

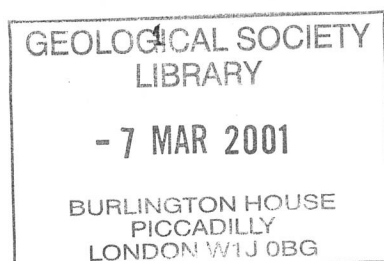
No. 13.....February 2001

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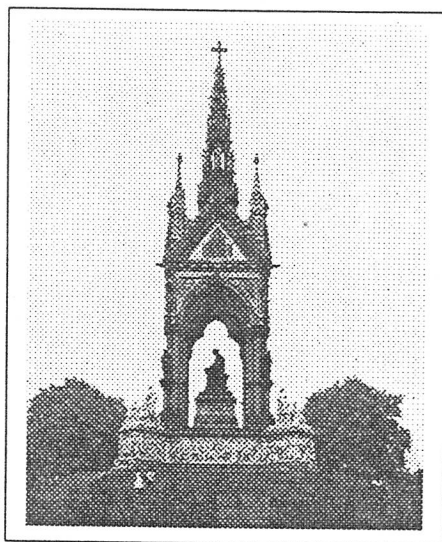
150th Anniversary of the Geological Museum, London

**planned to include a tour of the museum, a 'field trip' to the Albert
Memorial and a suitable toast!**

On Monday, 12 May 1851, the Prince Consort, Prince Albert, opened the Museum of Practical Geology in Jermyn Street, Piccadilly, before a crowd drawn from the science's elite. Murchison, De la Beche, and others who had pioneered this new science, saw the museum as marking the end of an age of great personal achievement; it was a celebration but also an immortalisation of an heroic age. The museum had briefly existed in an earlier form under a different government department, as the Museum of Economic Geology, though its remit then was entirely economic and its premises and arrangement were a source of some embarrassment. The new museum, which was a wing of the Geological Survey, was very fine, but not, as its supporters hoped, immortal. Later, with the building in a state of potential collapse, the collections were rescued and rehoused in a new building in Exhibition Road, South Kensington. There they stayed until the Geological Museum passed from the Survey to the Natural History Museum in the mid 1980s. The Survey's collections were then removed from London to a relatively isolated spot in Nottinghamshire; the Survey's great museum was all but lost. However, reclassified as part the Natural History Museum, the building remained, and still remains, the largest exhibition space for the earth sciences in Britain. The Geological Museum lives on, though in very different form! Eclipsed by the splendid architecture of the Natural History Museum, removed from its original home and without its original collections, it is difficult now to understand the true significance of Henry De la Beche's great museum.



This meeting will celebrate its history, architecture, and current role. A geological walk and tour of the museum are planned, together with a birthday toast.



The Albert Memorial

Speakers are expected to include Sophie Forgen (University of Newcastle), Hugh Torrens (formerly University of Keele), Simon Knell (Leicester), Adrian Rushton (NHM, London), Shuna Gibson (NHM, Tour Guide), Bob Bloomfield (NHM, Exhibitions), Ian Mercer (ex-Geol.Museum)

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...and the previous HOGG event

"The Dudley Gathering"



About 30 members of HOGG and the Black Country Geological Society, attended this meeting in the Museum in Dudley. A welcoming reception at the Museum on Friday evening, was followed by a full programme of papers on Saturday, and a canal trip to the point deep under Castle Hill where Sir Roderick Impey Murchison has spoken to people in 1849. A resume of the papers follows (all from notes by the Editor - who assumes all responsibility for errors - unless otherwise stated).

Alan Cutler: " The Dudley Geological Societies, 1842-1901".

The first Dudley Geological Society was established following the visit of the annual British Association meeting in 1839. That group visited Castle Hill caverns and the Wren's Nest, and then also to Dudley to see a collection of the local fossils. John Payton the Mayor of Dudley had arranged this display, and it was thought regrettable that after the BA visit it should be dispersed. A committee was set up to establish a society and a meeting place for members. The inaugural meeting took place on Monday 17 January 1842 at the Grammar School, Dudley, at which the name of the society was decided to be *The Dudley and Midland Geological Society*. A total of 150 subscribing members were lined up. The great Roderick Impey Murchison, no less, gave the address, and it was so impressive it was published. A copy of *Siluria* was given to the society (and can be seen in the museum today). Subsidies were set at 1 Guinea, but details of subsequent meetings are scant. The establishment of a museum was a prime objective, and one was established in the Britannia Inn, open each day. Finance was not a problem, as many of the subscribing Peers gave 40-50 Guineas each, and indeed out of a running total of £550, £430 5/- was from donations. A Wolverhampton branch was set up also in 1842 with Henry Hill as president. Subscriptions were 5/- but ladies could become members without joining the parent society. On 14 June 1842, the parent society produced a report on the igneous rocks of the South Staffordshire coalfield. The only records extant are two newspaper reports of the period. Hugh Miller visited the society in 1845 and gave a talk. In September 1849, the BA again came to Dudley. Lord Ward, the landowner, had the lost caves specially illuminated, and a poet penned a 220-line poem entitled "The Dudley Gathering". A second society was then inaugurated, calling itself *The Dudley and Midland Geological Society and Scientific and Society and Field Club*. At its first meeting on 15th August, Profs Tennant and Buckmaster (of the BM) were present and Prof. Beckett gave the address. After lunch there were visits to Wren's Nest, Castle Hill and the Silurian caverns. By the end of the year membership was 200+, and a special membership card was issued (but none are known to remain). They also had ideas for a museum, and a new building was constructed in Wolverhampton Street at a cost of £3,800, the money coming from the Society, a public appeal and the Earl of Dudley. Collections were loaned and 300 people attended the first meeting. The building was (alas!) demolished in the 1960s. In March 1863, the two societies met to allocate space in the building, and it opened to the public late in 1863. By the time of the 1st AGM, membership was 350, and included many famous names. The parties then set off for the Wren's Nest, Castle Hill, and the caverns where a brass band performed, and J.W. Salter spoke on the Dudley Limestone. Later at Russell Hill, there was a special tapping of molten iron, and the following day visits to Pensnett and the Silurian strata. Later in the year, the society sponsored the earliest extra mural geology classes, but details are not known. By 1864 there were 2 classes of membership: ordinary and field club, and by 1865 some members were attending the BA meeting at Bath. In 1866, the society sponsored an exhibition of the Earl of Dudley's pictures, getting 25% of the proceeds which enabled a decent fossil collection to be purchased. Some transactions/proceedings were published but they were erratic, and were best when John Jones was secretary. Field trips became increasingly popular, and included visits to Cheltenham & Llangollen, and sometimes started early. The Society did not survive long into the 20th century, and by 1900, income was just over £34. A new local authority museum was established in 1912, and despite a decline, since 1987 with a permanent curator, the future began to look brighter. The Black Country Geological Society was established in the 1970s.

