

# Genetics and the Neolithic of Europe

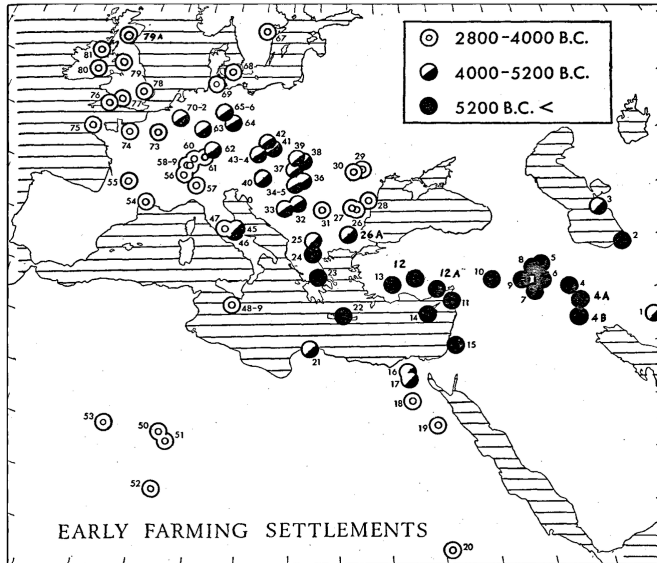
Alan R. Rogers

7 Nov 2013

# Outline

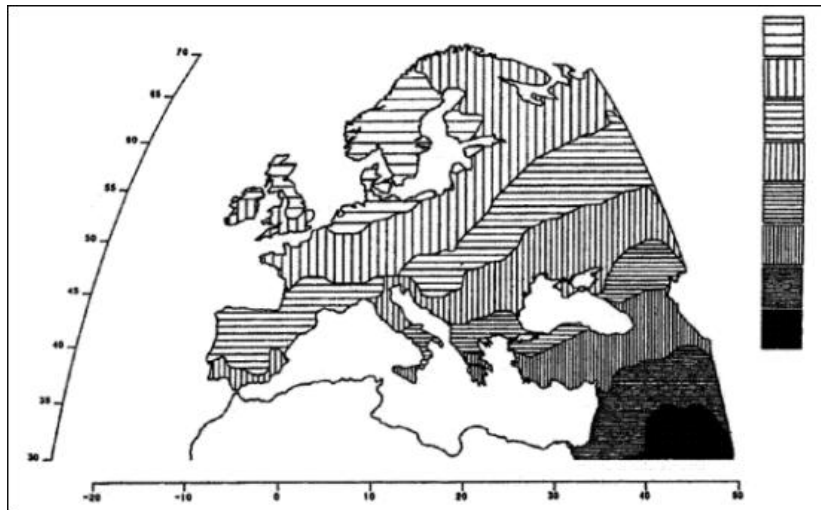
- ▶ The European Neolithic: a movement of peoples or of technology?
- ▶ Linkage disequilibrium (LD)
- ▶ How LD responds to changes in population size.
- ▶ The history of European population size.

# Spread of farming across Europe



(Grahame Clark, 1965, *Proc. Prehist. Soc.*)

## Major axis of genetic variation in Europe



95 genes (Cavalli-Sforza, 1994, p. 292)

## Movement of people or of technology?

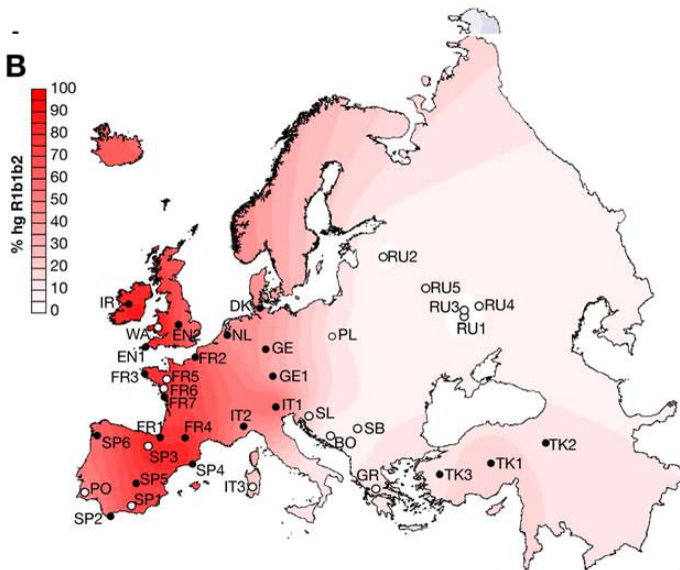
Local hunter-gatherers contributed less than 30% in the original settlements. This finding leads us to reject a predominantly cultural transmission of agriculture.

