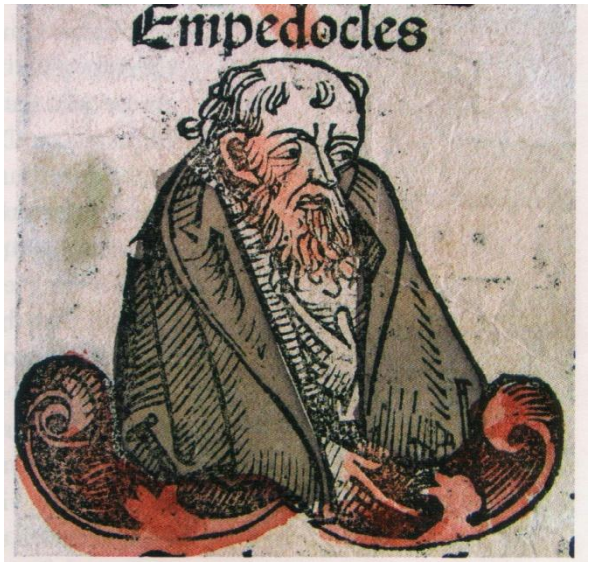
Introdução à Evolução

Bergstrom, CT. E Dugatkin, L.A. (2016) Cap. 1: Early Evolutionary Ideas and Darwin's Insight



3, 4004 B.C.E.
er's attempt to
on at the time

FIGURE 2.4 Empedocles (ca. 492–432 B.C.E.). Empedocles argued that plant life preceded animal life.

FIGURE 2.5 Charles Lyell (1797–1875) and uniformitarianism. **(A)** Lyell's theory of uniformitarianism helped pave the way for modern evolutionary thinking about the vast expanse of time. **(B)** Uniformitarianism posits that the slow process of erosion (left), when carried out over long stretches of time, can produce massive canyons (right).

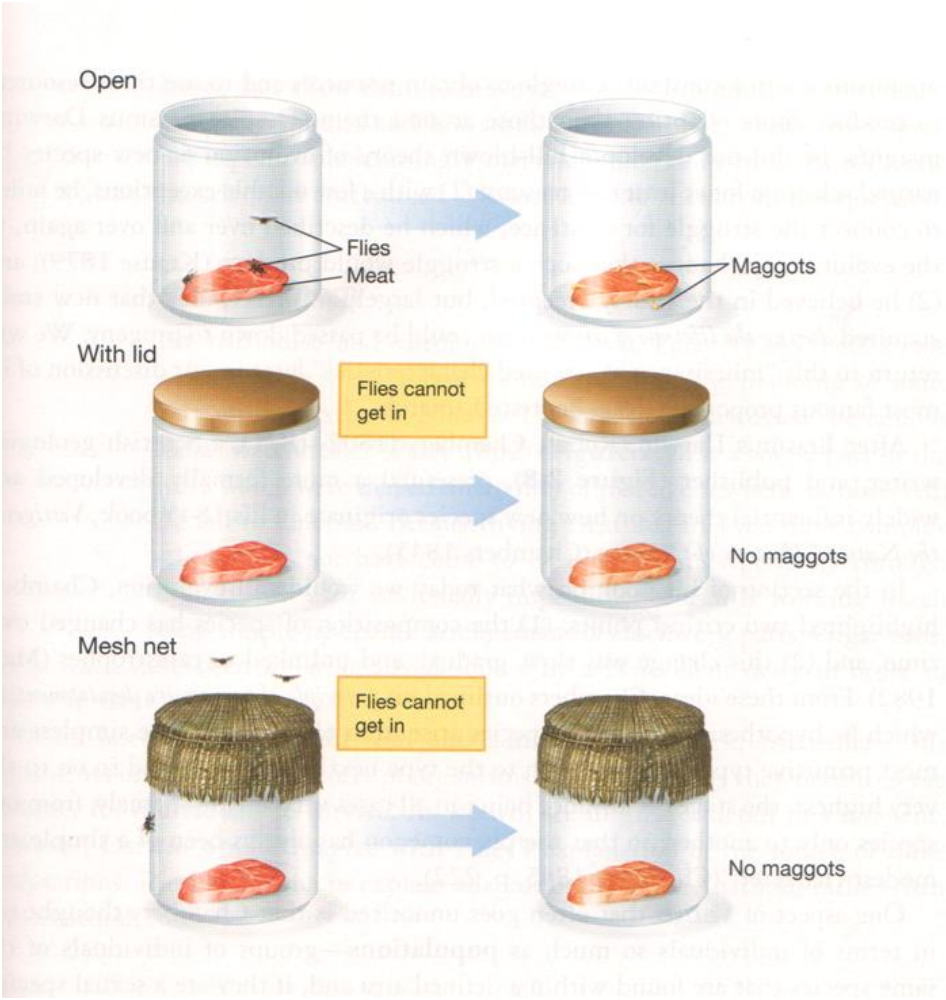
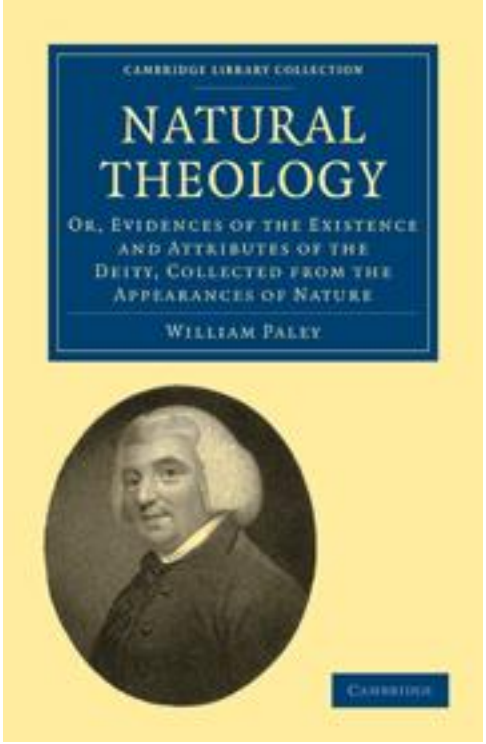


FIGURE 2.6 Redi's experiment. Redi's experiment demonstrated that maggots did not arise through spontaneous generation. Uncovered jars with meat have fly eggs and maggots. When the jars are covered, and flies cannot enter and lay eggs on the meat, no eggs or maggots are found.

