

Book Review

The Wandering Gene and the Indian Princess: Race, Religion, and DNA

Jeff Wheelwright

New York and London: W.W. Norton and Company, 2012.

In August 1992, in the San Luis valley of southern Colorado, a beautiful young Hispano woman named Shonnie Medina married a Anglo boy named Michael. Following the wedding,

“The dashing couple turns, waves and disappears into the limo with the quick and agile grace of their youth. The gene gets in with her, the gene that has followed her from Judea to Sepharad to Mexico and up the winding aisle of the Rio Grande.”

So begins an engagingly written book by Jeff Wheelwright about a 2500 year old mutant gene's path to the present, but in fact there are three stories told in this book. The first is the story of the gene itself, BRAC1 and the mutant allele, 185delAG, a two-base-pair deletion 185 nucleotides from the 5' end of the gene. BRAC1 is not a gene that directly causes breast cancer, rather its protein product is involved in DNA repair. The mutant allele has a dominant effect because in a heterozygote, if the wild-type allele mutates, the protective effect of diploidy is lost and the somatic cell loses the ability to correct mutations in or environmentally caused damage to other genes. The penetrance of a breast cancer phenotype varies from 35% to 80% in families with the 185delAG mutation. There is some speculation that, like certain mutant hemoglobins and malaria, 185delAG heterozygotes may exhibit overdominance.

The mutant allele arose in Judeans exiled to Babylon about 2500 years ago and stayed primarily in Jewish populations well into the Christian era. Indeed, the persecutions and diasporas in the early years of that era in some ways restricted, but only imperfectly, the spread of the mutant allele to other groups. While genetic drift in populations like the Ashkenazim in eastern Europe may have resulted in local increases in 185delAG's frequency, admixture with some European populations was also occurring. In particular, in one region of Spain during the inquisition, many Jews were forced to assimilate with the Catholic Spaniards, forsaking their Jewish religion and culture. Inter-marriage between these so-called Conversos and the Spaniards introduced 185delAG into Shonnie's ancestors who subsequently carried the allele into the new world. Wheelwright tells this part of the story in fascinating detail.

The second story concerns the interplay between genetic testing of Jewish, Hispano, and Native American

populations and the efficiency, or lack thereof, of counseling people identified as 185delAG carriers. The efforts of two people in particular, Harry Ostrer and Stanley Hordes, are discussed in this book—Ostrer for his documentation of the genetic variation in Jewish populations and Hordes, a New Mexico historian, for discovering the traces of Jewish heritage in Hispano populations. The excitement and local enthusiasm about so-called crypto-Judaism in this area of the United States is described, once again in great detail by Wheelwright.

Not surprisingly, 185delAG was one of the clues leading to the discovery of crypto-Judaism. Screening for the mutation was well underway in other parts of the country by the mid-1990s. Indeed, Wheelwright refers to 185delAG as the “most worried over piece of DNA in the world.” In general, carriers of 185delAG, most of them Jewish, have opted for breast and/or ovarian surgery. Testing for the mutation in the San Luis valley, where Shonnie and her family lived, came later but uncovered an alarmingly high number of carriers in her family. The courage and hard-headed decisions made by women in the Medina family are admirable as are the efforts of several genetic counselors, notably Jeffery Shaw from Colorado Springs.

The third story in this book is Shonnie's, and it's heart-breaking. She was a bright light in the Medina family, who incidentally are quite remarkable in their own right. Wheelwright writes about them almost lovingly as well as the awesomely beautiful part of southern Colorado where they live. Shonnie, who earlier had become a Jehovah's witness discovered a lump in her breast in 1996, 4 years after her marriage to Michael. She eschewed surgery, tried a number of homeopathic remedies, and died in 1999. The chapter entitled “The last days of the Indian Princess” is tough going. Nevertheless, you cannot help but admire both her courage and her undying love for her family. She was, not surprisingly, heterozygous for the 185delAG allele of BRAC1.

Finally to me, this book puts those dry and abstract mechanisms of population genetics, such as mutation, genetic drift, migration, and selection, into a vividly painted historical and human context.

ROSS MACINTYRE
Professor emeritus
Cornell University
Ithaca, NY
July, 2012

doi:10.1093/jhered/ess078