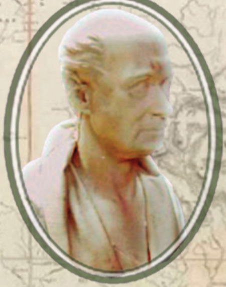
G. B. Greenough & 'his' geological map p.4

HISTORY OF GEOLOGY GROUP



A
Geological Map
OF
ENGLAND & WALES
BY
G. B. Greenough Esq.
President of the Geological Society
F.R.S. F.L.S.
This Map is accompanied by an Explanatory Memoir.

GeoHistories

the magazine of the History of Geology Group

No. 72 October 2021

GeoHistories

No. 72 **October 2021**

Contents

Editorial

I must begin by thanking the many people who sent encouraging comments following the publication of the first issue of *GeoHistories*. I can only hope that this second number lives up to any expectations that it may have created.

A large part of the current issue is devoted to reporting on HOGG's very successful Greenough Map Conference, held last May. Whereas we have long moved on from Thomas Carlyle's view that 'The history of the world is but the biography of great men', it remains important for historians to examine the lives of actors in the historical narrative. Just occasionally perhaps, we may also be allowed to celebrate their achievements. George Bellas Greenough, like most men, was a complex individual. As well as triumphs, a full account of his life would undoubtedly reveal vulnerabilities and flaws – hinted at in Simon Knell's 2009 paper, 'The Road to Smith', and asserted more emphatically by Hugh Torrens in his recent 'Pills & Politics' presentation to the Geologists' Association. But on this occasion, the 200th anniversary of the publication of the Geological Society's geological map of England and Wales, it was fitting to explore those aspects of Greenough's life that contributed to the production of this, 'his', map, as well as the legacy of the map itself. I am grateful to the various contributors to this conference for providing such clear and succinct accounts of their own presentations.

Thanks also go to Sandra Freshney and Chris Duffin for 'writing up' their own talks, and to the several authors who have volunteered book reviews (Duncan Hawley, John Henry and Douglas Palmer) and articles for this edition. The historian E.H.Carr likened historical facts to fish swimming in a 'vast and sometimes inaccessible ocean', going on to say that what historians 'catch' will depend on the part of the ocean in which they choose to fish. We are blessed in HOGG to have members fishing in some very different waters and bringing up for us a wonderfully varied diet of articles. These range from Hugh Torrens' endlessly fascinating Lost Books appeals (with, this time, some direct responses from Chris Toland), through the account by Sue Newell and Tom Sharpe of the discovery of a 'lost' Mary Anning fossil, to Phil Stone's appreciation of William Speirs Bruce – a perhaps lesser known 'great man'. Professor Frank James of UCL has kindly contributed a piece on Humphry Davy's geological interests, and I would urge anyone with a minute or two to spare to sign up to help transcribe Davy's notebooks (details given in Frank's article.)

Our 'regular slots' are filled by John Henry and Consuelo Sendino, whose contributions I know you will take pleasure in, and we once again thank Nina Morgan for providing a fascinating conclusion to the issue with her 'Tailings…'.

Finally, I must mention the visit to Kensal Green Cemetery, so ably recorded by Phil James. I have high hopes, following Duncan Hawley's earlier suggestion in Newsletter No. 70, that this may be the first of a series of articles on the 'final resting places' of geologists around the country. As always, all contributions gratefully received!

Peter Lincoln
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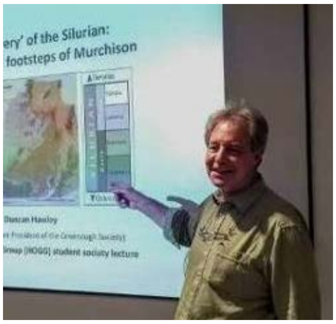
Comment from the Chair

Duncan Hawley



Sometimes history can work in reverse. Recent events somehow affect the past – or at least how we interpret it. I am thinking about reputations, and specifically those of earlier geologists. The 'default' position considers only the impact a geologist had on the development of the discipline. Those who, through their work, initiated, provoked, pioneered or consolidated significant advances in geology were rewarded with a 'good' reputation. Of course, the question as to what *is* significant begs discussion and debate.

However, I suspect HOGG members would mostly agree about those who deserve the reputation of being a 'geological great'. William Smith?, Lyell?, Murchison?, MacCulloch?, Buckland?, Sedgwick?, Lapworth? Peach and Horne (should these be separated)?, Arthur Holmes?, Dan McKenzie? – plus many other names not possible to list in the space here. For historical reasons, women get less of a look in, despite HOGG's recent efforts to raise the profile of women's contributions and redress the balance. While Mary Anning is undoubtedly the foremost of the female 'geological greats', others are beginning to be more widely acknowledged; Mary Buckland, Gertrude Elles, Catherine Raisin and Dorothy Rayner, to name but four. For information on these, and many other women in geology, past and recent, visit https://trowelblazers.com.

These lists are of course very British-centred. They would look very different from a continental perspective – what about H.-B. de Saussure? Georges Cuvier? Leopold von Buch? Alexander von Humboldt? Pentti Eskola?, to name yet another few. And there are many others who deserve a 'reputation'. It is a somewhat subjective business, but nevertheless debating reputations is an interesting and useful pursuit, not least because it throws light on selectivity (scientific and political) in geology.

