



Neolithic Spread Eight Times Faster In Mediterranean Than Rest Of Europe

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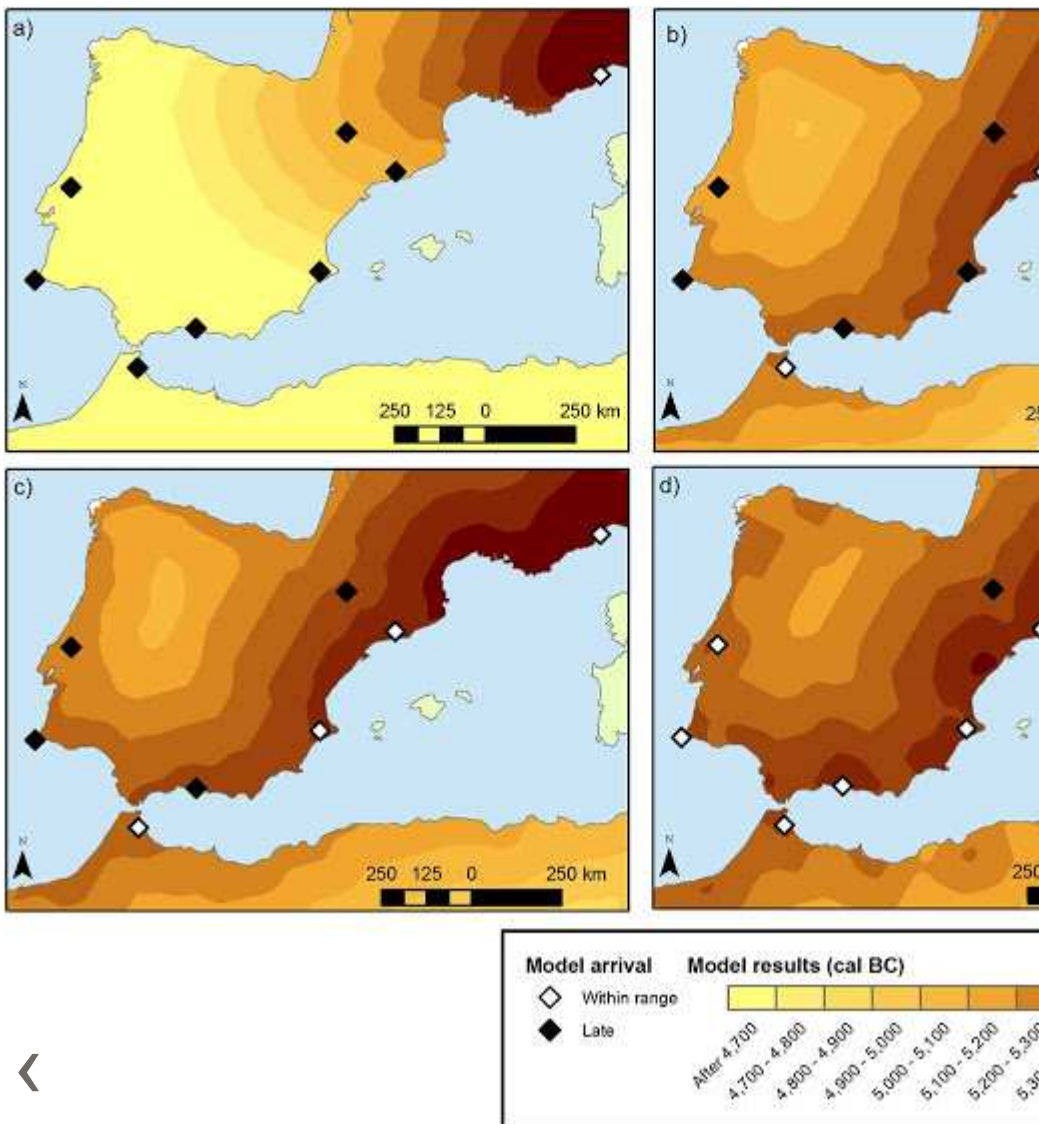
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The Neolithic spread in Europe occurred mainly by land and progressively. However, a study by the UdG, UB and the Colgate University concludes that the Neolithic expanded eight times faster in the western Mediterranean coast than in the rest of the continent. Therefore the hypotheses stating that Neolithic populations moved through the sea are now confirmed.



A study by the UdG, UB and the Colgate University concludes that the Neolithic expanded in the western Mediterranean coast than in the rest of the continent [Credit: Universitat de Barcelona]

The transition towards the Neolithic was a large-scale transformation, experienced by many human societies, which went from a subsistence economy based on hunter-gatherer societies to an economy based on agriculture and livestock. This allowed the development of sedentary communities and complex social and political structures that represent the seed of current societies. In Europe, agriculture was brought from the Middle East and it spread through land gradually, at an average rate of 1km per year. However, the archaeological records show that West Mediterranean underwent a faster process. The expansion speed from North-Western Italy to the central area of Portugal is estimated to be 8,7 km per year.

