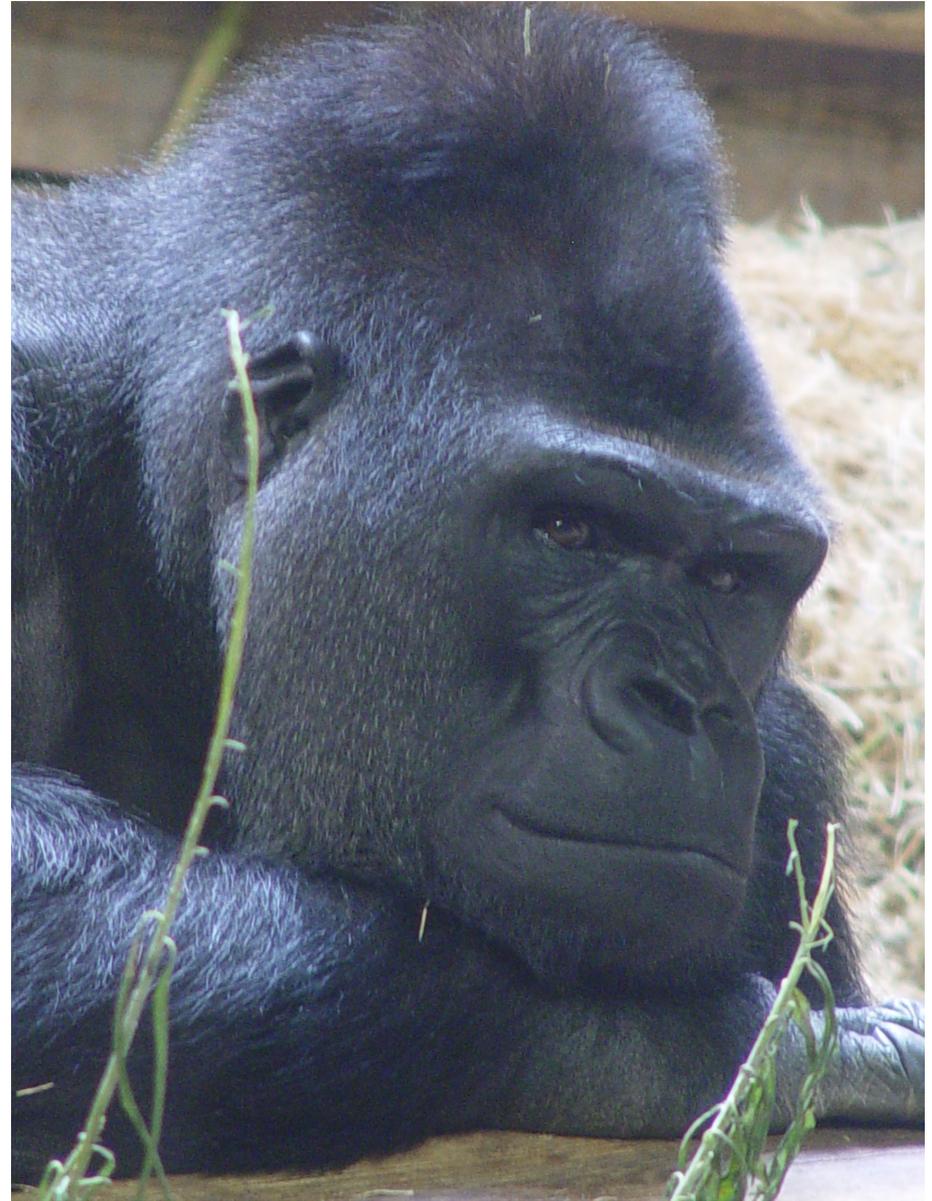


Lecture 1:
The Primates

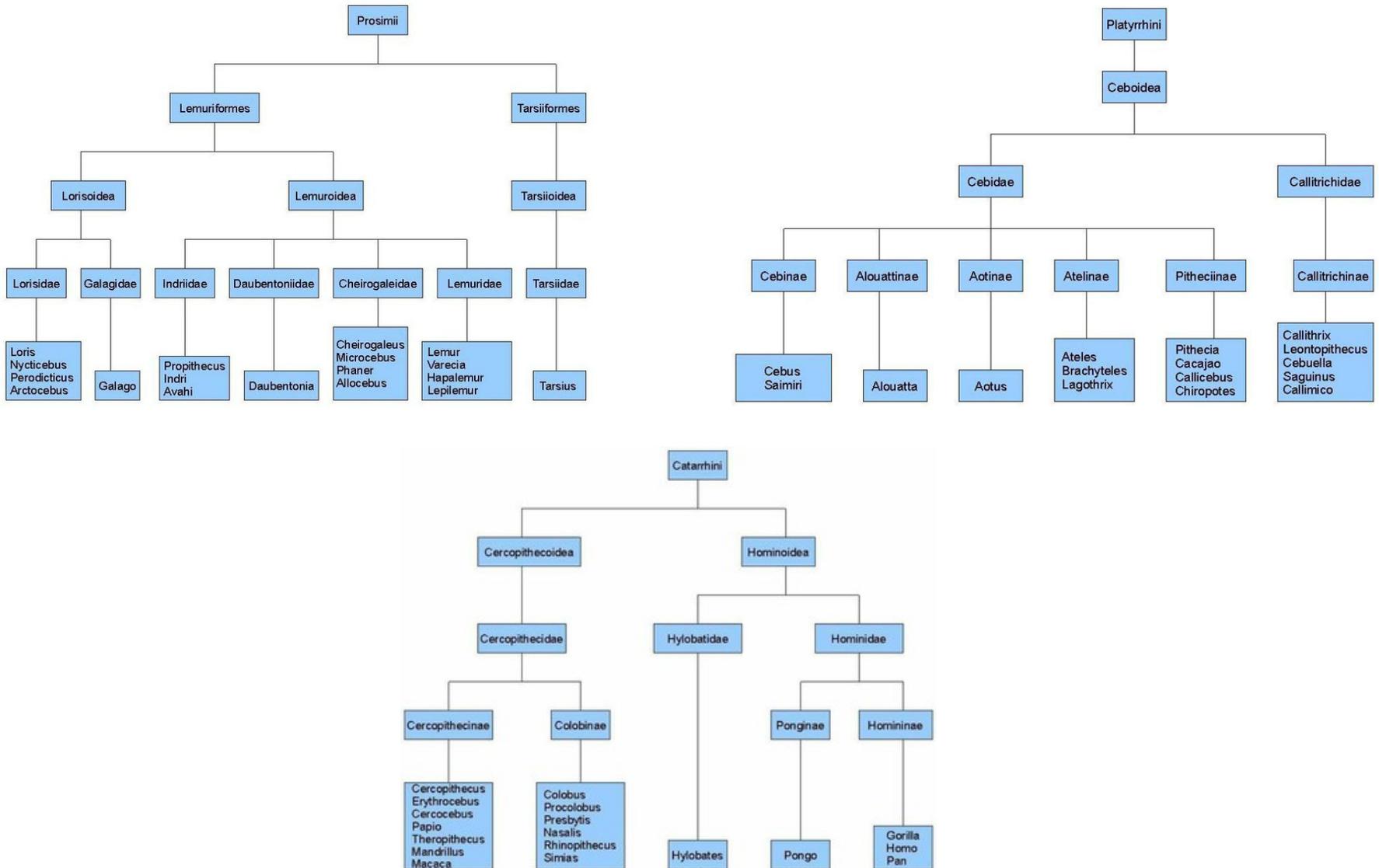


Cogs 143 * UCSD

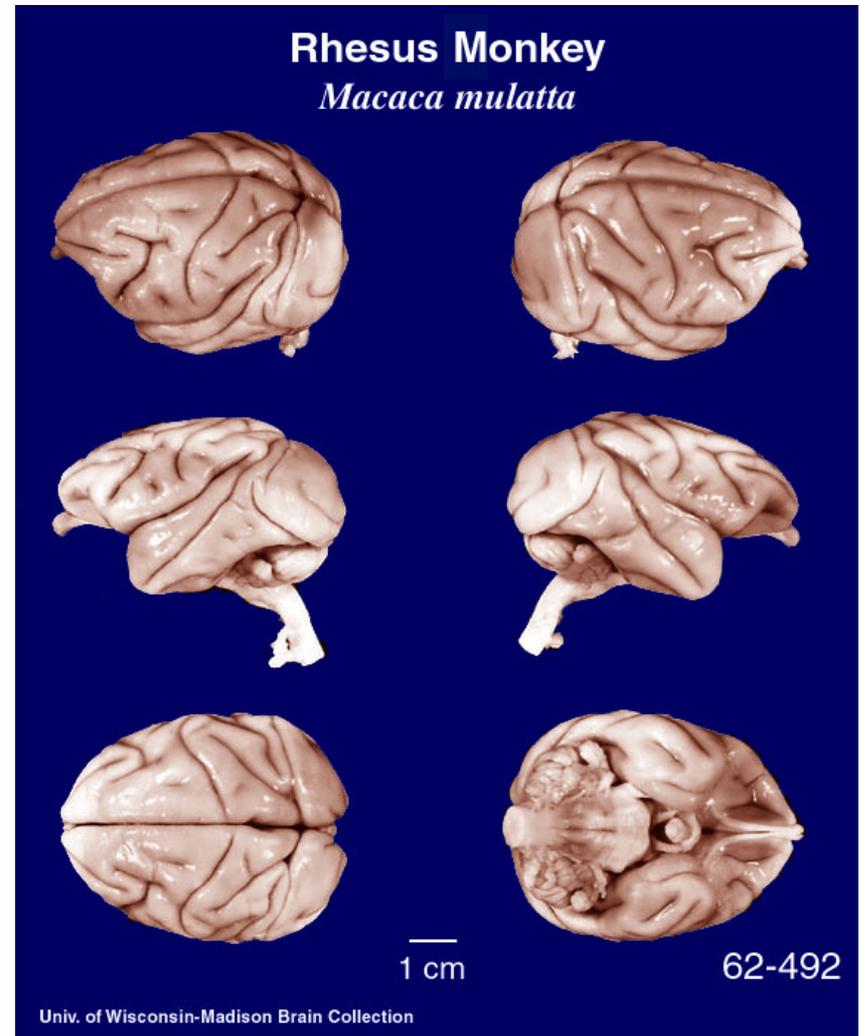
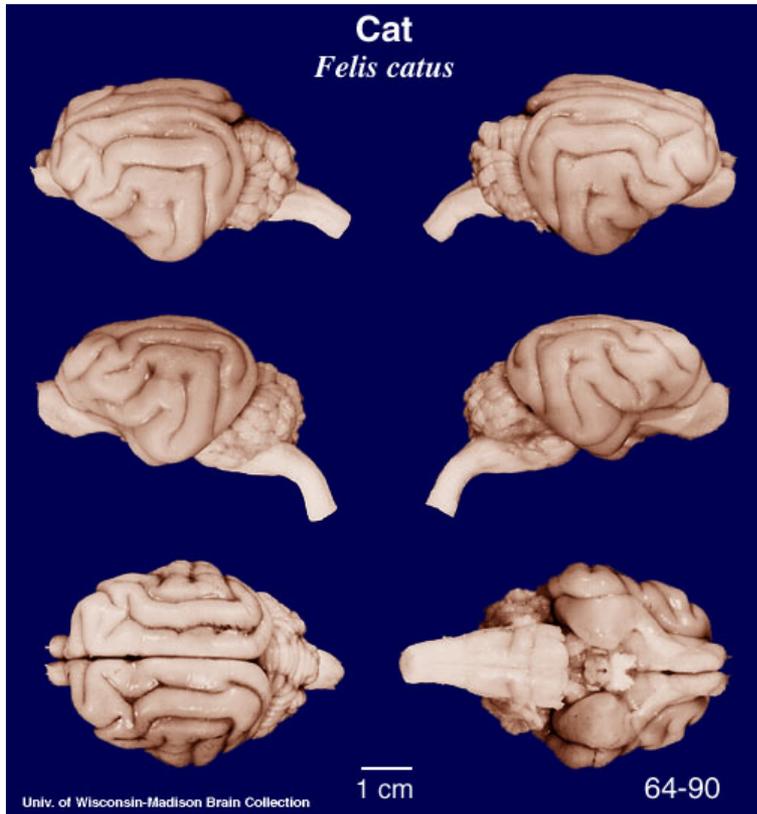




The Order of Primates



Large Brains



Primates have significantly larger brains, compared to other Mammals.

