CHARNIA

Newsletter of the

Geology Section

Of the Leicester Literary and Philosophical Society

Celebrating 30 Years of Charnia

LEICESTER LITERARY & PHILOSOPHICAL SOCIETY
SECTION C. ESTABLISHED 1849
GEOLOGY

June 2021

CONTENTS

Front cover pictures: Section logos from summer 1991 and 2021

Editor's notes

Welcome to the summer edition of Charnia. Rob Tripp drew my attention to this being the 30th anniversary of Charnia, first published in the summer of 1991. The first edition was produced to try to revitalise the Section following declining attendances at lectures and field visits. The cover page is reproduced on page 4. (All previous editions of Charnia are available to view on the web site under the Newsletter archive).

The contents strike a familiar chord today. Membership numbers have declined this year due in part, no doubt, to the restrictions on meetings meaning that lectures have had to go on-line. Not everyone has access to suitable technology to join Zoom or are less inclined to do so. To counterbalance that, we have been able to get speakers from further afield and to join meetings with other Societies. The social aspects of meetings are important and many organisations have found similar effects. Attendance on Zoom meetings has been patchy and there is uncertainty over summer visits (although see an announcement later on page 15). There has also been difficulty over the last few years in encouraging members to join the Committee to help run the Section.

Declining membership puts pressure on the finances and we will print fewer copies of this edition. A few members have decided to take Charnia as a pdf so we can have a print run of the next size down. If you would like to follow suite and take a pdf in the future then please let me know by e-mail.

However, the more pressing need is to revitalise the Section, find new members and involve everyone in bringing ideas and support for the future as Roger made clear in his report in the January 2021 edition. If you would like to start a discussion in Charnia please send a contribution to a letters page with your thoughts, ideas for events or offers to help.

The first edition has a history of the Section and details a full programme of fourteen field trips between June and December, some jointly with other organisations. It also has a long report by Sandy Colby (son of the editor John?) about a day school on Sea Dragons at Vaughan College. It was chaired and introduced by John Martin with a talk entitled "Sun, Sea, Sex and Saurians". Surely a bit racy for Leicester Museum in 1991.

The editor is always looking for contributions to Charnia, racy or otherwise. Thank you to those members who contributed this time. Reports of site visits or suggestions for members; reviews of books or TV programmes (relevant); ideas on any topic likely to interest the members. The next edition will be in September - contributions by the end of August please.

In the meantime, here's hoping that restrictions start to lift and that we are able to get back to meeting face to face soon.

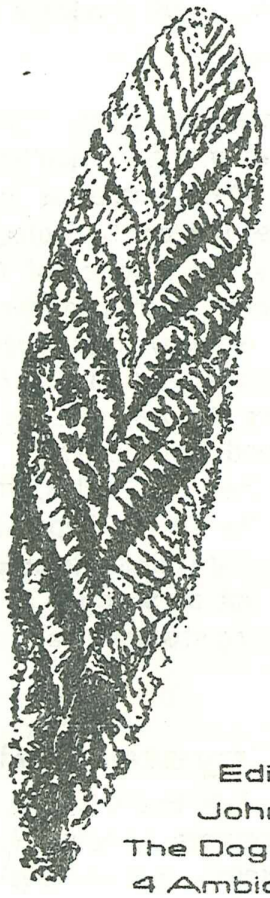
Keep safe,

Brian Waters bdh2o@hotmail.co.uk

Newsletter of the
Leicester
Literary and Philosophical Society
Section C
Geology

Summer
1991

Charnia



Edited by:
John Colby
The Dog House
4 Ambion Rise
Market Bosworth
Nuneaton
CV13 0NY
Telephone: Market
Bosworth 290271

A New Venture

This first issue of the newsletter is unashamedly a selling tool. Over the past couple of years the committee has been wondering what it has been doing wrong - why the attendances at both lectures and field meetings have been in some cases minimal, and why, despite the general increase in interest in Earth Sciences in general and Geology in particular, this has been happening. Had the time come to shut up shop?

Some of us think not, and we are attempting to revitalise your society, which can lay claim to being one of the oldest geological societies in existence. This newsletter, incidentally, is planned for issue quarterly - if we get your support.

So now it is your chance to tell us, whether you are a regular attender at either lectures or field meetings or not what we are doing wrong and stop it, what we are doing right and how to capitalise on this aspect of the work. If you don't attend meetings we'd like to know why. So please complete the enclosed questionnaire and return it in the stamped addressed envelope provided.