Hugh Torrens: "Midlands Collectors & Collections"

Birmingham, the largest of the towns in the Midlands, had a Philosophical Institute since 1800. By 1830 there was a paid curator, but he was replaced by James Buckman. By the 1840s the euphoria of a new Institute had vanished and there was disinterest. The collection was passed to the Midland Institute, and Buckman's collections ended up as hardcore at Cirencester (Gloucestershire). Some of this valuable material was rescued by Swinnerton, and went to Nottingham Museum. Buckman's career was terminated in 1863, after he became involved with Darwinian researches (agricultural), and a conspiracy of academics decided that he was too busy earning money from consultancy, and also that he was associated with Charles

Darwin. He was accordingly fired. 1839 saw the publications of Murchison's *Silurian System*, but there were also publications by William Sharpe, who stressed how important it was to form local museums. He was inspirational in the formation of the first Dudley Geological Society's collection in 1842. Despite the enormous interest in geology in the 1840s in Britain, Birmingham Museum closed. Like others it was competing with the new popularity of field clubs who did not have the millstone of a collection too care for. The coming of the railway, giving people greater freedom spelled the death knell for many museums.

Michael Roberts: "Dudley the gateway to Wales; Sedgwick 1831 from Dudley to Snowdonia"

Sedgwick's first fieldtrip to North Wales in 1831 is often overshadowed by the presence of Charles Darwin. His three-month tour saw the beginning of his unravelling of the Cambrian, while Murchison began in South Wales. Sedgwick drew the short straw.

Sedgwick left Cambridge at the end of July 1831 and arrived in Dudley on 31 July and spent two days geologising in the vicinity before slowly moving towards Snowdonia. He finally began his work there on 22 August and his visit to Dudley gives clues why he spent 3 weeks before biting the bullet.

While at Dudley Sedgwick made several pages of detailed notes on the succession of coal seams with little explanation. One may surmise that this had no relevance to the Welsh visit. However he also looked carefully at the Transition limestones of Wren's Nest just west of Dudley and drew a section based on the canal tunnel. These notes give no indication of any purpose to his visit.

On 2 July he sped off to Shrewsbury and made no notes en route. Elsewhere I argue that he stayed with the Darwins and that until 20 August had young Charles in tow. The two days at Shrewsbury were spent in exploring southwest of Shrewsbury almost entirely on coal Measures and the base of the NRS at Cardeston. Above Pontesbury he looked at the Transition limestones and then the igneous "Urinconian" (anachronism!) of Pontesford Hill which he thought had tilted the Coal Measures and the NRS and thus was more recent. This raises the question, "What was he doing?" At a base level he was simply touring the area familiarising himself with the geology. Ironically he was only a matter of miles from an outcrop of ORS (or rather today ORS facies of Silurian) to the west of Westbury, which would have allowed him to work down the sequence. However no ORS was marked on Greenough's map. But his plans were more likely to go to Anglesey and build on Henslow's work.

On 5 August the pair sped off in the gig to Llangollen, where Sedgwick pumped Dawson and then ascended Castell Dinas Bran, a "Silurian" hill and scratched at the base of the Mountain Limestone on the Eglwyseg unsuccessfully for ORS. Next day Sedgwick indulged in old abbeys at Valle Crucis, looked at the "Silurian" opposite and ascended the Horseshoe Pass (closed by a landslide as I write 7/11) in a downpour briefly looking at clay slate before taking more interest in Mountain limestone below Dafarn Dwrarch. They descended the new road of the Nant y Garth to the Vale of Clwyd checking out Dawson's Mountain limestone and vainly looking for ORS, which they thought they found at a quarry west of Ruthin. Both began to doubt the existence of ORS indicated by the tentative comments in both sets of notes. These doubts increased and just west of St Asaph Darwin was sent off on a 30-mile traverse while Sedgwick sped on to Conwy. The following day Darwin concluded that there was no ORS. Sedgwick wrote to Murchison, 'The Old Red all round by Orm Head &c. is a pure fiction.' It took the Geological Survey until 1900 before all ORS was considered to be basal Carboniferous. Meanwhile Sedgwick had travelled from Conwy along the coast to Penmaenmawr and eliminated Greenough's ORS which was clearly marked on his map. Sedgwick had spent 5 days looking vainly for ORS from Llangollen to Penmaenmawr. The reason is not obvious, but in 1831 the Geological Column was only known down to the ORS (and that only sketchily). If Sedgwick could have got a definite stratigraphic horizon in the ORS he could then have worked down from the known into the unknown into the Transition as Murchison did in South Wales. However his notebooks contain no such thoughts and thus one can only try to imagine what he thought.

With Darwin back, Sedgwick spent two days starting to survey the greywacke and associated igneous rocks between Conwy, Aber and Bethesda. His notes were lithological rather than stratigraphic and give no clue as to relative age.

Thus on the night of 11 August Sedgwick left the British mainland for Anglesey where he spent 6 days with a weekend visit to Dublin. His Dublin visit may be due to business on either the Irish geological Survey or Geological Society, but so far no supporting evidence is forthcoming. On return he spent 5 days on Anglesey aided by Henslow's Memoir. Sedgwick's own notes show how he was questioning Henslow but as he wrote to Murchison he found the visit of no help for Snowdonia. On 20 August Sedgwick recrossed the Menai Bridge, where Darwin had once rescued an errant toad, left Charles at Menai and

worked his way to Caernarfon. The next day after morning worship he began his work in earnest 3 weeks after arriving in Dudley.

