Occasional Erratics

Newsletter of the

MEDWAY FOSSIL AND MINERAL SOCIETY

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The editor of this edition of the MFMS Newsletter was Nick Baker

Cover picture

Part of the Pleistocene mammal collection of David and Martin Rayner. Fossil Road Show, Guildhall Museum, Rochester, May 2016.

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Editor's notes.

Welcome to edition number eight of *Occasional Erratics*. I have an item from Gary on *Fossil Weather*. That is to say, the traces left within the geological record of aspects such as wind, rain drops etc. Fred has sent a good photo report of a Dinosaur theme park in southern France. Apparently very visitor-friendly and informative, for both adults and children, - just what one hopes all such enterprises should be. A few photos from the fossil road show, and then my input on a deep sea deposit from Barbados, then the relationship of flint and sponges, and a look at the Aylesford Gault—stratigraphy and the situation regarding the clay pit now. There is also a round-up of the spring program

May I just comment on my view of being editor of this newsletter, or editor of anything for that matter. In the past, I have submitted material for other publications and in the case of several editors—who shall be nameless—then published text, the message of which bore no relationship to what I had originally said. Recently, I was invited to submit an article for a geological magazine. The text was returned to me for my approval. It was very largely re-written, with sentences and paragraphs omitted. I was invited to write a new introduction, they having edited out the original. I got the indication that a lot of the photos were to be left out, which made the information of large parts of the article nonsensical. I tried to comply but it was, so to speak, 'doing my head in'. In the end, I decided enough was enough, and 'pulled' the article, which a comment of what I felt about their editorship

So, my policy is, that which is submitted is sacrosanct. I want to respect the authors as much as possible, after all, they have gone to the trouble and time to submit material. The situation where material appeared to be so rubbish that I had to have a quiet and meaningful talk with the originator, has not yet occurred, and I do not foresee it. This might imply that I am not a good editor (just a compiler). There is a view that the editor's word is law, and is not a functioning editor unless he-she has made changes. In which case, I am a heretic, and if all are happy with that, I will remain so.

I recall one of those situations where a quiet and meaningful talk would have been applicable. I was not the editor. A little lad had submitted ideas that some changes in the Earth environment would cause evolution to go 'into reverse'. So, it would seem that claims made by researchers such as James Lovelock can be disregarded. My own view is not helped in this in that, as far as evolution is concerned, I am a determinist. Evolution has a reason and an end point, but I would still go to the 'barrackades' to defend natural selection!!!

So, what to do about our lad. New blood must be encouraged, but to what extent? The whole article was accepted. For myself, it would be difficult. The lad is probably being nurtured in the view of evolution being 'non-determinist', and yet going towards authors which, some at least, may have been just a little mite fundamentalist—I don't know. To point out the counter arguments might have had a discouraging effect. Perhaps it did happen—I have not seen the lad for over ten years. The subject is wide and when I was getting interested in geology all manner of strange ideas came to mind but I did not go into print.

But finally, here is a case where I should have held my ground. It's not geology, it's an OU poetry soc. magazine, and every month different folks had a go at being editor. Everything was fine and then 'it' arrived. It was a very pornographic poem. I did not know the wider views of the readership but I did know that quite a high proportion were not 'gagging for porn'. I should have left it out, without explanation, but I showed it to the chairman, who said it was a 'good example of contemporary thinking' and I should leave it in. So I did, and guess who got the **FL**eiger**A**bwehr**K**anon? It was not the Chairman.

FOSSIL WEATHER

Gary Woodall

A fossil is evidence of ancient life, most commonly it is the remains of the animal or plant 'turned to stone'. But the imprint of burrows or footprints are another form of evidence and are called 'trace fossils'. There are also sedimentary structures such as ripple marks and current cross-bedding which preserve evidence of the action of water. In a similar manner some sedimentary structures preserve evidence of the action of sun, wind and rain and could thus be defined as fossil weather!

Probably the most common example would be fossil mudcracks. These occur when a pool of water has dried up and the mud bakes hard. In much the same way as columnular jointing in basalt, as it dries the mud shrinks and forms hexagons. If this surface is left exposed long enough without being re-covered by water (for instance in a semi-arid environment)and then gets covered by sand. The mudcracks may be preserved, in a way fossilised. In Britain I have seen mudcracks in the Triassic rocks along the river Severn and in the Purbeck beds of Dorset

Preserved mudcracks in the Purbeck beds.

Preserved rain-pits in Triassic rocks.

Perhaps the opposite of mudcracks, which are evidence of the sun, are rain-pits which, as the name implies, are evidence of rain. They too tend to form in semi-arid environments where the ground is subject to a short but heavy downpour. The falling raindrops leave small depressions, rain-pits. If the ground is then given long enough to dry out and harden before being covered by sediment the rain-pits can be preserved. I have found rain-pits in the Triassic rocks at Aust.

Dreikanter from Budleigh Salterton

Wind is one of the great forces of erosion and in many parts of the world today, especially in deserts, sculpts the rock into weird and wonderful shapes. On a small scale a pebble lying in the desert will be blasted by the wind borne sand. Over a long period of time this cuts facets on the pebble usually tending to be with three faces. Hence they have been given the name Dreikanter (from the German for three edged). Dreikanters are forming today in desert regions and funnily enough Antarctica whose interior regions are actually a desert, albeit a very cold one! In Britain they can be famously seen in the Budleigh Salterton pebble bed.

A very violent type of weather is the thunderstorm and there is even geological evidence for this. Not just in the form of flood deposits but preserved lightning! When lightning hits the ground in a desert the temperature of the bolt at over 1800 degrees centi grade is enough the fuse the sand into hollow glass tubes. These are called fulgurites from the latin fulgur for lightning.

Fulgurite from the Sahara

So we can see that evidence of ancient sun, rain, wind and lightning can be preserved as fossil weather.

(see editor's notes next page)

(Editor's note)

Gary's mention of fulgurites raised a memomory for me from Darwin's account in *The Voyage of The Beagle*. On July 26th 1832, The Beagle had reached Monte Video, and Darwin then spent some time exploring Maldonado, which is on the north side of the Rio Plata, and close to its estuary. Part of his account is as follows..

'In a broad band of sand-hillocks which separate the Laguna del Potrero from the shores of the Plata, at the distance of a few miles from Maldonado, I found a group of those vitrified, siliceous tubes, which are formed by lightning- entering loose sand. These tubes resemble in every particular those from Drigg in Cumberland, described in the Geological Transactions.[1] The sand-hillocks of Maldonado, not being protected by vegetation, are constantly changing their position. From this cause the tubes projected above the surface and numerous fragments lying near, showed that they had formerly been buried to a greater depth. Four sets entered the sand perpendicularly. By working with my hands I traced one of them two feet deep and some fragments which evidently had belonged to the same tube, when added to the other part, measured five feet three inches. The diameter of the whole tube was nearly equal, and therefore we must suppose that originally it extended to a much greater depth. These dimensions are however small, compared to those of the tubes from Drigg, one of which was traced to a depth of not less than thirty feet.

