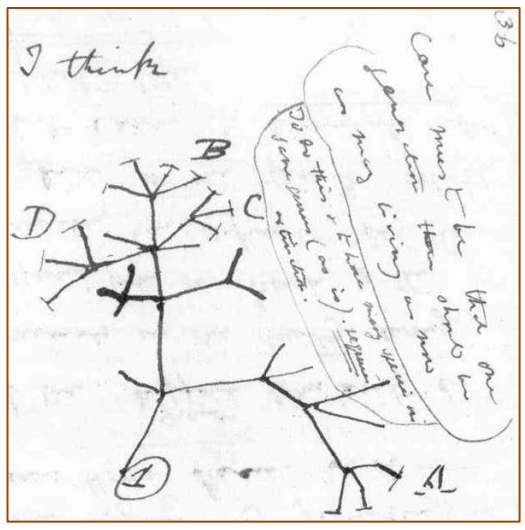
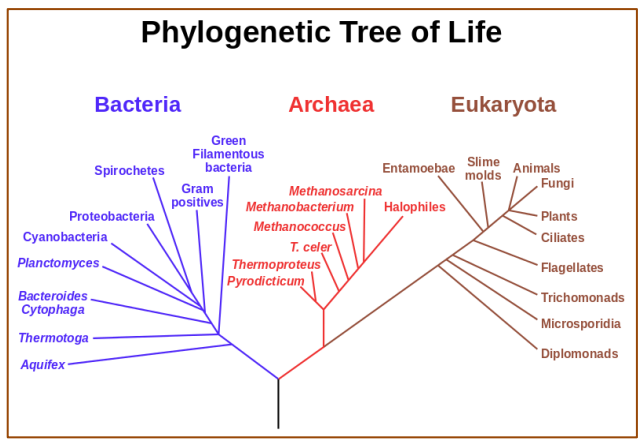
THE TREE OF LIFE

Our Evolving View of Life on Earth

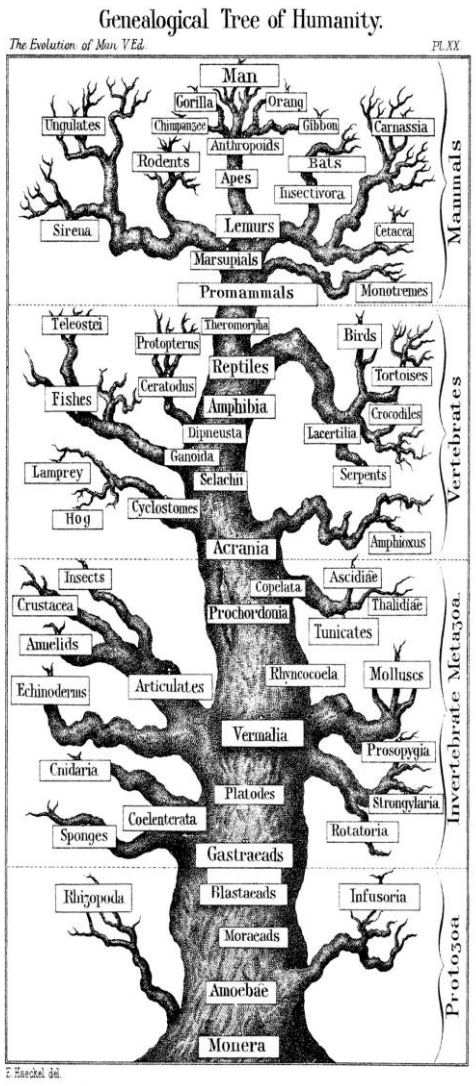
The Tree of Life is a metaphor used to help us understand how living organisms, past and present, are related to one another. Three major changes have taken place as we've learned more about the world: **1)** humans used to be at the top but now we know we're a part of life, not apart from life; **2)** the variety of microscopic organisms is more appreciated; and **3)** just above the base, the trunk weaves back on itself though Horizontal Gene Transfer.



