North Eastern Geological Society

Newsletter March 2023

UPCOMING EVENTS

AGM and lecture:

Going down the Drain:Water Quality in a Changing Climate

Prof Julia Knapp. Durham University

Friday March 17th 7.15 pm

Arthur Holmes Lecture Theatre, lower floor of the Chemistry Building

(The Annual General Meeting of the Society will precede the lecture. The acting secretary has sent a separate email with the agenda for the meeting.)

PLEASE NOTE - this a face to face lecture and will not be recorded

FIELD TRIP / LECTURE REPORTS

Members Evening

12th December

A large group of members gathered to hear the exploits of two members and an excellent quiz from Christine Burridge.

Christine Telford (CT) has her own geological consultancy company based in the North East. She delivered a pacy and inspiring account of her own experiences getting a foothold in a traditionally male dominated business. She then progressed to a variety of roles, mudlogger, wellsite geologist and operations geologist, that included developing field expertise in a wide range of activities : drilling rig protocols, translating data from drilling, interpreting this data to guide the depth and angle of the drill, communicating the implications of the data and negotiating the progress of the drilling to minimise the expense of the activity.

Her role is as the geological support for the drillers and engineering support for the subsurface team, her title is thus the Operations Geologist, gathering a multitude of varied data, analysing it and guiding the drilling. Seismic data, structural models, paleontological data, historical and real time rig engineering and geological data, temperatures, pore pressure are examples of the data she uses. This then contributes to the plan to reach the target locations.

As the drilling proceeds data is collected and used to interpret progress with a constant update of the look ahead prognosis. There is always significant risk and practical contingencies. The work is very high pressure requiring exceptional communication skills as the drilling process develops and multiple data sets present decision options.

Christine used graphics to show how information overlapped and allowed success. This role is one of the pinnacles of theory and practice combining to allow a successful enterprise yet it is one of the most hidden with few understanding the role.

Christine read Geology at Reading, graduating in 1982. Early posts included IT at ICL, massive practice at job applications before joining her first mudlogging and data acquisition company : Gearhart —as a mud logger, this led onto work with BP in Lincolnshire and onto the North Sea. She determined that setting up her own company was the optimum way forward with her experience. This proved to be challenging in that some appointments were amazingly demanding in terms of longevity and challenge. Her track record was clearly enough to make her recruitment highly desirable. Wytch Farm has been a frequent posting with the AONB status of the site requiring exceptional care with the surface installations and the development of 'extended reach' drilling 15km distant from the well head at a depth of 1500 m.)

Her skills have taken her around the world to support drilling sites. Viet Nam, New Zealand and Columbia, the Orinoco Basin being ~~an~~ examples. Today her work is focussed more in lecturing (Aberdeen IPG MSc course), industry teaching, forensic analysis of drilling campaigns and field trips. She is also, with industry colleagues, part of OGICA (Operational Geoscience International Competency Assessment) who have developed and delivered an online competency assessment for the UK and international operational geoscience community to assess their skills and identify skills gaps.

The audience were delighted to see the importance and detail of an Operations Geologist in a tough commercial environment. Christine dealt with many questions using her excellent communication skills. It really was exciting to see the elements of a geology career focussed on a career. The audience gave a warm thank you and continued to discuss with her at the post lecture social event, excellently provided by Vin Murphy.

This inspiring presentation was followed by Ian Fulton who gave a presentation on the Achanarras Fish Bed in Caithness -which he studied whilst at University. Specimens of the fish were circulated.

There have been fifteen varieties of fish identified, these swam in a huge Devonian lake that existed when this part of the world was 20 degrees south of the equator. Today It forms part of the Orcadian Basin.

Ian introduced the audience to Dipterus, Diplocanthus and Palaeospondylium. In an enthusiastic session he summarised his experience as an undergraduate in the area (10 miles west of Wick) allowing us to appreciate the challenges and success of field work.

His presentation was very much appreciated, he outlined some present day research he is doing and promised to bring it to NEGS!

Christine B introduced a short quiz that she had developed with suggestions from many members. We thoroughly enjoyed the questions and equally the possible answers!

We adjourned to the lovely spread that Vin had organised. The evening was a great success. Members were delighted to see one another after the 'lockdown'. The next two meetings are on Zoom as members requested this to avoid travelling in the difficult weather that can affect evening meetings.

Gordon Liddle

Dr Keith James Plate Tectonics at 50 not written in stone

NEGS lecture online January 2023

Dr James took his audience of geological enthusiasts and gave us a good (and good natured!) talking to about our understanding of plate tectonics.

