Dorset GA Group

Newsletter Spring 2021

https:dorsetgeologistsassociation.org/

Contents

Welcome to the Spring Newsletter!

At the time of writing, some lockdown restrictions are being eased, so fieldtrips will resume in April with social distancing measures in place. Thankfully, I've been able to continue producing Newsletters over the past year and I'm very grateful to the contributors for that. However, the programme of evening lectures was suspended and it remains to be seen whether DGAG will host them or whether they will resume under the auspices of the Dorset County Museum. Whatever happens, I'll endeavour to keep you informed, either through my email updates or through the Newsletter.

Kelvin

Mike Bowler writes about Canford Cliffs

In January 2018, a small landslip occurred in the Canford Cliff in Poole, threatening beach huts located on the esplanade below. The (then) Borough of Poole Council, had been planning to replace or upgrade the beach huts located beneath the landslip. So there was a commercial incentive to avoid part of Poole slipping into the wide open sea. In the meantime, the beach huts concerned have been fenced off. Over the last two years, the authorities have placed several monitoring devices in the cliff-face (the cliff is not vertical, probably more like 45 degrees), to monitor the movement. Finally, in 2020, someone decided that it was worth significant financial investment to protect those lucky enough to live in residences above the cliff in question (very fine views of Studland and Old Harry Rocks). There is also a psychiatric hospital located a few metres to the west of the landslip, which may have helped to secure the funding. Work commenced in late summer 2020 (post Covid-19 lockdown 1) to stick huge pins into the cliffside to hold back the natural forces of nature.

Most of the work is being done from the cliff top, but some intriguing machinery has been procured to do some of the pinning on the lower cliff, as the photo above shows (these photos were taken in late November 2020). Obviously, the interest for this group is the geology of the cliffs and the reasons for their slippage (basically geology and climate change, I suspect). Perhaps this is a good time to reveal that I am no real expert on either, although I have clocked up 18 years as a member of DGAG, 8 of which as Hon. Treasurer. This was to compensate for a lack of geological expertise as it was my sister and second wife that drew me into this field.

I was a pupil at Yeovil School many years ago and the late Hugh Prudden, a well-known Somerset geologist, was my geography teacher.

From what I have learned since moving to Bournemouth in 2002, I know that the Poole and Bournemouth cliffs east of Poole Harbour are mainly Tertiary deposits plus flint gravels and clays from the periglacial aftermath of the most recent ice age. (That exhausts most of my geological vocabulary, so forgive my mainly plain English from now on...). I will throw in a few geological terms in the next paragraph or two though.... There is a line of the willow leaf beds running along this stretch of the cliff, and the various layers of topography will almost certainly create differential erosion. Since the whole of the seafront from Southbourne in the east, to the edge of Poole Harbour in the west, has been managed and protected by sea walls and a promenade over the last century. The main cause of landslips is, obviously, rainfall. Eventually, the accumulation of water above any relatively impervious strata will lead to water finding the easiest route and taking significant solid matter with it. This only matters when there is nothing sideways to stop it. Cliffs are a good escape! Therefore, the accumulation of excessive rainfall probably led to a relatively small volume of Eocene material slipping down the cliff. There have been several landslips along the Bournemouth and Poole seafront over the last fifteen years or so. One was very dramatic, close to the East Cliff funicular lift, and then another which rendered the latter out of action by damaging the tracks. The Canford Cliffs work has been prioritised, possibly for commercial reasons, or because it is simply easier to manage.

The location of the landslip is found here, courtesy of Dr Ian West, and marked 'Poole Head'.
Eocene Cliffs of Bournemouth Dorset (soton.ac.uk)
The outcome of the works will probably be unclear for many decades, but I hope to update this in twenty years' time!

Mike adds this footnote:

On a subsequent visit to the suspended works to stabilise Canford Cliffs, I noted hundreds of pins stuck into the cliff and there seems to be some further slippage, possibly due to the recent heavy rain and the short-term interference of the stabilisation works. Meanwhile, I understand they are delivering the hardware to start the beach replenishment both sides of Boscombe Pier, ready to start pumping sand from the bay between Old Harry and The Needles in January. This is always fun to watch so I will attempt a few photo visits and do a writeup for the next Newsletter, including the west Bournemouth beach groyne replacement programme which is nearing completion. The 4 new groynes are almost finished, but two old groynes need to be removed.

Jo Thomas writes about mining graphite in Cumbria

Recent articles on Lake District minerals reminded me of a holiday in Keswick a few years go. We visited the Keswick Pencil Museum, and during a walk in Borrowdale saw the entrance to a graphite mine.

This is relevant to Dorset because the 'lead' in pencils is graphite. Sir John Bankes (1589-1644), whose family came from Keswick, owned the graphite mine. The money he made from selling the graphite to the navy for lubricants in the moulds for cannon balls, and on ships rigging, as well as pencil 'lead' enabled him to buy the Kingston Lacy estate in 1643. The receipt for its purchase is in the Bankes collection in the Dorset History Centre.

Graphite, which is pure carbon, forms from the alteration of organic materials in sedimentary rocks during metamorphism and occurs in Borrowdale near Seathwaite in lumps within the rocks. It is greasy to the touch, due to platelets coming off the surface and therefore provides a lubricant. Historic England have listed the mine and its grinding mill as sites of historic interest.

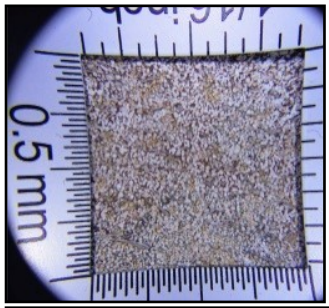
References

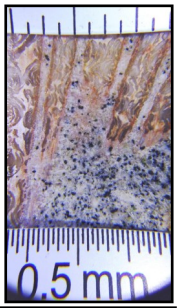
1) Ian Tyler 1995: Seathwaite Wad and the mines of the Borrowdale Valley.