As historians of geology our interest must include the background biographical elements that provide context to the thoughts and actions of our subjects. The history of geology is as much about empathy as it is about scientific understanding, and it is contemporary material and archives that allow us to examine status and reputations in context.

Recent events have put a focus on our colonial past, causing reputations – including those of some geologists – to be re-examined. Henry De la Beche, founder of the (British) Geological Survey and a key player in the early development of scientific geology, has come under particular scrutiny for his inherited ownership of a slave plantation in Jamaica.

The history of geology is inextricably entwined with the enterprise of Empire, which was, after all, the prevailing social and political paradigm during the discipline's foundational years. HOGG members may have read the article 'Decolonising geoscience' by Caroline Lam, Geological Society Archivist, in Geoscientist Magazine: https://geoscientist.online/sections/features/decolonising-geoscience

The Geological Society has recently set up a 'Memorialisation Working Group' to examine what to do with reputations, and how to respond to materials in their archive. In response, our HOGG Committee had a weighty discussion about the appropriate approach to such matters. Context, we felt, was all important in understanding how matters were and how they played out in the development of geology. No expunging or sweeping under carpets; only an honest examination of context will provide that empathy required to evaluate whether reputations (social or scientific) need to be reinterpreted. Only such exposure can precipitate learning that will properly balance current sensitivities with the past workings of our geology and geologists. HOGG is represented on the Working Group by Andrew Hopkins.

Speaking of reputations, George Bellas Greenough has, arguably, had a 'bad press' over the years: variously portrayed as a 'snob' who snubbed the 'practical men' of geology, or as a villain accused of plagiarism. The HOGG conference reported in this issue tried to provide some balanced context to Greenough's reputation and his approach to geological mapping. Read on to decide if his reputation is deserved.

While on the subject of Greenough, HOGG members might be interested to know that they can now purchase a high-quality facsimile of the GBG 1st edition map and memoir from the BGS Shop at £39.99 – just google 'BGS Shop Greenough'. I recommend it. The provenance of this facsimile and its accompanying memoir is interesting. The map is number 189, originally sold to Count Bardi, Director of the Museum of Florence, Italy in 1827, when the transaction was on the 'orders' of Greenough himself. Bardi was heir to the Grand Duchy of Tuscany. The Museum itself was also a teaching institute specialising in courses of applied geology and mineralogy (including agriculture). Subsequently the map seems to have found itself in the collection of French naturalist and explorer Alfred Grandidier (1836-1921) and latterly it was sold to the BGS by a Dutch auction house for £750. The memoir facsimile is taken from a copy that belonged to Murchison. Scribbled on the rear page of the original there are a few notes about inaccuracies on the map, but these do not appear in the reproduced version by BGS.

Another Greenough initiative, to conserve his map collection, is underway at the Geological Society. HOGG Members might like to support and be associated with it – see extract from the Geol. Soc. website on page 12 of this issue.

Duncan Hawley: duncan.hawley.hogg@gmail.com

The Geological Society's Map:
understanding George Bellas Greenough and his 1820 geological map project

An Online Conference, Wednesday 12 May 2021

This conference was jointly convened by Duncan Hawley (HOGG) and Professor Ian Wood (Dept. of Earth Sciences, University College London) in association with UCL's Greenough Club and its alumni.

Conference Overview

Piotr Krzywiec

The Covid pandemic has caused many problems for our group, but it has also created new opportunities. Travel restrictions have prevented in-person attendance at meetings and conferences, but have also led to more online participation which has, without doubt, allowed more people to join conferences of interest. This is what happened to me recently – on 12 May 2021 I had a chance to attend, from the comfort of my chair at my home in Warsaw, the very interesting conference entitled "*The Geological Society's Map: understanding George Bellas Greenough and his 1820 geological map project*". The program was extensive and diverse, with superbly prepared talks, all richly illustrated and excellently presented. An accompanying book of abstracts was available giving extended abstracts of the talks, all nicely illustrated, together with short biographies of the presenters. The online event itself ran quite smoothly, without any major glitches, and with enough time for interesting discussions and Q&A.

George Bellas Greenough, portrait by E.U.Eddis, c.1830 *Public Domain*

Duncan Hawley, the current Chairperson of HOGG, started the conference with an overview presentation on the life and key achievements of George Bellas Greenough. This set the scene for the entire meeting and provided us with a great deal of information regarding Greenough's life and work.

Maximiliaan van Woudenberg then focused on an important and formative period in Greenough's life when he was a student at the University of Göttingen, where he went to study law – before switching to his lifelong passion: geology and mineralogy. Allison Ksiazkiewicz sketched in the wider panorama of the early-nineteenth-century London society within which Greenough had functioned. She discussed the influence of art and sensibility on geology in its early days. Peter Lincoln analysed the connections that Greenough established with the Oxford geologists, using letters that two prominent members of the 'Oxford Geological Club', William Buckland and William Daniel Conybeare, exchanged with Greenough. Next, four talks by Hugh Torrens & Geoffrey Walton, Duncan Hawley, Tom Sharpe, and Karen Severud Cook, focused on Greenough's main achievement: his Geological Map of England & Wales and its accompanying Memoir. They provided very detailed accounts of how the map was devised, produced and published, all set against the context of other relevant publications of the era. The presentation by David Bate discussed the influence that Greenough and his work had on later geological cartography, in particular on the colour code used to depict rock of various ages and lithologies. Then, following this theme, Duncan Hawley, in his third talk at this conference, discussed how Greenough's map was used by other cartographers as a point of reference or rather a direct source of information. Citing no fewer than fifteen relevant examples, Duncan explained how the Greenough map eventually became a 'standard' for subsequent geological maps of England and Wales. The last talk of the day, by Christopher Toland, teleported us from the UK to India to discuss another great – but less well-known – achievement of Greenough's: the large-scale geological map of the entire Indian sub-continent entitled "General Sketch of the Physical and Geological Features of British India".

