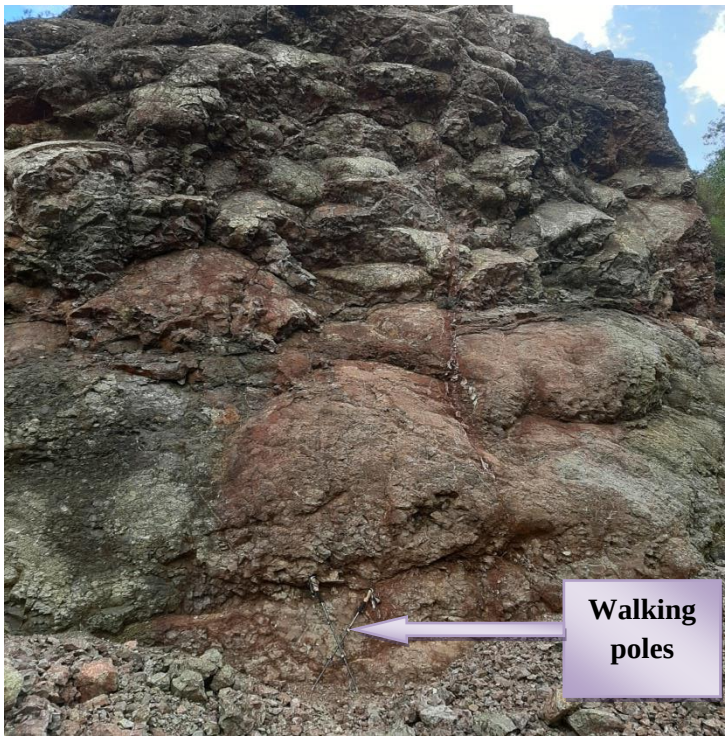
- On a recent walk around the Kannaviou Dam area, I noticed that the heavy rain and/or earthquakes have caused a number of rockslides. These have exposed, well formed, pillow lava outcrops. In the rubble (there is probably a proper geology term for this), I noticed rocks with elongated cavities. As magma rises to the surface the pressure on it decreases. When this happens, the gasses dissolved in the magma expand and come out of the solution, forming gas bubbles inside it. These cavities are called '<u>vesicles</u>' and their shape can indicate the direction of the lava flow. They could also be 'spiracles' which are formed by a gaseous explosion in lava that is still fluid, probably due to steam generated from underlying wet material. Some spiracles can be millimetres in diameter or as shown in the photograph – large enough for a geologist to stand in!



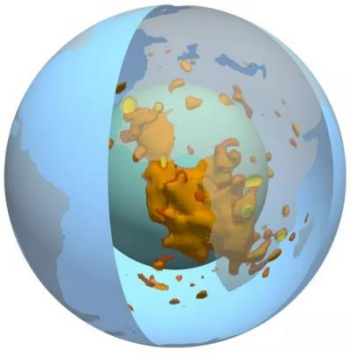
Some of the vesicles were in-filled with a secondary mineral, they are then called '<u>amygdules or amygdales</u>' from the Greek word αμυγδαλή, meaning "almond" – reflecting the shape of an in-filled vesicle. The minerals in the amygdales are typically: <u>calcite</u>, <u>quartz</u>, <u>chlorite</u>, or one of the <u>zeolites</u>. The rock in which they are present is 'amygdaloidal'.

Mary Anning (1799–1847) was an English amateur fossil collector and palaeontologist who became known around the world for the discoveries she made in Jurassic marine

fossil beds in the cliffs along the English Channel at Lyme Regis. Anning's findings contributed to changes in scientific thinking about prehistoric life and the history of the earth. Her discoveries included the first correctly identified ichthyosaur skeleton when she was **twelve years old**; the first two nearly complete plesiosaur skeletons; the first pterosaur skeleton located outside Germany; and fish fossils. Her observations played a key role in the discovery that coprolites, were fossilised faeces, and she also discovered that belemnite fossils contained fossilised ink sacs like those of modern cephalopods. Unfortunately, as a woman, she was not eligible to join the Geological Society of London and she did not always receive full credit for her scientific contributions. In 2010, 163 years after her death, the Royal Society included Anning in a list of the ten British women who have most influenced the history of science. A film based on segments of Anning's life and legacy entitled *Ammonite*, was released in 2020 with Kate Winslet portraying Anning.