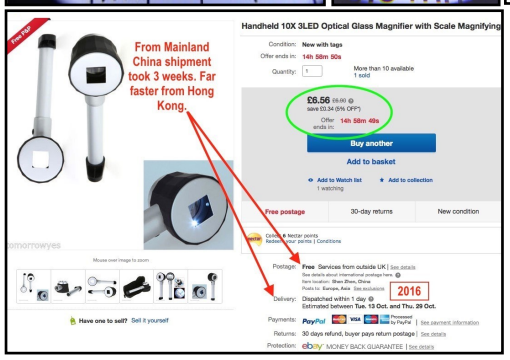
2) Historic England website: The Borrowdale graphite mines and associated grinding mill 660m north west of Seathwaite.

Our Legacy from Geoff Townson: the Dorset Building Stone website by *Peter Bath*

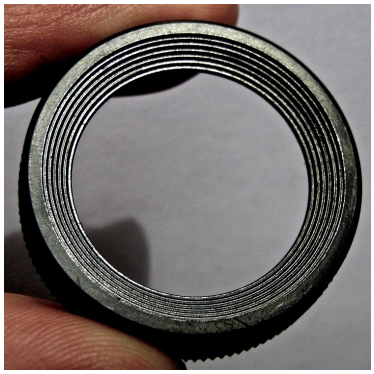
In September 2016, two photos of the Lincolnshire Oolitic Limestone came in from Geoff with a note to say that he'd captured them by using a Chinese LED Loupe and his pocket camera. Loupes were ordered immediately via eBay and from Amazon for the Japanese one, and back-ups from time to time.







Both loupes have countersunk eyepieces that will receive a pocket camera – if its front lens has a matching diameter to one in the serrated eyepiece. They both took my Canon Powershot 460 D that worked fine, until finding that only a high-resolution camera will allow the best definition of microfossil components.

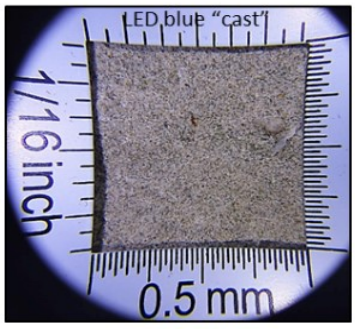


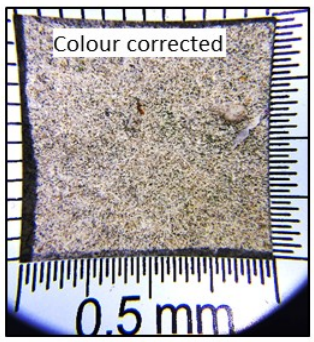
Hi-res is required for reliable identification magnification and any colour printing of images. The identification of grains and bioclasts, notably in the matrix in carbonates, can be colour adjusted digitally to both remove the LED violet false colouring or to become the sharpest best focused imaging possible, to differentiate grains and clasts. It may well not then resemble the actual colouring, which can be a contributory identification deciding factor. One of each if attainable, can always be filed.

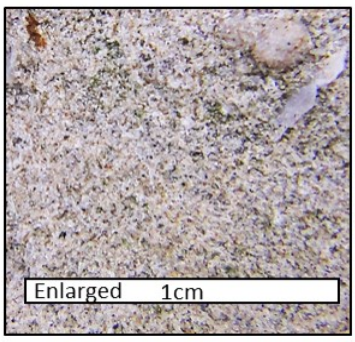
It was not long before we came to rely on Geoff's expertise as the better focus, magnification and scale given us using these affordable instruments had us discussing whether we should try our own website – within only a matter of months. Geoff had almost become a Lead to his own project when joining us all at Lulworth Castle and so, not only was he our best-informed advisor but one of us as well. His guidance became imprinted on the web and he always "kept things simple" as seen below:

2) Loupe/hand lens & camera (WGT)

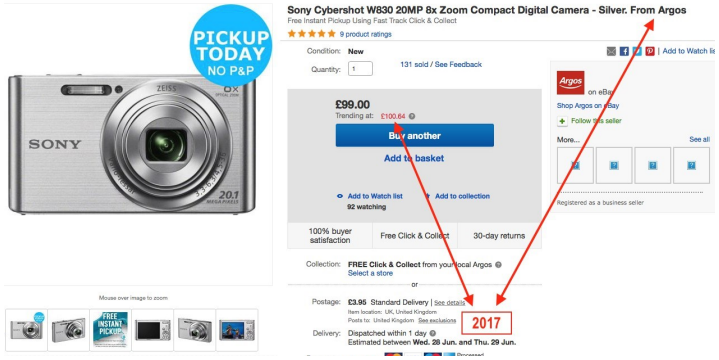
A 10x magnification hand lens is essential for looking at details of the rock type. Recently "LED loupes" have become available through which, if your camera permits, one can take images of a 2 x 2cm area with scale included. Colour correction is needed because the LED light is blue. With the scale known, one can enlarge to see more detail. These images are Wardour Main Building Stone (qv), a fine-grained glauconitic quartzose bioclastic limestone (calcarenite, grainstone-packstone).



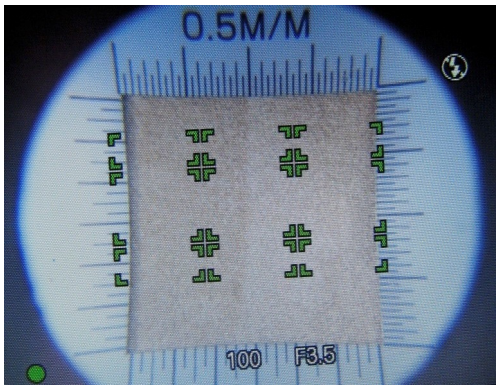




To maintain better quality, I disposed of the Canon. To attain regular good focus and sharpness, I soon bought a “special version Zeiss-lensed” Sony W 830 D with 20.1 megapixels in silver and a black one as a back-up. They are simple to use once set up for this purpose and to store ready for immediate use. Other good cameras are available at reasonable prices now that most people rely on their mobile phones for regular hi-res use. German eBay holds most good new and used pocket camera kit and the service is very good.