I'm sure that all attendees enjoyed this Greenough conference, and HOGG should be congratulated for organizing such an event. It would be great if all extended abstracts could eventually be published as full papers in a separate volume. They surely deserve this, and I'm sure that such a volume would be very well received.

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Paper 1 George Bellas Greenough – a short biography

Duncan Hawley

Greenough was born in London, as George Bellas. His father, also George Bellas, was a civil lawyer. His mother, Sarah, was the daughter of Thomas Greenough, a successful apothecary whose patented preparations and tinctures had brought him great wealth. Young George was orphaned at the age of six and adopted by his grandfather Thomas. At the age of 12 he inherited a considerable fortune in land and property from his father and when his grandfather died in 1795 he also inherited much of the Greenough wealth, taking also, at his grandfather's request, the family name.

Aged 6, George entered Mr Cotton's School at Salthill near Slough. At 10 he spent a year at Eton, then six years at Dr. Thompson's School in Kensington, before going up to Peterhouse Hall, Cambridge to study law. He completed three years study but scruples about subscribing to the 39 Articles, which he believed "…are now wholly exploded from the creed not only of all sensible layman also many dignitaries in the church", prevented him from taking his degree. Although clearly dissenting, Greeenough was not strictly a Dissenter.

In 1798, he began further legal studies at Göttingen, but, finding to his surprise that the teaching was in German rather than Latin, he attended Blumenbach's natural history lectures to improve his fluency in that modern language. However, Blumenbach's lectures proved more inspiring than the law, and Greenough switched his attention to mineralogy and geognosy. He also fell in with a group of English companions, including Samuel Taylor Coleridge with whom he formed a close friendship and made mineral-collecting excursions. These were formative times for Greenough, who, in 1799, confessed to his guardian that a "great object of my labour must ultimately be my happiness […] I am sure I could never pursue with ardour the employment of any profession unless I considered it probable that I should by that means render myself eminent in that profession". He then declared that, since the Law was not to his suiting, he should like, instead, to become a "Gentleman-Philosopher".

Between 1801 and 1806 Greenough made several tours – in England, France, Italy, Scotland and Ireland. In Ireland he became concerned with political questions and between 1807 and 1812 he sat as MP for the 'rotten' borough of Gatton, voting always by his conscience rather than any party line. Also, from 1803, he served in the exclusive Light Horse Volunteers of London and Westminster but very publicly resigned his commission in 1819 following the Peterloo massacre, which he regarded as a political abuse of military power. Together with his earlier objection to the 39 Articles, these actions clearly paint him as a man with "firmness of principle".

Greenough was active in numerous scientific and cultural societies or institutions. Between 1801-1807 he worked on chemistry under Humphry Davy and William Wollaston at the Royal Institution. He was elected FRS in 1806 and the following year was one of the founders of the Geological Society of London (GSL). He later resisted the GSL's incorporation into the Royal Society and, in 1811, ensured its independent constitution, becoming its first president. In 1830 he helped found the [Royal] Geographical Society of which he was president from 1839-1841. From its inception in 1831, Greenough was closely associated with the BAAS (now the British Science Association). He was a member of the Royal Asiatic Society and also supported the Society for Diffusion of Useful Knowledge (SDUK).

In 1819 Greenough published *A Critical Examination of the First Principles of Geology* – to mixed reviews. In it he attempted to evaluate the state of popular theories about geology. He was not against theory *per se*, but thought the systematic collection of evidence should precede any attempt to formulate a grand theory. On his Scottish tour of 1805 he sought to evaluate the Plutonist and Neptunist theories and generally concluded that neither was entirely satisfactory as an explanation of the observable facts. He visited the 'Parallel Roads' of Glen Roy and, based on his own observations, was the first to suggest them to be the successive beach-levels of a former lake, despite being troubled that he could find no evidence of any confining barrier.

The 'Geological Map of England and Wales' had occupied Greenough since 1809. A first draft of the map was ready by 1812, but publication was delayed in order to produce a base map that could accurately portray relations

Geological Map of England and Wales, by G.B.Greenough, published by the Geological Society, 1820 (Duncan Hawley Collection CC BY-NC-ND) between the topography and the underlying strata. Completed by 1814, it took a further five years to add the geological detail to Greenough's satisfaction.

The map was finally published in May 1820. It bore his name, not least because he underwrote the cost of its production. Greenough rejected accusations that he had plagiarised William Smith's 1815 map. Although he clearly used information from Smith, he claimed quite legitimately that he had made his compilation from many sources, and that any map showing the true distribution of rock groups would inevitably look similar. A presentation copy of his map was given to Smith by the GSL (Number 20).

Greenough's wide interests included architecture and in 1822 he built a fine classical-styled villa on the edge of Regent's Park. Designed by his friend Decimus Burton, Grove House had a purpose-built map and mineral rooms as well as a library, but, peculiarly, no bedroom wide enough for a double bed. Greenough also delighted in the two-acre garden surrounding the house.