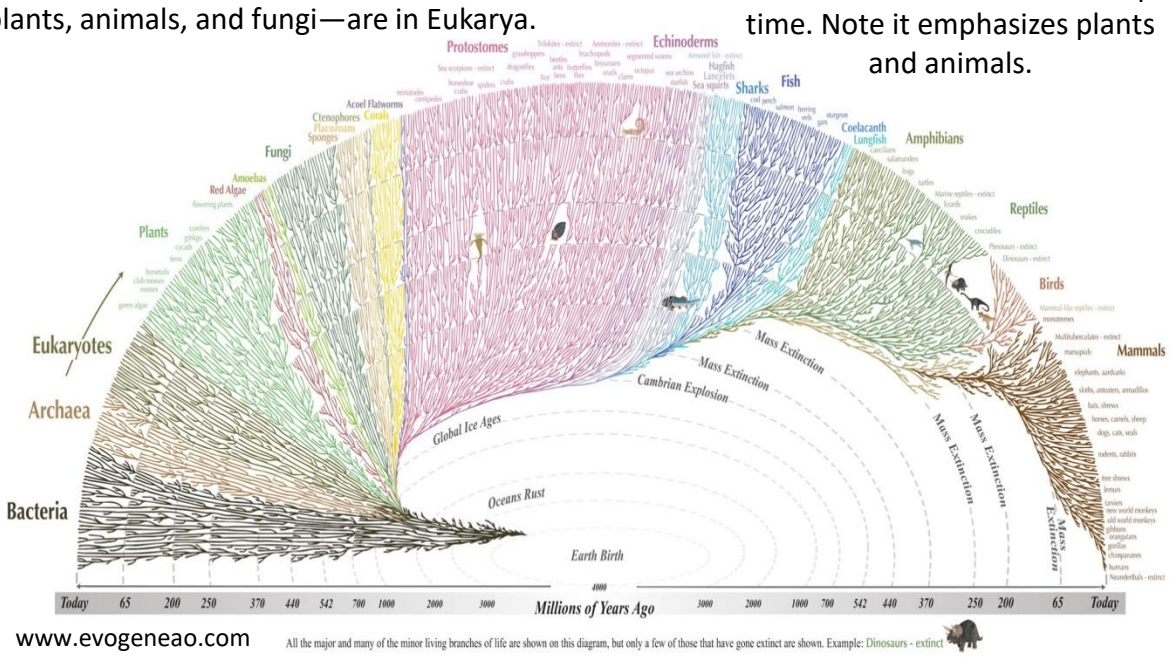
Charles Darwin's first tree sketch, July 1837



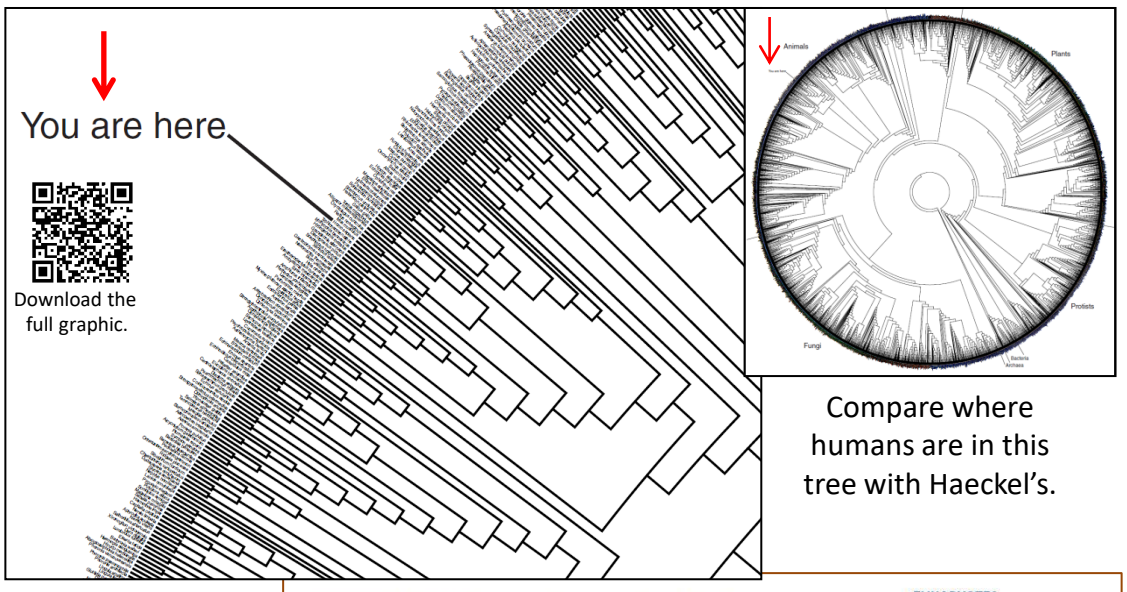
Simplified view of the three Domains of Life: Bacteria, Archaea, and Eukarya. All life you can see—plants, animals, and fungi—are in Eukarya.