(Lounès Chikhi et al. 2002)

Both mitochondrial DNA and Y chromosome analyses have indicated a contribution of Neolithic Near Eastern lineages to the gene pool of modern Europeans of around a quarter or less. This suggests that dispersals bringing the Neolithic to Europe may have been demographically minor.

(Martin Richards 2003)

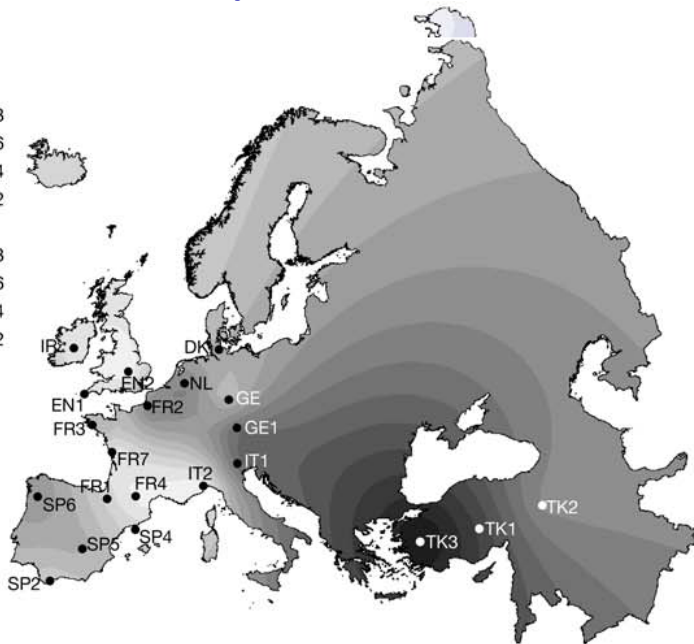
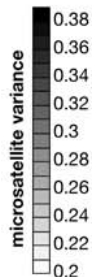
# Y haplogroup R1b1b2 most common in Ireland: Mesolithic origin?