In May 2020 a statue of Mary Anning was unveiled at Gun Cliff Walk and Long Entry in Lyme Regis.

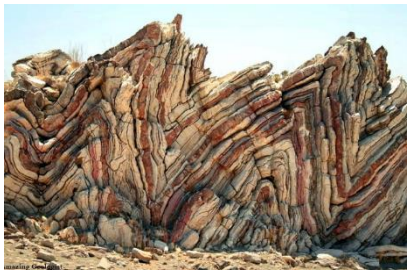
Mysterious continent-sized lumps deep inside Earth? These blobs, which sit below West Africa and the Pacific Ocean, have confounded seismologists for decades. They are the size of continents, covering almost a third of the boundary between the core and the mantle. We also know that they are hotter than their surroundings. Officially known as Large Low-Shear-Velocity Provinces (LLSVPs. A team of researchers believe that these anomalies are actually the remains of Theia, a protoplanet that struck the Earth 4.5 million years ago, in a collision that resulted in the formation of the Moon. The blobs have their roots 2,900 km (1,800 miles) below the surface, almost halfway to the centre of the Earth. They are thought to be the birthplace of rising columns of hot rock called "deep mantle plumes" that reach Earth's surface.

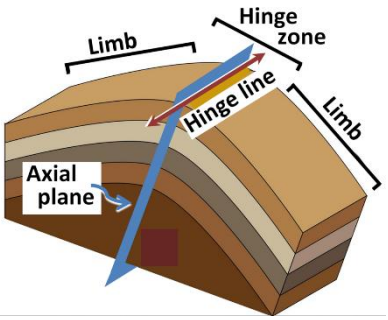


When these plumes first reach the surface, giant volcanic eruptions occur – the kind that contributed to the extinction of the dinosaurs 65.5 million years ago. The blobs may also control the eruption of a kind of rock called kimberlite, which brings diamonds from depths 120-150 km (and in some cases up to around 800 km) to Earth's surface.

Video - Earth's strange blobs could be huge pieces of alien planet

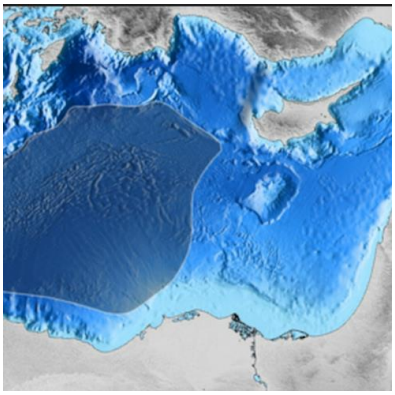
- **Akamas field trip.** Folded rocks, schists and a Magnesite mine were highlights of a recent field trip to the Akamas.
  - ***Folds*** occur when rock deforms because of tectonic pressure in such a way that it bends instead of breaking. Folds occur over very long periods of time and vary in size from microscopic crinkles to mountain-sized folds. The deformation is maintained even if the forces that created it disappears. The hinge is the line connecting the points of maximum folding in each layer. Fold (Geology)

