



# CHARNIA

Newsletter of the

## Geology Section

of the Leicester Literary & Philosophical Society

[www.charnia.org](http://www.charnia.org)

JANUARY 2017

The Editor writes

## NOMINATIONS for SECTION C COMMITTEE 2017-18

Will anyone step forward?

This question is worrying the present committee, as it has, increasingly, for two years now. Apologies if this gives you a moment of *déjà vu* (see *Charnia* January, 2016).

The sustainability and vitality of the Section are at risk while the same few people are put in the position of having to continue in post year after year. However much the present committee enjoy running the Section, it is **your** Section C and the constitution says it should be run by its members. *As things stand it's being run by people who were on the committee at the end of the last century.*

Don't be shy – help bring new life to Section C.

Nominations will soon be open – please contact Mark or Roger if you would like to be involved.

Mark Evans: 0116 225 4904 [mark.evans@leicester.gov.uk](mailto:mark.evans@leicester.gov.uk)

Roger Latham: 01509 856562 [rogerlatham@lineone.net](mailto:rogerlatham@lineone.net)

THANKS



**COVER:** Bright Angel Trail, Grand Canyon, Arizona, USA.

The Section's Life President, Trevor Ford, spent several summers at the Grand Canyon between 1965 and 1972, doing fieldwork and research - and being a guide-lecturer on raft trips down the Colorado River rapids. See **p. 11**

**Photo:** John Martin

**WITH GEOLOGY IN MIND:  
OUT AND ABOUT IN LEICESTERSHIRE AND RUTLAND 3**

Roy Clements

**More Stones: Rearsby and Gaddesby  
... in the footsteps of John Wesley**



This particular jaunt took place in September 2015, with a brief re-visit in October 2016 – how time flies! We shall be concentrating on two, free-standing large boulders, probable glacial erratics, respectively in the villages of Rearsby and Gaddesby to the north and east of Leicester. The two boulders have been previously briefly mentioned in an article in *Charnia* by Helen Boynton in 2011. They are both also referred to in that interesting on-line stimulant to the enquiring geologist's mind – [www.megalithic.co.uk/](http://www.megalithic.co.uk/) the *Megalithic Portal* and *Megalith Map* – where they are described as menhirs (tall standing stones) – probably incorrectly, in that neither of them is 'tall', nor 'standing' in the normal sense!



**Fig. 1a** The Rearsby 'Wesley Stone'

The village of Rearsby is now bypassed by the main Leicester to Melton Mowbray road, and is easy to miss. The so-called 'Wesley Stone' lies at the 'back' of the village at the junction of Brookside and Mill Road, on a small grassy area by the footbridge and ford crossing of Rearsby Brook (NGR: SK64961452). The boulder (figure 1a and b) is quite large (figure 2) with a maximum dimension of just over a metre. The boulder's supposed association with the 'elevated ministry'



Fig. 1b The Rearsby 'Wesley Stone'

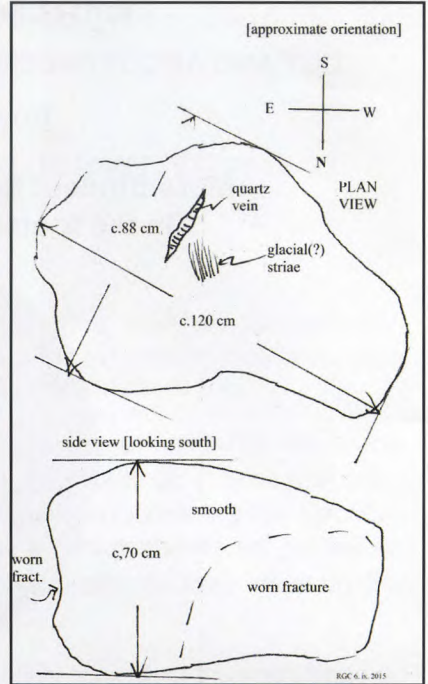


Fig. 2 Field sketches of the Rearsby 'Wesley Stone'

of the early Methodist evangelist, John Wesley, in 1753, is conveniently recorded on a pegged metal label (figure 3). The boulder has a smoothed, irregular, rounded upper surface (perhaps an ancient weathered surface)(figure 1b), with more planar 'worn' looking fracture surfaces forming the sides (figure 1a). The precise lithology is hard to determine (and sampling is clearly not to be countenanced), but the rock is quite massive with some signs of tectonic foliation (see figure 4 - possibly also some weak bedding foliation), and seems to consist of massive, fine-grained (?) bluish-green (chloritic) rock of low greenschist facies. There are quartz veins, including a prominent weathered out lensoid tension gash (figure 5). All this is consistent with an original source for the boulder in the Charnian intermediate volcanoclastic rock sequence of Charnwood Forest. On the upper surface of the boulder, there is a small area of parallel striations (see figure 6) – interpreted as glacial striae. All-in-all, this is consistent with the boulder having