For the next 2 months he traversed most of Snowdonia and Llyn, sometimes spending 18 hours in the hills and left Wales in mid-October. By then he had worked out a basic succession and the structure of the area, but his Cambrian did not link upwards into known strata, such as the ORS. What he had done was to start in the middle, where there were few fossils, and then tried to work upwards. In future years this led to various problems, culminating with the breakdown with Murchison (Secord, 1985).

It does not seem to have been Sedgwick's intention to start in "undatable" strata as he first skirted the North Wales Transition area to the Northeast and then the north coast and then in Anglesea. The first three weeks of his work was a case of trying to find some point where he could work down the succession – hence his search for ORS – from a clear stratigraphical marker. It was very different for Murchison in south Wales as his later "Silurian" had a ceiling in the red beds of the ORS (OK of both Silurian and Devonian age!). Sedgwick's Cambrian was, as it were, floating in geological time somewhere between the ORS and the older rocks of Anglesey, and the paucity of fossils made it even harder to pinpoint the relative age. The interest in later years of the Bala Limestone demonstrates the need of marker zones and reference points. (Incidentally there is a superb exposure of Bala Limestone in a cutting on the A5 – GR995446. Someone found it worth travelling from Australia to see it!)

His visit to Dudley represented the beginning of Sedgwick's trying to move from the known to the unknown and to work down the succession into the Transition rocks, but the complexities of North Wales geology and his chosen starting point prevented that. As the Rev John Parker of Llanyblodwel wrote in his diary of 1833, 'Professor Sedgwick who has lately been to North Wales, i.e. during the last two summers. He considered Snowdonia to be extremely perplexing as to Geology.'

(communicated by Michael Roberts)

Gordon Herries: "Davies J. Beete Jukes"

Jukes was one of the outstanding British field-geologists of the mid-nineteenth century. Born at St Martin's, Summerhill, near Birmingham, on 10 October 1811, his father and paternal grandfather were involved in the local button trade, while his maternal grandfather, Joseph Beete, had made a modest fortune in Demerara. Jukes was schooled in Wolverhampton and Birmingham before going on to St John's College, Cambridge, in 1830, with the intention of preparing for ordination. At St John's one of his friends was John William Colenso, the second Wrangler of 1836 who became a controversial first Bishop of Natal. It was a friendship that endured throughout Beete's life. As a schoolboy he had already brushed with geology through his aunt Jane Jukes, who was an avid collector of all manner of geological specimens. Despite the wishes of his Tutor, Beete joined the geological class of Adam Sedgwick, and at Sedgwick's feet all thought of the Church melted from Jukes's mind. His own father having died in 1818, Beete found for himself a new parent seated in the Woodwardian chair. Henceforth in their correspondence Sedgwick featured as 'My Father in Geology' or simply as 'My dear Father'.

Beete graduated in 1836, and upon coming down from Cambridge he became a geological itinerant, delivering courses of lectures in various institutions and exploring the regional geology as he walked from town to town. During 1837 and 1838 he gave his course of lectures (originally a course was six lectures later expanded to eight) in Wolverhampton, Liverpool, Birmingham, Leicester, Derby, and Nottingham, several of the courses concluding with a field excursion.

On 11 April 1839 Beete sailed for Newfoundland because, supported by Sedgwick, he had been appointed Geological Surveyor to the colony. There he conducted field-surveys, often under the most rigorous of conditions. He produced a series of geological reports for the colonial government, and, following his return to England in November 1840, his Newfoundland experiences became the subject of a two-volume work published during 1842.

He joined Sedgwick in a brief tour of Devon and Cornwall during the summer of 1841. He served as the president of the Wolverhampton Literary and Philosophical Society 1841-42. He delivered the inaugural address to the Wolverhampton Branch of the Dudley and Midland Geological Society on 11 February 1842. Just two months later he cleared Falmouth aboard H.M.S. *Fly* (485 tons, 18 guns). He had now been appointed as Naturalist to a naval expedition which was to explore the Torres Straits, and not until 19 June 1846 did the *Fly* once again anchor in British waters.

Beete was now a geologist of global experience. He applied to the Sir Henry De La Beche for a post with the Geological Survey; he gave a favourable impression at interview; he was appointed to the staff. On 1

October 1846 he reported at Bala to be trained under (Sir) Andrew Crombie Ramsay and William Talbot Aveline.

He had found his element. He proved to be a superb geological surveyor who relished the fellowship of Survey life. The years between 1846 and 1850 were for Beete a joy as he mapped in North Wales and the English Midlands. He even found himself a wife. On 22 September 1849 he married Georgina Augusta Meredith of Harborne, near Birmingham. That marriage was only a doubtful success. Augusta never enjoyed sound health, and to his regret there were no children. Above all, his new financial responsibilities caused him to fall easy victim to both De La Beche's offer of the Local Directorship of the Geological Survey of Ireland and to his chief's deceitful assurance that he and Augusta would find the cost of living to be lower in Ireland than in Britain.

Beete assumed the Irish Local Directorship (Directorship as from April 1867) on 30 November 1850, and he held the office for the remainder of his life. His administration proved to be an outstanding success. He and his men developed the art of six-inch (1:10,560) field mapping, and between 1856 and 1869 he oversaw the publication of 117 (most of them with an accompanying memoir) of the 205 sheets necessary to complete the one-inch (1:63,360) geological map of Ireland. But Beete and Augusta were unhappy in Ireland. During June 1851, Beete admitted to Ramsay that 'much of the zest of life has departed', and the 1860s brought Beete repeated episodes of illness. Finally, on 8 May 1869, Augusta and two physicians committed him to a private Dublin lunatic asylum, and there he died on 29 July in the same year. In an act symbolic of their unhappy relationship with Ireland, Augusta removed her husband's body back to his native Warwickshire for burial at Selly Oak in Birmingham.