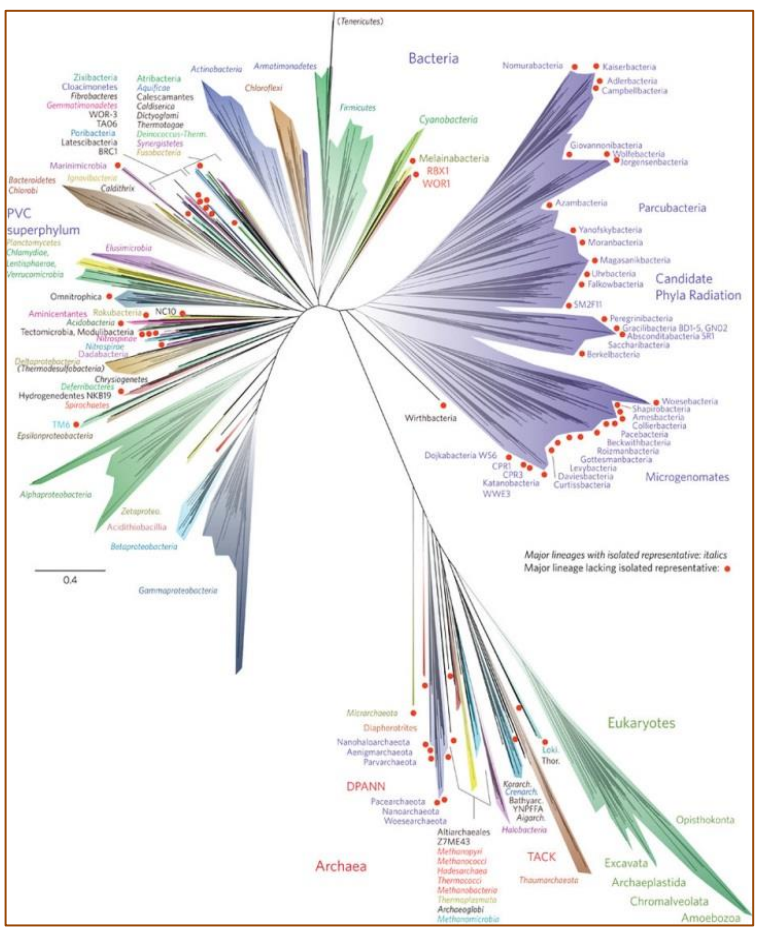
An early view of the relatedness of animals. Note where humans are. Ernst Haeckel *The Evolution of Man,* 1879.



A tree of life that includes deep time. Note it emphasizes plants and animals.



Compare where humans are in this tree with Haeckel's.



A Tree of Life that emphasizes microbe diversity (Bacteria and Archaea). All plants, animals, and fungi are represented by the green limb in the lower right corner. (doi:10.1038/nmicrobiol.2016.48)

Early branches on the tree of life grew back into one another! It's called **Horizontal Gene Transfer**. The mitochondria in your cells are the decedents of free-living bacteria! *Uprooting the Tree of Life* by W. Ford Doolittle, *Scientific American,* Feb. 2000.