

genome is disturbingly reminiscent of that of the fruit fly, and 99% of it all is shared with chimpanzees.

Somewhere amid what it says about our ancient past and possible future, our DNA conveys information about our more recent past—and perhaps the means to extend history into the realm of prehistory. And so it is that in the last decade, and at an increasing pace over the past few years, genetics has rejuvenated and somewhat confused the far older and dustier field of prehistoric archaeology. What had been a largely humanistic quest for first principles has been bolstered by complex statistical analyses of genetic ev-

idence, allowing new voices to emerge from the long silence that makes up almost all of the history of *Homo sapiens sapiens*. In Europe alone, which manifests the least human genetic variation of any continent, genetic research is changing long-held notions of ethnic identity and origin. Among the most startling findings: some 80% of the gene pool of modern Europeans stems from ancestors who came to the Continent more than 11,000 years ago. The vast majority of Europeans, be they Italians or Swedes, whether they pride themselves on their aristocratic or their peasant origins, can trace their ancestry to just seven female lineages

and as few as 10 male ones. Most of them came to Europe as Paleolithic hunter-gatherers, and far from being wiped out by the superior technologies later brought from the Middle East by Neolithic farmers, they might well have lived side by side with the newcomers for millennia.

Alongside the classical archaeologists unburying, dating and correlating physical artifacts, a growing number of molecular anthropologists—or archaeogeneticists—are working to reconstruct the genetic heritage of modern Europeans. The data from the digs and the labs don't always sit easily with one another, and when increasingly bold

SEVEN DAUGHTERS OF EVE

All About My Mother

Plowing through church records and birth rolls will only get you so far in reconstructing your family tree. For the really deep stuff, you must look to your genes, and Bryan Sykes, professor of human genetics at the University of Oxford, is there to help you. His company, Oxford Ancestors (motto: "We put the Genes in Genealogy"), can identify portions of your DNA that chronicle an unbroken chain of descent back to the Stone Age. All it takes is a swab from the inside of your cheek and \$180.

The DNA in the mitochondria—cell organelles whose genetic makeup is determined by the mother alone—of all native Europeans except the Sami people of Northern Scandinavia reveal descent from one of what Sykes grandly calls "The Seven Daughters of Eve" (the title, incidentally, of his upcoming book to be published in June). He contends that these ancient matriarchs migrated to Europe from Africa via the Middle East or Asia as long as 50,000 years ago, and he has even assigned evocatively mythical names to each one: Ursula, Helena, Velda, Tara, Katrine, Xenia and Jasmine. He has also delineated rough population histories for the particular mutation patterns that define and date each of

those ancestral groups.

Some of Ursula's people, for instance, were among the first modern humans to arrive in Europe, while others of her group came from the Middle East much later. The clan of Helena, the most common matrilineal ancestor of modern

Europeans, is thought to have emerged from Ice Age refuges around the Pyrenees and migrated northward as the ice sheets began receding around 13,000 years ago. Velda's people similarly dispersed northward from the Iberian Peninsula, while Tara and Katrine's clans spread northward from present-day Italy. The descendants of Xenia are thought to have spread from an origin

in the Caucasus not only westward into Europe, but also eastward and into the Americas. Beginning some 10,000 years ago, Jasmine's people brought agriculture with them from Syria.

Descendants of these seven lineages show up in all European ethnic groups, so correlating them to our modern notions of ethnicity is pointless. There is no evidence that differences in mitochondrial DNA track with any other inherited traits. Besides, there is the small matter of men, whose genetic contributions don't show up in mitochondrial DNA. In the coming months, Sykes expects to start offering codification of the prehistoric ancestral information imbedded in the Y chromosome. Other recent research suggests that there are 10 patrilineal lineages in Europe; Sykes says there are more, and he is likely to create names and histories for them as well.

As databases improve, Oxford Ancestors will be able to fill in the somewhat sketchier information for non-Europeans, for whom at least 30 further mitochondrial clans have been identified. In Africa, where human genetic variation is the highest, there are thought to be 14 of them. The noncombining elements of our genetic makeup strongly point to common ancestors there for all humans. Genealogy can't go any deeper than that. —J.G.



Prehistoric Eves: There may have been seven European ones

EVE BY LUCIEN LEVY-DHUMER; ARCHIVO ICONOGRAFICO, S.A./CORBIS