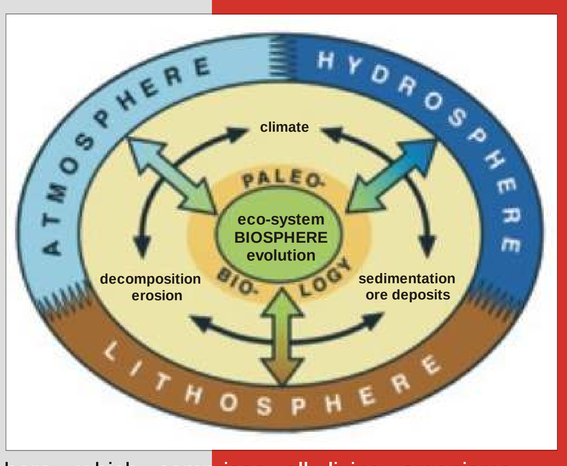
International Year of Planet Earth

Earth and Life -
origins of diversity

The biosphere is the "living sphere" of planet Earth. It is the most remarkable characteristic of our planet, and makes Earth unique within the planetary system. The evolution of life and biosphere began perhaps as early as 4.2 billion years ago, but by 2.7 billion years ago life had started to have a significant effect on the atmosphere, oceans, and lithosphere.

It is the joint aim of research by palaeontologists and biologists worldwide to understand the multiple factors that control the processes of life. This research includes insights into the functioning and stability of palaeo-ecosystems, understanding of biodiversity dynamics over long time scales, and predicting future biosphere vitality. All these topics are inextricably linked. They require palaeontologists, biologists, and Earth scientists to work together at local, regional and global scales.



Earth's biosphere, which comprises all living organisms, depends on the interaction with atmosphere (air), hydrosphere (water) and lithosphere (rocks)

Protecting the biosphere is a responsibility of us all

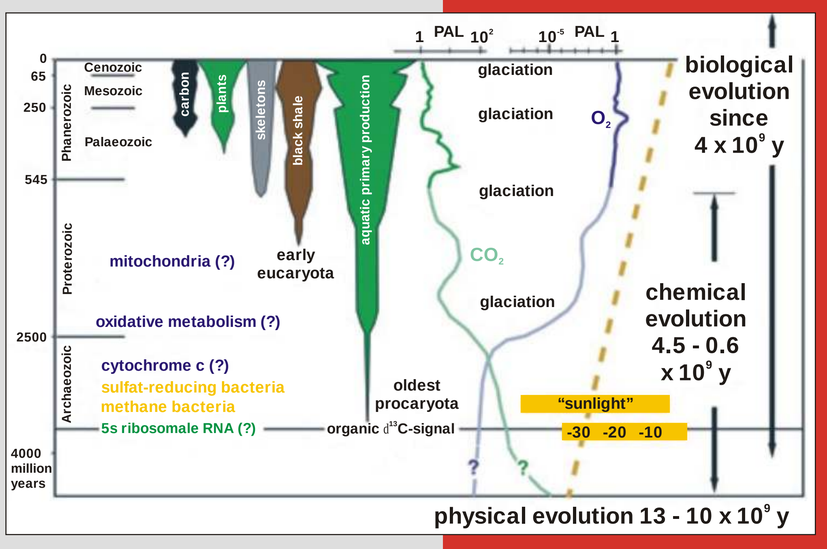
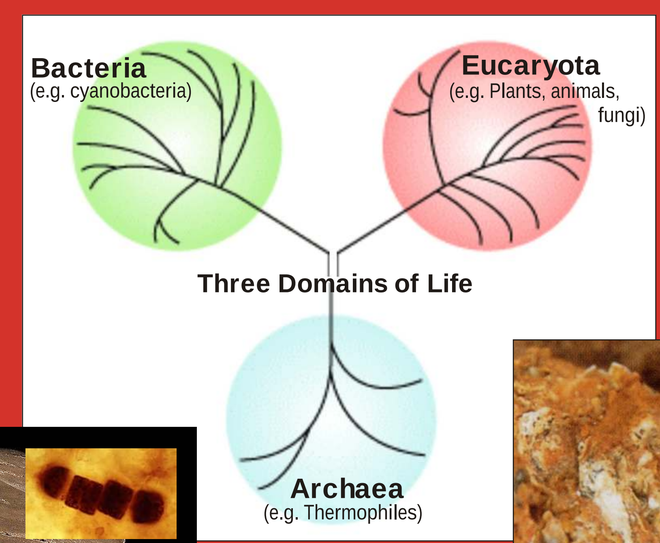
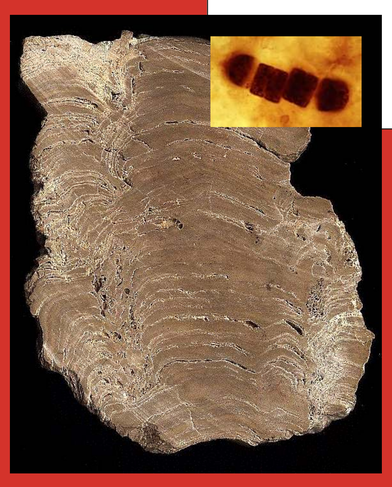


