

Home Counties North Regional Group

Newsletter - Issue No. 11 – February 2021

WELCOME to the eleventh edition of the Newsletter of the Home Counties North Regional Group. We hope you are staying well and safe during the current circumstances. It has been a tough few months, and a difficult start to the year 2021, but hopefully the lockdown restrictions will ease shortly. In the meantime, we hope that this newsletter will find you well during this lockdown. The different members of the committee have stayed busy within their geoscience related roles, whether working from home, the office, or visiting numerous site visits. An article within this newsletter issue has been inspired by one of the site investigation techniques that Zuzana has seen whilst being offshore during her last project. Furthermore, it is also the time of the year to elect new members into the committee, and we discuss the AGM in this issue for the upcoming year.

Zuzana Lednarova Newsletter Editor

Home Counties North Regional Group Officers 2020

Chair: John Wong has a BSc in Geology (University of London) and MSc in Analysis of Geoscience Data, including computer modelling (Kingston University). He also studied Masters degrees in Petroleum Geology and Geophysics at Greenwich University and Sedimentology at University of London. John has worked in the oil and gas industry as Development Geologist and Consultant Geoscientist. He is the Field Officer for the Amateur Geological Society (AGS, based in Finchley, north London) since 2007 and has organised/led more than 80 monthly field trips for that group and he was the Events Organiser for the Bedfordshire Geology Group from 2008 to 2010. John has a passion for vertebrate paleontology; and geoarchaeology of Hertfordshire and medieval battlefield geology are amongst his many leisure research interests in geology.



Secretary: Rudy Domzalski is a geophysicist with experience in archaeology as well as the petroleum industry. He started his career as an archaeologist excavating and applying geophysical surveys on sites in the UK. Following further studies at UCL and Imperial College he became a Petroleum Geophysicist where he processed seismic maps for oil and gas exploration. He keeps his knowledge of Geology and Geophysics up to date by going on fieldtrips and conferences around the world



Treasurer: Michael McCullough got his M Phil from Camborne School of Mines in 1976. He is a Chartered geologist, scrutineer and Chartership Committee member. He has worked for Wimpey Laboratories as a field geophysicist, Exploration Consultants, Pentex and Marathon Oil as Senior Geophysicist in the oil industry and as consultant senior geophysicist since 1995 for both seismic interpretation and client representative on VSP and site surveys. During downturns in the oil industry, he has been an associate of M & M Geophysical for geotechnical geophysics and part owner of Blue Diamond Drilling, a geotechnical drilling company and spent several years as second driller and site geologist.



Web Administrator and Publicity Coordinator: Karoly Pesztranszki has a BSc in Geology (University of London) and an MSc in Engineering Geology (University of Portsmouth). Since finishing his studies in 2018, Karoly has been working as a graduate geotechnical engineer at RSK Environmental Ltd. Karoly has a passion for geology, astronomy and various engineering subjects and he is keen on attending lectures and field trips as part of his personal and professional development. He also enjoys undertaking various engineering related online courses. Karoly joined the HCNRG Committee in May 2018.



Newsletter Editor: Zuzana Lednarova is currently working as a geotechnical engineer, and has a BSc in Geology (Imperial College London), and an MSc in Engineering Geology (University of Portsmouth). To date, Suzie has had the opportunity to work in numerous locations around England, familiarizing herself with the Wealden Basin, the London Basin, and also areas around Bedfordshire, Birmingham, and Leicester. Suzie is highly interested in the geological subject and enjoys attending lectures and seminars, as well as travelling around the world and visiting geologically famous landmarks/sites. In 2020, Suzie has decided to join the offshore industry and has since travelled to numerous countries to work on windfarm construction projects.



Table of Contents

Home Counties North Regional Group Officers 2020	1
Letter from the Chair Home Counties North Regional Group February 2021	4
Meetings of the Home Counties North Regional Group (2021)	5
Geoscience Articles - Introduction	6
Remarkable Creatures - a story of two forgotten women and their contribution to paleontology	7
Site investigation techniques to aid construction at challenging offshore and onshore (Stonehenge) sites	8
Future Meetings of the Home Counties North Regional Group 2021	11
Note from The Editor	12

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Letter from the Chair Home Counties North Regional Group February 2021

Dear HCNRG members,

I wish you are all well and safe.

