

GEOLOGICAL SOCIETY



HISTORY
OF
GEOLOGY
GROUP
NEWSLETTER

No.14.....July 2001

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"History of Palaeobotany"

A joint HOGG meeting together with the Linnaean Society, to be held at the Linnaean Society, London, on Wednesday 24th October 2001

Programme of Speakers:

Andrew C. Scott (Royal Holloway & New Bedford College) : "Federico Cesi (1585 – 1630) and Francesco Stelluti (1577 – 1630); the first Paleobotanists?"

Bill Chaloner (Royal Holloway & New Bedford College) : "John Lindley – the reluctant Palaeobotanist."

Hugh Torrens (Formerly Keele University) : "Henry Steinhauer and the first scientific descriptions of fossil plants."

Barry Thomas (Aberystwyth University) : "The Palaeobotanical beginnings of geological conservation."

Christopher J. Cleall (with Maureen Lazarus and Annette Townsend): (National Museums of Wales) : "Illustrations and Illustrators from the Golden Age of Palaeobotany."

J.E.A. Marshall (Southampton University): "Arthur Raistrick – Britain's Premier Palynologist."

Nick Rowe (Montpellier): "Brogniart, Renault and a Yorkshire Naturalist: the Anglo-Franco Battle of the Bois.."

Allan J. Bowden (Liverpool Museum): "Palaeobotanical Studies and collecting in the North-West from the time of Charles Leigh to Henry Hugh Higgins."

Joan Watson (Manchester): "150 Years of Palaeobotany in Manchester."

Charles Wellman (Sheffield University) "Fifty years of Palynology in the University of Sheffield."

Three short papers:

Richard Wilding (HOGG): "Richard Brookes, M.D., - Keeping up appearances"

Barry Thomas, (Aberystwyth University) "A palaeobotanical design by Thomas Wedgwood".

Bill Chaloner, "The Palaeobotanical work of Marie Stopes".

HOGG Annual General Meeting 2001

It is proposed to hold the Annual General Meeting at lunchtime during the combined HOGG/Linnaean Society meeting on the 24th October 2001. Any member wishing to propose a motion should send a copy of the motion, together with their name and that of a seconder, to the HOGG Secretary (Dr Cherry Lewis, 21 Fowler Street, Macclesfield, Cheshire, SK10 2AN) by Friday 28th September.

"The Dudley Gathering" - a postscript

Athenaeum Club, London April 19th 1847

I am also much flattered by your passing allusions to my Silurian labours. On two points however I have to offer critical remarks. The first of these is purely personal, and may be considered as a little symptom of Silurian (not Scotch) pride.

In your excellent work you speak of Buchland haranguing the philosophers of the British association in the Dudley Caves. Now, the fact is, that by virtue of my labours on that ground I was named generalissimo of that expedition, and I executed my duties, I assure you, like an autocrat. When all the barges laden with geologists, had entered the caverns, which were previously filled with "Ladies & gentlemen" of the neighbourhood, perched all around the lighted vaults, I commanded silence, and gave them a regular half-hour's harangue on the structure of the Wren's Nest and the surrounding tract. This address has been graphically alluded to by Schoenbain the chemist (now so famous for his gun-cotton), in a lively German work descriptive of his visit to England and he specially adverts to my military air and voice, the relics of the old peninsular soldier. I have not the slightest jealousy towards my dear and good friend Buchland, and if the den had been tenanted by hyenas, I should have ceded my place to him; but being in the very heart of my Silurian I was necessarily the commandant. He it is true got together some portion of the party, and after the harangue he amused that detachment, whilst I led the chief forces to the top of the Wren's Nest, and descanted on the exterior face of the surrounding country. The press got hold of his name, and forgot mine, so my operations had no recording poet. I give you the hint in case of a second edition of which I doubt not.....

Sir Roderick Murchison

The Hogg meeting last autumn was held at Dudley at the kind invitation of the Black Country Geological Society, who were celebrating their 25th anniversary. In addition to a first class programme of lectures that they had arranged, they also organised a visit to the extensive caverns underlying Castle Hill which were excavated as a result of Silurian ironstone mining in the early 19th century. The HOGG party followed much the same route as was taken by the British Association, and at the point where Murchison addressed the meeting in 1849 the task was carried out in 2000 by Hugh Torrens. The event in 1849 made a sufficient impression upon one of the attendees that he or she felt moved to record it in verse. Thus was created "The Dudley Gathering," the name which was in turn used to entitle our own meeting. The work comprised no fewer than 53 stanzas each of four lines and written in a didactic style befitting McGonagal rather than say Tennyson, for example:

Hurrah, for Sir Roderick Murchison
 HGurrah, for the noble Ward!*
 Hurrah, for the miners of England
 Society's basis and guard
 (* Lord Ward, owner of Castle Hill and its attendant mineral wealth)

Eleven stanzas later...

Quoth Roderick, "Look on this calm scene,
 These plains with riches fraught;
 Volcanic shores, convulsions dire,
 This wealth to us have brought.
 "In wanderings far o'er hill and plain,
 Upon this varied earth,
 From Cumbria to the Ural chain,
 I've seen these rocks crop forth.

When Murchison had finished speaking...

