

Primate Characteristics

- What characteristics define primates?
- What are they an adaptation for?
- What was the likely early primate adaptation?

Traits of Primates

- Emphasis on vision
 - binocular or stereoscopic vision
 - forward facing eyes
 - postorbital bar or post orbital closure

Limbs and locomotion

- Erect posture
- retention of clavicle
- Grasping hands with opposability
- Nails instead of claws

Diet

- Generalized dentition
- Tendency towards omnivory

Senses, brain and behavior

- emphasis on vision
- decreased snout and olfactory areas
- larger and more complex brain
- longer gestation, infancy, life span
- more k-selected (tend towards single offspring)
- greater dependency on learned behavior
- more social

Primate trends

- Arboreal adaptations
- Dietary plasticity
- Behavioral complexity



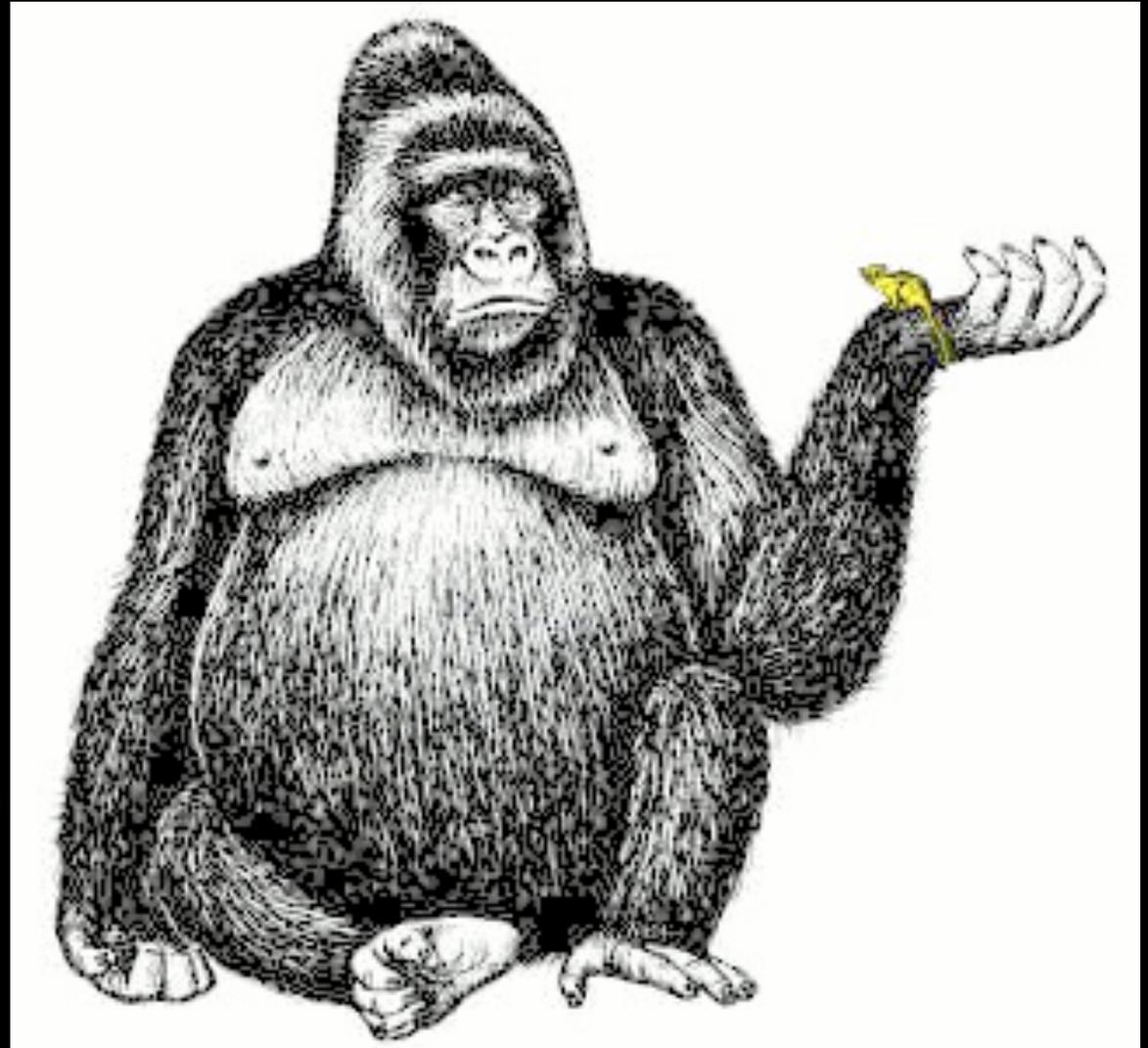
Primate Evolution and Diversity

- Primates arose as part of the Tertiary mammalian radiation after the dinosaurs went extinct.
- First clear primates identifiable in the fossil record by 50 mya.
- Today about 350 species of primates (compared to, say, 2277 species of Rodentia or 260 species of Carnivora)



Figure 5.2 Geographic Distribution of the Living Primates

Primate body size and shape vary widely from the 440-lb. (200-kg) gorilla to the 2oz. (40-g) mouse lemur.