The internal surface is completely vitrified, glossy, and smooth. A small fragment examined under the microscope appeared, from the number of minute entangled air or perhaps steam bubbles, like an assay fused before the blowpipe. The sand is entirely, or in greater part, siliceous, but some points are of a black colour, and from their glossy surface possess a metallic lustre. The thickness of the wall of the tube varies from the thirtieth to a twentieth of an inch, and occasionally even equals a tenth. On the outside the grains of sand are rounded, and have a slightly glazed appearance. I could not distinguish any signs of crystallization. In a similar manner to that described in the Geological Transactions, the tubes are generally compressed, and have deep longitudinal furrows, so as closely to resemble a shrivelled vegetable stalk, or the bark of the elm or cork tree. Their circumference is about two inches, but in some fragments, which are cylindrical and without any furrows, it is as much as four inches. The compression from the surrounding loose sand, acting while the tube was still softened from the effects of the intense heat, has evidently caused the creases or furrows. Judging from the uncompressed fragments, the measure or bore of the lightning (if such a term may be used), must have been about one inch and a quarter. At Paris, M. Hachette and M. Beudant[1] succeeded in making tubes, in most respects similar to these fulgurites, by passing very strong shocks of galvanism through finely-powdered glass. When salt was added, so as to increase its fusibility, the tubes were larger in every dimension. They failed both with powdered felspar and quartz. One tube, formed with pounded glass, was very nearly an inch long, namely .982, and had an internal diameter of .019 of an inch. When we hear that the strongest battery in Paris was used, and that its power on a substance of such easy fusibility as glass was to form tubes so diminutive, we must feel greatly astonished at the force of a shock of lightning which, striking the sand in several places, has formed cylinders, in one instance of at least thirty feet long, and having an internal bore, where not compressed, of full an inch and a half; and this in a material so extraordinarily refractory as quartz !'

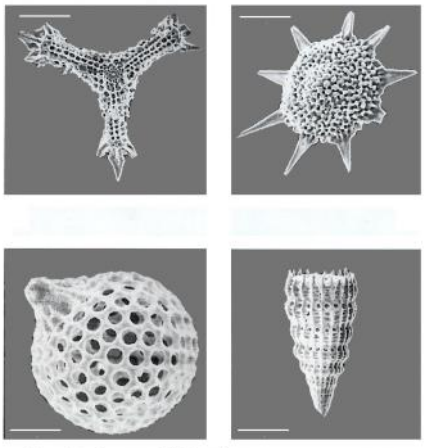
[1] Geolog. Transact., vol. ii. p. 528. In the Philosoph. Transact. (1700, p. 294) Dr. Priestley has described some imperfect siliceous tubes and a melted pebble of quartz, found in digging into the ground, under a tree, where a man had been killed by lightning.'

Darwin. C. 1839. *The Voyage of The Beagle*. (the quote is from the Everyman edition, 1972 pp56-58, published by Dent—London) ISBN 0-460-01104-9.

BARBADOS EARTH - deep sea, high and dry!

Nick Baker

As I seem to have acquired a large number sediment samples (as a by-product of looking for microfossils), I have always wanted samples of deep sea sediments. I have a superabundance of calcareous ooze, but no diatom ooze, red clay or radiolarian ooze. However, in looking through some of the collections which MFMS seem to have acquired recently, I came upon a small bag of brown powder labelled as Barbados Earth. No one seemed to have heard of it but I knew of it as a radiolarian ooze. It covers much of Barbados and seems to be an accretion from a Tertiary age subduction zone. It appears to be entirely composed of silica, and so must have come from at least 6,000 metres depth and is of Tertiary age. Now, I must point out that **the photos on the right are of Cretaceous species,** but will give some idea of what I will be looking for - my microfossil techniques are going to be put to the test!



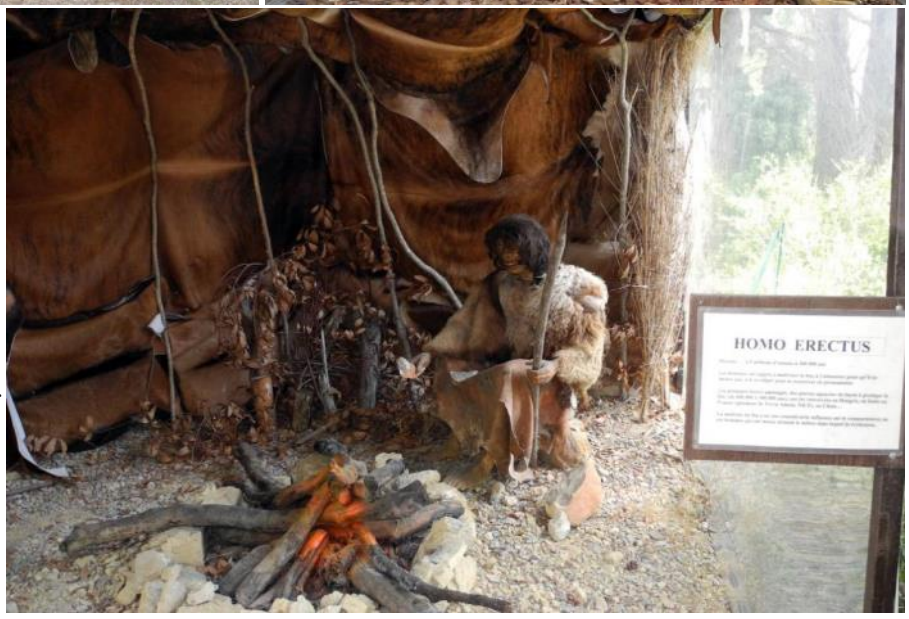
Radiolaria from the Cretaceous, Trudos Mountains, Cyprus

Scale bar = 100 microns.

Just a few kilometres inland from the Meditterrean sea in the South of France. not too far from Montpellier. is an extraordinary theme park. Driving along the D613 from Mèze towards Pezenas a life size model of a *Spinosaurus* comes into view perched high on an embankment. Apart from some very small signs, this is the main indication that the park is nearby.

The Musée-Parc des Dinosaures (Dinosaur Museum-Park) in Mèze, Hérault is the largest site museum in Europe to feature dinosaur eggs and bones. Children can embark upon an amazing scientific adventure with the help of simple words displayed on large explanatory notice boards that are both fun and educational. All along the pathway, that winds through the shady pine trees, children and adults can go back in time as they follow the trail punctuated with skeletons and life-size reconstructions.

The other museum park within the Mèze site features the origins and evolution of man, from mans earliest fossil skulls from Africa, his evolutionary journey out of Africa towards *Homo Sapiens*. As you walk around the park, there are various exhibits reconstructing scenes of life from Lucy and the Australopithecines to the Neanderthals. Various exhibits show the development of tools, the control of fire and some of the animals that they shared their worlds with. Life size models, casts of important fossils from museums around the world, and real fossils found on the site, forms a wonderful educational experience for both adults and children alike.

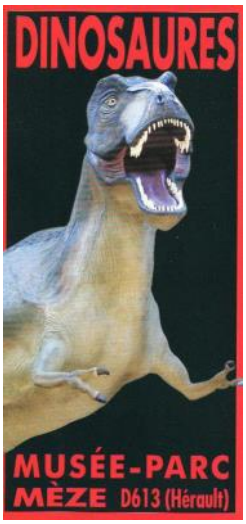


Rarely has an important paleontological site where on-going excavations are revealing new finds been combined with a theme park providing financial support for the work carried out there.