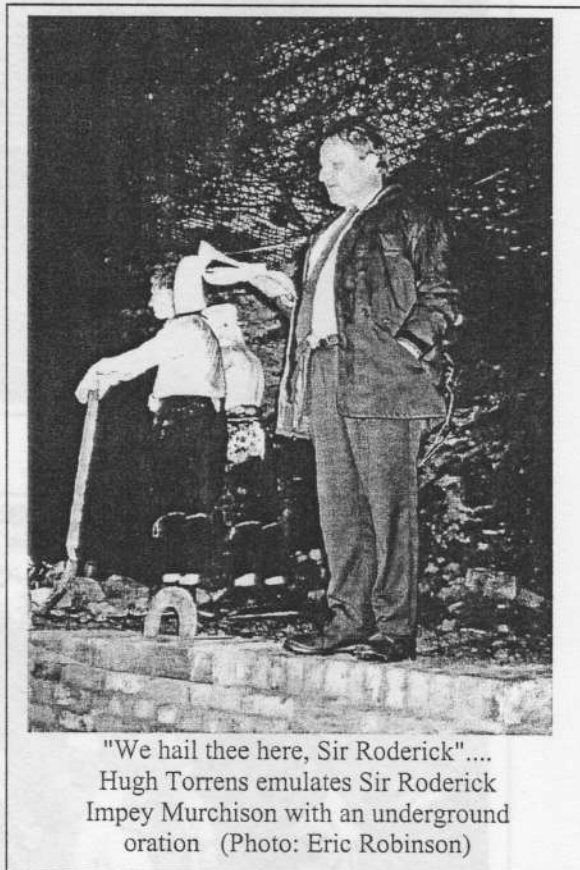
He ceased - then at his side uprose
 Oxford's prelatial Head;
 Hammer, not crosier, now he bore;
 Right generously he said:
 "We hail thee here, Sir Roderick
 A true Silurian King;
 Laurels of science nobly earned
 To wreath thy brows we bring."

and so on...

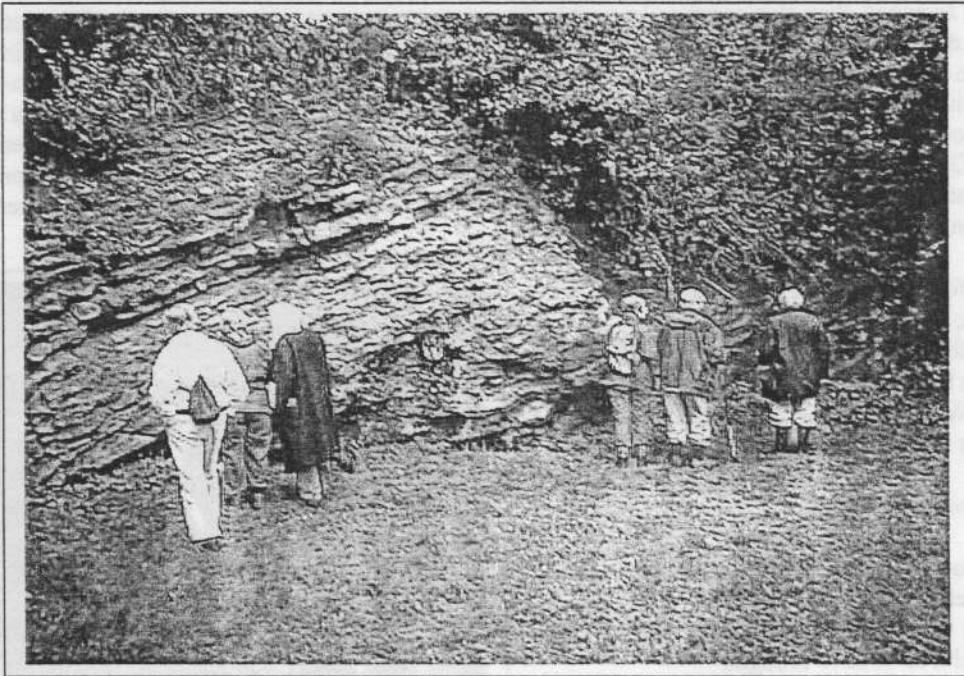
It was published as a ballad by Cornish Brothers, Birmingham and signed only with the letter "E". There was no indication of the tune to which it was to be sung. One doubts if it has ever been heard in full.

John Martin, HOGG Chair

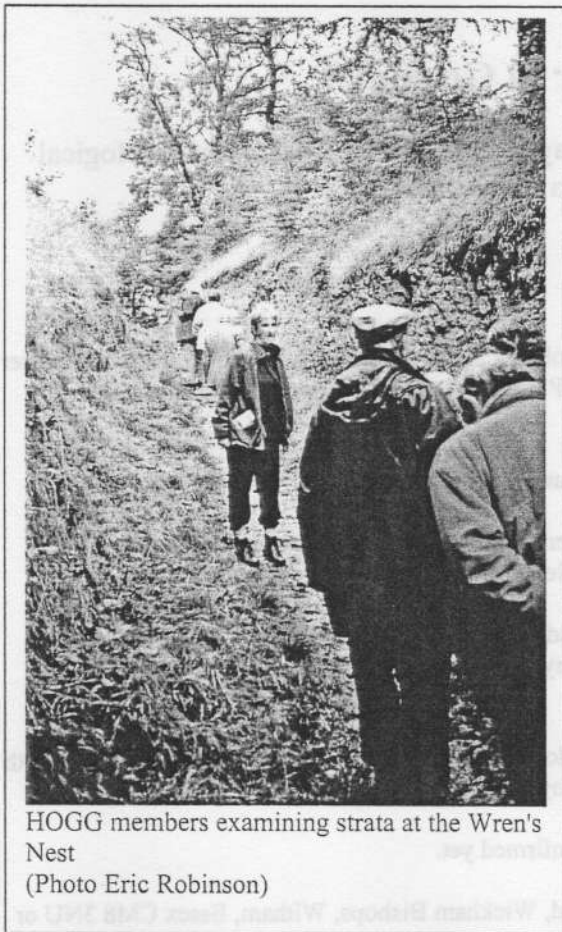
Editor's Note: Not many members attended this excellent meeting, those that did not missed a great event, but of those that did perhaps someone would like to enshrine in similar verse, Hugh Torrens' oration at the same spot.... The Editor would be pleased to see at least one stanza (not 53 PLEASE!) from anyone (whether on the trip or not).



