

Tenth World Conference
THE FUTURE OF SCIENCE

The Eradication of Hunger

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THE CO-EVOLUTION BETWEEN HUMAN BEINGS AND NUTRITION

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1. The Cooking Hypothesis

Homo ergaster-erectus transition (2 My)



**Eating meat by
scavenging (behav.)**



- Bigger brains
- Smaller teeth

**Cooking tubers and
vegetables (cultural)**



Potatoes, cassava, yams,
rutabagas, kumara, manioc

Review

‘Cooking as a biological trait’[☆]

Richard Wrangham*, NancyLou Conklin-Brittain

Department of Anthropology, Harvard University, Peabody Museum, 11 Divinity Avenue, Cambridge, MA 02138, USA

Received 28 June 2002; received in revised form 16 January 2003; accepted 17 January 2003

Cooking tubers implies:

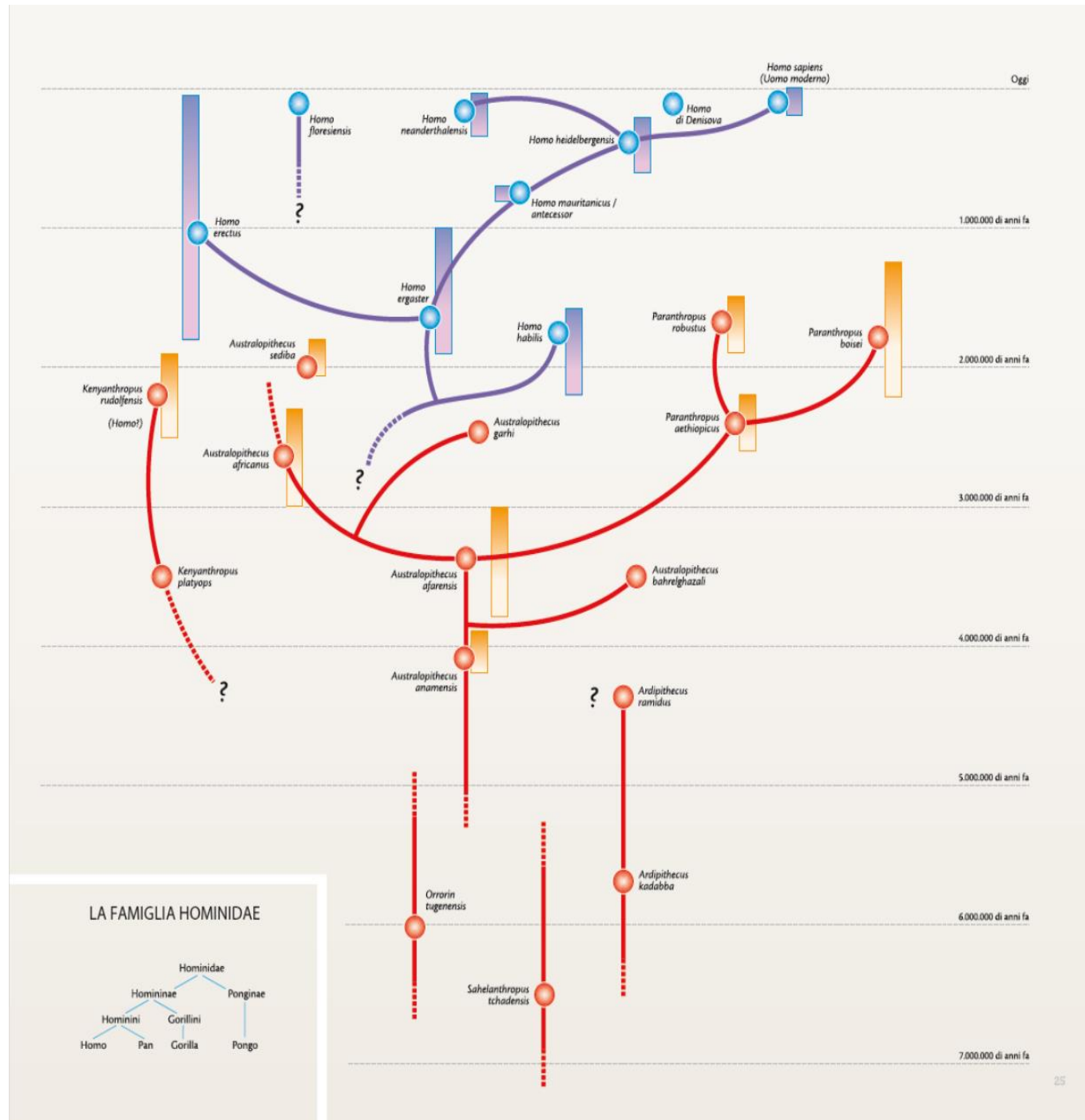
- large brains (carbohydrate digestion)
- smaller teeth (tender food)
- male-female bonding (female gathering)
- cooking became obligatory for humans

??