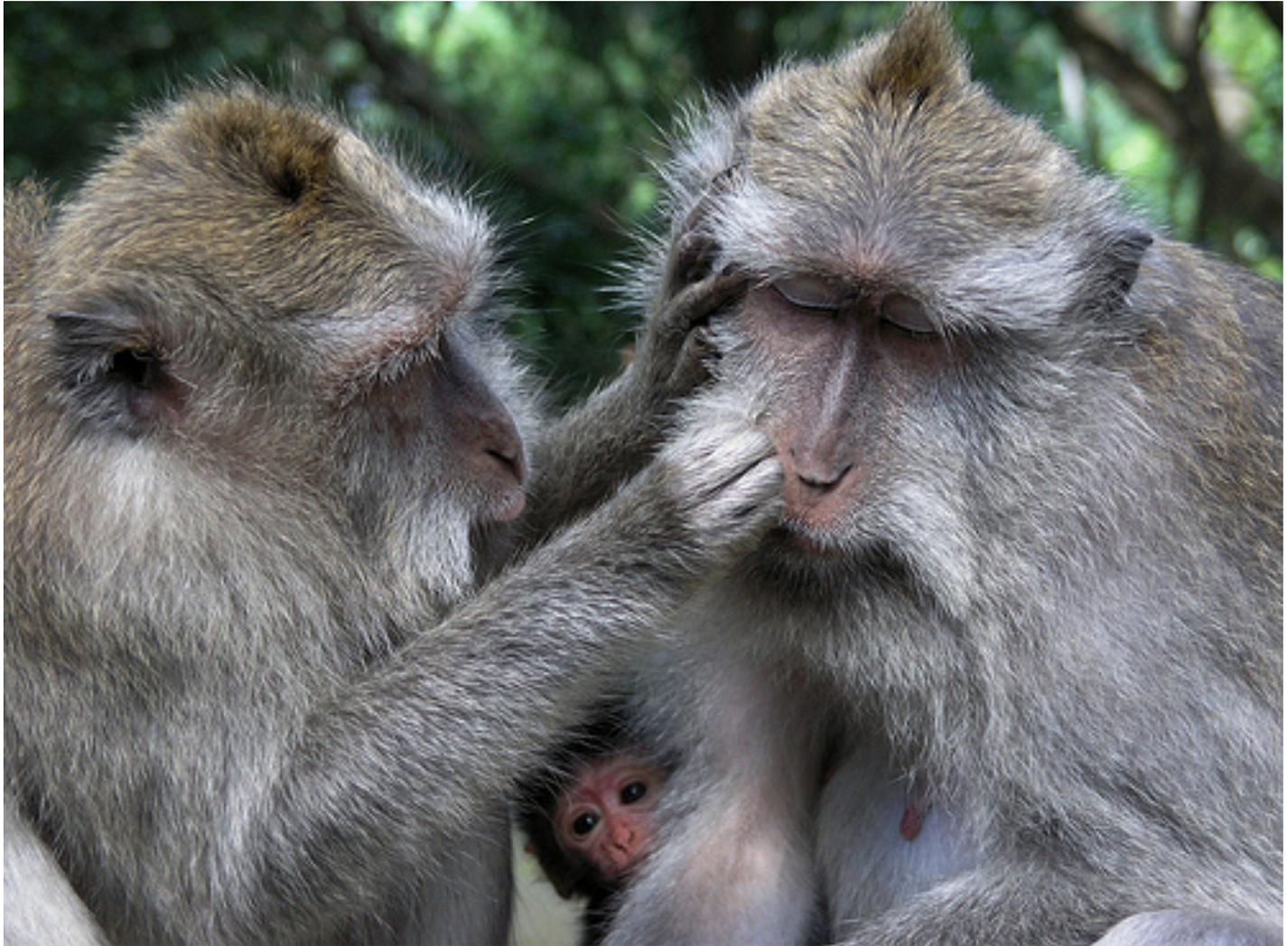
Hand-Eye Coordination



Few, Long-Dependent Young



Highly Social



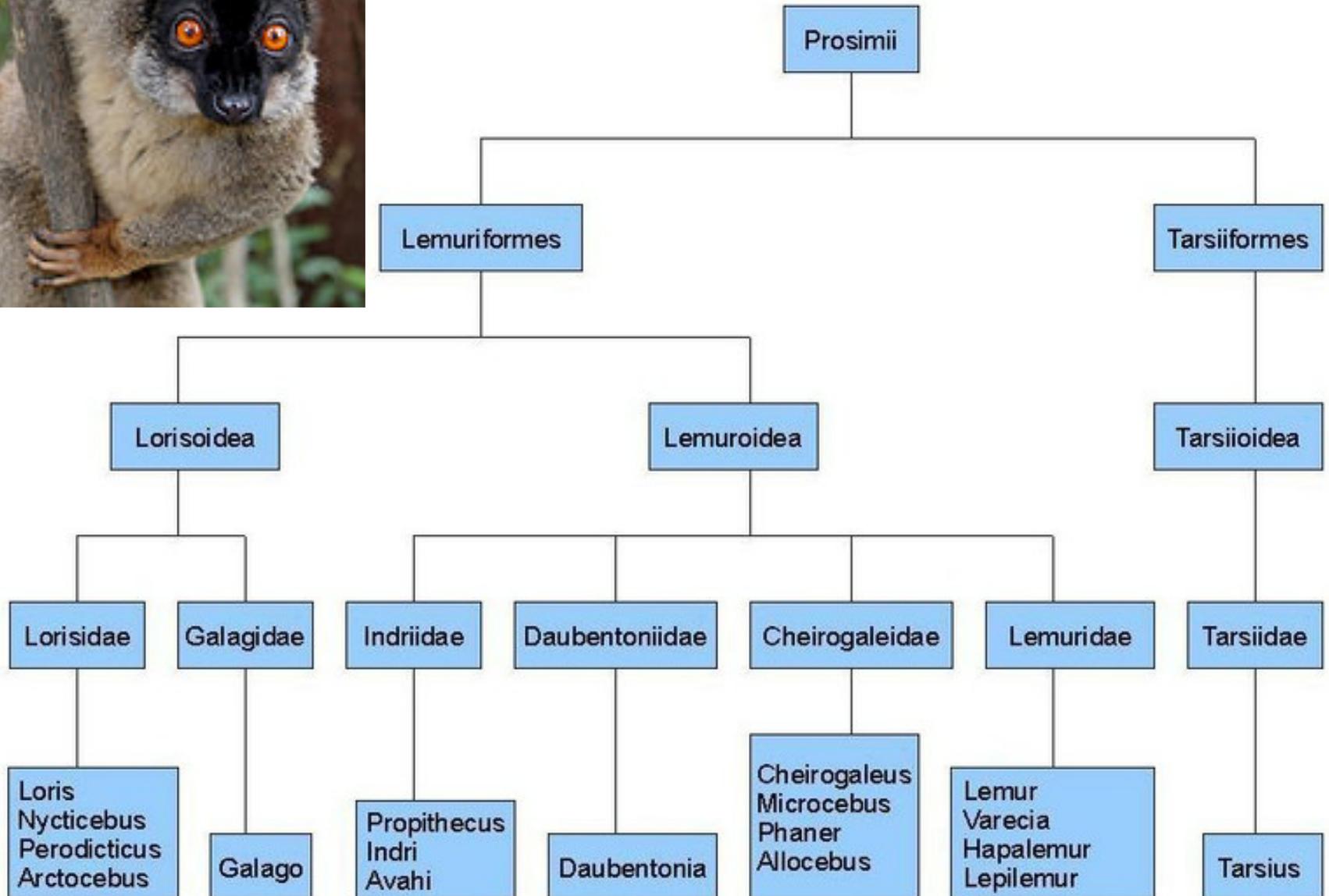
Playful



Two Major Divisions – Prosimians and Anthropoids



Prosimians: Primitive Primates



Ancestral Primate (-like)



Tree Shrew
(not a primate)



Lemur
(primitive primate)

Prosimians



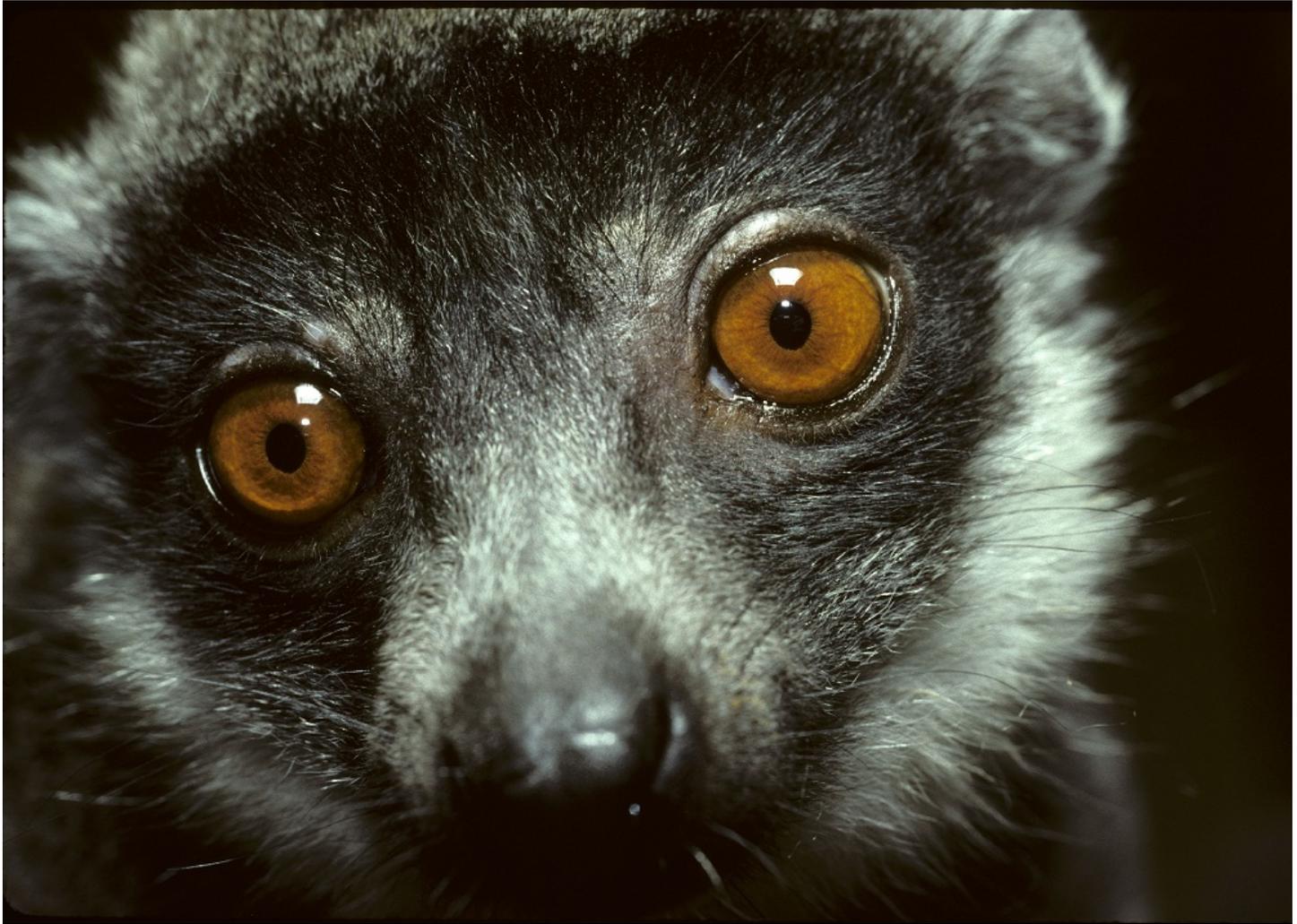
Most are
Insectivores
(hunters!)

