

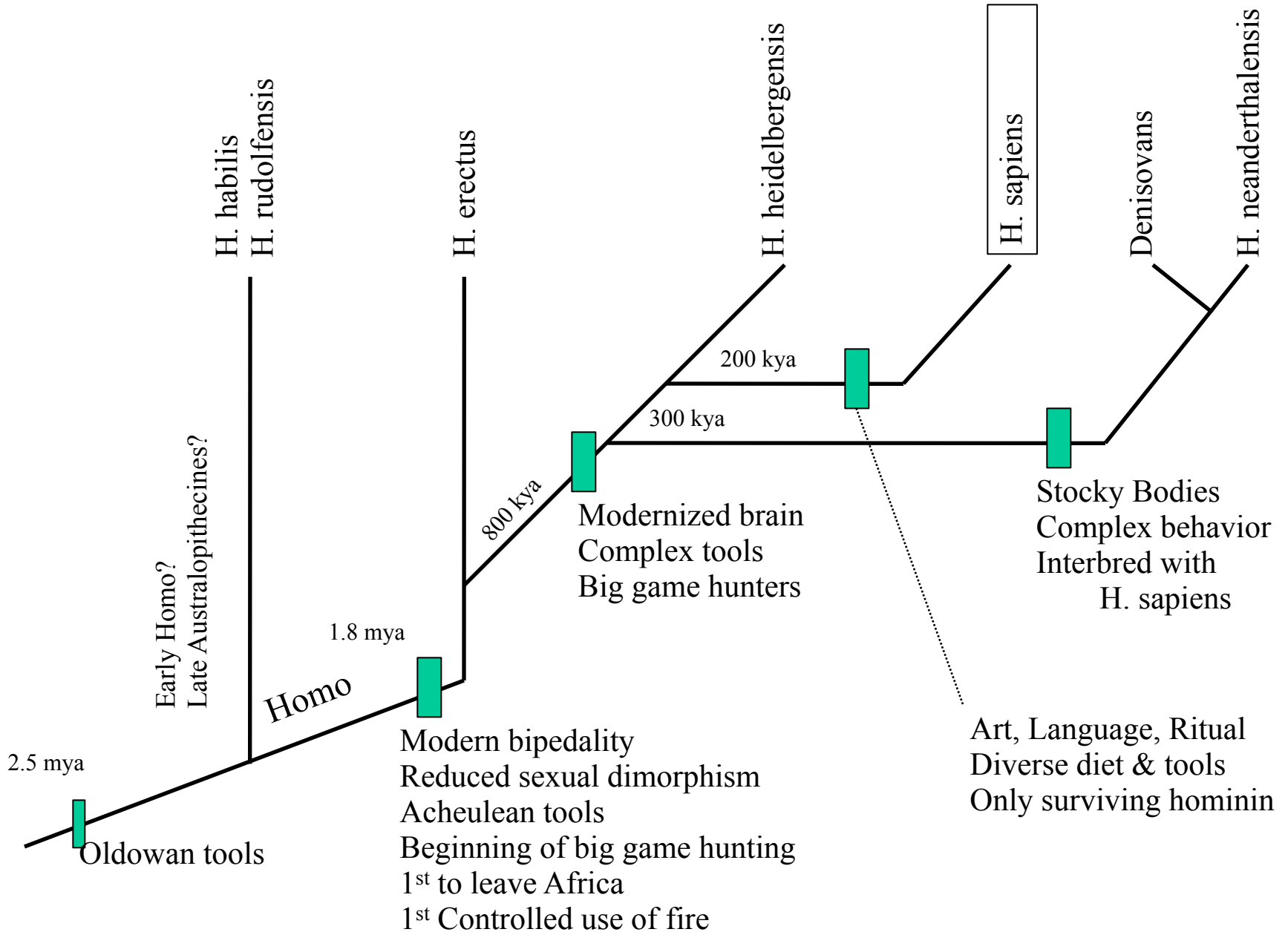
Anthro 101:
Human Biological Evolution

Lecture 14: Origins of the Modern Human
Lifestyle

Prof. Kenneth Feldmeier

Phylogenetic conclusions to remember

- Hominins originated in Africa during the late Miocene epoch = 6 to 7 mya
- One or more of the Miocene species evolved into the Australopithecine species and those into the Paranthropine species
 - Two genera included **many diverse** species
- *Australopithecus* went extinct about 2.5 – 2 mya
- *Paranthropus* & (*Homo*) *rudolfensis* & *habilis* appeared about 2.5 mya
- Likely one of the *Australopithecus* genus gave rise to *Homo*



