Introduction to Biological Anthropology: Notes 10

An introduction to our relatives

- Order: Primates
- Suborders of primates: prosimians vs. anthropoids
  - Suborder: prosimians
    - our most distant primate relatives
    - the most varied category of primates
    - many nocturnal (active in the night), hence:
      - more developed sense of smell than other primates (wet, "naked" doglike nose)
      - large eyes
      - independently mobile ears
      - sensory whiskers
    - many arboreal, hence the four non-thumb digits act together, not independently
    - many employ a body posture and locomotion called “vertical clinging and leaping”
      - different species vary from being very specialized for vertical clinging a leaping and doing it much of the time, even on the ground
      - to being more or less capable of doing it, and only actually doing it poorly and occasionally
    - many have a "grooming claw" on the second toe only; nails on other digits
    - many have a "dental comb": the four lower incisor teeth and the lower canines are long, narrow, and close together, for use in grooming fur and gathering food
    - less complex behavior, less learning, relatively smaller, less developed brains than the anthropoids
    - most have the full three premolars (as do some anthropoids, too)
    - all prosimians except tarsiers have the post-orbital bar but lack the post-orbital plate; tarsiers have both, like anthropoids do
    - 3 infraorders: lemuriformes, lorisiformes, and tarsiiformes
      - lemuriformes (lemurs)
        - only on Madagascar (a huge island off southeastern Africa)
          - evolved there in isolation from competitors on mainland
            - including humans
          - lemurs were a case of adaptive radiation
            - they evolved in many different directions to fill many of the niches occupied by other animals on the mainland
            - there were lemurs the size of calves!
          - humans reached Madagascar around the time of Christ
            - and within a few centuries had completely exterminated all the larger lemurs
            - mostly the smaller, tree-dwelling, nocturnal ones survived
          - the SF zoo has an important project going to study, breed, and release Madagascar lemurs, and many prosimians that you can see
            - fantastic new lemur area - really fun, highly recommended
        - quadrupedal plus vertical clinging and leaping

    - in many lemur species, females are socially dominant; they can push a male away from food
  - lorisiformes (lorises)
    - African and Asian forests
    - small, nocturnal, arboreal
    - mostly eat fruit, gum, insects, some small vertebrates
    - lorises: slow climbers and creepers
    - galagos: fast hoppers and runners ("bushbabies")
  - tarsiiformes (tarsiers)
    - high rain forests of Southeast Asia and Indonesia
    - small, nocturnal, arboreal
    - vertical clinging and leaping
    - eat insects and some small vertebrates
      - some tarsiers can withstand neurotoxins produced by snakes
    - probably belong in the anthropoid suborder, rather than prosimians (details later)
- Suborder: anthropoids
  - this is our branch: monkeys, apes, and humans
  - generally larger body size
  - mostly diurnal (active in the day)
  - retina with a fovea (central area of higher resolution vision)
    - absent in prosimians except the tarsiers
  - dry nose, reduced sense of smell
  - reduced sensory whiskers
  - independently controlled, dexterous digits
  - nails on all digits (no claws)
  - generally larger brain relative to body size
  - generally more complex behavior
  - post-orbital bar (like all primates) plus post-orbital plate
    - post-orbital plate is absent in prosimians except the tarsiers
    - see why the tarsiers seem to be more like anthropoids?
      - they must have split from anthropoids later than the other prosimians
      - after the fovea and post-orbital plate evolved
      - but probably before the other anthropoid features did
  - Two infraorders of anthropoid primates: Platyrrhines and Catarrhines
  - Infraorder: Platyrrhines
    - "flat nosed": round, forward-facing, widely separated nostrils
    - only in the New World, hence often called "New World monkeys" (NWMs)
    - three premolars on top and bottom
    - almost all diurnal
    - all mostly arboreal, living in forests
    - mostly quadrupedal, some able to swing by arms or tail
    - a few have prehensile tails, which are found only among the New World monkeys
      - specifically, only among one family of NWMs, the Cebids