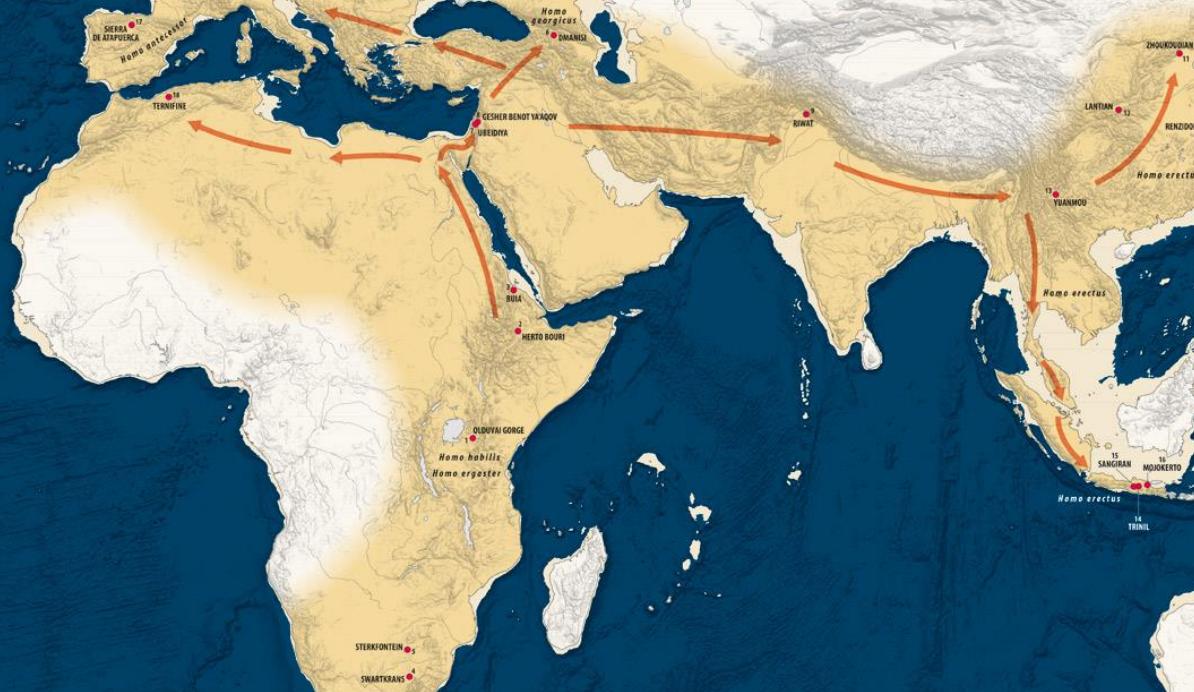
Skepticism:

- Intentional fires: 400 Ky;
- Fragmentary evidence.