Diagram showing the interaction of physical, chemical and biological evolution

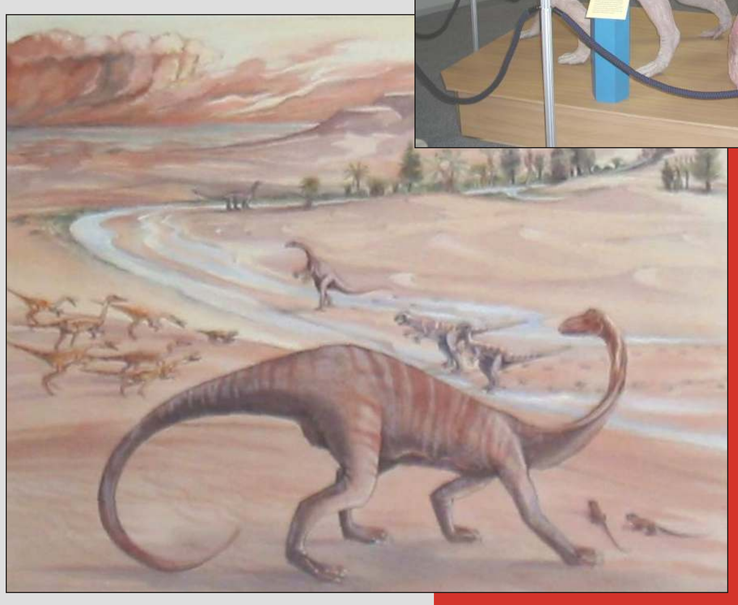




Stromatolite produced by the activity of cyanobacteria

Mandible of *Otavipithicus namibiensis*, the first Miocene hominoid discovered south of the equator

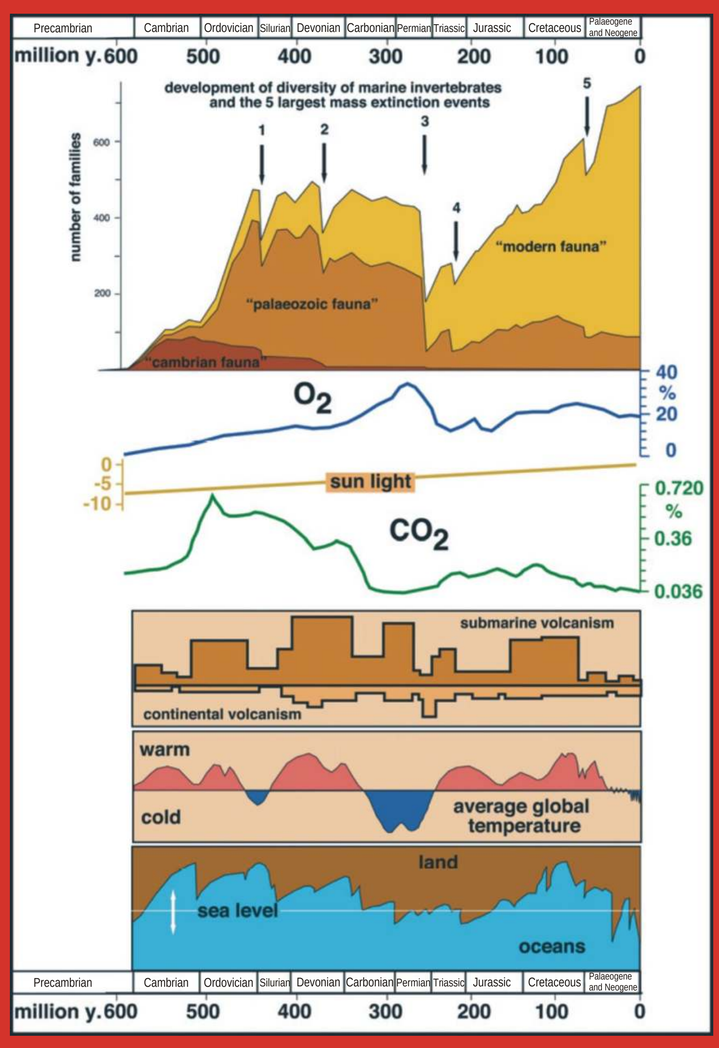
Massospondylus, a herbivore that lived in the region of today's Waterberg Plateau during the Triassic, in its natural environment (below, painting by C. Marais) and as a cast in the National Earth Science Museum, Windhoek (right)



Two million-year old leopard skull

The scientific importance of Namibian fossils is today known and appreciated well beyond the country's borders. Sites within the Nama Group, the Karoo Sequence and in Cenozoic rocks of the southern Namib Desert and the Otavi Karstveld rank as world-class resources. The Ediacaran fauna from the Nama Group is amongst the best preserved and most extensive of its kind in the world, and has provided information essential for understanding the palaeo-biosphere in the Neoproterozoic leading up to the so-called Cambrian explosion of life some 550 million years ago. Many new species of these fossils are based on Namibian material.

The Mesozoic Karoo Sequence has also yielded important finds, and several mammal-like reptiles and plants found in these rocks are unique to Namibia. The Cenozoic deposits of the southern Namib contain well over 100 species, more than 80 of which have been first described from Namibia. Last but not least, the Otavi Karstveld has yielded the first known hominoid from subequatorial Africa, along with an exceptionally rich microfauna of rodents, insectivores and bats, many of which comprise new species or genera.



The development of life on Earth did not proceed smoothly, but in its course suffered a number of set-backs related to the chemical and physical evolution of the planet

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