FIGURE 2.7 Erasmus Darwin (1731–1802). Charles Darwin's grandfather proposed the idea of evolutionary change in his book *Zoonomia*.



A

B

VESTIGES

OF

THE NATURAL HISTORY

OF

CREATION.

WITH A SEQUEL.

NEW YORK:
HARPER & BROTHERS, PUBLISHERS,
329 & 331 PEARL STREET,
FRANKLIN SQUARE.

FIGURE 1.14. (*A*) Robert Chambers believed that nature's laws could explain the material universe. (*B*) His *Vestiges of the Natural History of Creation* (published anonymously) described a theory of everything, from the origin of the universe to the origin of life and of humanity.

Jean-Baptiste Lamarck
(France - 1744-1829)

- Based theories on observations of similarities between ancient fossils and modern animals, vestigial structures and passing on of desired traits by selective breeding
- Proposed than an individual gains or loses traits during its lifetime which are then passed on to its offspring.
- Believed evolution is a constant process striving toward greater complexity and perfection.

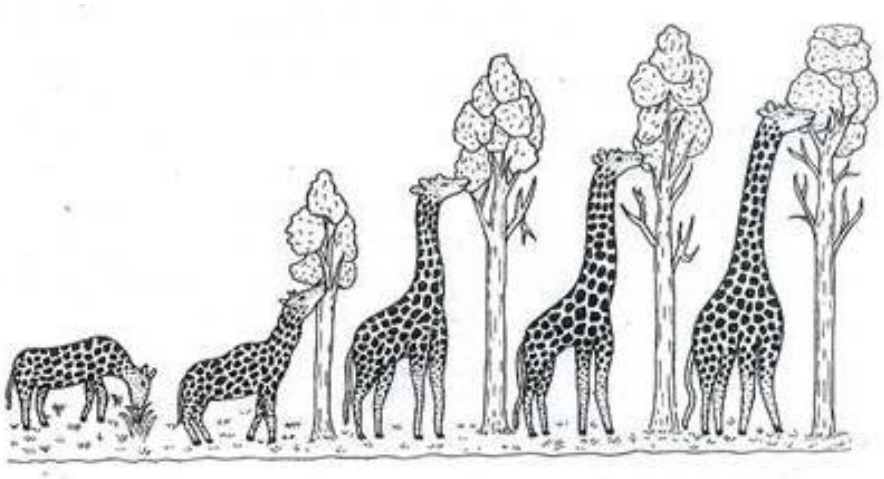
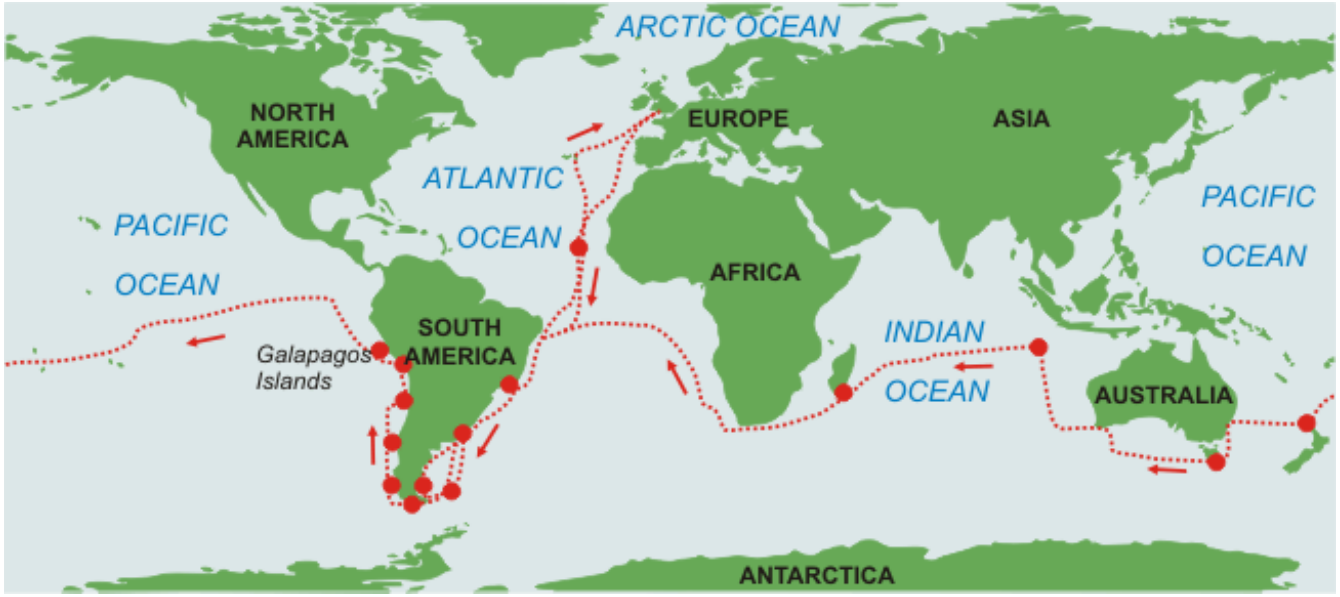
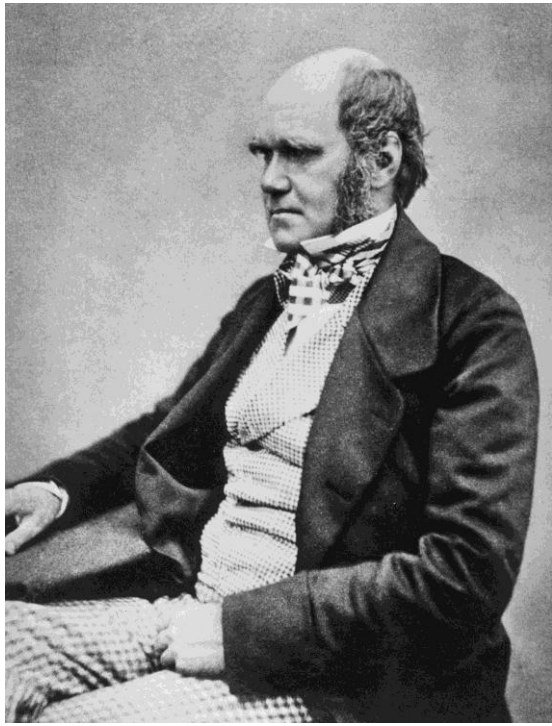
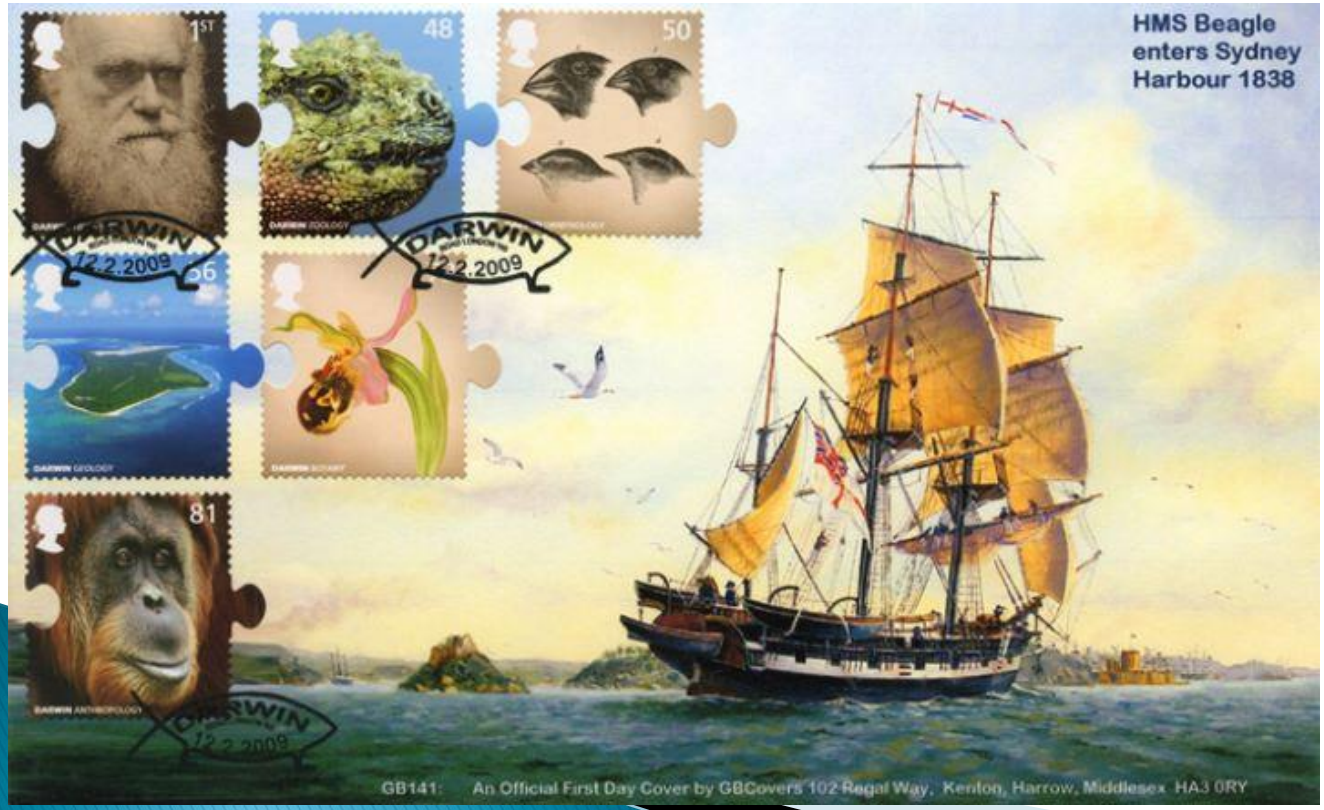
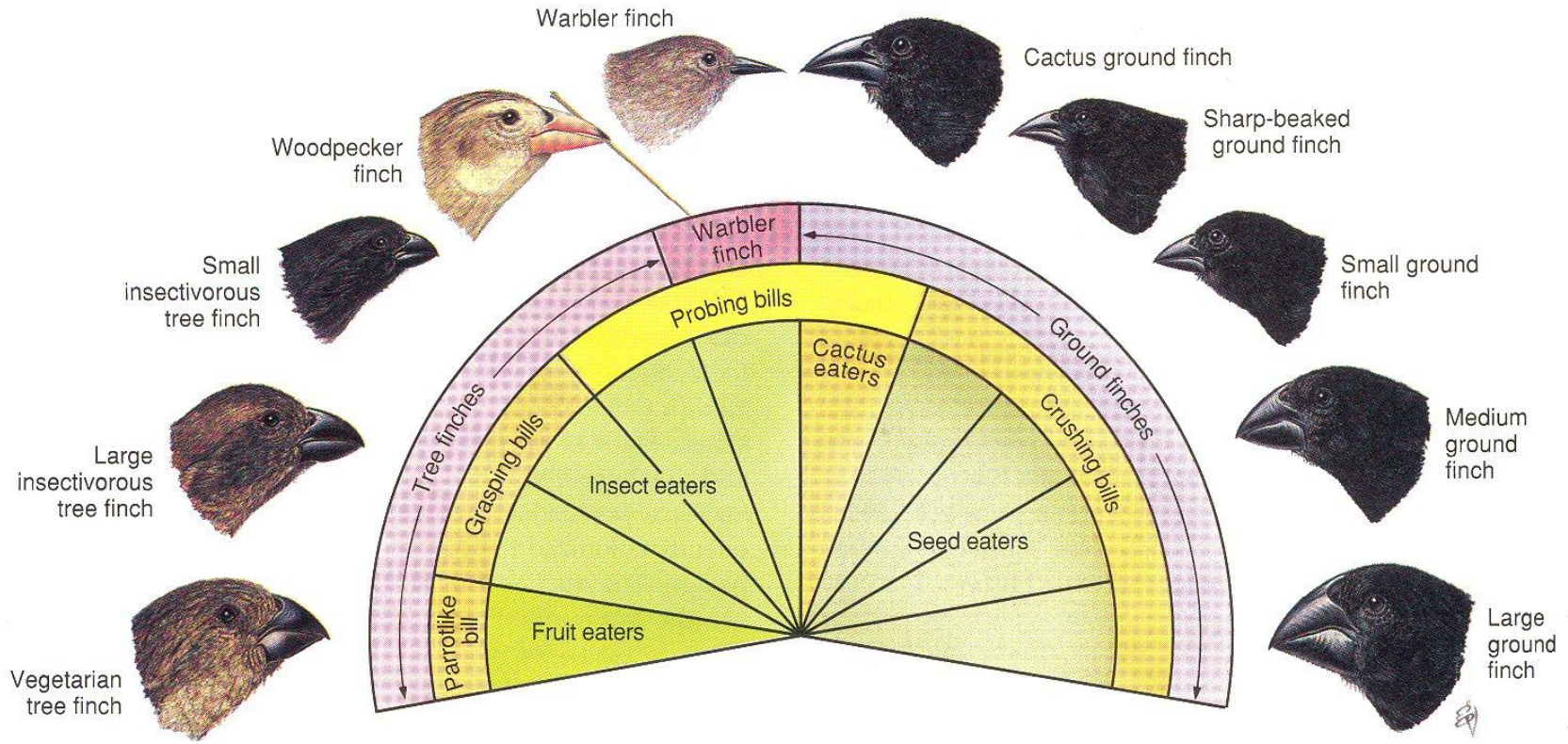