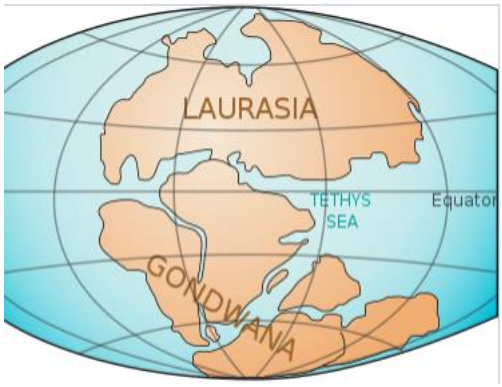




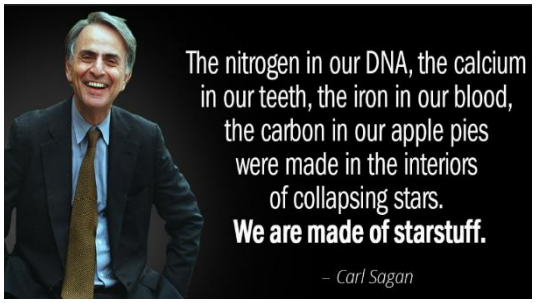
  - ***Schist*** is a medium grained, foliated **(**repetitive layering**)** metamorphic rock made up of plate-shaped mineral grains like biotite, muscovite, talc and chlorite with smaller amounts of bulky minerals like quartz and feldspar. The grains are large enough to be seen with an unaided eye. The platy minerals are oriented parallel to one another, making it easy to break the rock into thin plates**.** Schist isn't primarily defined by its mineralogy, but rather by its texture. The huge variation in the mineralogy of schist means that it can come in a wide variety of colours. A schist can technically be composed of almost any combination of minerals as long as the rock has a ***schistose texture***. The rocks that we picked up from the beach contained easy to see crystals that glistened with reflected light. Schist usually forms on a continental side of a convergent plate boundary where sedimentary rocks, such as shales and mudstones, have been subjected to compressive forces, heat, and chemical activity. In our case the southern margin of the Anatolian Plate is in collision with the African Plate, which has created the uplift of the Cyprus arc and Cyprus itself. The word *schist* is derived from the Greek word σχίζειν (*schízein*), meaning "to split", which refers to the ease with which schists can be split along the plane in which the platy minerals lie.
  - ***Magnasite*** is a mineral with the chemical formula $MgCO_3$ (magnesium carbonate). It is named after the presence of magnesium in its composition. Magnesite is used to produce magnesium oxide (MgO), which serves as a refractory material for the steel industry and as a raw material for the chemical industry. Magnesite usually forms during the alteration of magnesium rich rocks or carbonate rocks by metamorphism or chemical weathering. Magnesite is generally white but can be tinted gray, yellow or brown. It was mined on the Akamas until around the 1950s. The group inspected the mine tunnels and the kiln where the magnesite ore was roasted to produce magnesium oxide that is used as a refactory material and in the chemical industry .

- **340-million-year-old floor of 'Lost Ocean' found** – and it's near to Cyprus! Oceanic crust has a high density and therefore is recycled by subduction back into the Earth's mantle. This means that most of the crust is less than 200 million years old. Scientists believe they have found a part of a 340-million-year-old ocean floor at the bottom of the Mediterranean Sea, which was a part of the of the ancient Tethys Ocean. The 60,000-square-mile crust may have also been formed around the time Earth's landmasses formed the supercontinent Pangea. As oceanic crust is formed at mid-oceanic ridges and magma cools, magnetic minerals align with the direction of the Earth's magnetic field, which changes polarity over time. The new oceanic crust records these magnetic stripes like a bar code and they can be analysed to determine the age of the crust. Lost Ocean Floor Found



