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The Thule culture in relation to changes in climate and environment in Northeast Greenland, 1400-1850 AD

Mikkel Sørensen(1), JT Pedersen(2), AB Gotfredsen(3), B Grønnow(4), BH Jakobsen(2), HC Gulløv(4), A Kroon(2), JF Jensen(4), M Meldgaard(3)

(1) SILA-The National Museum of Denmark, Saxo Institute University of Copenhagen, GeoArk, Copenhagen, Denmark

(2) Institute of Geography and Geology, University of Copenhagen, Denmark

(3) Natural History Museum, University of Copenhagen, Denmark

(4) SILA-The National Museum, Copenhagen, Denmark

This paper will explore and discuss the Thule Cultures strategies and adaptation to climatic and environmental changes in Northeast Greenland from their arrival in the beginning of the 15th century AD until their disappearance around 1850 AD. Main questions addressed are: Which climatic, environmental and cultural preconditions favoured the initial Thule Culture colonization of the High Arctic and which factors, including external cultural changes like European commercial whaling and sealing, triggered their disappearance? The studied case is an example of how indigenous Arctic societies formerly responded to climatic and environmental changes by having a flexible economy, a many faceted technology and a high mobility. The case provides important knowledge and background for the recent discussion on Arctic peoples adaptation to a warmer climate and the following societal changes. Researchers from humanities (archaeology/history) and natural sciences (geo- and biosciences) have collaborated across disciplinary borders in the Geoark project to elucidate the delicate interplay between human history and environmental changes in the Clavering Island - Wollaston Forland region, 74°- 75° North. Thus, a detailed scientific record concerning human habitation, human subsistence, fauna, coastal environment and regional climatic changes during the Holocene, was established for the specific region, based on results from four field expeditions between 2003 and 2008. The Geoark project has employed a methodology in which natural scientific methods (analysis of lake sediments, isotope analysis, radiocarbon dating, OSL-dating, studies of coastal morphology and palaeo-zoology) and archaeological scientific methods (archaeological excavations, comparative artefact studies, studies of the human settlement pattern, studies of written historical sources, ethnography) have been integrated. Changing properties of lake sediments and poly-sequent soils in the study area clearly indicate a change from more snow rich and warmer conditions prior to the Thule colonization of Northeast Greenland, to generally dry and cold, but also highly variable climates during the period from the 12-19th century. Ice rich coastal waters and less snow coverage in coastal landscapes have prevailed, especially from the 15-19th century ("the little ice age"), culminating in the 19th century. The Thule Culture settlement pattern within the region demonstrates a seasonal exploitation in which both the inland, via deep fjords, and the outer coastal locations was in use during a yearly circle throughout the Thule Culture's entire habitation period. However, the seasonal habitation during early spring is concentrated at aggregation sites at specific outer coastal locations, e.g. at a small island (Hvalros Ø) and at promontories reaching out in the Greenlandic Sea. At these sites, large meat caches are abundant, indicating that much of the yearly consumption of meat and blubber was processed and stored here. Recent satellite data on the yearly formation of sea ice along the coast of Northeast Greenland clearly demonstrates that the Thule aggregation sites are exactly situated where polynyas (openings in the sea ice) have land contact. Archaeozoological analysis yields that walrus was an important prey at these aggregation sites. Thus the Thule Culture economy in the region was highly dependent on marine mammal resources from the polynyas, and changes in the sea ice formation, e.g. during "the little ice age", was decisive to the Thule Culture economy. Isotope analysis on human bone samples from graves of the Thule Culture in Northeast Greenland has, on the other hand, revealed that the inhabitants had the highest intake of terrestrial food, when compared to other prehistoric Thule populations in Greenland. Excavations during the 2008 field season of Thule middens support the isotope results by demonstrating that caribou was a most important prey in the Thule economy. Caribou depend on an arctic environment with a low precipitation (minimal snow cover). Therefore optimal climatic conditions for caribou existed from 1600 -1850 AD. However it is also known that caribou populations fluctuate considerably, thus an economy based on this prey is vulnerable. Comparative studies of artefacts and architecture in the research area and the neighbouring southern areas (the Ammasalik region), demonstrate material influxes and human migration from Northeast Greenland into Southeast Greenland. The Thule migration into Northeast Greenland in the beginning of the 15th century

was only possible due to ice-free coastal conditions around north Greenland, facilitated by the “late medieval warming” (1000-1400 AD). However, this migration route closed with the beginning of “the little ice age” and prevented migration and communication back, towards the Thule region in western North Greenland. During “the little ice age” the Thule Culture moved down into the southern parts of Northeast Greenland, with demographic core areas near the polynyas east of Clavering (74° north) and Scoresby Sund (70° North). In the paper it is argued that the cold optimum during the 18th century resulted in later formations of the polynyas in the region and consequently in a restricted human access to marine mammals, leading to severe changes in the Northeast Greenlandic Thule Culture. The Thule Culture declined in population size during the 18th and early 19th century and their last descendants solved their problems by migrating gradually into East- and South Greenland. Thus after 400 years under high arctic conditions, the Northeast Greenland Thule Culture disappeared.