The diary details eleven field trips and two residential weekends. There must be something here to suit you.

In this issue:

and introducing:

and

on the back page

With Geology in Mind – out and about in Leicestershire and Rutland – 8.

Sence and Geosensibility

To misquote the wrong novel: **"**It is a truth universally acknowledged that" the good people of Leicestershire are upright and worthy. Perhaps this is the reason why the County has two rivers named Sence. The one rises near Bardon, flows south-west to join the River Anker, and thence by way of the Rivers Tame, Trent and Humber to the North Sea. The other, the subject of this short note, rises near Billesdon, flows south via Great Glen and then west to join the River Soar near Whetstone, and thence by the River Trent, and The Humber to the North Sea as well.

This June 2020 jaunt takes us to the Newton Harcourt and Wistow area, south of Leicester, and to the floodplain of the second of these two rivers. The River Sence in this region (see map - Fig. 1) provides a gentle and instructive circular walk (details are given in Footnote 1).The River Sence hereabouts is typical of the small lowland rivers of the region – the stream itself is some 2-3 metres wide, in a channel way some 8-10 metres wide with 1-5 – 2metre high banks.

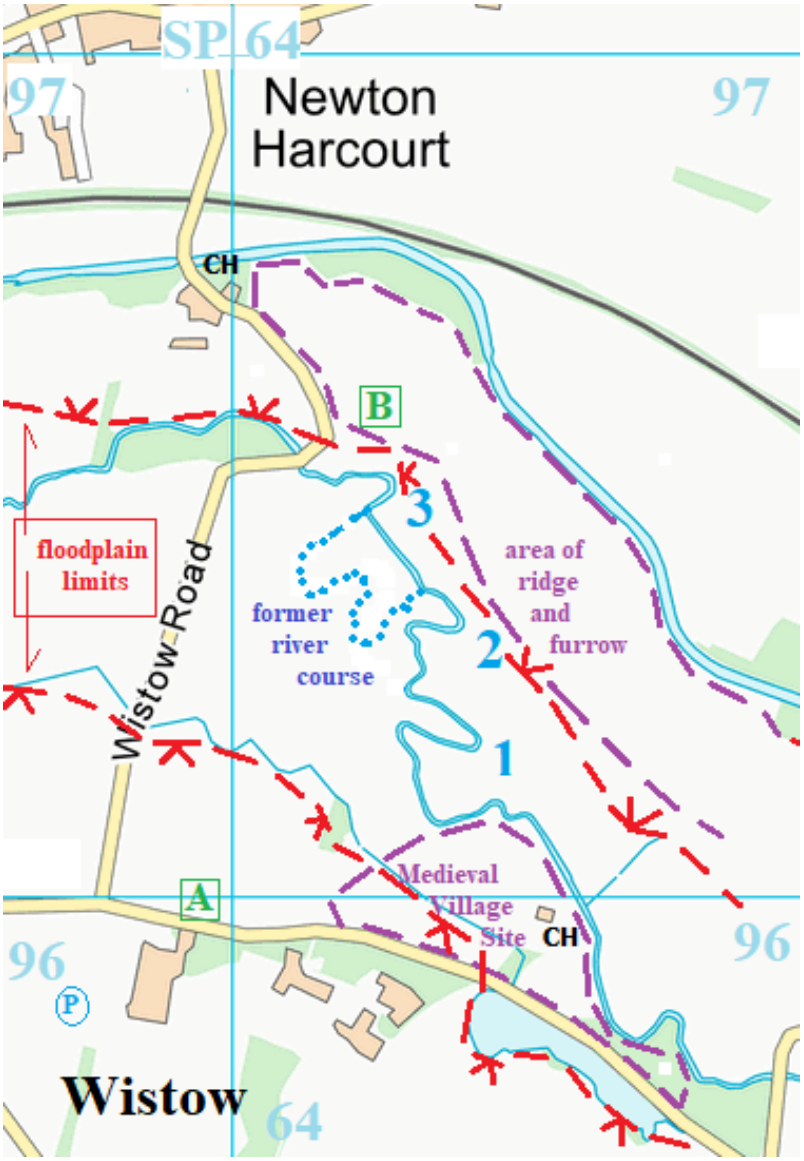


Figure 1: Simplified map of the River Sence valley at Wistow, showing the limits of the floodplain (red), areas of historical human activity (purple), etc. 1 kilometre OS grid lines shown in blue.