Prosimians



They retain the ancestral
pointed snout

Prosimians



Wet noses! Depend on smell

Prosimians



Few young

Unlike rodents...

Prosimians



Like ALL Primates,
Prosimians have
opposable thumbs

Prosimians



Tethered lips. Relatively limited facial expressions.

Prosimians



Some are social

Prosimians



But many are solitary & most are nocturnal

Prosimians



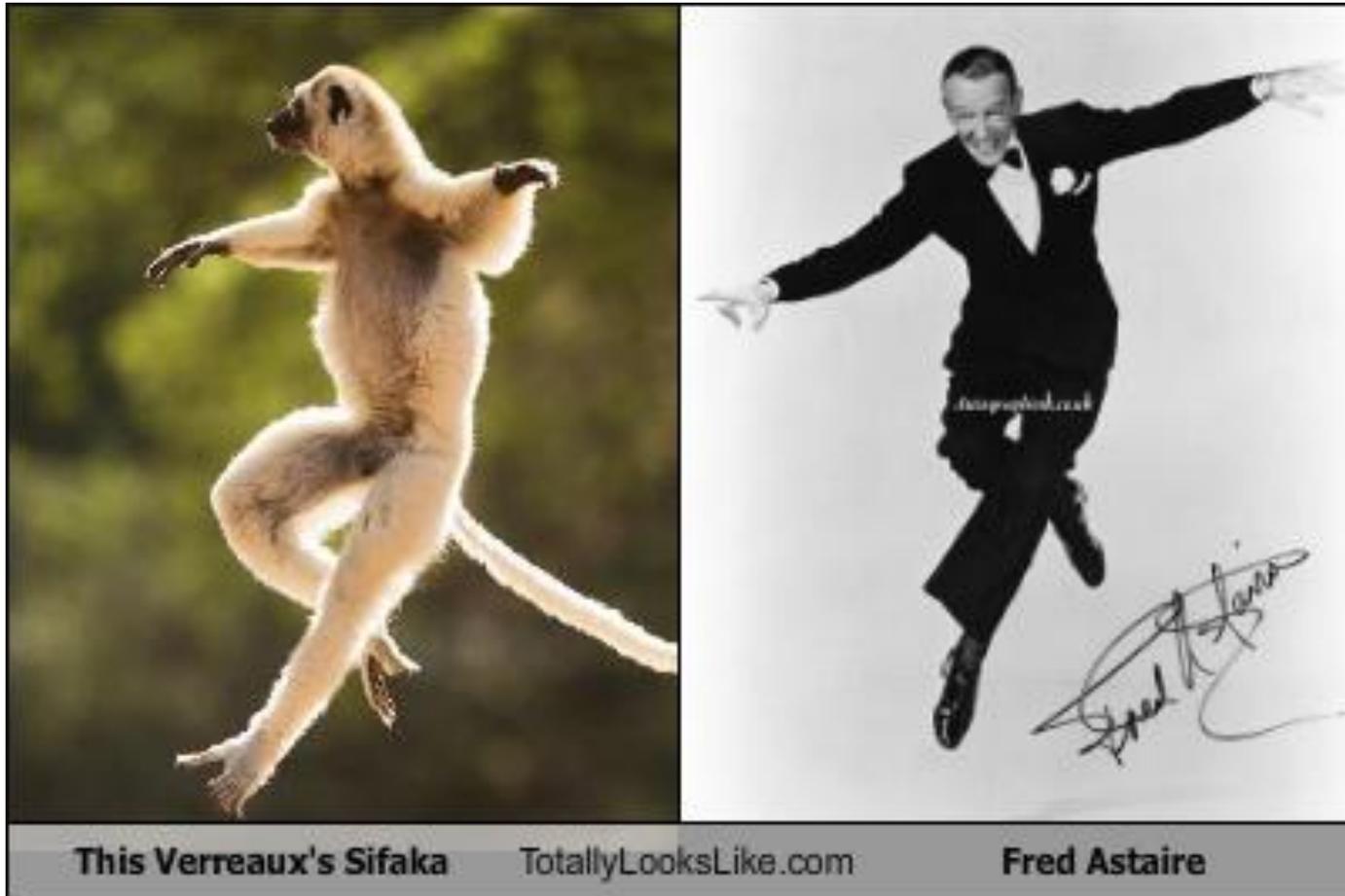
Sifaka running

Prosimians



Like all primates, sifakas can walk on two legs, and laterally raise their arms

Prosimians



Different, but the same. . .

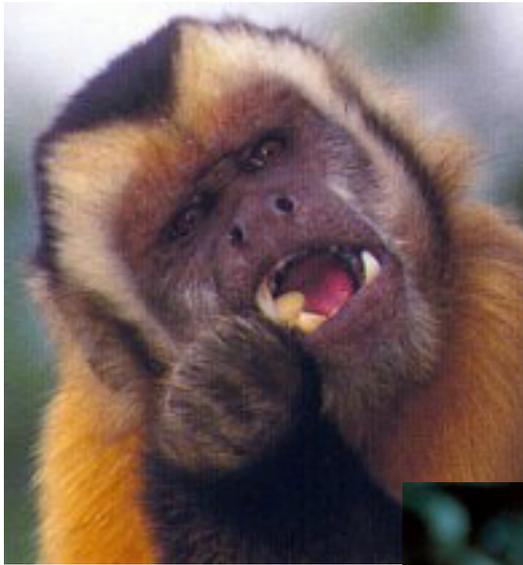
Prosimians



Dr. Erik Patel – former UCSD undergrad, now studies the songs of the sifaka.

e.g. Patel, et al. (2003) *American Journal of Primatology*, 60: 71-72

Anthropoids: the “True” Monkeys



New World Monkeys

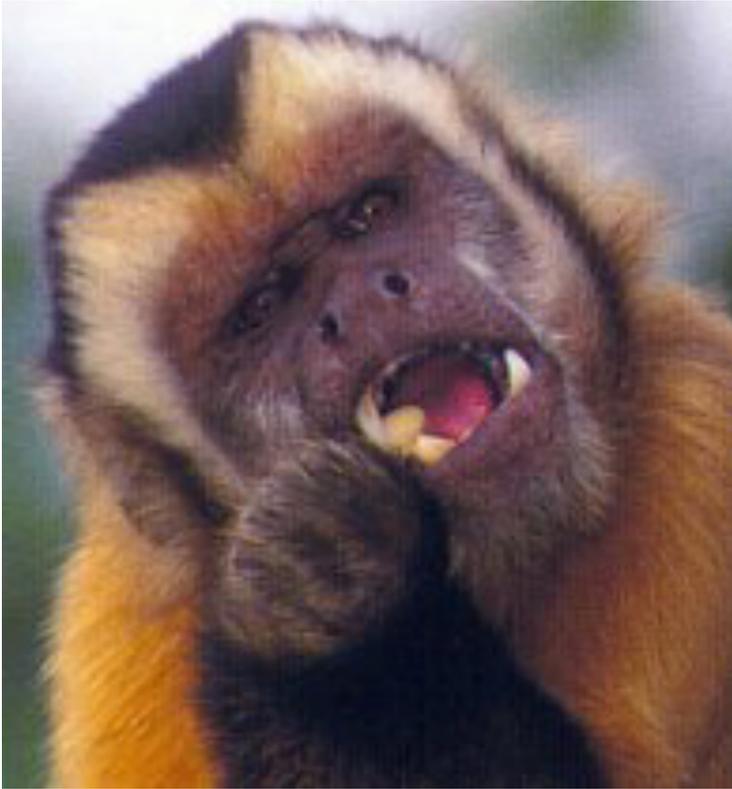


Old World Monkeys



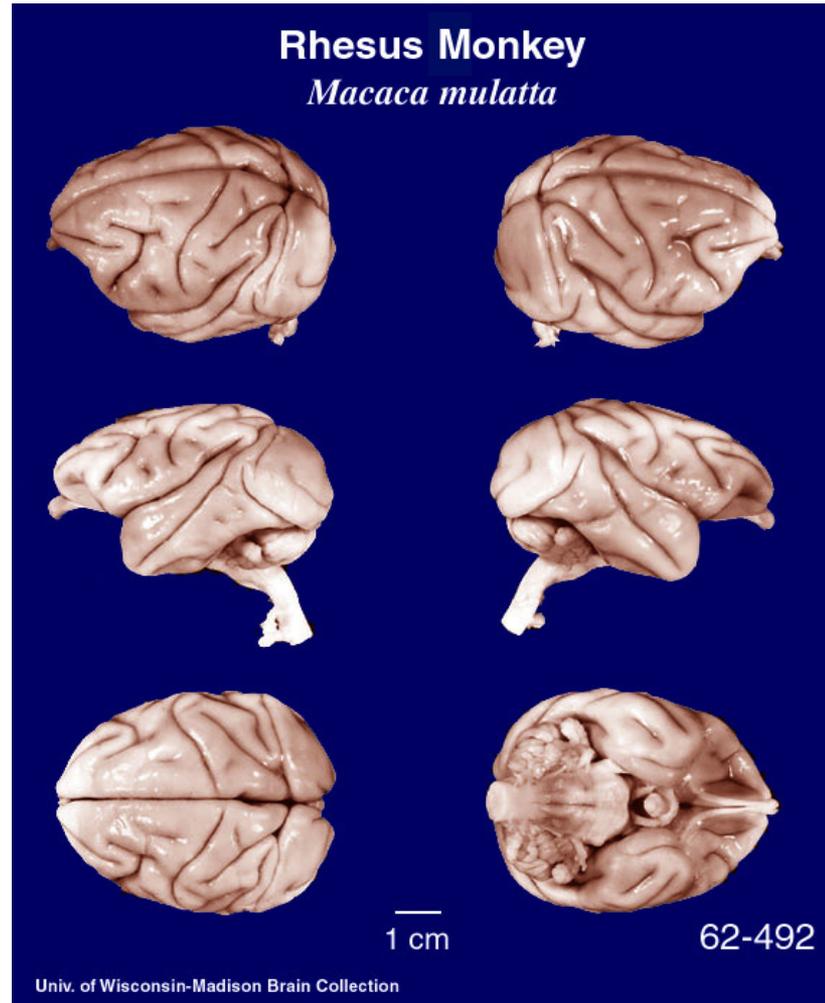
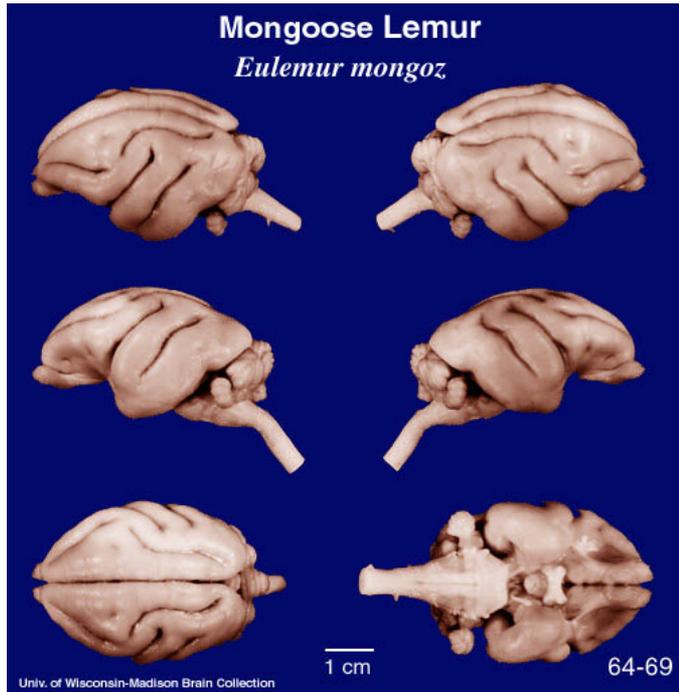
Apes

