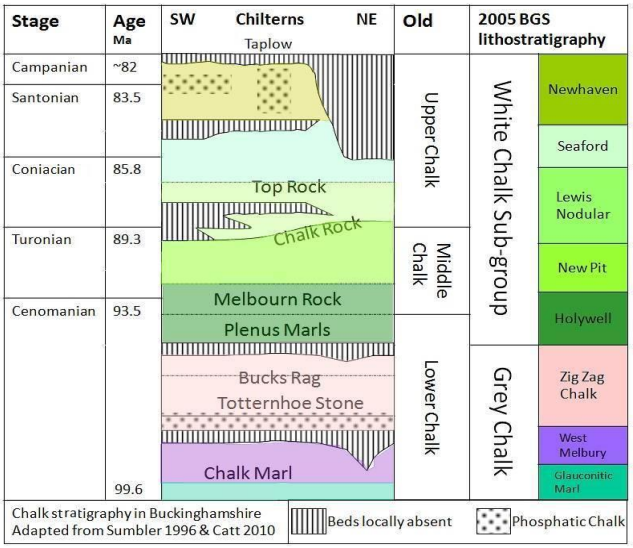
Buckinghamshire Earth Heritage Group

Newsletter No. 24 April 2014

Chalk - backbone of the Chilterns: talk by Dr. Haydon Bailey – Nov 2013

Dr. Hayden Bailey spoke to a well-attended, joint meeting of the BEHG/BAS on Saturday 23rd November, 2013. The subject matter being of great interest to both the archeologists and geologists present. Hayden started by describing the general composition and formation of Chalk; it largely consists of the skeletal remains of single cell algae, often referred to as "coccoliths", which lived during the Cretaceous Period when a shallow ocean covered much of what is now land surface, including large parts of southern England. These organisms are believed to have been similar to modern day algae. Such algae are the most common plant cell in the world and can form huge blooms which are sometimes seen from space. As they died, the accumulation of their remains formed the thick deposits of the Chalk. There are, of course, lots of other fossil remains of sea creatures within the Chalk, witnessed by the many broken shells, fish scales, echinoids and sharks teeth etc.

Traditionally the Chalk has been divided into three sections. The Upper, Middle and Lower Chalk Formations. (Table 1 below. Shows the new terminology introduced by the BGS in 2005). In the Chilterns a large part of the Upper Chalk is missing – some 20 million years of deposit.



As a consultant geologist for the Chiltern Society, Dr. Bailey was heavily involved in the campaign against the proposed High Speed HS2 routes through the Chilterns. The greater part of his talk concerned HS2 issues, which was interesting to many of those present. One of the towns strongly associated with the 'resistance' is Great Missenden so, as fuel to fan the flames, he gathered much evidence from that locality as possible. The end result of his research was a paper entitled 'Concerns arising from the geology and hydrology of the ground underlying the HS2 routes through the Chilterns' (2010) which is available to download from:
www.chilternsociety.org.uk/hs2/dloads/geo_paper_dload.php.

Dr. Bailey's main conclusions were that the HS2 project could potentially damage the Chalk aquifer, cause pollution, risk ground collapse and modify the aesthetic attraction of the Misbourne River and Valley by potentially lowering the water table.

It is interesting to note that there was a similar campaign in the Misbourne Valley when the present railway line was being proposed, in the late 19th century (an extension of the Metropolitan Railway). Large parts of this line go through cuttings in the chalk, especially between Amersham and Missenden, and it is only visible here and there, most prominently near Wendover Dean where it cuts across what was valuable farmland. It now appears that it will have a bedfellow, the new line on a viaduct on the opposite side of the main road. One of the problems with a cutting or a tunnel is where you dump all the spoil, and this is destined to be spread on farmland in three different locations, presumably in mounds. Concerns were raised about runoff from these locations. Of course, we might also ask – what happened to the spoil from the cuttings dug out in the 19th century? Where are the mounds from that period?

Phillip Clapham

Chalk sinkholes in the news

Many members will have seen the recent press coverage given to the recent sink hole which opened up in Walters Ash, near High Wycombe, which swallowed up a car.