Winter snow/wonderland ambience in the Home Counties North area came and lingered briefly; it brought us unexpected high spirits with joy and its passing left many memories. Spring 2021 is now knocking amongst the clouds, the anticipated gradual easing of lockdown restrictions is awaited with patience. Many of our office-based geoscience HCNRG members swapped their office desks for rooms at home and kitchen tables almost a year ago at the first lockdown but the coronavirus-induced homeworking 'smart working' boom is becoming questionable. People are tired and bored of this mode of operating, since it is generally one-dimensional and lacks the face-to-face interaction of people in the way that we are used to. Given time, however, we should have some normality back and I will be able to tell you that HCNRG field trips and workshops are back, along with lecture meetings.

Dr Bryan Lovell OBE (past HCNRG Chair/past President of the Geological Society) sent a letter to the newspaper, in which in commenting on the Prime Minister's speech on Brexit – quote "UK will remain geologically attached to Europe" – he said that the Anglo-Paris Basin was formed 60 million years ago and will remain for some time. A reader replied that Scotland belongs to a completely different formation, being part of the Canadian-Laurentian shield. This brief anecdote confirms my view that geoscience is always interesting and rewarding to put some sparkles into casual conversations with intellectual wit and joy.

The nominations for HCNRG committee members for 2021 close on Friday 26th February, I hope you would consider joining the committee. We are seeking HCNRG members who would be willing to assist with arranging lecture speakers and new meeting venues, leading a field trip or workshop, and help us further with our ongoing job seeking programme which aims to assist the unemployed HCNRG members when we are asked.

Below was the email sent to you from the HCNRG Secretary Rudy Domzalski on 25th January 2021.

Registrations of nominees for the HCNRG committee 2021 are open. The Committee positions available are as follows: Chair, Treasurer, Secretary, Ordinary Member (of which there are 8 available).

Every nominee must be a FGS and a member of the HCNRG, nomination applications must include names of a proposer and a seconder to the nominee, proposers and seconds must be FGS and members of HCNRG. The closing date for nominations is Friday 26th February 2021. After the closing date, we will announce all the nominees to the HCNRG members for voting via emails, closing date for voting is Thursday 4th March.

Due to the current pandemic restrictions we will not be holding a usual AGM in person, we will announce the 2021 elected HCNRG committee members to the HCNRG members on email on Wednesday 10th March, together with the 2020 Chair's report, 2020 Treasurer's report, AOB, and answers to all the AGM questions we have received.

Please send your nominations to homecountiesnorthregionalgroup@gmail.com by 26th February, we look forward to hearing from you.

Covid-19 pandemic lockdowns are our current experience; tomorrow our hope is for the future. Today my fellow HCNRG committee members and I are doing the best we can for the benefit and support of HCNRG members, such as the scheme to give assistance to unemployed HCNRG members who are seeking employment. (I am particularly grateful and wish to extend my thanks to all the unsung HCNRG members who have helped with this programme behind the scenes), and plans for new lecture meeting venues in Northamptonshire, Bedfordshire, east London and west Essex. There should be no core HCNRG areas, I will work on future HCNRG activities to take place in as many different areas as possible rather than have three lecture meetings at the same venue in a year as in the past.

Have a good and successful year 2021 every HCNRG members, take care and stay safe.

My best wishes to all of you and your families.

John Wong FGS Chair Home Counties North Regional Group

Meetings of the Home Counties North Regional Group **(2021)**

It is with great regret for us to write this, but due to the coronavirus outbreak, and a third national lockdown which was announced at the start of this year, meetings of the HCNRG have come to a halt. Therefore, no meetings have been discussed within this issue.

If you wish to hold a meeting about a project or a topic which you are or have been involved in, please get in touch with us and we can discuss this with you. Given the current restrictions on social gatherings, any future meetings will be held virtually until we can return to some normality in the future.

Zuzana Lednarova

Geoscience Articles - Introduction

We have two articles for you to read in this issue; one article is a book review about “Remarkable Creatures”, which discusses the life of Mary Anning. Recently the Mary Anning Rocks fund has been under the spotlight as it was raising money towards the construction of a Mary Anning statues at Lyme Regis. Successfully, the charity has been able to reach its target goal. Mary Anning Rocks fund aims to not only build a statue, but to also create free and accessible apps to allow explorers to follow in the footsteps of Mary Anning.