Fig. 2 is a view across the valley, from the south-west (point 'A' on Fig.1) and shows the flood-plain nicely picked out by the field with a yellowish colour. The limits of the flood plain (Fig. 1) are subtle, but clear, and can be easily walked out; Fig. 3 is a view from point 'B' on the map (Fig.1), looking across the flood-plain towards the church of St. Wistan in Wistow, and the diagonal line in the foreground (in front of the sheep!) is the minor break of slope that marks the northern edge of the flood-plain.

Figure 2: View across the Sence valley looking north-east from point A on the map. (RGC July 2016.)

Figure 3: View across the Sence valley looking south-south -east towards St. Wistan

Following the course of the walk, you will come across three magnificent meanders (Fig. 1, nos. 1, 2, and 3; and see panoramic photomontages, Figs. 4, 5 and 6 respectively) (see also Footnote 2).

Figure 4: Photomontage of meander no.1 (see map), looking north-west. (RGC June 2020.)

Figure 5: Photomontage of meander no.2 (see map), looking north-west. (RGC June 2020.)

Figure 6: Photomontage of meander no.3 (see map), looking west. (RGC June 2020.)

They show very active erosion on the exterior of each bend, with land slumping, etc., exposing the field drainage pipes. The erosion involves much slumping/mass movement that reflects the high river levels and flooding of the previous winter. It is worth noting that the slumping does not conform to the rotational block model for soft/consolidated sediments (Fig.7; contrast a (the slumps here) and b (the standard rotational block model)). [It was also apparent at the time of the visit that adventuresome cows also contributed to the degradation!] The aggrading inner sides of the meanders, show corresponding sediment accumulation, but to a large extent it is hidden by vigorous vegetation. As a side issue, it is interesting to note that all three meanders have their axes of symmetry **not** perpendicular to the axis of the valley (as one might expect) but oblique to subparallel to it. Why? Does this perhaps reflect the underlying 'solid' geology?

