

Darwin on the geological record: “I look at the geological record



as a history of the world imperfectly kept, and written in a changing dialect; of this history, we possess the last volume alone, relating only to two or three countries. Of this volume, only here and there a short chapter has been preserved, and of each page, only here and there a few lines.”

What does it take to become a fossil?

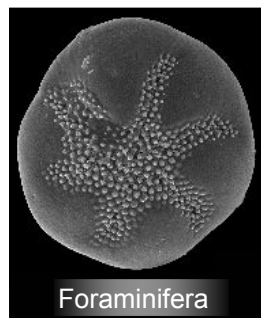
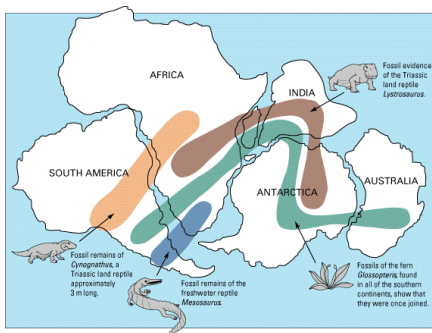
- ❑ A dead organism must escape the decomposers of a food web and be exposed to specific geological conditions.
- ❑ Fossilization is *extremely* uncommon.
- ❑ Today, at least about **7 million** species are living worldwide. By contrast, the fossil record has only about **250,000** species named.



Fossils & mythology



- ❑ People have always sought explanations for fossils. Many familiar mythological creatures arose from such attempts.



Fossils & earth science

- ❑ Comparison of fossils between continents provided critical support for continental drift theory—and eventually plate tectonics.
- ❑ Oxygen isotope ratios can give us clues about past climates.
- ❑ Comparisons between modern and fossil organisms allow researchers to make inferences about that organism’s environment. However, this can be tricky, because we know that extinct species are not identical to modern species!
- ❑ “Index fossils” have long been used in hydrocarbon exploration.

Fossils & molecular clocks



- ❑ Molecular sequence data can tell us the **relative** ages of taxa.
- ❑ Calibrating the molecular clock with fossils allows for estimation of the **absolute** ages of taxa.