Fig. 3 The label to the Rearsby 'Wesley Stone' recording John Wesley's use of the boulder in 1753

the boulder having



**Fig. 4** Weak foliation in the Rearsby 'Wesley Stone'



**Fig. 5** Quartz-filled tension gash in the Rearsby 'Wesley Stone'

been transported as a large glacial erratic by the ice sheet that deposited the Thrussington Till Member (Anglian – c.300 Ka ago). According to the BGS map of the area, the Thrussington Till is prominent among the varied deposits that underlie Rearsby.



**Fig. 6** Supposed glacial striae on the Rearsby 'Wesley Stone'

Before moving on, it is worth noting that on the other side of the stream, there is a very fine tile-topped wall around the yard to Manor Farm (figure 7). Much of the wall is of red brick construction, but there are large, darker patches which are made of original 'cob' or 'mud walling'.



**Fig. 7** Tile-capped wall with 'mud-walling' stretches, Home Farm, Rearsby

Crossing the Brook and following the track northwards it is easy to get a close view of the mud walling material. Its colour is consistent with it having been derived (originally) from the Thrussington Till, although a quick examination of the clasts in the 'mud' show an admixture of materials, including sub-Recent helicid snails. The layers of straw that were originally used to bind the 'mud' can readily be made out (fig. 8).

When I first visited the site, I



Fig. 8 Detail of 'mud-walling', Home Farm, Rearsby



Fig. 9 Slate slab, behind Home Farm, Rearsby

followed this track (and wall) around the back of the farmyard (as if heading for the convent), and found a large flat slab (c.1.1 m x 0.95 m) of blue-grey rough 'slate'(figure 9) (NGR: SK64971463). It had some slickensided

surfaces. The 'freshness' of the surfaces suggested that, in contrast to the Wesley Stone, it had been brought here by man – presumably from the Swithland Slate of Charnwood (observer beware!).

The nearby village of Gaddesby has an air of being much more 'out in the sticks' – and none the worse for that! The boulder of interest here is at the corner of Chapel Lane and Cross Street (NGR: SK68691315) but, unfortunately is largely hidden under a hedge (figure 10). This boulder is again associated with the preaching of John Wesley. There is no documentation of this at the site, and the association may just be anecdotal (further research may be rewarding), but a very helpful local



Fig. 10 Basaltic erratic, Gaddesby



Fig. 11 Detail of Gaddesby erratic

resident who lives on the Lane was in no doubt that it was true. The boulder is quite large, but because of its position under the hedge the following dimensions can be regarded as little better than estimates: c.1.4 – 1.5 m long; c. 0.55m high; c. 0.70+ m wide. The boulder is a massive, black, fine-grained rock – very basalt-

like (figure 11 – again no sampling is to be countenanced!), and has worn-looking, sub-rounded surfaces. The BGS 1:50,000 geological map shows the immediate substrate to the locality to be Thrussington Till Member, but the Oadby Till Member (later Anglian glacial drift) occurs in broad spreads just 100 m or so to the north. I am not aware of any basaltic/fine-grained doleritic rock quite like this from the Charnwood Forest area, and if, as I suspect, this is another glacial erratic, its source must be much further distant, presumably to the north.

As a postscript, 2016 was such a year as to suggest to my wife and I a repeat of the honeymoon we had had in Swanage (Isle of Purbeck, Dorset) ... some time ago. What were we to find, right across the road from our comfortable hotel, nothing but a carved stone memorial to ... guess who?! (figure 12).



Fig. 12 Memorial to John Wesley's 1774 and 1787 stays, High Street, Swanage, Dorset

**Reference:**

Boynton, Helen, 2011: On the trail of large glacial erratics in and near Leicestershire. *Charnia*, May 2011, 8pp.

