Chairman's Report for the Bath Geological Society, 2018/19

2018

As we have not published a Journal since for almost two years, I have combined the last two year's programmes.

We started the year 2018, following the AGM, with Dr Daniel Field from the University of Bath discussing his research into modern birds and their dinosaurian ancestors and how they survived the end-Cretaceous mass extinction. We were unable to have a lecture in March owing to violent arctic weather in Northern Europe and our speaker was unable to travel from Germany. Fortunately the weather improved in April and we were able to hear Dr Michael Taylor, from the University of Bristol, talk to us about the scientific reasons for the extreme neck length of sauropod dinosaurs compared to modern mammals,

The May lecture by Dr Lucy Clarke, from the University of Gloucestershire was on the Antarctic Peninsula Glacial Change, made possible by the comparison of modern satellite data to a large amount of 1940's aerial photography. In June, Lisa McNeill, from the National Oceanography Centre of the University of Southampton reviewed the available geological and geophysical data of the Sumatran subduction zone and the related major tsunami and earthquakes in this area of Indonesia.

We continued into July with the earth's natural hazards with a talk by Dr Simon Wakefield, Cardiff University, on the 'Dangerous Earth' on which we all live. September's meeting was our annual joint meeting with the BRLSI, given by Dave Green, on the Earth's Oceans, Past and Present, and our understanding of the geological processes operating in the oceans.

October brought us another member of staff from the University of Bristol, Dr Heather Buss, who spoke to us about that critical zone between the treetops and where rocks begin to weather, and its importance in this time of environmental change. November's talk saw us return to palaeontology with Dr Aaron Hunter, University of Cambridge, speaking about new fossils discoveries in France and Morocco improving our understanding of the development of starfish and brittle stars in the Great Ordovician Biodiversification Event. Our last talk of the year was given by T.M. Gernon from the University of Southampton, concerning Diamond Eruptions and kimberlite eruptions.

Three field trips were organised during the year, our usual annual clean-up of Brown's Folly, and thanks to Professor Maurice Tucker for leading the trip and to our members who helped. Maurice was busy with the trips this year and took us down to Watchet to examine the Upper Triassic and Lower Jurassic sediments of the North Somerset Coast. The last field trip of the year was to Dead Maid's Quarry, Mere to see the Upper Greensand and Lower Chalk, and to help clean up this SSSI site.

I would like to thank Maurice Tucker for including Brown's Folly in the national GeoWeek listing, in early May.

2019

We started the year, following the AGM in February, with our Chairman for the last few years, Professor Maurice Tucker, giving us a talk on 'Limestones, Microbes and Viruses'. His talk explored the potential role of viruses in carbonate precipitation. This was followed in March with Dr Tiago Alves from Cardiff University with a talk on 'Oil and Gas Fields for the 22nd Century' on the dramatic changes in the more sustainable way these fields will be exploited and how governments, industry and the public are investing in new technologies and approaches to energy production. Keeping to the theme of 'energy', April's meeting was given by Dr. James Verdon, from the University of Bristol on the worldwide boom in shale gas and the history of 'fracking'.

Our May meeting brought us a little closer to ourselves with Professor Phillip Toms from the University of Gloucestershire, talking to us about Luminescence dating, Climate Change and Hominins, concentrating on where this has played a central role in past climate change and evolution and dispersal of Hominins. In June Dr. Mike Fowler from the University of Portsmouth gave us a fascinating talk on 'Granite Petrogenesis', highlighting recent work on juvenile granites that may represent unrecognised long-term crustal growth, with attendant implications for the evolution of the planet (well, bits of it anyhow…).

In July, Dr. Alison Mcleod from the University of |Reading gave us a talk on 'Climate, chronology and conundrums in the \north \Atlantic region' which may be giving us a look into the world's concerns regarding Global warming. Following our 'August' holiday from talks, we returned to an excellent talk by Professor Michael Benton from the University of Bristol, in September on 'The Dinosaurs Rediscovered: How a Scientific Revolution is Rewriting History'. He explained how the study of dinosaurs has transformed into a true scientific discipline, where new technologies have revealed secrets locked in prehistoric bones that no one could have previously predicted. Members were able to order and purchase copies of his book.

In October, Dr. Peter Wigley gave us a talk on our 'father of English geology' William Smth, concentrating on his activities in Somerset and the production of the early geological maps of this area, particularly of Bath in late 1799. Professor Malcom Hart, University of Plymouth, returned to us in November to talk about 'Jurassic calamari: death and preservation of fossil squid in the Jurassic rocks of the Wessex Basin'. He discussed the great importance of the cephalopods in the Jurassic ecosystem and the excellently preserved specimens found within the local area. The final talk of the year, in December, was given by our own member, Graham Hickman, on his time in the islands of Trinidad and Tobago and the continuing successful hunt for gas in the offshore region within the Columbus basin.

We have had a number of Field Trips this year, including our February clean-up of Brown's Folly, a visit to the Etches Museum and Kimmeridge Bay in Dorset. A few other field trips were made with other local societies.

We have had another successful year, with a range of topics for talks and fieldtrips. However, membership remains at about 60 members after a brief reduction during the year. We have had to keep to the smaller room for our lectures, as attendance is usually around 45. Once again, we have had an excellent selection of speakers and topics and I would like to thank our Committee Members for their help in suggesting and arranging the speakers.

Finally, I would like to thank all the committee members for all of their help and to Melissa Freeman for producing the Journal.

Our stand at the Festival of Geology, UCL, 2018 by Mellissa Freeman

Browns Folly, site 5. Some of the crew hard at work!. By Mellissa Freeman

Kaikoura Earthquake and after
By Isabel Buckingham

On 14th November 2016 at 2 minutes after midnight an earthquake started 60 km south of Kaikoura off the east coast of South Island New Zealand. The rupture spread north and lasted about 2 minutes. The strongest part of the quake was felt north of the epicentre near Seddon a few km south of Blenheim. This 7.8M quake was the second largest to hit NZ since European settlement and also caused damage in Wellington and Lower Hutt in North Island. In all 21 faults moved and in one case by >10m. What is less widely appreciated is that a tsunami followed, this being recorded by the tide gauge at Kaikoura, and debris lines. Initially the sea withdrew then water returned in waves. The highest 7m was recorded at Goose Bay which is south of Kaikoura from stranded debris. The drop was 2.5m complicated by the land lifting by 1m at the gauge site. At Goose Bay, unlike the rest of NZ there is no continental shelf, as the Hikurangi trench starts 1.6km offshore at a depth of <2,000m and extends north to just off Gisborne as it continues as the deeper Kermadoc trench. *This shows well on Google Earth.*

Image by Isabel Buckingham: Large Slide , full height

This trench had just been surveyed at the time of the earthquake. Part of the interest is the similarity with the sea bed off Japan. Unlike the area off the west coast of USA little is known of the frequency of earthquakes, so geologist look for turbidites off shore, raised sea beds and tsunami deposits. There seems for example to be a tsunami deposit from about 800 BP at Lake Grassmere a salt lake near Seddon The most recent orogeny is called the Kaikoura Orogeny and is known to have been at an increasing rate over the last 5 million years.