In 1826, together with geological friends, Henry Warburton and Leonard Horner, Greenough helped found the University of London (now UCL) and in 1841 he worked to appoint Thomas Webster as its first Professor of Geology. Greenough bequeathed his fossil collection to UCL where, later, the student geological society was named after him and where the Greenough Papers are now held in the Library Archives.

From 1820 Greenough worked to improve his map, issuing a second edition in 1840. However, by 1843 he was working on another grand project. Using his ability to marshal information from scattered sources he published his *General Sketch of the Physical and Geological Features of British India* in 1854. It was the first geological map of the sub-continent.

Greenough's diaries show that by the early 1850s his health was failing. He died from a heart condition, aged 76, in the Italian city of Naples, where he had begun research to connect his work on India with the geology of Europe. He is buried in Kensal Green Cemetery, West London.

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Paper 2 Greenough and Göttingen

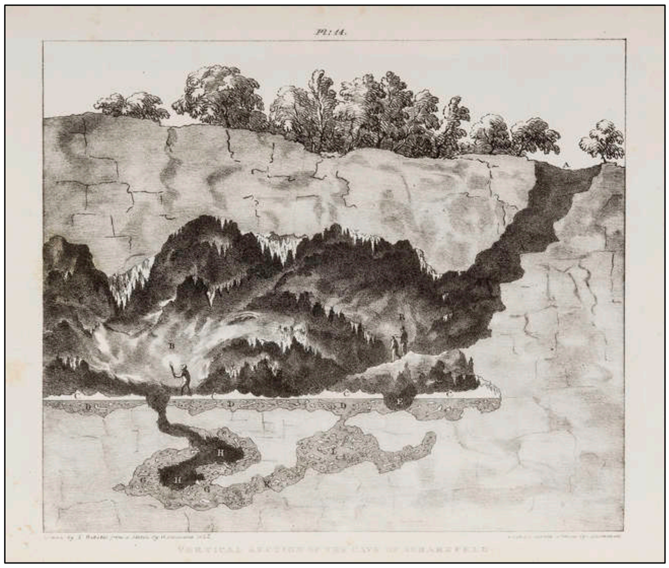
Maximiliaan van Woudenberg

During the last quarter of the eighteenth century, Romantic-era figures such as Samuel Taylor Coleridge, Thomas Young, and George Bellas Greenough attended the University of Göttingen, arguably Europe's most celebrated university at the time. This paper filled in many details of this largely neglected formative period in Greenough's life.

Within nine months of his arrival in Göttingen Greenough had discovered his lifelong passion for geology and mineralogy. This led him to drop the law, claiming 'all lawyers are rogues'. As he wrote to the lawyer, William Hunt, 'If I do not like to be a lawyer you will very naturally ask me what shall I do? What should I like to be … an inspector into nature, a prayer into other men's business or in one word – a Gentleman-Philosopher!!!' How did this come about?

Göttingen was a 'Reform' university, funded by the state and free to teach secular subjects including history, law, politics and natural history, which it did with a great emphasis on a historical-critical method, using not just textural sources but also material objects. It also had a fine library – the best in the world according to Coleridge – which Greenough made great use of, borrowing 45 of its books (compared to the 6 he borrowed over three years at Cambridge).

Soon after arriving in Göttingen in September 1798, Greenough enrolled in Professor Blumenbach's famous and popular natural history course. In addition to teaching mineralogical theory, Blumenbach showed his students how and where to obtain specimens. Inspired and guided by this, in May 1799, Greenough, Coleridge and Charles Parry made a specifically geological expedition (as distinct from a typical Romantic walking tour) into the Harz mountains, where, guided by up-to-date mineralogical guidebooks, they visited caves and quarries and collected many specimens.



Unicorn Cave, Scharzfeld, visited by Greenough on his Harz tour of 1799. Drawing from Buckland's Reliquiae Diluvianae*, 1823* *(Duncan Hawley Collection CC BY-NC-ND)*

In Germany, Greenough also enjoyed an active social life, associating with German students and other Englishmen. He played in a string quartet in Göttingen, visited the opera and theatre, and made trips to cities such as Vienna and Berlin.

The paper concluded by sketching some of the ways Greenough applied his Göttingen studies after he had returned to England, and exploring the implications of his Anglo-German knowledge-exchanges during the Romantic Period.

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Paper 3 Greenough's aesthetic cultures of science

Allison Ksiazkiewicz

While romantic landscapes and wilds of nature characterized the remote regions in which geological travellers observed the structure of the earth, the city of London, where the young Geological Society met, debated and published their observations and theories, was a world dominated by aesthetic sensibilities and fashions.

Buildings that hosted centres of intellectual and scientific engagement projected ideas of progress and identity through visual references to ancient cultures of art and science. Somerset House in London, which housed the Royal Society, the Society of Antiquaries and later the Geological Society of London, was designed with ancient sources in mind.

Fingal's Cave, Staffa - drawn by James Skene who accompanied Greenough for part of his tour of Scotland in 1805 (reproduced by permission of the Geological Society of London)

The homes of private individuals likewise projected the public persona of their 'cultured' owners through design. The Neoclassical-inspired residence of George Bellas Greenough (1778– 1855) doubled as a domestic space and as a site for gatherings and meetings dealing with the young Geological Society.