Living Primates

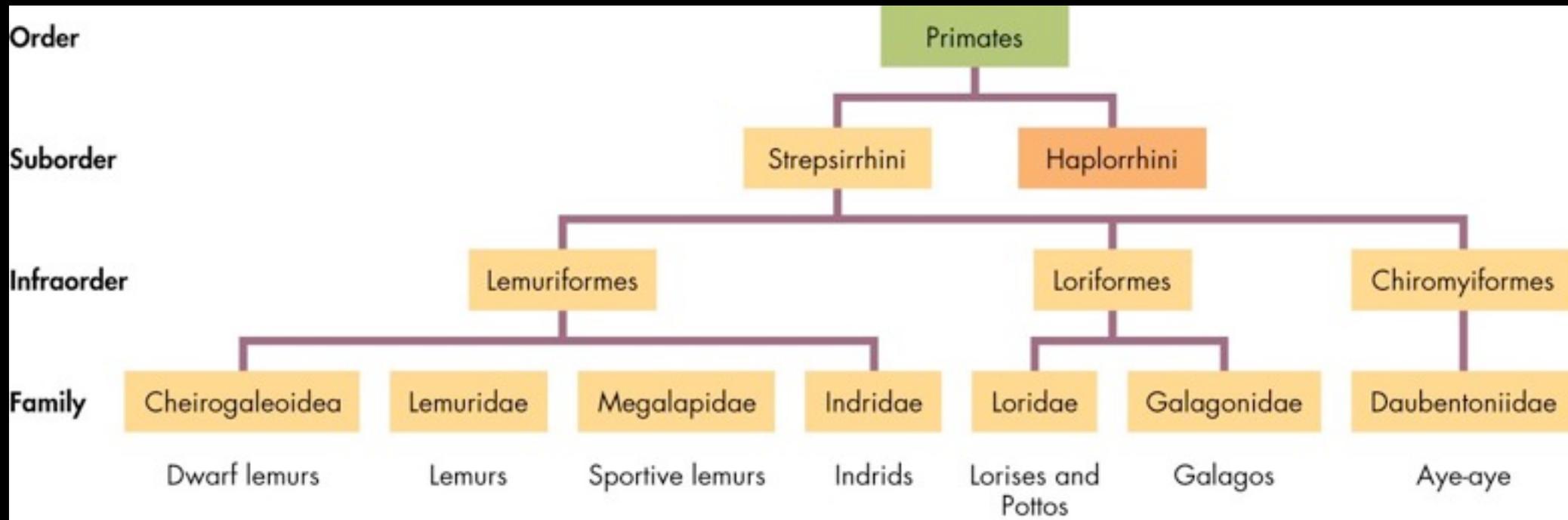


Figure 5.3 Taxonomy of the Strepsirrhines to the Family Level

Living Primates

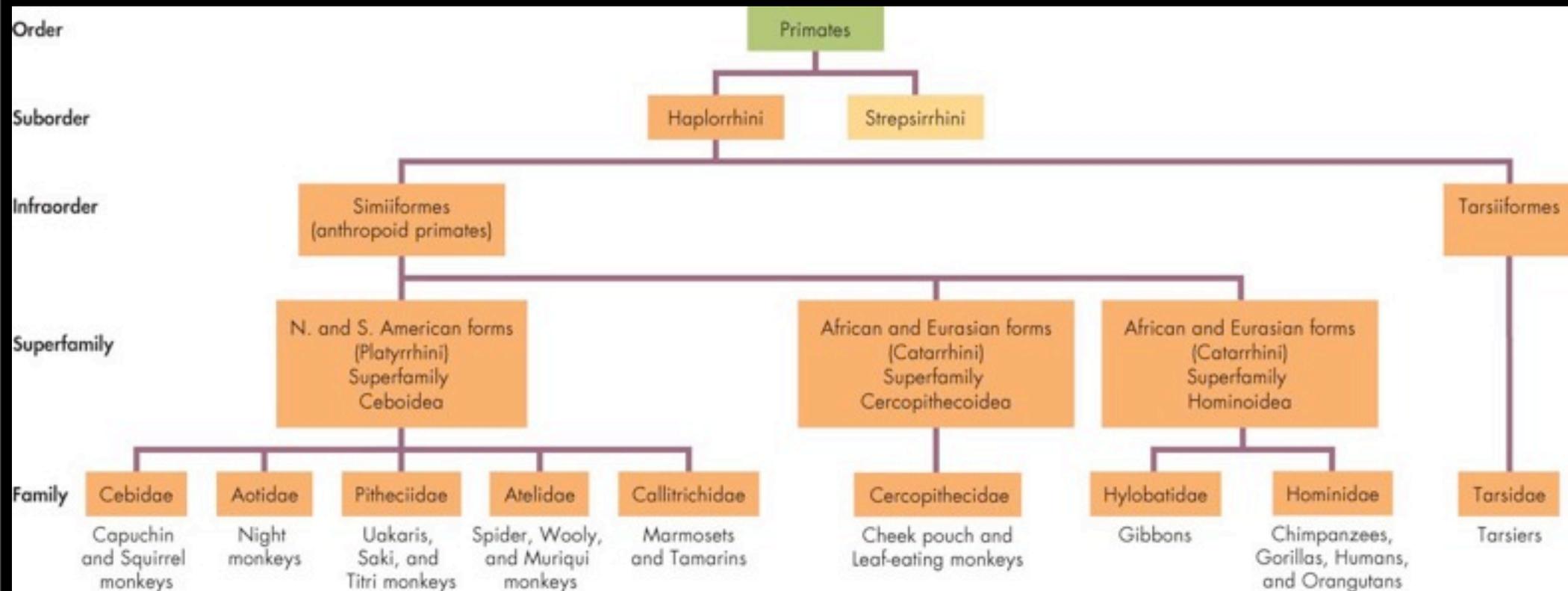
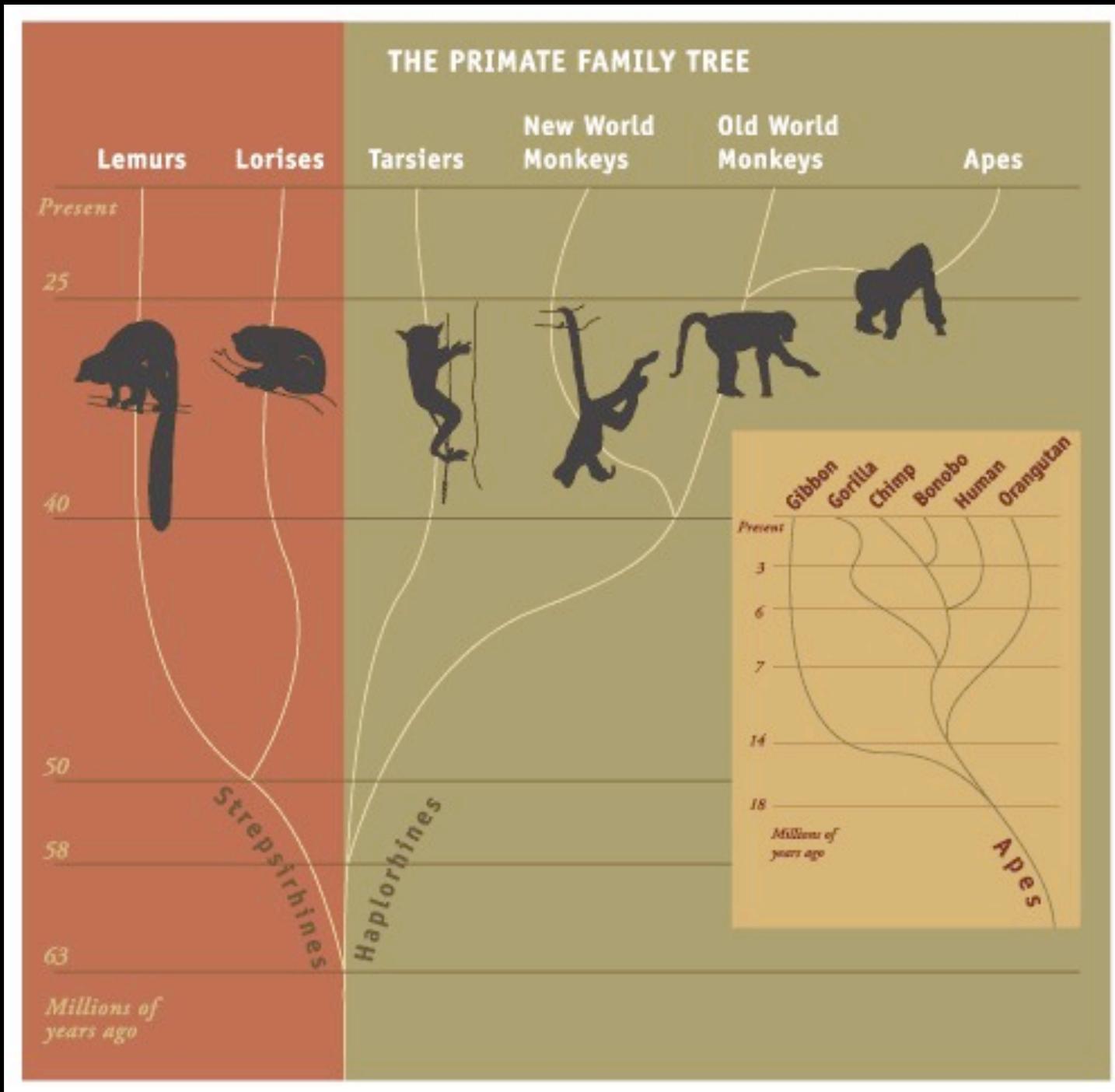
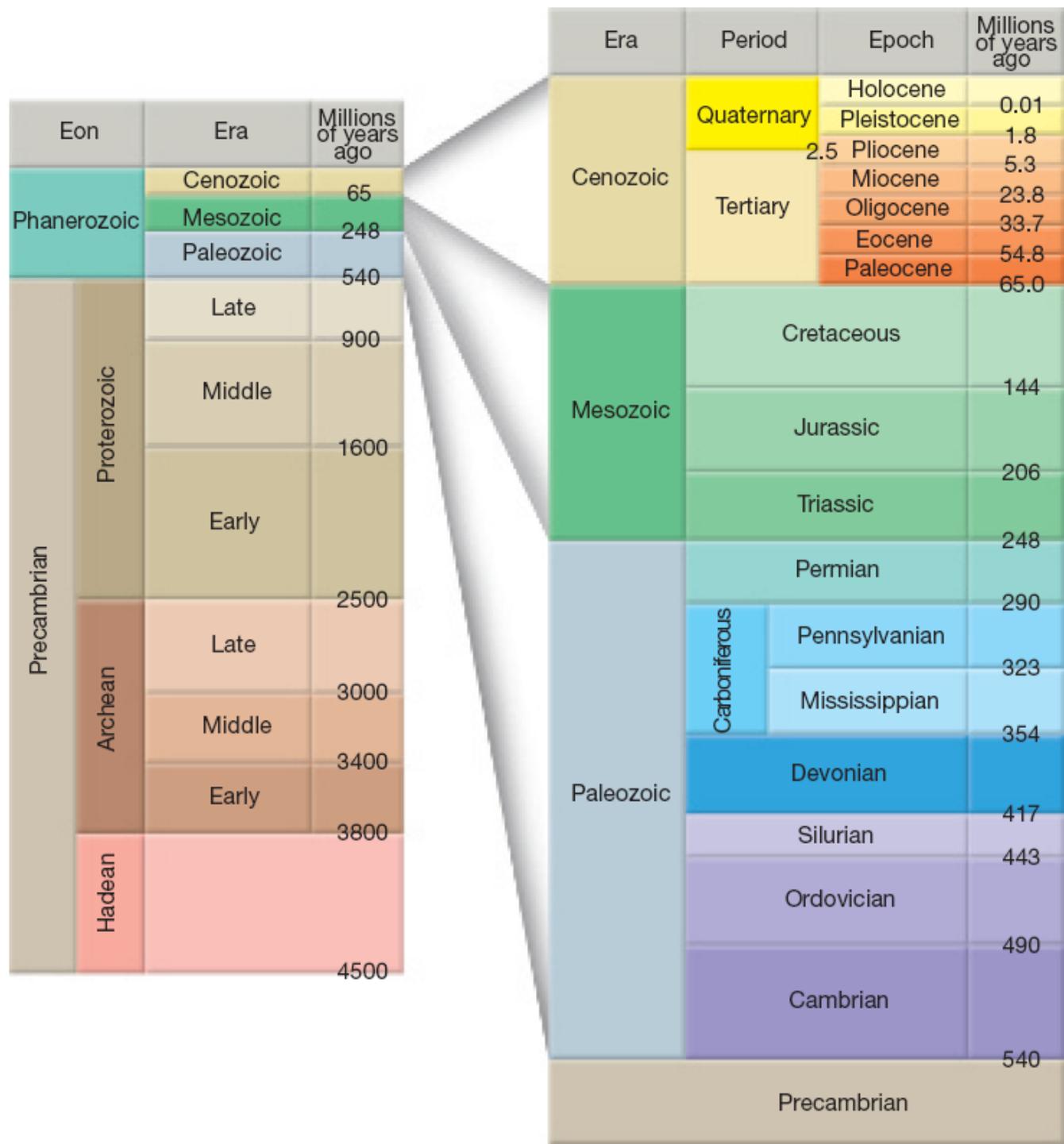


