Agriculture in SW Greenland in the Norse Period (A.D. 982-c. 1450)

Abstract

It is easy to trace the Norse landnam in the virgin Greenland landscape at around A.D. 985 in lake and bog sediments in South Greenland, especially in the central part of the Eastern Settlement around today's Qagssiarssuk and Igaliko. Judging from pollen- and macrofossil analyses the low Mountain birch-Northern willow forest was cleared and many weeds were introduced. Most of these were annuals like chickweed, shepherd's purse, and annual meadow-grass, but perennials like sheep sorrel and green sorrel also spread on to the fresh soil resulting from grazing, heavy traffic or sod-peeling. Towards the end of the 15th century colonization came to an end and the landscape had more than four centuries to recover before sheep-breeding was introduced in the beginning of the 20th century, first as a hobby, and from 1924 as a principal occupation. This sequence of events has given a unique possibility for following the effect of grazing of c. 50000 sheeps during the summer and the cultivation of fields for haymaking, to provide the necessary fodder for the animals during winter when they are kept in big, open cots close to the farms. To a certain extent the effect on the landscape seen today must be similar to that in the Norse period.

In 1984-87 a working group, appointed by the Ministry for Greenland and the Greenland Home Rule Authorities had the possibility to pay young research workers to carry out investigations concentrating on the changes in vegetation and soil erosion as a result of grazing. Measurements concerning the latter were extended back in time to also cover the Norse landnam. Analyses of vegetation composition and productivity in reference areas are being carried out every third year in different plant communities that are either heavily grazed, lightly grazed or protected against sheep by fencing, and even over a such short time span changes have been registered. Biomass production is also monitored by means of satellite data as the product of the length of the growing season and mean NDVI (normalized difference vegetation index, that is reflecting the amount of chlorophyl). For Qagssiarssuk the estimated production for four subsequent years has ranged between 880 and 1160 kg/ha/yr.

On the basis of the number of stall stones and the floor area of the sheep and goat cots, the total number of animals kept in the five Norse farms in the