A research study led by the University of Girona (UdG) suggests that this fast expansion would have an answer in the maritime voyages by the first farmers. Researchers of the UdG, the University of

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Barcelona (UB) and Colgate University (United States) reached this conclusion and published it in an article on the scientific journal *Proceedings of the National Academy of Sciences*.



The study developed a computational model in which different maritime traveling mechanisms are explored, as well as the interaction between the area populations. Researchers compared these simulations with forty-two high-quality data from an archaeological database and could identify the key elements and mechanisms that lead to the observed archaeological pattern.

The simulation shows that this fast expansion cannot be explained without sea traveling. Researchers opt for a situation in which small groups of farmers would have travelled bordering the coast (300-450 km per generation). Also, the archaeological pattern, which shows multiple entry points around the marine coast, can be explained with leapfrog dispersals and leaving uninhabited areas. The interaction and reproduction with hunter-gatherer local populations could have contributed to reach these dynamic advances.



Multidisciplinary research

This research results from a multidisciplinary collaboration between two archaeologists and two physicians, experts in the Neolithic transition. The physician Neus Isern (UdG) dedicated great part of her research to the study of Neolithic transitions around the world, out of two mathematical and computational models that allowed her to reach a better understanding of the implicit mechanisms in agriculture expansion processes. The archaeological research by the ICREA Senior researcher João Zilhão (UB) is essentially focused on the periods of middle and upper Palaeolithic, but he dedicated part of his research to the study of the early Neolithic in West Mediterranean, until creating the pioneer hypothesis for the maritime expansion analyzed in this article. Joaquim Fort (UdG), professor of Physics and ICREA Academia researcher, started applying physics models to the propagation of the Neolithic transition in 1999, and has developed mathematical representations of anthropological processes, such as cultural transmission equations between farmers and hunters used in the article. Albert J. Ammerman (Colgate

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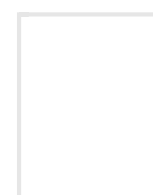


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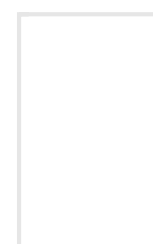


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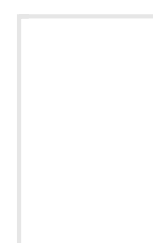
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University) has dedicated his study to archeological research in the Mediterranean area for more than forty years. He was pioneer in the application of mathematical models in the Neolithic expansion together with the geneticist Luigi Luca Cavalli-Sforza.

Source: *Universitat de Barcelona* [March 21, 2017]

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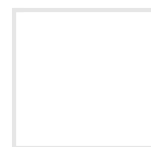
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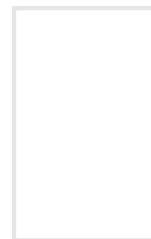
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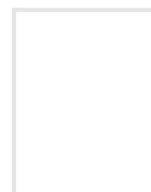
Thanks for this. Human dispersals always happened along coasts or rivers (never over hot dry planes!), typically 20 or 25 km



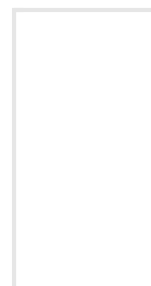
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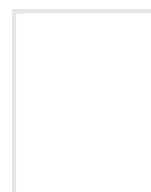
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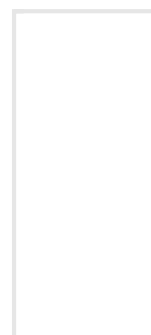
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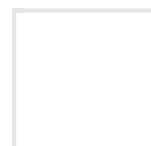
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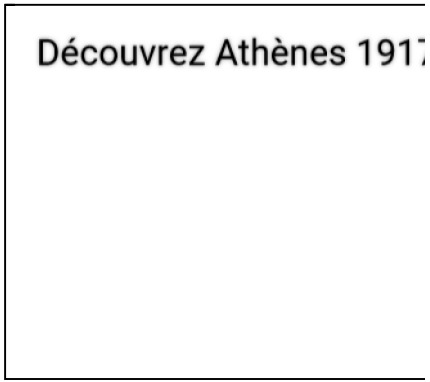
per generation, possibly already since the early-Pleistocene (coastal dispersal model of archaic Homo), but this late dispersal in the western Mediterranean, just like the dispersals of the Austronesian languages at the other side of Eurasia, happened much faster, oversea.

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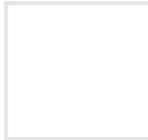


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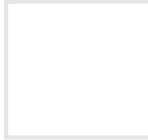
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