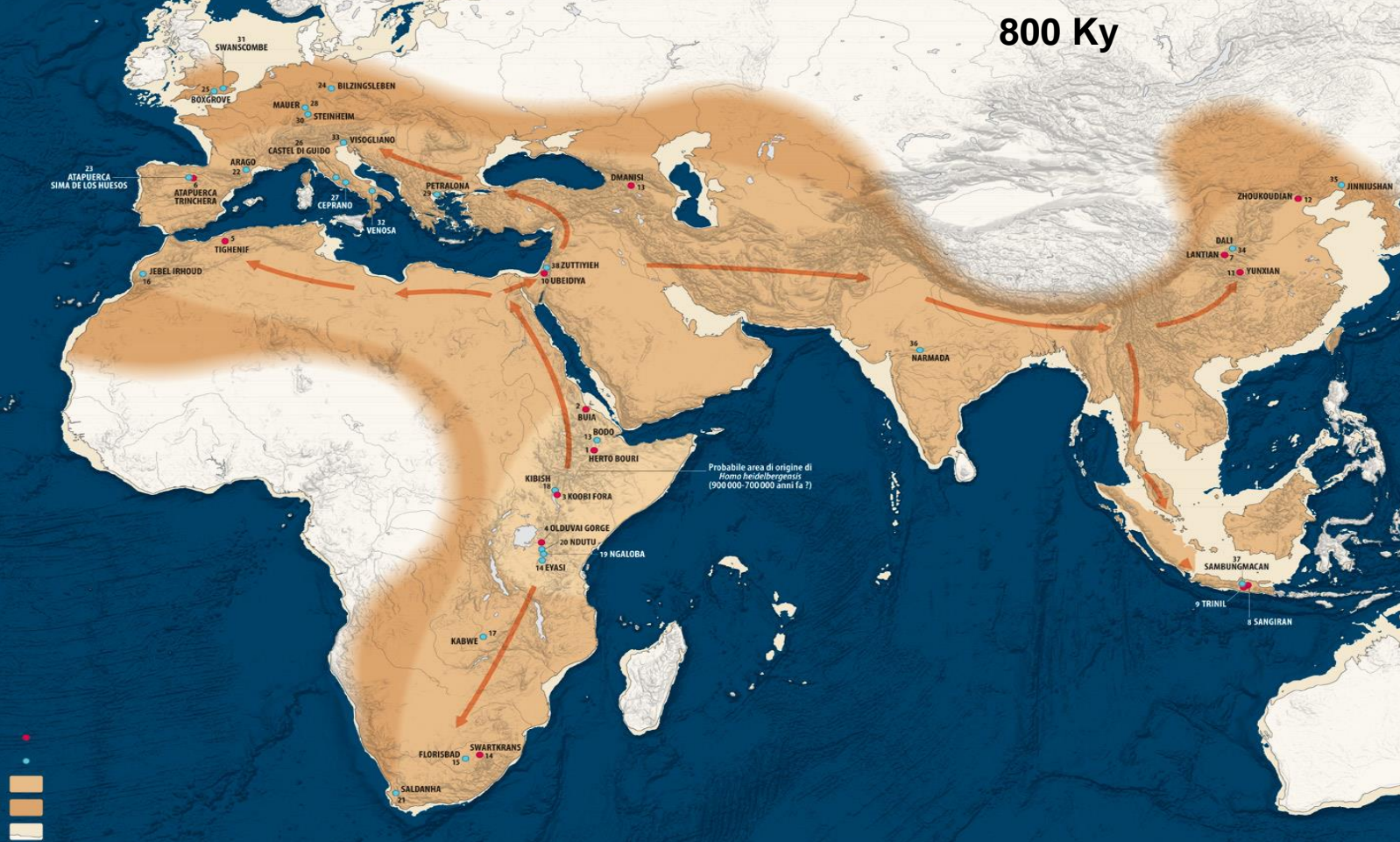
Hominin “bushy tree” 2014



Out of Africa 1 (2 My)



Out of Africa 2 800 Ky





Naturwissenschaften (2012) 99:617–626

DOI 10.1007/s00114-012-0942-0

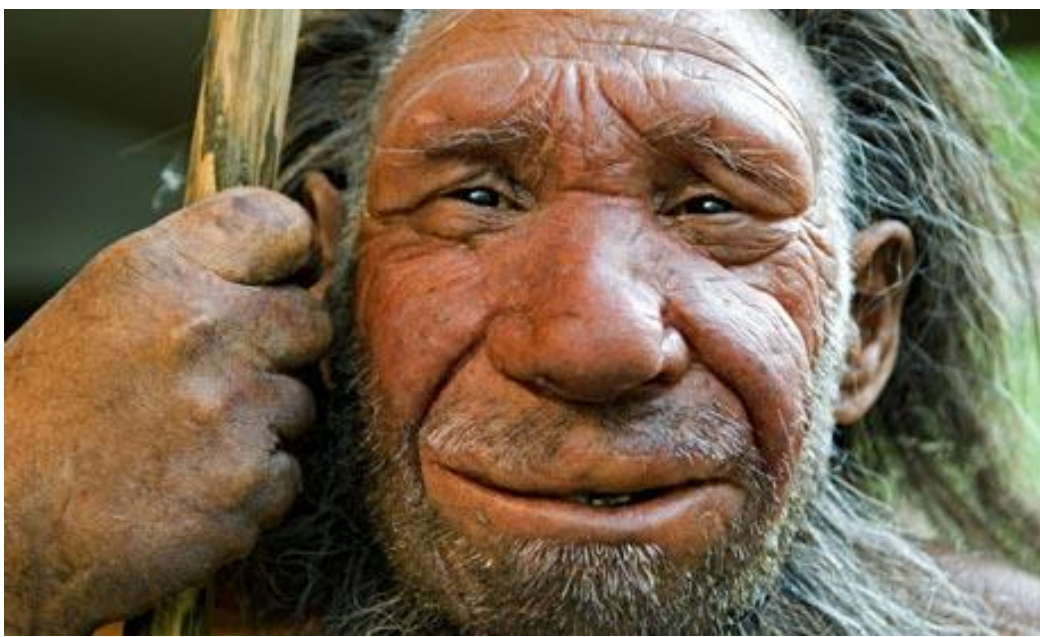
ORIGINAL PAPER

Neanderthal medics? Evidence for food, cooking, and medicinal plants entrapped in dental calculus