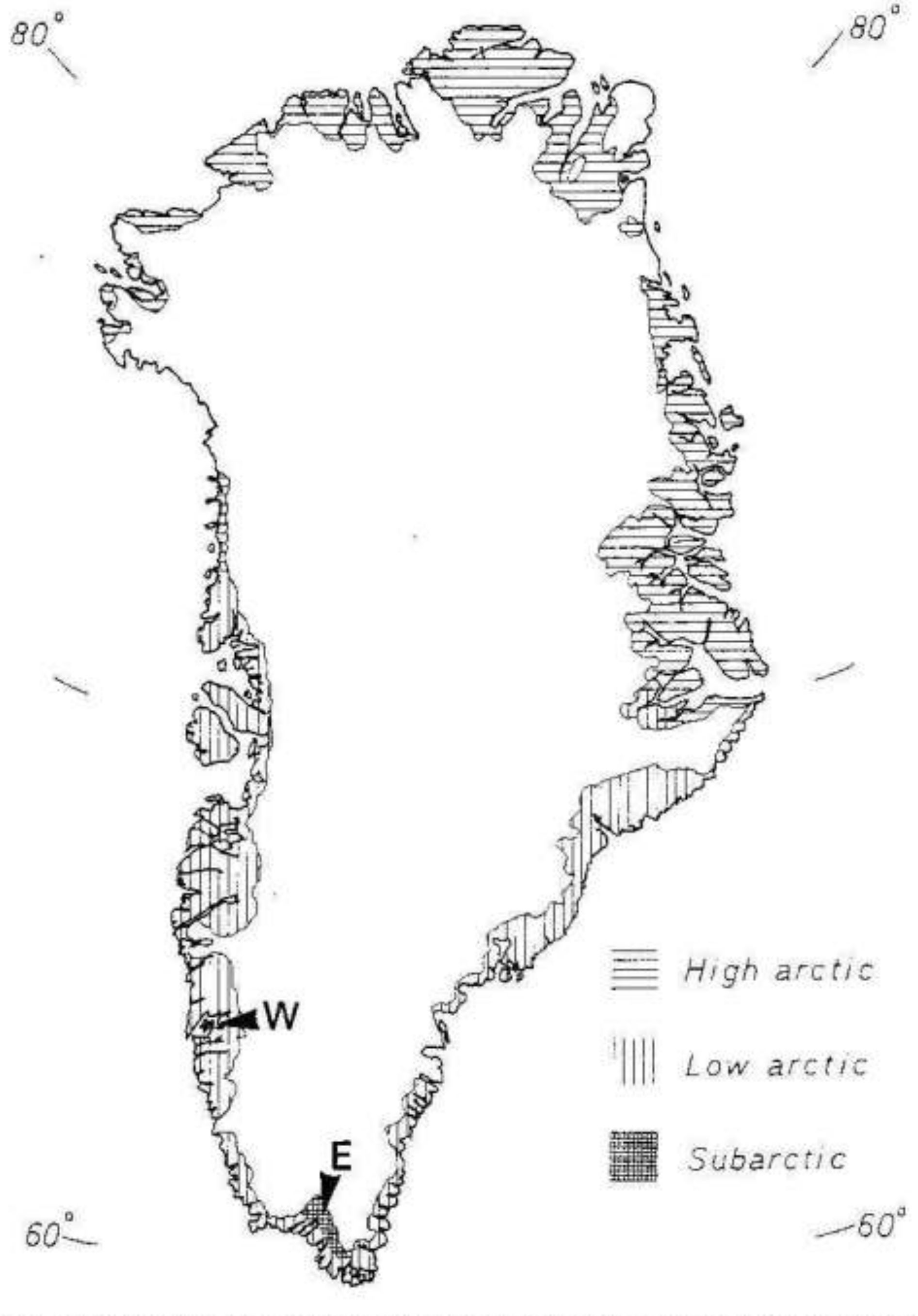

Fig. 1. Map of Greenland showing the position of the Norse Western (W) and Eastern (E) Settlements.