Background

It was in 1996 that this site was excavated and some dinosaur egg clutches were found. After further excavations took place the following year it transpired that this site contained one of the largest deposits of dinosaur eggs in Europe. This site is late Cretaceous, approximately 68 million years old, and predominantly comprised of fairly soft sandstone layers. Various species of Dinosaur used this site to deposit their eggs including both herbivores and carnivores. Early in 1998 further excavations led to the discovery of an extensive fossiliferous layer containing dinosaur bones near to several nests. During 1999 a team of palaeontologists from the museum and The University of Montpellier discovered a new species of dinosaur:- ANKYLOSAURUS - NODOSAURIDAE - STRUCTHIOSAURUS, a quadrupedal herbivore 3 meters in length' This site has produced eggs of the smallest carnivore, *Prismatoolithus* which are only 7cm long and 4.5 cm across. One of the latest discoveries is of a nest of un-hatched eggs belonging to an herbivore, and two new species of turtle.

Several clutches of eggs are displayed *in situ* complementing the egg clusters in glazed display cases at the beginning of the park. Those in situ are collapsed, or hatched, but when removed and prepared, the undersides can retain their original shape.



If you are a dinosaur lover, if you have children, or if you haven't this is a great day out, being both interesting and educational. In the summer it is very hot indeed. The park offers some refreshments, activities for the children, a fossil hunt in a large sand pit and the usual site shop with casts of dino-related specimens such as teeth and eggs as well as the usual toys for the children.

Reference, Musee-Parc des Dinosaures. www.dinosaure.eu

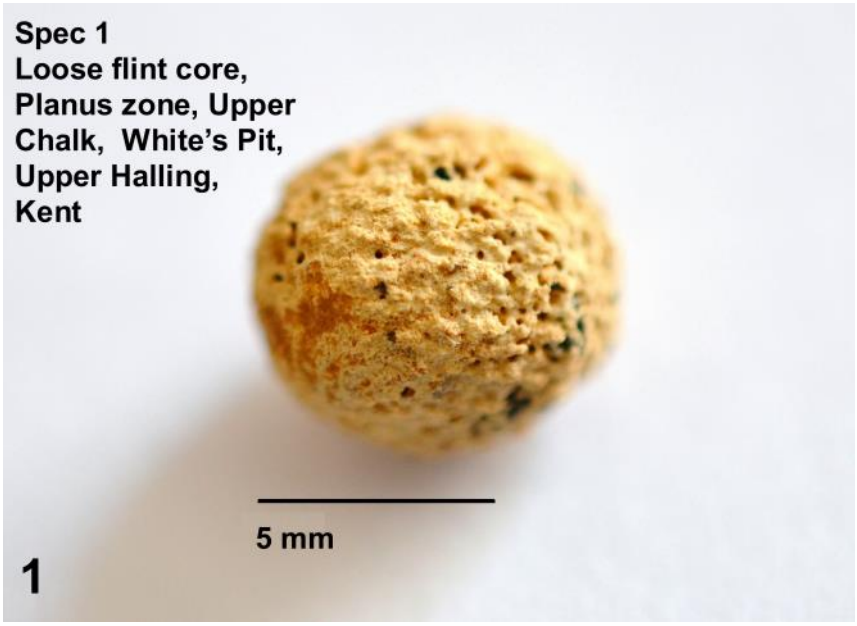
Fossil and Mineral Road Show—Guildhall Museum, Rochester—May 28th

I was not present at the show, and so nor was my camera, but other people were, and these photos are from Lilly O'Keefe. 'Footfall' was less then in the last two years, largely because we were not ably to present such widespread preadvertising, but here we see Gary (ask the expert) between customers (in front of some of the permanent exhibits) Our own exhibits were again up to high standard—on the right are some photos of Fred's London Clay collection of fossil vertebrates, crustacea, and nautili etc. May I say thanks, on behalf of all the members, to those who made the occasion a success. I should mention that Tony, our President, was taken ill for a time during the day, but made a quick recovery.

Porosphaera, Flint Cores and Flint Formation.

Nick Baker

I think it can be said, that for most of us, when we begin collecting fossils, we tend to pick up all manner of things with no connection to fossils, except that they will most likely be made of stone! Sometime, with the help of the 'topping' of a little *disinformatzia*, the misguidance can go on for even a decade or two. And so it was that in 1961 I was on Blue Bell Hill, where I found a round nodule, which I hammered, thinking it was marcasite. It was in fact flint, with a sphere of white material at the centre. This object did not react with acid and cleaned up quite well. It was a rough, white silica sphere, which I thought might be a fossil coral. *British Mesozoic Fossils* was not published until 1962 and when I got a copy the nearest I could see to these objects was *Porosphaera globularis*—but they did not have a syphon duct. None the less, I felt sure that these objects were fossils, and in the following years found around 15-20, rarely in flints (see Fig 2) and more commonly, loose (see Fig 1).