## TRIP REPORT: OLD CLIFFE HILL QUARRY

Helen Boynton

Recent *Charnia* articles have mentioned the difficulty of accessing Old Cliffe Hill Quarry to visit the location of the important exposures of fossiliferous Precambrian rocks. As far as I know, the only recent visits by Charnian biota specialists and professionals have been the one arranged by the British Geological Survey (BGS) in 2009, when bedding plane moulds were made and collected – see *Charnia* September 2016 – in June 2016 by members of the Russell Society, and by Aron Bowers in October 2016.

So, in what might well be a final productive research opportunity, the *Charnia* Research Group (CRG), with the welcome support of quarry manager Paul Campion, made a visit on October 22<sup>nd</sup> 2016. They were transported into the quarry by Land Rover, then spent several hours examining the site of the previous discoveries (from a distance – this quarry wall is not safe for unprotected humans) and examining loose material in the surrounding area of the quarry floor.



Aron Bowers had found four small 'charniodiscus' discs on his visit, and the CRG/BGS group were able to collect a few possibly fossiliferous



fragments this time, but the trip confirmed my previous expectation that quarry operations have removed or obscured the bedding planes on which the important 2009 discoveries had been made.

Two of the specimens collected in 2009 by Ben Bland, showing (top) various fragmentary impressions (fronds?) and 'microbial matting'; and (bottom) 'microbial matting' overlain by the parallel lines of tectonic structures



We do know that at least four boreholes have been drilled in the quarry and that the cores from two of them are now lodged at BGS; they will be studied in due course, while Mike Howe is now following up on the locations of the others.

Thanks to Paul Campion for permitting access on this occasion, and to Ben Bland and Mike Howe for providing the photographs.

## HOW I BECAME A GEOLOGIST

T.D. Ford

I was born in Westcliffe-on-Sea, Essex, but my father's job moved the family to Sheffield when I was 6 months old and I was brought up there. When I was fourteen two houses were built on waste land adjacent to our home. One was



TDF as a schoolboy

occupied by Freddie Harrison, and, when World War II broke out, he and his brother Harold were offered the Speedwell Cavern as Arthur Ollerenshaw, its proprietor, did not want to run both that and the Blue John Cavern owing to shortage of staff. Both Freddie and Harold had sons of about my age, and we played together. During the war years, I used to cycle out to Castleton (13 miles each way), and at weekends I took to guiding tourists through the Speedwell. About this time a local caver, Dick Howes, persuaded Harold to let him do a resurvey, and I went with him to hold the other end of the tape measure! I took to a bit of exploring on my own and found the crawl leading to what we later found was part of Pilkington's Cavern (described by Pilkington in 1789; see also Shaw 1983).

TDF with Peter Harrison and Cyril Adamson



I left school in 1940 and was employed as a temporary wartime (and almost unpaid) bank clerk for 3 years until call-up into the RAF in June 1944. They soon decided that I was of no use owing to colour-blindness. I was transferred to the Royal Navy, and did my basic training as a Stores Assistant at Butlins, Skegness. I was shipped out to Ceylon (Sri Lanka) and posted to the corvette HMS Linaria, where I was responsible for victualling ninety men. As we cruised along the Burma Coast we were without depth-charges and their storage racks were filled with sacks of potatoes – so if the Japs appeared we could pelt them with spuds! In July 1945, I was sent to join a Naval Force being assembled at Deolali (the origin of “to go Doolally”), about one hundred miles inland from Bombay (Mumbai). We were allegedly being trained for the invasion of Malaya – but then atom bombs were dropped on Hiroshima and Nagasaki and the war came to a sudden end, and it became a reoccupation. I was shipped via Port Dickson to Singapore, and eventually spent nine months in Hong Kong. I was sent home (seven hundred of us in the hangar of an aircraft carrier) and demobilised in December 1946.

I did not want to go back to the bank, and looked for a job connected with caving – unsuccessfully! Someone suggested that geology was the next best thing, and I became one of the three honours students at Sheffield University – under Prof. Shotton for two years and then under Prof. Leslie Moore. On my graduation, Prof. Moore got me a grant to do a PhD (on the Ingleton Coalfield), and that started my



TDF - the young academic!