Figure 5.5 Taxonomy of the Haplorrhines to the Family Level

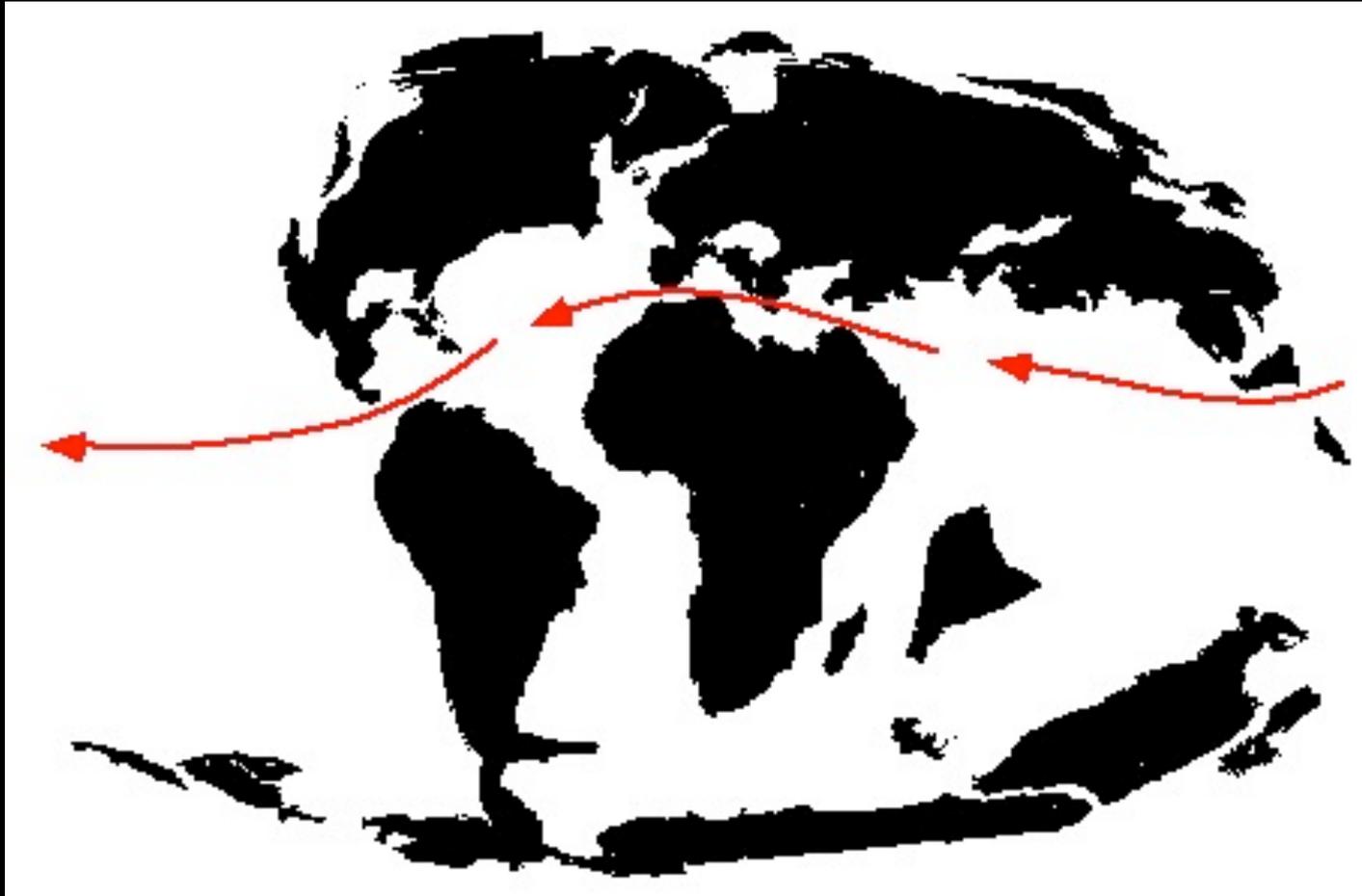




Homo sp.
Hominids
Apes
Monkeys
Prosimians
Protoprimates

Era	Period	Epoch	Time Scale	
CENOZOIC	QUATERNARY	HOLOCENE	Present	
		PLEISTOCENE (ICE AGE)	10,000 years ago	
	TERTIARY	NEOGENE	PLIOCENE	1.8 million years ago
			MIOCENE	5.3 million years ago
		PALEOGENE	OLIGOCENE	23.8 million years ago
			EOCENE	33.7 million years ago
			PALEOCENE	54.8 million years ago
				65 million years ago