**Karen Hardy • Stephen Buckley • Matthew J. Collins • Almudena Estalrich •
Don Brothwell • Les Copeland • Antonio García-Tabernero •
Samuel García-Vargas • Marco de la Rasilla • Carles Lalueza-Fox •
Rosa Huguet • Markus Bastir • David Santamaría • Marco Madella •
Julie Wilson • Ángel Fernández Cortés • Antonio Rosas**

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El Sidròn (Asturias)
50-47 Ky

**They appreciated
nutritional
and medicinal values
of certain plants**

- **Traces of camomile (no food-no good):
self-medication (azulene)**
- **Coumarins (analgesic and anti-
inflammatory)**
- **Nuts**
- **Raw and cooked vegetables**
- **Carbonized food**
- **Inhalation of wood-fire smoke**



Thirty thousand-year-old evidence of plant food processing

Anna Revedin^{a,1}, Biancamaria Aranguren^b, Roberto Becattini^a, Laura Longo^c, Emanuele Marconi^d, Marta Mariotti Lippi^e, Natalia Skakun^f, Andrey Sinitsyn^f, Elena Spiridonova^g, and Jirí Svoboda^{h,i}

^aIstituto Italiano di Preistoria e Protostoria, Florence 50121, Italy; ^bSoprintendenza per i Beni Archeologici per la Toscana, Florence 50121, Italy; ^cDipartimento di Scienze Ambientali "G. Sarfatti"—Unità di Ricerca Ecologia Preistorica, University of Siena and Museo Civico di Storia Naturale, Verona 37129, Italy; ^dScienze e Tecnologie Alimentari, Facoltà di Agraria, University of Molise, Società Italiana di Scienze e Tecnologie Alimentari, Campobasso 86100, Italy; ^eDipartimento di Biologia Evoluzionistica-Biologia Vegetale, University of Florence, Florence 50121, Italy; ^fInstitute for the History of Material Culture, Russian Academy of Sciences, Saint Petersburg 191186, Russia; ^gInstitute of Archaeology, Russian Academy of Sciences, Moscow 140127, Russia; ^hDepartment of Anthropology, Faculty of Science, Masaryk University, Kotlarska 2, Brno, Czech Republic; and ⁱInstitute of Archaeology, Academy of Science of Czech Republic, Kralovopolska 147, Brno, Czech Republic

Edited* by Erik Trinkaus, Washington University, St. Louis, MO, and approved September 7, 2010 (received for review May 21, 2010)

European Paleolithic subsistence is assumed to have been largely based on animal protein and fat, whereas evidence for plant consumption is rare. We present evidence of starch grains from various wild plants on the surfaces of grinding tools at the sites of Bilancino II (Italy), Kostenki 16–Uglyanka (Russia), and Pavlov VI (Czech Republic). The samples originate from a variety of geographical and environmental contexts, ranging from northeastern Europe to the central Mediterranean, and dated to the Mid-Upper Paleolithic (Gravettian and Gorodtsovian). The three sites suggest that vegetal food processing, and possibly the production of flour, was a common practice, widespread across Europe from at least ~30,000 y ago. It is likely that high energy content plant foods were available and were used as components of the food economy of these mobile hunter-gatherers.

