Foreword

Jette Arneborg[1,2,*], Jan Heinemeier[3], and Niels Lynnerup[4]

This project all began in 1982 when one of the editors, J. Arneborg, was preparing for her first fieldwork in Greenland and Henrik Tauber, then head of the carbon-14 Dating Laboratory at the National Museum in Copenhagen, had published his ground-breaking article in *Nature*, where he used the ^{13}C fractionation pattern to demonstrate the dramatic change from Danish Mesolithic man's dependence on marine food sources to Neolithic man's predominant subsistence on terrestrial food (Tauber 1981).

Tauber wanted to continue his research on the marine effects on carbon isotope ratios and radiocarbon dating and the consequences for the study of past dietary habits. When he learned that the Greenland National Museum had initiated archaeological excavations at the Norse magnate farm *Anavik* in the Norse Western Settlement under the direction of Hans Kapel and with Jette Arneborg as participant, Tauber asked us to collect Norse skeletal material and, for the assessment of marine radiocarbon reservoir effects in the skeletal samples, he also wanted terrestrial samples from the same graves for comparison of the radiocarbon dates. We managed to collect human skeletal samples and charcoal from three graves, and the $\delta^{13}C$ results were astonishing. The burials were dated to the later period of the Western Settlement, and according to the $\delta^{13}C$ values, the Norse had had a predominantly marine diet very similar to the pre-1721 Inuit population (Tauber 1989). The 1982 *Anavik* results are published in this volume for the first time (Arneborg et al. 2012).

It was tempting to look further into the diet of the Norse Greenlanders, but the conventional radiocarbon method required large amounts of bone, and it would be almost impossible to get the permission from Danish National Museum to take samples from the Norse skeletal collections at the Laboratory of Biological Anthropology at the University of Copenhagen.

Things had changed when N. Lynnerup began his PhD project in 1992 on the Norse human skeletal material. Again, analysis of diet and precise dating were necessary, but at this point in time, a new method for radiocarbon dating, requiring a thousand times less sample material, had become available in Denmark. The AMS (accelerator mass spectrometry) method had been implemented at Aarhus University by upgrading the existing 5 megavolt tandem accelerator through the joint efforts of the physicists H.L. Nielsen, N. Rud, and J. Heinemeier (Arneborg et al. 2002). Stable isotope analysis was available through collaboration with Árný Sveinbjörnsdóttir at Science Institute, University of Iceland. The first collaborative efforts in the early 1990s thus resulted in the first AMS-datings and ^{13}C analyses of Norse human skeletons (Arneborg et al. 1999, Lynnerup 1998). Again, some exciting results were obtained: e.g., the Bishop found interred at *Gardar* was shown to have a much more terrestrial diet than his flock—in line with him not having been raised in Greenland and then when living in Greenland probably consuming a more elite diet of terrestrial animal meat. Most interesting was a further corroboration of the above first results from *Anavik*: the Norse seemed to have changed their dietary habits, and indeed their whole dietary economy, towards a much larger marine component. Could this give us new insights about the history, and demise, of the Norse settlements in Greenland?

Further studies on a larger scale would be needed to solve this. Thus, an application was made to the Carlsberg Foundation resulting in a generous three-year grant that became the basis of the study presented here: a comprehensive dietary analysis of the Norse, including the animals—terrestrial and marine, tame and wild—that formed part of their diet and similar analyses of the contemporary Thule Culture Inuit and their game animals. With assistance from the Danish Natural Science Research Council and SILA (The Danish National Museum), our research team was expanded with E. Nelson of Simon Fraser University, Vancouver, BC, Canada and Jeppe Møhl of the University of Copenhagen Zoological Museum.

What we present here is one of the most comprehensive studies to date of the food consumption and dietary economy of a historical population based on stable isotope analysis. The Norse Greenlanders are in this respect particularly of interest because their settlements in Greenland were constrained

[1]Danish Middle Ages and Renaissance, Research and Exhibitions, The National Museum of Denmark, Frederiksholms Kanal 12, DK-1220 Copenhagen, Denmark. [2]Institute of Geography, School of GeoSciences, University of Edinburgh, Edinburgh, Scotland UK. [3]AMS ^{14}C Dating Centre, Department of Physics and Astronomy, Aarhus University, Ny Munkegade 120, DK-8000 Aarhus C, Denmark. [4]Laboratory of Biological Anthropology, Section of Forensic Pathology, University of Copenhagen, Copenhagen, Denmark. *Corresponding author - jette.arneborg@natmus.dk.