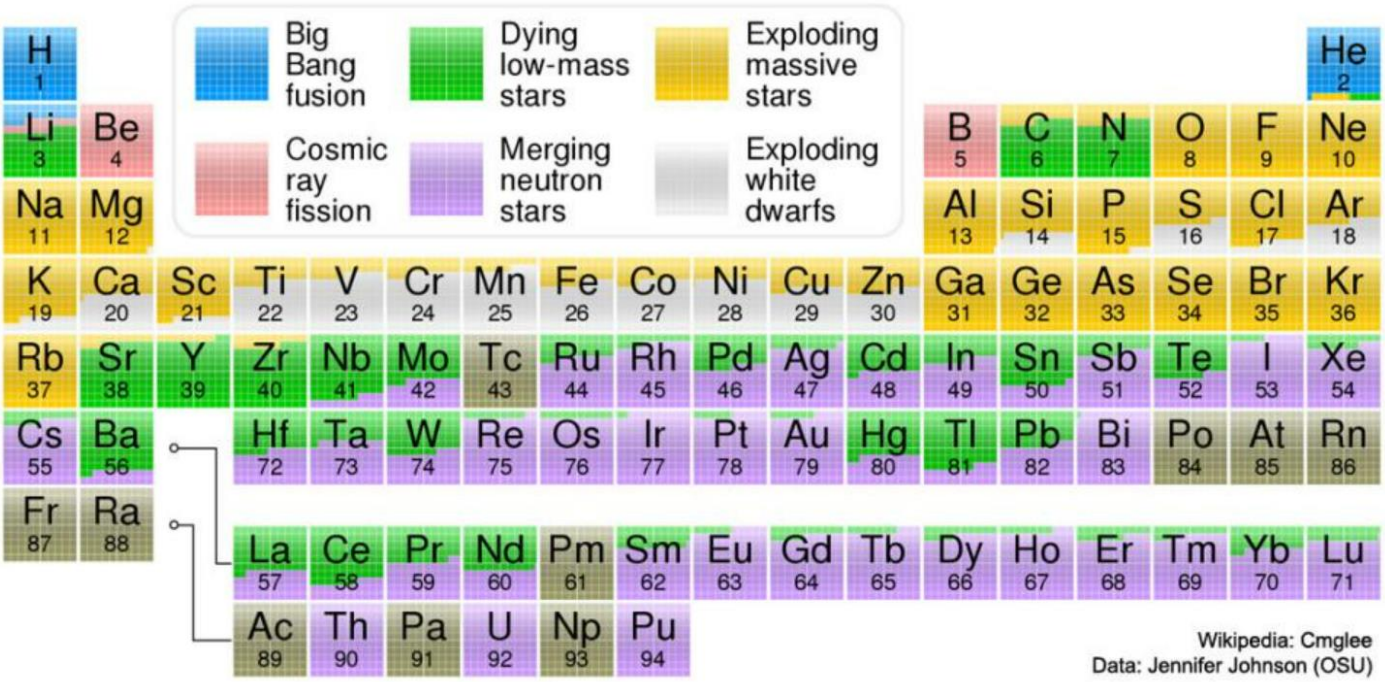


- **Where do elements come from?** Rocks are made from minerals, which can be just one chemical element (they contain only one type of atom) or the mineral can be a chemical compound (they contain atoms of more than one chemical element). Fundamentally, the human body is made up of the same elements. Most of the human body is made up of water, H_2O (Hydrogen and Oxygen). 96.2% of the mass of the human body is made up of just four elements: oxygen, carbon, hydrogen, and nitrogen. Where do all these elements come from? There are 98 naturally occurring elements. From a few minutes after the Big Bang until the universe was about 400 million years old, it was made of just hydrogen, helium and a very small amount of lithium and these still make up 90% percent of the atoms in our cosmos. So where do all the other elements come from? In the early 1950s, it was still unclear how the elements that make up our universe, our solar system, even our human bodies, were created. We now know it takes stellar activity to produce the rest of the elements, it is only in stars that the immense pressures and temperatures can be found to combine the simpler hydrogen and helium atoms to make more complex and heavier elements. The larger the star the stronger the gravity in their cores, they can fuse more elements – all the way up to iron. So where do elements heavier than iron come from? Once a star burns through all its fuel the core collapses under its own weight and atoms are crushed extremely close together, it then explodes as a supernova creating an even greater pressure surge, resulting in atoms fusing into heavier elements like copper and zinc. Any element in your body that is heavier than iron has travelled through at least one supernova.



♫ As Joni Mitchell wrote "We are stardust, we are golden, We are billion year old carbon" *"Woodstock" (Joni Mitchell)*

The Periodic table summarising how elements are formed.



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- **Geology Museum:** On the 7th June the Earth Science field trip included a visit to the new 'Geology Centre' at Pano Arodes. It only opened in April and is still a 'work in progress' - some exhibits are still to be labelled. The curator is Arsinoe (mob: 99885588), a Cypriot geologist trained in Greece.

Directions

Fortunately, Google Earth for this area is dated ‘Oct 2021’, so the geology Centre is shown on the map.

- Heading from Fytos Taverna direction (Kathikas to Polis road), turn left into Pano Arodes. This turning is opposite the builder’s yard on the right-hand side of the road.

- 100m down the road, from the turn off to Pano Arodes, on the RHS is the 'track' that leads to the car park - this is just before the building itself. The car park is good - not sure why they did not build a descent access road.

Internal/External views

The geology display is one long room split into 3 areas (1-3) with a children's teaching area at the end (4)
Roughly area 1 is the general geology (stuff from the eastern Mediterranean area - North Africa) and an explanation of the 'Big Bang'.

Quiz

Clouds: Fact or Fiction

When I find another cool rock to take home.

Acknowledgements

LymeOnline
NewScientist
BBC NEWS
Wikipedia The Free Encyclopedia
Natural History Museum
LIVESCIENCE
Earth Eclipse
Geology.com
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