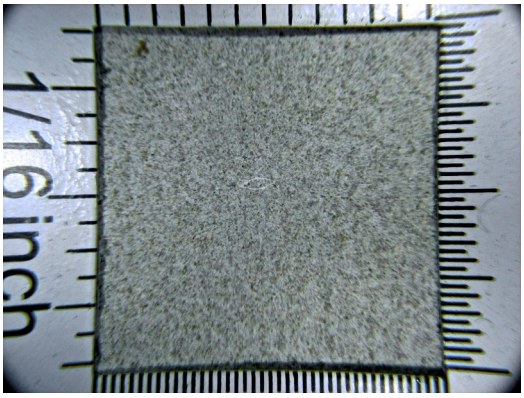
Back-up chargers, camera USBs and spare batteries are well worth buying. I still rely on them today. Unfortunately, the new Sony front lenses were too large to fit well and the black-painted one’s diameter was even wider for that reason. Any machinist or engineering company can open the Loupe eyepiece to fit your camera snugly if that occurs. The first essential is that the camera lens is easily set square in the eyepiece to your loupe so that each shot has a realistic chance of holding focus across the image captured. Any part of your image screen that is missing will be out of focus in your photo even it the stone itself is very flat–faced to camera. Minor movement of the camera or loupe will improve or mar the fully focused pattern of your focusing screen – as seen here at fully focused.



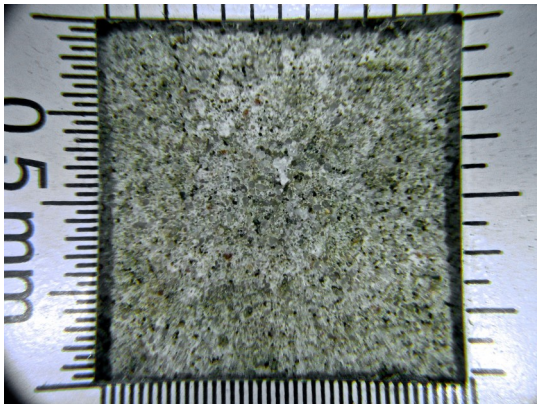
My machinist made sure that each camera fits into their respective eyepieces very well – as can be seen above. To gain best use of an LED loupe and the Sony, whereby the camera has a W-T range of in focus zooming from minimal 1.0 to maximum 8.0x - I set it at +2.0 to show all four scale lines or at 2.4 for one or opposite scales to reveal a higher original magnification. (However, for best stone I.D. from any good in focus shot, either setting will easily fill your PC screen for I.D. needs). Results from either loupe can be equally good. The Chinese use AA, and the Japanese conventional torch batteries – which rattle loosely unless padded out with paper or cloth.

The AA batteries last well but dying batteries will lose focus. Flash must be switched off. In practice it pays well to take much time selecting the cleanest stone and focusing the centre of each image on the most informative textures. If the stone is bumpy then best focus seems to occur with the domed areas or mouldings are centred in the opening of the Loupe’s face. Scaled images often lose focus at the corners and marginal shadowing commonly occurs too. However, the central textures always reveal the best grains, bioclasts and terrigenous evidence that are needed for reliable I.D. of our predominantly calcareous sedimentary building stones. To avoid confusion and interrupting progress making written notes, it pays to always take more than one shot per block and to take a stand-back shot of where the loupe has been placed. That way you also have proof of the pudding along with the metadata as to when and where the image was taken. Wardour Lower Building stone aka Chilmark Main Building stone has the same main components as the Upper Building Stone but for their grain size. At St. Nicholas, Durweston, the former was used internally and the latter with flint for the exterior.

One’s scaled image evidence can be verified or discounted by anyone at any time, if stand-back photos are also taken. Even thin sections don’t have this proof of provenance!



Wardour Lower Building Stone: scaled and stand-back images.



Upper Greensand: scaled and stand-back images.

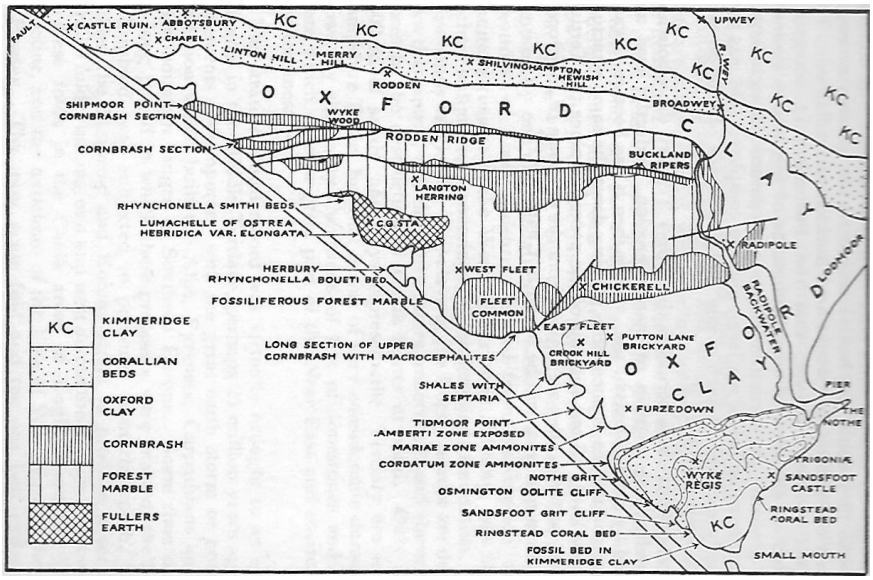
The near substitution of scaled close-up photos for rock thin sections works very well for the identification of sedimentary building stone. It also makes a rewarding pastime available for retired mountain goats with any remaining interest in man-made exposures of once-buried geological treasure! The Dorset Building Stone website is a monument to someone (Geoff) freely sharing his new finds with friends and then being instrumental in building a new website with a so simple and now scientifically valid methodology. *(Pete will follow this article with 'Colour correction for LED blue/violet tones' in the next Newsletter-Ed.)*

A tribute to the late Geoff Townson appears on page 12. To see more of Geoff's legacy visit https://www.dorsetbuildingstone.org/
Kelvin

The Geology of Chesil Beach and the Fleet by *Alan Holiday*

Chesil Beach is a barrier beach, sometimes called a tombolo, and extends from West Bay to Chiswell on Portland. From Abbotsbury to Ferrybridge (Small Mouth) it forms a barrier on the seaward side of the Fleet. The landward side of the Fleet lagoon exposes a variety of sedimentary rocks deposited in horizontal layers on the sea floor in Jurassic times between 150 and 170 Ma. Subsequently, the sediments were buried deeply and converted into rock. Later earth movements folded them, and then they were uplifted and exposed above sea level. This allowed the fold feature called the Weymouth Anticline to be partially eroded so a range of rocks are now exposed. The fold, a dome shaped structure has an east west axis (shown on the map on the next page) formed around 20-30 Ma. and linked to the Alpine Orogeny (mountain building episode). This has resulted in the exposure of rocks duplicated to the north and south of the centre of the fold at Langton Herring. Chesil Beach covers up the rocks on the seaward side of the Fleet, but they are occasionally exposed following severe storms such as in 2014 when the Kimmeridge Clay was exposed in Chesil Cove, Portland. The rocks exposed on the Fleet Shore (landward side) range from 168 Ma. (Frome Clay Formation) to 152 Ma. (Kimmeridge Clay).