Beete holds an honoured position in Ireland's geological valhalla, but this son of the English Midlands is deserving of remembrance in a context far wider than the Hibernian. His Geological Survey reports of 1853 and 1859 devoted to the South Staffordshire Coalfield remain much thumbed works of reference. His *Student's Manual of Geology* of 1857 (second edition 1862) stood comparison with Sir Charles Lyell's *Elements of Geology*, and in its third edition (1872), edited by (Sir) Archibald Geikie, the work is not unrelated to Geikie's own highly influential *Text-Book of Geology* first published in 1882. Finally, Beete's paper on the drainage pattern of the south of Ireland inspired the mid-nineteenth-century revival of fluvialism among British geomorphologists. The paper was seminal for Charles Darwin, Ramsay, Geikie and William Whitaker, while on the other side of the Atlantic the significance of Jukes's thinking was not lost upon the likes of Grove Karl Gilbert. It is highly appropriate that Jukes should have been remembered when HOGG visited the English Midlands.

(communicated by Gordon L. Herries Davies)

Colin Knipe: "Henry Johnson's Diaries"

Henry Johnson was the 11th of 13 children of John Johnson a farmer at Sedgley. He was born in 1823, employed as a bailiff of the Earl of Dudley, and apprenticed at 16 to John Orme Brettle, a local mine surveyor. After a 5-year apprenticeship, he founded a firm of mine agents on 24th June 1844, his 21st birthday. He was already an accomplished geologist, and had drawn a 3-dimensional section of the Coal Measures at the age of 19. He became a good friend of James Ryan, and his first task was as a mine surveyor doing regular surveys at Netherton. Railway mania was in full swing, and he played a part, laying out routes into Dudley, often on his own initiative. He was one of few who could read and write, and produced hundreds of mine plans. He was an acute observer of local geology down the mine and later at the surface also, and knew the geology better than the great J.B.Jukes who was sent to map it for the Geological Survey. The two met on April 19th 1849 when Jukes visited Johnson. Johnson apart from being a good mining engineer, was also a competent draughtsman, and he drew plans for machinery at brine wells at Droitwich, as well as sketching other people's devices, of which he later worked out the method of operation; he also built his own ingenious inventions. One of his greatest triumphs was to see through the South Staffordshire Mines Drainage Act. Mine waters seeped from pit to pit, increasing the load on some pumps, and in 1860s he started to formulate the Act to have a communal drainage system. He started by culverting the water to stop it seeping down and then to concentrate pumping to just a few powerful pumps. The coalfield was divided into a number of 'pounds' (areas), and along with John Brown he surveyed all operating mines - thousands - working out the water flowage, pumping capacity, how much water went down rivers and the like, in order to size some big new pumping stations. In 1873, the Act was passed by Parliament. The remaining operators paid a small levy to a Commission who drained the mines. Johnson was also one of the first to operate beyond the eastern boundary of the coalfield, and was thus a prime instigator of the Sandwell Park boring which proved the existence of Coal Measures to the east. He was a

leading member of the Dudley and Midland Geological Society, but a bigger claim was to found the local mine agents' association.. He was also a huge collector of fossils, and when he died in 1885, his son, young Henry tried to make money by selling the collection. The whole collection of 2524 fossils went to the British Museum (Natural History) for £450. Colin Knipe is proud to be a leading partner in the firm of Johnson, Poole & Bloomer, the oldest established mining consultants still extant.

Graham Worton: "The Sandwell Park Sinking"

Henry Johnson believed there were Coal Measures strata beneath the 'Red Rocks' of the Triassic, to the East of Dudley. Most believed that the Coal Measures strata stopped, as they found at for instance, Heath Colliery at West Bromwich that the Coal measures stopped at a red wall. Some thought the Coal Measures were washed out. Henry Johnson challenged these beliefs. He predicted that the South Staffordshire Pit Coal (10 yard seam) would lie at 350 yards depth, and in February 1870, set up a company to drive a trial shaft. A 3-year lease was agreed with the Earl of Dartmouth at West Bromwich, with a 60-year lease if the pit was successful. Two hundred shares of £100 each were proposed, and at a meeting in Birmingham in 1870, the appeal was so great applicants were turned away disappointed. There was discussion about just where to site the shaft, which even then took into account visual intrusion on the Earl's estate. Sir Roderick Murchison turned the first sod on 2nd May 1870, and by September they had made 40 yards depth without encountering water; a 9' diameter shaft was tendered for. On 1st October the actual sinking began, with Henry Johnson as Engineer and Secretary at a huge salary of £200/year. By December a horse gin and winder had been purchased, as well as a beam engine. In January 1871, the shaft was at 50 yards depth when water was struck, which rose 28 yards up the shaft. Some months were taken installing winding engines to take the water out. By August 1871, at a depth of 70 yards, another spring was encountered and worked again stopped. Work was only able to continue after the installation of a pumping engine in November, and the de-watering of the shaft. In January 1872, the decision to widen the shaft to 10' was taken, and by March it reached 92 yards. In May the pump rods broke and the shaft was flooded. Work was progressing slowly, sinking averaging only 6 1/2 yards a week. Henry Johnson, with his management skills offered the diggers a leg of mutton and more ale if they increased the rate, and it duly went up to 8 yards. At the end of August it had reached 202 yards and a 7" seam of coal was met. This caused a sensation in the local press, and shares prices rocketed to £750 per share. But by October a hard band of rock was met, and the rate slumped to 4 yards a week. The rock was so hard that gunpowder was tried with little effect, and then a new explosive called 'dynamite' was tried. In November the shaft passed through limestone, and there was panic as it was thought it had passed through the Coal Measures and into the Silurian. The share price collapsed to £50. To make things worse the pump rods broke again and water rose 89 yards. It was decided to make a further 18 yards exploratory borehole from the shaft bottom, with the idea of then deciding whether to abandon digging or not. The borehole hit 7' of limestone, then 10 yards of hard sandstone, then 6' of coal with 4'6" of fireclay. As a result in February 1873, the share price rose to £210, and there was further investment in plant. By September, the shaft was at 250 yards but another two thin coal seams had been found. By December with the shaft at 312 yards, an Extraordinary AGM was called to raise money for more investment. On 28 April 1874, four years after starting, and with the shaft at 418 yards Thick Coal in a seam 6 yards 2 feet 6 inches was at last found. There was jubilation. The shaft eventually bottomed at 440 yards, with the Heathen Coal being found at 427 yards and the Gubbin Ironstone at 425 yards. The venture had cost £21,000. On 24th June, 1874 a second shaft started with 24 hour working and the share price reached £1,100 per share!!! By August 1876, over 110 acres of Thick Coal had been proven, and 17,000 tons was brought out. At its height, 300 miners were employed bringing out 1400 tons a week.

