IV. Macroevolutionary Pattern

A. Tempo of Speciation

1. gradualism

2. punctuated equilibrium

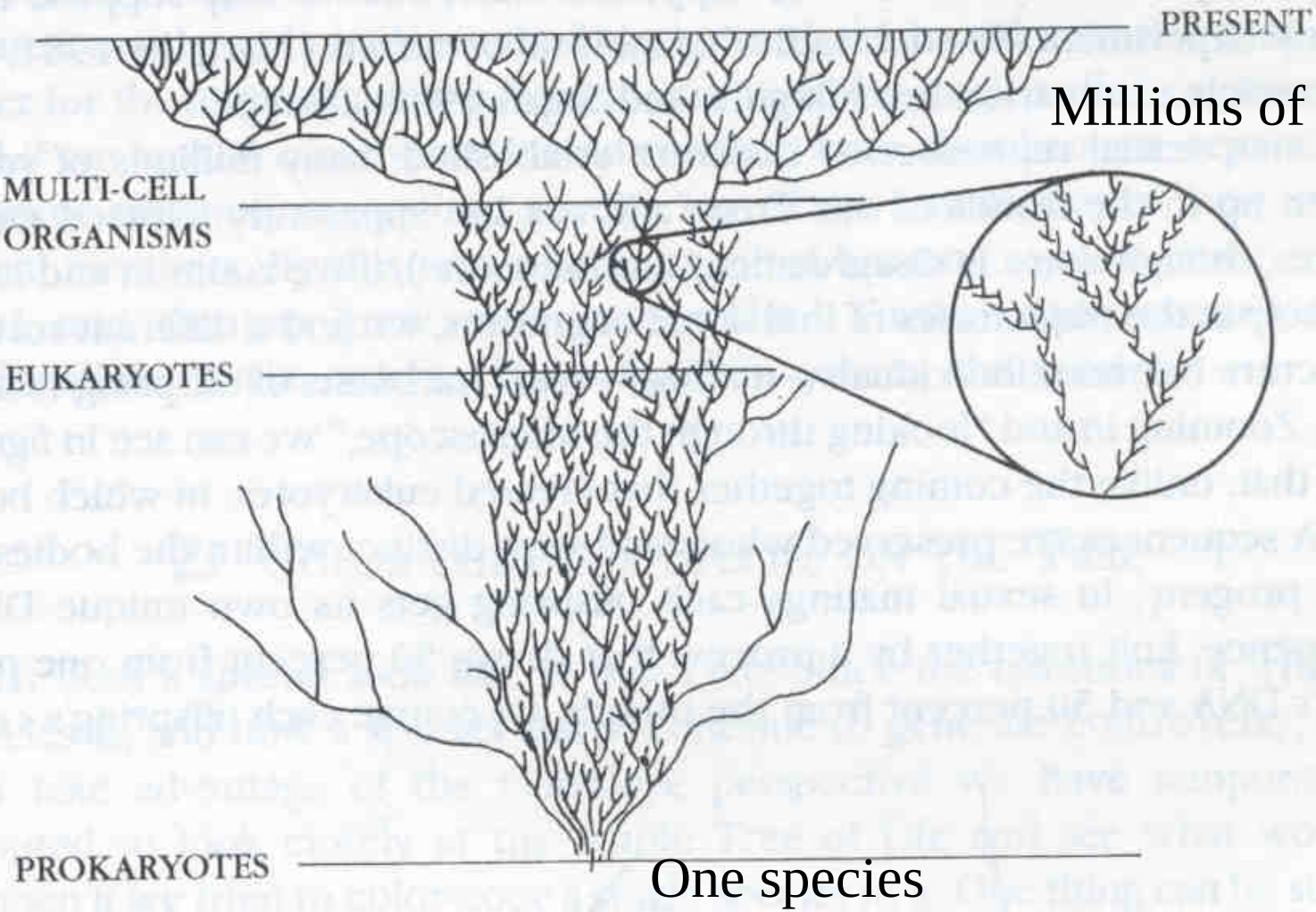
B. Phylogenetic Reconstruction

1. an example