Anthropoids: the “True” Monkeys



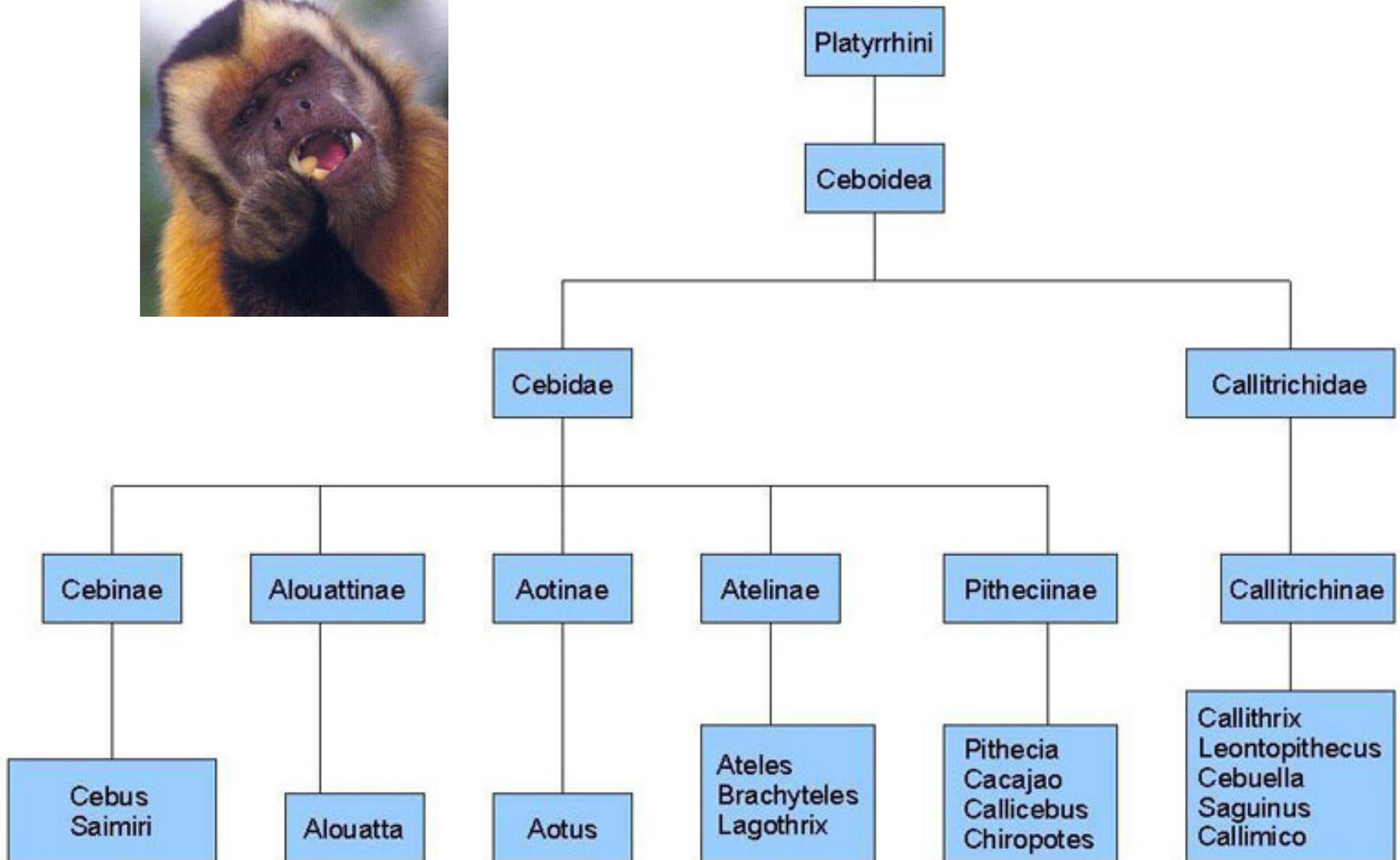
Compared to Prosimians, monkeys have flatter faces, dry noses, and more dexterous hands.

Anthropoids: the “True” Monkeys



Monkeys also have relatively larger and more convoluted brains than Prosimians.

New World Monkeys



New World Monkeys



Wide variation in niche



Leaf-eaters tend to be smaller brained than more omnivorous species

New World Monkeys

Most grasp with
hook grip
(and tail)



New World Monkeys



Many have
prehensile tails

(No Old World
monkeys do)

New World Monkeys



ALL are arboreal

New World Monkeys

All are diurnal



New World Monkeys

All are diurnal

(except the
Owl Monkey)



New World Monkeys



Nearly all are highly social



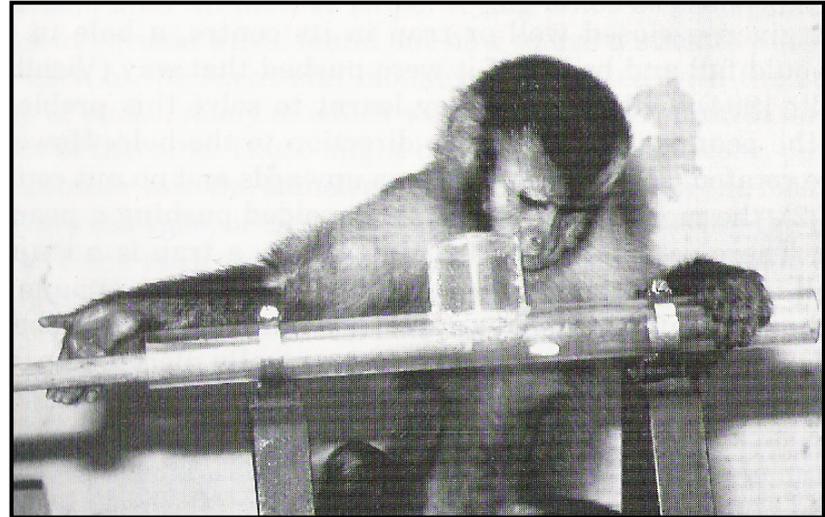
New World Monkeys



Cebus (AKA Capuchin) monkey has the largest relative brain size of all New World monkeys

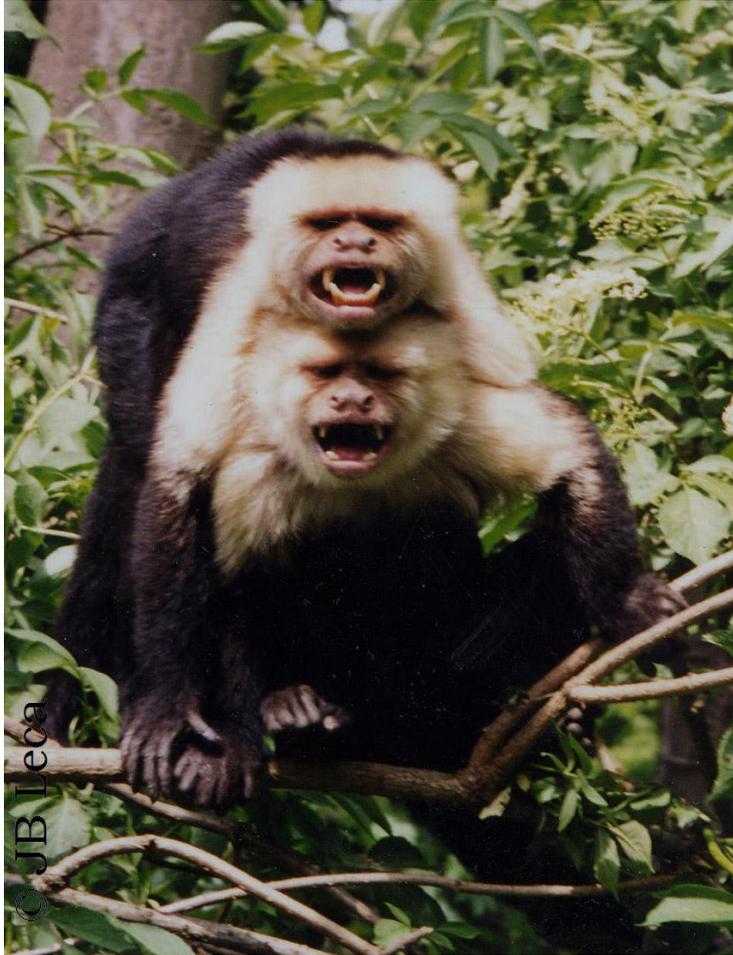
LATIN: *Cebus* spp.

New World Monkeys



Cebus have long been recognized for their refined motor skills.

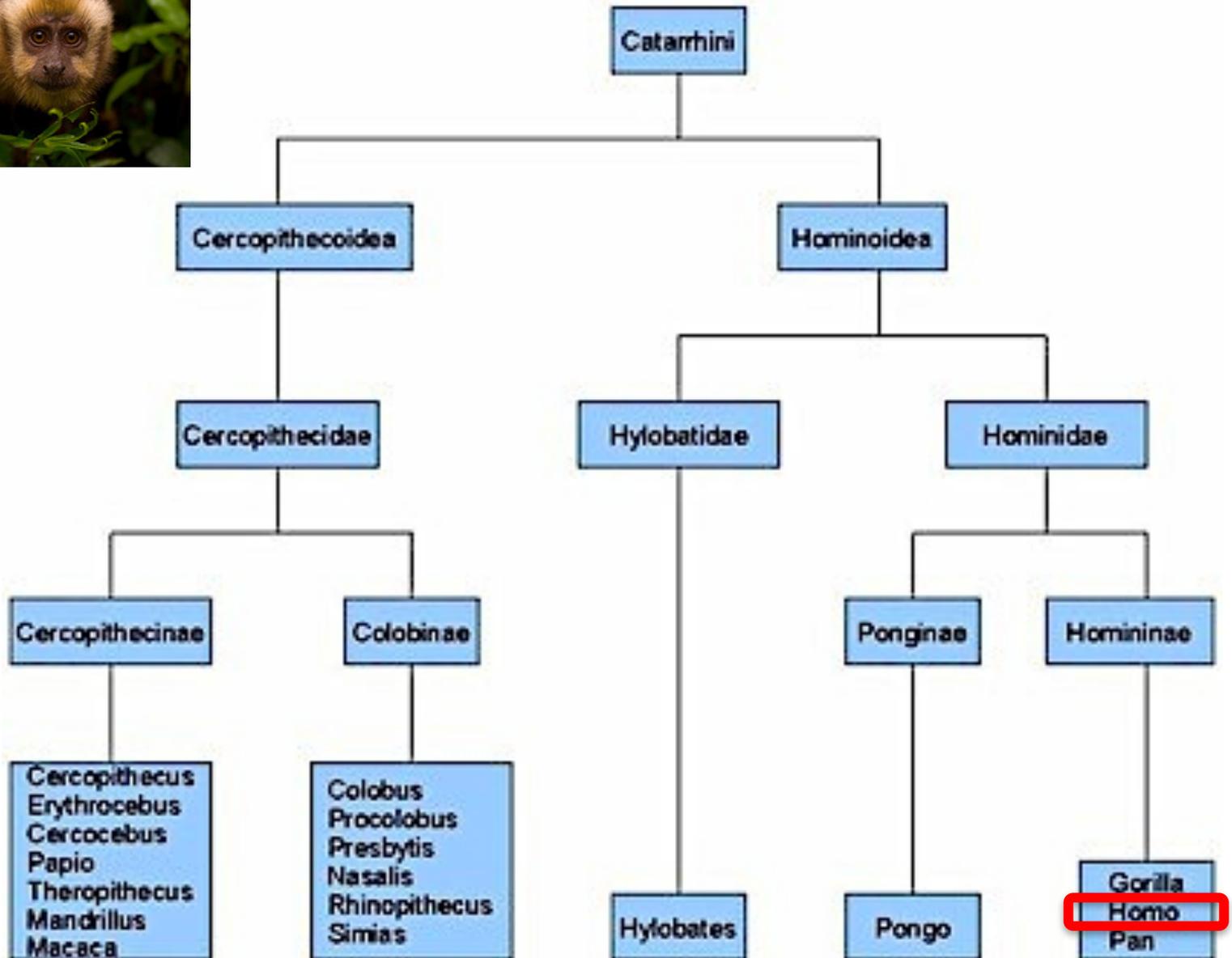
New World Monkeys



Sometimes called “the apes of the New World”, ***Cebus*** also engage in complex social interactions



Old World Monkeys & Apes



Old World Monkeys & Apes



Many arboreal,
but some are terrestrial



Old World Monkeys & Apes



Many have
Ischial callosities

Old World Monkeys & Apes



Ischial callosities are an arboreal adaptation, allowing us to sit upright in trees

Old World Monkeys & Apes



Ischial callosities ...

help free our hands!