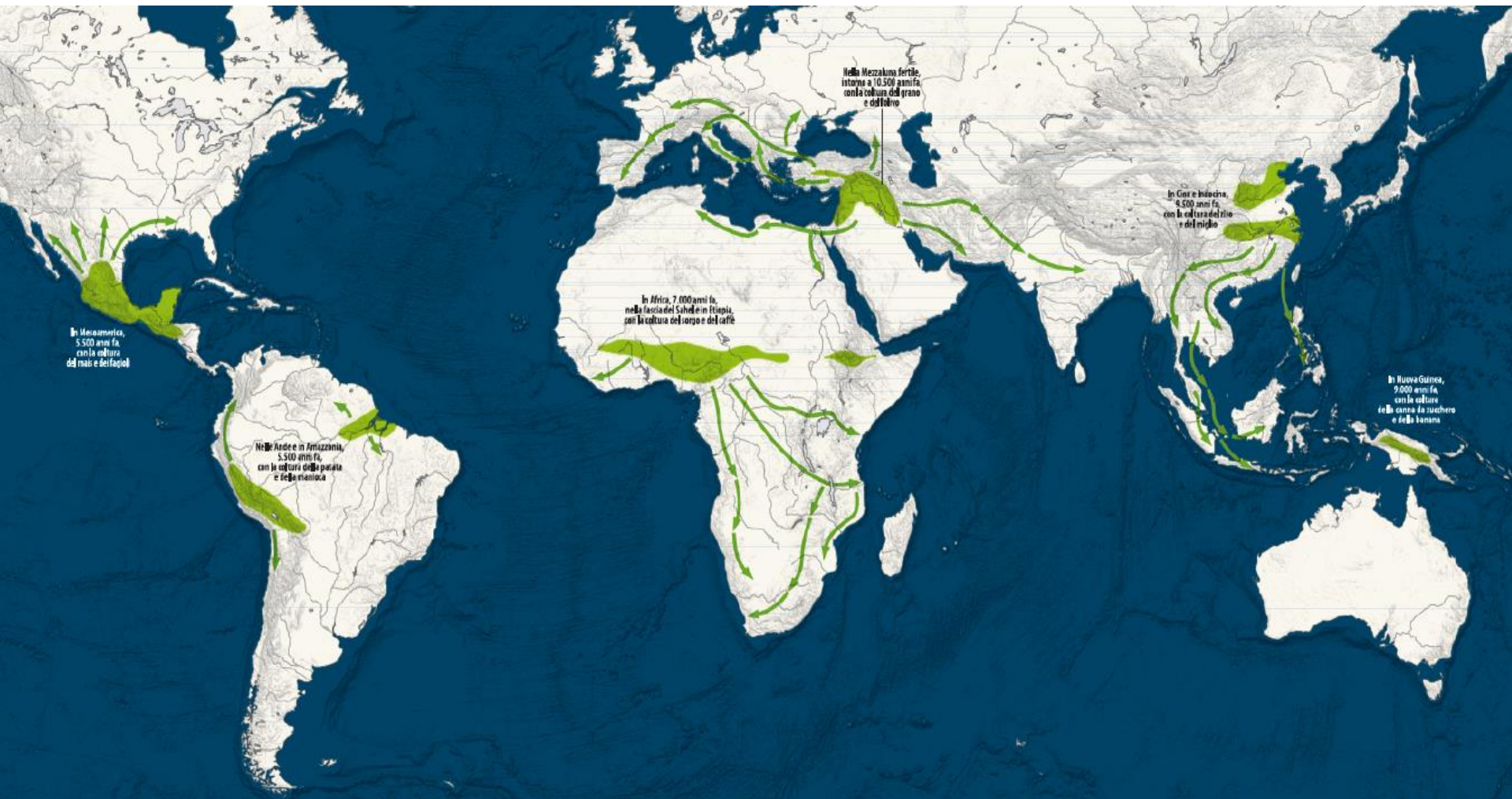




Starch-rich parts selected and cooked.

**Independence from environmental and seasonal fluctuations
HUMAN EVOLUTION OCCURRED IN ECOLOGICAL INSTABILITY**

4. Multiple centers of plant domestication



Geographic distribution and domestication of wild emmer wheat (*Triticum dicoccoides*)

Hakan Özkan · George Willcox · Andreas Graner ·
Francesco Salamini · Benjamin Kilian

Received: 14 December 2009 / Accepted: 27 May 2010
© Springer Science+Business Media B.V. 2010



The complex history of the olive tree: from Late Quaternary diversification of Mediterranean lineages to primary domestication in the northern Levant

G. Besnard, B. Khadari, M. Navascués, M. Fernández-Mazuecos, A. El Bakkali, N. Arrigo, D. Baali-Cherif, V. Brunini-Bronzini de Caraffa, S. Santoni, P. Vargas and V. Savolainen