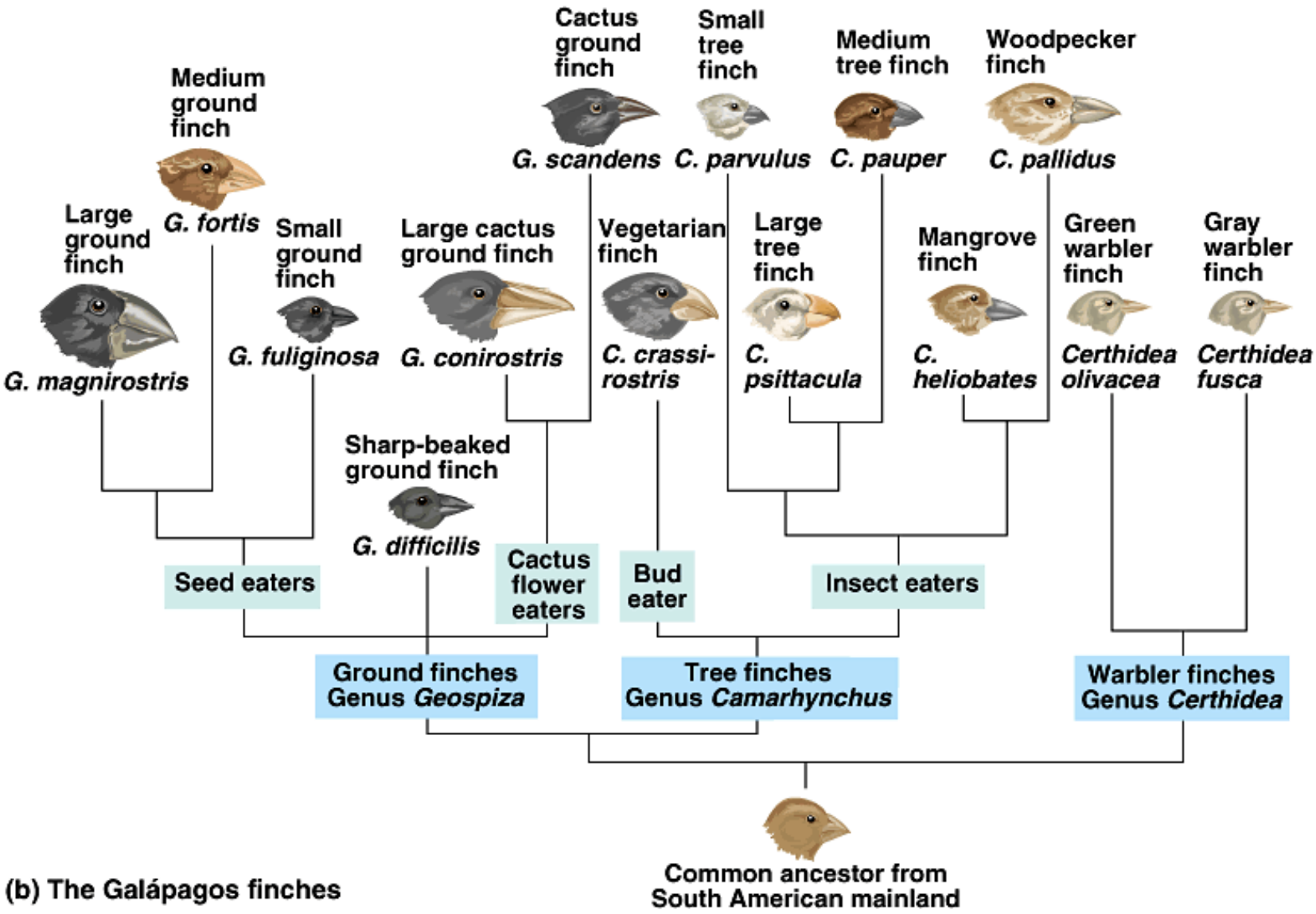
2. the problem of convergent evolution

3. molecular traits

A cartoon of the evolution of species diversity

