven Seas.

The diagram also shows three main phases in the history

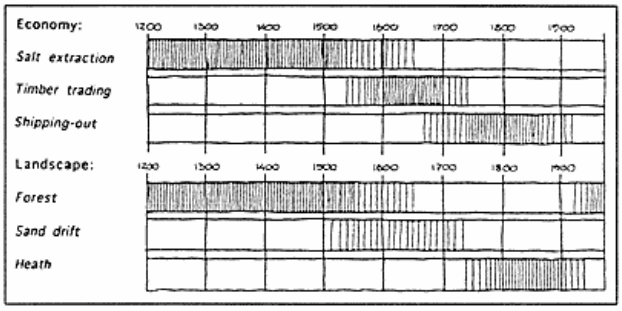

Figure 4: Time chart for the periods in the history of Læsø.

of the landscape, which more or less correspond with the economic periods. During the salt extraction period a major part of the island was covered by forest - or, more correctly, it was in the early stages. In fact, this industry was the main cause of the total destruction of the forests of Læsø, which again, after a long and devastating period, resulted in the final stop to all salt extraction in 1652.

When the last remnants of the pine forest had been destroyed, the sand drift that had been a threat for more than a century was free to spread and in the end of the 17th and the beginning of the 18th century, most of the natural resources of the island were exhausted or destroyed. During the shipping-out period, however, from about 1750, the sand dunes were anchored by lyme grass and the soil that had been exposed to sand drift could gradually support heather and grass again. The improvements in the vegetation cover meant that a new ecological balance based on raw materials from the heath like heather and turf could be established. This pattern involved no actual over-exploitation, but it did maintain the heathercovered moorlands as a geographical feature, which is characteristic of that period in the history of the island (Stoklund 1985).

Turf manuring on Læsø c. 1500-1800.

The turf manuring method that has been described in a previous chapter is connected with this stable period of relative ecological balance. There were no real problems in acquiring the necessary humus for the manure mixture, although informants are complaining about difficulties in getting hold of turfs or sods of the best quality.

At least, the problems of the islanders in that period were minimal compared to what we meet in the source material

from the previous centuries (Stoklund 1980). At the end of the 15th century the first complaints were heard about the over-exploitation of the woods, and the first measures were suggested for conserving them; as might be expected there was just as much concern about the digging up of turf between the trees as about felling them. As late as around 1650 timber could still be fetched in the pine forest. 30 years later, however, the last remnants of the forest had disappeared.

This constituted a new situation with increased demand for any kind of humus layer on the surface of the island. This was where compensation was to be found for the missing resources from the forest. Turfs and sods now had to cover the needs not only for manure mixture but also for building materials for walls around the enclosures and fuel for fire-places and stoves. When, at the same time, a considerable part of the commons was destroyed by sand drift, many farmers in the crisis period around 1700 had to rely on their individual enclosures for as well cattle grazing as the digging of sods.

Another consequence of this pressure on the resources during the crisis years was that cattle manure came in demand not only as fertilizer but also as fuel. This was relatively harmless as long as only the cow pats, which dropped in the common and individual grazings, were collected for that purpose, but when even a part of the manure from the byre was made into sun-dried briquettes, it became more disastrous for the agriculture of Læsø (Stoklund 1954/55).

There are indications that wooden fences have been in use in the heydays of the Læsø forest but from at least the middle of the 17th century the small plots of cultivated land were instead surrounded by massive walls of turf that served the double purpose of screening the fields from the ever present threat of sanddrift and protecting the crops from untended cattle, grazing on the commons outside the turf dykes. A few of these dykes still exist today as green overgrown banks (Fig. 5) (cf Johannsen 1983).

A specific kind of turf recycling was connected with these dykes. When they grew old and had to be rebuilt, they were not simply replaced by new dykes in the same place. A new dyke was moved a number of metres out into the outfield or common and the content of decomposed turf in the old dyke was used to fertilize the plot of land, which was reclaimed in this way. There are so many examples of this in the court books that I would not hesitate to call it a common procedure (Stoklund 1980).

Figure 5: *A few of the old turf dykes can still be found as green overgrown banks. This is the dyke around the enclosure "Overhaven" in Vesterø. Photo Kay Johannsen 1982.*

In the 17th century the tenants paid an entrance fee when they had reclaimed land from the commons, but such an expansion of the arable land seems to be accepted at that time. In the 18th century, however, the Chapter summoned people, who had practised such reclamations, to the court. In 1772 the court book is dealing with such a case and by that occasion the farmer to his defense mentions that "it is the custom in this island that the cultivated land is enclosed by dykes. When old dykes are not able to stand any longer, it is well known that the islanders establish new dykes, and when the old dykes are thus suited, to use them for agricultural purposes. There are hardly ten persons among the inhabitants of the island who have not spread out their field-dykes and enclosed new land" (Stoklund 1980).

The high turf dykes were necessary at a time when the land between the enclosures was used for common grazing. The dykes seem to have lost their importance around 1800, and those that were leveled were not renewed. In the 19th century sheep and cattle were grazed in some distance from the farmsteads and their arable land, either in "Nordmarken", the waste land to the north, or on "Rønnerne" to the south, where they were shepherded by young boys.

There is another feature connected with turf manuring that seems to have disappeared with this change in the herding of the cattle: the use of folds. As mentioned the turf filling for the dunghill was called "hakkemøg". In sources from the end of the 18th century we meet another concept: "foldtørv" ("fold-turf"). This word was in general use in North Jutland, where it can be explained from a

practise to keep the cattle in a fold enclosed by a turf wall during night. Heather turf ("foldtørv") was put on the floor of the fold to suck up and mix with the animal manure from the cattle. It is thus a close parallel to what took place in the yard of the West Jutland farms during milking.

There is evidence in sources from the end of the 18th century of a similar practise on Læsø, where the cattle were kept during the night in either the farmyard or a fold made for that purpose (Stoklund 1984).

Conclusion

It is most likely that concentration agriculture with turf manuring has been practised on Læsø since the commencement of cultivation in the middle ages, although the method can only be documented historically from the 16th century on. That turf manuring has been one of the main causes for the ecological crisis and the geographical changes in Læsø, as argued by Jens Morten Hansen (Hansen 1997), is obvious too. The humus layer was, however, after the deforestation used for three different purposes: manure, fuel and dykes, and only with regard to the latter purpose was there a recycling possibility.

Although the main principle in the concentration agriculture has been maintained in at least four centuries, the sparse sources utilized in this paper have indicated that the procedures have been changing in accordance with shifting conditions and organization in the agriculture of Læsø.

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