

Introduction

The Thule culture is named after the settlement of Uummannaq (Thule) in Polar Greenland (Mathiassen 1927b). It is the first Neo-Inuit culture and directly precedes all recent Inuit societies of the North American Arctic (Raghavan et al. 2014). After its evolution in coastal North Alaska around 1000 AD it quickly spread eastwards (Friesen and Arnold 2008). Greenland as its easternmost distribution area was probably reached in the beginning of the 13th century (Gulløv 1997). In turn, the foundation of a missionary and trading station by Knud Rasmussen in 1909, again at Uummannaq, can be regarded as an upper temporal limit, marking a point in Greenland's history when Danish colonisation activities, which started in the early 1700s, had finally reached the most remote indigenous population. Hence the development of the Thule culture in Greenland covers around seven hundred years (Gulløv 2005).

The hunt was the backbone of Thule subsistence and therefore an extensive and complex assortment of specialised weapon systems for capturing a great variety of marine and terrestrial prey species existed (Fabricius 1818; Gulløv 1997; Hansen 1998). Bow and arrow were the single most important weapon set for hunting big land mammals, predominantly caribou and musk ox. Not surprisingly, already the pioneers of Greenland archaeology and ethnography, Kaj Birket-Smith, Erik Holtved, Helge Larsen, Therkel Mathiassen, Knud Rasmussen, Peter Valentin Glob, Hans Peder Steensby and Thomas Thomsen, paid considerable attention to that subject in their manifold works. In 1918, Birket-Smith published his seminal study *The Greenland Bow*. Being a compact overview which is based on examples in the collections of the National Museum of Denmark it presents the state of research at the beginning of the 20th century and provides a concise survey of the weapon's occurrence and variation in the different regions of Greenland.

The present study hence builds on a 100-year research tradition on Greenland archery. In doing so, it complements and further develops the work done by the pioneers but also adds important new information. First of all, detailed metric data as well as a thorough visual documentation of the original objects are presented. Second, the arrow as a complementary to the bow and equally important part of the weapon system will also be dealt with. Third, specifications about raw materials, design and technology are provided as this information is of great relevance for the classification and evaluation of archery equipment within the cultural context of its makers and users (Alix et al. 2012; Junkmanns 2013; Lepers and Rots 2020). Finally, continuous fieldwork and research carried out in Greenland

and other Arctic and Subarctic regions since Birket-Smith and his contemporaries have, of course, yielded many new finds and insights modifying their observations and conclusions significantly as well as putting them into a broader context. The revision of the chronology of the Thule migration into the Eastern Arctic (Friesen and Arnold 2008; Raghavan et al. 2014) and the ongoing discoveries of extensive archery equipment for caribou hunting from melting alpine ice patches in Northwest Canada since 1997 (Andrews et al. 2012; Hare et al. 2004) are two prominent examples. The backbone of this work is a catalogue with provenance, context, quantitative and qualitative data, as well as detailed illustrations of all accessible bows and arrows of the Greenland Thule culture held in the archaeological and ethnographic collections of the National Museum of Denmark in Copenhagen. In addition, the ethno-historical tradition, consisting of written sources and pictorial representations, is taken into account. On this basis, the typological diversity, regional variability, and chronological development of Greenlandic Thule archery will be discussed. A second focus of the study is on functional analysis. Design features such as profile, cross section, silhouette, and length result in characteristic shooting characteristics of the bow and flight behaviour of the arrow. These are not random, but reflect a technological tradition that – influenced by the main parameters of raw material, habitat characteristics, prey species and cultural conventions – aimed at producing highly optimised hunting weapons. Taking into account the current state of interdisciplinary research on projectile technology and recent materials scientific studies against a cultural scientific background (e.g. Margaris 2009 and 2014; Pfeifer et al. 2019), an attempt is made to decipher these complex interactions. Projectile technology plays a central role in archaeological and historic hunter-gatherer societies (e.g. Iovita and Sano 2016; Knecht 1997; Langley 2016), and thus the study of the archery of the Greenland Thule culture from a spatiotemporal and technological perspective can make an important contribution to our knowledge of the cultural history of the Eastern Arctic.