Diagram showing elongation of neck in giraffe according to Lamarck.


ARCTIC OCEAN
NORTH AMERICA
EUROPE
ASIA
ATLANTIC OCEAN
PACIFIC OCEAN
PACIFIC OCEAN
AFRICA
SOUTH AMERICA
Galapagos Islands
INDIAN OCEAN
AUSTRALIA
ANTARCTICA




1ST
48
50
26
81
DARWIN
12.2.2009
HMS Beagle enters Sydney Harbour 1838
GB141: An Official First Day Cover by GBCovers 102 Regal Way, Kenton, Harrow, Middlesex HA3 0RY


Warbler finch
Cactus ground finch
Sharp-beaked ground finch
Woodpecker finch
Small insectivorous tree finch
Small ground finch
Large insectivorous tree finch
Medium ground finch
Vegetarian tree finch
Large ground finch
Warbler finch
Probing bills
Cactus eaters
Tree finches
Grasping bills
Insect eaters
Ground finches
Crushing bills
Seed eaters
Parrotlike bill
Fruit eaters

ALFRED R. WALLACE. 1848.

(*From a daguerreotype.*)

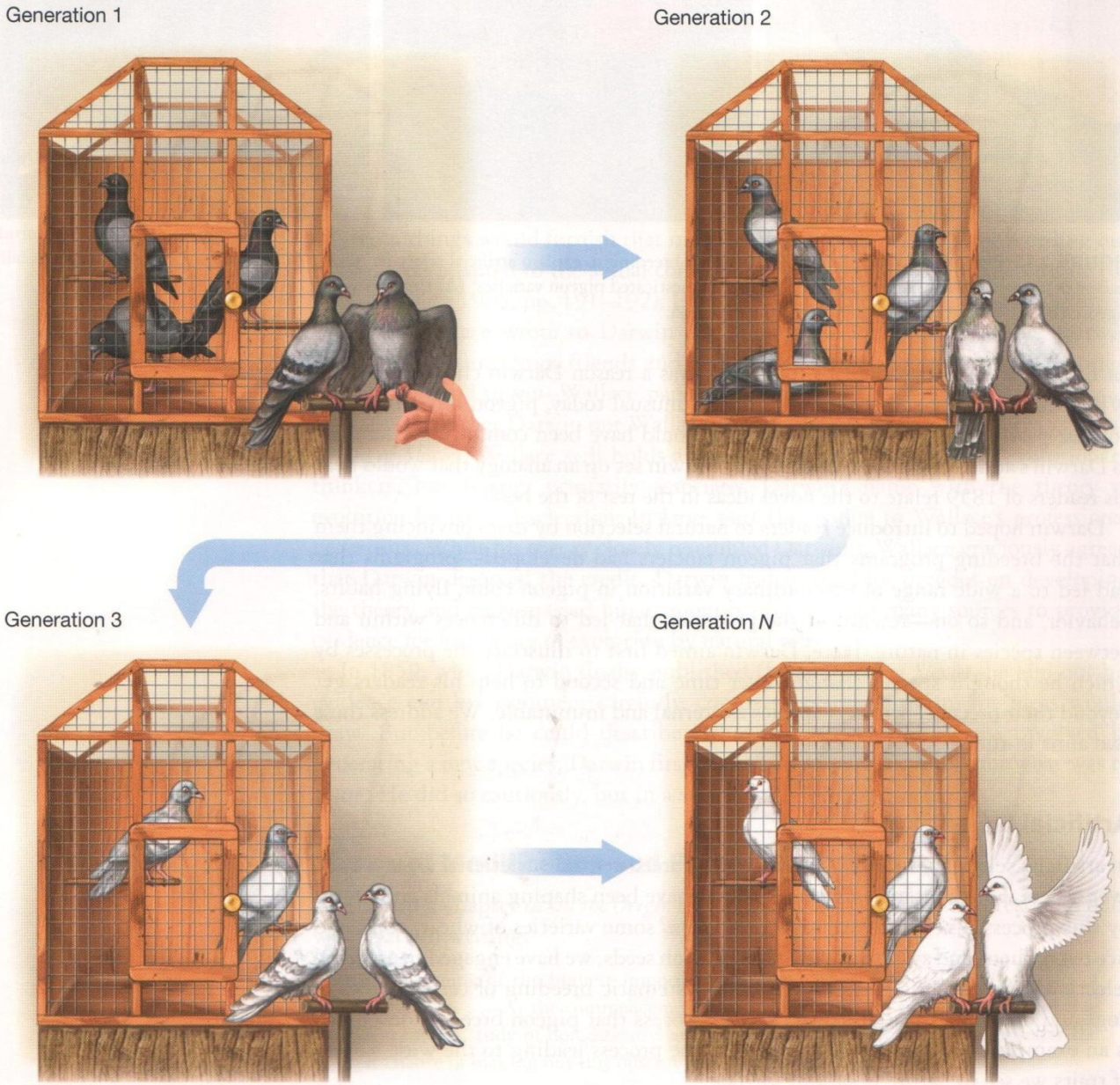


FIGURE 2.16 Artificial selection for white plumage in pigeons. Each generation, a breeder selects the pigeons with the whitest plumage and allows them to breed. Many generations later (generation *N*), at the end of the process, the breeder has a pigeon variety with much whiter plumage than that of the original stock.

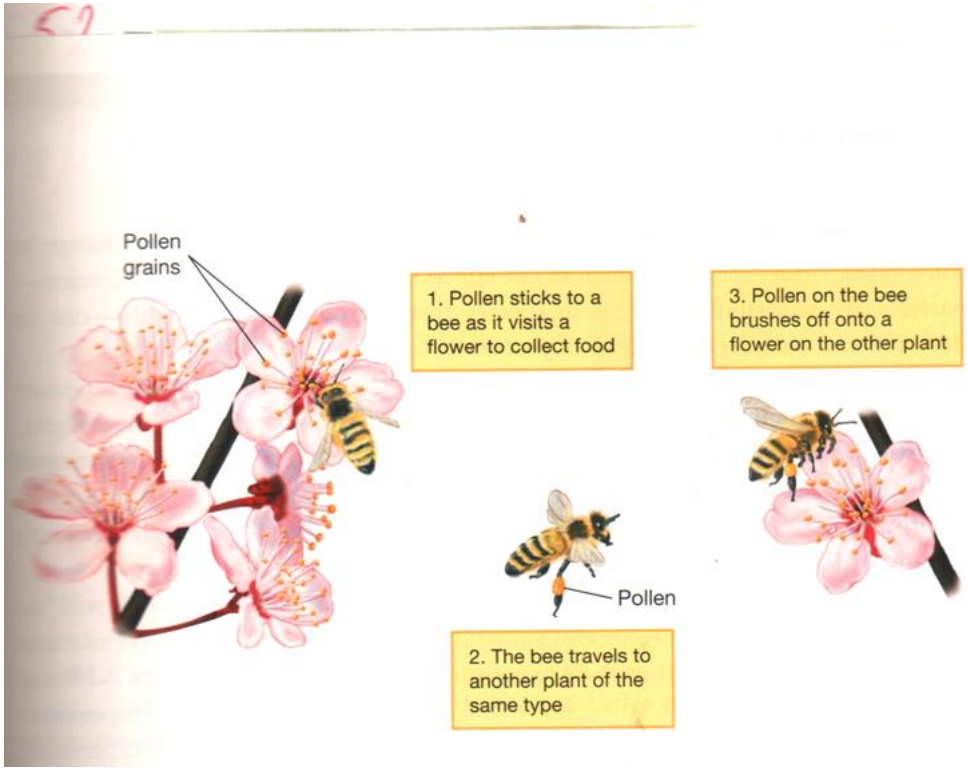
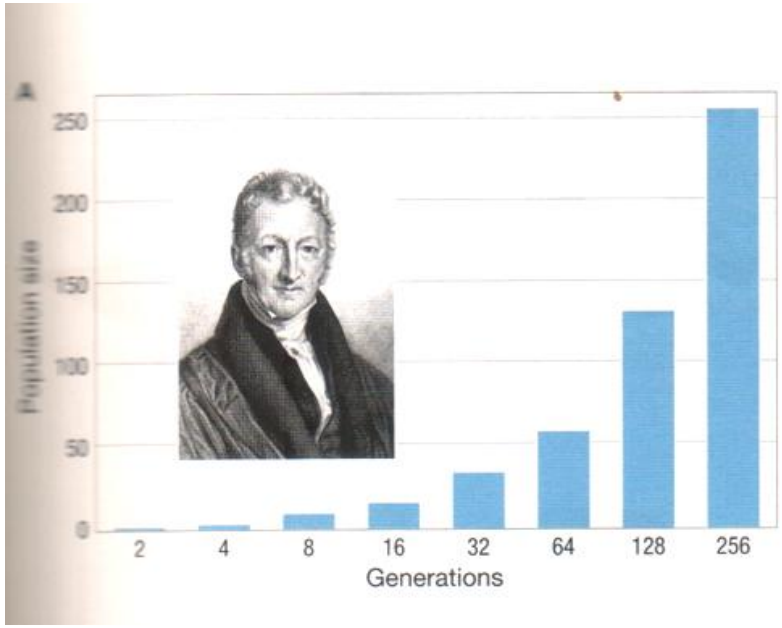
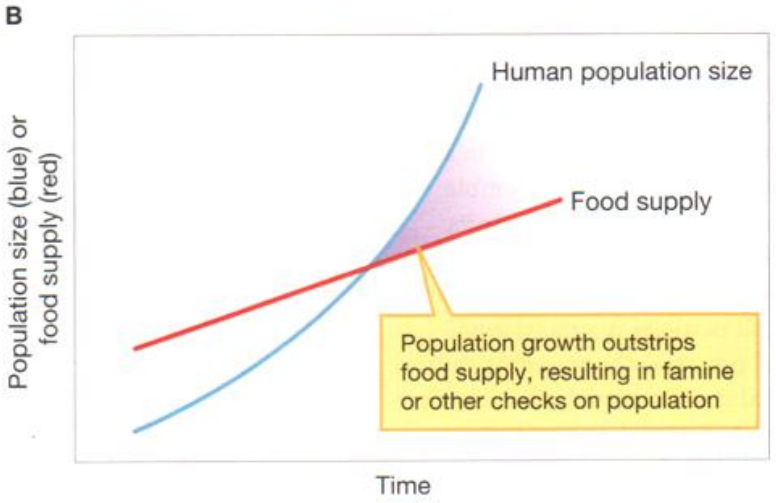
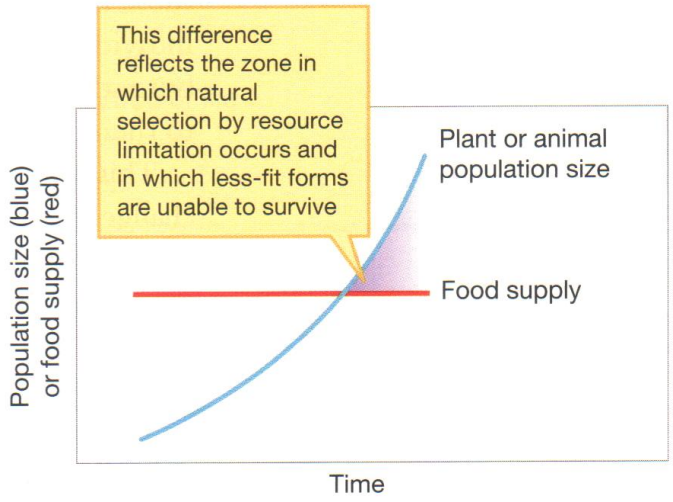


