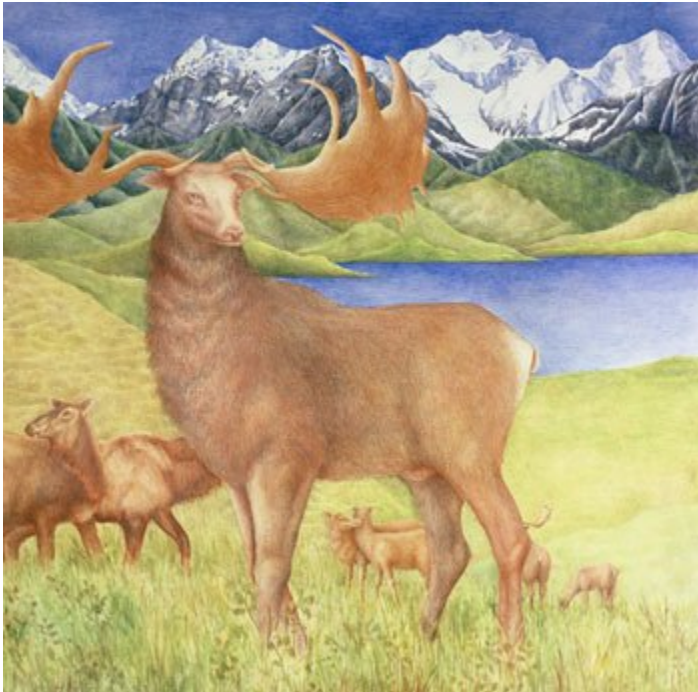


Great Irish elk was really an old deer

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The misnamed giant Irish elk was not an elk at all and its nearest living relative is the pint-sized fallow deer. **Dick Ahlstrom** reports



Antlers that led to extinction?

Megaloceros giganteus.

Photograph Image:

National Museum of Ireland

A 100-year debate over the extinct Irish elk, the largest deer to have lived, has finally been settled. For decades there has been argument over whether the Irish elk was more closely related to the modern red deer, or the fallow deer. But DNA studies published in an online version of the journal *Nature* earlier this month reveal that the Irish elk, which became extinct 8,000 years ago, has closer kinship with the modern European fallow deer.

Dr Ceiridwen Edwards, a research fellow in Prof Dan Bradley's laboratory in the Smurfit Institute of Genetics at Trinity College, Dublin, says there has always been controversy over this point.

She collaborated with lead researchers at University College London to answer the puzzle once and for all, using funding provided by the Irish Research Council for Science, Engineering and Technology.

According to Edwards, the giant Irish elk, *Megaloceros giganteus*, meaning gigantic antlers, was badly named in English, given that it was a deer, not an elk, and that it lived in an area ranging from Ireland to Siberia. It did not live exclusively in Ireland, nor did it migrate away from here.

It was a giant, however, standing two metres at the shoulder and with a set of antlers 3.5 metres across.

"The only reason it is called Irish is because there were so many finds here," says Edwards.

Dead Irish elks ended up in bogs up and down the country, where their bones were conserved for future scientific scrutiny.

Lead author of the study Prof Adrian Lister, of UCL, and his colleagues decided to solve the riddle of whether the elk was related more to modern fallow deer or to red deer.

Earlier studies comparing the shapes of teeth, bone and antlers from the giant with those of red and fallow deer initially suggested close kinship with the red, *Cervus elaphus*. The new study went into much greater morphological detail, analysing 74 key characteristics of the three deer groups. Lister also took a more definitive route, preparing a sort of DNA fingerprint so that the giant could be compared with modern deer.

Edwards extracted ancient DNA from an 11,500-year-old Irish bone sample and Dr Ian Barnes, from UCL, provided samples from giant elk bones recovered in Siberia and thought to be about 8,000 years old.

"I got a very nice bone taken from the Ballynamintra Cave in Waterford, provided by Nigel Monaghan at the Natural History Museum in Dublin," Edwards says.

Although she and Barnes together provided a giant deer DNA sample no more than 988 base pairs long, it was enough to establish true kinship with the modern European fallow deer, *Dama dama*, and the Mesopotamian fallow, *D. mesopotamica*. Any resemblance is well hidden today, given that the fallow deer stands around 90 centimetres, less than half the size of its bigger relation.

Not revealed by the study is why the giant Irish elk disappeared off the map right across its range 8,000 years ago. One theory is that as the Ice Age ended 10,000 years ago, the tundra where the animal lived gradually gave way to woodland, Edwards explains. The trees made it impossible for the animal to move through the emerging forests, its antlers being as wide as a family car is long.

Thus, its most striking characteristic probably put paid to the Irish elk. As trees began to cover what had been cool, arid grasslands, the animal's dietary intake of minerals would have been insufficient to meet requirements for antler mineralisation, leading to osteoporosis, malnutrition, enfeeblement and eventually extinction.