

## Reading Questions for:

*The Birth of Complex Cells* by Christian de Duve

Scientific American April 1996

*Uprooting the Tree of Life* by W. Ford Doolittle

Scientific American February 2000

1. What are three fundamental differences between prokaryotic and eukaryotic cells?
2. What is the *endosymbiont hypothesis*? Of what eukaryotic cellular organelles does it attempt to explain the origin?
3. What is a stromatolite, and what are two things about their existence helped scientists develop hypotheses about the evolution of eukaryotic cells?
4. How does a flexible membrane enable eukaryotic cells to grow larger than prokaryotic walled cells?
5. What is the origin of atmospheric oxygen on planet Earth?
6. How does de Duve use oxygen toxicity to explain the evolution of endosymbionts and various organelles now extant in eukaryotic cells?
7. What evidence is there that there are three, rather than two, distinct groupings based on evolutionary lineage (Domains) for all current life on Earth?
8. What is the evidence that eukaryotes evolved from archaea, rather than eubacteria?
9. In what way is this viewpoint considered to be over-simplistic? What evidence is there to support a more complicated set of inter-relationships among the earliest organisms?