TDF with Mac Whittaker at the University College of Leicester

geological career. Two years later I was appointed Assistant Lecturer at the infant University College of Leicester – where I stayed for 38 years. My involvement with the discovery of *Charnia* indirectly took me to the Grand Canyon where Precambrian fossils had been found. I also made visits to the Flinders Range in Australia, to Newfoundland, and to the Rocky Mountains, all of which have yielded Precambrian fossils.

#### REFERENCES:

**Pilkington, James**, 1789: *A view of the present state of Derbyshire with an account of its most remarkable antiquities etc.* J. Drewry, Derby, 2 Vols (494 and 464 pp).

**Shaw, R.P.**, 1983: Pilkington's Cavern, Castleton. *Bull. Peak District Mines Historical Society*, 8(5), 296-300.

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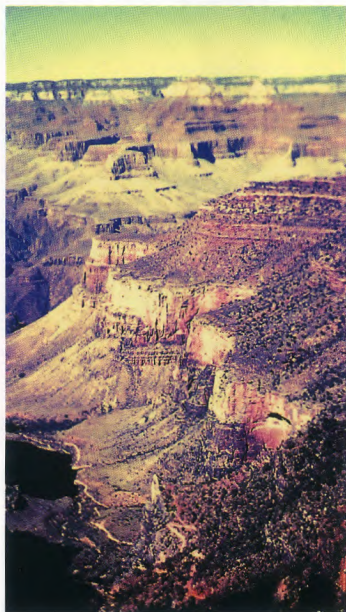
### Presidential Pearls 3

#### FROM CHARNWOOD FOREST TO THE GRAND CANYON

T.D. Ford

The Precambrian fossil *Charnia masoni* was found by Roger Mason and school friends during rock climbing in 1957. I formally named and described it in the Proceedings of the Yorkshire Geological Society in 1958.

A few years later, in late 1964, the University introduced a system of study leave (half sabbaticals), and Prof. Sylvester-Bradley saw the possibilities for geologists to “do something useful” free of all other academic commitments. My name came out of the hat first (one of the few times I have won a raffle) – and I was told I had the summer off in 1965. I chose to follow up the then skimpy records of Precambrian fossils in America. By chance, Dan Merriam from Kansas University was visiting Leicester, and he fixed it for me to spend six months based in Kansas. I raised a travel grant, and my wife, two daughters and I spent a happy time in Kansas. I bought an old car and we travelled far and wide including a visit to the Grand Canyon. There I met two local geologists, Eddie McKee and Bill Breed, and was invited back in 1966 to try to locate Walcott's locality for Precambrian ‘brachiopods’ found in the 1880s. Bill Breed and I were successful in finding *Chuarina* – not a brachiopod, but mega-acritarchs (primitive giant algal cysts). This led to further visits to the Grand Canyon – in 1969 and 1972 – as a result of which I



was able to map part of the eastern Grand Canyon and to recognise not only *Chuar* but extensive stromatolite horizons (= concretionary algal limestones). At that date, few isotope ages were available, but it turned out that these younger Precambrian rocks in the Grand Canyon were much older, at *circa* 800 million years, than the Charnian at *circa* 500-600 million years.

I partly financed all this by doing a bit of teaching at Northern Arizona University in



Flagstaff, and later, at Fort Lewis College in Durango, Colorado. An interesting spin-off was being engaged as a guide-lecturer in four raft trips through the Grand Canyon. Each rafting trip took about ten days, and with rapids every one and a half miles or so, was quite exciting. It also involved camping on riverside beaches. The geology was impressive with rocks ranging from early Precambrian gneisses,

through the younger Precambrian sediments, up to the Permian rocks of the Canyon rim.

After the 1969 trip, we came home the long way round via Hawaii, Fiji, New Zealand and Australia. The last gave me the opportunity to visit the Flinders Range, north of Adelaide, where *Charnia*-type fossils had been found. We called at Mauritius and Nairobi *en route* to London.