John Fuller: "Dud Dudley 1665; Bellers & Hauksbee 1712"

Fettiplace Bellars & Francis Hauksbee in 1712 published a density log of sub-surface strata. They may have been the first to do so. They logged a real section & made a genuine bed-by-bed list of measured densities. The logged hole was the shaft of a coal pit at Dudley. Thirty beds were sampled, measured, and described. Specific gravities of each were calculated, and the values listed stratigraphically.

Like many scientific papers of the time, its authors offered virtually no discussion of the data. Yet they seem to have been refuting a Theory of the Earth that plagued English geology during the years from 1695 to 1719. The Theory said that the strata had formed by a process of ordered gravity-settling from a cosmic flood, the heavier matter forming the lower strata and lighter matter the upper strata. It was clear nonsense to some people, and they said so, though no firm regularity or order among strata was yet established.

Among Bellers' and Hauksbee's unfamiliar words and archaic spellings some recognisable names reveal that their log is not a fake. It does refer to a section of Pennsylvanian strata near Dudley, though the geological sequence as printed is not immaculate: two samples of coal, and bituminous shale seem to be misplaced. On the other hand, the ironstones and their associated beds are complete in every detail of nomenclature, sequence, and thickness.

All the Specific Gravities of lithologic units shown by bellers & Hauksbee fit bulk density values found in present-day well-logging

Lithology	Bellers & Hauksbee, 1712	Bulk density range 1994
Bituminous Coal	1.26-1.47	1.2 - 1.5
Shale	2.53 - 2.56	2.2 - 2.75
Clay	1.76 - 2.10	1.7 - 2.3
Sandstone	2.43	2.3 - 2.6
Sideritic iron ore	3.03 - 3.58	3.0 - 3.8

Bellers & Hauksbee gave no reason for the considerable investigation they made of the strata penetrated at the Dudley colliery. It was not the first time that geological details of these coal and ironstone measures had been published (Dud Dudley the ironmaster had made a map of them in 1665), though no one had previously attempted density logging.

An explanation may be found among rebuttals to John Woodward's "Account of the Universal Deluge, and of the effects that it had upon the earth", which was published in 1695. Woodward's imagination led him to believe that the centre of the Earth was a great spherical water-filled cavity, an Abyss, which upon bursting open caused a Flood in which the Earth "was taken all to pieces and dissolved". When this vast suspension began to settle it did so in the order of "different specifick Gravity...the greatest degree of Gravity sinking down first...to make a Stratum...and so on...to the lightest".

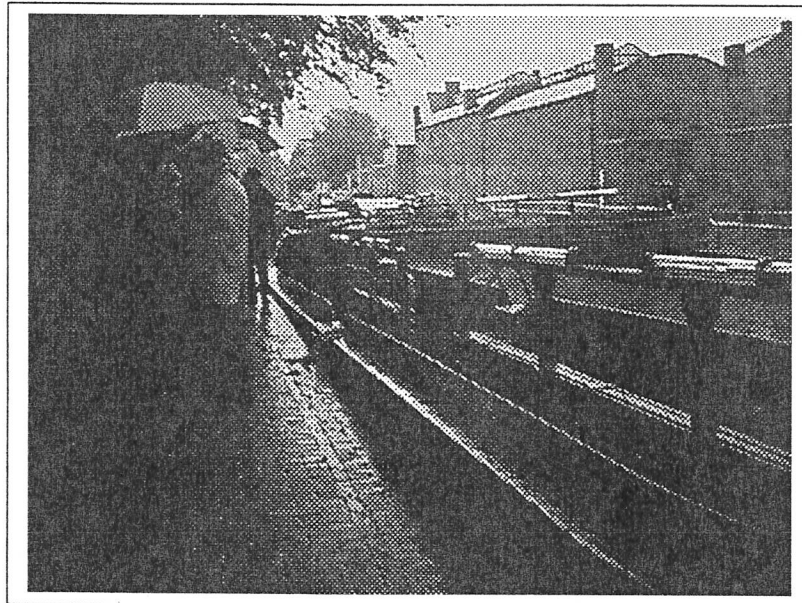
Hugh Torrens: "James Ryan of Dudley"

James Ryan was born in Ireland, but his birthplace is not known. By 1792 he was in Britain earning a living, but he started working on the grand canal of Ireland. A small coalfield near Doonane in Kilkenny, had installed the first steam engine in Ireland in 1740 and the first Boulton & Watt engine in 1782. But royalties required by Boulton & Watt meant the coalfield could not justify the cost, and the colliery company leased it to the Grand canal company. Ryan was a surveyor for the company in 1784. He was the first to conceive of the idea of cores to study the underground geology, and in 1804, he invented a device to cut and extract them. He showed this to the Royal Dublin Society, showing a core bought up by the invention. He was helped by the mineralogist Richard Kirwan, who was living in Dublin, and by Richard Lowell Edgworth, who lived at Edgworth, who trialled the device. Edgworth was impressed by it, and thought it might allow ventilation shafts into mines. Ryan's machine was patented in London in 1805, and there were immediate improvements in mining as a result. It could cut cores from 1-20" and 2-10" in diameter. James Miller, who edited the book "The Natural History of the Mineral Kingdom" by John Williams, noted that a similar device had already been invented, but there was no suggestion here of using it to deduce underground geology. Prior to Ryan's invention, boring devices powdered material down the hole, producing a paste of ground 'rock flour' for which it was easy to deceive prospective miners by the admission of a small coal sample. There was a difficulty over whether this was a device for surveying or to ventilate coal mines; the latter was expensive, and doing so was politically difficult. Mineral surveying was a better use but this required people who could interpret the results, and the device was not thought to be much use. Ryan wrote in 1807 to the Board of Agriculture about draining land using the device, and held a trial at Kingston House, Knightsbridge, under Mr Lovenden. There was a further demonstration in June 1807, to the British Mineralogical Society; the secretary, William Allen was persuaded that it gave much better results than methods then in use. Ryan gave another demonstration at the Isabella Pit, Workington where it was worked to a depth of 31 metres (100+ feet), but the powerful mine agents meant he was unable to use it at their rates. Ryan got another chance in 1807 when Richard Trevithick wanted to bore a rail tunnel under the Thames and saw Ryan's machine as being ideal. At James Sowerby's house in Lambeth, he bored down 10 feet with a diameter of 8". Sowerby, Sir Joseph Banks, and J.B. Greenhough were all