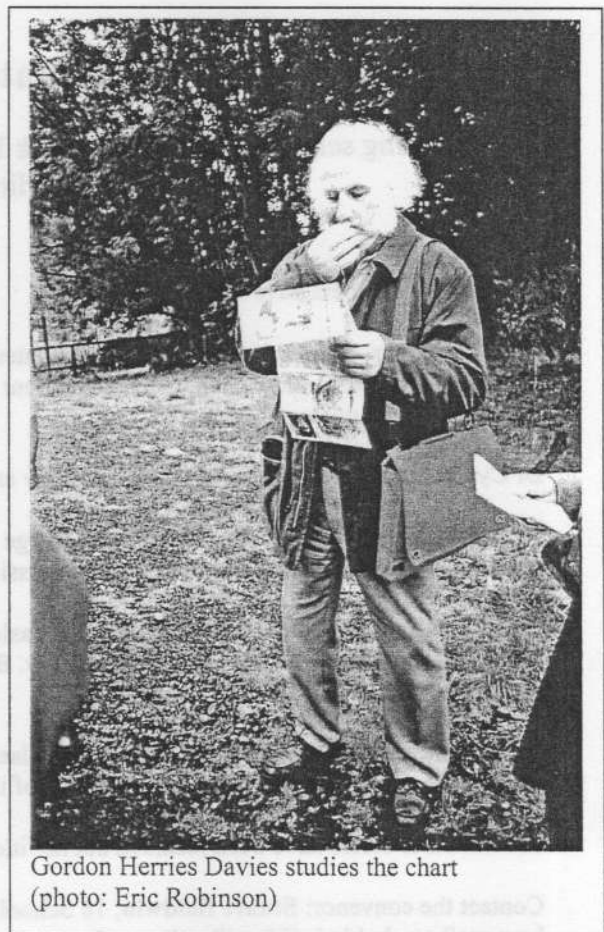
"We hail thee here, Sir Roderick"....
 Hugh Torrens emulates Sir Roderick
 Impey Murchison with an underground
 oration (Photo: Eric Robinson)



Alan Cutler of the Black Country Geological Society explains the finer points to the HOGG group (Photos: Peter Tandy)



HOGG members examining strata at the Wren's Nest
(Photo Eric Robinson)



Gordon Herries Davies studies the chart
(photo: Eric Robinson)

"150 Years of the Museum of Practical Geology"

Nearly 70 people attended this joint HOGG and GCG meeting to mark the 150th anniversary of the founding of the Museum of Practical Geology. Speakers starting with Simon Knell, talking about the earliest days, through to Bob Bloomfield of the Natural History Museum Exhibitions Department looking at the most recent developments and into the future, covered its entire history, and showed how despite being absorbed into the Natural History Museum in 1895, it still exists in many ways. In between, delegates were invited to a tour of the museum from Shuna Gibson one of the NHM's tour guides, and later to a walk to the Albert Memorial with Eric Robinson. Finally, back in the Natural History Museum, after hours, there was a toast dedicated to the Museum of Practical Geology.

A full volume of "*The Geological Curator*" published by the Geological Curators' Group, with papers from the speakers, is expected some time in the future.

HOGG in 2002...

"The Amateur in Geology"

A meeting scheduled for Thursday & Friday 14-15th March 2002, at the Geological Society, Burlington House, London

The following papers have been offered so far:

Anne O'Connor, on Hazzledine Warren, an amateur geologist and archaeologist, on the creation of a Lower Paleolithic industrial succession, the development of a Pleistocene framework and the links between archaeology and geology.

Dr Cynthia Burek, Women in Geology, are they amateurs or professionals?

Dr Patrick Wyse Jackson/Tom Sharpe, on George Robert Vine of Sheffield, Victorian amateur palaeontologist, bryozoologist and sometime fossil dealer.

Geoff Tresise, on the roles played by Henry Beasley and George Morton in devising a classification of Triassic footprints in the late nineteenth century. Beasley was a bookkeeper and Morton a painter and decorator by trade.

Stuart Baldwin, on W S Bisat, carboniferous palaeontologist and stratigrapher and one of the very few 20th century amateur scientists to become a Fellow of the Royal Society.

