May 2018

Editorial

This month marks the end of our winter programme, one which has been varied, and we hope one that you have also found interesting. The Group is run as a cooperative venture and so relies on the good will of its members and I'm pleased to say that both last and this month I have been helped in my Editorial endeavours by two long standing members who you will see credited in the text. If you have any suggestions about what you would like to see/read about, then please let me know.

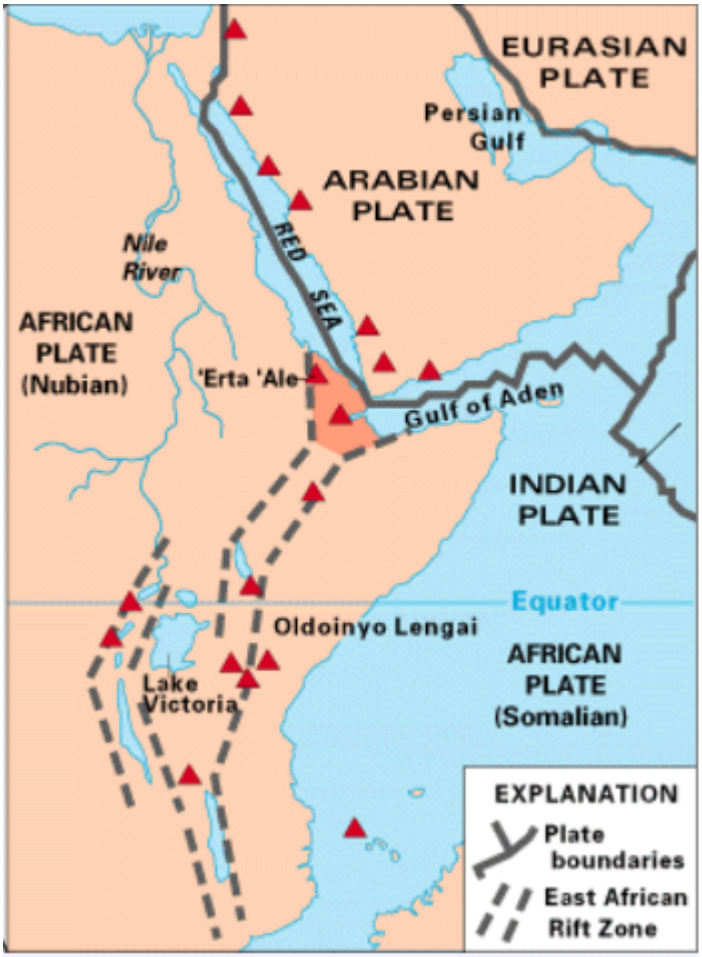
Editing this publication means acting as a very fine filter, a statement that you might find a little curious – so let me explain. I subscribe to a range of internet based websites and user groups that are dedicated to science generally and some of them specifically to geology. These vary wildly from academic papers like **http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0135593**, **Thecamoebians (Testate Amoebae) Straddling the Permian-Triassic Boundary in the Guryul Ravine Section, India: Evolutionary and Palaeoecological Implications** to more lurid headlines such as **"If you've ever wanted to own a dinosaur skeleton, it's time to start collecting your nickels and dimes, folks."**
I've reported this latter story, but in the interests of retaining your attention, I've avoided the first one. If you have ever attempted to read a Ph.D thesis then you'll understand what I mean.

There will be two more editions of Geology Matters and then something of a hiatus in August whilst you are off to your favourite holiday spots – please let us know about your favourites. Now on with the geology…

Spock might have said…

Plates Jim, but not as we know them. That is, those in East Africa, which are very different to the constructive and subductive types with which we are fairly familiar. East Africa is tearing itself apart

along the dashed lines in the map below; the red triangles being historically active volcanoes. The East African Rift System, is one of the most extensive rifts on the Earth's surface, extending from Jordan southward through eastern Africa to Mozambique. The system is some 4,000 miles (6,400 km) long and averages 30–40 miles (48–64 km) wide. The rift has been forming for some 30 million years (as Africa and the Arabian_Peninsula separated) and has been accompanied by extensive volcanism along parts of its length, producing such massifs as Kilimanjaro and Mount Kenya.