Old World Monkeys & Apes



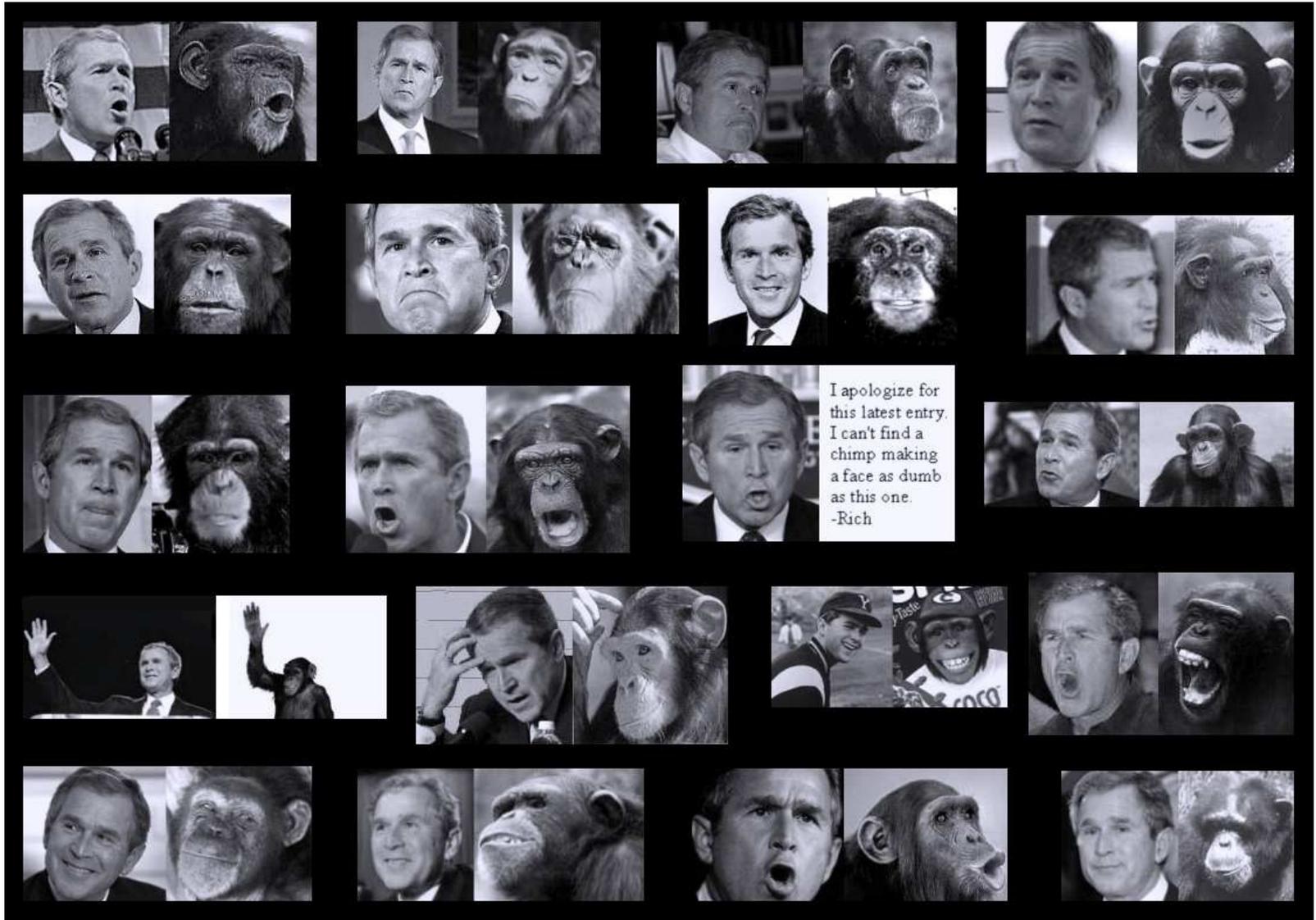
Precision grip

Old World Monkeys & Apes

Includes the flattest
faces



Old World Monkeys & Apes



Faces highly malleable – wide range of facial expressions

Old World Monkeys & Apes



Highly social

Old World Monkeys

of special interest...



Vervet
Alarm calls

LATIN:
Cercopithecus
aethiops



Baboon
Coalitions

LATIN:
Papio spp.



Macaque
Traditions

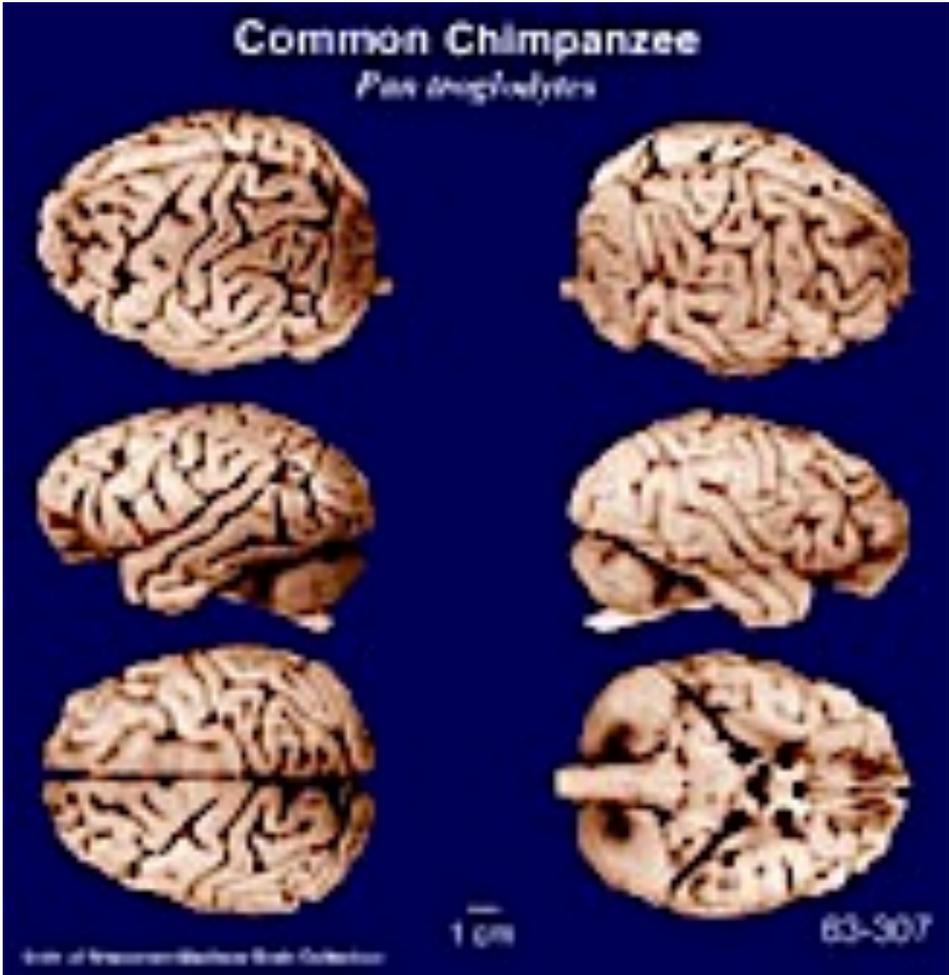
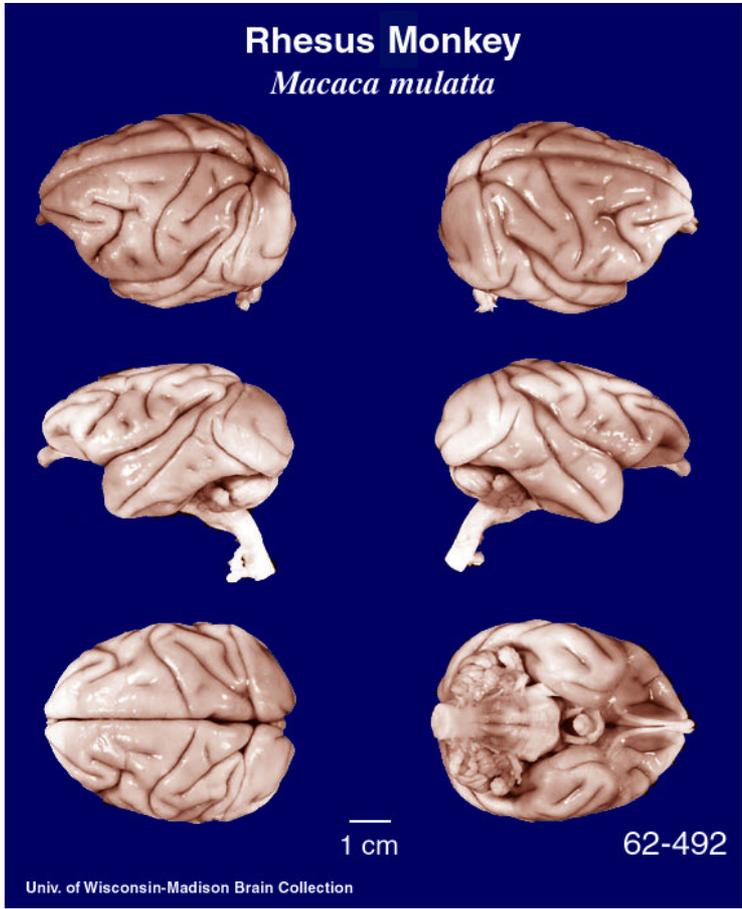
LATIN:
Macaca spp.

The Apes



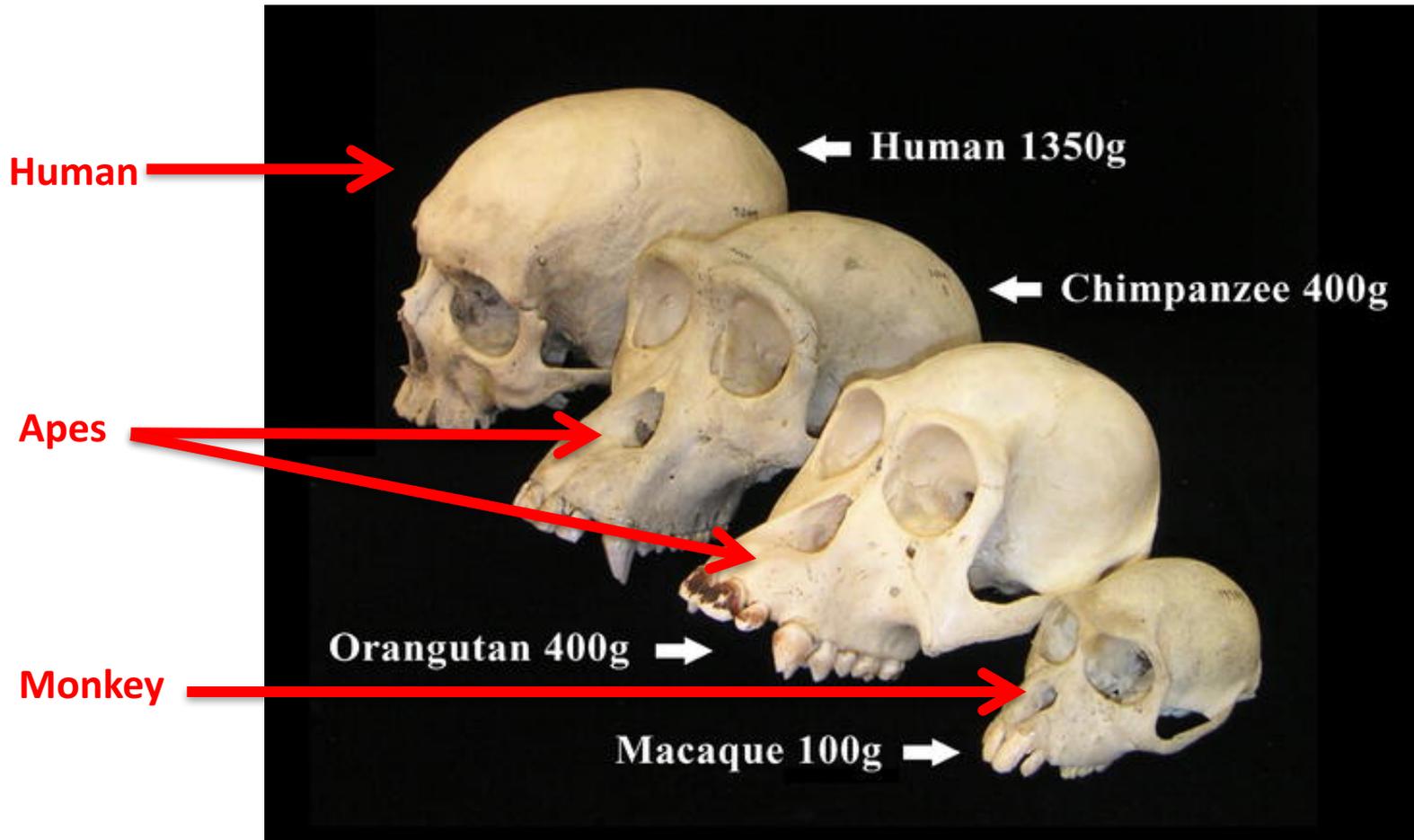
The Apes

Largest Brains



The Apes

Large bodied



Most prolonged immaturity



Apes nurse for up to 4 years

Not sexually mature until 10-12 years

The Apes

The Lesser Apes



The Great Apes



The Lesser Apes



Monogamous

The Lesser Apes



Pairs duet on their territory

The Lesser Apes



Like ALL the apes, they have no tails.

