THE RECORD

Secretary's Report 2022/3

Despite the ups and downs of the last few years the Society continues to thrive. We have around 200 individual, joint and institutional members. Although we have a few new members each year the total number **is** slowly declining. The shortage of younger members, as is the case with many groups such as ours, is a cause for concern for the long term viability of the Society.

Lectures

With the resumption of business as usual we thankfully had our full programme of lectures on a wide variety of subjects.

The Presidential Address for 2022 took place in March, entitled **Landforms of the Yorkshire Dales**, it raised some thoughtful questions. Known for their spectacular geology and their glaciated and karst landscapes, the Yorkshire Dales remain enigmatic in parts of their geomorphology. Are the benches erosion surfaces or stratimorphs? Why are the pavements so well rounded? Do the erratics indicate erosion rates? What broke up Brimham Rocks? What did sulphuric acid do for early cave development? Is Malham Cove fluvial or glacial? What did the pre-Anglian terrain look like? What happened to the caves beneath the icecaps? To these questions some thoughts and maybe some partial answers were provided.

April's lecture was given by Dr Peter Jones and had an historical theme: **The Pleistocene succession in the Middle Basin according to R. M. Deeley (1886) and what we now know from subsequent research**. Richard Mountford Deeley (1855–1944) was well known in engineering circles. He was Chief Mechanical Engineer of the Midland Railway, the Works Manager at Derby and eventually Chief Locomotive Superintendent. His co-authored work on *Lubrication and Lubricants* (Archbutt & Deeley 1900) extended to over 500 pages and at least five editions. However, in his 'spare' time, Deeley was a dedicated geologist who published over 50 contributions in various scientific journals. Many of these related to the properties and behaviour of glacier ice but he also wrote on topics such as isostasy and mountain building as well as producing a manual on the Principles of Meteorology (Deeley 1935). In 1879, Deeley began an investigation of the succession of superficial deposits around Derby and Nottingham. It resulted in a substantial paper presented to the Geological Society of London (Deeley 1886) and several subsequent articles including an account of *Hippopotamus* remains in interglacial river gravels at Allenton (Bemrose & Deeley 1896). This pioneering work created a firm foundation for later studies. The talk reviewed Deeley's contribution to establishing the sequence of glacier incursions within the Middle Trent Valley and discussed recent advances in the understanding of local Quaternary events.

In the October lecture, postponed from April, Nic Pierpoint considered **Sub Surface Risks and Uncertainties**. Equipped with an understanding of subsurface risk, in particular relating to pore pressure, he focused on a case-study of a well control incident which occurred in the Nile Delta. The prospect to be drilled was well constrained by offset well data. The potential geohazards, whether identified on seismic or encountered in offset correlation wells, were assessed and mitigated against in the well design. In doing so, this should have enabled the well objectives to be achieved in a safe manner, and within budget. Following a post well investigation of data (black box) recovered from the rigsite it was possible to understand what occurred and why. This case study illustrated how vital it is to fully assess accurately geological data near real-time. Lessons from this incident have been shared across the industry. A critical link is communicating geological uncertainties to the rigsite team in a clear and timely manner. A drilling rig located over 100 km offshore and in water depths in excess of 300 m can feel a remote and potentially vulnerable place if things do not go to plan.

In November, Dr Craig Magee of the School of Earth and Environment, University of Leeds, spoke on **Revisiting Emplacement of Igneous Intrusions in the UK**. Current understanding of volcanic plumbing systems was arguably founded by studies examining igneous intrusions in the UK from the mid-1800s to the mid-1900s. Simple models describing how such intrusions were emplaced have since been applied to help imagine the inner workings of many active volcanoes. The original work on these UK intrusions was certainly pioneering, but new techniques are now available and much has changed in regard to the geological context needed to interpret magma emplacement (e.g. plate tectonic theory). Part of the speaker's research career has involved questioning how magma emplaces through the crust and sedimentary basins, using cutting-edge technology to test ideas and, often, refine models. In this talk he demonstrated the need to revisit 'classic' igneous intrusions in the UK (and elsewhere) with a view to updating understanding of volcanic systems. The first part of the talk focused on testing emplacement models for the cone sheets of Ardnamurchan, NW Scotland, before moving on to thinking more broadly about what can be learnt about magma flow through the crust from UK geology.