The recent wet weather has also resulted in more which have not made it to the media headlines. Elizabeth Smeeton, Clerk to the Conservators, Nettlebed and District Commons Group contacted us on 12th Feb 2014 to inform us of one which has appeared on Nettlebed common. The hole is at least 4 metres in diameter. Many tonnes of earth must have gone down it without trace. Now identified as a Crown Hole caused by the collapse of old mine workings. Please be aware that it is very dangerous if you go to investigate. From the Kiln, walk towards Catslip (The Green on your right), past Gorse Cottage and Walnut Cottage, then enter the woods on the right hand side. Grid reference SU704868.

The narrow funnel-like throat in the bottom of the hole is characteristic of crown hole, an improperly capped underground working. Most naturally occurring sinkholes have a bell-like cross section. Chalk bell pits often called ''Dene holes'' were frequently dug in the 19th century in proximity to lime kilns or brick works. Road transportation was either very poor or too expensive so digging deep working to access Chalk was common practise.

"Dene holes" were often sunk with a vertical shaft and two or three galleries going off at the base.

Map showing location Grid reference SU704868

See Clive Edmonds talk for further background.

http://www.bucksgeology.org.uk/pdf_files/BEHG_Newsletter_May_2009.pdf

Graham Hickman

Mammoth find in a Charity Shop – Mike Palmer & Mick Oates discuss

Question: Had a recent enquiry of a mammoth molar and tusk bought in an Aylesbury charity shop along with what looks like a horse molar and a mystery bone. Thought you might like to have a look. They were apparently donated by a doctor (unknown whether medical or academic) who was 'down-sizing' but know no more than that so don't know if local or not. Also don't know if they were found at one site or separately. The tusk is a 370mm in length and roughly 115mm and 87mm diameter at the end. The molar has around 13 plates across a 200mm length. It is a sizeable tooth but couldn't say whether it is a final tooth. Don't know how easy it is to identify Mammuthus trogontherii, primigenius and Palaeoloxodon from such a molar. The small molar compares well to hores molars in the collection. Can't really say much more than this

The mystery bone looks like it formed part of a socket at one end while it is so flat at the other end that it looks like it might have been cut (by who & when). Any thoughts on id?

Mike Palmer

Answer: The molar looks like normal Mammoth to me. Value would not be very great and a lot would depend upon condition and provenance. The molar is in reasonably good condition. But the tusk has warped and split somewhat, but there's no indication of origin. As to value…you can't just walk into a store and sell such an item and to buy one might cost between £50 and £500. I have purchased one or two as trophies for work colleagues some years ago for nearer £25, from an acquaintance, so that will be nearer the wholesale value.

The problem with these items is that the tusks and teeth split when they dry out. I suspect that most movement of the ivory is now complete and, as long as the items are kept in a stable environment, without excessive change in temp-

-erature or humidity, they should not move any more. But, to be on the safe side, PVA (wood glue) can be used to patch up any obvious cracks, although it should differ a little from that sold as glue or Unibond, by having a much higher plasticiser content (20%) and a neutral pH. If they were fresh, I'd advise a couple of months in a PVA suspension, then drying out over half a year in the loft, inside a plastic bag, with regular reapplications of PVA to top up any minor fractures developing.

The website link below contains lots of useful information about care and distinguishing mammoth from elephant ivory.
http://www.mammothivory.org/Mammoth%20Ivory%20Care.htm

Ivory from mammoths is completely free from any trading restriction. After all, its exploitation can hardly be affecting the mammoth population, unlike with elephant poaching. Even antique elephant ivory is looked on more favourably than the new material. You wouldn't expect the Ivory Police to seize your Edwardian piano.

The Horse tooth also is more likely to be modern because it is very large and there is much more potential for preservation of more recent livestock than stuff from antiquity. But I'd eat my words if it could be demonstrated to have come from some Pleistocene gravel deposit.

One good method of discriminating between "modern" and fossil – sub-fossil bones is to touch the surface of the bone to the lip. If it seems to stick, it's lost all its collagen and is almost certainly ice age rather than historical.