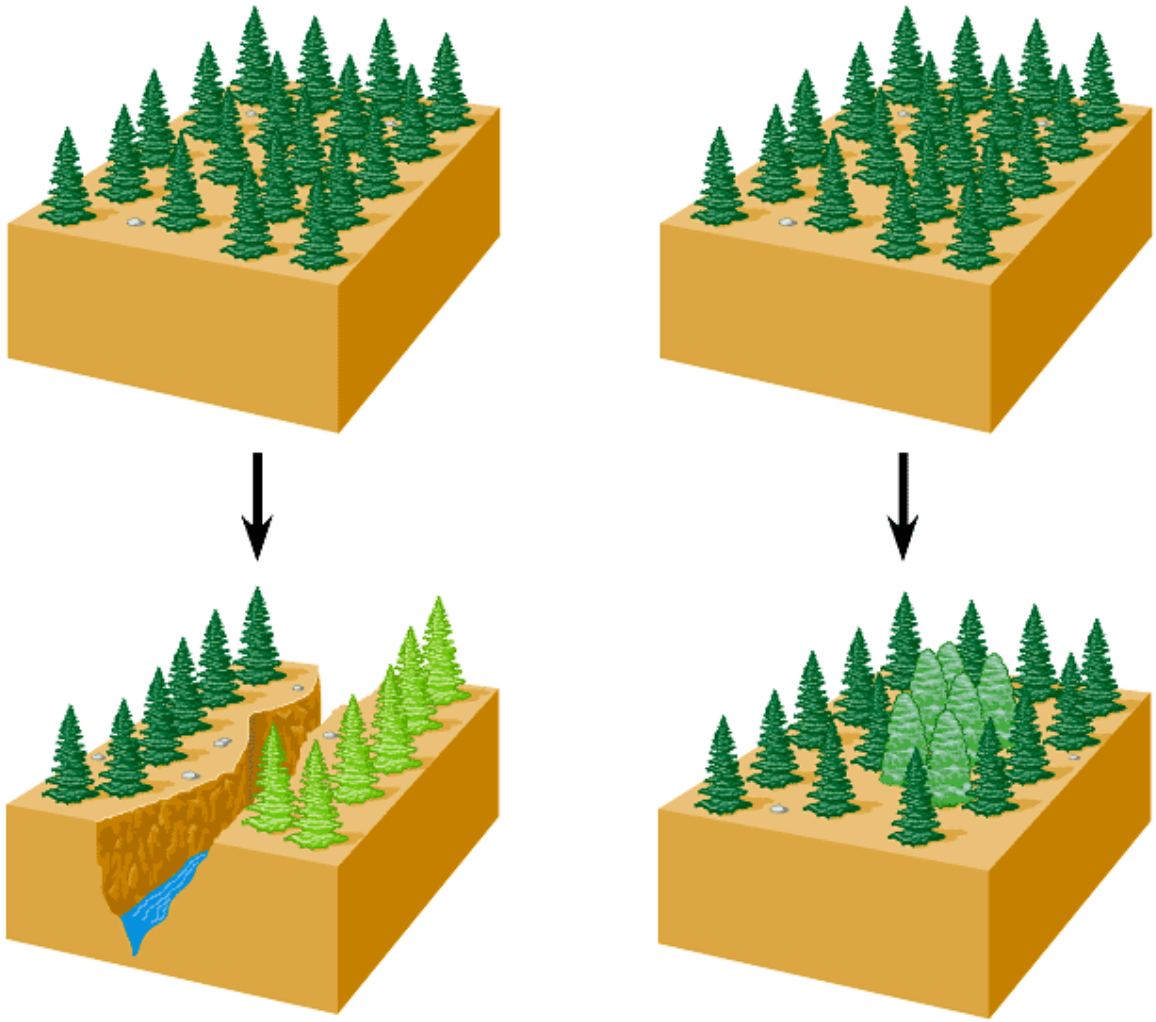


Finches of the Galapagos Islands



(b) The Galápagos finches

Fig. 24. 6



(a) Allopatric speciation

(b) Sympatric speciation

Sympatric speciation ??