Paleocene



Distribution of the continents at the end of the Cretaceous

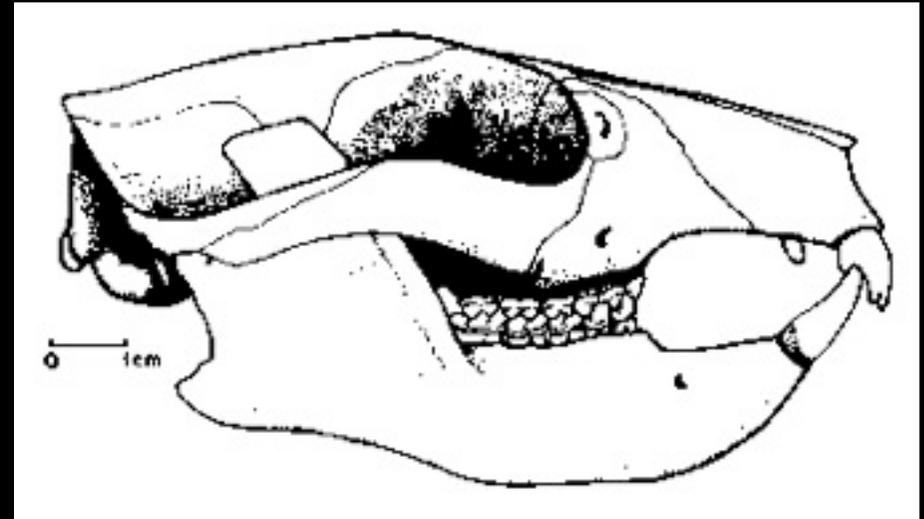
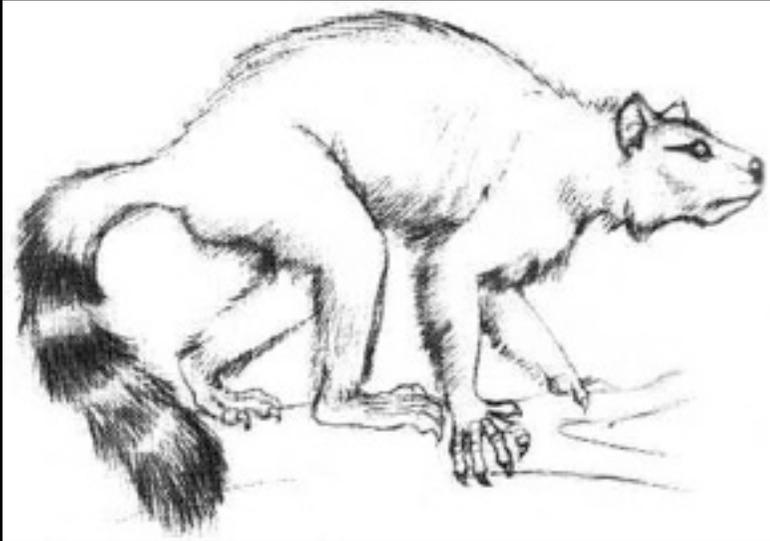
Paleocene

- Infraorder: Plesiadapiformes
- proto-primates
- teeth like primates, otherwise not really
 - no post-orbital bar
 - claws