FIGURE 2.17 Plants and their pollinators. Darwin discussed the relationship between plants and the insects that cross-fertilized them as an example of how natural selection operates. Insects, such as the bee seen here, may eat some of the pollen produced by a plant, but if they move enough pollen from plant to plant, their actions may be in the plant's reproductive interests as well.


A
250
200
150
100
50
0
Population size
2
4
8
16
32
64
128
256
Generations


B
Human population size
Food supply
Population size (blue) or food supply (red)
Population growth outstrips food supply, resulting in famine or other checks on population
Time


This difference reflects the zone in which natural selection by resource limitation occurs and in which less-fit forms are unable to survive
Plant or animal population size
Food supply
Population size (blue) or food supply (red)
Time

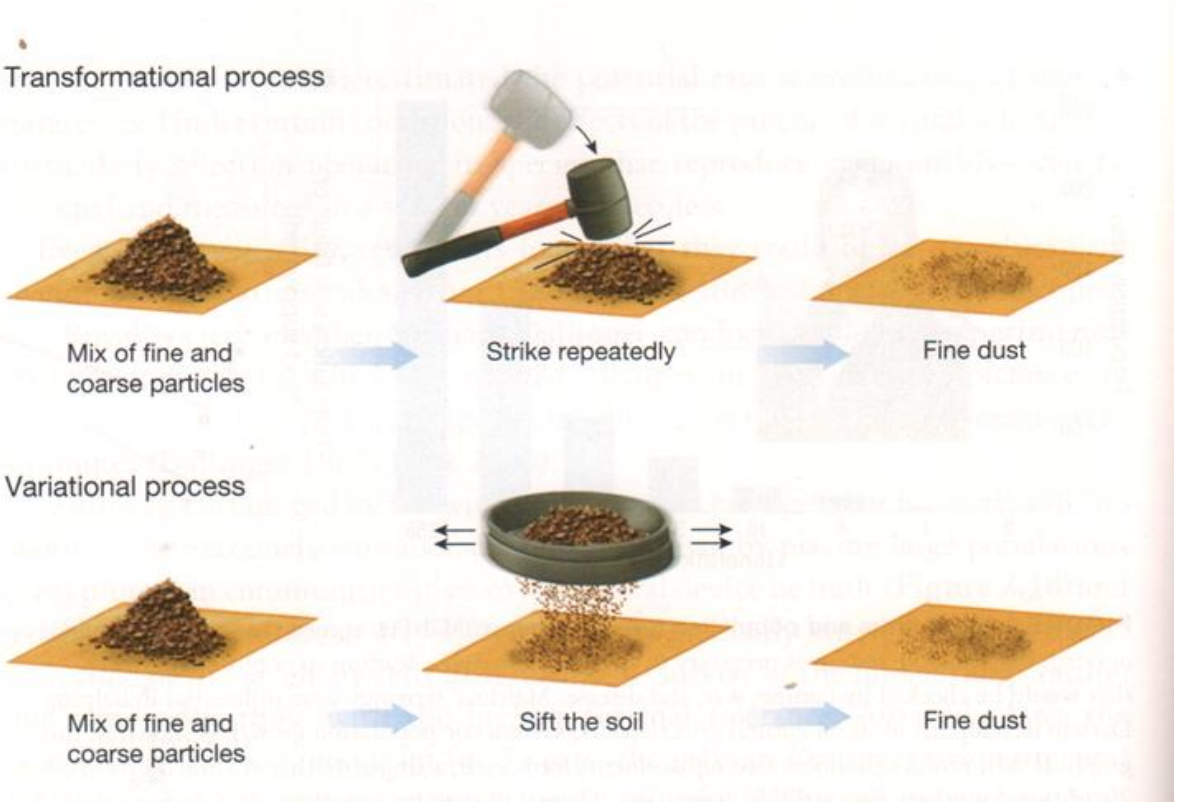


FIGURE 2.21 Different processes of change. In a transformational process, the ensemble changes because each individual member changes. In a variational process, the ensemble changes because something sorts among the variants in the original ensemble. In this example, crushing the soil particles is a transformational process—the ensemble shifts toward smaller particles because the individual particles are reduced in size. Sifting the soil is a variational process—the ensemble shifts toward smaller particles because the larger particles are sorted out.