Grove House, Regent's Park, designed for Greenough by his friend Decimus Burton (Duncan Hawley Collection. CC BY-NC-ND)

Grove House, as it is called, was constructed on the lush grounds of Regent's Park, a playground for urban gentility. As geology developed within private and public topographies of good taste in the early nineteenth century, a question remains: how did the new science embody these aesthetic sensibilities?

One way that aesthetic conventions dovetailed with the new science of geology was through the visual and cultural context of the history painting genre. The final decades of the eighteenth century saw a reconfiguration of historicism that increasingly focused on the private lives and motivations of protagonists in the history painting genre. New depictions of civic virtue in painting invited the viewer into the scene as a participant of the past and marked a monumental shift in how the middling class related to historical subjects. *A Geological Map of England and Wales* echoes many of these trends: it is representative of civic duty, good geological knowledge, and is at once a private and public document. Like William Buckland who described the geologist as 'the first and only historiographer' of rocks that 'record the warfare of ages antecedent to the creation of the human race', Greenough settled on the analogy of 'historian' for thinking about the role and work of the geologist. *A Geological Map* represented the communal nature of establishing geological 'facts', as notes and observations were collated from other members of the Society and beyond. In rural areas, the physical marks left of ancient political geographies commonly revealed something about the character of the terrain. Greenough included elements of human physical geography in his geological map 'wherever a connection can be traced between them and the strata beneath'. Tensions between practical utility and an aesthetically pleasing map were resolved by balancing the visual weight of each coloured stratum equally. Interpretation of these elements depended on connoisseurship that unified individual parts into a harmonious whole. As John MacCulloch noted, 'experience must still be the guide', as 'a glance will teach more than long descriptions.' In conclusion, the map's moral picture, in particular its relationship to a human-based history and readership, exhibits motivations and cultural currents sympathetic to contemporary history painting and its theory.

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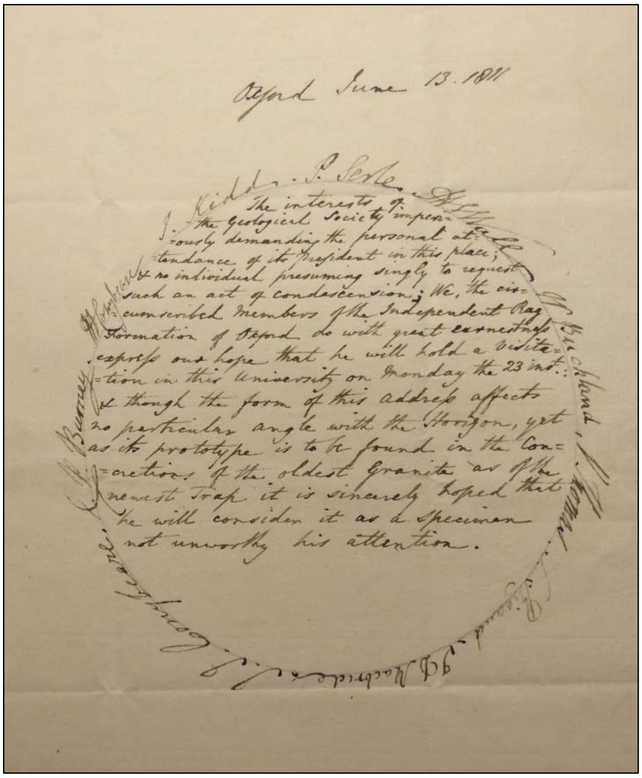
Paper 4 Greenough and the Oxford connection

Peter Lincoln

When George Greenough visited Oxford in 1810 he became acquainted with a small group of university men who, like himself, were absorbed in the study of the newly developing science of geology. The group included established professors and newly matriculated undergraduates – all brought together through attendance at the series of mineralogical lectures given by the professor of chemistry, Dr John Kidd.

Enjoying the fellowship that derived from the pursuit of a common interest, these men saw themselves as an informal geological club. Some went on to make significant contributions to the science; for others geology was little more than a passing interest. George Greenough, the gentlemanly president of the recently formed Geological Society of London, was an attractive figure whose intimate acquaintance they sought to nurture.


Oxford June 13. 1811

The interests of the Geological Society imperiously demanding the personal attendance of its President in this place; & no individual presuming singly to request such an act of condescension; We, the circumscribed members of the Independent Rag Formation of Oxford do with great earnestness express our hope that he will hold a visitation in this University on Monday the 23 inst: & though the form of this address affects no particular angle with the Horizon, yet as its prototype is to be found in the Concretions of the oldest Granite as of the newest Trap it is sincerely hoped that he will consider it as a Specimen not unworthy his attention.

Kidd

Conybeare

The 'round-robin' invitation to GBG to attend the 'Independent Rag Formation of Oxford' on 23 June 1811, written by WD Conybeare & signed by him and 9 others.
(photo P. Lincoln, reproduced courtesy of UCL Library Special Collections)

The paper charted what might be termed the Oxford men's 'courtship' of Greenough and the mutually beneficial, if occasionally troubled, relationships to which it led. The study was based on letters, now in the UCL Greenough Collection, ex CUL Add MSS 7918, written by two of the more geologically active of the Oxford men: William Buckland who, in 1813, succeeded Kidd as mineralogical lecturer, and William Daniel Conybeare. Both these men had quickly formed a close bond with the slightly older Greenough, and each repeatedly sought to persuade him to join them in their geological endeavours. However, Greenough's busy social life and his duties as both an MP and president of the Geological Society meant that they were to be repeatedly disappointed.