- one kind of Cebid is the capuchin monkey, which is notable for being one of only a few primates that known to regularly make and use tools:
  - Capuchin monkey
    - use sticks as weapons, modify twigs and leaves to probe for insect larvae
  - Chimpanzees
  - Bonobos
  - Orangutans
  - Humans
  - consider where in the phylogeny of the anthropoids the tendency to regularly use tools might have developed…
    - there is no one place on the phylogeny where tool-using could have appeared that would account for these four tool-using species
    - what might this suggest about the anthropoids in general?
  - Only in 2005 were two gorillas observed to use tools
    - one used a stick to test the depth of water, another put a trunk in a muddy area and then walked across it like a bridge
  - considering the phylogeny of these species, is this surprising?
- Infraorder: Catarrhines
  - our branch
  - narrow, downward-facing nostrils
  - only in the Old World (except humans)
  - two premolars on top and bottom, rather than three
  - some have tails, but none are prehensile
  - more variable adaptations than New World monkeys
  - two superfamilies: Cercopithecoids (Old World monkeys) and Hominoids (apes and humans)
  - Superfamily: Cercopithecoids
    - Old World monkeys (OWMs)
    - highly variable group
      - arboreal and/or terrestrial
      - many different kinds of social organizations and mating strategies
      - often groups of numerous females and one or several males
    - Two subfamilies: Colobines and Cercopithecines
    - Subfamily: Colobines
      - most arboreal leaf-eaters
      - Africa and Asia
      - langurs: sometimes called "leaf monkeys"
      - colobus monkeys: no thumbs (apparently an adaptation to moving through trees?)
      - "Miss Waldron's Red Colobus": last seen in 1970's, declared extinct in September 2000
    - Subfamily: Cercopithecines
      - many are semi-terrestrial
      - species are quite varied

    - Africa, plus macaques also live in Asia
    - typically live in large, multi-male, multi-female groups
    - baboons
    - macaques
    - vervet monkeys
- Hominoids
  - our branch: apes and humans
  - generally the largest primates
  - no tails
  - relatively larger brains
  - Y-5 molars
  - basically forest dwellers, more or less arboreal, flexible tree climbing adaptation
    - wide chest with shoulder blades (scapulae) on the back, rather than on the side as in quadrupeds
      - so the forelimbs can stick out sideways, rather than just moving forward and back
    - greater mobility of shoulders, elbows, wrists
    - these are presumably adaptations for complex climbing in trees, rather than just walking on top of branches
  - traditional classification has three families: hylobatids (lesser apes), pongids (great apes), and hominids (us)
  - we will use the more correct one in which hominids are included within the pongids (great apes)
  - Family: hylobatids
    - "lesser apes", generally smaller than the pongids
    - gibbons and siamangs
    - live in tropical forests of Asia
    - nearly full-time brachiators (overhand swingers through the trees) with very long arms
    - monogamous mating
    - little sexual dimorphism
    - males more involved in infant care than most other primates, especially the siamangs
    - highly territorial
  - Family: pongids
    - "great apes"
    - orangutans, gorillas, and chimps
    - should include humans, too
      - but many resist this, because humans are so different from other pongids
    - generally the largest primates
    - generally the largest brains relative to body size
    - orangutans
      - only on southeast Asian islands of Sumatra and Borneo
      - extreme sexual dimorphism in size, face, etc.

        - quadrumanual and arboreal when small, more terrestrial when grown to large size (especially males)
        - very solitary
        - fruit, leaf, and bark eater
      - gorillas
        - central African forests
        - small groups of one or two adult males, a few females, some young
        - eat leaves, stalks, bamboo
        - mostly terrestrial (although this may vary depending on their environment)
      - chimpanzees
        - and their close relatives, bonobos
          - called "pygmy chimps", even though they are not consistently much smaller
        - mostly eat plants, especially fruit, but sometimes insects and other animals
        - common chimps: large multi-male, multi-female groups centered on a stable group of related males who stay in their natal group
        - bonobos: female-centered groups
        - regularly use tools and modify objects to serve as tools
          - strip twigs to "fish" for termites or ants
          - wad up leaves to sponge water out of cavities in tree trunks
          - crack nuts using a stone in one hand and a larger stone or root as an anvil
    - Family: hominids
      - us and our ancestors
      - hominids were traditionally placed in their own family
        - as if our lineage had long been separate from the pongids
        - this was basically vanity
      - the evidence suggests instead that we are just another kind of great ape
        - probably more closely related to chimps than gorillas are
      - much more detail later, but for now:
        - bipedal
        - reduced canines
        - huge brains for body size

- Many non-human primates are in danger of extinction
  - capture for sale for pets or research (now partially controlled)
  - hunting for exotic meat or trophies for sale
  - hunted for "bush meat": in some areas, wild animals are not owned by anyone nor effectively protected, so they are a source of cheap meat or minor income for desperate people who can't afford beef, pork, or other preferred species
    - humans are driving our only close relatives to extinction for the equivalent of cheap horsemeat
  - but ultimately, the biggest reason is the reduction of habitat by logging, farming, ranching
    - there are fewer and fewer "wild" places where they can live

- We will come back to many of these primates as examples or case studies