In December, Mark Evans of the British Antarctic Survey and University of Leicester described the extraction of a recent fossil find in Rutland: **A Giant Ichthyosaur from Rutland: Britain's largest 'sea dragon' from England's smallest county**. In early

2021 some large fossil vertebrae were found protruding from the mud beside a lagoon at Rutland Water Nature Reserve. An initial site visit confirmed that they belonged to a large ichthyosaur — fish-shaped marine reptiles from the Mesozoic. An initial dig revealed that the specimen was complete from the skull to the end of the tail. At approximately 10 metres in length, it is the largest complete skeleton of an ichthyosaur, or any other fossil reptile, ever found in Britain. Its geological setting is the Whitby Mudstone Formation, which largely underlies Rutland Water, and it is therefore approximately 180 million years old (Toarcian, Early Jurassic). He described the full excavation and lifting of the specimen over a period of approximately three weeks in late summer 2021. Although there remains much research to be done following the eventual cleaning and conservation of the skeleton, it was possible to discuss the fossil'a wider context and significance.

In January 2023, the speaker, Dr Clare Boston from the University of Plymouth, gave a broad overview of the **Dryas Glaciation in Scotland**. She addressed the key debates and recent advances concerning the Pleistocene/Holocene transition. Covering the basic origins of glacial structures and limits she went on to compare the use of tephrochronology and cosmogenic radionuclide dating. She suggested that the former appeared to be more accurate, especially if related to carbon dating, showing the Highlands icecap to be late in the Dryas. The relationship between glaciers and climate with the parts played by precipitation, temperature and terrain was then considered. She concluded that the West Highland ice field reached its maximum extent during the late interstadial (but other satellites may be earlier). This period being warmer and with more precipitation may have led to surging but more evidence is needed to confirm this view.

The presidential address for 2023 took place in February on the subject of **Civil Engineering meets Geology in the Panama Canal**. A long and varied history of great canal construction extended throughout the 1800s and included the first attempt at a canal across Panama, which failed in its early stages. It was therefore into the next century that the Americas built the Panama Canal between 1904 and 1914. Construction of the massive concrete locks and of Gatun Lake both broke world records at the time, and was brilliant in concept and evolution. Complex geology, dominated by the horrendously weak Cucaracha Clay, created huge problems in the deep Culebra Cut, and these were overcome in less than subtle style, by brute force and massive expenditure of machinery and effort. The Panama Canal continues to be a critical element in world trade, and recent completion of its larger locks assures its future.

We were very pleased to once again hold our well supported Cheese & Wine event after the December lecture.

Field trips

Despite one or two false starts and inclement weather some well attended field trips were held this year.

The Roaches, Leek Staffordshire with leader Martin Whiteley took place in July and was a walk around the area that is known geologically as the southern end of the Goyt syncline in Namurian 'Millstone Grit' formations. This remarkable structural feature produces some interesting landforms and the several localities visited allowed the participants to build up an understanding of how the area formed.

In July during the hottest part of the summer a very comprehensive weekend took place centred on **Llandrindod Wells.** Friday evening was a detailed background briefing from the expert leaders Dr Joe Botting and Dr Lucy Muir who have carried out extensive paleontological research in the area with the advantage of living locally. The next two days began with a visit to the local museum which has an excellent display of fossils and was followed by guided visits to a number of nearby exposures of Ordovician and Silurian sedimentary and volcanic rocks which contain a varied fauna, including trilobites, graptolites and crinoids.

The fieldtrip in August was to **Tearsall Farm, former opencast site, Bonsall area**, led by Mike Allen. This was an opportunity to see a complete section through one of the generally poorly exposed Lower Carboniferous lavas in Derbyshire together with a former opencast fluorspar quarry in an area of intense historic lead mining activity. The Upper Matlock lava in former opencast workings at Tearsall was visited in the morning, followed by exploring above Bonsall village to examine volcanic rocks, evidence of former mining, and miscellaneous points of interest.

Council

This year Council was able to have the full number of meetings face to face in order to co-ordinate the activities of the Society.

A number of members took part in the clean-up of an exposure of the Upper Miller's Dale Lava on the Monsal trail which the Park Authority will maintain in future. Subsequently members of the public have been seen taking an interest, so those that took part can feel that their efforts are being appreciated, proving it was a worthwhile activity for the Society to undertake.

Having sold 14,000 copies since the original publication of the Nottingham Caves book a new reprint of a further 2,000 copies was authorized by Council.

During the year an EMGS Facebook was set up. It not only posts EMGS news but also has links to that of other organizations. Our Website has been updated and is now live. It is similar to the previous one but will be more user-friendly, particularly on mobile phones.

As always our thanks go to all Council members who have worked hard to maintain the efficient running of the Society.

I would like to finish my report on a personal note. As I step down from the role I would like to thank all those who have supported me during my 20 years as Secretary. I have thoroughly enjoyed the job having worked alongside seven Presidents, three Treasurers, 34 different individual members of Council and met or been in contact with countless members of the Society. But having recently typed up my 3,860th minute item I think it is time to pass the baton on and I wish Vanessa well.

Janet Slatter