

Fact sheet

Facts on carbon-14 dating from Borgring fortress

Carbon-14 dating is one of archaeology's most important methods of dating artefacts of biological origin. The method is based on the fact that the carbon that exists in all living organism - plant or animal - absorbs a small amount of the radioactive isotope carbon-14. When the organism dies, the radioactive isotope decays slowly. This means that it's possible to determine how much time has elapsed since the organism died by measuring the proportion of carbon-14 to other carbon isotopes in the material. To determine the age of the artefact in calendar years, the results of the carbon-14 dating are compared with a calibration curve based on measurements of growth rings in trees. There is always some degree of uncertainty in the results of carbon-14 dating: the results express a time range that is more or less dependent on the calibration curve.

Two samples of wood from the Borgring fortress near Køge were dated. The two samples were both taken from the outermost tree rings of charred logs that were found in the northern gateway of the fortress. The carbon-14 dating was performed by the AMS 14C Dating Centre at the Department of Physics and Astronomy at Aarhus University in close collaboration with Accium BioSciences' laboratories in Seattle. The results of the two samples are almost identical:

Sample no. AAR-21258 (elm) was measured with a 14C age of 1082.25 years. This corresponds to a calibrated calendar age of (with 95% probability): 895-1017 CE

Sample no. AAR-21259 (oak) is measured with a 14C age of 1091.25 years. This corresponds to a calibrated calendar age of (with 95% probability): 893-1012 CE

Facts about Viking ring fortresses

We know of four major Viking ring fortresses in Denmark: Fyrkat near Hobro, Aggersborg on the Limfjord, Nonnebakken near Odense and Trelleborg near Slagelse. There are also two ring fortresses in Scania (southern Sweden): Borgeby near Lund and a ring fortress in the town of Trelleborg on the southern coast of Scania. Both Trelleborg near Slagelse and Fyrkat were definitely built during the reign of Harald Bluetooth around the year 980 CE. Both Aggersborg and Nonnebacken, as well as the two Scanian fortresses, were most likely built around the same time. All of these fortresses have wood-clad circular ramparts and a number of characteristic features, including:

The ramparts are precisely circular

The gateways in the ramparts are oriented at the four corners of the compass

The construction of the ramparts with vertical wooden posts along the inner and outer sides with sloping support posts on the outer wall.

It has now been documented that Borgring shares these characteristics. Whether Borgring also had the longhouses found at Trelleborg, Fyrkat and Aggersborg inside its ramparts has not yet been investigated.

In 2010, Aggersborg, Fyrkat and Trelleborg included on UNESCO's tentative lists of world heritage sites. The decision will be made in the summer of 2015.