The Great Apes



Orangutan

LATIN:
Pongo
pygmaeus

The Great Apes



Gorilla

LATIN: *Gorilla gorilla*

The Great Apes



Chimpanzee

LATIN: *Pan troglodytes*

The Great Apes



Bonobo

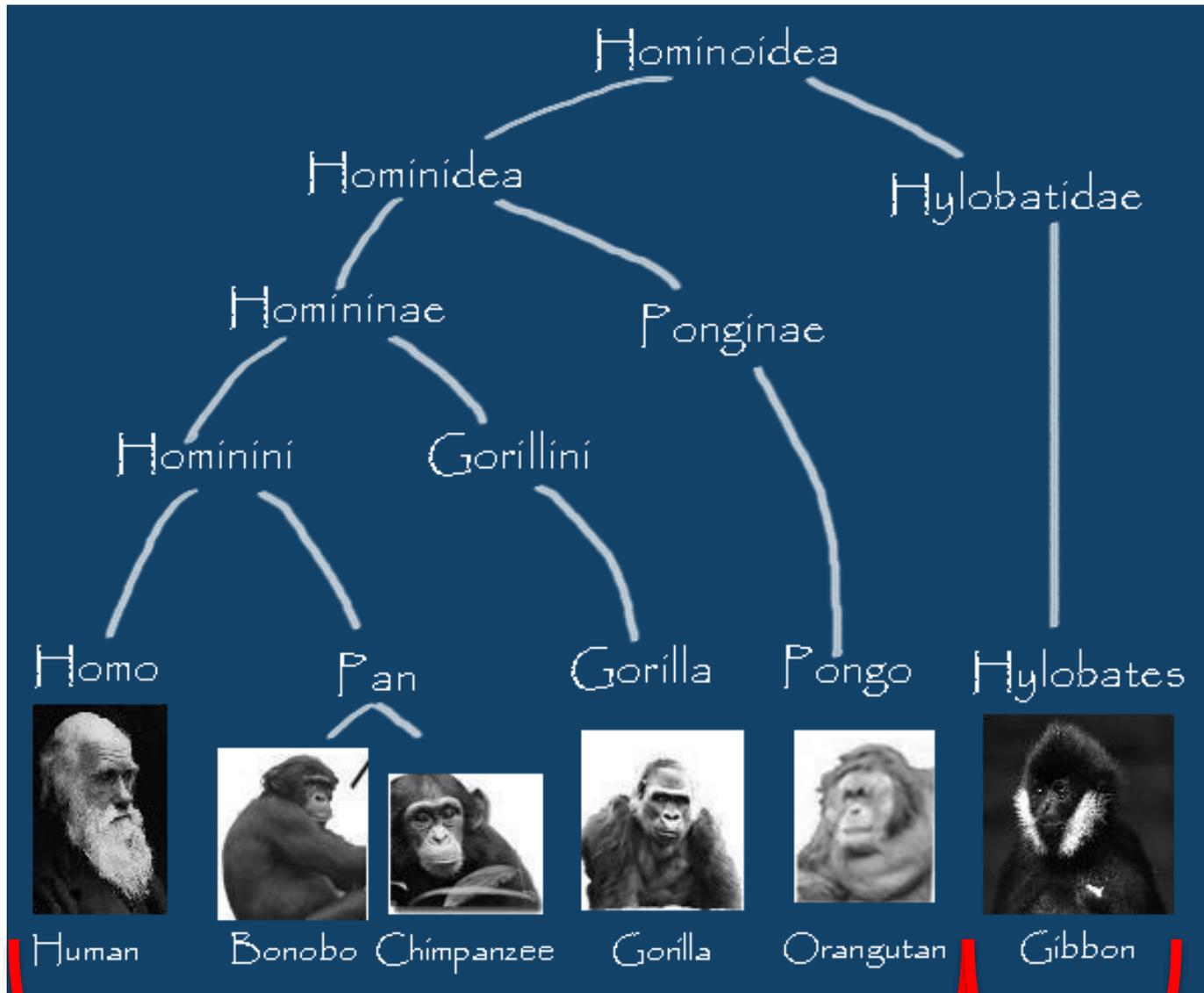
LATIN: *Pan paniscus*

The Great Apes



Human

LATIN: *Homo sapiens*



Great Apes

Lesser Apes

Homo sapiens

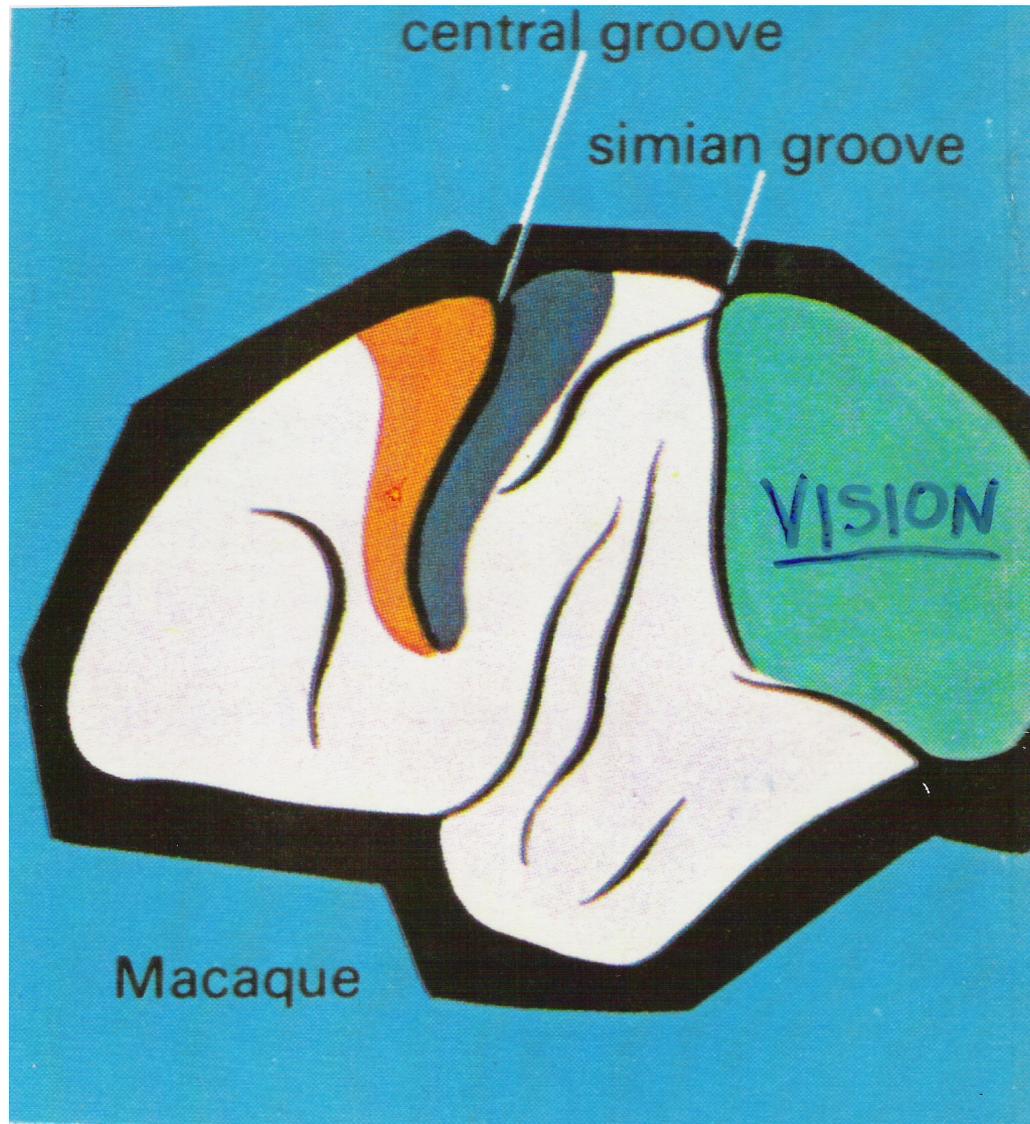
- Bipedal
- Altricial
- Dexterous
- Largest brain



- Language, teaching, cumulative culture, etc...