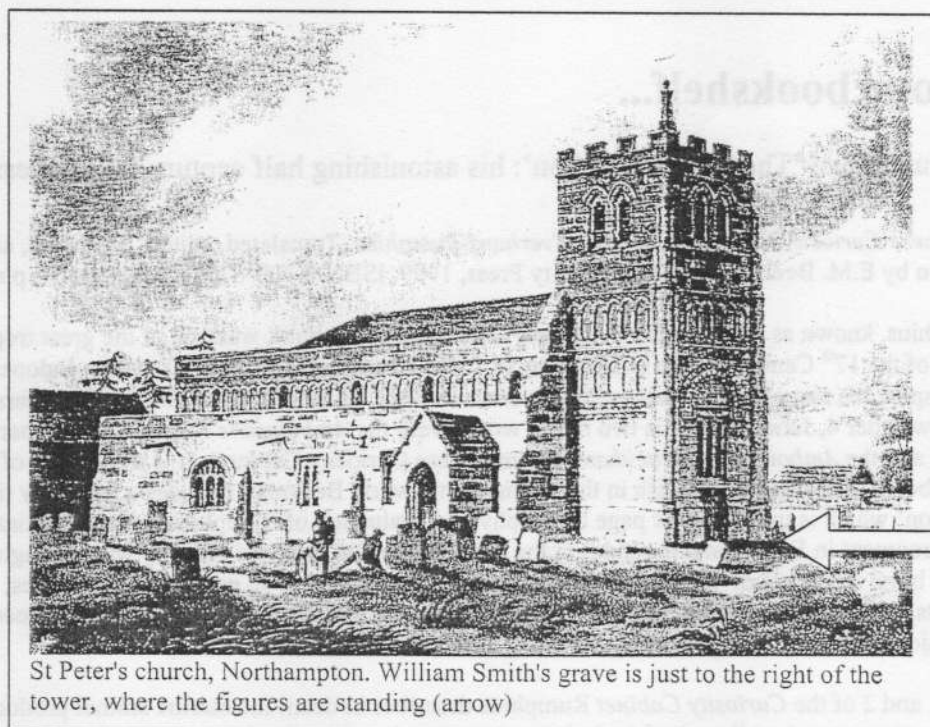
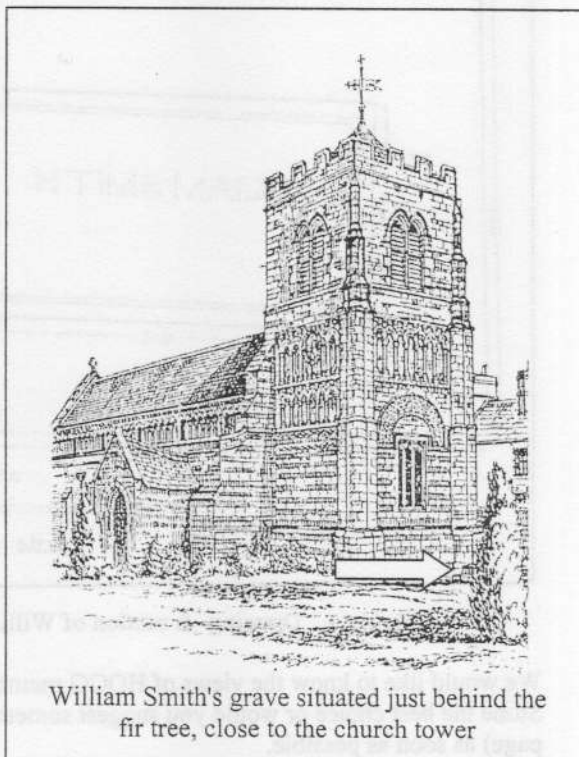
Several other offers have been received but no titles confirmed yet.

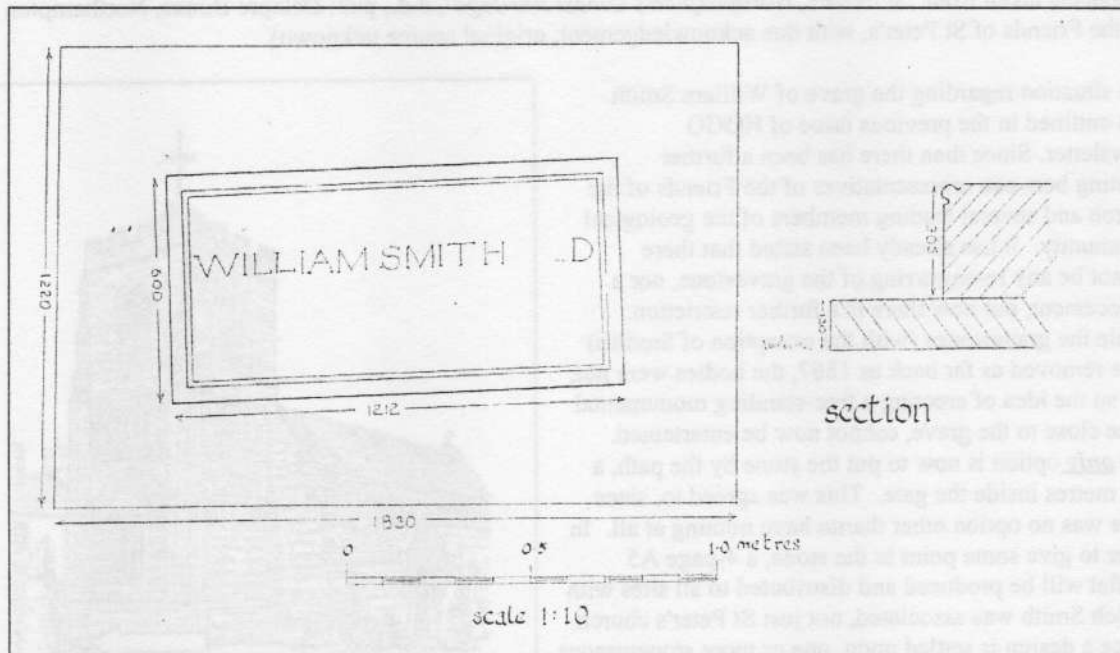
Contact the convenor: **Stuart Baldwin**, 18 School Road, Wickham Bishops, Witham, Essex CM8 3NU or by e-mail at: sbaldwin@fossilbooks.co.uk

William Smith - Is it graver than we thought!?

(woodcuts taken from "*St Peter's, Northampton's Oldest Heritage*", n.d., pub: Delapre Books, Northampton for the Friends of St Peter's, with due acknowledgement; original source unknown)

The situation regarding the grave of William Smith was outlined in the previous issue of HOGG Newsletter. Since then there has been a further meeting between representatives of the Friends of the church and several leading members of the geological community. It has already been stated that there cannot be any re-engraving of the gravestone, nor a replacement, but now there is a further restriction. While the gravestones (with the exception of Smith's) were removed as far back as 1867, the bodies were not, and so the idea of erecting a free-standing monumental stone close to the grave, cannot now be entertained. The *only* option is now to put the stone by the path, a few metres inside the gate. This was agreed to, since there was no option other than to have nothing at all. In order to give some point to the stone, a 4-page A5 leaflet will be produced and distributed to all sites with which Smith was associated, not just St Peter's church. Once a design is settled upon, one or more stonemasons will be approached for a detailed design. It is suggested that Hornton Stone might be an appropriate material.





