

Biology 114
Spring 2009
Dr. Taylor

Lecture 1

Introduction
and
History of Evolution
and Natural Selection

Assumptions

- You have access to the syllabus through Carmen
- You have or will read the syllabus thoroughly to know important dates and regulations.
- You know the order of problem-solving:
Your TA
Head TA
Course coordinator
Dr. Taylor

Preparation

- Lecture order is associated with labs NOT with chapter order of the book.
- Only a portion of lecture is predicted by the syllabus, other by the *N.Y. Times* and discussion.
- Exam questions are based on what occurs in lecture (clarification of material is provided by the book). Lecture includes class discussion.

A reminder of what scientists do

1. Observe
 2. Question
 3. Form hypothesis (hypotheses)
 4. Test hypothesis
 5. Reject or accept hypothesis (as explanation)
- Accepted hypotheses that support one another and that together are grand in scope form a theory, which generates more hypotheses.

Hypothesis

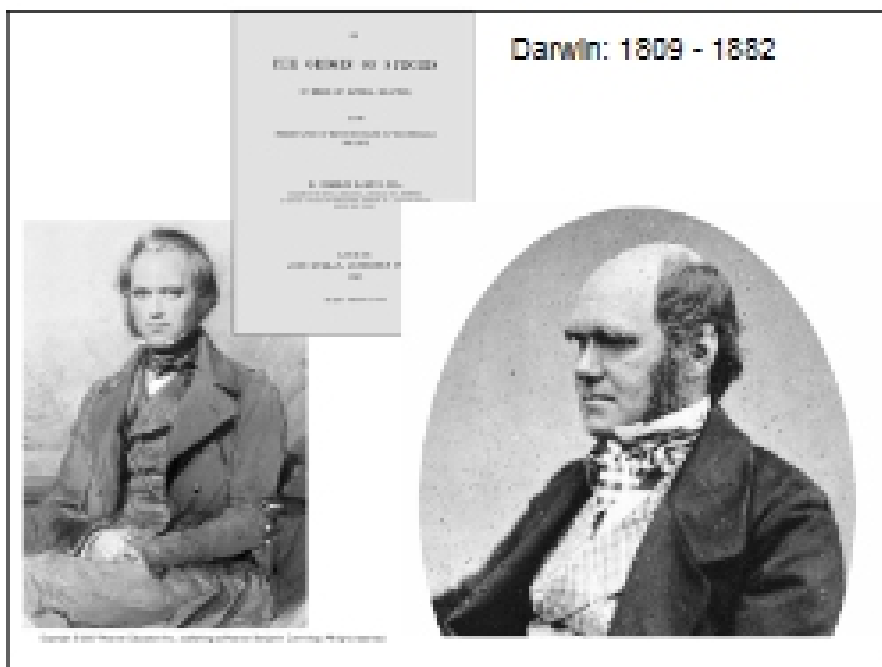
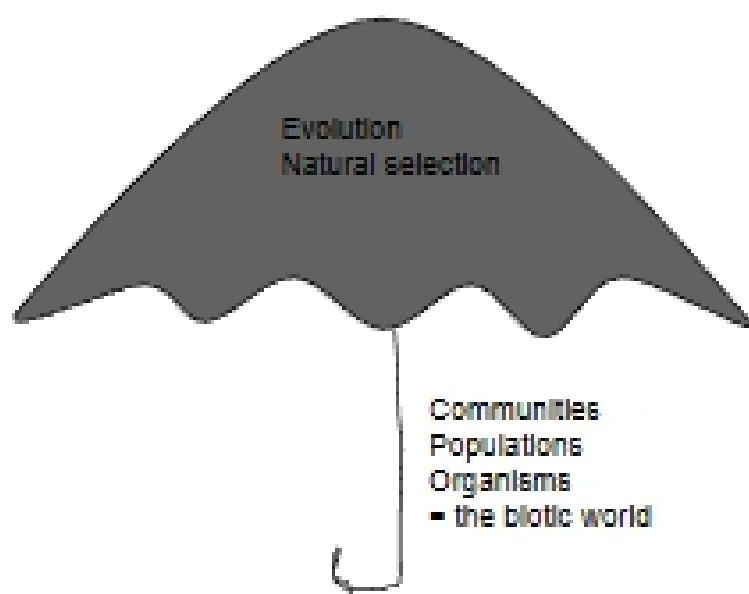
- A testable supposition
- Part of the scientific method

What gives a theory its credibility?