Sensori-Motor Constraints on Primate Cognition

Visual Brain

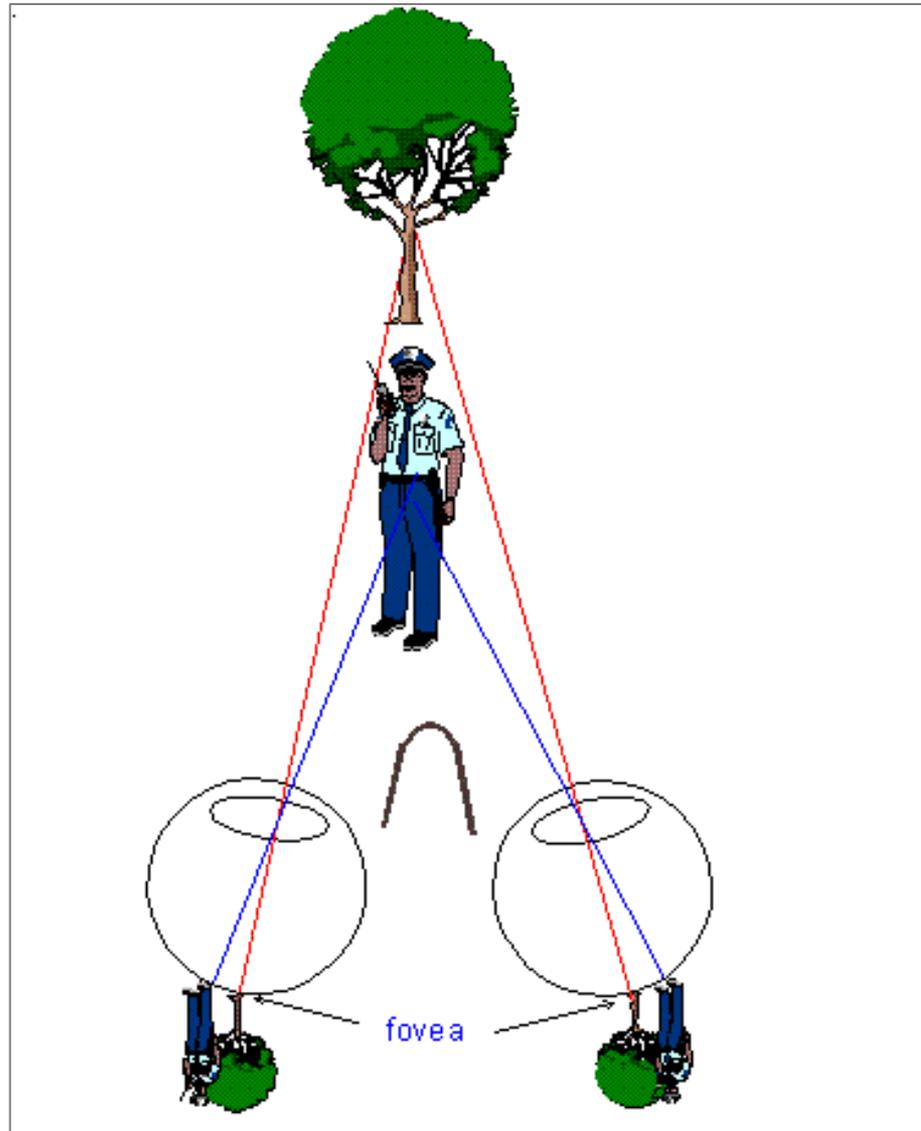


Forward facing eyes



Forward facing eyes

Binocular
Disparity



Forward facing eyes

Good Depth Perception

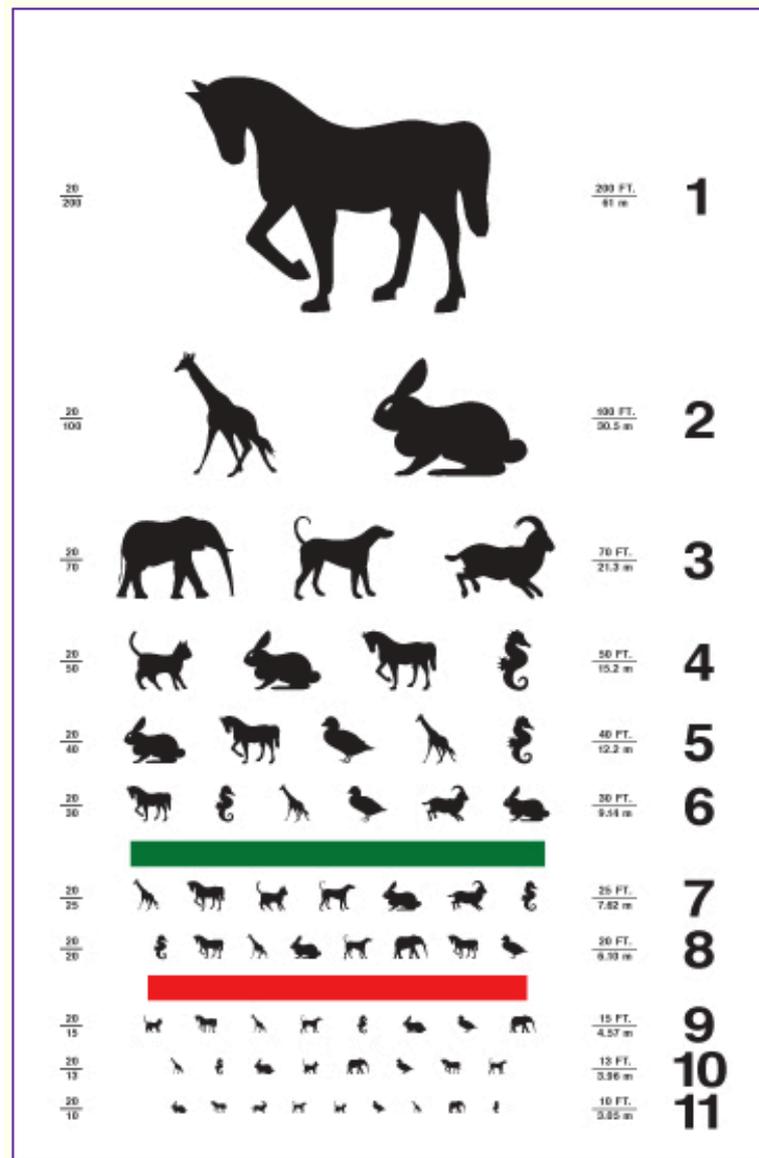


For arboreal locomotion



For hunting (insects)

