

## “The Howler Monkey’s Tale”

an excerpt from The Ancestor’s Tale: A Pilgrimage to the Dawn of Evolution  
By Richard Dawkins. (pages 145-155) Used with permission

Just as we trace our personal family trees from parents to grandparents and so on back in time, Dawkins does the same in his book The Ancestor's Tale. In this book he traces the ancestry of life backwards from the species that are alive today to those that predated us. It is a family tree filled not just with humans but shrews, sponges and bacteria. At 40 points along the way Dawkins stops to tell us the story of a particular concestor (a common ancestor or two or more species) as they join the pilgrimage back towards the common ancestor to all life on Earth.

We will get much deeper into phylogeny (the evolutionary history of an organism) when we get to the chapters specifically dealing evolution and classification but for now we will focus on the role of evolution on the genetics of color vision.

### Define the following key vocabulary terms:

Cystic fibrosis	Mammals
Dichromatic	Mutation
Diurnal	Nocturnal
Gene	Polymorphism
Genome	Sickle cell anemia
Loci/Locus	Tetrachromatic
	Trichromatic

### Answer the following questions after you read the Howler Monkey’s Tale (pages 145-155)

1. What is the role of the rods and cones in vision?
2. Why did primates (a group that includes humans) have to regain their ability to see in three colors?
3. Why is it thought that trichromatic vision was important to our ancestor’s survival?
4. Why are all of the eyes on the planet earth set up to “see” the same small section of the electromagnetic spectrum?
5. How is the operation of the eye similar to the picture on a television set?
6. What is the role of the protein opsin and the chemical retinal in sight?
7. On what chromosome(s) are the genes for building opsin located?
8. Describe how dichromatic vision in New World Monkey works.
9. Why are the male and female Tamarins color blind in different ways?
10. What is the benefit to the Tamarins that they have this polymorphism in their population?
11. What is the advantage to humans who are heterozygous for sickle cell anemia, cystic fibrosis?
12. What is the role the translocation mutation and crossing over played in creating human color vision?