If you are reading this, and you have not heard of Mary Anning prior to this, or prior to this year, then you are not alone. Many books and publications still fail to recognize Mary Anning as one of the best paleontologists of our time. During the time of Mary Anning, she faced many difficulties as it was always the male geologists who published the scientific descriptions of the specimens she found, frequently neglecting to even make reference to her name. Some time before 1836, Anning discovered a fossil of a marine reptile known as the Ichthyosaur, dated to be from the Jurassic Period. Amongst this amazing discovery, Anning continued to work and search for other fossils to also discover plesiosaur skeletons, the first pterosaur skeleton, and fish fossils.

The first article is a great read which will help you learn more about Anning and her discoveries. In addition, the short review also highlights some of the challenges Anning faced as a female paleontologist within the geoscience community in the 1800's.

This article leads well onto the second article, written by a female geotechnical engineer working offshore. Many would associate offshore work as a man's world, however cultural shifts within the scientific and engineering communities are now open to equality. The openness of our geoscience and engineering community has allowed me (the newsletter editor) to be able to go offshore and enjoy these projects more than land-based geotechnical projects. In the second article I briefly describe the offshore experience, and also discuss site work techniques to obtain ground data from an onshore project.

Zuzana Lednarova

Remarkable Creatures - a story of two forgotten women and their contribution to paleontology

Jacqueline Clayton (FGS)



Figure 1: Rummaging through pebbles in Lulworth Cove in an attempt to find a remarkable creature of my own.

As a geologist that has studied and worked in the UK for over five years, I was a bit embarrassed to say I had never heard of Mary Anning when I first picked up *Remarkable Creatures*. Originally given to me as a birthday gift, I was excited to brush up on my knowledge of fossils (it's been a long time since my undergraduate paleontology lessons!) and learn more about the geology of the south coast. The book was of particular interest to me as I had just undertaken a walk along the Jurassic Coast path from Weymouth to Bournemouth.

The book is set in Lyme Regis, West Dorset during the early 1800s - think bathing machines, Jane Austen novels, and bonnets. The story alternates between the perspectives of two women: Mary Anning, young and of the working-class, and Elizabeth Philpot, a middle-aged woman perceived as a "spinster" by others. While written as a fictional narrative, the story is loosely based on actual events and explores the unlikely friendship that develops between these two over a fascination of fossils.

Mary Anning is described as having "the eye" and as her reputation grows, she begins to help fossil collectors and well-established academics with their own searches. Mary finds some curious creatures - most notably one with striking similarities to a crocodile - but there's one problem. It has fins. While this species was later identified as an *Ichthyosaur*, it was truly puzzling at the time - if it was not a crocodile, what was it? Instead of gaining recognition for these remarkable finds, Mary is doubted and even accused of being a fraud. While Elizabeth attempts to salvage her reputation among the enthusiasts (including the Geological Society!), even she does not have enough influence, being a woman at a time when the Society did not allow female members.

This disparaging behaviour shown towards women by the academic community is just one of the major cultural shifts that *Remarkable Creatures* highlights. Set in a time where the age of the Earth was widely believed to be just under 6,000 years old, we are reminded throughout at how the unyielding belief in the creationist myth hindered progress in the fossil record. The idea that there were once species that roamed the Earth that now no longer exist was a severe jolt to the community.

Whether you're already an expert in fossils or hoping to learn more, *Remarkable Creatures* casts an interesting light on the field of paleontology with a nod to its once-overlooked contributors. Today, a selection of Mary Anning's fossil collection can be found on display at the Natural History Museum in London. Another post-Covid activity to add to my list...

Site investigation techniques to aid construction at challenging offshore and onshore (Stonehenge) sites

Zuzana Lednarova FGS

Working offshore is a great experience. Sites are located in the middle of vast open water, surrounded by infinite shades of blue. Sometimes, the blues become shades of red, orange, purple, and the list goes on... I never get tired of the sunsets and the sunrises. However, we are out there to complete a project, therefore we cannot just look out for dolphins, and get lost in the forever changing colours of the sky.