impressed with its operation. But there was the problem of the value against the cost. In 1806 there was an abortive exploration for coal at Bexhill by William Jones a member of the Geological Society of London, who wasted £30,000 on the project. In 1806, Ryan went to Newcastle, cradle of coal mining, and met John Duddle. They tried to show that Ryan couldn't know anything about coal mining which they didn't. Later Lord Dudley employed Ryan to clear Nethercoat mine of methane, which he did in a few days using narrow bored tunnels at the tops of shafts and passageways. As a result, Ryan became popular with the miners, and lectured to the Royal Institution on mine ventilation. In 1811, Ryan's wife gave birth, and in 1812, a major explosion at Dudley killed 92. A Mines Act was passed to try and make mines safer, but Ryan's expensive method of ventilating was up against both Stephenson's and Davy's safety lamps, both of which were cheap. There was especially prejudice in northern England. In 1811 he was elected a freeman of Shrewsbury, and surveyed the Breiddon Hills mines, discovering feldspars later used in pottery glazes whilst looking for lead ore. He surveyed and lectured all around the country. In 1835 he was called up before a Parliamentary Committee on the safety of mines, and set up the first school to teach mining safety. In 1844 there was a terrible disaster at Heswall colliery with 100 killed, but although he attended, Ryan was not allowed to speak at the inquest. A similar incident occurred in Northumberland. Ryan died at the age of 77 in Dudley at the residence of Mr Brooks in Wolverhampton Street, and is buried at St Thomas' Dudley.

Excursion by narrowboat

Following the meeting, members travelled to the Black Country Museum, and a canal narrow boat for a short trip along the caverns beneath Castle Hill and the Wren's Nest. At the end of the navigable canal, Hugh Torrens stood at the spot where Sir Roderick Impey Murchison had stood in 1849 and gave an oration about the canal system.



Members wait to embark on the narrowboat in the pouring rain- but it wasn't raining underground!

Royal School of Mines 150th Anniversary

To be held at Royal School of Mines, Imperial College of Science, Technology & Medicine, Prince Consort Road, London SW7 2 BP

Friday 11th May - Sunday 13th May 2001

Members of the Geological Society History of Geology Group are warmly invited to attend the symposium on Saturday free of charge (with our apologies for ruining your Museum 150 Fiesta). Lunch is available afterwards for £10 (including wine).

(Editor's note: It isn't clear whether HOGG members can attend the other days' events, and whether there would be a charge for doing so. Any member interested in doing so should perhaps contact: Prof. Richard Selley Phone: : +44 (0)1306 882026 Fax: +44 (0)1306 882006 email: <r.selley@ic.ac.uk>)

Friday 11 May :

Opening of the meeting by HRH the Princess Anne

Dr J Secord (University of Cambridge) A brief history of the Royal School of Mines

(followed by other learned lectures on current research in the RSM)

Saturday 12 May

SYMPOSIUM:

T H HUXLEY & THE ROYAL SCHOOL OF MINES

LOCATION:

Room 1.31, the Mining Lecture Theatre in the Royal School of Mines, Prince Consort Road.

PROGRAMME

11.00 - 11.35 Dr J Secord (University of Cambridge) A history of the Royal School of Mines

11.40 - 12.15 Dr S Forgan (University of Teesside) Huxley and buildings: working environments for the Royal School of Mines

12.20 - 1.00 Dr G Gooday (University of Leeds) Huxley as orator, educator and microscopist.

(Thus each speaker has 35 minutes + 5 minutes for questions.)

HOGG AGM 2000

The Annual General Meeting for 2000 was held during the HOGG meeting at Dudley on Saturday 14th October. 14 people attended, and the various reports circulated in advance to members were all accepted without exception. The Treasurer read out the results of the ballot for Chairman, with 7 votes for Richard Howarth, and 18 for John Martin, with an approx. 25% return. The new committee was thus confirmed as Chairman: Dr John Martin; Secretary: Dr Cherry Lewis; Treasurer: Dr John Fuller; Newsletter Editor: Peter Tandy; Committee Members: Mr S.A. Baldwin, Dr C. Burek, Mr W.H. George, Prof. Richard Howarth, Prof. M.J.S. Rudwick, Mr R.A. Wilding. Richard Howarth was elected to the committee in place of Dr Simon Knell, who had indicated that due to work pressures, he was unable to continue.

The only resolution was to increase subscriptions from the present £7/year to £10/year starting on 1st January 2001. This resolution was carried without exception.



Members listen to the Chairman in the 'blue room'

...and the next HOGG meetings

History of Palaeobotany

A joint HOGG/ Linnaean Society meeting on the "History of Palaeobotany" will be held on **Wednesday, 24th October, 2001** at the Linnean Society, London. To date, offers of papers have come from:

Andrew Scott - Federico Cesi (1585-1630) and Francesco Stelluti (1577-1533) - the first palaeobotanists?