The succession is more accessible from Rodden Hive (near Langton Herring) southward to Portland due to the coast path going inland from north of Rodden Hive to Abbotsbury.



Geology map of the Fleet derived from the geological memoir *Geology of the Country around Weymouth, Swanage, Corfe and Lulworth, Geological Survey of Great Britain.* 1947.

At Langton Hive Point, an oyster bed (lumachelle) (Picture 1) is exposed within the Frome Clay, formerly known as the Fullers Earth Clay. The main fossil found is the oyster *Ostrea hebridica*. (Picture 2). Further south on the north side of the Herbury peninsula another fossil bed is exposed, the Boueti Bed, with many brachiopods, *Rhynchonella boueti*. Unfortunately, this is not accessible due to restrictions by the landowner. (Picture 3 *Rhynchonella boueti*).

1. Oyster lumachelle

2. Ostrea hebridica

The next rock in the succession is the Forest Marble which is named after the Forest of Wytchwood in Oxfordshire. It is called a marble because of its value as a building stone (stone masons' terminology) but not a marble in a geological sense. This is seen on the Fleet Shore by the Moonfleet Hotel.

The limestone is very fossiliferous with fragments of a variety of fossils. In picture 4 there are echinoid spines (sea urchin), crinoid ossicles (sea lily related to sea urchins and star fish) as well as a variety of bivalves (oysters). It is thought that it was formed in a shallow marine, possibly coastal environment, experiencing high energy conditions due to wave action which broke up the organisms that are now preserved as fossils (Picture 4). Nearby, there is an exposure of rock with trace fossils (tracks and trails) from animals that crawled over the sea floor but are not preserved (picture 5). There are also what are called sedimentary structures such as ripple marks formed by currents or tidal movements in shallow water (similar to modern ripples on a beach).

3. Rhynchonella boueti

4.

5.

4. Fossiliferous Forest Marble

5. Trace fossil on a slab of Forest Marble– a "snail trail"

Further south along the Fleet shore in Butterstreet Cove there are exposures of the next rock in the succession (younger) which is called the Cornbrash.

The name ‘Cornbrash’ is derived from the rock weathering to form a stony soil good for growing cereals. This rock does contain fossils but they are not very well preserved. However, it does demonstrate a feature called honeycomb weathering due to it being carbonate rich and therefore affected by the natural acidity in rain. It is in a very exposed position on the Fleet shore.

6. The Cornbrash at Butterstreet Cove

7. Honeycomb weathering in the Cornbrash

Perhaps in picture 6, you can see that the rocks are dipping gently to the left (south) as it is on the southern side of the anticlinal fold mentioned at the beginning of this account.

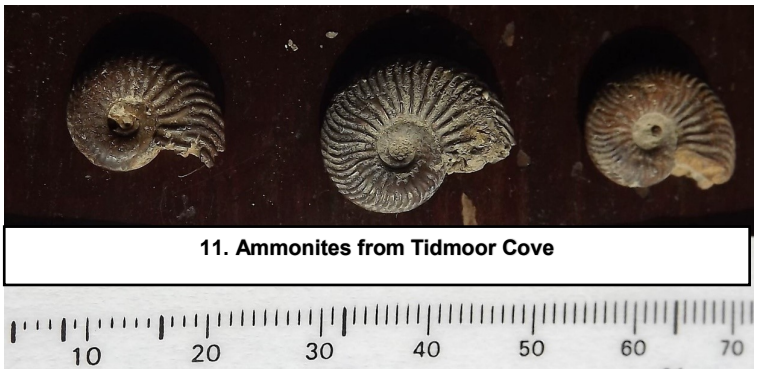
Moving further south from Chickerell Hive Point, there are exposures of Oxford Clay. Here the clay splits into thin layers along bedding planes and form what geologists call a shale. This was exploited in the past at Crookhill (now Weymouth Council Depot) for the manufacture of bricks, which ceased in 1969. This part of the succession is organic-rich and this helped in the firing of bricks in the past. Fossils found include the ammonite *Kosmoceras* as well as small bivalves. They are just impressions as the shells have been lost through geological processes.

8.The ammonite *Kosmoceras* in Oxford Clay shale

Another feature of the Oxford Clay south of Chickerell Hive Point are the large concretions called septarian nodules. These formed in the sediment below the sea floor and are made of calcium carbonate. When pure it forms white crystals of calcite. The concretions can be up to a metre across and are left weathered out on the beach because they are stronger than the clay (Picture 9). Further south at Tidmoor Point there are more exposures of Oxford Clay where pyritised ammonites especially *Quenstedtoceras* can be found as well as small belemnites and crinoid fragments (ossicles). The clay slumps onto the beach and wave action washes out the fossils.

9. Septarian nodule south of Chickerell Hive Point

10. Ammonite from Tidmoor Point



11. Ammonites from Tidmoor Cove

Walking further south keeping to the footpath in Tidmoor Cove to Lynch Cove, more Oxford Clay is exposed and another species of *Quenstedtoceras* can be found (Picture 11). Other common fossils include the oyster *Gryphaea* .