Drawing & section of William Smith's grave as it now appears

We would like to know the views of HOGG members. Should there be a stone of any kind? Is Hornton Stone the best choice or would you suggest something else? Please let the editor know (address on front page) as soon as possible.

For your bookshelf...

Rumphius, 'The Sage of Ambon': his astonishing half century in Indonesia

The Ambonese Curiosity Cabinet: Georgius Everhard Rumphius. Translated, edited, annotated, and with an introduction by E.M. Beekman. Yale University Press, 1999. ISBN 0-300-07534-0. xxix, 567, plates LX

G.E. Rumphius, known as 'The Indian Pliny' and 'The Sage of Ambon', was one of the great tropical naturalists of the 17th Century. Born in Germany in 1627, he arrived in Amboina (eastern Indonesia) in 1653, and spent the rest of his life there until his death in 1702. (A brief outline of his life appears in the HOGG Newsletter 4, June 1996). His two major works were the *Amboinsche Kruidboek* (Herbarium of Amboina), and the *Amboinsche Rariteitkamer* (Amboinese Curiosity Cabinet). It is the second of these which has been translated into English in this monumental work. Beekman includes a modestly titled 'Introduction' which is in effect a 77 page biography and evaluation of Rumphius and the political and social environment in Europe and the Indies at the time. Rumphius' life was in many ways a tragic one: he was struck blind at the age of 42; his wife and a daughter were killed in an earthquake; his notes, manuscripts, and specimens were variously destroyed by fires, lost at sea, and dispersed by forced sale; and his two major works were not published until long after his death.

In Books 1 and 2 of the *Curiosity Cabinet* Rumphius describes in detail the marine animal productions (mainly crustaceans and molluscs) of Amboina and surrounding islands and similar imported objects, most

of which had never before been described or illustrated. Book 3 describes rocks, minerals, gems, fossils, and pre-historic stone and metal artefacts, and is of particular relevance to the history of geology. Rumphius deals with metals - gold, silver, various alloys such as the Indonesian *suassa*, and iron and how it was forged. He describes various minerals such as orpiment, realgar, marcasite, and asbestos, and their uses. Black ilmenite sand was used to blot the ink on written documents, and Beekman notes that this 'still rustles out of VOC [Netherlands East Indies Company] documents that were never consulted before'. Next Rumphius deals with gemstones including 'Cat's eye' chrysoberyl and opal, which were (Beekman points out) far more important in Asia than diamonds. Rumphius devotes much attention to stones or concretions reputed to be derived from plants and animals, known as *mestikas* or *guligas* and valued for magical or curative powers, as indeed they are today. Rumphius gives the first description and illustration of Indonesian prehistoric tools and weapons, which he classifies (according to the common belief in Europe and the East) as 'thunder stones' originating in the clouds. Among many curiosities described by Rumphius are 'stone crabs' imported from south China for their supposed medicinal powers. [One of two types illustrated (plate LX) appears to be *Macrophthalmus latreillei*, used in China at least as early as the Sung Dynasty. As recently as 1977, specimens of this fossil, derived from the Pleistocene of southern Thailand, enjoyed a brisk sale in Kuala Lumpur.]

Beekman makes the point that Rumphius, an accomplished linguist, developed a profound sympathy for Indonesian culture, and often took the side of the local people against the all-powerful VOC...nor did he scruple to lecture and criticize his European superiors...he has no hesitation in calling a native informant his "Master" and telling his readers that he could not have achieved what he did without the help of people he could easily have left unmentioned.'

The *D'Amboinsche Rariteitkamer*, in spite of its title, is far more than a dry catalogue of curiosities; the reason it was submitted for publication under that title (Beekman suggests) was that Rumphius was desperate to get at least one of his books into print in the face of the paranoiac secrecy of the Company Directors in Holland - he was attempting to exploit the current vogue for oriental 'curiosities'.

In this translation, and in the accompanying biography, bibliography and the 163 pages of closely written notes, Beekman makes available an important work in the history of natural history, and brings out the personality and beliefs of a major scholar and fascinating man who deserves to be better known. Bearing in mind that Rumphius was working in isolation, connected to other scholars only by long and tenuous lines of communication, in the face of hammer blows of fortune that would have crushed a lesser man, his achievements are astonishing.

Neville Haile

The First Fossil Hunters: Paleontology in Greek & Roman Times,

by Adrienne Mayor, pub Princeton University Press.

The ancient Greeks knew that human beings were not the first inhabitants of the Mediterranean world: classical myths painted a picture of primeval giants, monsters, and ancestral heroes who flourished and died out while mountains were still being formed. For proof, ancient Greek and Roman writers pointed to the enormous bones that continually emerged from the earth.

In fact the fossil remains of long extinct prehistoric creatures lie buried all around the lands known to the ancients. Today, palaeontologists are bringing to light rich deposits of the dinosaurs, mastodons, mammoths and other strange and colossal creatures that roamed Eurasia and North Africa millions of years ago.

But modern scientists are not the first fossil hunters in these lands. This book explores the earliest history of human encounters with large vertebrate fossil remains from the Mediterranean basin to the Himalayas. Beginning in the age of Homer and until the end of the Roman Empire, ancient people collected measured and recorded gigantic bones of extinct creatures. Adrienne Mayor demonstrates that fossil relics were displayed in Greek temples and Roman museums. She documents the first attempts to reconstruct the appearance of prehistoric creatures and to explain their extinction.