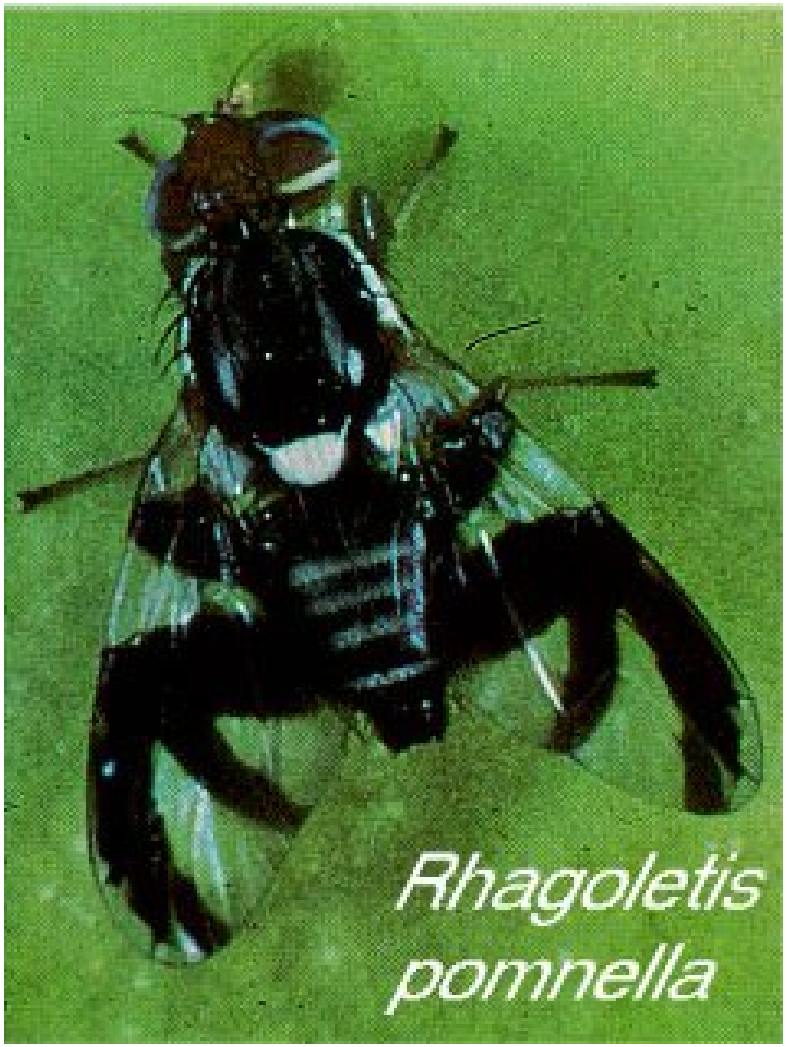