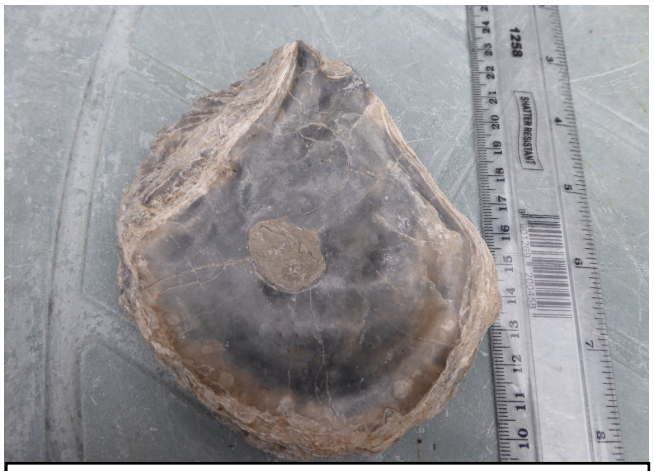
The next section of the Fleet shore south of Lynch Cove is not accessible as it is part of the army bridging camp but access to the Fleet Shore can achieved via Camp Road. Here you can see the next rock in the succession, the Corallian and particularly the oolitic limestone called the Osmington Oolite. The rock formed in shallow sub-tropical waters and oolitic limestones are forming now around the Bahamas. The limestone is made of small spherical grains around 0.5 mm is diameter. The limestone also shows ripple marks and cross bedding (tilted layers) as the sediment was moved around in shallow water (picture 14). The beds have trace fossils (worm tubes) and you may find the echinoid *Nucleolites* (picture 13).

12. Oolitic limestone

13. The irregular echinoid *Nucleoites*

14. Cross-bedding and ripple marks in the Osmington Oolite

Walking further south round Pirates Cove other parts of the Corallian sequence can be seen (Sandsfoot Grit) before reaching the Kimmeridge Clay which is not particularly well exposed but does contain many specimens of the oyster *Ostrea delta*. These look very similar to modern oyster shells and this demonstrates an interesting feature relating to evolution. Some organisms hardly change through many millions of years, e.g. Nautilus, while others evolve rapidly lasting a few million years or less such as the ammonites.



15. The oyster *Ostrea delta*

16. Kimmeridge Clay exposed in Chesil Cove, 16.2.2014

From Ferry Bridge to Chiswell there is no rock exposed due to the Kimmeridge Clay being covered with pebbles. At Chiswell (Chesil Cove) the shingle is occasionally removed by storm action as in 2014 to expose the Kimmeridge Clay (Picture 16).

17. Chert pebble with *Aptyxiella* and bivalves

The pebbles of Chesil Beach are made of a variety of rocks, some local and some from more distant sources. The local source is chert from the Portland Limestone beds, especially the Cherty Series. These can be recognised as they contain fossils typical of the Portland Limestone especially the gastropod *Aptyxiella* (picture 17).

Other pebbles are also made of chert from the Upper Greensand, which is exposed along the coast, for example at Golden Cap. Erosion of the land during the Pleistocene ice ages transported weathered rock material down into what is now Lyme Bay. As the sea level rose in the warmer inter-glacials, the pebbles were rounded by wave action and added to what is now Chesil Beach. Longshore drift has helped move the pebbles along the beach. Another source of pebbles are the Budleigh Salterton Pebble Beds, seen in east Devon just to the west of Budleigh Salterton. Again, erosion of the cliffs has resulted in pebbles forming the beach and transported them eastwards by longshore drift to be incorporated in Chesil Beach. The pebbles are often stained red and are made of a resistant sandstone known as a quartzite. Owing to the development of harbour defences at locations such as Lyme Regis and West Bay, longshore drift is now more limited and there is little new material being added to Chesil Beach. It is essentially a relict feature, and this is the reason why pebbles should not be removed from the beach.

THE HOT ROCK SLOT

PSEUDOTACHYLITES by *Giles Droop*

We are all familiar with the concept of frictional heating – think of rope burns, or rubbing your hands together on a cold day. There are geological environments in which the movement between rock volumes can be fast enough to cause frictional melting, notably seismic faults and meteorite impact sites (astroblemes). The rocks produced by melting in these high-strain environments are known as pseudotachylites.

As the term implies, pseudotachylites in hand specimen look a bit like tachylite (volcanic glass of basaltic composition) in that they are black and glassy (or ultra-fine-grained), but the geological settings are completely different. The typical fault-related manifestation of pseudotachylite is as discrete bodies within quartzofeldspathic igneous or metamorphic rock, either as isolated veins (Fig. 1) or as irregular, branching veins between clasts in complex fracture zones (Fig. 2). In either case they are usually narrow (widths typically on a mm to cm scale, rarely dm) and contacts with the original wall-rocks are sharp. Glass, where it survives, provides clear proof that temperatures were high enough to cause partial melting, though un-melted mineral fragments often persist; these may preserve microstructural evidence of shock deformation, such as deformation lamellae and unusual twinning in quartz. The presence of glass also indicates extremely rapid cooling. However, as with volcanic glass, it is common for the glass in pseudotachylites to become devitrified to cryptocrystalline mineral aggregates with the passage of time.

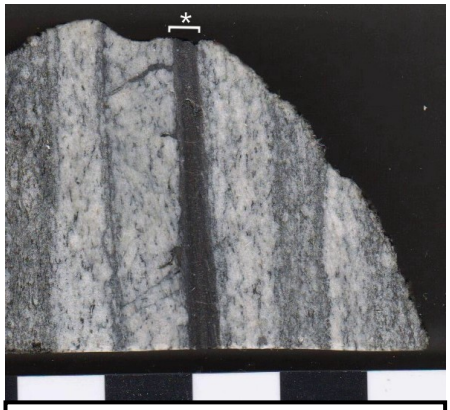


Fig.1.Thin pseudotachylite vein (asterisked) in a banded gneiss specimen from the Reisseck Group, Austria. Note offshoots. Scale intervals: cm. Photo: Giles Droop.

Fig.2. Branching pseudotachylite veins in the Outer Hebrides Fault Zone, Barra, Scotland. Photo: Steph Walker.

Pseudotachylite-cemented breccias occur in the basement rocks in the Sudbury complex in Canada and the Vredefort Dome in South Africa (Fig. 3 – see over) and provide some of the strongest evidence that these structures were generated by large meteorite impacts. The volumes of pseudotachylite in these occurrences are much larger than in fault zones.

The most spectacular pseudotachylites in the UK are probably those associated with the Outer Isles Fault Zone along the eastern side of the Outer Hebrides archipelago (Fig. 2). This is a complex Caledonian thrust sub-parallel to the Moine Thrust on the Scottish mainland.