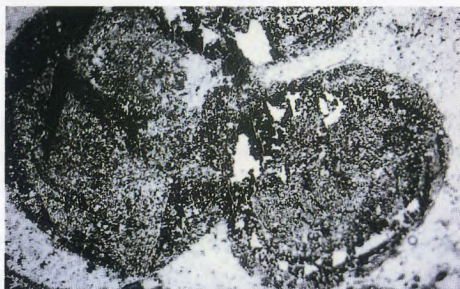
Other trips took me to Mistaken Point in Newfoundland, with its masses of Precambrian fossils; to a locality near Banff in the Canadian Rocky Mountains; and to southern Sweden where the late Gonzalo Vidal of Uppsala University had found Precambrian acritarchs. So my chance involvement with Roger Mason took me round the World.

#### Reference:

**Ford, T.D., and Breed, W.J., 1973:** The problematical Precambrian fossil *Chuar*. *Palaeontology*, 16(3), 535-556.



*Chuar* *circularis* Walcott 1899 – cluster of carbonaceous, 2-3 mm diameter impressions. Chuar Group, Late Precambrian, Grand Canyon



*Chuar* *circularis* Walcott 1899 – peel of 2-3mm diameter carbonaceous discs representing originally spherical bodies. Chuar Group, Late Precambrian, Grand Canyon

# ABSTRACT OF WINTER PROGRAMME TALK

Wednesday November 30, 2016

## Fossil brains from the Cambrian Chengjiang biota

Xiaoya Ma<sup>1,2</sup>

(1) Department of Earth Sciences, The Natural History Museum, Cromwell Road, London SW7 5BD, UK. [x.ma@nhm.ac.uk] [g.edgecombe@nhm.ac.uk]

(2) Yunnan Key Laboratory for Palaeobiology, Yunnan University, Kunming 650091, China.

Comparative studies of nervous systems and sensory organs are fundamental for understanding the evolutionary relationships between major animal groups and their ecological adaptation throughout evolutionary history. Exceptionally preserved

Cambrian panarthropod fossils provide a rich and underexploited source of data pertaining to neural and sensory organization during the early stages of their radiation.



*Fuxianhuia protensa* from the Chengjiang Lagerstätte

© *Nature* 490 (October 2012)

Recent reports of the brain and other neural structures of Cambrian panarthropods demonstrate that these ancient animals had acquired complex central nervous systems (CNS) and sensory organs by 517 million years ago and that the two main configurations of the brain and eyes observed in extant arthropods (Mandibulata and Chelicerata) had already evolved. The neural structures identified in a Cambrian stem-euarthropod anomalocaridid provide direct evidence for the segmental affinity of its frontal appendages, shedding light on the origin of the euarthropod CNS. However, scarcity

of fossilized neural tissue has meant that most studies to date have been based on single specimens, hindering tests of the fidelity of those structures and understanding the diagenetic processes that led to their exceptional preservation. Geochemical analyses provide crucial insight into neural tissue preservation, revealing that the neural tissue was initially preserved as carbonaceous film and subsequently pyritized. This mode of preservation is consistent with the taphonomic pathways of gross anatomy, indicating that no special mode is required for the fossilization of labile neural tissue. Preliminary decay experiments also support the preservation potential of neural structures and their morphological interpretation after compression.

## Winter Programme, 2016-2017

All held at 7.30pm in Lecture Theatre 3, Ken Edwards Building, on the main University of Leicester campus, except where stated. Refreshments served from 7.00pm.

Details: Acting Chairman Mark Evans, [mark.evans@leicester.gov.uk](mailto:mark.evans@leicester.gov.uk), 0116 454 0231

**Wednesday January 18<sup>th</sup>** Note: Lecture Theatre 2, Ken Edwards Building

Dr Alex Liu (University of Cambridge). **Decoding the fossil record of early animal evolution.**

**Wednesday February 1<sup>st</sup>**

Dr Gawen Jenkin (University of Leicester). **The mine of the future: Can we make metal extraction from ores “green”?**

**Wednesday February 15<sup>th</sup>**

Members' Evening, New Walk Museum, Leicester.

**Wednesday March 1<sup>st</sup>**

Dr Erwan Le Ber (University of Leicester). **High impact drilling: Chicxulub and its peak ring.**

**Saturday March 11<sup>th</sup>**

Annual Saturday Seminar, University of Leicester.

**Geology in Space.**

Details to follow.

**Wednesday March 15<sup>th</sup>**

Prof Jane Evans (BGS), **Richard III: analysing the skeleton of a King.**

**Wednesday March 29<sup>th</sup>**

Annual General Meeting. Details to follow.

# Officers and Committee 2016 - 2017

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