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How Blue or Green Eyes Appeared

Some researches

Blue or almost black, slate-gray, golden or violet or fainted green. Our eye color depends on that of our parents or grandparents. This is one of the strictest genetically inherited traits. No matter the hues, eyes are divided in two types depending on their color: dark (brown or black) and light (blue or green). The eye color is given by the amount of melanin, the same pigment from hair and skin. The higher the melanin amount, the darker the eye color, and vice-versa. Black eyes have the largest amount of melanin in the iris, blue eyes the lowest. No melanin (like in case of albinism) translates through red eyes, because of the blood vessels of the iris. Darker eyes are believed to be more adapted to sunny environments, as more melanin makes the eyes less sensitive to strong light. No matter the color of the eyes, this does not influence visual sharpness, as the pigmentation of the iris has no role in it. Only 200 million people are believed to have light eyes. This means less than 4% of the world's population. This genetic type is not associated strictly to what we call Whites, but with a specific type, the Indo-Europeans, which spread it 6,000 years ago from Central Asia or Caucasus Mountains to Europe and northern India, and from Europe, during the colonial era, to other areas. Moreover, the genes for light eyes are recessive, while those for dark eyes are dominant. Each person has two genes for eye color. This means that a person that has two genes for brown or blue eyes will have the respective eye color, while a person with a gene for blue eyes and a gene for brown eyes will have brown eyes. That's why mulattoes in the first generation have always dark eyes, while the cross child of two mulattoes, if both mulatto parents have a light eyed parent themselves, can have blue or green eyes. A 2006 Australian research showed that blue eyes are the result of a "single nucleotide polymorphisms" (SNPs) (minor mutation) near a gene called OCA2 that encodes a controller of the melanin synthesis, the P protein. The total deactivation of OCA2 causes albinism. The mutation does not turn off completely the OCA2. It just decreases its action of spurring melanin synthesis in the iris, so that the low amount of melanin in the iris appears as blue, and not brown. Thus, brown is the primordial color of the human eyes. Eye color variation from brown to green is caused by the variable amount of iris melanin, but blue eyes are correlated with just one genetic variation. This means that all blue-eyed individuals are linked to the same ancestor, having inherited the same mutation at exactly the same spot in their DNA. Oppositely, brown eyes can be the result of a large variation in the DNA sector controlling the melanin synthesis (thus, there are several gene variants encoding for brown eyes). The mutation from brown eyes to blue eyes is another example of neuter mutation; like hair color or baldness, it does not impact the individual's survival ability. A 2008 Danish research even showed when the mutation for blue eyes emerged: 6,000-10,000 years ago. Some researchers say that green eyes are the result of mutations that change the melanin structure (thus, the melanin in blue eyes would be the same like in brown eyes, but less, while the green eyes would have a melanin type different from brown and blue eyes). Natural selection is obviously not the only factor that could explain the spread of blue eyes, which represent a recessive mutation; a sexual selection is also involved: those traits were appreciated in sexual partners (viewed as beautiful) and, this way, these people could have had increased sexual fitness, translated in more offspring. Imagine how, 10,000 years ago, all the women of the group preferred the blond blue-eyed hunk: he would have practically fathered a whole generation.