Undeterred, Buckland and Conybeare supplied detailed accounts of their own fieldwork and information gathered from other reliable sources for inclusion in the great mineralogical map that Greenough was putting together under the aegis of the London society. In 1815 Greenough first attended one of the Whitsuntide gatherings which, between 1813 and 1819, were a regular feature of geological life in Oxford. What began as an opportunity for the Oxford men to demonstrate to a wider audience their expert knowledge of the local area gradually became geological jamborees that ventured further afield. These meetings were an important and influential point of intersection between leading geologists from Oxford and London.

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Paper 5 First Principles and the Geological Map & Memoir: GBG's objectives

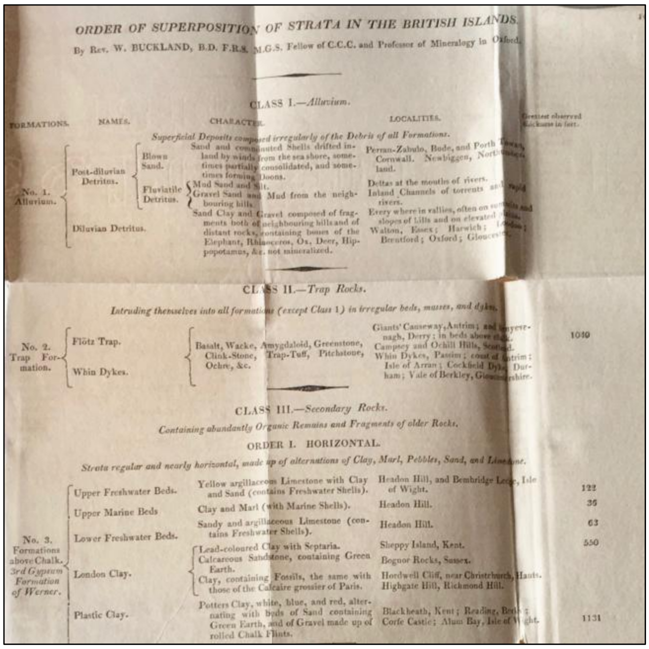
Hugh Torrens & Geoffrey Walton

This paper reviewed the content and reception of Greenough's two earliest publications – his 1819 *First Principles of Geology* and his 1820 *Geological Map & Memoir* – and the relationships between them.

Greenough's agreement with his publisher, Longman, for *First Principles* was dated 24 June 1818 and its completion may have delayed his geological map. The book's title was originally to be 'Essays on the Elements of Geology'. It exists in 3 states: as initially printed, then, after a complaint by John Farey that he had been overlooked, with a replacement sheet of 16 pages, and finally some unbound stock from 1838 which includes mention of Farey on pp.155-6. The book received many, but various, reviews, five of which were considered by the present authors. The *British Critic* and the *Monthly Magazine* generally approved. Two were by geognostic reviewers; that by John Fleming said it was not 'calculated to advance his own reputation or promote the interests of geology'. Robert Bakewell's, published in London and later in Paris, thought it was baffling to understand, given the confused use of facts. Some saw it as a vituperative, late argument against Hutton's theories which was also intended to side-line William Smith's work by ignoring the use of fossils in the correlation of strata and concentrating on their use to identify rock types. Greenough clearly demanded a theory-free philosophy.

The shortly-to-be-published map was not mentioned in *First Principles*. Also, nowhere in the book does Greenough refer to an English sequence of strata in the way that he does sequences elsewhere, even though he had significant English data. Was this because he knew that it had often been collated using fossil evidence? However, for his map to have any reliability, this established order had to be used, and, with the vital help of Buckland and Conybeare, this is exactly what Greenough attempted in his mapping by committee. The Order of Strata used by Greenough has been compared with the Orders shown in eight different versions produced by Buckland in the five years up to 1818, all of which may have helped with the map.

Although Greenough readily used, without acknowledgement, many of the names for strata that had appeared on Smith's map, he refused to record characteristic fossils in the final tabulations on the map.



ORDER OF SUPERPOSITION OF STRATA IN THE BRITISH ISLANDS.

By Rev. W. BUCKLAND, B.D. F.R.S. M.G.S. Fellow of C.C.C. and Professor of Mineralogy in Oxford.

CLASS I.—*Alluvium.*

Superficial Deposits composed irregularly of the Debris of all Formations.

FORMATIONS.	NAMES.		CHARACTER.	LOCALITIES.	Greatest observed thickness in feet.
No. 1. Alluvium.	Post-diluvian Detritus.	Blown Sand.	Sand and comminuted Shells drifted inland by winds from the sea shore, sometimes partially consolidated, and sometimes forming Doons.	Perran-Zabulo, Bude, and Porth Towan, Cornwall. Newbiggen, Northumberland.	
		Fluviatile Detritus.	Mud Sand and Silt. Gravel Sand and Mud from the neighbouring hills.	Deltas at the mouths of rivers. Inland Channels of torrents and rapid rivers.	
	Diluvian Detritus.		Sand Clay and Gravel composed of fragments both of neighbouring hills and of distant rocks, containing bones of the Elephant, Rhinoceros, Ox, Deer, Hippopotamus, &c. not mineralized.	Every where in vallies, often on summits and slopes of hills and on elevated plains. Walton, Essex; Harwich; London; Brentford; Oxford; Gloucester.	

CLASS II.—*Trap Rocks.*

Intruding themselves into all formations (except Class 1) in irregular beds, masses, and dykes.