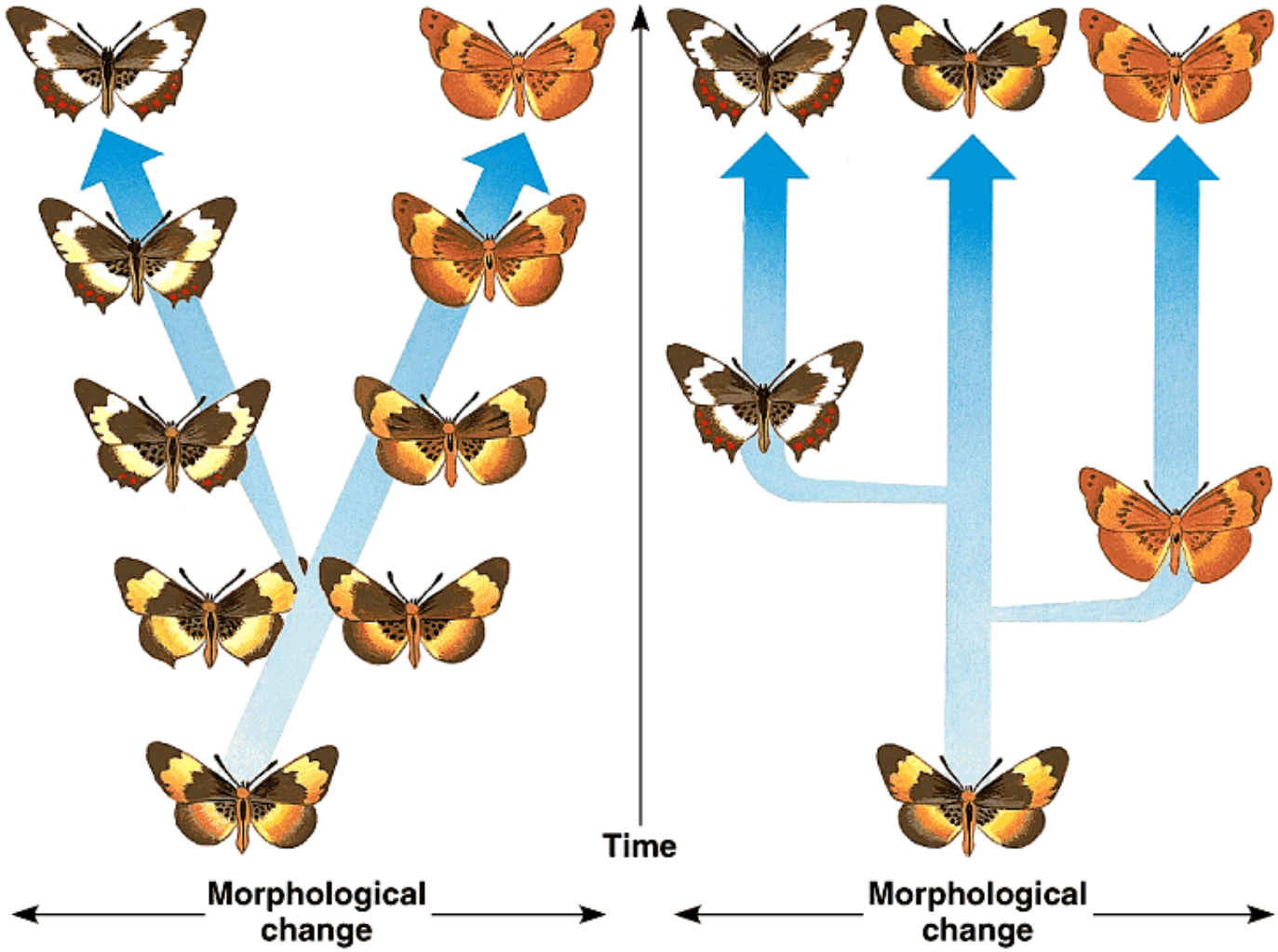