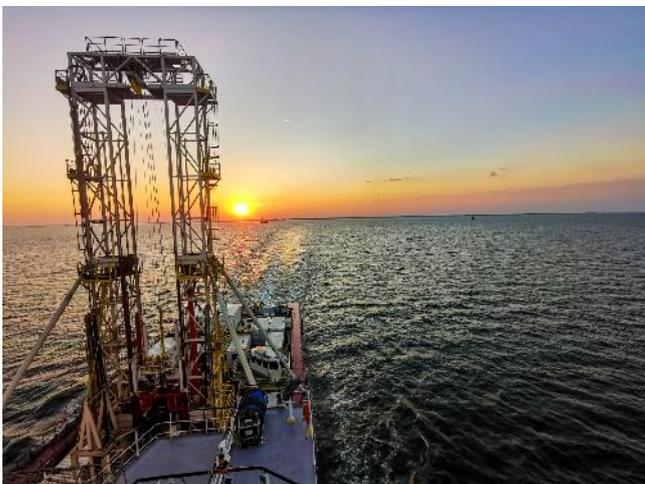


Figure -1: Double derrick of a geotechnical drilling rig. Sun set offshore.

My role is to observe, analyse, and describe the soil and rock samples, which have been brought up from deep below the sea floor. Sometimes we drill quickly and we drill a new borehole each day, and sometimes we can be on the same borehole for weeks. This all

depends on the ground conditions, and the kindness of the weather, which also affects the behaviour of the water around us. But, just as onshore drilling (cable percussion/ rotary/ windowless sampler), the aim of offshore geotechnical drilling has similar goals. There are many similarities with onshore geotechnical work.

On my last project, we drilled to a target depth, and then deployed P-S logging equipment and a High Resolution Acoustic Televiewer (HRAT) provided by Robertson Geo to observe the ground conditions. The HRAT was used to record the presence of fractures within the rock formations as it passed through the borehole. As this was the first time I have seen how P-S logging obtains subsurface information- I decided to share a little piece with you. Having studied geology as my BSc, I have learnt a little about geophysics, but I have only just seen it in the field – three years after leaving university.

The P-S logger is a low frequency acoustic probe, which measures compressional-wave (P wave) and shear-wave (S wave) velocities in soils and rock formations. The HRAT is a probe which provides a high-resolution ultrasound image of the borehole walls, and is most beneficial in identifying fractures and their orientation. This can aid stratigraphic studies. This probe can be used in fluid and mud filled boreholes – ideal for use offshore!

In fact, Robertson Geo has also completed a site



Figure -2: Stonehenge site in view – photograph captured by Robertson Geo Engineer during site visit.

investigation supporting the construction of the new tunnel in Salisbury, at the site of Stonehenge using P-S logging and a High Resolution Optical Televiewer (HI-OPTV). The HI-OPTV can be used in dry, or water filled (clear fluid) boreholes to provide continuous very high-resolution oriented image of the borehole walls. The equipment provided high definition information at the site, which can be used in the design of the new proposed tunnel at the A303 road. The bedrock at Salisbury, where Stonehenge is located is the Newhaven Chalk Formation overlying the Seaford Chalk Formation. Through extensive mapping, and previous investigations the Cretaceous chalk has been found to comprise localised phosphatic chalk deposits containing varying degrees of phosphatic material.

Phosphatic chalk poses a geotechnical challenge as these deposits may result in 'running sands' during the construction phase of the tunnel. Running sands are a threat within construction sites. When these sediments become fluidised with the addition of water pressure, they start to 'run', and may cause instability to foundations and structures. The extent of the phosphatic chalk deposits will also determine the way the tunnel is constructed at the site - open face tunneling or whether a closed system of tunneling with tunnel-boring machines (TBMs) will be more economical and efficient.

The colour of the chalk deposits where phosphatic material is most concentrated, is beige-brown and the grain size is also slightly coarser, equivalent to fine sand. Therefore, phosphatic deposits can be visually identified in the field. As a result, during the investigation by Robertson Geo, the P-S Logging probe and the HI-OPTV probe were used to determine the boundaries of the phosphatic chalk deposits. The HI-OPTV was used to identify colour changes within the chalk beds, as shown in figure 3. In addition to identifiable colour differences, phosphatic chalks can also be identified by their high natural gamma-ray readings when compared to surrounding non-phosphatic chalk deposits. Natural gamma levels are typically measured using a sodium iodide crystal detector and photomultiplier combination which is found in many geophysical probes. The use of natural gamma-ray logs is also used extensively for depth correlation between different log runs. However, high gamma-ray readings may also be recorded at the presence of clays and silts within the chalk deposits. Therefore, these results are often analysed with additional different site collected data to constrain our understanding of the geometry of phosphatic chalk deposits.