Bill Chaloner- John Lindley - the reluctant palaeobotanist

Hugh Torrens. - Henry Steinhauer and the first scientific descriptions of fossil plants

Barry Thomas - the palaeontological beginnings of geological conservation

Christopher J. Cleal (with Maureen Lazarus) - Illustrations and illustrators from the golden age of palaeobotany, 1800-1840.

Papers on other related subjects are solicited.

Please contact the convenor: Richard Wilding, 175 Whitton Road, Twickenham, Middlesex, TW2 7QZ (tel: 020-8892-3132)

The Amateur in British Geology

Scheduled for the Thursday & Friday 14th & 15th March 2002, at the Geological Society, this meeting will examine the role of the amateur in the history of British Geology. Anyone interested in giving a paper should contact the convenor:

Stuart A. Baldwin, Fossil Hall, Boars Tye Road, Silver End, Witham, Essex, CM8 3QA (tel: 01376-583502; fax: 01376-585960; e-mail sbaldwin@fossilbooks.co.uk)

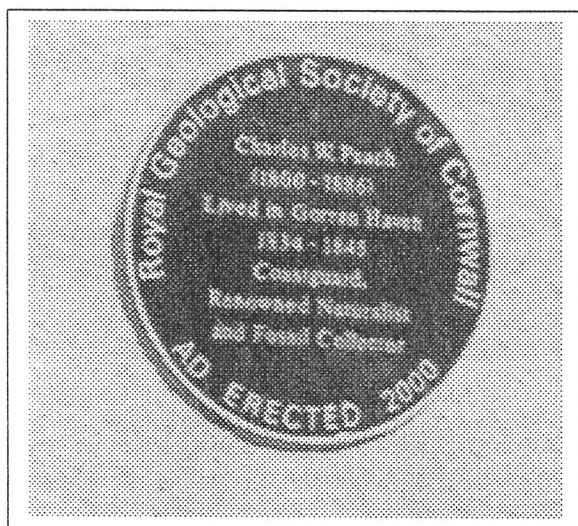
William Smith, a grave situation.....or not?

William Smith was born in 1769, and was a civil engineer dealing mainly with water management and hydraulics. As a child he collected fossils, and continued this into adult life as a surveyor making widespread travels around the country. In 1815 he produced the first geological map of the British Isles, and was able to relate fossils to various strata. This made him, in the eyes of many, "the father of English geology". Smith was self-taught and just an ordinary working man, which did not square very well with the upper classes who administered the Geological Society of the time, but his contributions to the understanding of geology forced them to award him the Wollaston Medal in 1831. Smith died in 1839 and was buried in the grounds of St Peter's church, Northampton. A bust and tablet was erected inside the church, being paid for by the Geological Society, even though Smith's only connection with the town was to be staying there when he died.

The church became redundant in 1998, and is now cared for by the Churches Conservation Trust. The grave, one of very few still left there, is covered by a flat sandstone slab on which the name is now indecipherable due to weathering and it is sad that a man who gave so much to geology should lie so ignominiously. For various reasons it is not possible to re-engrave the slab, and a plaque to direct people to the grave and its significance cannot be affixed to or near the church. The result is that the Friends of St Peter's and members of the geological community feel a free-standing stone placed near the grave but away from the church, and giving details of Smith's achievements is the way forward. Decisions needing to be addressed at this stage are: what form the plaque should take, where it should be placed, what rock should be used, what the inscription should say, who should sculpt it, and where will the money to finance it come from? Suggestions from HOGG members should be addressed to Peter Smith (c/o Geology Today, fax: 01908-510578, or e-mail pjsgcologytoday@aol.com).

A one-day meeting between the University of Leicester, the Friends of St Peter's Church and *Geology Today* magazine, has been organised for Saturday 3rd March 2001, from 10.15am-4.00pm. The meeting will include talks by Hugh Torrens on William Smith, Mrs J Minchinton on George and Ann Baker (with whom Smith was staying when he died), and Dr Norman Butcher on John Phillips (Smith's nephew and an accredited geologist in his own right). A buffet lunch and tea/coffee is included in the price of £16.00. Bookings should be made with the University Centre, Queen's Building, Barrack road, Northampton NN2 6AF (tel: 01604-251801; fax 01604-620544). Cheques should be made payable to The Friends of St Peter's, Northampton. Credit card bookings cannot be accepted. Enclose an SAE if you want a map showing location of the church and convenient (pay & display) parking space.

Charles W. Peach (1800-1886) honoured.



On Saturday 30th September 2000, the exact bicentenary of his birth at Wansford, Northamptonshire, the Royal Geological Society of Cornwall unveiled a plaque to Charles William Peach (1800-1886), the renowned Coastguard naturalist & fossil collector, on the old Custom House in Gorran Haven, south Cornwall. The unveiling ceremony, conducted in brief sunshine interrupting rain, was carried out by Professor Keith Atkinson, Director of the Camborne School of Mines. The audience of some 30 or so people included William & Sheila Marshall from Peterborough, great-great-grandchildren of Charles Peach, two representatives of present-day Coastguard Service, several geologists from the BGS Exeter Office & academics. After Professor Atkinson's speech extolling the achievements of

Charles Peach, everyone enjoyed refreshments inside the old Custom House, kindly provided by the owners Mr & Mrs Debotte, who now run a very nice and cosy cafe there. Professor Colin Bristow from nearby St Austell was the principal instigator of the project and deserves the thanks of the scientific community, not just in Cornwall, for bringing this to fruition. The rain *resumed* in time for a short geological excursion across the nearby sands to examine rocks appearing on the newly published Mevagissey Sheet of BGS.

Charles Peach was one of those early Victorian self-taught pioneers of palaeontology who made important discoveries in both south Cornwall and later in north-west Scotland. Living with his large family in Gorran Haven between 1834 & 1845, where he was stationed as a 'riding officer', his principal contribution was the discovery of brachiopods in the quartzites of Gret Perhaver Bay which led to the recognition of rocks older than the Devonian in S.W. England. He published a number of papers in Transactions of the Royal Geological Society of Cornwall, and there are specimens he collected in the Cornwall Geological Museum in Penzance. Transferred to Scotland in 1849, first at Peterhead and then to Wick in Caithness, he discovered the fossils in the Durness Limestone in the north-west Highlands, again leading to the recognition of a Lower Palaeozoic age.