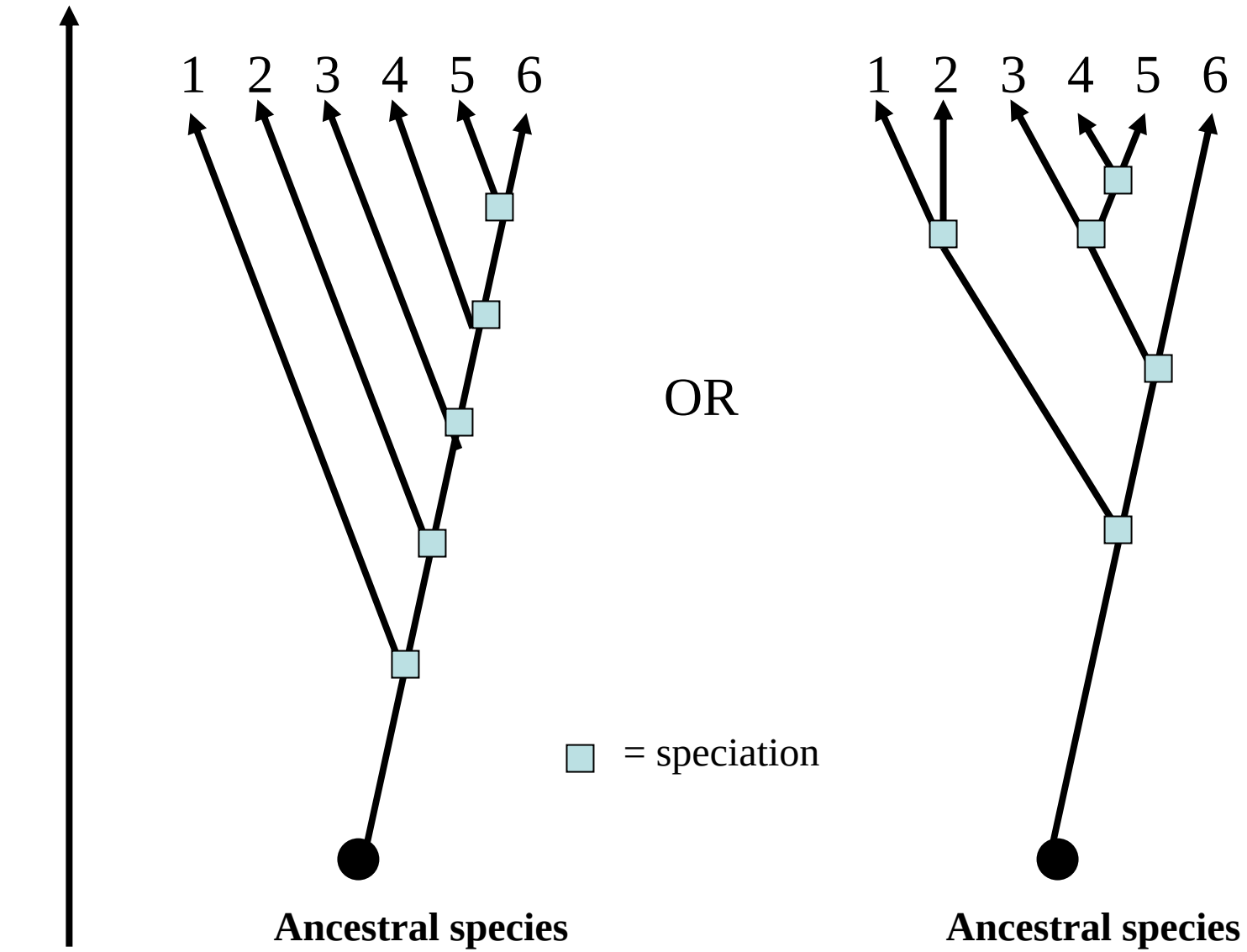