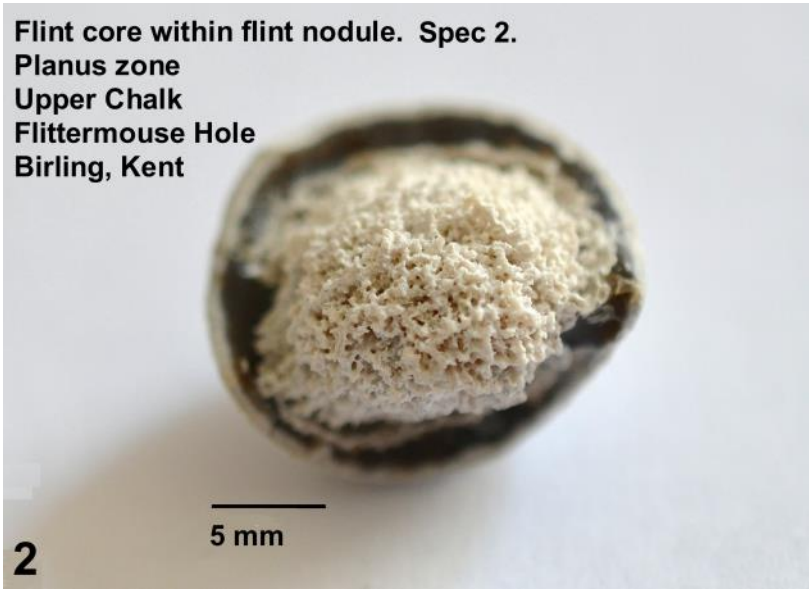


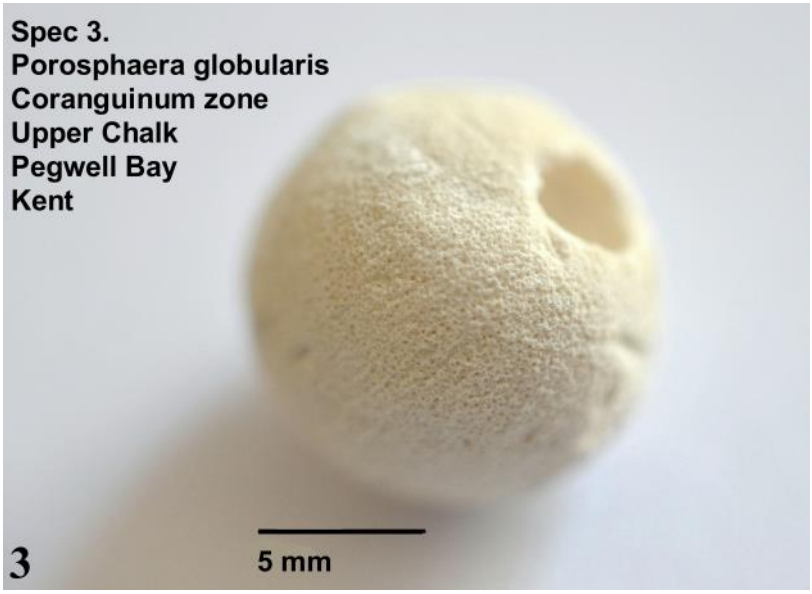
In 1969 I sent some to the Natural History Museum and the answer came back that these were *Porosphaera*. All of these items were found in the basal beds of the Upper Chalk, but later, in the higher beds around Cliffe, and Thanet I found true *Porosphaera*. An example from Pegwell can be seen in the picture (Fig 3). Note the pores in the surface and the large duct on one side. This was a fully-functioning sponge, quite removed from the previous items. Interestingly, *Porosphaera* is almost always calcitic. The 'flint cores' seem to be rarer in the higher beds of the Upper Chalk—are we looking at the results of changes in the amount of available silica in the sea water?

In the 1980s my main geological contact was Chris Darmon, but he tended to shy away from 'problems of minutei'. In the 1990s Dr A. J. Rundle looked at the samples. Adrian's diagnosis was that these were 'flint cores', but did they have a fossil connection or were they just the first stage of flint formation? When we look at the thin sections in the following pictures, the *Porosphaera* (Fig 6) show all the order of a functioning sponge, while the flint cores show silica crystalisation. Have we moved from biological structure to chemical structure?

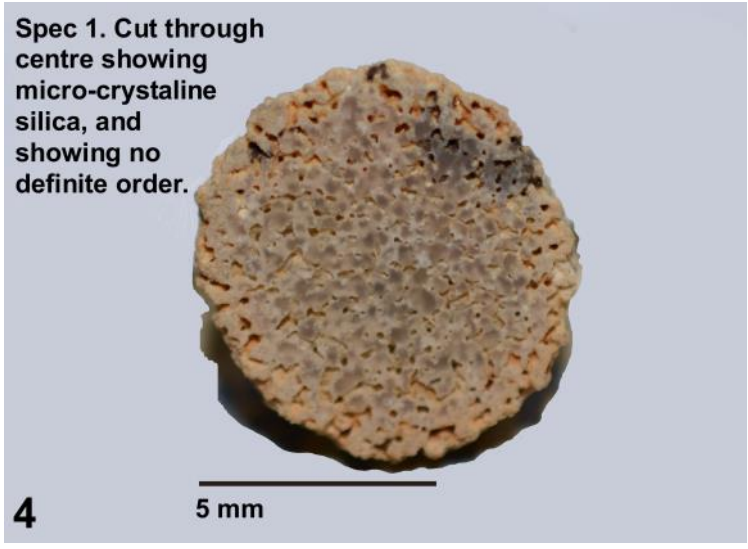
I have mentioned that most of the flint cores that I have found, were found loose. Only occasionally were they found within flints—most likely because I did not break open many flints! But a look at the latter is curious. The flint core is often surrounded by what appears to be mature flint. But, the apparent immaturity of the centre is a fossilization of the earliest phase. The whole of the flint is largely composed of microquartz, with some chalcedony. The structure is a fossilization of the stages.

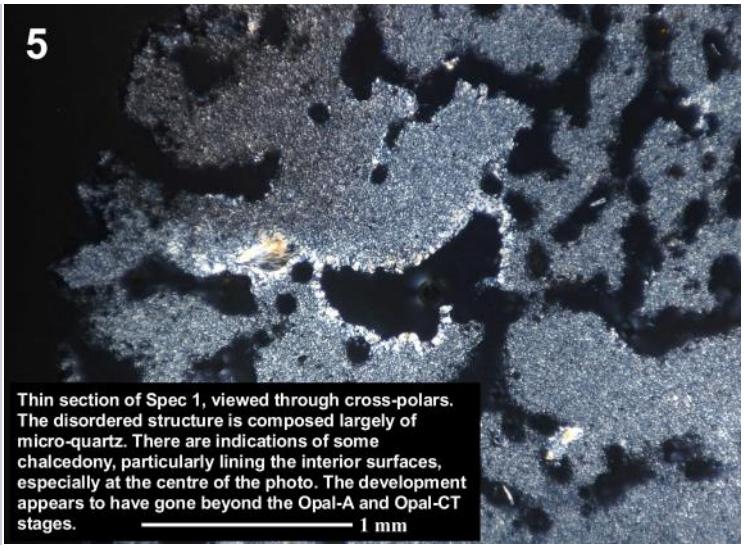
Fig. 4 shows specimen 1 cut through the centre. There is a disordered—I hesitate to say 'honeycomb' - maize-like structure. In thin section (Fig. 5) we see that it is largely composed of micro-quartz. Relative chemical maturity has 'captured' early structural disorder. The linings of the 'vugs' show development of larger crystals of chalcedony.





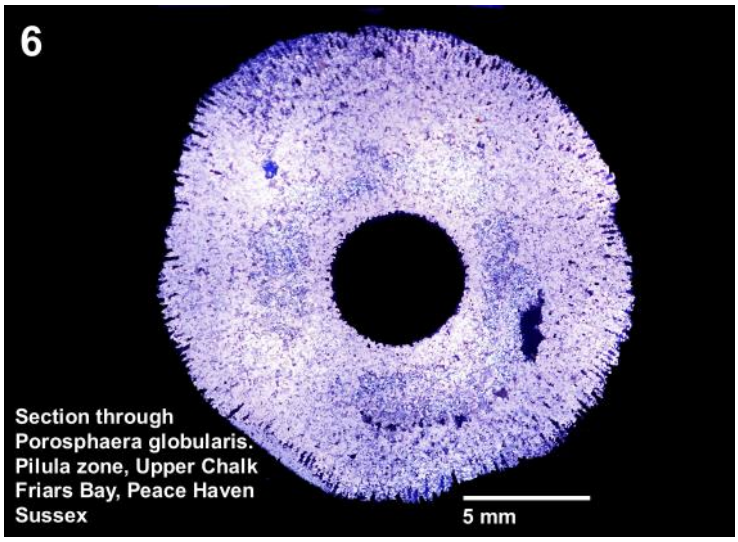
We tend to think of silica as being completely insoluble but this is far from true. How else would silica-based rocks be eroded. Or large quartz crystals form, unless they came out of solution? It is true that silica is almost insoluble at pH below 9 at about 6 parts per millon but above 9 (in alkaline conditions) rates of solubility increase fast. At pH 11 we are talking about 500 parts per million. But that is for mature quartz. In the processes concerning us, we are talking of amorphous silica—opals etc. At pH 11 solubility is at 5000 parts per million. We are in the realm of silica gel. Dry, desert-lands





bordering chalk seas are most likely to bring in high pH water. Rivers draining jungle or forest are more likely to supply humic acids (low pH) and so less good for maintaining chalk. The difference in solubility between silica gel, Opal-A, Opal-CT and quarts means that once the sea is saturated with respect to Opal-A, it is supersaturated with respect to Opal-CT. So the trend is mainly in the direction of supplying mature quartz.