Using modern foragers as a model to understand the importance of complex foraging technologies



Human foragers exploit a diverse array of resources

Collected foods:



Human foragers exploit a diverse array of resources

Collected foods:

Extracted foods:



Human foragers exploit a diverse array of resources

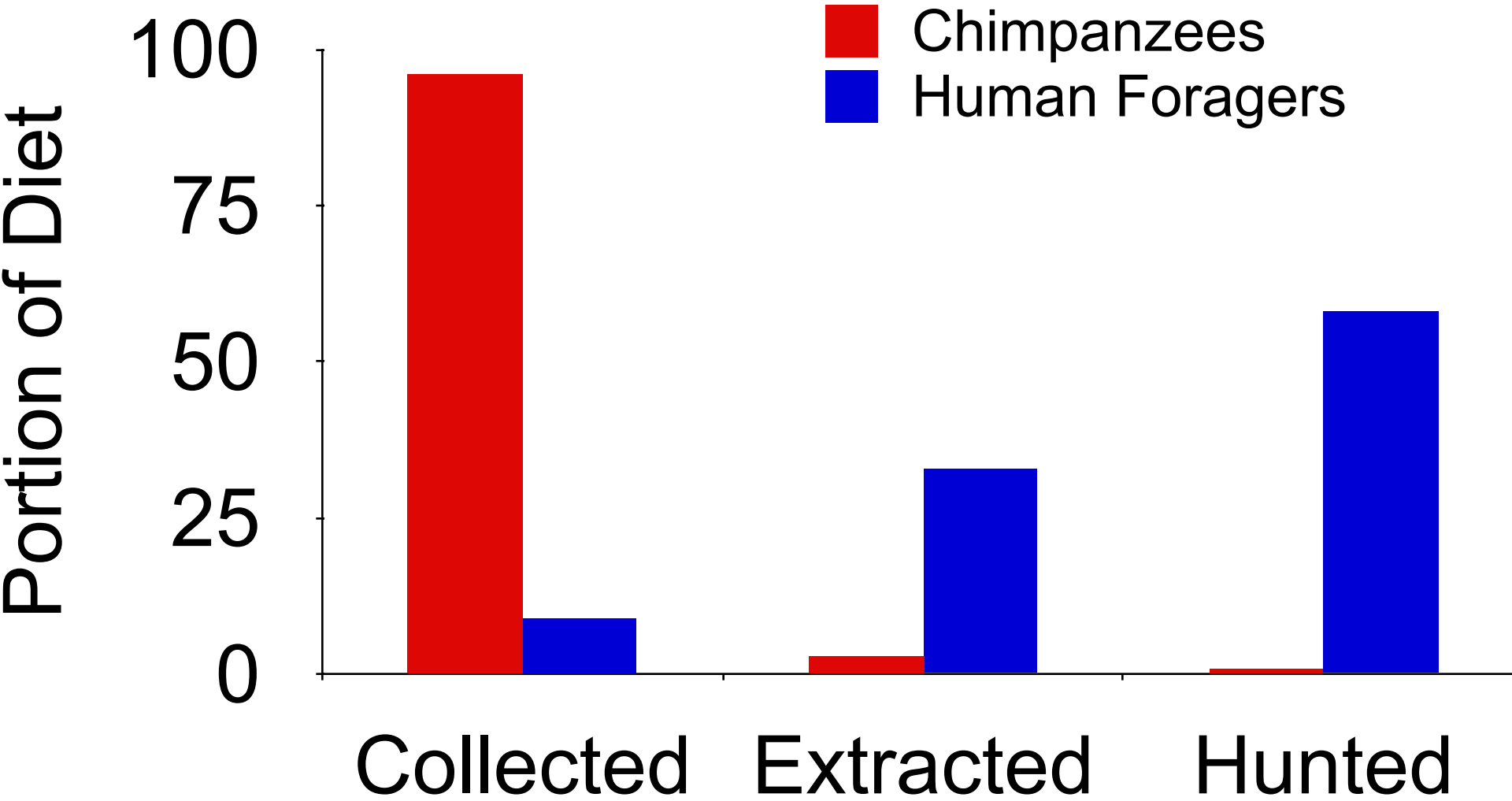
Collected foods:

Extracted foods:

Hunted foods:



Humans rely more on foods that are hard to get than other apes do



Human foragers use wide range of prey and techniques

- Prey
 - Mammals, birds, reptiles, fish
- Techniques are variable
 - Prey type
 - Season
 - Snares, traps, calls, tracking
 - cooperation
- Processing
 - Butchery
 - Smash bones
 - Cook
 - Process plant foods too