Fig. 24. 17



Two possible phylogenetic reconstructions for 6 species



The problem of **convergent evolution**: the Tasmanian wolf is more closely related to the kangaroo than it is to the North American red wolf

Red Wolf

Tasmanian Wolf

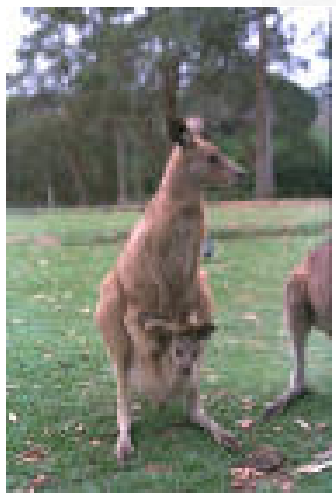


Table 22.1 Molecular Data and the Evolutionary Relationships of Vertebrates

Species	Number of Amino Acids That Differ from a Human Hemoglobin Polypeptide (Total Chain Length = 146 Amino Acids)
Human 	0
Rhesus monkey 	8
Mouse 	27
Chicken 	45
Frog 	67
Lamprey 	125

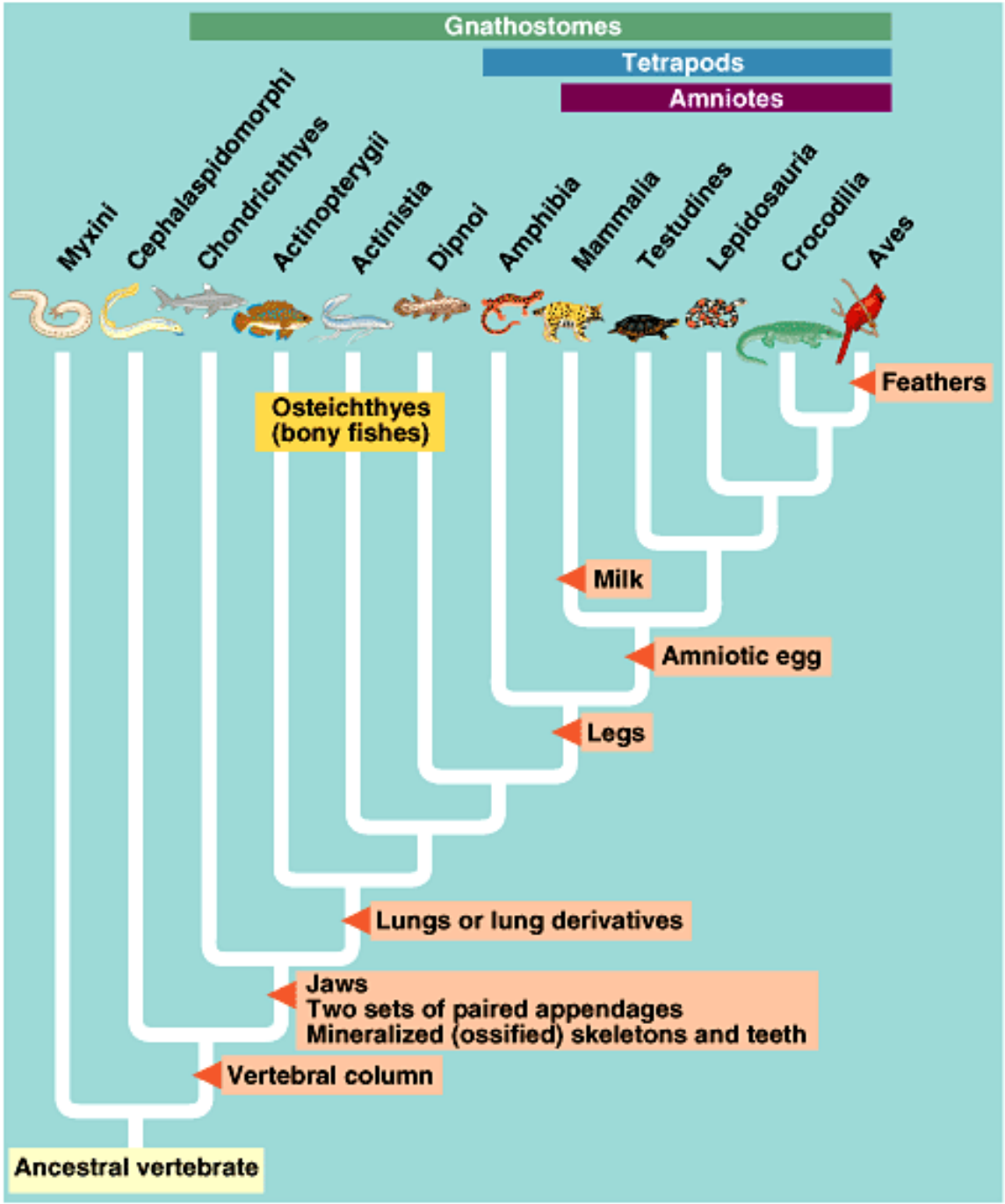
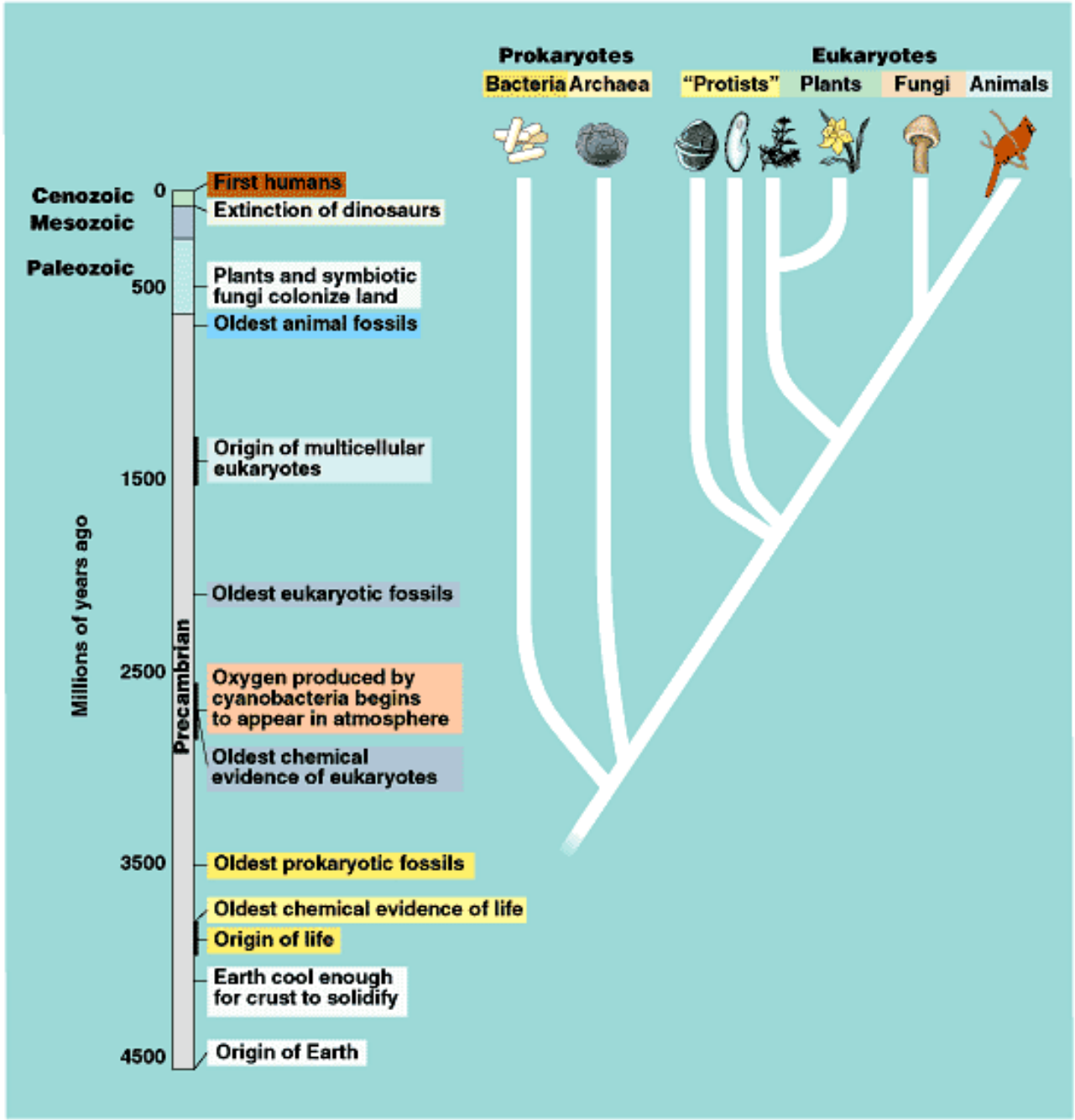


Fig. 26.1



A cartoon of the Tree of Life