Current thinking is that silica rocks are biogenic, with silica-rich sponges and sponge spicules as the main source. In the past, sub-marine volcanoes were thought to be the main supply, but writers such as Tucker (*Sedimentary Petrology*) point to the sparscity of such volcanoes. But, perhaps land-based volcanoes should be considered, with the atmosphere as a more efficient distributing agent of the resulting dust. Whatever the 'first cause', siliceous sponges would be a vehicle for concentrating silica in the water-column, to a higher degree than would otherwise be the case. The question remains, how do sponges metabolise such an unlikely material as silica?



Recent research has demonstrated the presence of two enzymes—silica polymerase and silica esterase—working in the metabolic pathway from the supply of silica in sea water to the building of sponge spicules (see Muller 2007).

Going back to the process of flint formation, it should be noted that each stage, from Opal-A to Opal-CT etc tends to be destructive of previous structures. So, don't be surprised if there is no trace of the originating organism—and it may be that the organism was well-decayed before the process began. Which brings me to mention the role of secondary deposition. The decaying organic material can act as a trigger for silica-genesis to begin. Just as phosphates can attract heavy elements such as thorium, uranium etc, so decaying carbon can be a focus for silicon. A flint core alone might indicate a limited supply of silica, while a larger overgrowth of flint will have indicated less limitation.

Fig. 6 shows a cross section through *Porosphaera* preserved in calcite. Very occasionally, the specimens are preserved in silica and showing the whole structure, but that is rare. Given what I have mentioned above, stages in silica genesis often destroy the original structure, so you may well be left with a flint core. But as we do not know for certain of its original structure, we should not give it a genus or species name—it is a flint core. So, are they collectables? I would say yes—you never know of what you may learn

Refs.

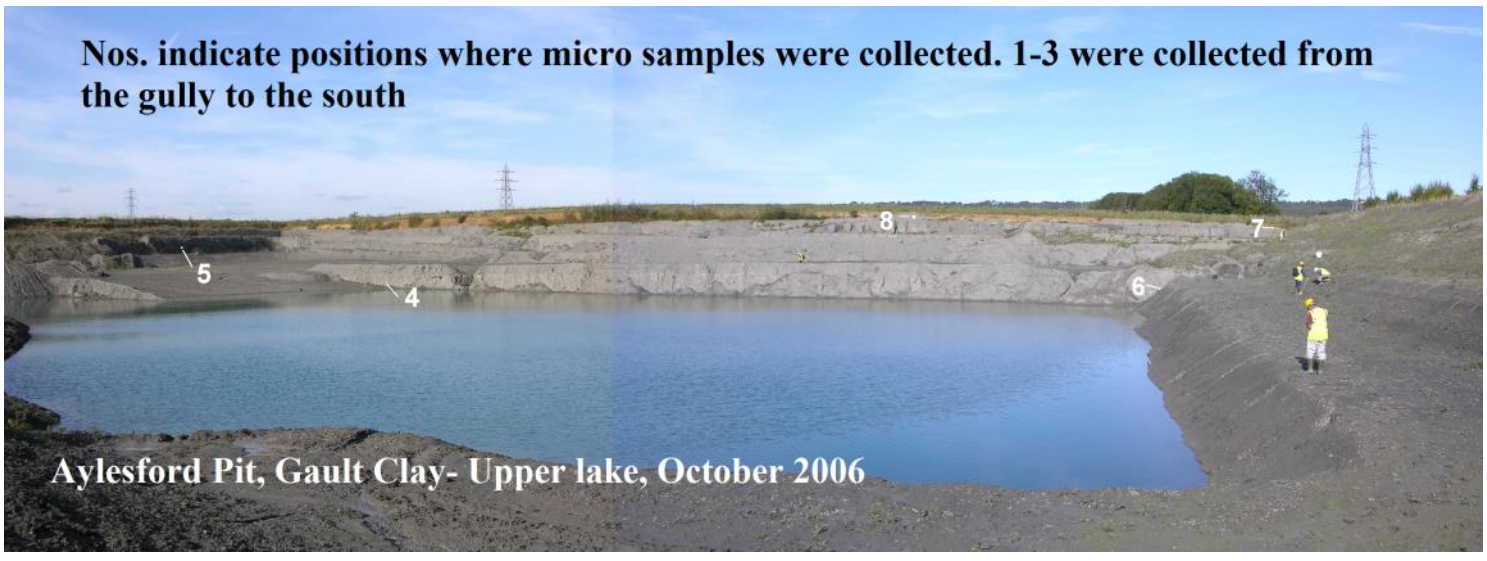
Tucker. M. E. 1981 *Sedimentary Petrology—an introduction to the origin of sedimentary rocks*. Blackwell. Oxford. ISBN 0-632-02961-7

Muller. W. E. G *et al.* 2007 *Poly(Silicate)-metabolizing silicatein in siliceous spicules and silicasomes of demosponges comprise dual-enzymatic activities (silica polymerase and silica esterase*). FEBS Journal 275 (2008) pp362-370

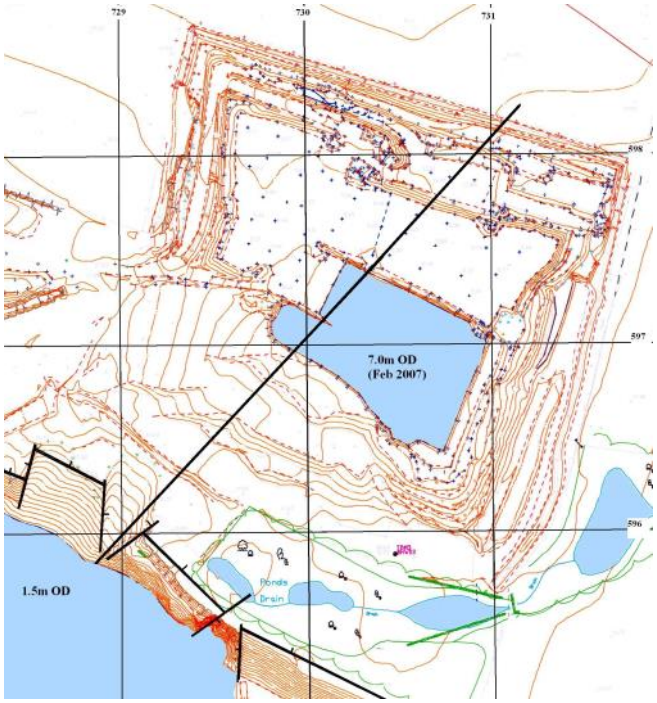
A look at Aylesford 10 years on.

On the problems of surveying and preserving a soft-rock site (with an uncertain degree of faulting)

Nick Baker



The Gault clay site was surveyed by the (then) Kent RIGS team in 2006-07. The work was led by Prof David Ray and Dr Andy Gale. Surveying a working site is always difficult, obviously due to changes caused by the quarry work. However, some useful data was obtained during the visits, although the structure of the geology led to uncertainty in some aspects of the stratigraphy. When visiting the site, one is first confronted by the Lower Greensand (Folkestone Formation), which has been worked (first for glass) since the 1600s. The Gault lies above the sand and to the north. The lower pit is flooded and the water surface was at 1.5m OD in 2006, while, at the time of observation, the Gault was also flooded, with the lake surface at 7m OD (See photo on previous page). In the period of our visits the site was relatively stable and so it was possible to refer specimens and features to the measured log (see next page). In order to try and get a better understanding of what was going on, I also drew sections across the quarry and local area.