Pseudotachylites are also exposed within the ring faults surrounding the Glen Coe caldera, where they form fault-parallel layers up to 3cm thick of so-called 'flinty crush rock' in close association with rhyolite of the ring intrusion. The classic locality is on the south side of Stob Mhic Martuin (at NN 2084 5738) which is relatively easy to reach from the West Highland Way footpath.

Fig.3 Spectacular pseudotachylite impact breccia, Vredefort, South Africa. Photo: Pierre Thomas.

Mapping a Remarkable Life: A virtual introduction to the Lyell Collection

Centre for Research Collections, University of Edinburgh

Elise Ramsay, Project Archivist

Dr Gillian McCay

online presentation 10 December 2020, summarised by *Dr. Fiona Hyden*

Edinburgh University has acquired 294 notebooks written by Charles Lyell from the age of 16 to his final days. The notebooks are an amazing account of the development of the science of geology as well as all sorts of musings on politics, slavery etc. The notebooks were saved from export by public appeal. Much more than was presented in this talk are available from the University of Edinburgh library at http://libraryblogs.is.ed.ac.uk/lyell/
This blog is currently documenting new discoveries in the notebooks.

Charles Lyell was an evidence-based, eminent geologist in the Victorian era. In the 18th and 19th centuries, specialisms were less distinct than now and scientific discovery was pursued by gentlemen scientists who could afford to indulge their passions. At the time of Lyell, ideas were very varied, including the likely Age of the Earth. Arguments about how the Earth formed abounded – Neptunists, for example, believed that all rocks formed in the sea. Gradualists (gradual change) and catastrophists (mostly palaeontologists) held quite opposite views on the processes responsible for the observed rock record.
In Scotland, the now famous unconformity at Siccar Point was discovered in the late 1700s. Hutton, Playfair and others knew that the unconformity represented a long period of time.

Playfair "The mind seemed to grow giddy by looking so far back into the abyss of time"
Hutton: "The result, therefore of our present enquiry is, that we find no vestige of a beginning, no prospect of an end".
Lyell: "The Present is the Key to the Past"

Lyell uniquely brought pragmatism to the debates that raged between two polar opposite views, that of gradualism and catastrophism. He had a legal background and this helped him to come to a more nuanced position. 'Why cannot you have gradual change interspersed with a catastrophic event - just like today?' His views were considered heretical, and going against society-held beliefs e.g. Age of the Earth.

The following quote from Lyell's *Principles of Geology* (published in 3 volumes 1830–1833) essentially describes the Rock Cycle.

"Nature is not repose, but war. It is not rest, but change. It is not preservation, but successive production and annihilation. The elements destroy what they have made. The melted rock sends its fuel to the volcano again to destroy itself, the waves throw the pebbles against the cliff. The torrent & c. so it is with organic life. It is let loose against itself, it is, itself, destruction. It is like time eats its children." -Charles Lyell

It provided the environment for Darwin to consider evolution in the context of deep time, not just a young Earth. Darwin acknowledged this:

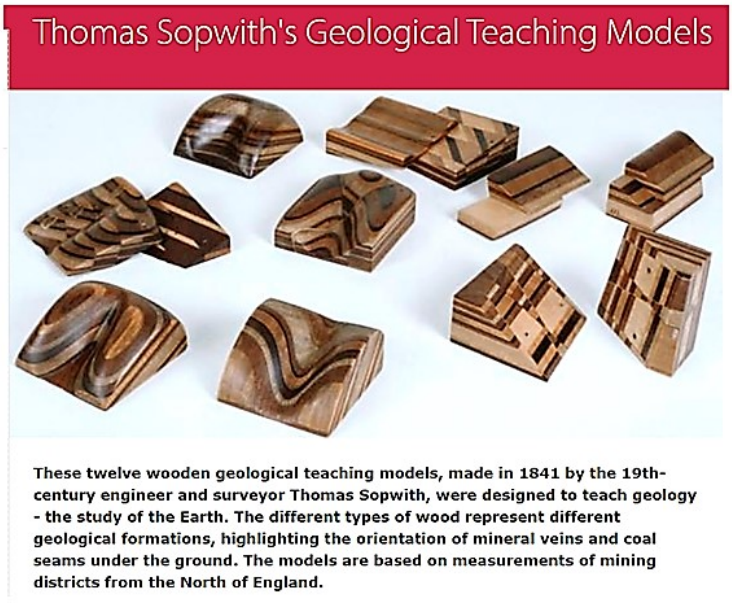
> *"I have always thought that the great merit of the Principles, was that it altered the whole tone of one's mind and therefore that when seeing a thing never seen by Lyell, one yet saw it partially through his eyes" and "The very first place which I examined . . . showed me clearly the wonderful superiority of Lyell's manner of treating geology, compared with that of any other author, whose work I had with me or ever afterwards read."*
> - Charles Darwin

The principle of 'the present is the key to the past' can be illustrated by specimens collected by Lyell, including fossil ripple marks and fossil rain prints (from North America). They are mentioned in his notebooks, and further study of the books should reveal more intriguing information about so many phenomena that Lyell studied.

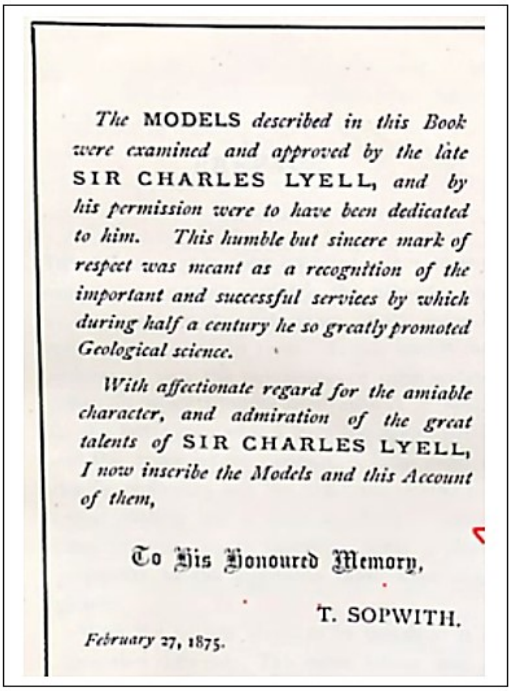
Fossil ripple marks compared to a modern beach.