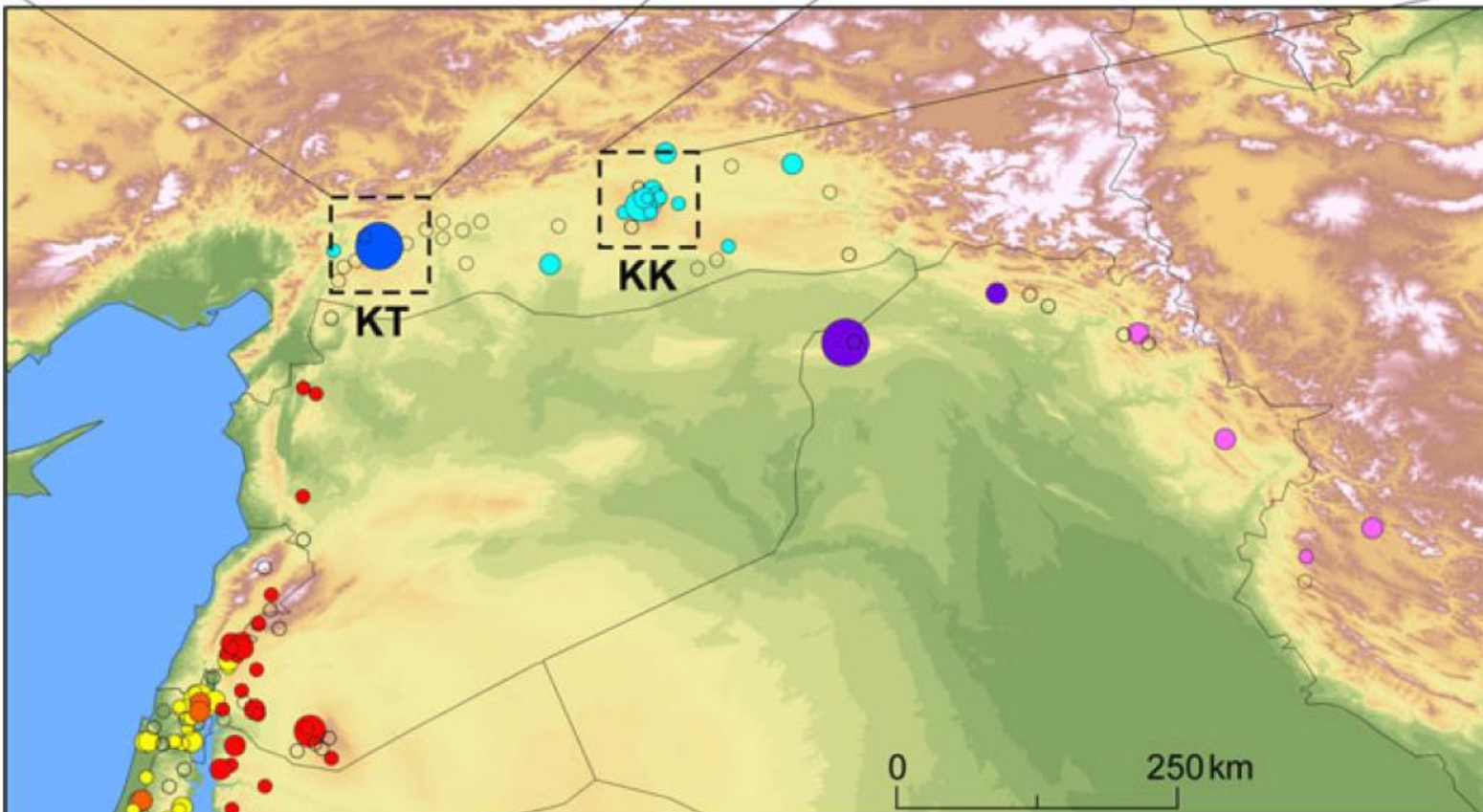
Proc. R. Soc. B 2013 **280**, 20122833, published 6 February 2013





Kartal
Karadag

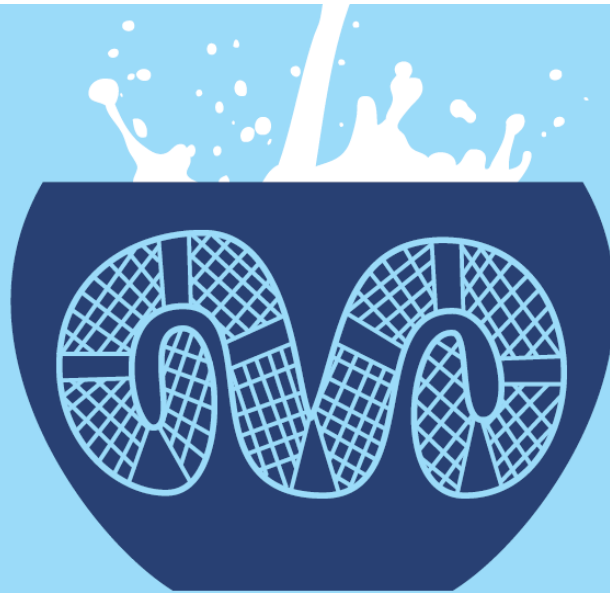
Karakadag
region





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5. The Milk Revolution



The milk revolution

*When a single genetic mutation first let ancient Europeans
drink milk, it set the stage for a continental upheaval.*

BY ANDREW CURRY

Nature, Aug. 2013, 500: 20-22.