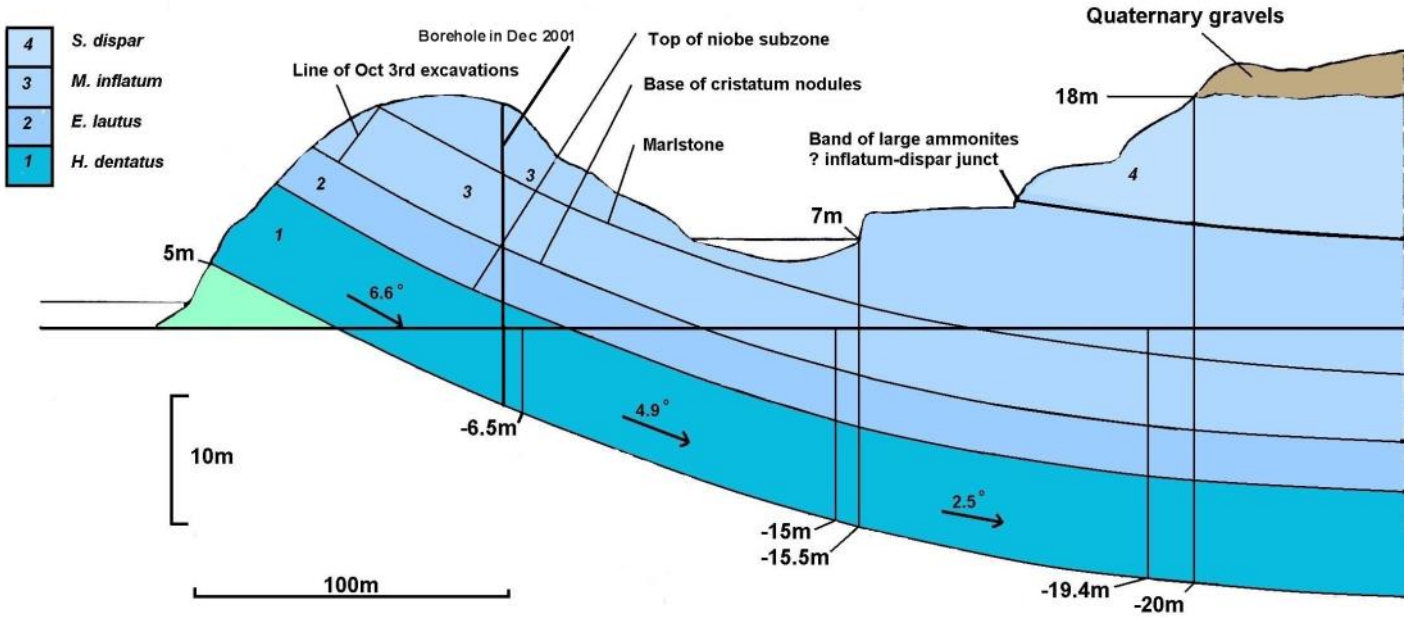


The line of my section passes from TQ729596 to TQ731598 and does not appear to cross major faulting.The largest faults appear to be close to the northern boundary of the lower lake, where several 'block faults' occur, which may be due to the quarrying. The base of the Gault occurs at the SW end of the section at 5m OD. Exposures pass rapidly up through the *dentatus, lautus* and *inflatum* zones. Excavations in the faulted gully on Oct 3rd 2006 began at the base of the *lautus* zone—at the *cristatum* nodule bed, and ended with a marl seam abut 5m above. This passed just below the lake. A band of large ammonites in the north-eastern terraces probably marks the base of the *dispar* zone. 10m above this is a nodule bed at the very top of the exposed section at about 18m OD.

In all, about 38m of the lowest Gault was logged. Using this data and calculating the elevation of the Gault base, it was possible to calculate the angle of dip at various points across the quarry. A dip of close to 7 degrees occurred near the Gault base and slowly decreased to the NE. Close by the faulting, it was possible to see very steep dipping c40 degrees due to fault-drag. It follows that artificially high thicknesses of strata may be detected in vertical drilling in such situations. This situation must be considered when an exploratory drilling was made to the SE of the site—see below

Cross-section of Aylesford Quarry -

Effect of faulting not applied.

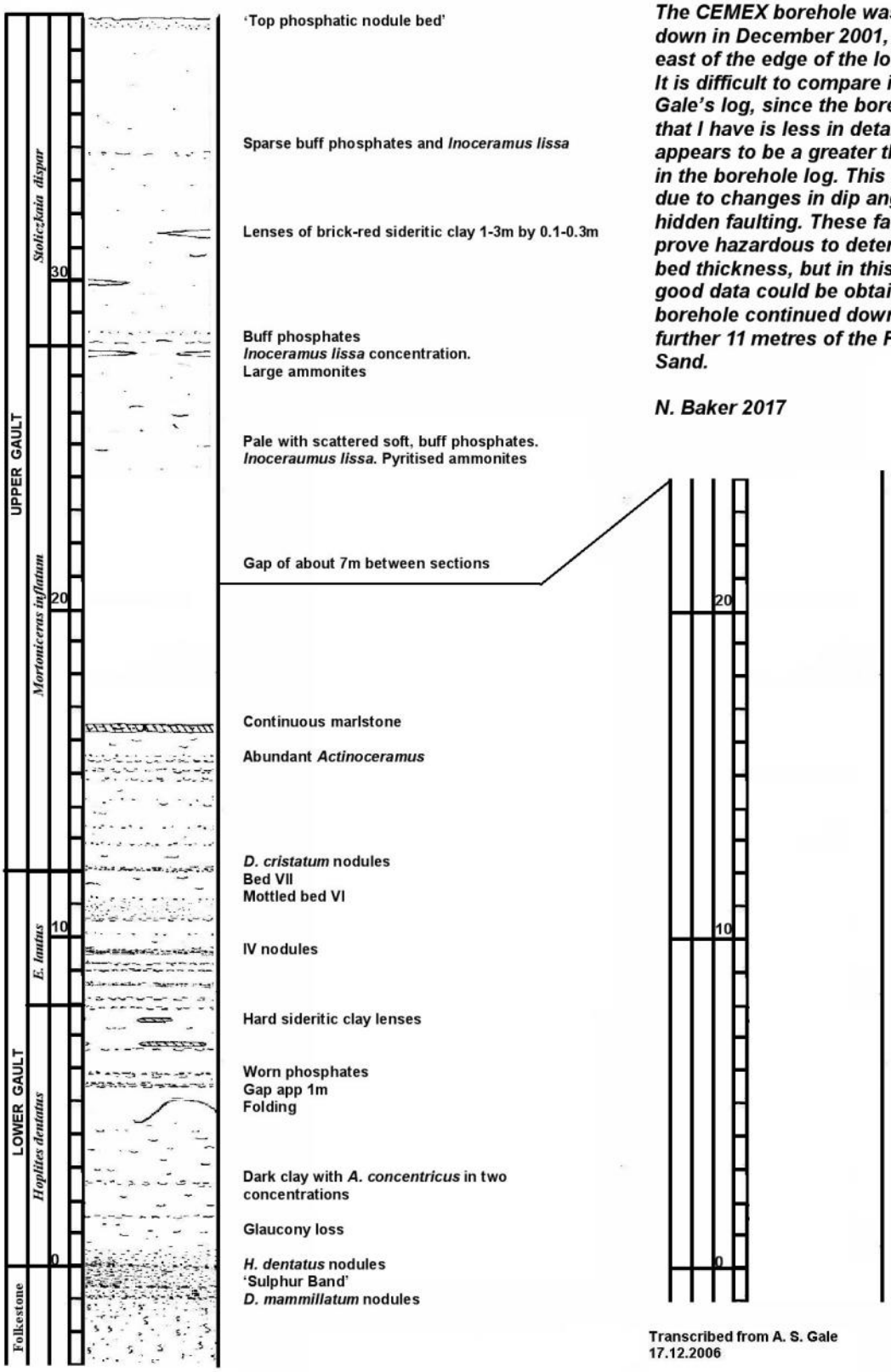


Dip values are calculated and based on the height of the Gault base at intervals of 100m NE of the boundary of the main lake. Thicknesses are based on the log, calculated from the base of the Gault (5m OD), the north side of the upper lake (7m OD) and the junction with the Quaternary gravels (18m OD).