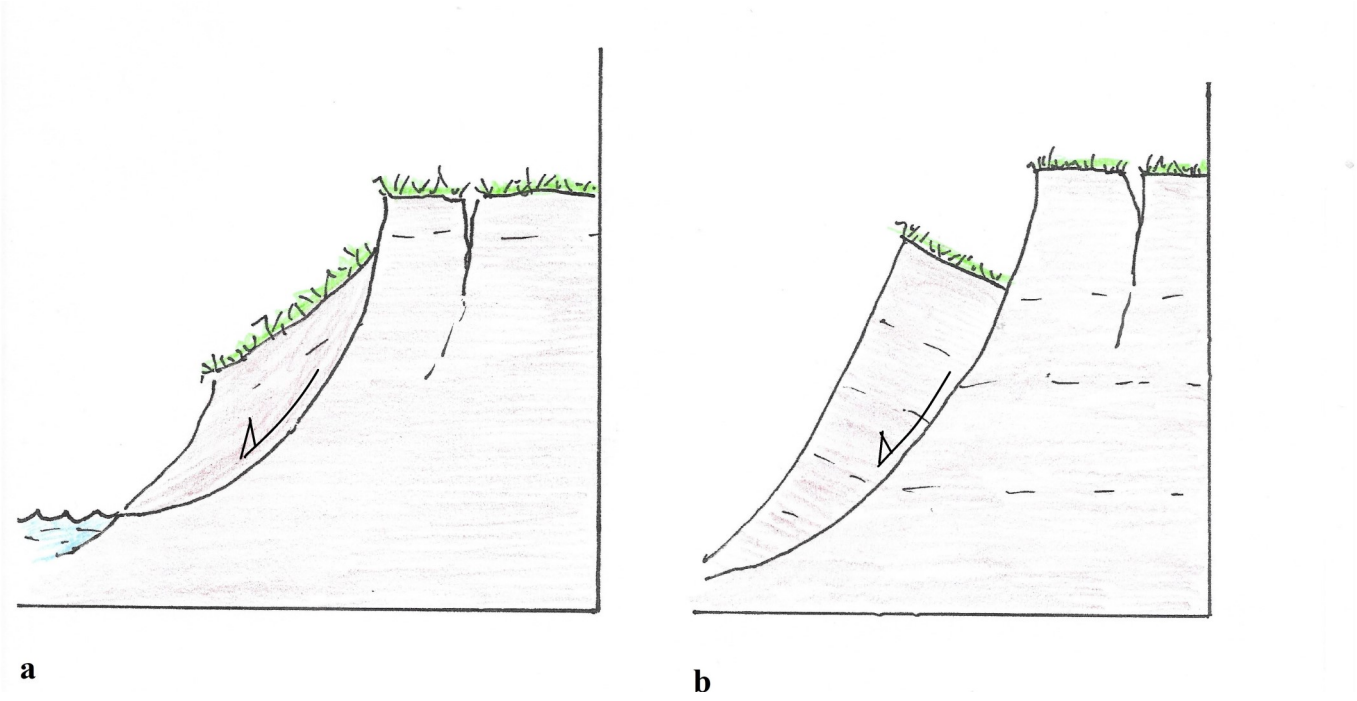


Figure 7: Schematic cross-sections showing differences between (a) the landslips seen on the River Sence, and (b) those of the standard back-rotation model. (Not to scale.)

And if all this wasn't enough, I "tripped over" a 'living fossil' – well strictly speaking, a dead living fossil(!), in the form of a loose, single right valve of the freshwater mussel *Unio pictorum* (Linnaeus) (figs. 8 & 9). (I presume it came from the nearby river.)

Figure 8: *Unio pictorum* (Linnaeus), external, right valve. (Scale in millimetres.)

Figure 9: *Unio pictorum* (Linnaeus), internal, right valve. (Scale in millimetres.)

Unio-like fossils are known right back to the Triassic (c. 230/240 mya), and are usually placed in the same, or a closely related genus. Although this specimen is not strictly-speaking the Freshwater Pearl Mussel (see *Margatifera margatifera* (Linnaeus) – which forms the basis of a local industry in northern UK), it is closely related. Our specimen shows (figs. 9 & 10) the same pearly lustre of its inner shell surface which is made of nacre (aragonite laminae). Closer inspection shows little pearl-like lumps of "clinging pearls" (*natural shell blisters or natural blister pearls*); they will do nothing for the bank balance, but will add further treasure to the mind!

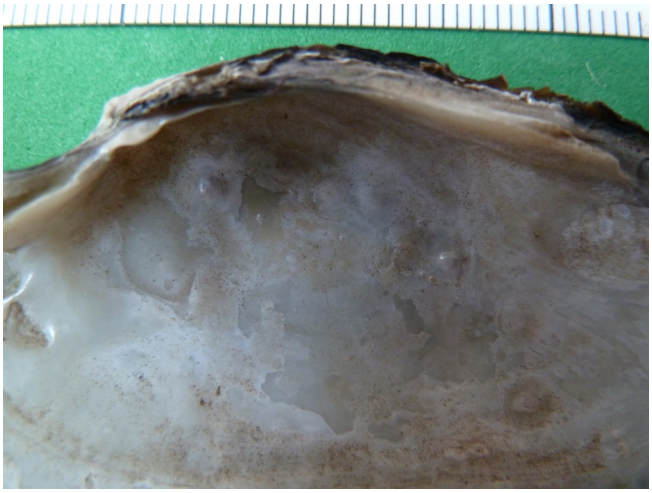


Figure 10: *Unio pictorum* (Linnaeus), enlargement, internal, right valve, showing 'blister pearls'.

Footnote 1: Route (see map – fig. 1): park at P; take the road to Wistow Church; follow the footpath down to the west of the Church and cross the river by the foot-bridge; bear left, follow the footpath diagonally across the fields (visiting meanders 1, 2 and 3); back on the road (Wistow Road), turn left and head back to the car park.

Footnote 2: The term "meander" derives from the name of a river – the River Meander, in south-west Turkey. The river is currently known as the Bűyűk Menderes River ('bűyűk' means 'great' in Turkish). A quick Google Earth visit to this part of Turkey, reveals a broad floodplain, intensely cultivated, crossed by a river with beautiful, regular meanders, ox-bow lakes, etc.

Roy G Clements June 2021

Society Displays at the New Walk Museum

The New Walk Museum holds an event most years where various history and natural history organizations, with links to the Leicestershire Museums, put on displays to raise awareness of there own work and to hopefully gain new members. The geology section puts on a display of fossils in the hope that we would find one or two people interested in geology that had not known of the group.

It was thought that the best way to get people interested in fossils and geology was to have a display of the types found locally and also at the various site we visit on our field trips. It was also thought that we would get more interest if the public could handle the fossil specimens.