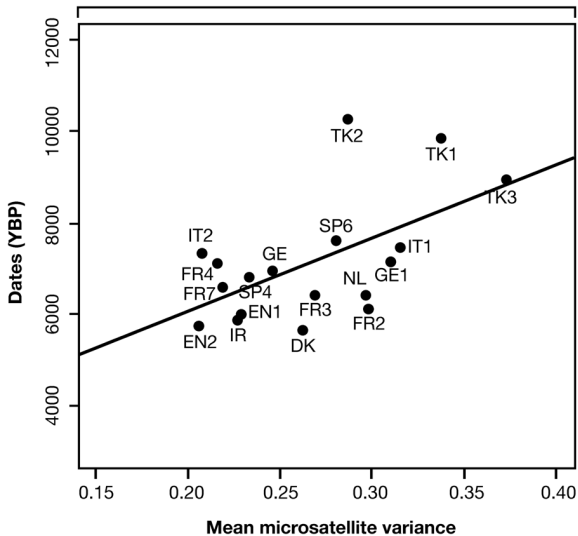
No: it originated in Turkey

**C**

microsatellite variance

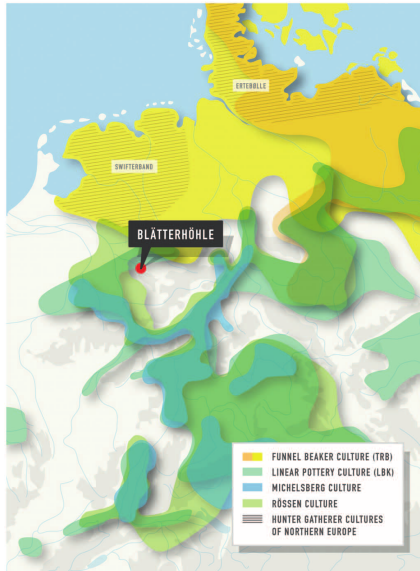


# Microsatellite variance vs. earliest Neolithic dates

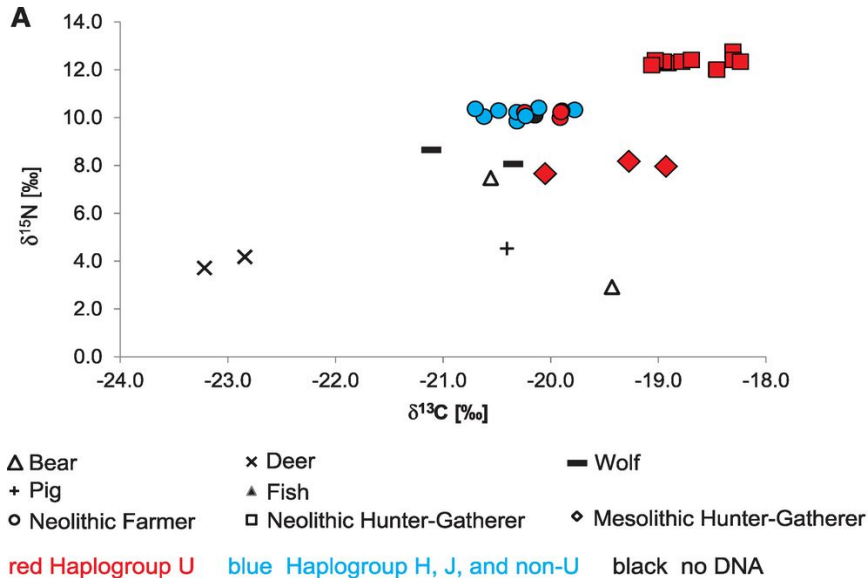




# The Blätterhöhle site in Germany

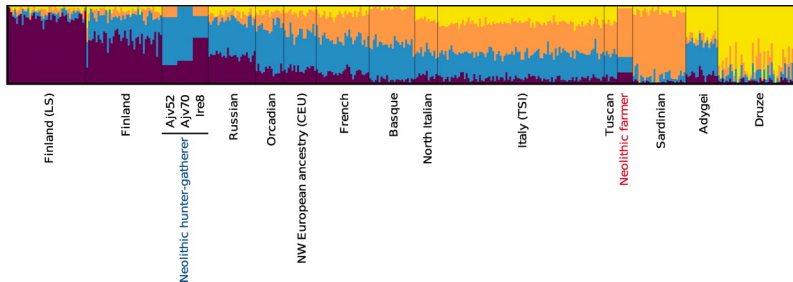


# mtDNA of Neolithic farmers and foragers



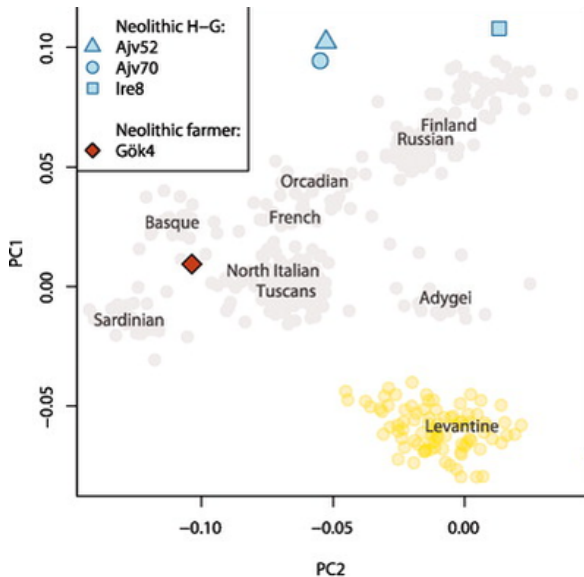
(Bollongino et al, Oct 2013)

# Nuclear genes of Neolithic farmers and foragers



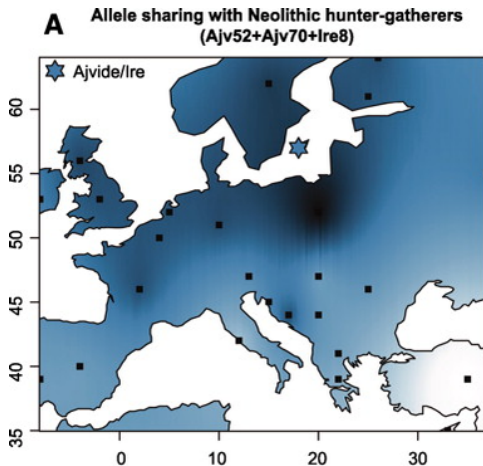
(Skoglund et al, 2012)

## Nuclear genes of Neolithic farmers and foragers



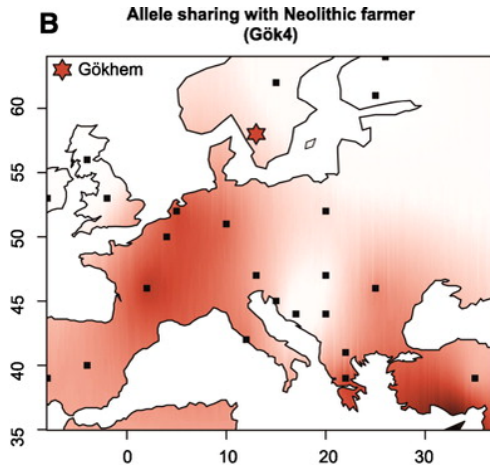
(Skoglund et al, 2012)

# Northern Europeans resemble Neolithic foragers



(Skoglund et al, 2012)

# Southern Europeans resemble Neolithic farmers



(Skoglund et al, 2012)