"There's a lot wrong with the theory of plate tectonics" was an arresting introduction. It seems some people have never been entirely happy with the theory as an explanation of life, the universe and everything.

Dr James began by highlighting problems raised by the timings implied in the accepted story of plate tectonics. He pointed out that South America and Africa are considered to have parted company 120 million years ago (Ma), yet fossils of freshwater creatures (including the catfish and the Manatee) identical in both their speciation and even their parasites have been dated to 45 Ma on both sides of the Atlantic.

He explained that while 12 to 13 tectonic plates are recognised in the typical representations we see there is evidence of transform faults traversing continental masses to support his contention that there are rather more than the accepted number.

He explored the understanding of the "convection cell" as a mechanism creating new oceanic crust in the spreading mid oceanic ridges and subducting crust at continental margins. He illustrated how seismic pictures of the crust show that there is extension of the substance of the crust not compression as is implied in the picture of subduction we have been taught.

Dr James then expanded our understanding of the interpretation of the recording of magnetic fields, pointing out that the alternating pattern attributed originally to reversing global POLARITY reflects in fact varying INTENSITY of magnetic fields, and commended the rather beautiful global magnetic map to us. This illustrates the symmetrical striping of magnetic changes we see alongside the mid oceanic ridge of the Atlantic just as it also demonstrates a margin where the stripes are not seen off the coasts of Africa and South America. The number of reversals of polarity purported to be documented in the Atlantic is not matched by recordings in the Pacific. The original authors of the interpretation of the magnetic record acknowledged themselves that a reversal of global polarity need not be the only explanation for their findings

He supported his assertion that oceanic crust spread is not as great as is made out by pointing out that some active volcanic islands in the Pacific remain active when according to the theory they would have moved in the oceanic crust several hundred kilometres away from their related underlying "hotspot"

Dr James touched on the results of the Deep Sea Drilling Project which sampled 165 deep ocean crust basalts globally. 153 were judged to be from the "basement" of the oceanic crust. 19 had evidence that they represented

intrusions with related “baked sediments”. He told us that the evidence for this sampling did not point to a spreading basement basalt.

The next area he moved onto was the nature of the crustal fabric. He took us on an interesting tangent into the notion of the hexagon as a basic geometrical feature of the universe’s highlight the polygonal, commonly hexagonal, appearance of, for example, lunar craters, the Giant’s Causeway basalt, fascinatingly, a hurricane photographed on the pole of Saturn and the structure of minerals we are familiar with such as olivine, aragonite and quartz. He went on to discuss his concern to develop a 3 dimensional view of structures and emphasised the significance of vertical fractures. In this discussion he introduced to some mooted ideas about other continental structures not at this time recognised as such including for example “Zealandia” a larger land mass with New Zealand at its centre.

The length of mid ocean ridges has been measured in total at 75 000 km, while trenches and collision junctions have been measured at 39,500 km. To accommodate this discrepancy Dr James pointed out that the earth is expanding. Satellites have detected electrons and protons in the solar ejections he told us and pointed out that the earth year used to be 424 days half a billion years ago but as the globe has expanded, like the ice skater spinning faster by bringing their arms close to their body so vice versa the earth now rotates 365 times for each orbit of the sun. He looked at the points of the tectonic plates where three plates meet and demonstrated how from the perspective of the south pole, extension of the plates at these points shows them moving away from south pole and that with the expansion of the earth the continents are separating in three dimensions (ie radially).

Dr James went on from this point about the earth’s expansion by explaining how the magnetic map we look at earlier with it apparent “margins” points to the continental land masses experiencing extension to meet the spreading ocean floor and that this explains the issue regarding the fossil record, since a land bridge would have persisted between South America and Africa until the Eocene.

Now if the above (which is an incomplete account) has given you a taste for the lecture then you are in the very fortunate position of being able to view his presentation for yourself on our Youtube channel. I have enclosed the link. The content of the lecture was very dense and at times a little more technical than the competence of your editor though I hope I have given you a flavour of the challenging content. Do watch it, I look forward to discussing Dr James’ assertions with other geological heads. I cannot think that everyone takes the same view as he does. There was a lot here and for my part it certainly made me think.

https://youtu.be/nkHpEMY3U7A

Administration

Please note the AGM will precede the March lecture, see the acting sec’s separate email with the agenda

Apologies for the late newsletter - as ever if you wish to contribute please email me at huttonsedgewick@gmail.com - Ed