Peach's youngest son, Benjamin Neve Peach, was born in Gorran Haven in 1842 and was to become one of the famous Peach and Horne duo who unravelled the structure of the N.W. Highlands of Scotland, commemorated since 1930 in the memorial erected at Inchnadamph. Charles Peach was awarded the Neill Prize Gold Medal of the Royal Society of Edinburgh in 1875 and ended his days at his home in Haddington Place in Edinburgh, at the top of Leith Walk. It is perhaps unique that father and son are each now commemorated at opposite ends of Britain.

Norman E. Butcher

"Blue Plaques"

Does anyone have suggestions or comments about investigating erecting 'blue plaques' to honour geologists of the past?

The Editor or Secretary would be pleased to receive nominations for contenders or opinions about the suggestion.

The Bedfordshire Coprolite Industry or Who took the Dinosaur Shit out of Bedfordshire?

The story of Bedfordshire's Coprolite Industry In the second half of the 19th century many hundreds of men, women and children across Bedfordshire were engaged in a new type of extractive industry - digging "coprolites" - fossils of an assortment of creatures that lived in the area during Jurassic and Cretaceous times. They were extracted from pits, in places up to five metres deep, where the seam occurred along the slopes of the Greensand Ridge where it lay above the clay.

WHAT ARE COPROLITES?

Locals thought they were fossilised dinosaur droppings but whilst some flat-bottomed lumps certainly resemble sun-dried turds the deposit included the teeth, bones and claws of such dinosaurs as dakosaurus, dinotossaurus, craterosaurus, megalosaurus, scelidosaurus and iguanodon. There were also remains of marine reptiles like ichthyosaurus, pliosaurus and plesiosaurus as well as the bird pterodactyl. There were fossils of shark, whale, crocodile, turtle and a host of marine organisms. The most common was ammonite - a member of the squid family. Land animals including elephant, hippopotamus, bear, horse, tapir, armadillo, hyena and ox were also found in the diggings as well as unrecognisable lumps of inorganic phosphate.

WHAT IS THE ORIGIN OF COPROLITES?

Dinosaurs that lived in the area were experiencing great stress from the increasing carbon dioxide in the atmosphere. At the time the dinosaurs were at their most massive during Jurassic times oxygen levels were as high as 35% but extensive volcanic activity as the continents drifted apart released vast quantities of carbon dioxide which caused big problems for big creatures. The large dinosaurs' respiratory systems experienced asthma-like problems. They were exhausted having to conserve enough energy to "dash and dine" like crocodiles. Many were probably just too tired for sex! Those dinosaurs that adapted to the changing climatic conditions met their demise in this area following a major rise in sea level about 90 million years ago. Waters covered the south of England many hundreds of metres deep. The land animals were drowned and their bloated bodies eventually sank to the seabed and accumulated as a vast graveyard. Their fossils built up in a huge bed, in places up to two metres thick, which stretches almost a hundred miles across the Eastern Counties.

WHAT WERE THEY USED FOR?

Whilst many Geology students and professors revelled in the finds, Victorian museum and drawing rooms had their shelves filled with the better specimens of these fossils. But furthering academic research was not the main reason why they were extracted.

Britain's population had doubled in the first half of the 19th century. Many millions lived in towns and cities and there was a huge increased in demand for food. This led agriculturalists to introduce an assortment of innovations. Perhaps one of the most practical was the use of chemical fertilisers. The "coprolites" mined from the base of the Upper and Lower Greensand were their major raw material for the fertiliser business for forty years.

WHERE WERE THE COPROLITES FOUND IN BEDFORDSHIRE?

The major area where the "coprolite" was raised was along the Greensand which stretches roughly ortheast to southwest across Bedfordshire but there were also workings in parts of Cambridgeshire, Suffolk, Norfolk, Herts., Bucks, Oxfordshire, Hants. and Kent. They were first worked in Bedfordshire in 1862 following their "discovery" in Shillington and continued over a forty year period. There are records of coprolite or fossil diggers in Ampthill, Arlesey, Great and Little Billington, Campton, Clifton, Everton, Heath and Reach, Henlow, Langford, Meppershall, Pottton, Puttenham, Shillington, Lower Stondon, Stanbridge, Stotfold, Sutton and wrestlingworth.

WHO WAS INVOLVED?

After washing and sorting at coprolite washmills they were carted to the nearest wharf or railway siding for freighting to manure factories in Cambridge, Royston, Burwell, Ashwell as well as in King's Lynn, London, Ipswich, Wolverhampton and elsewhere. Having a high phosphate content they were ground to a powder, dissolved in sulphuric acid to produce superphosphate - the world's first artificial chemical manure. The world's first agricultural research station at Rothamsted was set up using the profits from the business. Manure companies like Lawes, Fisons, Packard, Colchester and Ball developed and expanded in this area. The Fertiliser Manufacturers Association was made up of many local companies that purchased coprolites. Surveyors and solicitors like Bidwells, Carter Jonas, Francis, Beaver, Mann and Raven were very much involved in the legal arrangements between landowner and coprolite contractor.

Many farmers and landowners made considerable fortunes from having the deposit raised from their property. Many of the Cambridge Colleges, the Queen, the Church and Charity Commissioners were able to expand their holdings, renovate properties and generally increase their revenue from coprolites. Sandy Lodge, Fulbourn Hospital and the Cambridge Corn Exchange were funded from coprolite revenue. Local churches were renovated during this period, some with monies from having the glebe worked. Many local traders, bankers, brewers, shop retailers and other entrepreneurs catered for and profited from the improved spending power of the diggers.

There were numerous cases of accidents in the works, many fatal. There was tension between coprolite diggers and locals given their higher wages and shorter hours and attempts were made to deter the diggers' frequent use of the public houses and beerhouses that spread like wildfire in the coprolite villages.

Bernard O'Connor (For more information email: Fquirk202@aol.com)