"We sailed to the island to view yet another giant skeleton revealed by an earthquake," wrote Philostratus in about AD218. "The bones were completely shaken out of their proper position, the backbone was in pieces, and the ribs were wrenched away from the vertebrae. But as I examined the entire skeleton and each individual bone, I got an impression of terrifying size..."

Long thought to be mere fantasy, the remarkably detailed and perceptive Greek & Roman accounts of giant bone finds were based on solid palaeontological facts. By reading these neglected and ancient narratives for the first time in the light of recent and exciting discoveries, Adrienne Mayor illuminates a lost world of fossil exploration.

(from publication information, via Stuart Baldwin)

"A Grounding in Science? John Murray of the Challenger, his grandfather John MacFarlane and the MacFarlane Museum of Natural History at Bridge of Allan", by Margaret B. Deacon, *Scottish Naturalist*, 111, p.225-265, (1999)

"The Life & Times of Richard Owen: Victorian Naturalist", by M.H.W.Parsons (transcript of a lecture to Westmorland Geological Society, October 2000), in Proceedings of the Westmorland Geological Society, no.28, p.9-12, (2000)

"In the steps of Adam Sedgwick along the Dent Fault" (transcript of a talk by Denis Sanderson to the Westmorland Geological Society), in *ibid*, p.16-17 (+map p.15)

Commentary on a British Geological Survey Computing Archive 1965-1985, by Dr T.V.Loudon, Technical Report WO/96/3. This report describes the growth and development of the use of computer methods in geology, particularly relating to mapping, as developed within the BGS. The critical documents relating to these developments are organised in a series of envelopes archived at the BGS library at Keyworth. These envelopes are listed, with contents, as an appendix to the report. It is good to see that an effort has been made to keep and store a modern archive.

Worth a visit....?

HUGH MILLER IN CONTEXT: THE EDINBURGH YEARS

A bicentenary conference to be held in the National Museum of Scotland on Friday 12th October 2001.

Celebrating the life & times of Hugh Miller, the geologist & writer

A one-day conference will be held at the National Museum of Scotland in Edinburgh on Friday 12th October 2001 as part of the bicentenary celebration of the life and times of Hugh Miller, the renowned geologist, folklorist & writer. This conference, arranged by the Cromarty Arts Trust, in collaboration with the National Trust for Scotland and the National Museums of Scotland, will launch a year-long celebration of the life & times of Hugh Miller who was born on 10th October 1802 in Cromarty.

Hugh Miller became the first editor of "*The Witness*" in Edinburgh in 1840, and was active in the movement which led to the Disruption in the Church of Scotland in 1843. He also wrote influentially about many social and political issues, and published popular works based on his passion for geology, and his travels throughout Scotland and England. He died in 1856 and 10,000 people attended the funeral. Charles Dickens and John Ruskin spoke highly of his writing.

He was a contemporary of Adamson and Hill, the Edinburgh-based pioneers of photography. David Hill's own bi-centenary also occurs in 2002, which will be celebrated by a major exhibition at the Scottish National Portrait Gallery.

The Edinburgh conference will feature well known speakers of the social and political events of the mid 19th century. This follows the well attended conference held in October 2000 in Cromarty, which dealt with Hugh Miller's early life & times.

The National Trust for Scotland maintains the Hugh Miller Birthplace Cottage in Cromarty, and is developing the adjacent Miller House for the celebrations in 2002. On 9th March 2002, the National Museum's of Scotland will open a major exhibition about Hugh Miller's life & work.

Tickets for the Edinburgh Conference at the National Museum of Scotland on 12th October 2001 will cost £35 (to include refreshments, buffet lunch & all conference papers).

Further information about registration may be obtained by contacting the Department of Public Affairs, National Museums of Scotland, Chambers Street, Edinburgh EH1 1JF.

IN MEMORIAM

Dennis Curry

18th May 1912 - April 2001

Dennis Curry, a philanthropist known to many geologists, died at the age of 88. He was born in Leicester, but spent his early childhood in Brighton before the family moved to Bournemouth. Following his father on fishing trips he became interested in Chalk fossils, and later Tertiary molluscs from the Eocene of Hampshire. It was expected that he would join the family business, but he won a scholarship to Jesus College, Cambridge, taking a double first in Natural Sciences. Despite a desire by himself and his tutors for him to stay in academia, he was persuaded to join the radio buying department of Curry's in London. Privately he continued research, & published his first paper in 1937. By 1938 he was a director of the firm. In the War he joined the RAF as a radio/radar instructor, & returned to the family firm as managing director, eventually becoming Chairman in 1967. He retired in 1984. Before then, he published many scientific papers, and was appointed visiting Professor of Marine Geology at University College, London. His knowledge of Isle of Wight Tertiary rocks was said to be "unsurpassed", and he helped map some 15,000 square miles of sea bed by core sampling. As a philanthropist he gave, in 1958, many Curry's shares to the Geologists' Association, of which he was President from 1963-1965, to create a charitable trust, as well as donations to the Geological Society to fund its publishing activities.