Tree Shrew



Plesiadapis



Purgatorius



Eocene

- First true primates
- Prosimian “grade”
- Strepsirrhine characteristics

Eocene continents



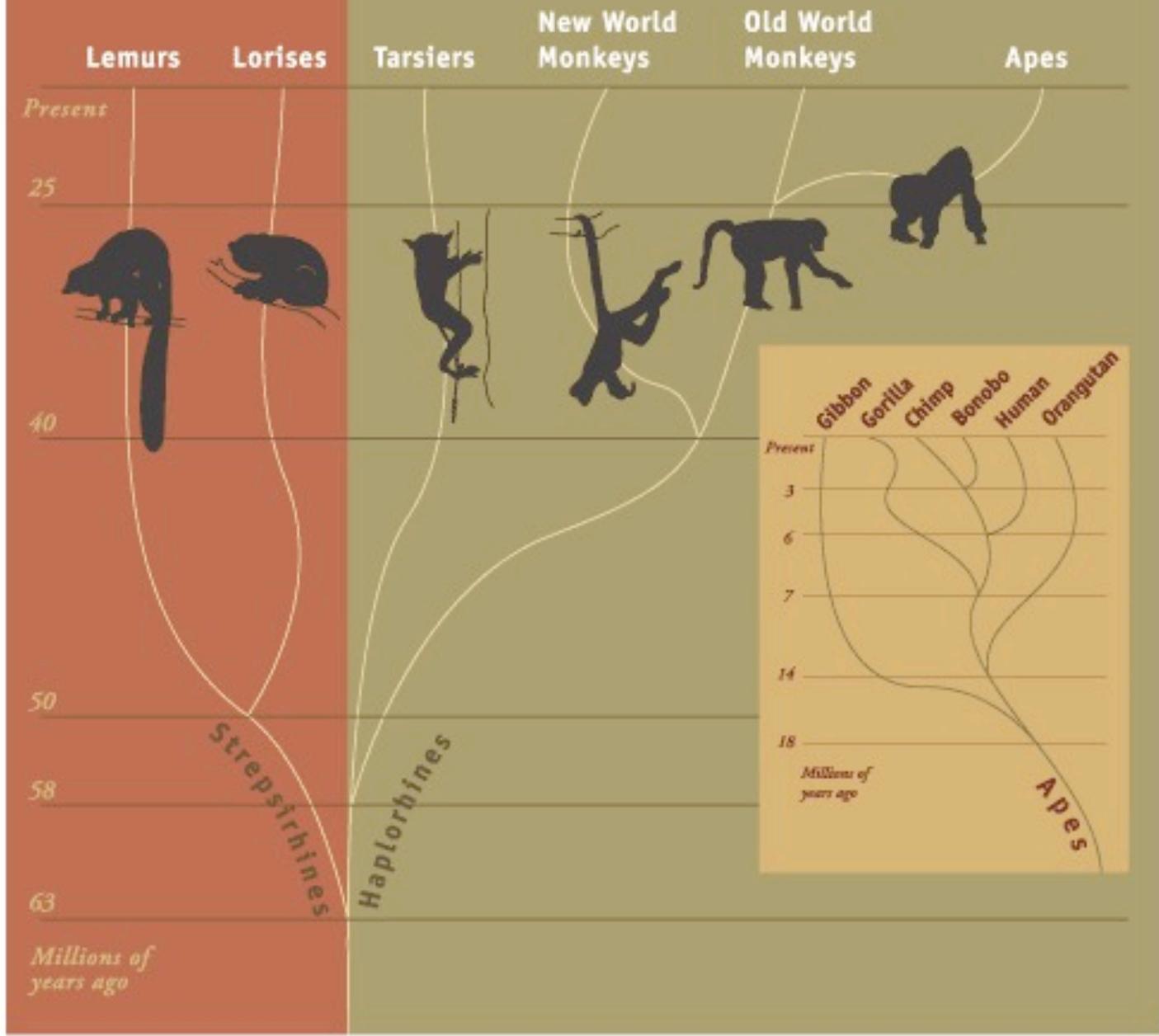
Strepsirhines

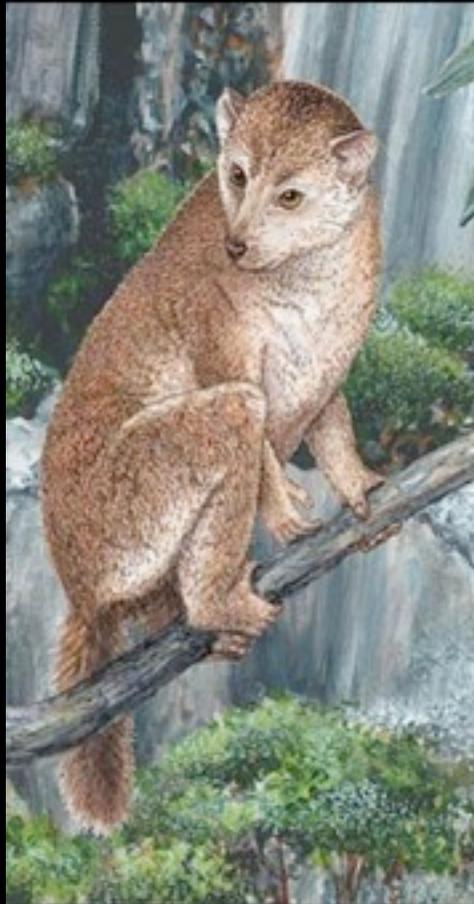
- Lemurs, lorises and galagos
- often used interchangeably with Prosimian (difference is placement of the tarsier)

Strepsirhines

- reliance on olfaction
- often nocturnal (lorises and galagos)
- lack of complex social behavior
- tooth combs
- some claws

THE PRIMATE FAMILY TREE





Adapis parisiensis

<http://gnsi.science-art.com/2004VA/paleo.htm>

Postcranial adaptations suggest that *Adapis* used climbing and quadrupedal locomotion similar to extant lorises such as *Nycticebus*.



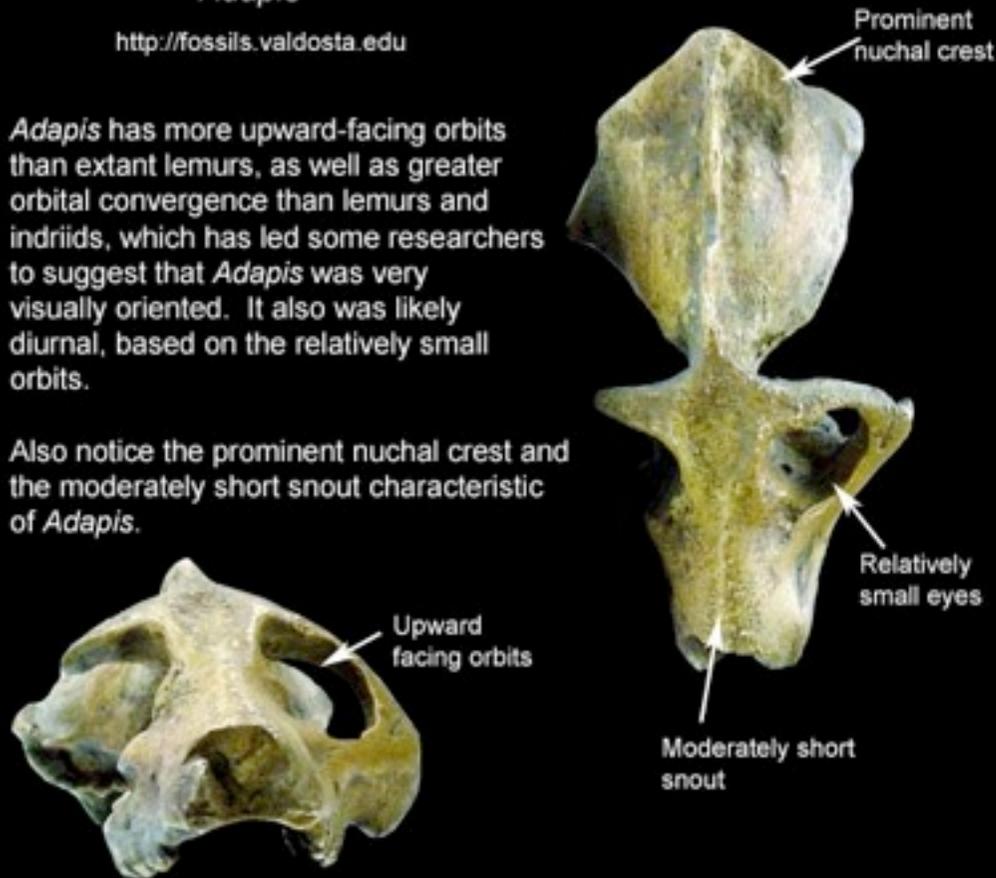
<http://www.hedweb.com/animimag/slowloris.htm>

Adapis

<http://fossils.valdosta.edu>

Adapis has more upward-facing orbits than extant lemurs, as well as greater orbital convergence than lemurs and indriids, which has led some researchers to suggest that *Adapis* was very visually oriented. It also was likely diurnal, based on the relatively small orbits.

Also notice the prominent nuchal crest and the moderately short snout characteristic of *Adapis*.



<http://www.laits.utexas.edu/shapiro/index.h>

Strepsirhini

- Lemuroidea
 - lemurs and the aye-aye
- Lorisioidea
 - lorises and galagos

Strepsirhine Distribution



Mouse lemur

Lemurs:

- ONLY on Madagascar
- from really small (<5 inches) to moderate (about 2 feet)



Madagascar



Mongoose Lemur

Lemurs:

- both nocturnal and diurnal
- both arboreal and terrestrial



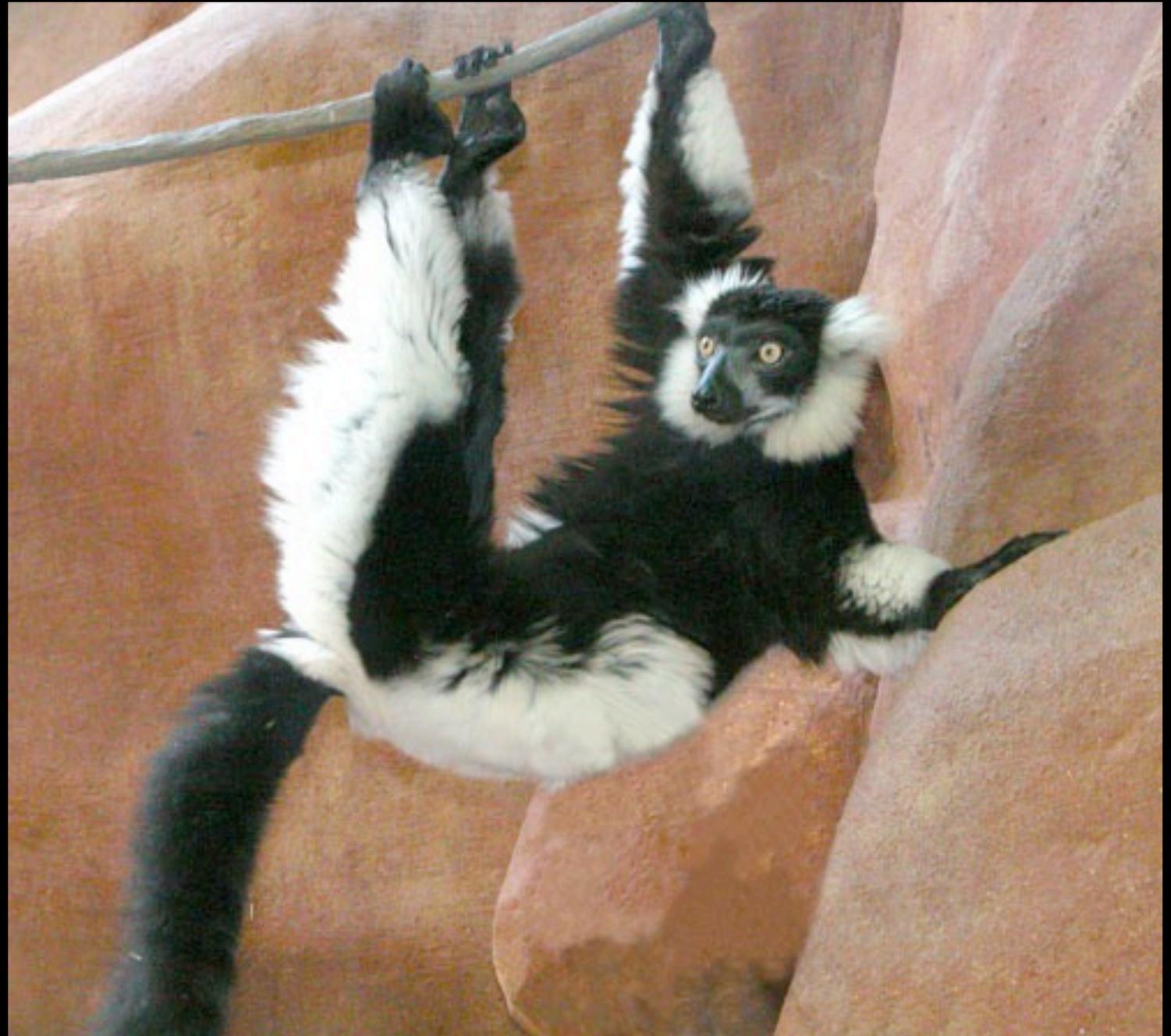
Fat-tailed Dwarf Lemur



Red Ruffed Lemur



Black and White Ruffed Lemur



Golden Bamboo Lemur



Ring-Tailed Lemur

Lemurs:

- both quadrupedal and vertical clingers and leapers (VCL



Vertical Clinging and Leaping





Indri

Lemurs

- scent mark
- diurnal lemurs tend to have more complex social relationships

Aye-aye



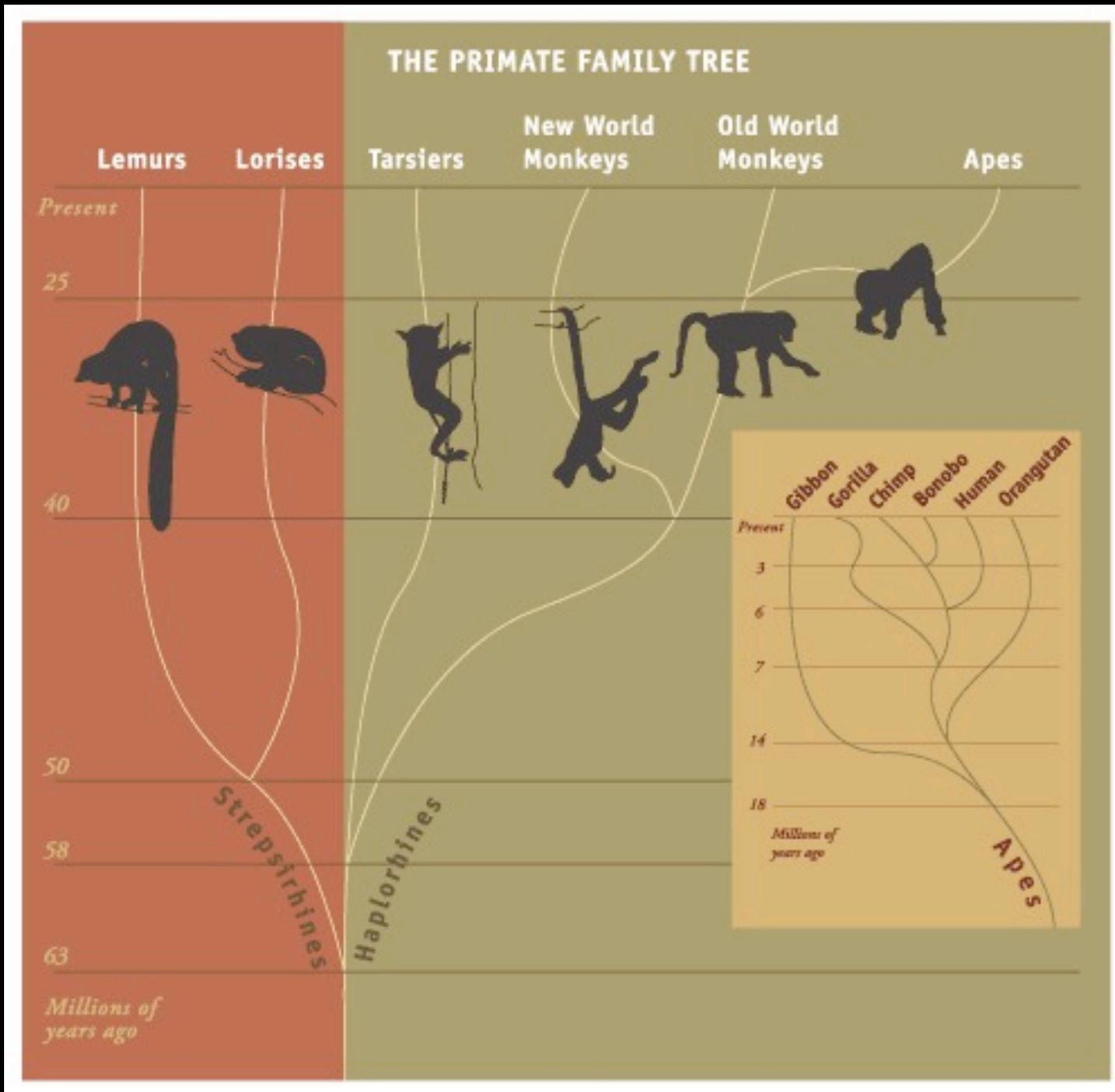
Aye-Aye



Aye-Aye hand



Photo by David Haring



Loris

Lorises - Asian
and African
(Potto)