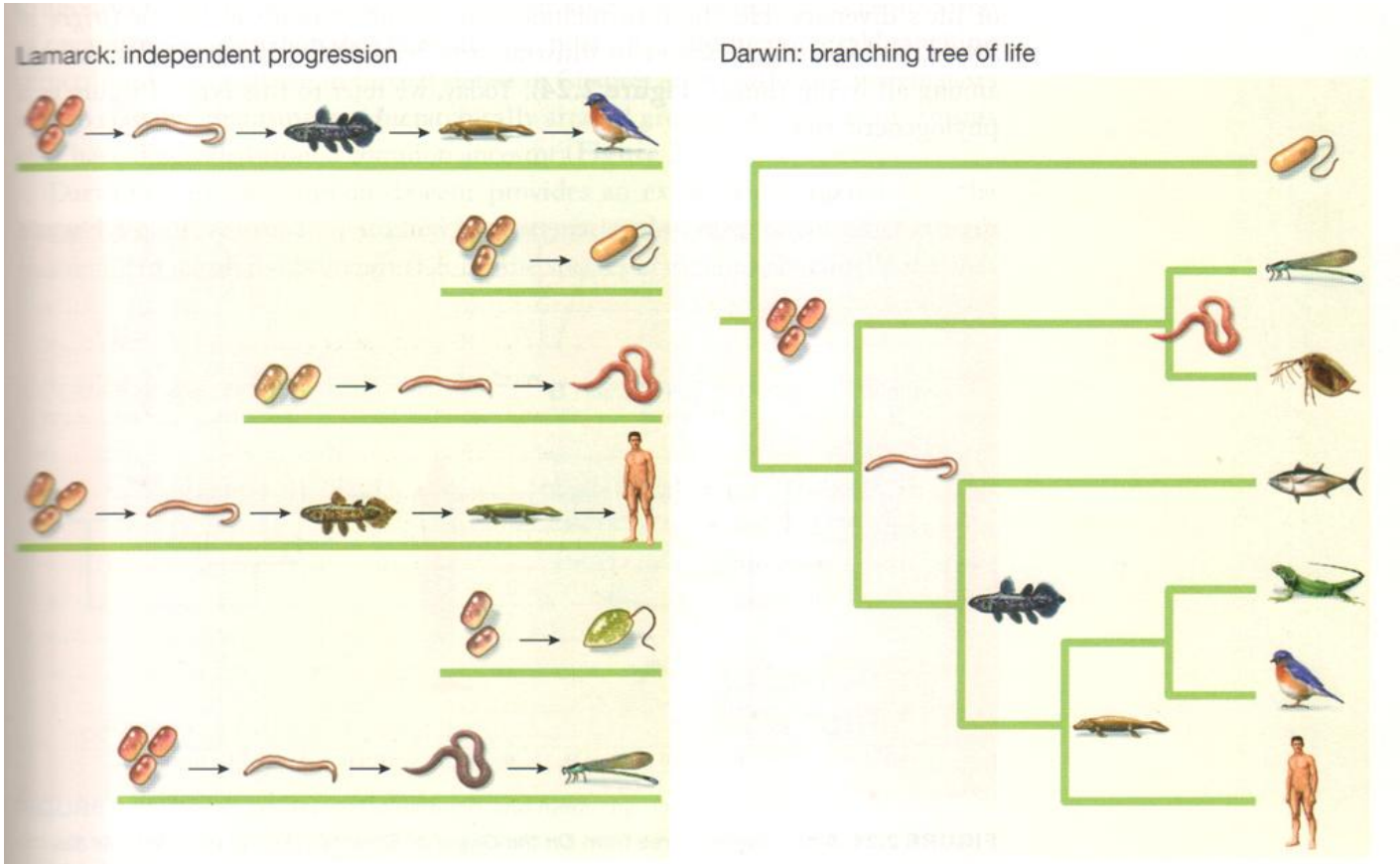
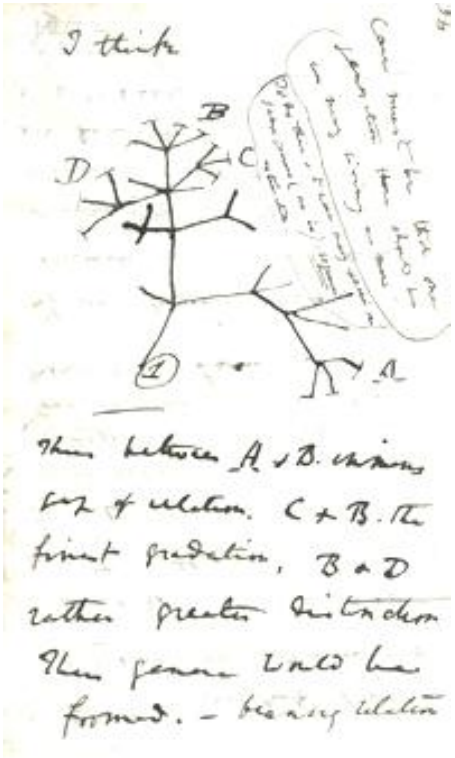
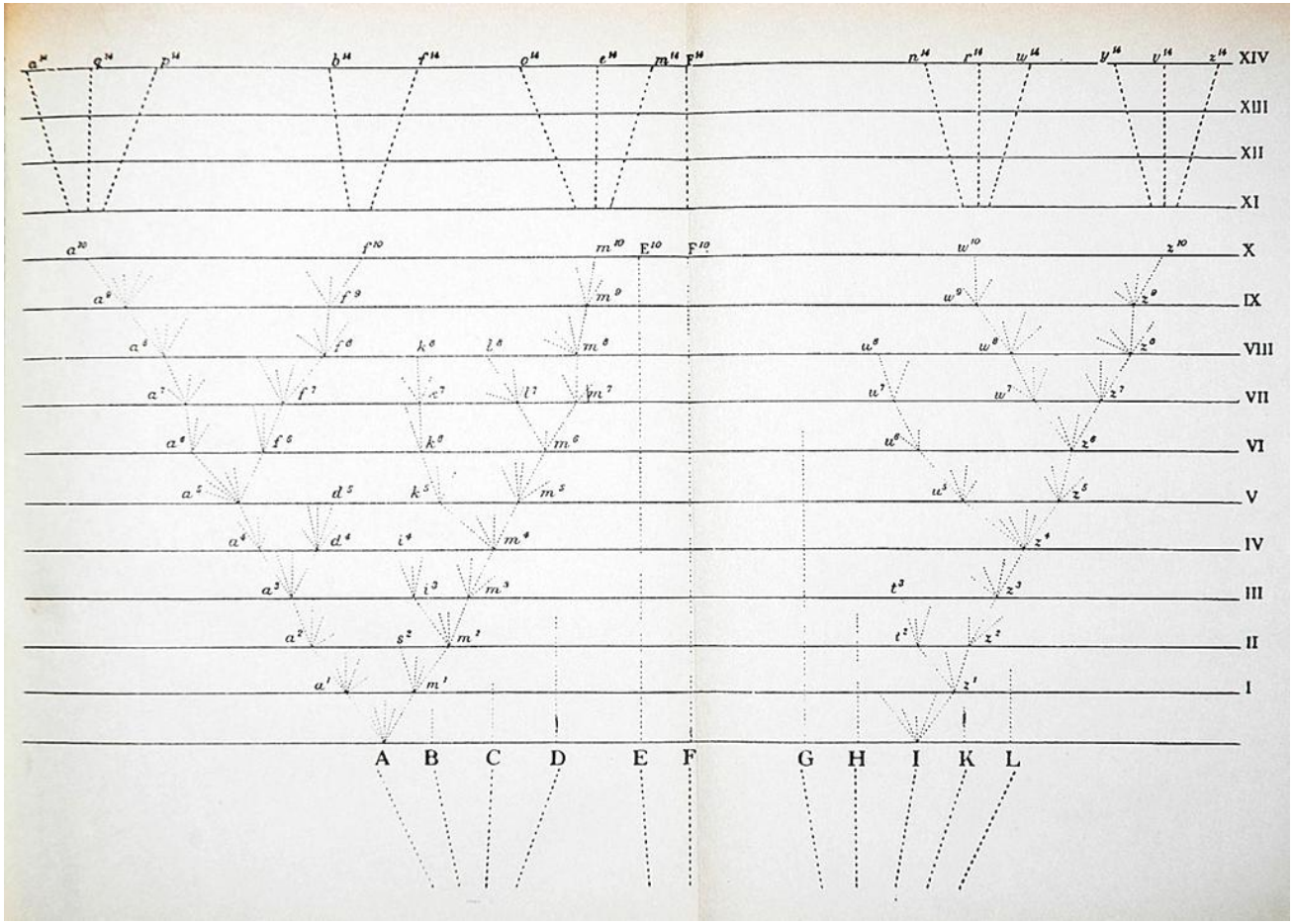