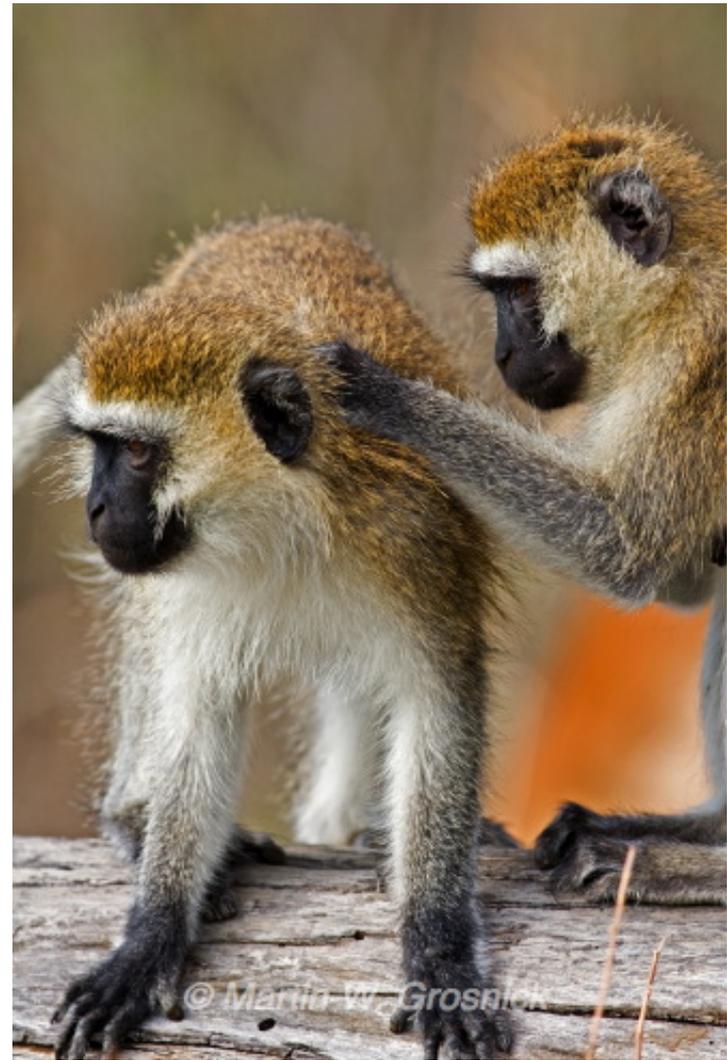
Visual Acuity



Visual Acuity

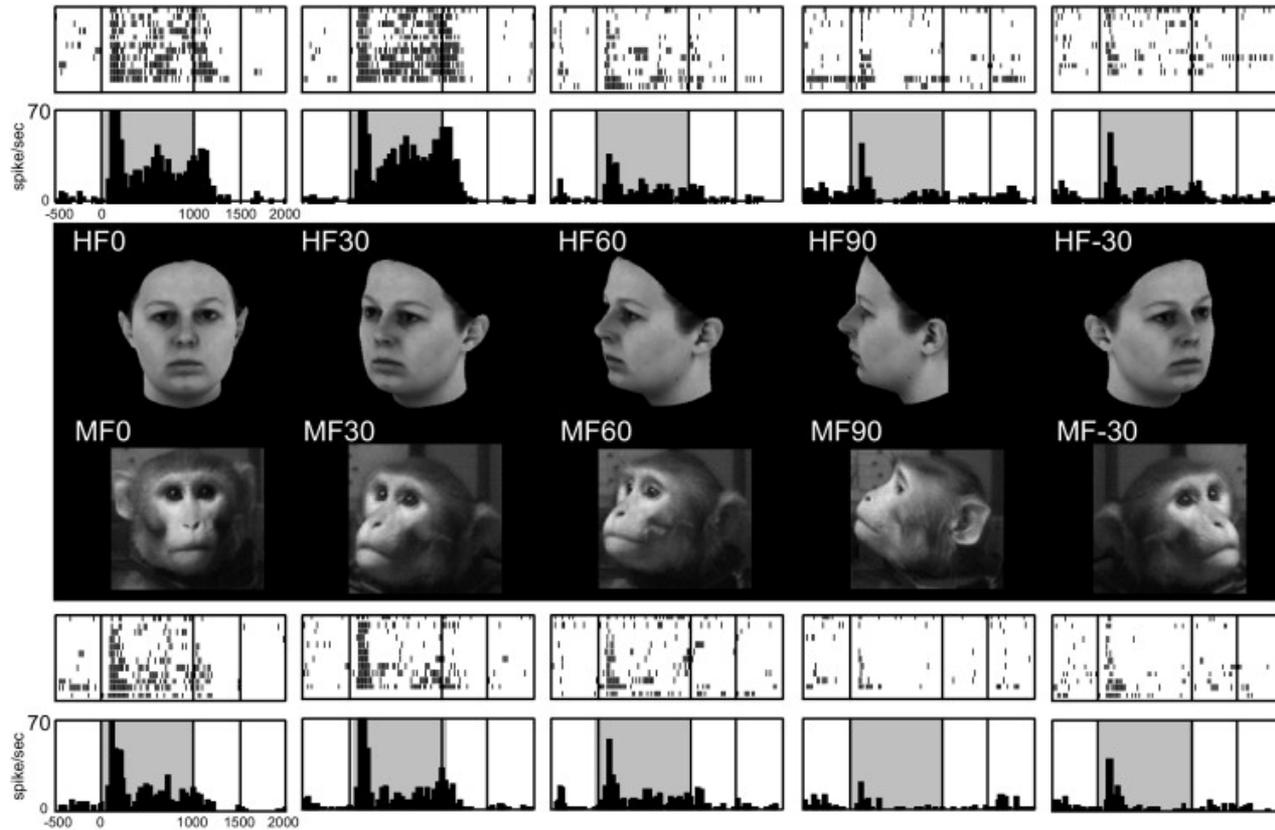


For foraging



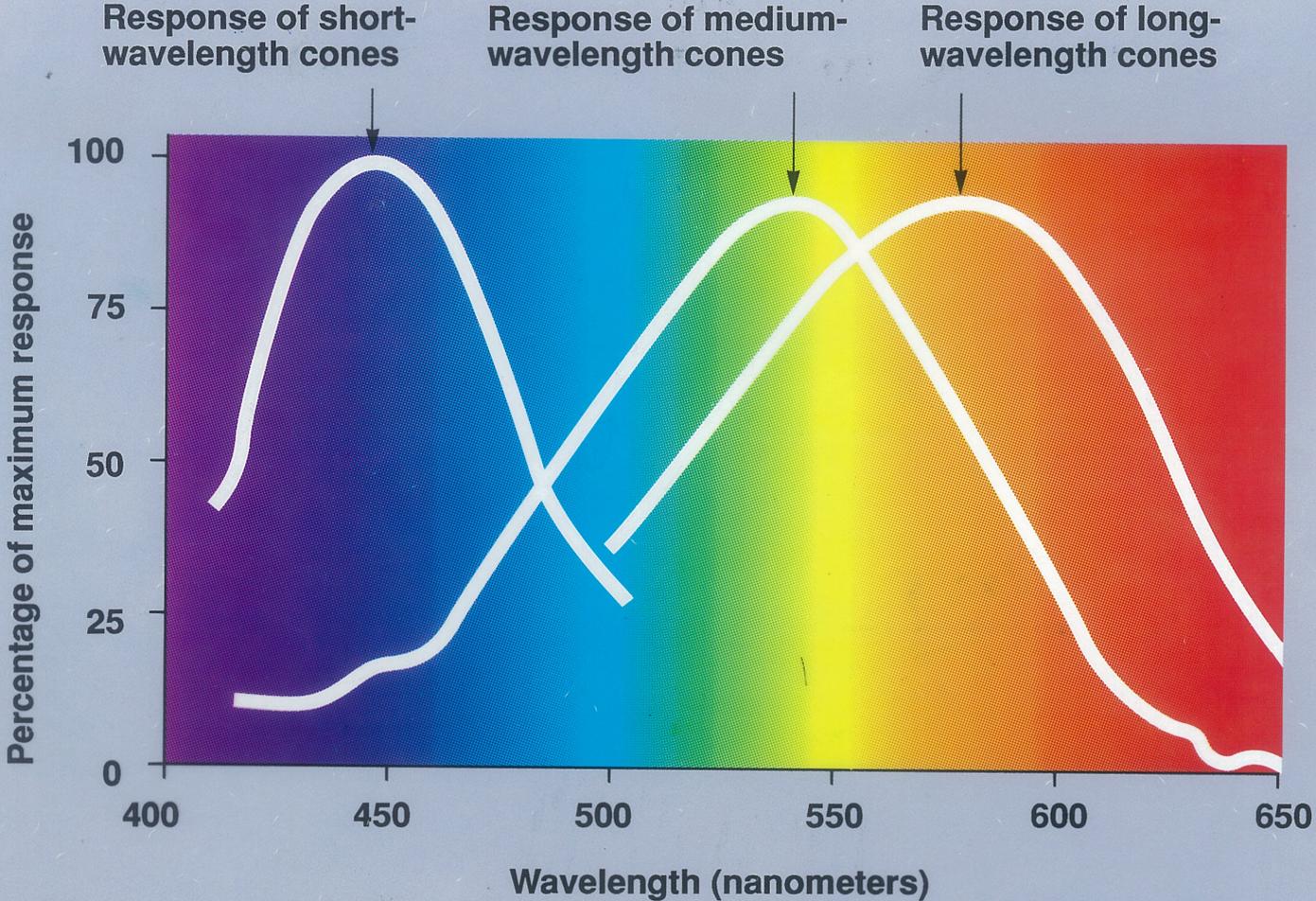
And social interaction

Visual Acuity



Special sensitivity to faces

Color Vision



Response to various wavelengths

Color Vision



For discriminating ripe, from unripe, fruit

Color Vision



For social signals



Progressively refined motor control of face



Balance



Well-developed vestibular system

Good Hearing



Varied vocal repertoire,
including loud broadcast calls
and intimate signals

Relatively poor sense of smell

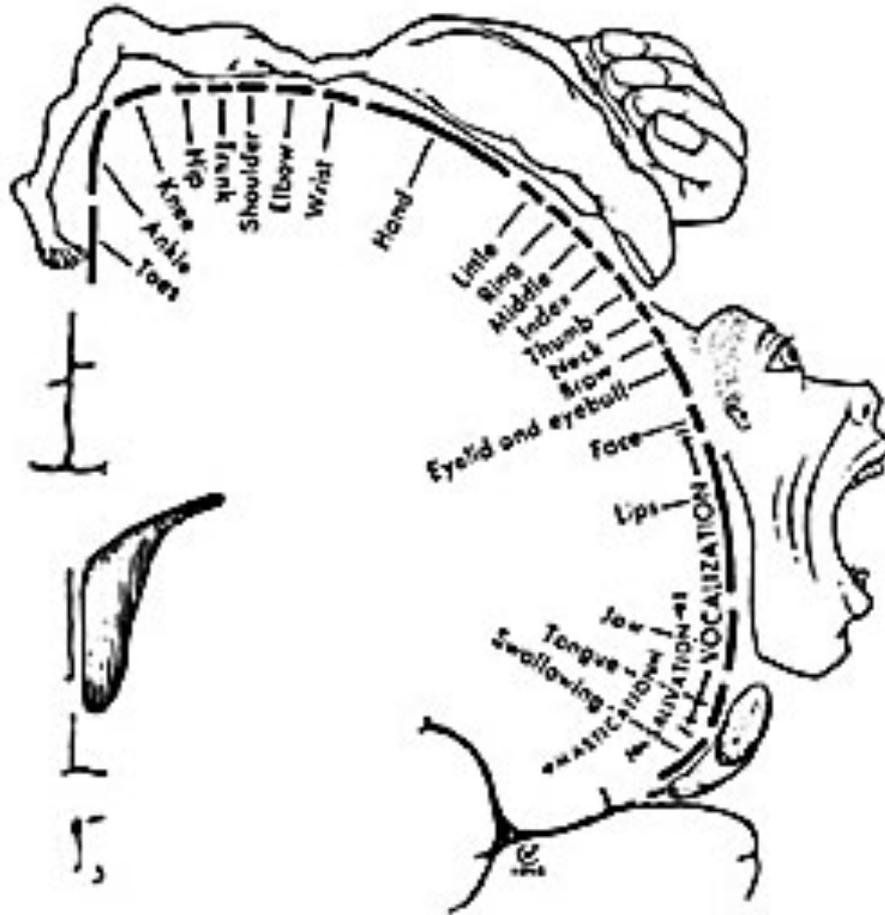


Rely heavily on vision

Tactile Sensitivity

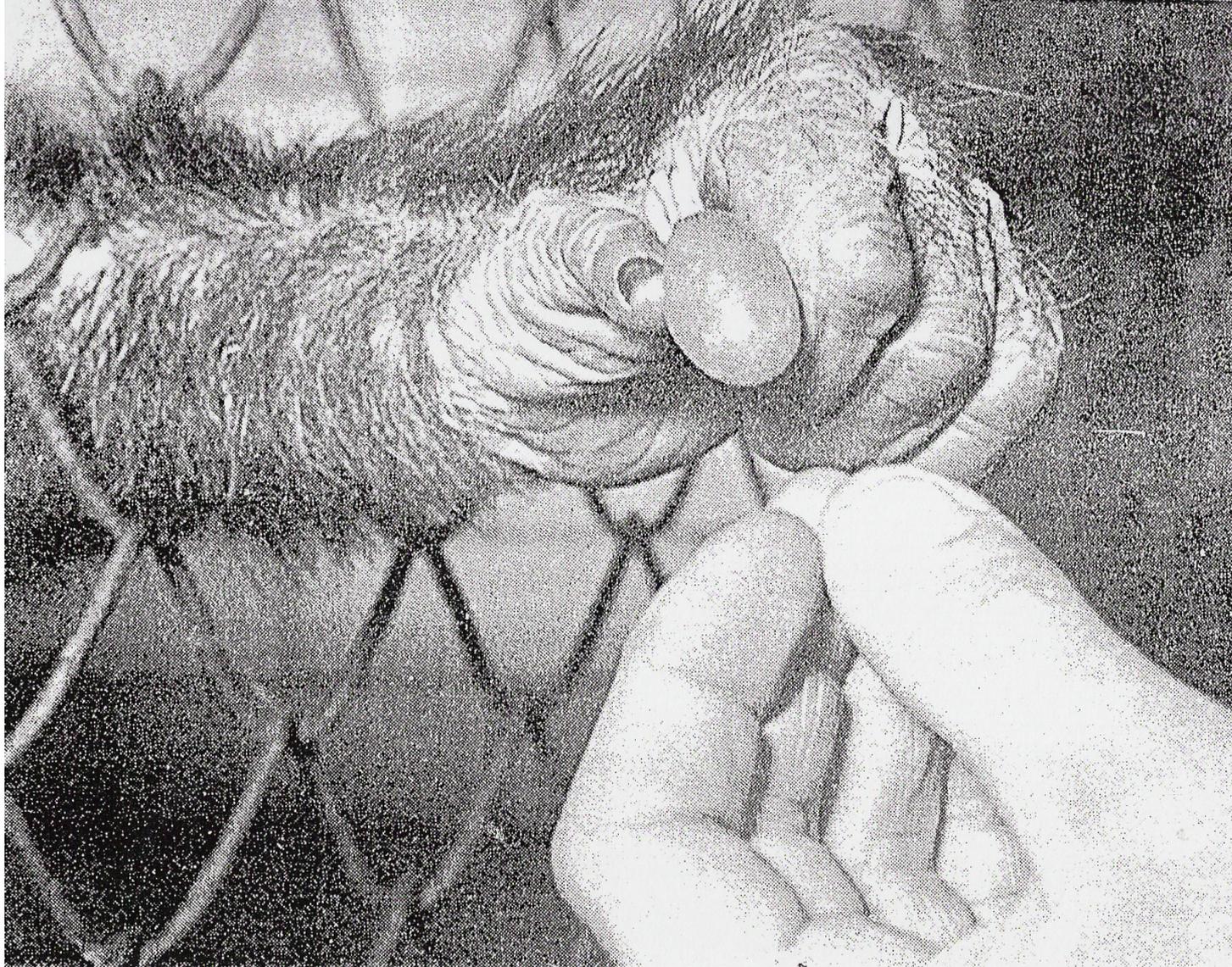


Tactile Sensitivity



Especially in hands and face

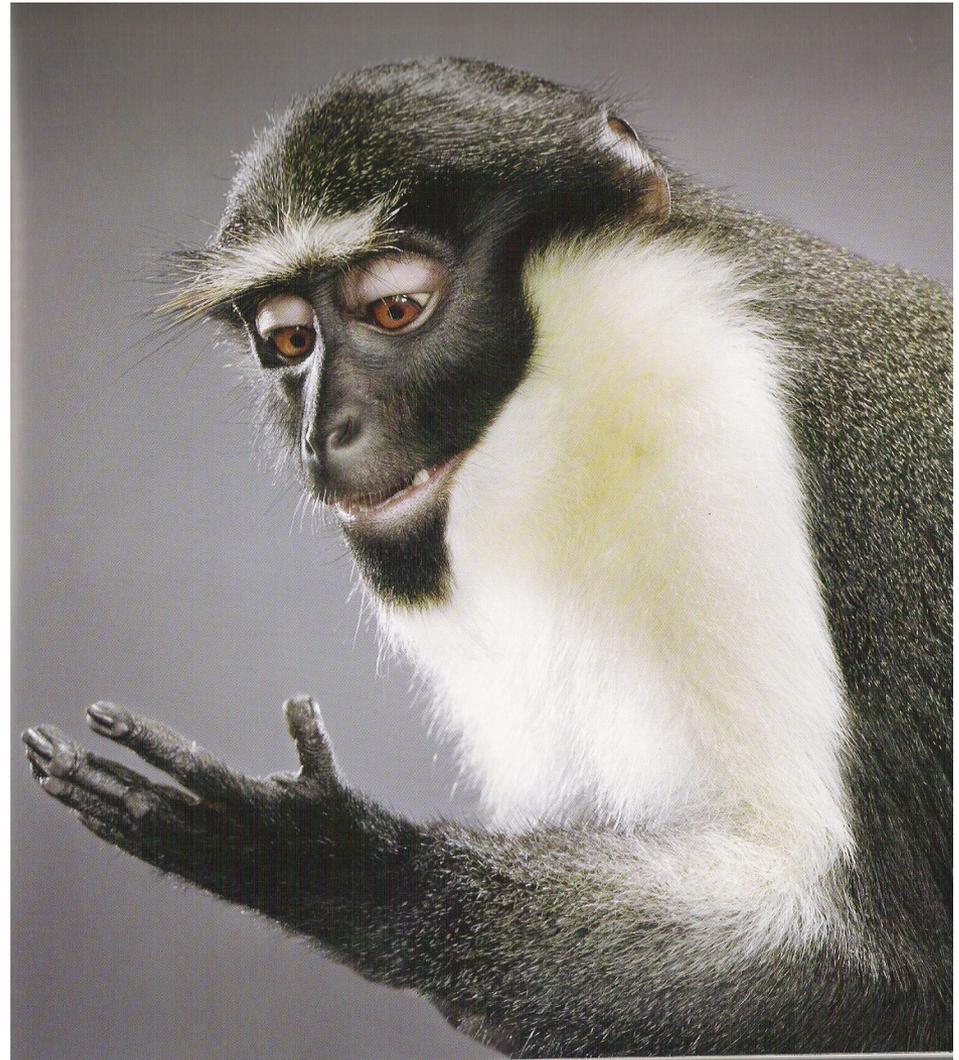
Opposable thumbs, grasping hands



Other animals also have dexterous hands with opposable thumbs...



But primates can *SEE*
their own hands >>
Hand-Eye Coordination



Hand-Eye Coordination >>> Tool Use in Some Species



Hand-Eye Coordination >>> Tool Use in Some Species



Especially humans!