SUPPLEMENTARY MATERIALS FOR

EXPLORING CLIMATE CHANGE, GEOPOLITICS, MARINE ARCHEOLOGY, AND ECOLOGY IN THE ARCTIC OCEAN THROUGH WOOD-BORING BIVALVES

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A sample from the driftwood log was taken from the radial section for wood identification and "washed" with a mixture of water and ethanol. The sample was studied in a microscope, and the wood anatomy observed supports identification of the log as larch (Larix sp.), closely resembling that of a Larix sp pictured by Schweingruber (1982). For the dendrochronological analysis, tree-ring widths in the sample were measured along a radius from the innermost to the outermost ring. The measuring instrument is directly linked to a computer and the data set is ready for processing as soon as the measurements are completed. Dendrochronological study involves cross-correlation between the tree-ring patterns of samples. A sample of unknown age is dated by matching its tree-ring pattern with a local tree-ring chronology of known age. Several tree-ring chronologies are constructed by overlapping of successively older ring patterns from a number of areas. After the computer finds a position with high correlation values, it is the visual match of the tree-ring patterns that determines whether the sample of unknown age can be dated. However, statistics offer an important tool for finding the matching position and obtaining mathematical value for the quality of the match. The match is presented with t-test correlation values as described by Baillie and Pilcher (1973). The tree-ring pattern from the sample has a t-test of 9.7 against the Larix reference chronology described as 9KULYUSW and 7.6 against the reference chronology 3SB00089, both reference chronologies being from the northern part of the Yenisei River. This is well above 3.5 which is often used as a limit value for possible dating. The high correlation values may be related to the fact that Larix are often considered "sensitive," that is, they reflect climatic conditions well when they grow in their natural environment.

Because university-level dendrochronological laboratories all use the same software, it is common to send measurement series to colleagues in other countries. In Iceland, there is a long tradition of dendrochronology on driftwood. The dating of the sample in question is also dated at "Land og Skogur" in Iceland with the same result (Olafur Eggertsson, personal communication). Further dendrochronological presentations, among others, are available in Baillie (1982), Eckstein (2007), Thun et al. (2016).