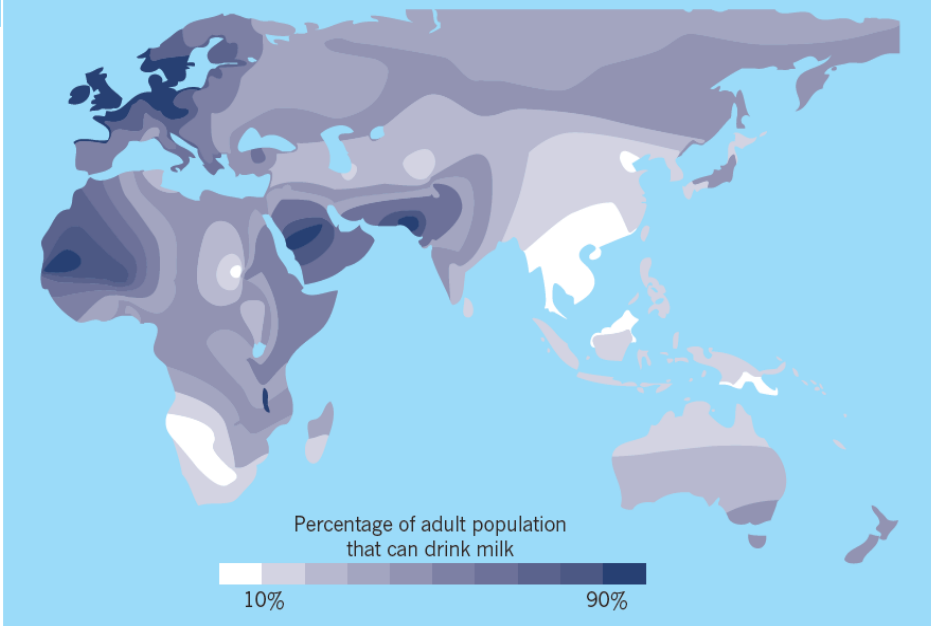
DAIRY DIASPORA

Dairying practices spread from the Middle East to Europe as part of the Neolithic transition from hunting and gathering to agriculture.



LACTASE HOTSPOTS

Only one-third of people produce the lactase enzyme during adulthood, which enables them to drink milk.



EVOLUTION

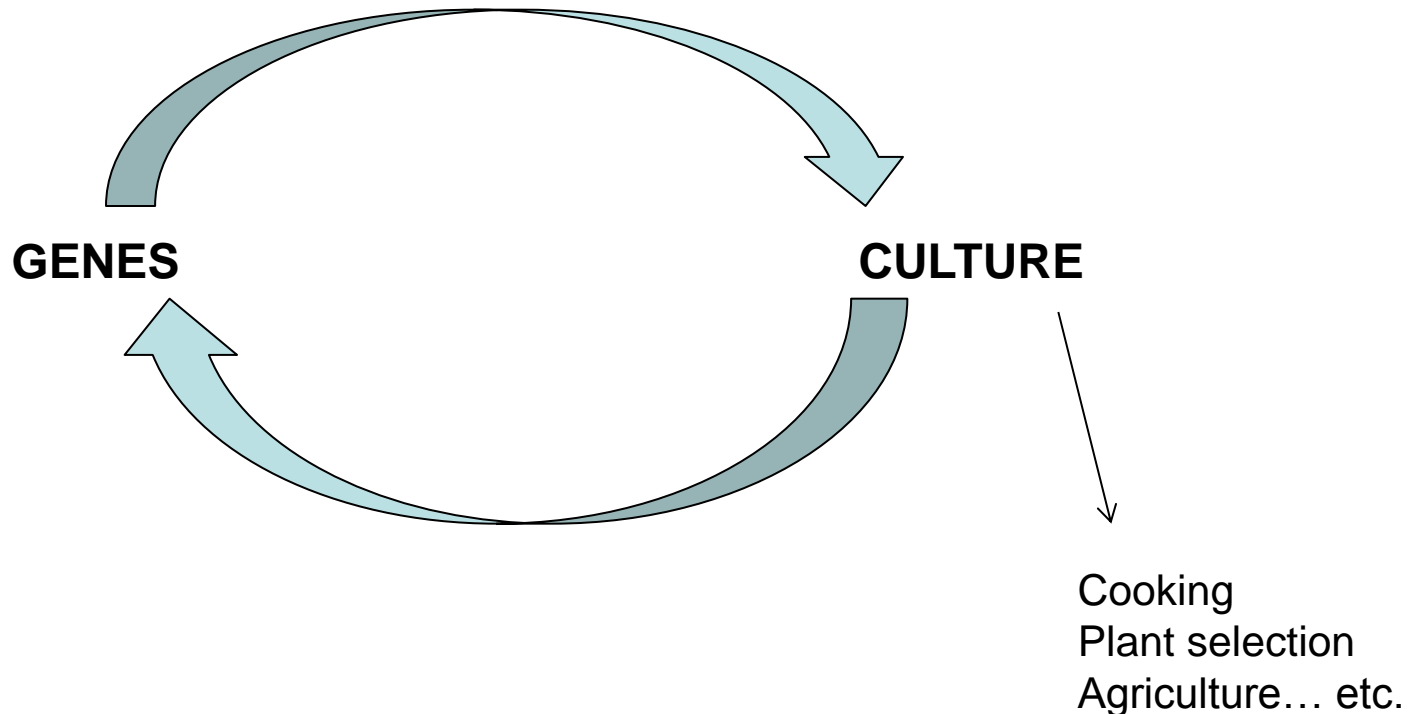
Culture, Genes, and the Human Revolution