Obtaining extractive resources requires skill, strength, and detailed knowledge



For humans, foraging technology takes years to learn



Complexity of foraging tasks may favor bigger brain & slower development

- Learn skills & knowledge
 - long period of learning
 - Long period for practice

Favors

- larger brain
- Slow development
- Longer reliance on parents



Long juvenile period may favor longer life span

- Longer childhood delays start of reproduction
- Big investment in growth & development (of self)
- Payoff from this longer period of development will be greater if allowed to accumulate over longer life span
- Longer lifespan means bigger payoff for early investment



High skill tasks favor division of labor and food sharing

- Foraging tasks hard to master ==> specialization
- Specialization ==> food sharing
- In modern foraging societies
 - Women mainly forage
 - Men mainly hunt



Resource exchange is extensive in human groups



Hadza People

- <http://phys.org/news/2012-01-hunter-gatherers-social-networks-evolution-cooperation.html>

What can we learn from the Hadza people?

- What does the article tell us?
- Have we changed as a species?
- What do you think?

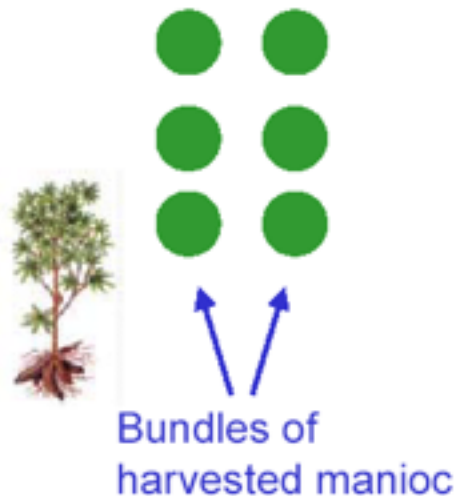
Meat is a high-variance food source

- Meat is a high-quality food source: vitamins, protein, fat
- However, meat is a food source with highly variable returns:

Some options are riskier than others

Low variance option (safe)

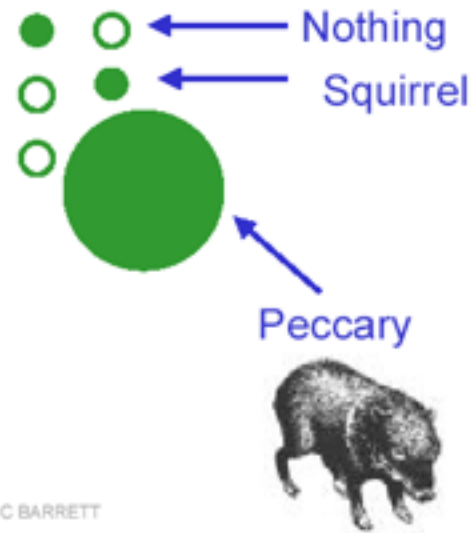
Returns from 6 visits to garden:



1/29/2002

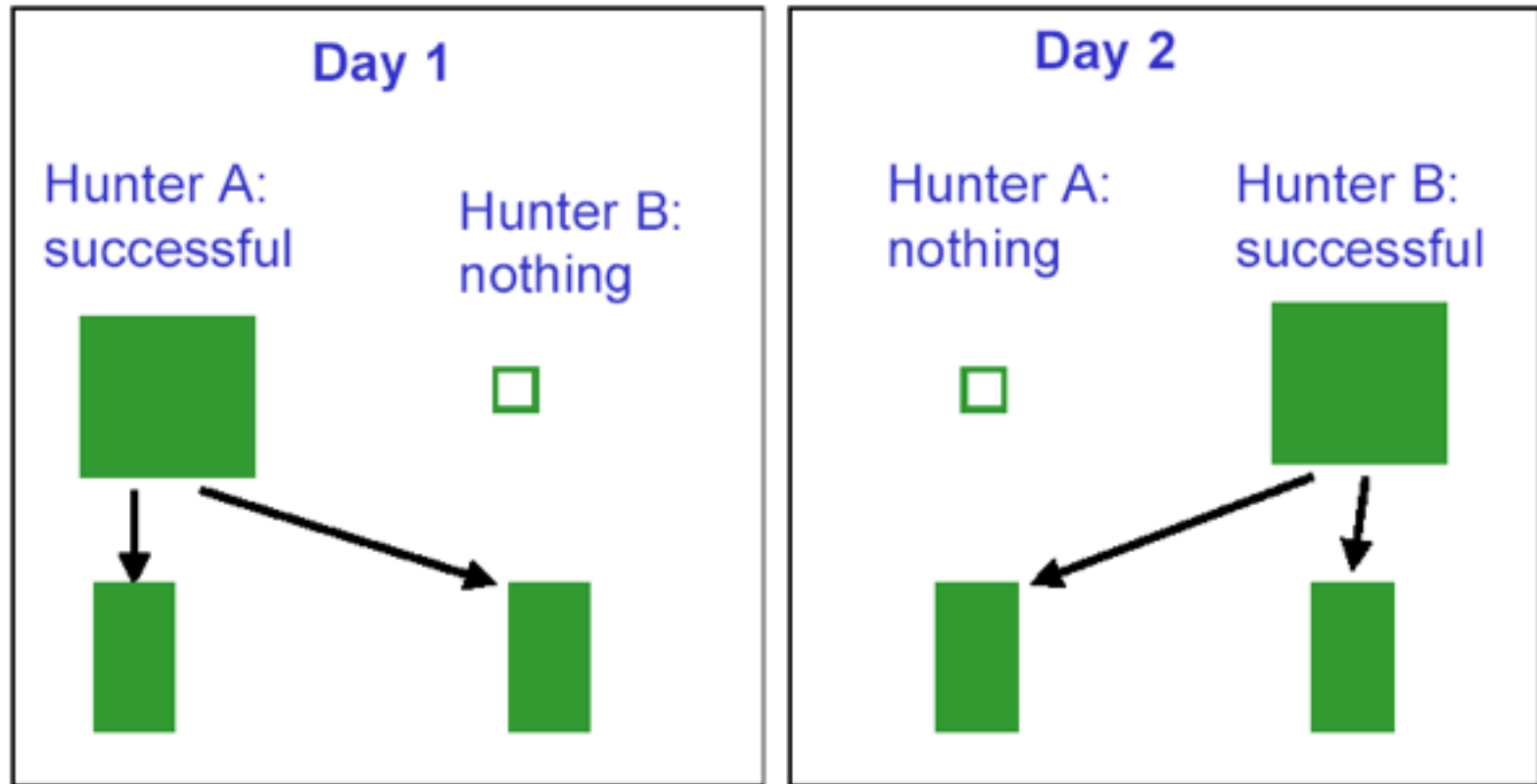
High variance option (risky)

Returns from 6 hunting trips:



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Sharing as risk-reduction



Each day, both have something to eat. (Only works if you can ensure reciprocation...)

Requirements for successful reliance on high variance food: Reciprocal Altruism

- Live in large enough groups of hunters to reduce risk and have enough sharing partners
- Have cognitive skill to keep track of partners & history of sharing
- Be able to prevent people from taking and not giving



In modern hunting societies, riskier foods are shared more widely:

Yanomamö resource types

- Garden foods: low variance; very certain
 - E.g. manioc, plantains
- Gathered foods, fish, small game: intermediate variance
 - E.g. stream fish, birds
- Big game: high variance
 - E.g. peccary, tapir



Yanomamo are hunter / horticulturalists in modern day Venezuela

Shared More!→

Food sharing + division of labor may favor reduced sexual dimorphism

- Men produce extra calories
 - support a women & **their** kids
- If kids need males' contribution
 - selection favors investing males
 - selection favors male-female bonds
- Reduced male-male competition
 - Favors reduced sexual dimorphism



Efe man with newborn

What does this tell us about foraging in the Pliocene era?

- Contemporary foragers rely on complex foraging
- Complex foraging linked to important features of human life history
- **Did Oldowan toolmakers have complex foraging strategies?**
 - Toolmaking suggests they at least began to
 - First step in transition from ape-like hominins towards more human-like hominins
 - Morphology and behavior of **later species** can be explained by this innovation

Did *H. erectus* have a *more* modern human lifestyle?

- Reduced sexual dimorphism (Yes)
 - Less male-male competition?
 - Reduced polygyny, tendency toward pair bonds?
- Infant (& adults) brains larger than earlier species (Yes)
 - Altricial infants - dependent on parental care
 - Rapid brain growth after birth, slower maturation rate (Yes)
- High energy demand on mothers from altricial infants
 - Selection for paternal investment?
 - Selection for menopause & female-female cooperation?

The transition to (later) *Homo* marked by:

- Increased reliance on hunted meat and extracted foods
- Greater reliance on (more complex) tools
- Longer juvenile period to learn foraging and tool use techniques; longer life span
- Greater paternal investment → increased pair bonding, reduced dimorphism
- Origins of transmitted culture (eg foraging & tool making techniques)