FIGURE 2.22 Darwin's theory versus Lamarck's theory. In Lamarck's theory, species evolve independently and in parallel; in Darwin's theory, species are descended one from another to form a branching tree of life.


I think
B
C
D
A
1
Then between A & B. there
two of relation. C & B. the
first gradation, B & D
rather greater distinction
Then genera would be
formed. - bearing relation


XIV
XIII
XII
XI
X
IX
VIII
VII
VI
V
IV
III
II
I
A B C D E F G H I K L

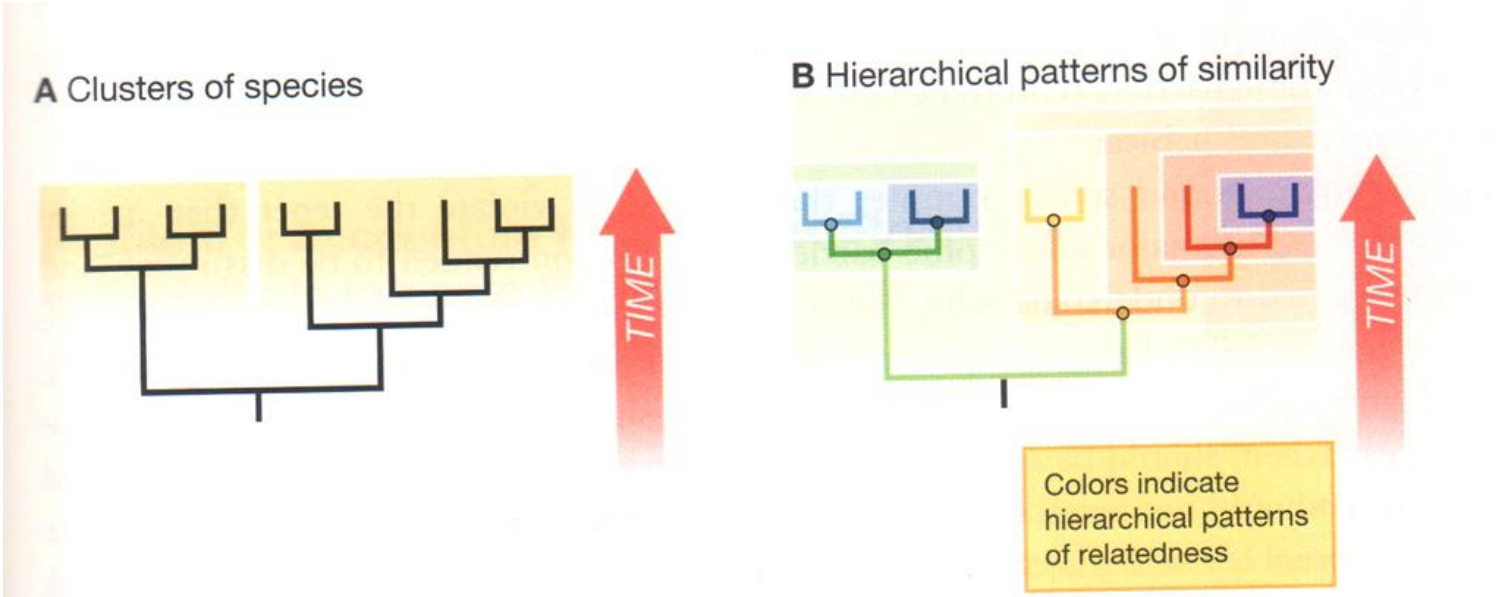


FIGURE 2.25 Branching descent, clustering, and hierarchy. Darwin's view of branching descent explains both the clustering of species in terms of similar form **(A)** and the hierarchical patterns of similarity **(B)** that we can discern when studying groups of species. In panel B, some of the different clades are shown in different colors, with the node representing the common ancestor of that entire clade in the clade's characteristic color.