Nick Baker
Feb 23rd 2007

Aylesford Gault

Logs in metres



The CEMEX borehole was put down in December 2001, just north east of the edge of the lower lake. It is difficult to compare it with Dr Gale's log, since the borehole data that I have is less in detail. There appears to be a greater thickness in the borehole log. This might be due to changes in dip angle or hidden faulting. These factors prove hazardous to determining bed thickness, but in this site quite good data could be obtained. The borehole continued down for a further 11 metres of the Folkestone Sand.

N. Baker 2017

Transcribed from A. S. Gale 17.12.2006

N. Baker 1.7.2017

Some observations regarding the Aylesford borehole.

I'm assuming that the change from clay to sand at –6m OD represents the Gault base. The absence of reference to phosphate or glauconite is interesting but I also assume that there is a limit to the information published. The depth of the base is well within the limits I expected, but several questions arise when making comparison with Andy's original section.

1. Is the mottled bed (11m above Gault base (Andy)) the same as that in the borehole (15.5m above Gault base). There is a constant relationship in this difference (0.7). Similarly, the top of Andy's section at 17m is almost on the same position on the outcrop strike as that of the borehole at 24m (0.7).
2. The ratio is interesting. Do we have a steep dip where the borehole is situated? I raise the question of the possibility of 'fault-drag' on the Gault.

It is difficult to come to any real conclusions in absence of any structural knowledge of the geology. At the northern edge of the pit, a level at 38m above the base of the Gault—at 18m OD, thus assumes that the base of the Gault is at 20m below OD. 1500 metres to the NE, at the 'moted farm' at the junction with the Chalk, the elevation is 35m OD. The Cossington borehole reports 60 metres of Gault. Can we assume that the base of the Gault at the 'moted farm' is at 25m below OD. Well, we can if the thickness of the Gault does not change, or that there is no local faulting, or there was no steep faulting in the neighbourhood of the borehole—then, sorry! - no! But if you want to just pay your money and take your chance, then the base of the Gault at the 'moted farm' is 25 metres below OD.

I have collected micro samples from 8 locations in the pit

1. Just above the base of the Gault. A heavily glauconitic sample, with few fossils in the 250-1000 micron range (*dentatus* zone). (20061003 04)
2. One metre above the *D. cristatum* nodules. Heavily fossiliferous – abundant forams and ostracods. (*lautus* zone) (20061003 02)
3. The marlstone, 7m above the *D. cristatum* nodules. Fossils more sparse than 2. (? *inflatum* zone) (20061003 01)
4. Base of low cliff on north side of pond. Results similar to 2 (top of *inflatum* zone?) (20061003 03)
5. Red band on west side of quarry. Fossils sparse – a large amount of ferruginous sand. Some small gastropods. (low *dispar* zone?) (20061012 01)
6. Red clay in large ammonite band NE corner of pond. Moderately fossiliferous. (top of *inflatum* zone?) (20071108 01-02)
7. Top of NE corner of quarry – just below top nodule band. Moderately fossiliferous with teeth and small gastropods (?*dispar* zone) 20060516 02)
   Just west of 7 – same level – but not yet examined. (20071108 04)

A sample was also taken from the Pleistocene buried channel. Sample still being examined – a lot of material derived from the Chalk. It was hoped to get more material from this location but was not accessible in the recent visit – having been buried!

Take a break

Here are some pics of the RIGs team in action

The dug sequence
I hope no fault-drag got in the way…!

The fault

There are two aspects that I must mention before we leave this—Stratigraphy and Palaeontology .

There was a suggestion by Spath (1926, pp. 421-2 ; 1943, p. 738) and Brown (1929) that there is a gap in the Lower Gault succession near Maidstone, involving the greater part of the Lower Gault as developed at Folkestone *{intermedins* to *daviesi* subzones inclusive). This is seen on re-examination of the fossils to be unsound.

The supposed evidence for this gap was obtained from two exposures, the Bearsted Brick and Tile Works Pit, near Bearsted station, and a pit at Eyhorne Street, Hollingbourne, both now obscured. The Eyhorne Street pit was described by Jukes-Browne (1900, p. 85). It showed a marked bed of nodules which according to Jukes-Browne contained ***Inoceramus sulcatus*** Parkinson and was considered to mark the junction of the Lower and Upper Gault ***(cristatum*** Subzone), that horizon being commonly represented by a bed of nodules with ***I. sulcatus.*** Brown (1929, p. 4) stated that the clay immediately underlying the nodule bed belonged to the ***dentatus*** Zone ***(dentatus-spathi*** Subzone of the present classification) having yielded to him a specimen of ***Hoplites dentatus,*** identified by L. F. Spath. These determinations imply that the Lower Gault from ***intermedius*** to ***daviesi*** subzones is missing. A collection of fossils from the Eyhorne Street pit, made by Jukes -Browne's collaborator, W. Hill, is preserved in the Geological Survey and Museum, and has been re-determined. It includes ***Inoceramus concentricus*** Parkinson but no representative of ***I.sulcatus*** and the assemblage of ammonites (in a phosphatic mode of preservation) is that typical of Bed IV of Folkestone, ***i.e.*** the ***subdelaruei*** Subzone. This section does not lie on the boundary of Lower and Upper Gault, but is half-way up in the Lower Gault. This is confirmed by the lithological description of the strata lying between 4 ft 6 in and 5 ft 9 in below the nodule bed, for there is only one horizon in the Gault of south-east England where both fawn-coloured clay and lenticles of " hard stony material of a dull red colour "(clay-ironstone) occur, and that is the ***niobe*** Subzone (Bed III of Folkestone). Brown's record of ***Hoplites dentatus*** from immediately below the nodule bed is anomalous, for this fossil is restricted to the ***dentatus-spathi*** Subzone (Bed I of Folkestone). The specimen on which Brown based this record was acquired by the Geological Survey and Museum in 1944. When received it was labelled ***H.*** cf. ***dentatus.*** It is in fact an early ***Dimorphoplites,*** comparable with ***D. niobe*** Spath. At Folkestone ammonites of this group characterize Bed III and especially the lower line of nodules in Bed IV. The Gault succession in the pit is therefore normal and may be taken to represent the ***niobe*** and ***subdelaruei*** subzones. The lowest 6 ft of clay, from which we have no fossils, may belong to the ***intermedius*** Subzone.