Galagos -
African

- nocturnal
- scent mark
- solitary
- claw
- tapeta lucetum



Slow loris



Pygmy Loris



Potto



Galago

- nocturnal
- VCL
- rat to cat size



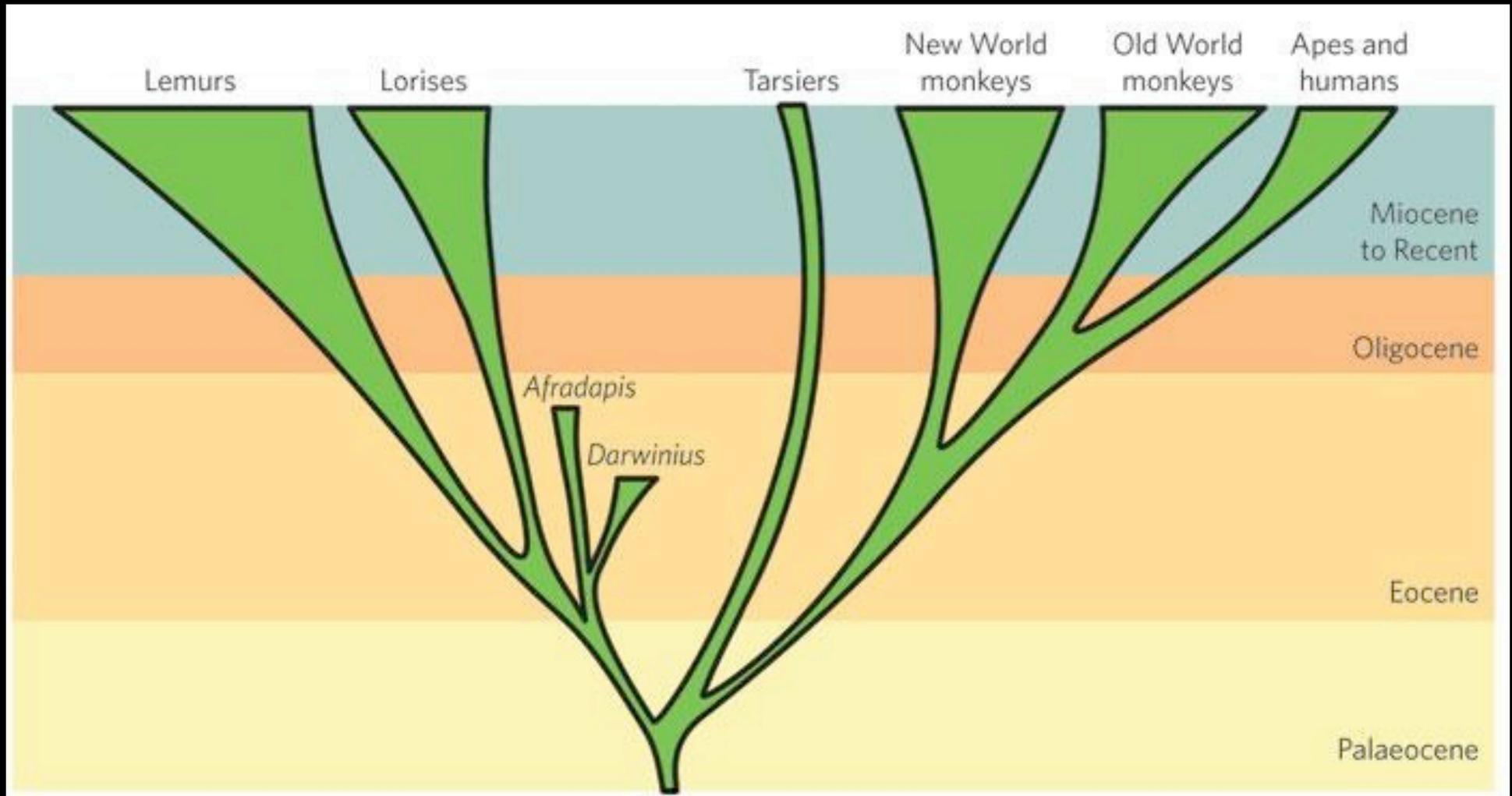
Lesser bushbaby



IDA



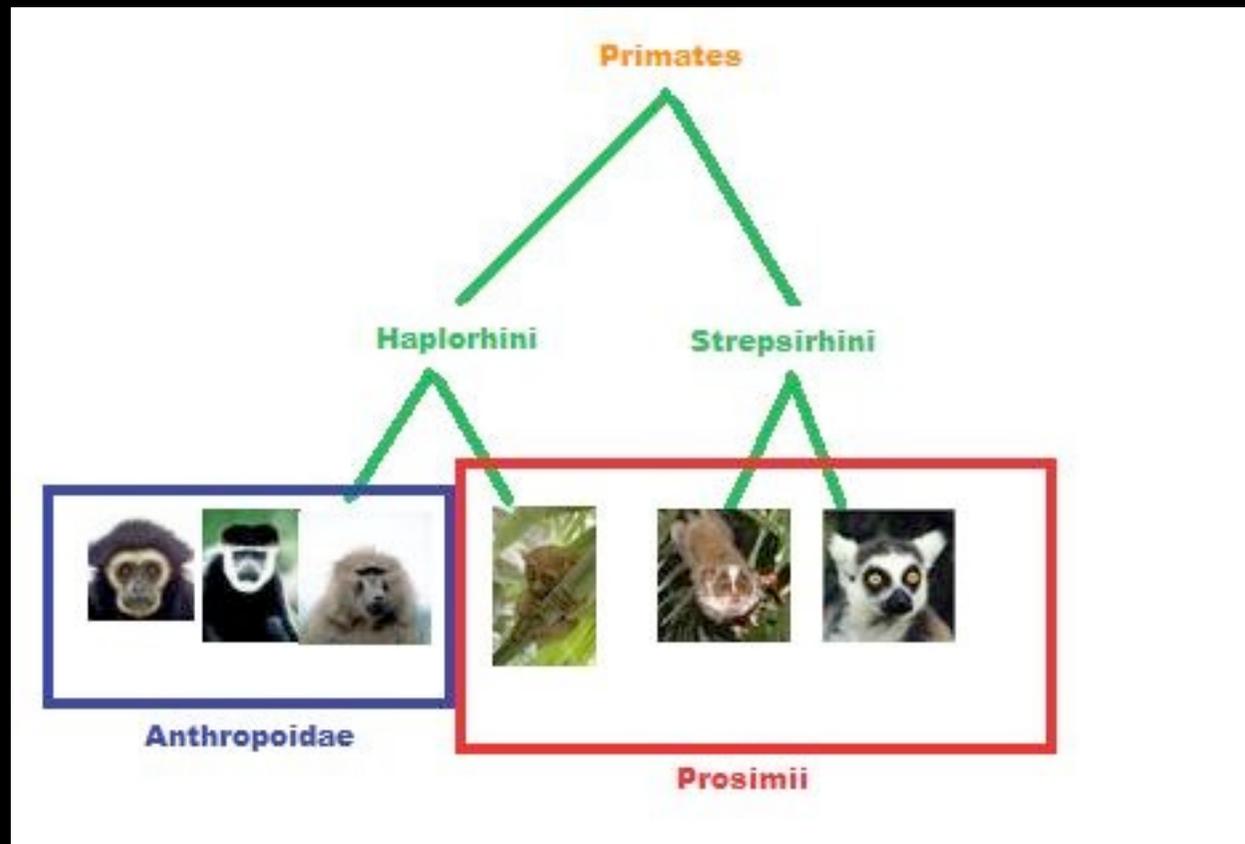
Ida and the Family Tree



Primate Suborders

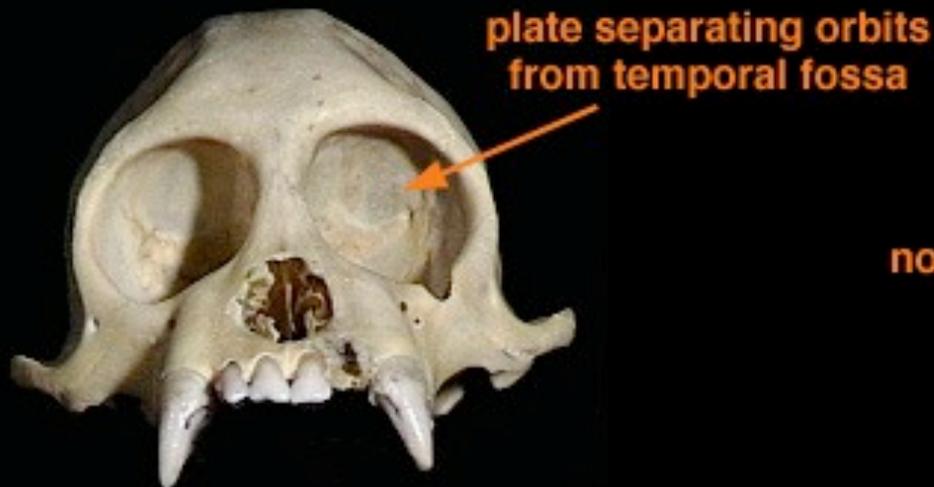
- Haplorhini vs. Strepsirhini
- Anthropoid vs. Prosimian
- What are the differences between these two ways of dividing the primates?