After the first couple of years it was realized that there were a lot of children coming with their parents to the event. Children are where it all starts. I myself started to pick up fossils from about the age of nine, so knowing this we made sure that the children were encouraged to pick up and examine the fossils. Display pictures were used to show how the fossil animal looked when alive all those millions of years ago. It is very difficult to explain to a young person what a Belemnite looked when it was alive, as the bit we see today is only a small percentage of the original animal.

For the last few times that we have put the display out we have also had a lucky dip box were we let children, who have shown an interest in the fossils, have a root around in the box. Within the box we have put a number of bags which contain a fossil and a label telling them what the fossil is and it's age. The age is one of the most interesting bits of information they want to know. All the fossils we give away are spares from the various field trips we have been on over the years.

The display fossils and the table cover along with the tables and pictures are kept at my shed. The stand itself is manned by myself and Helen Jones, who was a primary school teacher so is very used to talking to young children.

Dennis Gamble

June 2021

16 February 2017

17th June 2017

16th June 2018

2019

In 2017 we also put on a display at Kettering

Museum for one of their open days. It was a pity that we didn't have a plain black wall.

Leicester Literary and Philosophical Society, Section C (Geology)

Winter Programme, 2020-2021

This listing includes lectures by the Geology Section and those by invitation of other Societies. YGS is Yorkshire Geology Society and WGCG is Warwickshire Geology Conservation Group.

ABSTRACTS 2021

Wednesday 13th January: Lava Delta Systems on the Northeast Atlantic Margin and The Value of Core; from Continental Shelf to Bookshelf.

Kirstie Wright (Heriot-Watt University).

Wednesday 20th January: Castle Bank: a new Ordovician Burgess Shale-type fauna from Wales (WCGC).

Joe Botting (Guest Scientist at the Nanjing Institute of Geology and Palaeontology, and an Honorary Research Fellow at the National Museum Wales).

The Burgess Shale-type faunas of the Cambrian provide one of the best windows into ancient ecosystems, preserving a remarkable range of soft-bodied organisms in extraordinary detail. Most remarkably, they represent the extremely diverse, normal marine assemblages of the open shelf sea floor, and have therefore revealed the Cambrian Explosion (arguably the most important interval in animal evolution) in previously unimaginable detail. There are two known Early Ordovician faunas of this type (in Wales and Morocco), but after that the window seems to have closed. Later Ordovician exceptionally preserved fossil assemblages are more constrained and limited in scope often representing odd environments or specialist ecosystems.
During the lockdown of 2020, a new Burgess Shale-type fauna was discovered in Middle Ordovician rocks of the Builth Inlier, central Wales. The fauna is in the preliminary stages of excavation and interpretation, but has already yielded a remarkable range of lightly mineralised and soft-bodied taxa, including sponges, arthropods, several phyla of worms, molluscs and many other groups. The fauna is the most important Ordovician fossil discovery since the Fezouata Biota, and has the potential to revolutionise our view of Ordovician evolution and ecosystems.

Wednesday 10th February: Charnwood's Canadian Cousins: Recent Geological Discoveries from Newfoundland and How They Inform Our Knowledge of England's Oldest Fossils.

Dr Jack Matthews (Honorary Associate at the Oxford University Museum of Natural History).

Wednesday 17th February: Geological Time and the Anthropocene (WCGC).

Ian Fairchild (Emeritus Professor at the University of Birmingham and Chair of the Herefordshire and Worcestershire Earth Heritage Trust).

This presentation is in two parts. *Geological Time and the Anthropocene* examines the way in which geologists establish stratigraphic golden spikes that represent particular instants in geological history, using examples throughout the record. The particular issues from the idea of an Anthropocene Epoch are then examined. A key idea is that the Earth System is now operating outside its range of the Holocene Epoch, representing the time since the Ice Age. In the second part, we move to a scripted dialogue between the speaker and members of the audience called *Introducing the Anthropocene* in which different voices question the ideas surrounding the formal establishment of an Anthropocene Epoch.

Wednesday 10th March: Earthquakes, normal faulting and hazard in central Italy.

Dr Zoë Mildon (School of Geography, Earth and Environmental Sciences University of Plymouth).

Central Italy frequently has damaging earthquakes, including most recently the 2009 L'Aquila earthquake and the 2016 Amatrice earthquake sequence. My research uses a combination of fieldwork, modelling and cosmogenic isotope dating, to try and understand how the faults have moved in the past, how the faults interact together and ultimately what is the seismic hazard of the region.