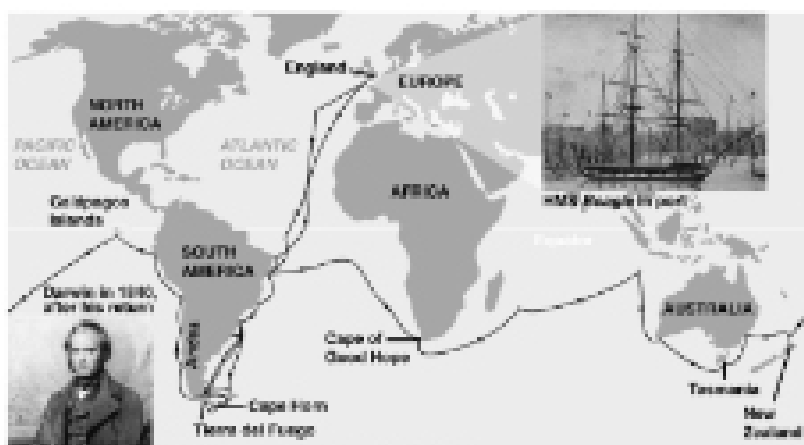
The Evolution of Darwin's Theory of Evolution by Natural Selection

Evolution: descent with modification

Why is the concept of evolution so important?



Darwin travels aboard HMS *Beagle* for 5 years



22.5 CAM

Charles Darwin (1809-1882)

- Travels aboard HMS *Beagle* as ship's biologist (1831)...for 5 years!
- Observes and collects a lot
- Throws up a lot*

*Has lots of time to read and think

**Evolution by Natural Selection
Begins with 5 obvious Observations**

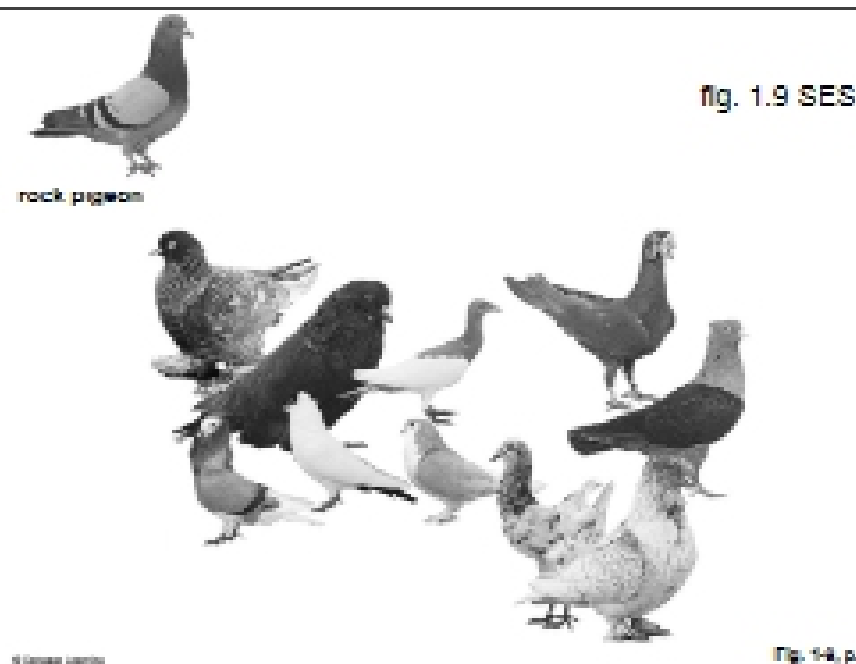
Photos in lecture that do not come from text books and have been downloaded from the Internet cannot be provided in notes (so as not to violate copyright).

fig. 1.15 Selection by humans of *Canis familiaris*



All descended from gray wolf *Canis lupus*

fig. 1.9 SES



**Evolution by Natural Selection
Begins with 5 obvious Observations**

- **Observation 1:** individuals reproduce as many offspring as possible, but
- **Observation 2:** populations are mostly stable
- **Observation 3:** essential resources are limited
- **Observation 4:** individuals of a population vary
- **Observation 5:** some variation is heritable

**Evolution by Natural Selection
Is Completed with 3 Inferences**

- **Observation 1:** individuals produce as many offspring as possible, but
- **Observation 2:** populations are mostly stable
- **Observation 3:** essential resources are limited
- **INFERENCE 1:** From Observations 1, 2, and 3?
- **Observation 4:** individuals of a population vary
- **Observation 5:** some variation is heritable