Fossil rain drop prints from a location in North America

Wooden model of folds were designed by Thomas Sopwith a cabinetmaker, who became a mining engineer, self-taught, and spent some time working in the coalfields of Northern England. He had amazing 3D understanding and his knowledge was appreciated by non-geologists, who needed to increase coal production. In his preface, he provided a fitting tribute to Lyell and dedicated his book only 5 days after Lyell died.



https://www.whipplemuseum.cam.ac.uk/explore-whipple-collections/models/thomas-sopwiths-geological-teaching-models



The MODELS *described in this Book were examined and approved by the late* SIR CHARLES LYELL, *and by his permission were to have been dedicated to him. This humble but sincere mark of respect was meant as a recognition of the important and successful services by which during half a century he so greatly promoted Geological science.*

With affectionate regard for the amiable character, and admiration of the great talents of SIR CHARLES LYELL, *I now inscribe the Models and this Account of them,*

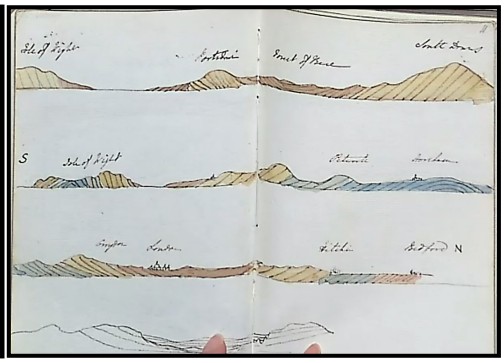
To His Honoured Memory,

T. SOPWITH.

February 27, 1875.

One of the many examples of sketches in Lyell's notebooks, includes a cross-section stretching from the Isle of Wight to Bedford. The research centre is currently working through the collection of notebooks. They are discovering new things, not only about geology, but everything from a list of peers to the national debt, thus placing his era in context.

As yet they have only scratched the surface of what they contain, with lots of nuggets that help to put a particular specimen in context, or cross reference to Darwin and others.



William Geoffrey ('Geoff') Townson 1947-2020

Geoff was born in Goring-on-Sea, West Sussex and first visited Dorset on a geology field trip in 1965. After A levels, he attended King's College, London and graduated with a B.Sc. in Geology and Zoology plus the A.K.C. He then did three years doctoral research at Oxford for his Ph.D. on the Upper Jurassic, obtaining his doctorate in 1971. He was also a fellow of the Geological Society. It was at Oxford that Geoff met his wife Jane, who was typing up his doctoral thesis just two days before they married! Geoff then obtained a post with Shell as a petroleum geologist, based in the Netherlands. From 1972-1976 he worked for Shell in London, but commuting from Woking. By this time Geoff and Jane had two sons, James and Richard. Petroleum geologists 'follow the oil' so by 1976 he was based in Brunei, followed by a stint in Perth in western Australia until 1980. During this time Geoff travelled widely, his work taking him all over the world, including the Shetlands, the North Sea, and several countries in Africa and the Middle East. From Australia the family moved back to The Hague until 1985, followed by a spell in London again and then finally in The Hague until 2001, when Geoff retired.

But Geoff had always harboured an interest in painting, and so rather than opting for a quiet retirement he embarked on a career change. Whilst resident in Australia, and then The Hague, Geoff pursued evening art classes, culminating in six years of painting and art history courses with the Open College of the Arts (OCA), which he completed after his retirement from Shell. Geoff's family moved from the Netherlands to a village in Hampshire, where he was clerk to the local Parish Council. Since then, Geoff's art work has been shown in group and solo exhibitions in Hampshire, Wiltshire and Dorset, as well as in several open studio events including Hampshire Open Studios and Dorset Art Weeks. Geoff's work was always varied, appealing and strong in impact, with a bold sense of design and structure which is no doubt influenced by his experience as a geologist.

Soon after retirement they decided to buy a second home in Charmouth, eventually settling in Dorset full-time in 2010. He went on to set up his own Art website and studio-cum-gallery plus signing up as a volunteer at Charmouth Heritage Coast Centre. Geoff also ran a u3a Geology group and his own art classes locally, successfully pursuing his two passions. After joining the DGAG he also led a number of field-trips in the Charmouth and Lyme Regis areas, which were always fun, interesting and informative. By 2017, we had established the Dorset Building Stone website and Geoff joined in enthusiastically, becoming its mentor and chief consultant. Following a long illness, which he sometimes made light of, Geoff sadly passed away in November 2020. Only a week or so before he died, he was still contributing to our discussions and the DGAG Newsletter!

Geoff was always very generous in sharing his knowledge and nothing was too much trouble for him. Geoff had a great sense of humour too, often sending us memes, cartoons and signing himself off in emails as 'Widget'! (WGT). We will miss his knowledge, expertise and guidance, but also his friendship, humour and humanity. Geoff is survived by his wife Jane, also an accomplished artist using mixed media, his two sons and his five grandchildren. His legacy lives on.

Written by *Kelvin Huff* (with a lot of help from Geoff's wife, Jane!)

Landslip problem solved? by *Alan Holiday*

Specialist engineering work has taken place on private land adjacent to Old Castle Road in Weymouth which is parallel to part of the north shore of Portland Harbour (post code DT4 8QG, GR SY675776). On Monday 7 December, work started to install a row of bored piles along the edge of the road to help protect the steep upper section of the slope, and road, from slipping. There had been fears that if the landslip continued without significant engineering the road would be completely closed cutting of residents the western part of Old Castle Road and the Castle Cove Sailing Club. This first phase of piling will enable building on the land to continue safely – with the slope being fully stabilised as part of the development process.

1

The work involves installing a set of closely spaced, bored piles with small gaps between them. This close spacing forms a wall to retain the ground, while the gaps allow water to drain through – an essential feature in this location where any interruption to the drainage path of groundwater could cause further instability (picture 1).

The slope instability is due to the geology with Sandsfoot Grit over Sandsfoot Clay. Earlier this year, following a landslip on land next to Old Castle Road, a geotechnical report identified a translational landslide – a down-slope movement of material – caused by a natural process of rainwater drainage through the land to the north through more permeable layers of Sandsfoot Grit until it finds the Sandsfoot Clay, it then soaks into the clay, which loses cohesion and mass-movement occurs towards the beach.