FORMATIONS.	NAMES.	CHARACTER.	LOCALITIES.	Greatest observed thickness in feet.
No. 2. Trap Formation.	Flötz Trap. Whin Dykes.	Basalt, Wacke, Amygdaloid, Greenstone, Clink-Stone, Trap-Tuff, Pitchstone, Ochre, &c.	Giants' Causeway, Antrim; and Magyeragh, Derry; in beds above chalk. Campsey and Ochill Hills, Scotland. Whin Dykes, Passim; coast of Antrim; Isle of Arran; Cockfield Dyke, Durham; Vale of Berkley, Gloucestershire.	1040

CLASS III.—*Secondary Rocks.*

Containing abundantly Organic Remains and Fragments of older Rocks.

ORDER I. HORIZONTAL.

Strata regular and nearly horizontal, made up of alternations of Clay, Marl, Pebbles, Sand, and Limestone.

FORMATIONS.	NAMES.	CHARACTER.	LOCALITIES.	Greatest observed thickness in feet.
No. 3. Formations above Chalk. *3rd Gypsum Formation of Werner.*	Upper Freshwater Beds.	Yellow argillaceous Limestone with Clay and Sand (contains Freshwater Shells).	Headon Hill, and Bembridge Ledge, Isle of Wight.	122
	Upper Marine Beds	Clay and Marl (with Marine Shells).	Headon Hill.	36
	Lower Freshwater Beds.	Sandy and argillaceous Limestone (contains Freshwater Shells).	Headon Hill.	63
	London Clay.	Lead-coloured Clay with Septaria. Calcareous Sandstone, containing Green Earth. Clay, containing Fossils, the same with those of the Calcaire grossier of Paris.	Sheppy Island, Kent. Bognor Rocks, Sussex. Hordwell Cliff, near Christchurch, Hants. Highgate Hill, Richmond Hill.	550
	Plastic Clay.	Potters Clay, white, blue, and red, alternating with beds of Sand containing Green Earth, and of Gravel made up of rolled Chalk Flints.	Blackheath, Kent; Reading, Berks; Corfe Castle; Alum Bay, Isle of Wight.	1131

Buckland's Table of the order of British strata, published in 1818 in William Phillip's 'A Selection of Facts ... so as to form an outline of the geology of England and Wales.

Finally, it was noted that neither the *Memoir* nor the *First Principles* contains any systematic inclusion of data of potential economic significance. The opportunity to add, systematically, data referring to items relevant to industry, mining or agriculture, at a time, soon after the Napoleonic Wars, when such data was so much needed, is a sad reflection on those who were driving the science. It is, as the authors ruefully noted, 'a very British approach to things!'

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Paper 6 The building blocks: illustrations of GBG's source maps and annotation

Duncan Hawley

From the outset the Geological Society's map was a collaborative effort. It was always intended to be a Society project, started with the Society's first publication, *Geological Inquiries*, in 1808. A key objective of the *Inquiries* was 'that Mineralogical maps of districts, which are now so much wanting, may be supplied'. These maps were to illustrate observations of 'metallic productions, the rocks, the strata, the coal of any district; or to the appearances and forms of mountains, the direction of rivers, and the nature of lakes and waters'. In 1809 a map committee was formed and settled on the preparation of a single geological map of England and Wales. From the outset the project was a collaborative effort. Observations were collected from Society Fellows, associate members and 'persons in every situation in life' who had expert knowledge of the areas where they lived or frequently visited. The resultant information was collated by Greenough, who also added details collected during his own travels. In the memoir that accompanied the map, Greenough wrote: 'Care has been taken to insert the names of all places geologically curious, or noticed by geological writers.' These can be seen as annotations on the map and are especially clear around the coast.

Draft map of north Somerset between Brean Down & Bristol, on an 1818 topographical map chiefly with notes & colouring by Buckland, but with annotations in other hands, including Greenough's (Reproduced by permission of the Geological Society of London)

The presentation highlighted some of the maps supplied to Greenough by Society members and attempted to illustrate some of Greenough's own working methods in compiling the 1820 geological map. It also considered the form and style of the annotations around the map, including some draft comments marked on early draft or proof copies of the 1820 map. Finally, an evaluation was made of the extent to which the map and its accompanying memoir fulfilled the original goals set out in *Inquiries*.

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Paper 7 The production and distribution of the map & a history of later editions