GALIUM KÆR B (61°10'N, 45°31'W)
Qagssiarssuk, S. Greenland

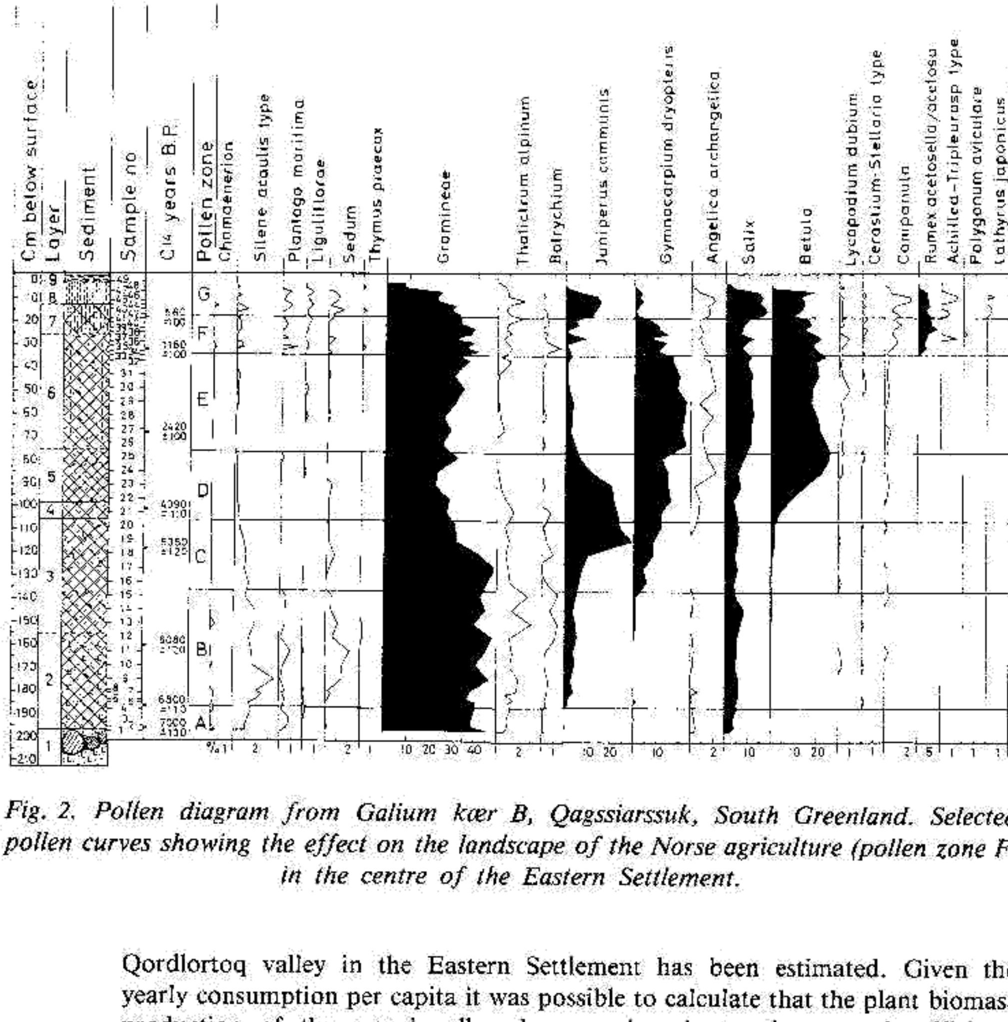

Fig. 2. Pollen diagram from Galium kær B, Qagssiarssuk, South Greenland. Selected pollen curves showing the effect on the landscape of the Norse agriculture (pollen zone F) in the centre of the Eastern Settlement.

Qordlortoq valley in the Eastern Settlement has been estimated. Given the yearly consumption per capita it was possible to calculate that the plant biomass production of the actual valley, however luxuriant today, was insufficient, thereby indicating that mountain pasturing had been a necessity. Intensive field surveying has confimed this, showing the existence in the upland of three types of saetres : « full saetres » where many people lived during the summer, converting the milk to non-perishable products, « dairy saetres », from which the milk was transported daily to the farm, and « hay saetres », inhabited for only short periods.

The light, often dry soils in the continental interior are very vulnerable. Once the vegetation cover and the thin humus layer are broken erosion starts and minerogenic matter is deposited elsewhere. By means of a Kajak sampler the uppermost, very loose and watery sediment in eight lakes and ponds has been sampled. Measurements of the high induced remanent magnetism and frequency-dependent susceptibility in 0,5 or 1 cm samples in some of these clearly show a marked increase during the Norse period followed by a slight decrease and/or a stabilization, and then an even more marked increase in 20th century. This is easily seen today in the surrounding landscape, where the subsoil in the most recent past has obviously been eroded, and this is confirmed in the ratio between the two parametres.

Common to all soil profiles investigated so far is a well developed, sligthly podsolized soil resting on till or glaciofluvial sand. On top of this is a layer of aeolian sand up to half a metre thick with or without vegetation stripes. In some cases charcoal in the original vegetation surface points to a clearance by fire, which is also registered in some lake pollen diagrams. Pollen analyses of the original soil surface tell of the vegetation at that time, which was quite different from that of today, and radiocarbon dating or the occurrence of *Rumex* pollen confirms that erosion did not occur in the 7-8 millennia prior to the Norse landnam.

In the Western Settlement 400 km to the north, Norse farms were only found around the head of two big fjords, where sheep-farming was unsuccessfully attempted in the first half of the present century. Analyses of the bones in the middens indicate a difference in livestock with more goats than in the Eastern Settlement, and an even greater number of seal bones shows the vital importance of sealing to the subsistence. Pollen and macrofossil analyses from middens have shown that in addition to weeds also flax and corn spurrey were introduced. Saetres have not been found in the upland which was mainly exploited by hunting caribou. However, some of the small inland farms may have served as saetres. The magnetic susceptibility of the lake sediments has not been measured so far, and the content of minerogenic matter in the only lake analyzed shows only a slight increase contemporary with a marked increase in microscopic charcoal. A decrease in temperature of only 1 degree C brings the sum of degree-days below the critical level for pasturing and also reduces the possibility for hunting seals. Since the decrease in 14th century was more than 1 degree, the climatic deterioration must have been the main reason for the extinction of the Western Settlement around A.D. 1350.

The Eastern Settlement became deserted during the following climatic deterioration in the middle of 15th century. Here overgrazing and soil erosion concurrent with the reduction in degree-days, and thereby biomass productivity, must have been disastrous.

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