Mick Oates

'Face lift for Thornborough' – Julie Carey reports on Coombs Quarry

The popular press seems full of reference to facelifts. Usually a movie star who feels the need to be ever youthful, but at Coombs Quarry it's something slightly different – rejuvenated rock faces. Coombs Quarry is located near Thornborough Buckinghamshire. Owned and managed by Buckinghamshire County Council this site was converted into a study and conservation area in the early 1990's; it is both a Local Nature Reserve and Local Geology Site.

The geological interest at The Coombs is focused around a series of faces which show off the underlying geology. Historically limestone was extracted for both local building stone and for lime making, evidenced by the remains of two old lime kilns hidden in an unused corner. Local quarrying must have been a common practice with many of the local villages utilising the rich cream coloured stone in their older buildings and walls.

In order to keep the geological interest visible bi-annual clean-ups have been undertaken by the dedicated band of Bucks Earth Heritage Group volunteers. However, recently some of the taller exposures needed more serious intervention. With time the rock faces erode back and the interbedded limestone and marl layers become unstable and top heavy. In addition each time the faces are cut back the quarry edge gets closer to the boundary fence leaving little room for manoeuvre.

Photo above: main face before the make-over.

Following discussion with various local experts, a plan was born to undertake a series of linked conservation and site improvement works utilizing the heavy machinery and excavator driven by our trusted driver George, who has worked with us for many years and is very familiar with the whims of both ecologists and geologists.

The adjacent agricultural tenant also kindly gave up part of his field allowing us to push back the quarry fenceline by some 30m providing better access from the top for management activities.

Photo above: Autumn 2013 after the make-up.

The main face now has large step like platforms in the main exposures, resembling the face of an Egyptian pyramid. Large blocks that were removed have been arranged on the quarry floor to form a new rockery habitat

Visitors can now spend happy hours peering at the newly visible rocks in the main exposures and also the rockery face in search of a nice fossil, wave ripples or maybe even the wildlife taking advantage of this new habitat. But beware they might not be the right way up! Some "take away" piles of smaller rocks have been left for those wanting to take specimens without causing damage to the main exposures. The carefully landscaped brash from the works will quickly regenerate with limestone loving wildflowers, which no doubt will be much enjoyed by butterflies, bees, and visitors alike.

Julia Carey

Details on the Coombs Quarry can be found at
www.bucksgeology.org.uk/coombs_quarry.html

Out for a fossil, back with a bottle – an article by *Nicky Muizelaar*

It may come as no surprise but the investigative skills of asking the questions; what, where, when, how and why used by geologists often come in handy applied elsewhere.

During the pleasant March weather my husband and I went for a walk along the Ridgeway National Trail between the M40 and Chinnor. We parked at the Aston Rowant Nature Reserve and walked down to the Ridgeway and followed it to just beyond the Chinnor Chalk Pits. Since this part of the route runs along the Grey Chalk I was searching for any exposures hoping to find fossils. We saw plenty of kites, buzzards, fieldfares, redwings, long tailed tits, snowdrops but sadly no fossils, apart from a broken bivalve found in the roots of an upturned tree.

Photo above: Cerulean blue of the flooded south-east Chinnor Pit, visible during winter months.

Then, there in the mud something caught my eye. I picked up a dirt encrusted bottle with the hint of a lovely iridescent surface showing underneath. (**Photo left**)

I stuck it in my backpack thinking that it would be interesting to clean up and investigate further when I got home.

There was no end of advice from internet forums and websites about old bottles and cleaning them. This is where, as a geologist, my understanding of the Mohs scale of hardness and some critical thinking came in useful.

Most sources agreed that washing soda was best to clean the exterior but would not remove any 'decomposition crust' that can form over bottles with a high soda and low lime content having been buried in the ground for a long time, especially in alkaline Chalk soil conditions. Although some bottle collectors prefer to polish off this crust, also known 'sick glass', it was this finish that gave the pretty iridescence that first caught my eye and which, for me, was integral to its history. Having cleaned the exterior (photo below) I examined the bottle for diagnostic features such as mold seams, pontil scars (for blown glass), air venting marks and embossing. Piecing all the evidence together I deduced the following;

WHAT - the bottle shape makes it most likely a medicinal or a sauce bottle.

HOW – the bottle was mouth-blown into a two piece split mold with an 'applied finish' (refers to the extra piece of glass applied to the top and tooled to a finish).

WHEN – most likely made between 1870 and 1890.