(abstracted from "The Daily Telegraph" Obituary columns, with due acknowledgement)

IN MEMORIAM

Professor Sir Kingsley Charles Dunham

2nd Jan.1910 - 5th April 2001

Professor Sir Kingsley Charles Dunham, died peacefully at the age of 91 on 5th April 2001. He was born in Sturminster Newton, Dorset, but moved at the age of 3 with his family to Brancepeth, Co. Durham. Following local education, he went on to read chemistry at Durham University, but met Arthur Holmes whose lectures converted him to geology. This led to a doctorate on the lead deposits of the Northern Pennine Orefield. In 1932 he went to Harvard on a Commonwealth Fellowship, returning to be appointed to the Geological Survey of Great Britain, eventually becoming chief petrographer. In 1950 he was appointed Professor at Durham, succeeding Arthur Holmes. After 17 years he was again called to the Geological Survey, as its new Director. His research into the distribution of ores in the Northern Pennines led to a postulation of a granitic mass at depth. Eventually he was able to secure funding for a bore-hole to be drilled to test the hypothesis. Granite was indeed found but it was 150m years older than the ores, and thus couldn't have influenced their formation. Away from research, he held 12 honorary degrees, the Wollaston Medal of the Geological Society, and the Gold Medal of the Institute of Mining & Metallurgy. He was elected an FRS in 1955 and received its Royal Medal in 1970. He was knighted in 1972. Of all the societies of which he was a member, it was the Yorkshire Geological Society which was dearest to him. Away from geology he was a accomplished piano player, but blindness in later life meant he was unable to sight read. This though did not stop him taking parties around Durham Cathedral, to have the geology of the building explained in detail.

(abstracted from "The Times" Obituary columns, 18th April 2001, with due acknowledgment)

Rock Stars (1)....

From Farmer-Laborer to Famous Leader: Charles D. Walcott (1850-1927)

by Ellis L. Yochelson U.S. Natural History Museum, Washington, DC 20560

A young Charles Doolittle Walcott. The back of this picture, copied from his daily pocket diary, bears the date 1873. At this time Walcott was living on the Rust farm, east of Trenton Falls, New York, and collecting fossils commercially with William Rust. Photographs of Walcott are easy to date relatively, because a few years after 1873, he grew a mustache. Subsequently, the amount of hair on both the top and bottom of his head was less in each succeeding photograph.



In today's vernacular, Charles D. Walcott was probably a high school dropout. Without formal scientific training, and Horatio Alger-like, he became an outstanding scientist, member and president of the national Academy of Science, director of the Geological Survey, and secretary of the Smithsonian Institution.

Walcott became interested in collecting local fossils before he was a teenager; it seemed to be the thing boys did in Utica, New York. His father died when he was two. The whole family was in the cotton milling business, and there is no indication that Walcott received any guidance into science from any of his relatives. Fortunately he met a retired curator from the New York State Museum who had moved to Utica, and it was Colonel Jewett who first gave him a notion of what fossils meant. It was equally fortunate that at age twelve, Walcott started spending summers at nearby Trenton Falls, New York, helping out on a farm during the Civil War. To the paleontologist interested in the Middle Ordovician, Trenton Falls is another name for heaven, for the rocks are crowded with fossils. Every rock in the farm fields was fossiliferous.

Walcott's schooling at the Utica Free Academy, where there were only two or three teachers, ended when he was 18, and he may not have graduated; the records of this period are lost. He tried working in a hardware store for a year, and hated it. At age 20 he went to live with William Rust, sometimes paying board and sometimes helping with the farming, which included spreading manure from the cows. Rust, a farmer who also was interested in the local fossils, showed Walcott where and how to collect and prepare. As collectors, Walcott and Rust were so food that in 1873 they sold one collection to Louis Agassiz, the preeminent naturalist of the day, for what would be \$70,000 in 1995 dollars. In 1879, Alexander Agassiz, Louis's son, paid them the modern equivalent of \$80,000 for another collection.

Walcott spent a week at the Museum of Comparative Zoology at Harvard in September 1873, unpacking and arranging the fossils he sold. This was his total involvement with college, but Professor Agassiz impressed Walcott with the importance of learning about the appendages of trilobites. Late, in the course of collecting at a quarry a few hundred yards from the farm house, Walcott noticed fragments that might have been of trilobite legs and hit on the notion of studying them by cutting thin sections. Cutting the rock and then grinding it down was all hand labor, but Walcott persisted through several hundred sections. No trilobite legs were known up to that time; in 1876 Walcott proved conclusively from the presence of jointed appendages that trilobites were arthropods.

A trio at Rust farm, Trenton Falls, New York. The center figure with the black beard and black hat is the young C.D. Walcott. The dandy on the right side of the picture is questionably identified as A.C. Peale, a geologist with the Hayden Survey and, later, the U.S. Geological Survey. The bearded older man is unknown, but he could be one of the elder members of the Rust family.

Smithsonian Institution Archives, Record Unit 95, Box 24, No. SA 187.



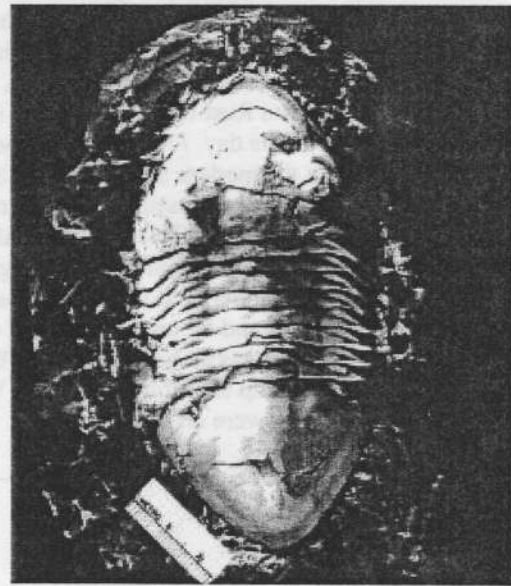
Late in 1876, Walcott became a special assistant to James Hall, the state paleontologist of New York, and the second most prolific paleontologist in the world. Hall had known Walcott for years and kept stating that he would buy Walcott's collection. R.P. Whitfield had left, and Hall was in need of an assistant, especially to run operations during 1877 when he went to Europe. Another volume of the *Paleontology of New York* had to be seen through the press, and the collections and exhibits in the New York State Museum were in terrible shape. Hall was autocratic and operated generally by terrorizing his assistants; Walcott is the only one who did not coauthor with Hall and who continued to publish under his own name.