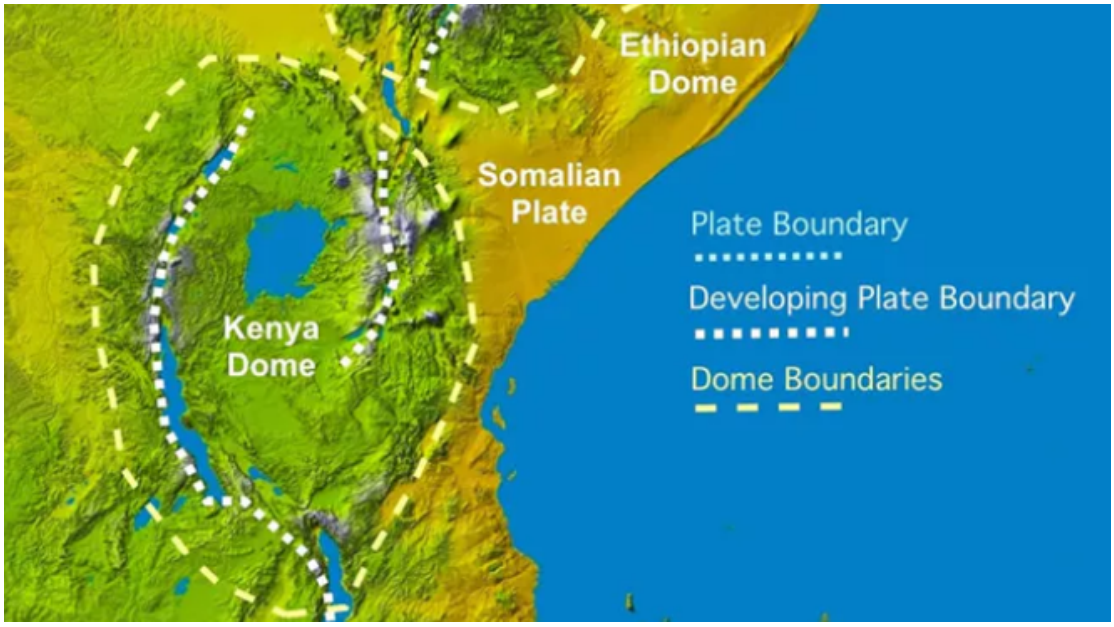


Recently, this fairly dramatic event happened at a place called Suswa, in Kenya, which also has its own shield volcano and is to the east of Lake Victoria.:

https://www.nation.co.ke/news/Suswa-rift-Kenya-splitting/1056-4348966-hhs3ol/index.html

Continental rifting requires the existence of extensional forces great enough to break the lithosphere. The East African Rift is described as an active type of rift, in which the source of these stresses lies in

the circulation of the underlying mantle. Beneath this rift, the rise of a large mantle plume is doming the lithosphere upwards, causing it to weaken as a result of the increase in temperature, undergo stretching and breaking by faulting.



And now for a bit of volcanism

You may have gathered that your editor is a bit of a sucker for pretty pictures, and so here are a few more:

The early morning light on Mount Bromo in Indonesia is quite striking.

This is Mount Suswa that was mentioned in the first story. The shadow cast by a phonolitic dome (?) is quite intriguing as is the snow on this near-equator volcano.

Klivachev on the left is the highest volcano in Eurasia and one of the most active in the world, the highest point in Kamchatka. On the right is the Kameni Volcano. Rather bizarrely the wind directions appear to be at right angles to each other.

Scouring – again, but on a huge scale

Six million years ago the Mediterranean Sea was a very different place than it is today. Plate tectonics had closed the Strait of Gibraltar separating modern-day Spain and Morocco, leaving the Mediterranean cut off from the Atlantic Ocean. The newly enclosed sea succumbed to evaporation, its water level falling by thousands

of metres, turning it into a desert-like environment pockmarked with shallow pools as salty as today's Dead Sea.

Eventually the tectonic forces reopened the Strait and there was a huge influx of water from the Atlantic; this megaflood rapidly refilled the Mediterranean. A recent study of buried ocean sediments near Sicily shows this flood may have washed all the way into the sea's partially filled eastern basin via a waterfall about 1,500 metres high.

Floods have punctuated the Earth's history, but the "Zanclean megaflood"—so named for the geologic age during which it occurred (from 5.3 MYA to 3.6 MYA)—is thought to be the largest ever; the deluge carved a 200-kilometre-long channel along the seafloor as it filled the western part of the basin. But an open question was whether the flood also tore through the eastern Mediterranean, over a seafloor cliff separating the shallower continental crust in the west from the deeper oceanic crust in the east. This natural barrier, called the Malta Escarpment, towers more than three kilometres high in places and is located to the east of modern-day Sicily and Malta. A new study has found the sediments buried near Sicily were probably deposited by the megaflood—a finding that implies a violent influx of water throughout the Mediterranean. The researchers used seismic reflection imaging, which allowed the team to reconstruct the thickness and likely composition of buried sediment layers.

One of those layers stood out from the others; it was a jumbled mix of angular pebbles and boulders which does not have internal layering like normal marine sediments. This irregularity implies the sediments—up to 800 meters thick in places—were laid down quickly and haphazardly, this layer lies just to the east of Noto Canyon, a large undersea gorge running through the Malta Escarpment. The canyon bears a curious geologic scar on its western side; a channel 400 meters deep runs through its hard limestone. This feature, similar to the signatures of erosion seen near the Strait of Gibraltar, was probably caused by flowing water.

Http://www.scoopnest.com/user/sciam/978276381183348737-watch-a-megaflood-powered-mile-high-waterfall-refilled-the-mediterranean

Jim Handley has kindly drawn my attention to a "home grown" example of this type of scouring – out in the English Channel. You can listen to the Radio 4 Podcast that explains all by following this link:

https://www.bbc.co.uk/programmes/b09wrmkb

Rock of the month

This is lustrous haematite from Morocco and on here are a whole series of images of this very variable and widespread mineral:

https://www.mindat.org/gm/1856

It is also the most commonly mined ore from which iron is extracted.

Fossil of the month (for those of you who have, well, almost everything)

Fancy a trip to Paris in June? And a visit to the Eiffel Tower? Then if you fancy owning the near-complete skeleton of an Allosaurus and you also have, say, a couple of million Euros left over from your last holiday, then this could be for you!

https://www.facebook.com/aguttes/videos/763812280475876/

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