Simon E. Fisher^{1,2} and Matt Ridley³

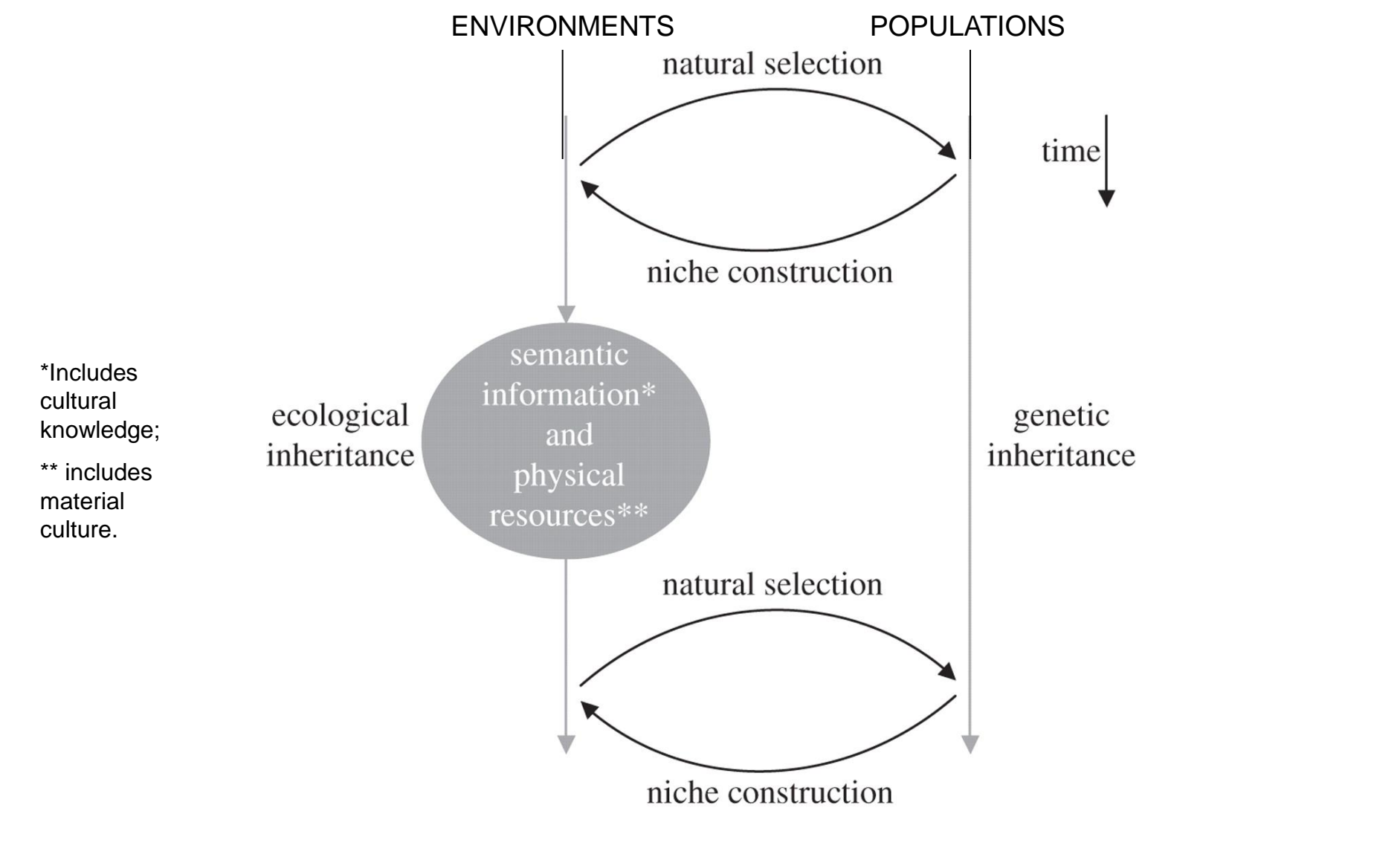
Science, May 2013, 340: 929-930.

Genetic evolution may have been driven by cultural innovations during the emergence of modern humans.

**Ex. lactase-persistence
Alcohol tolerance
Human language.**



NICHE CONSTRUCTION THEORY



*Includes cultural knowledge;
** includes material culture.

Waiting for you at The Garden of Biodiversity

Padua Botanical Garden



Thanks!