2

In the mid-1980s a resident of an adjacent property was concerned about their house and had a large amount of Portland Stone blocks (rock armour) placed on the slope next to the current work and that seems to have stabilised the slope (picture 2). Since that was carried out, Portland Harbour was designated as part of the World Heritage Site and it is unlikely that permission would have been given (this is a rather similar situation to that of Swanage to the south of Peveril Point in Durlston Bay).

Martin Green writes about **An Unusual 'Fairy Heart'**

I have spent a portion of my life searching the weathered surfaces of arable fields in my patch of chalkland on Cranborne Chase. This has been for the purpose of tracing how our ancestors have used the landscape in past times from the Palaeolithic period onward. For a lot of prehistory, the only surviving evidence consists invariably of flint tools and the waste produced in their manufacture.

However, from an early age I have been aware that fossils, mainly preserved as flint casts, could also be found and always kept an eye out for them. Echinoids are the most visually striking of these and over the years I must have picked up hundreds, most given away to school children who visit the farm. The folklore surrounding them is fascinating. Clearly, they have been regarded as special for a very long time.

A Bronze age burial, some 4,000 years old, excavated in the 19th century near Dunstable revealed a woman and child surrounded by over a hundred. Doing a little research, I came across Professor Ken McNamara's book "The Star Crossed Stone" in which he tells some remarkable stories of human relationships with these modest fossils over millennia. One of the most striking was found in Egypt engraved with hieroglyphics recording the name of the quarry and finder some 4,000 years ago!

Ken was formerly Director of the Sedgwick Museum in Cambridge but now lives in Western Australia. I have corresponded with him on topics of mutual interest for a while and he was able to provide some fascinating detail on an unusual 'fairy heart' I found recently. As can be seen in the photos one of the ambulacra (top left) appears to be constricted and Ken has kindly allowed me to quote from his reply to me concerning it.

"Such a stunning teratological specimen with the abnormal rows of pore pairs. Abnormalities in ambulacral growth turn up every so often, and seem to arise either from some inherent genetic defect early in development (which is probably the case here) or the effect of some parasite. I once found a big echinoid that only had four, not five ambulacra. That would have been a problem it had very early in development".

Clearly a very special fairy heart!

Members may like to know Ken has recently written another fascinating book "Dragon's Teeth and Thunderstones: the Quest for the Meaning of Fossils" Reaktion Books. 2020

Charles Jackson 1928 - 2021

I am sorry to have to report the death of one of our long serving members, Charles Jackson. Charles died on 7th January after a short illness at the age of 93. I learnt of his death through an item in the deaths column in the Dorset Evening Echo. Unfortunately, I had not seen Charles recently due to the Covid 19 lockdown. However, over the years I have known Charles, he was always such a lively individual very much involved in the local geology scene through DGAG, DIGS or Wessex OUGS. Despite his age, he regularly attended meetings and contributed through questions to the speaker or proposing or seconding motions or elections at meetings. In an email from his daughter Julia, she said Charles had accompanied her on a tour of Iceland as recently as 2015 when he was 88! Before I knew Charles, he organised field trips for the groups he belonged to, including Snowdonia. Charles's daughter Julia said that he was never happier than when on a field trip. Sheila Alderman recounted her most vivid memory was visiting a field at Ryewater Farm near Corscombe with Charles, to measure sarsen stones using the old-fashioned chain he provided. One link is 8 inches and the chain is 22 yards...the same length as a cricket pitch. A brilliant day out thanks to Charles. Another anecdote from Jo Thomas was a field trip to Crookhill Brickpit, Chickerell, which is just up the road from where Charles lived. Jo remembers finding crystals which I think were probably gypsum/selenite in the Oxford Clay. Charles was always very grateful when I took him to DIGS meetings and he enjoyed my cakes!

Charles's family are planning to hold a memorial event when Covid restrictions are eased. So, RIP Charles, a really lovely chap who will be missed by many!

Alan Holiday

Zoom lecture on carbonate concretions by Professor Jim Marshall

23 members joined in online for this excellent talk on 10th February, which covered the formation and occurrence of carbonate concretions. Dorset obviously got a mention as they are common in the Oxford and Kimmeridge Clays, plus the Bencliff Grit at Osmington Mills. Jim kindly provided a paper he'd written for *Geology Today* on the subject, which I then circulated by email. If you're not on my email list and would like a copy please let me know. *Kelvin Huff*

Dorset Building Stone Group

I've been working with Pete Bath to produce a guide to the building and decorative stones of Kingston Lacy House. Publication will be later this year so watch this space for more details. Future projects for the group include Wimborne Minster and Athelhampton House. More is being added to the website all the time! Any member wishing to join us, let me know. *Kelvin Huff*

DGAG Field Trips and allied events 2021

N.B. All events and field trips are subject to current Covid restrictions

To book a place on our field-trips, contact Val Fogarty using her details below. £2.00 day trip fee.

Sunday 25th April (10 a.m. start)
Weymouth Urban Trail. About 7 kms. of easy walking looking at building stones. Groups of 6 maximum including leaders. Leaders: Val Fogarty, Alan Holiday and Kelvin Huff. Full notes supplied.

Black Country Residential Field Trip 3rd-6th September 2021, based in Dudley.
Leaders: Graham Worton and Noel Donnelly.

If any member has ideas for field-trips please let Val know.

I have booked Broadmayne Village Hall for the following events:

23rd October 2021, Holiday Rocks

11th December, 2021, Winter Workshop

8th January, 2022, A.G.M.

https://dorsetgeologistsassociation.org/

https://dorsetbuildingstone.org

https://dorsetrigs.org/

DIGS (Dorset's Important Geological Sites)
The group welcomes anyone wishing to help with conservation work on Local Geological Sites. Please contact Alan Holiday if you are interested. Working parties go out on both weekdays and weekends.
alanholiday@btinternet.com

Wessex OUGS events

Please contact Jeremy Cranmer on: wessexdaytrips@ougs.org or telephone 01305 267133 to book a place. £2.50 day trip charge.

All OUGS Wessex fieldtrips have been postponed until further notice.

Can we help answer your geological questions?

Either post them on our website's contact form or send them, maybe including photos, to me at the email below.

Kelvin

Reminders: Contributors' deadline for the Summer Newsletter is: **Monday, June 7th, 2021.**

Committee news:

We **still** need an Events Officer (not a very onerous job at the moment!)

Kelvin

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