WHERE - it was made is uncertain but perhaps it was casually discarded by a traveller on the Ridgeway trail.

WHY – what exactly was in the bottle, is still to be determined. The inside had a viscous sticky black residue.

Glass is mostly silicon dioxide (SiO_2) but the addition of its other constituents (sodium oxide, lime and several other minor additives) lower its hardness from pure quartz at 7 to 5.5-6.5. Taking this into account I mixed a solution of washing soda liquid and copper 'shot' to clean the inside of the bottle without risking abrasive properties of a gravel mixture which would have approached the same hardness as the glass itself.

Treasure comes out of the ground in many forms - fossils, beautiful rocks and their constituent minerals. Call me a romantic, but I rather like being the custodian of an object that was born of the ground; discarded back into the ground only to be retrieved, wondered about, and placed into service once again.

Nicky Muizelaar

2014 Future Programme –

Further trips and talks will be scheduled as the year progresses. Please check the BEHG website or email the organisers before any event, for the latest update.

Sunday May 11th 2014, 10:30am-2:00pm, Ivinghoe Hills. Meet 10.30am in NT Car Park. A walk to the Ivinghoe Hills, Incombe Hole and then down into the historic Ivinghoe village and windmill (possibly watermill too). Lunch in the village tea rooms before village walk c. 12.15. For details or to book a place contact Mike Palmer (email: mpalmer@buckscc.gov.uk or 01296 624519 office hours)

Saturday May 24th 2014, 10:30am-2:00pm, AGM followed by a rock & fossil id session in the morning and a geological walk around Whiteleaf after lunch.
For AGM meet at Buckinghamshire County Museum Resource Centre, Rowborough Road (off Tring Road/Upper Icknield Way), Halton, HP22 5PL.
11am-12noon Rock and Fossil id session. 12-1pm lunch. 1pm-2pm Whiteleaf Geology Walk. For further information contact Mike Palmer 01296 624519 (office hours) or mpalmer@buckscc.gov.uk

Saturday July 5th 2014, 10:00am-2:00pm, Coombs Quarry: Coombs, nr. Buckingham. Leader Dr Jill Eyers. Come and see the new layout of the quarry and recently exposed strata. This event has been organised to collect some of the soft marl layers for wet sieving, followed by microscope investigation at a later indoor meeting. Fossils found will be put into the Museum collections (best ones) and also for the 'show and tell' collection which will be used for group talks. No need to book just turn up at 10am prompt and park in the BCC yard at the shed.

Wednesday July 30th, 11:00am -3.30pm, Matthews Brick Works, Chalfont. The tour of this facility has been arranged on a week day while it is operational. The tour takes around 1.5 hrs. Maximum group size - they can accommodate up to 20 people. To book a place or for more details contact Nicky Muizelaar (email: nicky.muizelaar@virginmedia.com)

Saturday August 30th, 10:00am, Pitstone droving & geological Walk. The walk will be along the top of the working quarry and may include Aldbury and Ashridge, exact route to be decided.
To book a place contact Phillip Clapham (email: carolflip@talktalk.net)

Membership

A thank you to those that have already renewed their subscriptions for this year, 2014 and a reminder to those that have yet to renew to forward on their membership fee as soon as possible please to Julia.

Annual membership runs from 1st January. Individual membership for the 2014 calendar year is **£7.50** and family membership is **£12**.

A copy of the membership form (Page 9) is available on our website:
www.bucksgeology.org.uk/pdf_files/BEHGMembershipForm2013.pdf

If you would like to join please complete and send the application form together with payment to:

Membership Secretary, Julia Carey, c/o BMERC. Place Service 9th Floor, County Hall, Aylesbury. Bucks. HP20 1UY

email: jcarey@buckscc.gov.uk

Alternatively, you can pay your subscription direct to the ***BEHG*** account at :
Lloyds TSB (White Hart Street, High Wycombe)
Sort code: 30-94-28 Account no. 00744003

Confirmation of receipt will either be by email or by post. The BEHG welcomes all new members.

The Buckinghamshire Earth Heritage Group aims to record, conserve and promote the geology of Buckinghamshire and Milton Keynes.

Website: *www.bucksgeology.org.uk*

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