Wednesday 17th March: An Introduction to the Geology of Iceland (WCGC).

Stuart Blake (Director at the Lochranza Centre, Arran).

The geology of Iceland is unique. Situated on the divergent boundary between the Eurasian plate and the North American plate, it also lies above a hotspot, the Iceland plume. The plume is believed to have caused the formation of Iceland itself, the island first appearing over the ocean surface about 16 to 18 million years ago. Upwelling commenced in the early Tertiary and sea bed core evidences 55 million year old rock. The result is an island characterized by repeated volcanism; Surtsey, a new volcanic island was formed in 1967. Geothermal phenomena such as geysers are a great natural resource.

Wednesday 24th March: Discovery of a meteorite ejecta layer at the base of Paleocene lavas, Isle of Skye, NW Scotland.

Simon Drake (Birkbeck College, London).

The talk will highlight the discovery of a meteorite ejecta layer discovered beneath the base of Paleocene lavas on the Isle of Skye NW Scotland. The layer has also been located at 2 other separate sites 7kms apart on South Skye. Within the layer shocked minerals from the country rock could only have been produced by an instantaneous impact event. Vanadium rich and Niobium rich Osbornite lave also been found within the layer. These minerals have never been found on Earth before and have only been recorded as comet dust collected by NASA from the Wild II comet trail. This ejecta layer likely acted as a driver for the volcanic episode within the wider British Paleogene Igneous Province. The layer has been subjected to geo-vandalism, wide media coverage, and is now under the Protection of the John Muir trust and Scottish Natural Heritage.

Wednesday 31st March: The keys to the past: a mixed-methods approach to reconstructing the 1812 eruption of La Soufrière St. Vincent. (Following the AGM).

Jazmin Scarlett (University of Hull).

Monday 12th April, Ethiopia from top to bottom: Using seismology to understand how tectonic plates rise, split, then fall. (Annual Joint Meeting with the Parent Body).

Dr Ian Bastow (Senior Lecturer in Seismology Imperial College London).

To an Earth Scientist, Ethiopia is a truly remarkable place. Its highest mountain, Ras Dashen, stands 4550m tall; its lowest point, the Danakil Depression, lies some 150km below sea level. From space, the immaculate jigsaw fit of the Somalian, Arabian and Nubian tectonic plates is un-mistakable. On closer inspection, active volcanoes and earthquakes provide daily reminders that this is a region that remains in a state of geological development. Active geological processes pose significant hazard, but also a remarkable opportunity for scientists curious about how tectonic plates break in two. In this talk, I will discuss how decades of work by seismologists like me have helped us understand how Ethiopia has come to be so topographically and geologically interesting. Our journey will take us from the core-mantle boundary, some 2891km below our feet, to the surface. I will also discuss how the lessons we have learned from the Horn of Africa have helped shed new light on how continents have broken apart through geological time.

Potential summer visit

The programme of summer visits is still uncertain due to COVID restrictions but Warwickshire Geology Conservation Group have invited Section Members to join them on a long weekend Friday 20th August to Monday 23rd August in North Lincolnshire. The provisional itinerary is:

Friday p.m. Claxby (complete, but attenuated, patchy hillside succession of Lower Cretaceous stratigraphy with emphasis on the former Claxby Ironstone industry – including industrial archaeology).
Saturday a.m. South Ferriby Quarry (Cretaceous L/M Chalk, Red Chalk and Carstone unconformable on late Jurassic Oxfordian & Kimmeridgian Clay.....highly fosiliferous.....site of a 2018 Pliosaur discovery).
Saturday p.m. Conesby Quarry (last exposure of the L. Jurassic Frodingham Ironstone.....former important local steel industry....."everyone guaranteed a fossil"!)
Sunday a.m. Kirton in Lindsey (M. Jurassic Lincolnshire Limestone – 'Inferior Oolite' equivalent).
Sunday p.m. Ulceby Vale ('Middle Chalk'.....Turonian Flint Maximum.....detailed stratigraphy of part of the Chalk).
Monday a.m. Welton-le-Wold (Pleistocene Sites of importance: Devensian and older tills (?Wolstonian) on Hoxnian gravels).

The Leader will be Paul Hildreth (President YGS), who lives in the area and knows the Chalk well.

Suggested accommodation Premier Inn Scunthorpe on B&B basis.

Watch out for further information from Rob Tripp but put the dates in your diary if you are interested.

SECTION C COMMITTEE 2021 – 2022

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