

By NICHOLAS WADE
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A new thread is being woven into the complex tapestry of Jewish history, a thread fashioned from a double twist of DNA.

The DNA data suggest a particular version of Jewish history and origins that historians have not yet had time to appraise but that seem to be reconcilable in principle with the historical record, according to experts in Jewish studies.

The emerging genetic picture is based largely on two studies, one published two years ago and the other this month, that together show that the men and women who founded the Jewish communities had surprisingly different genetic histories.

The earlier study, led by Dr. Michael Hammer of University of Arizona, showed from an analysis of the male, or Y chromosome, that Jewish men from seven communities were related to one another and to present-day Palestinian and Syrian populations, but not to the men of their host communities.



The finding suggested that Jewish men who founded the communities traced their lineage back to the ancestral Mideastern population of 4,000 years ago from which Arabs, Jews and other people are descended. It pointed to the genetic unity of widespread Jewish

populations and took issue with ideas that most Jewish communities were relatively recent converts like the Khazars, a medieval Turkish tribe that embraced Judaism.

A new study now shows that the women in nine Jewish communities from Georgia, the former Soviet republic, to Morocco have vastly different genetic histories from the men. In each community, the women carry very few genetic signatures on their mitochondrial DNA, a genetic element inherited only through the female line. This indicates that the community had just a small number of founding mothers and that

University, said the new genetic data could well explain how certain far-flung

"Racial science," Dr. Schiffman said, "has brought so many terrible things. But it's a norm now in genetics to study the racial genetics of groups. So I think it's an amazing difference."

Geneticists use the Y chromosome and mitochondrial DNA to track the movement of populations because each is passed unchanged from parent to child, escaping the genetic shuffle that occurs on the rest of genome between generations. Since the Y chromosome passes down only from father to son, and mitochondrial DNA is always inherited from the mother alone, the two elements serve to track the genetic history of men and women respectively.

But since the Y chromosome and mitochondrial DNA clock up occasional changes or mutations every thousand years or so, on much the same time scale as human population splits, different ethnic groups tend to have characteristic patterns of mutations.

The Y chromosome and mitochondrial DNA's in today's Jewish communities reflect the ancestry of their male and female founders but say little about the rest of the genome, which is by now a presumably well mixed set of genes contributed by all the founders of each community.

Noting that the Y chromosome points to a Middle Eastern origin of Jewish communities and the mitochondrial DNA to a possibly local origin, Dr. Goldstein said that the composition of ordinary chromosomes, which carry most of the genes, was impossible to assess.

"My guess," Dr. Goldstein said, "is that the rest of the genome will be a mixture of both."