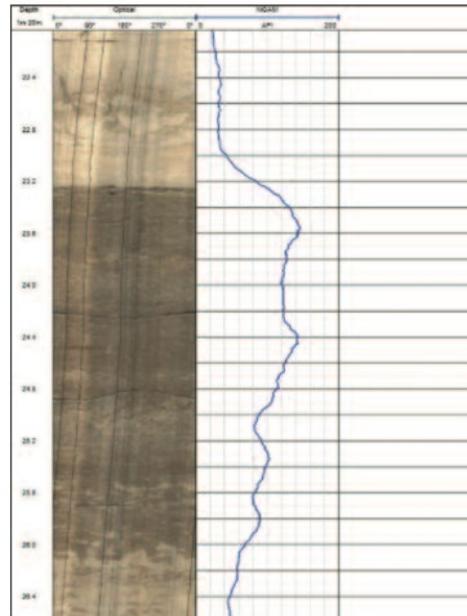


Figure -3: Chalk bed data sample from Stonehenge site (produced by Robertson Geo), as published in GeoUnlocked newsletter. Phosphatic chalk is shown to be a darker colour in the optical log, and the gamma ray logs also show that the upper part of phosphatic chalk comprises of less coarse-grained material, and relatively more radio-active constituents.

The P-S logger was utilised to determine the small strain moduli of the chalk, which will aid in the design and construction of the tunnel. In addition, as the phosphatic chalk may cause a threat of running sand potential – an Impeller Flowmeter was also used during one of the investigations to determine possible water ingress or egress within boreholes to identify water table movement across the site.

With such a controversial construction project (and most construction projects), it is important to obtain high confidence data. All collected field data (such as natural gamma-ray logs, HI-OPTV data, geotechnical borehole logs, and fossils and soil samples...) should be used together to aid our understanding of the ground model. This allows geotechnical engineers and geologists to understand the ground conditions and to form a realistic ground model of the site. With our understanding, and collaborative ideas amongst different engineering sectors, a project can succeed. After years of extensive work, research, mapping, site investigations, and collaboration, the £1.7bn A303 Stonehenge tunnel project has been approved by the government. The tunnel is proposed to extend over a length of 1.8 miles.



Figure -4: The Stonehenge site in view in the background during the site works. Photograph captured by Robertson Geo Engineer.

I would like to thank Graham Comber from Robertson Geo for proofreading the article, and for providing me with more information about Robertson Geo's different site investigation tools. Additionally, I would also like to thank James Boyett from Robertson Geo for inspiring me with his work during our offshore project, and for his help and support in providing me with photographs for this article.

References:

Mortimore, R. N., Gallagher, L. T., Gelder, J. T., Moore, I. R., Brooks, R., & Farrant, A. R. (2017). Stonehenge—a unique Late Cretaceous phosphatic Chalk geology: implications for sea-level, climate and tectonics and impact on engineering and archaeology. *Proceedings of the Geologists' Association*, 128(4), 564-598.

Robertson Geo (2018) – Wireline logging around one of the wonders of the world. *GeoUnlocked©* - Issue 3 Winter 2018, 2

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Weinfass. I (2020) - Green light for £1.7bn Stonehenge tunnel. *Construction News*

Future Meetings of the Home Counties North Regional Group 2021

COVID-19 Update: Postponing of Future Meetings

As already mentioned earlier in this newsletter, we have had to postpone all future meetings due to the current circumstances. As a committee, we will work towards arranging a virtual zoom lecture in the future if and when possible for the current year. In the meantime, we advise that you visit the events page of the Geological Society, where you can find all future lectures and events organized by the Geological Society, and the other regional groups.

Please continue to check out the HCNRG events page for the most up to date Programme of Meetings for 2021.

Zuzana Lednarova

Note from The Editor

We are pleased to offer you a short read to occupy you during the current lockdown. We look to provide you with a further newsletter later in April. If you have been inspired by anything you have read, please do not hesitate to contact us with one of your articles/ book reviews/ suggestions...

Should you wish to have your report included in the next newsletter, please inform the Chair, John Wong, of your intentions on HCNRG email homecountiesnorthregionalgroup@gmail.com , and forward your article to me on my personal email z.lednarova@gmail.com.

The closing date for the next article submission is 31st March 2021.

As a closing note, thank you for taking the time to read the newsletter, and I hope to hear from you all in the future, keeping me updated with future meetings.

Wishing you all stay healthy and safe, and we look forward to welcoming you in future meetings.