Lecture 9: 4 Oct 2018

Andrew

1. What supports theory of descent with modification?
   (a) Homology: LUCA (last universal common ancestor) can review what is extant and what each has in common to determine probable traits of LUCA. Shared hardware - forelimb example (vertebrates). Bats are one of three different times that forelimb modified for flight (bats, birds, pterodactyls)
   (b) Deep homology: 1.2% of human genome encode proteins, humans super super similar to other organims.
      i. Mouse gene in fruit flies - works the same way. Very different eyes, at least a billion years diverged, but the same genetic signal.
   (c) An increase in complexity: start simple and then you build up if theory is true. Fossil record supports this. Single-celled organisms and things are becoming more and more complicated.
      i. How to study deep history?
         A. Fossils: descending grand cayon - going back in time. Reconstruct history of life from fossils. Jawless to jawed fish, to amphibians, reptiles etc
         B. Building Phylogeny: traveling back in time via common ancestors through more and more distantly related organisms. Same answer and order
         C. Intermediate Forms: evolution of birds from small running dinos.
         D. *Australopithecus* Lucy. Bipedal. Great Ape-Human intermediate. Brain of ape brain. Bipedalism came first, big brain evolved more recently.
         E. Vestiges: traits in organism that are no longer necessary. Flightless cormorants.
         F. Vestigal organs: whales don't have hindlimbs except most species still have a little pelvis because whales have descended from four-legged organisms.
         G. Human infant grasp reflex
         H. Atavism: ancestral trait that reappears. Example of whale with hindlimbs with bones from 1920 in BC. Human tail. Stephan Jay Gould: Lousy design in nature. Ex. Panda's thumb.