Calcareous nannofossils reveal the foreign provenance of well-preserved Medieval sculptures in the Ribe Cathedral (Denmark)

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The Ribe Cathedral, situated on the West coast of Southern Jutland is the best preserved Romanesque building in Denmark whose first completed construction dates back from 1134. This monument was mainly built from volcanic tufa which was floated from quarries near Cologne (or Köln, North Germany) down the river Rhine and shipped north along the North Sea coast. The tufa stone was too porous for making any artistic sculpture. Another imported stone was used to carve a group of well-preserved decorative corbel figures (or pillar supports). These sculptures take the form of a man carrying a heavy load, illustrating the classical myths of the titan Atlas and are thus named atlantes. Until now, the origin of the Ribe atlantes which have been dated from c. 1250 had remained a mystery. The building stone of the atlantes is a relatively soft chalky and sandy limestone of Late Cretaceous age as we determined in a prior investigation. Deposits of this age are common in Denmark but not with such a coarse facies. A thorough analysis of the calcareous nannofossil assemblage allowed us to date the stone much precisely to the upper Campanian UC15e^{BP} nannofossil subzone. Upper Campanian sandy limestones are exposed in the Münster Basin in North Rhine-Westphalia, western Germany. In particular, the Campanian Baumberger Sandstein in this region fits well with the atlantes in terms of lithology and age, was used as a building stone in the Middle ages and is therefore the only possible provenance of the stone. Given its provenance, the stone was likely floated along the rivers Lippe and Rhine and shipped via the Wadden Sea to Ribe, making it a remarkably long transport distance for historic commercial stone transportation in northern Europe during the High Middle Ages.

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