Walcott was employed for little more than a year, but he remained in Albany, where he learned a great deal from studying Hall's collections and library; he also learned practical politics from lobbying for Hall in the state legislature. By good fortune, he was hired in July 1879, as one of the original members of the new

United States Geological Survey. Hall had written a letter of support for Walcott, but it was R.P. Whitfield who obtained the position for him.

Walcott's first year was as a temporary geological assistant at \$50 per month. He worked on the Colorado Plateau and found the position of the Paleozoic-Mesozoic boundary in the course of measuring a section from the Cenozoic-Mesozoic boundary in southern Utah down to the Devonian at Kanab Creek in the Grand Canyon, more than two miles of rock. His work was so satisfactory that he was given a permanent position as assistant geologist and a 100% raise, to \$100 a month. Although Walcott made contributions to paleobiology, throughout his career with the USGS his efforts were directed to biostratigraphy--advising field geologists on the age of sedimentary rocks by studying fossils.

Isotelus gigas (DeKay) from the Rust farm. The matrix is late Middle Ordovician limestone of the Trenton Group. This beautifully preserved trilobite is representative of the quality of the fossils that Walcott and Rust sold to Louis Agassiz. On the matrix are tool marks, an indication of some of the careful preparation done; in later years, William Rust worked for the U.S. Geological Survey as both a collector and preparator. Walcott's Rust farm trilobites, which had the appendages preserved, were more significant biologically than this specimen, but they were studied by cutting thin sections and are not photogenic.



If there was ever a geologist who deserves to be better known in America, and incidentally one who had the most inappropriate middle name, it is Charles Doolittle Walcott. In 15 years, he wrote a major monograph on Paleozoic fossils of the east, resolved the fundamental stratigraphic problems of the position of the "Taconic" system, confirmed the sequence of trilobite zones in the Cambrian, and summarized the stratigraphy of the Cambrian System of North America.

In 1894, Walcott became the third director of the U.S. Geological Survey; he served for 13 years in this post. Toward the end of his directorship, John Wesley Powell had gotten crosswise with Congress. The Congress slashed the budget of the Geological Survey and then when that did not work they slashed the salary of Powell. When Walcott took over, it was at a lower salary than Powell had received and it was to head a nearly broken organization. In just a couple of years, Walcott had the agency back on track. The USGS then expanded into work on water resources, more topographic mapping, and study of the national forests. While Walcott was administering all these different activities, he was still an active scientist. He wrote on Cambrian jellyfish and Cambrian trilobites from China, and he made significant advances in the understanding of Precambrian life. During this interval, Walcott also did most of the preliminary study for U.S. Geological Survey Monograph 51, *Cambrian Brachiopoda*, for which the volume of plates is as thick as the volume of text. Also during this time, Walcott essentially ran the Carnegie Institution of Washington (1902-1905) and deserves full credit for establishing the Carnegie Institution of Washington Geophysical Laboratory.

In 1907, Walcott became the fourth secretary of the Smithsonian Institution. He immediately began a program of field investigations, mainly in Alberta and British Columbia, and he was in the field every year until 1926. His research program was essentially the same as when he was at the USGS: to make known the stratigraphy and paleontology of the pre-Trenton rocks.

Walcott worked long and hard on the stratigraphy and paleontology adjacent to Banff, Alberta, though he had two significant distractions from his field program. First, he was the first geologist to attempt

geologic investigations around Mount Robson, the highest part of the Cambrian Rockies. Second, he found the Middle Cambrian Burgess Shale and its incredible biota. Walcott collected for five seasons to bring this treasure trove back to civilization. He described the fossils, both animal and plant, of the incredible deposit, and then continued on with the stratigraphy and paleontology of the overlying beds.



Charles Doolittle Walcott, in 1913, posing with a pry bar in the fossil quarry he opened to collect from the Middle Cambrian Burgess Shale. In five seasons, he obtained more than 50,000 specimens from this locality, by splitting slabs day after day. In 1907, Walcott began a systematic study of the Precambrian and lower Paleozoic rocks of western Canada. His discovery of spectacular fossils in 1909 distracted him for some years from his basic program, but he was able to study the Cambrian rocks and fossils of the region and made a start on the Early Ordovician. His last field season was in 1925.

Walcott had at his disposal the Smithsonian Miscellaneous Collections and was never one to waste an opportunity. He filled five entire volumes of that series. James Hall was the most prolific writer on American fossils, but if Walcott was not second, I cannot imagine who deserves that place. Besides doing research part-time while running the Smithsonian Institution, Walcott had other duties. After 10 years as vice-president of the National Academy of Sciences, he became president (1916-1922). Before the start of World War I, G.E. Hale, the astronomer, and Walcott had formed the National Research Council, and they applied science to warfare, setting a pattern for the years of World War II, 1941-1945. Quite apart from all this, Walcott decided that research on aviation was lagging in America. He steered the National Advisory Committee for Aeronautics through Congress and was its chairman for years. NACA is no more, but it laid the foundation for the National Aeronautics and Space Agency. If there is a great-grandfather of the space age, it is the paleontologist Charles Doolittle Walcott.

For more on Walcott:

Yochelson, E.L., 1967, Charles Doolittle Walcott, 1850-1927:

National Academy of Sciences Biographical Memoirs, v. 39, p. 471-540

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Rock Stars (other)....

SONIC GEOLOGY PRODUCES BIRDSONGS OF THE MESOZOIC!!

Alas,..... it is not possible to claim that any songs emitted by protobirds can be deduced by a new process of sonic geology, as the headline might suggest (but maybe one day....????). Instead, this is an album by a rock band (appropriate perhaps) called *Sonic Geology*. The album cover (below) features a silhouette of an archaeopteryx-like bird against a kind of stratified background.

