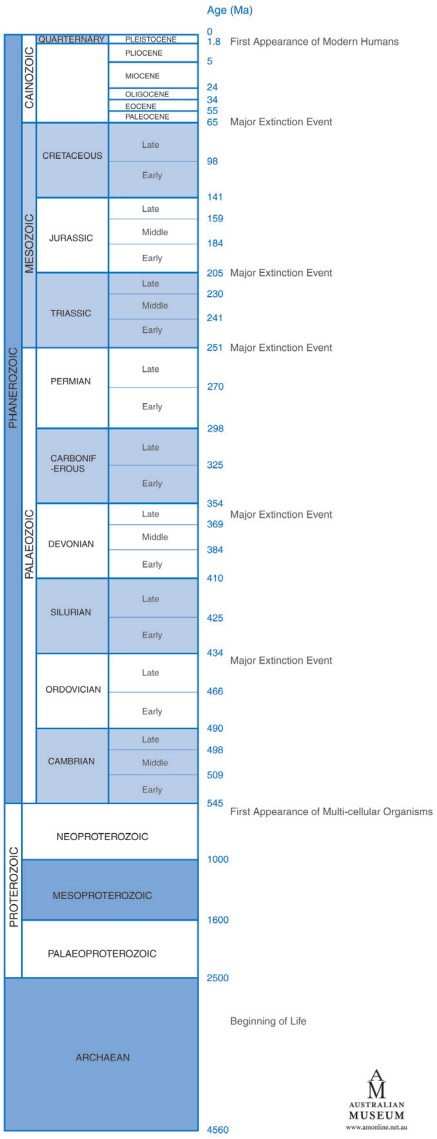
How else do we use Strontium (Sr) isotopes?

Geological Fingerprints

Rocks have different $^{87}Sr/^{86}Sr$ ratios – 'a geological fingerprint' based on their age and type. Erosion transports the 'fingerprint' into water and soils.

Anything which grows in soil or takes up water can acquire a unique $^{87}Sr/^{86}Sr$ signature. This is used as an archaeological tool. By analysing the Sr of teeth and bones we can trace the migration patterns of man and animals. You have a strontium isotope ratio in you which reflects where you live and where you have been!

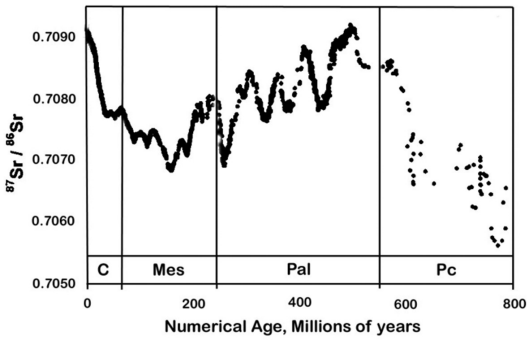
Geological timescale

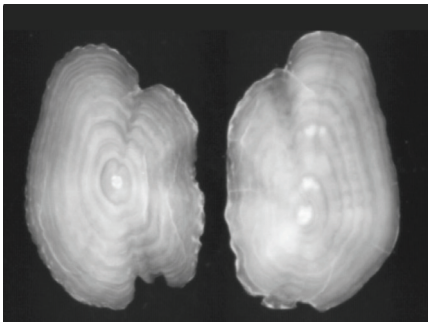


Dating Deep-Sea Rocks

The oceans of the world contain strontium with a uniform isotope composition. The levels haven't always been the same and over the millennia, with changes in geology and climate it has varied. This oceanic $^{87}Sr/^{86}Sr$ ratio is now very well characterised over the Ceneozoic period (today – 65.5 million years ago).

Fish, sea-shells and plankton contain strontium absorbed from sea water. When they die they sink and are buried in the sediment on the sea bed. Over geological time these sediments are turned into rocks. By analysing the $^{87}Sr/^{86}Sr$ of fossils we can work out the age of the sedimentary rocks in when they where found. This is called 'Strontium Isotope Stratigraphy'.





Fish ears, otoliths

Planktonic Foraminifera ~0.5cm