In 1944 the Geological Survey and Museum acquired a collection of ammonites from Bearsted. All bear Spath's determinations and some are labelled by him "Mr. Brown", and it may be surmised that the whole suite is the basis of the faunal list from the Bearsted pit given by Brown at the end of his paper (1929, pp. 5-6). Spath (1926, p. 422, footnote) wrote "Mr. H. J. W. Brown has kindly forwarded to me a fine series of ammonites from this bed". The specimens are now re-determined as follows: ***Douvilleiceras*** aff. ***monile*** (J. Sowerby), ***Beudanticeras newtoni*** Casey, ***Hoplites dentatus*** (J. Sowerby), ***H. dentatus densicostatus*** Spath, ***H. dentatus robustus*** Spath, ***H. dentatus sulcatus*** Seitz, ***H. similis*** Spath, ***H.*** aff. ***paronai*** Spath, ***H.*** aff. ***latesulcatus*** Spath, ***H.*** cf. ***escragnollensis*** Spath, ***H.*** aff. ***rudis*** Parona & Bonarelli, ***H. persulcatus*** Spath, ***H.*** aff. ***persulcatus*** Spath, ***Euhoplites sublautus*** Spath, ***E. ochetonotus*** (Seeley), ***E. proboscideus*** (J. Sowerby), ***E. meandrinus*** Spath, ***E.*** aff. ***lautus*** (J. Sowerby) trans, from ***E. aspasia cantianus*** Spath, ***Anahoplites planus*** (Mantell), ***Dimorphoplites*** aff. ***chloris*** Spath, ***D. sp. nov., D. ? silenus*** Spath, ***Epihoplites trifidus*** (Spath), ***E. compressus*** (Parona & Bonarelli), ***Hysteroceras subbinum*** Spath, ***H. orbignyi*** Spath, ***Diploceras pseudaon*** Spath, ***Hamites maximus*** J. Sowerby and ***H. attenuatus*** J. Sowerby. Except for species of ***Douvilleiceras*** and ***Beudanticeras (mammillatum*** Zone), the ***Hysteroceras (orbignyi*** Subzone) and the ***Hoplites (dentatus-spathi*** Subzone), the ammonites were attributed in Dr. Spath's labels to " Nodule Bed VIII" ***(cristatum*** Subzone) or "probably Nodule Bed VIII" or "about Bed VIII".

There are several specimens in this collection, however, that indicate the presence also of the middle part of the Lower Gault ; for example those labelled by Spath as ' *Euhoplites lautus* var. *duntonensis,'* a Bed VIII type, belong to a form of *Euhoplites* transitional between *E. aspasia cantianus* Spath and *E. lautus* which has never been found anywhere but in the upper line of nodules of Bed IV of Folkestone and its equivalents *(subdelaruei* Subzone). Another form of *Euhoplites* assigned to Bed VIII is now identified as *E. meandrinus* Spath, which at Folkestone ranges from beds II to IV. The *Dimorphoplites sp. nov.* of the revised faunal list also occurs in Bed IV at Folkestone.

It is concluded from this re-study of the fossils from Eyhorne Street and Bearsted that there is no evidence for a large gap in the Lower Gault sequence near Maidstone.[1] That we have from the late, great Raymond Casey.

But what is the situation today? The pit has not been worked for at least two years and one can assume that the Gault exposure is now different. I can say who looks after the pit. I have mentioned this before. This is a photo of the gate two years ago.

Ref
Brown. H. 1929. Notes on the Geology of the Vale of Holmsdale between Maidstone and Lenham. *Proc Croydon Nat Hist & Sci Soc* 10 1-6.

Casey. R. 1950. Field meeting at Wrotham and the Maidstone by-pass. *Proc Geol Assoc* 70 206-9

Spath. L. 1926. On the zones of the Cenomanian and the Upper-most Albian *Proc Geol Assoc* 37 420 -32

Spring round-up

January 18th 2017
The field trip planning meeting for the coming year.

January 25th 2017
Tony gave a talk on his trip to Iceland,

February 1st 2017
The theme was fossil crabs. I have almost none at all. Dave Rayner's collection is very good – many of the specimens from the London Clay, while Gary Woodall had specimens from the Gault Clay.

February 8th 2017
Fossils from Hampshire. I took along some of the items I had from Barton. Some of the other collections were quite impressive.

February 15th 2017
Anne Padfield gave a talk on Fracking.

February 22nd 2017
The theme was Fluorspar. I took along my samples and was the only one who did. So, I started my explanation and then Anne Padfield filled in on a lot of connected aspects – thermal vents to plate techtonics.

March 1st 2017
Alternative collections. Fred had a collection of tropical moths, butterflies and a collection of old vinyl – mostly 45s singles. Dave Rayner had a large collection of model cars – mostly Soviet. Steve Taylor had a collection of twigs, fruiting, budding, last year, which formed the subject of a quiz to determine the species. John Taylor had a collection of antique coins. David Cooper, jugs and cups. Yours Truly – my meteorological collection of cloud photos and weather observations.

March 8th 2017
Ann Barrett gave a talk on part of north-western Australia. The mountain area called Purnululu and The Bungle Bungles.

March 15th 2017
A silent auction had been arranged. The idea is that the folks bring along a load of items. An offer sheet is then attached to each item. The bids are written on the sheet and the one who has offered the most for a particular item, then pays that amount for the item.

March 22nd 2017
The theme was echinoids, and so folks brought along examples from their collections. The meeting went well and there was a lot of good discussion.

March 29th 2017
It was to be a DVD evening, but it took a long time for Tony to get his PC and projector set up – in fact he never did get that far. James and Gary were sat looking at the desk-top screen for almost an hour, with no connection to the projector. Gary seemed to think that there might be a rouge program on Tony's machine. So we all had a good natter, except the trio contemplating the computer. And so the winter term came to an end.

April 26th 2017
I gave an illustrated talk on *Sedimentary Rocks and Fossils in thin section*

May 3rd 2017
I took along 15kg of sedimentary rock samples, that being the theme for the evening.

May 10th 2017
The meeting was on flint implements, of which, Martin Rayner brought along a fine collection.

May 17th 2017
I was not at the meeting, but the theme was Ammonites from the Lower Greensand.

May 24th 2017
The theme was Cornwall, but I did not take any specimens in. Anne Padfield gave a good account of her collection of minerals. Others gave info on rocks and minerals

May 31st 2017
The subject was fossil fish, which Tony gave a commentary. Afterwards, James commented that there was an absence of Cretaceous material. That was mostly my area, but is mostly micro and part of which (Wealden) is a job in progress.

June 7th 2017
The theme was '20 photos on a stick' – Tony, Trevor and John all supplied subjects, which were much appreciated.

June 14th 2017
This was a question and answer session. Tony answered questions on evolution – how and why did flat fish evolve?

June 21st 2017
Ann Barrett gave an illustrated talk on Agates.

June 28th 2017
The theme was Shropshire. Gary Woodall and Tony brought fossil collections

July 5th 2017
End of term party (proposed)

July 12th 2017
A building stones walk in Maidstone, followed by a picnic (proposed)

At this time (July 2nd) I have no information on the autumn program. This should be available on the society website when the program is decided. The postal version of this letter will be delayed until the program can be included.

Nick Baker – July 2nd 2017