Traditional vs. Modern Taxonomy

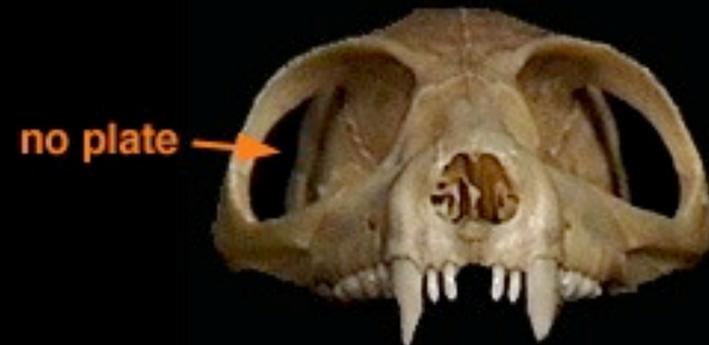
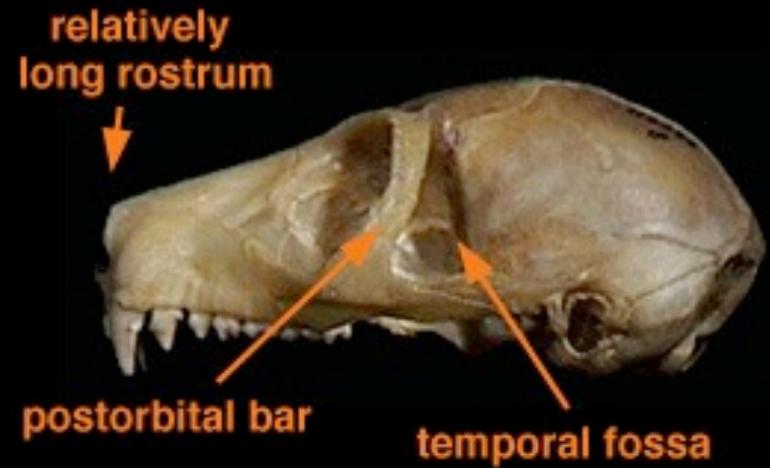


Primates

Haplorhini

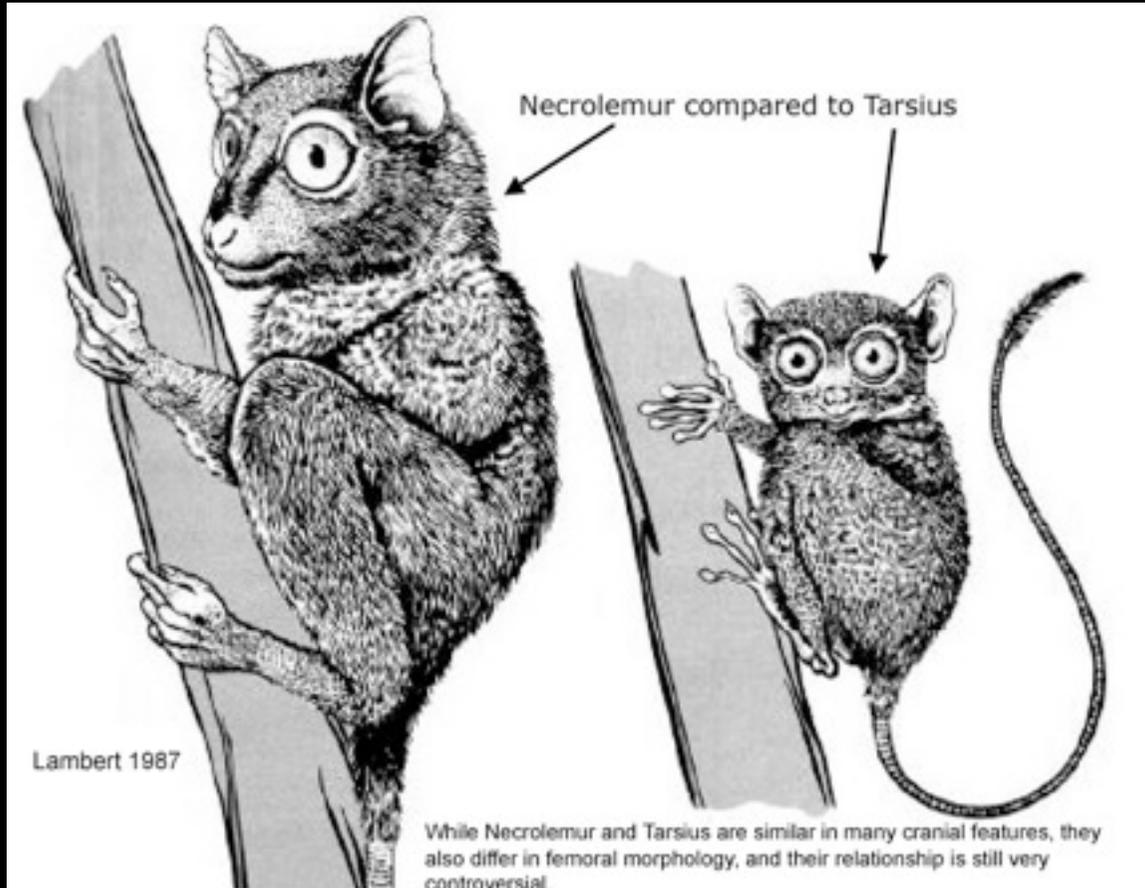


Strepsirhini



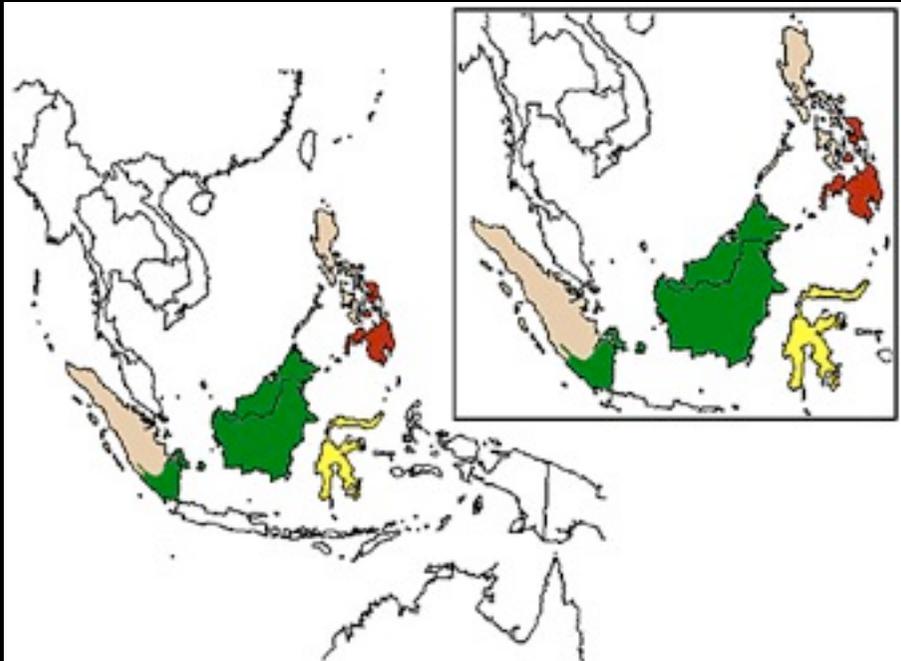
Haplorhines





Tarsier

Suborder: Haplorhini
Infraorder: Tarsiiformes
Superfamily: Tarsiioidea





Tarsier

- nocturnal
- no rhinarium
- grooming claw
- carnivorous
- monogamous pairs
- no tooth comb

Tarsier Skull

