

Geneticists track Indo-European languages

Linguistic tongues may soon wag over a study that correlates genetic traits with native languages throughout Europe, giving a new twist to old disagreements about the origins and distribution of the first Indo-Europeans.

Researchers have long debated the exact beginnings of different Indo-European languages, which include such diverse tongues as English, Greek, Russian, and Iranian.

These and 140 other modern languages are generally believed to have diverged from one ancestral language spoken more than 6,000 years ago, says linguist Merritt Ruhlen, an independent researcher in Palo Alto, Calif.

Currently two main theories, based primarily upon archaeological evidence, attempt to trace the spread of these languages into Europe.

Most experts favor the theory that the first Indo-European speakers invaded Europe from the Pontic Steppes—an area north of the Black Sea in what is now the southern Ukraine—starting around 4,500 B.C.

An alternative theory gives Indo-Europeans a longer European history, suggesting that early farmers brought agriculture and their language from ancient Turkey beginning approximately 7,000 B.C.

Because none of these early cultures had yet developed writing, such debates remain difficult to resolve with traditional archaeological methods. However, if biological divergence mirrors linguistic branchings, then researchers can look for evidence of ancient migrations in the genetic patterns of modern populations (SN: 6/9/90, p.360).

In the first such attempt focused specifically on Europe, geneticist Robert R. Sokal and his co-workers from the State University of New York at Stony Brook have now compared genetic traits with linguistic patterns.

The team analyzed existing data on the relative abundance of 25 genetic traits (such as blood proteins) examined in 2,111 studies from across Europe. In all, the Stony Brook researchers compiled data from more than 250,000 individuals, estimates Sokal. Results from the study appear in the Aug. 15 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES.

European genetic traits clearly correlate with language patterns, the researchers found. Geographic distribution can account for most of this correlation, but a “highly significant” partial correlation—15 percent of the total—remained after the researchers factored out the geographic distance between populations.

Sokal and his co-workers had hoped to find a genetic-linguistic pattern clearly associated with one or the other of the

early migration routes, but they saw “not even the slightest indication that genetic evidence supports” either of these theories, Sokal says. Their results indicate that ancestral groups of the modern Indo-Europeans divided several times, but do not show whether they divided before or after the settlement of Europe.

While these results do not disprove traditional theories, they indicate that scientists should reevaluate the current theories, says Sokal. He refuses to speculate on other possible origins for the

Indo-Europeans, preferring to “leave that to the archaeologists.”

In a study published last year, researchers led by Sokal found a genetic pattern consistent with a migration of early farmers, but did not look for a correlation with languages. The current lack of regional data complicates any similar study of genetic patterns associated with possible invaders from the Pontic Steppes, Sokal says.

He plans a more detailed study of the relationships between modern language patterns and archaeological data from Europe, without reference to genetic traits.

—K. Hoppe

Genetic clues to female homosexuality

Genes substantially influence the development of homosexuality among women, according to a preliminary study of female twins and adoptive sisters.

“Genes don’t account for all individual differences in sexual orientation, but pairs of female identical twins report homosexuality significantly more often than pairs of female fraternal twins or biologically unrelated sisters,” says psychiatrist Richard C. Pillard of the Boston University School of Medicine, who conducted the study with psychologist J. Michael Bailey of Northwestern University in Evanston, Ill.

The two researchers presented their findings last week at the annual meeting of the American Psychological Association in Washington, D.C.

Pillard and Bailey recently used the same research strategy to identify a moderate to strong genetic influence on male homosexuality (SN: 1/4/92, p.6).

The researchers recruited homosexual women with an identical, fraternal, or adoptive sister through advertisements in lesbian, gay, and feminist publications throughout the United States. They then interviewed pairs of sisters, usually over the telephone. Additional interviews with relatives of most participants revealed a high degree of agreement within families about each woman’s sexual orientation.

A total of 115 twin pairs, about equally divided between identical and fraternal twins, participated in the study, as did 32 pairs of adoptive sisters. Identical twins share all the same genes, whereas fraternal twins share some of the same genes.

Homosexuality or bisexuality occurred among both sisters in nearly half of the identical twin pairs, Bailey asserts. That figure drops to about one-quarter of the fraternal twin pairs and one in six adoptive-sister pairs.

Using estimates of female homosexuality in the general population and the assumption that several genes influence sexual orientation, Pillard and

Bailey calculate that genes account for half of the individual differences in women’s sexual orientation. Scientists refer to this as a heritability estimate.

Heritability studies, including those concerning sexual preferences, have recently sparked considerable controversy (SN: 12/7/91, p.376).

Some investigators consider heritability a hazy statistic that can change depending on the phrasing of interview questions and the way in which researchers recruit volunteers. Moreover, heritability estimates may tap into any number of genetically influenced traits, critics add.

Bailey acknowledges the problems in interpreting individual heritability studies and says independent research teams should conduct further twin studies of male and female homosexuality. He also notes an important problem with the new study: Lesbians with a lesbian twin may have been more willing to volunteer for the research than lesbians with a heterosexual twin.

However, heritability estimates for male sexual orientation recently reported by University of Minnesota researchers, based on identical twins reared apart since shortly after birth, closely match those calculated by Pillard and Bailey. Current heritability figures appear to reflect multiple genes involved somehow in male and female sexual orientation, Bailey contends.

Genes act in concert with the biological, psychological, and social environment, Pillard cautions. For example, he cites the case of two male identical twins separated at birth, raised in different families, and reunited as adults by the Minnesota researchers.

These men displayed striking similarities in virtually all aspects of their lives. They even discovered a shared proclivity for wearing leather garments during sex and employing various devices to heighten stimulation. Yet one man was gay, the other heterosexual.

—B. Bower