Tom Sharpe

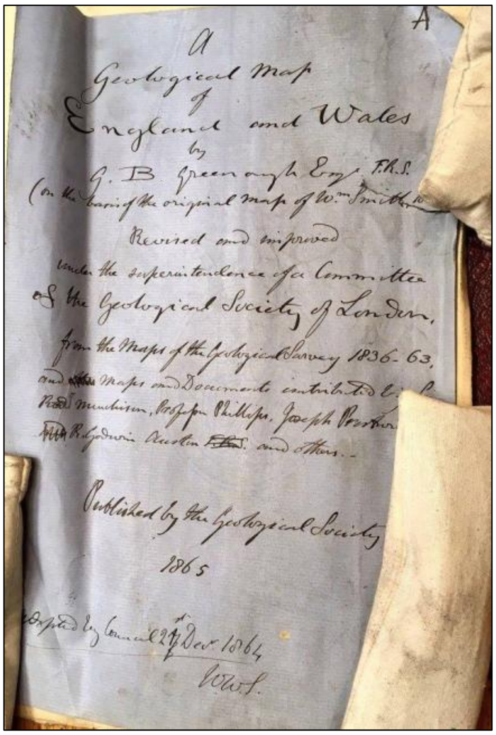
The gestation of Greenough's 1820 geological map of England and Wales was almost as long as that of William Smith's famous map of 1815: twelve years compared with Smith's fourteen. Using a new topographical base map drawn by Thomas Webster between 1814 and 1817 at a cost of about £200, the six-sheet map was engraved by S.J. Neele & Son and published for the Geological Society by Longman, the then long-established publishers of Paternoster Row. The geological colouring of the maps was also mostly undertaken by Webster, with some assistance from the map-maker William Ebden. Coloured maps sold to the public for six guineas and to Geological Society members for five guineas, so it is not the case that the map was priced to undercut that of Smith. Uncoloured sets sold for £4 15s, and were also available 'without mountains' for four pounds or with 'rivers only' for a guinea.

About 370 sets were printed, of which about 290 were coloured. About 280 sets were distributed: by sales through the Society, by purchase directly from Longman, or as gifts. Most direct sales took place in May and June 1820 (35 and 14 copies respectively) and only 19 copies in the remainder of that year. From 1821 to 1827, only 32 further copies were sold directly. Most copies are numbered, although an unnumbered batch of 36 copies was sold though Longman.

On 12 September 1840, having declined Longman's terms for publication, the Geological Society itself published a second, revised, edition of the map. Copies sold for four pounds to Fellows and for five pounds to the public. Some of the main changes in this edition resulted from the work of Murchison, Sedgwick and De la Beche in Wales, Devon and Cornwall. 224 copies of this edition were produced, of which 47 were presentation copies. The colouring was mainly by James Gardner and John Arrowsmith, with 20 copies coloured by W. Bone.

Twenty years later, the map sales ledger shows a third edition of 1860. This was effectively the same as the second edition but with revised Sheets 3 (Wales) and 5 (SW England). It is, however, the edition published on 1 August 1865 that is generally regarded as the true third edition.

Revisions for this 1865 edition, which incorporated the work of the Geological Survey, began under the presidency of William Smith's nephew, John Phillips. It is the first to credit the work of Smith and was funded by a bequest from George Greenough.



A

A Geological Map of England and Wales by G. B. Greenough Esq. F.R.S. (on the basis of the original map of Wm Smith [illegible])

Revised and improved under the superintendence of a Committee of the Geological Society of London, from the Maps of the Geological Survey 1836-63, and other Maps and Documents contributed by [illegible] Murchison, Professor Phillips, Joseph Prestwich, [illegible] Godwin Austen [illegible] and others.

Published by the Geological Society 1865

Adopted by Council 27th Dec 1864

[illegible]

Handwritten draft wording for the title of the 1865 3rd edition, adopted by Council in Dec. 1864. An earlier draft exists, in the hand of John Phillips – the main driving force behind the 3rd edition. (photo Duncan Hawley, reproduced by permission of the Geological Society of London)

Further revision of the Society's map was considered in 1883, but Archibald Geikie, the then Director of the Geological Survey, signalled that it was the intention of the Survey to publish a map on a scale of four miles to the inch within three years. This effectively brought the publication of the Society's map of England and Wales to an end.

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Paper 8 GBG's Legacy as a Geological Map Designer

Karen Severud Cook

The geological map of England and Wales for which George Bellas Greenough is known appeared in three editions. In the first edition's *Memoir* (1820) Greenough discusses his map's geological content but barely mentions its symbolization. Map design first assumes a major role in the second edition's *Memoir* (1840), where several pages advocate using area colours and patterns 'to make the tints of a geological map speak to the mind as well as to the eye' (p. viii- xi). The map's posthumous third edition (1865), revised by a Geological Society of London committee, appeared without a memoir, but its design features, some retained from the original, and others altered, are revealing indicators of George Bellas Greenough's design legacy.

Between the first and second editions of his map Greenough responded to criticisms of the readability of his map, proposals for developing uniform geological symbols, and the need to depict newly named geological systems. His archived papers record 75 information sources consulted while seeking ideas for better map design. He met, corresponded with, and read the publications of artists, colour scientists and manufacturers, as well as fellow geologists and natural scientists.

East Anglia, part of (Sheet 4) displaying colouring from the second edition map (1840) coloured on a first edition topographic base.

(Duncan Hawley Collection. CC BY-NC-ND)

He combined the idea of matching map colours to mineralogy with concepts taken from art and colour science, such as juxtaposing harmonious and contrasting colours, reserving strong colours for small areas, and colouring groups of formation brightest in the centre and duller outward. He also proposed varying the tone of hues by superimposing black line and dot patterns to differentiate related formations. He sought to incorporate these design improvements in his second edition but was hampered by his allegiance to associative colour, aversion to unit labels, and overly fine-textured black area patterns. However, study of the third edition reveals that some of Greenough's design ideas survived and were more successfully expressed by the committee responsible for it.

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Paper 9 GBG's influence on the colours employed on early Geological Survey maps

David G. Bate (B.G.S.)

Henry Thomas De la Beche (1796–1855), future founder and first Director of the British Geological Survey, was 24 years of age when Greenough's *Geological Map of England & Wales* appeared in May 1820. Elected to the Geological Society in 1817, he read his first paper, on the geology of part of the Devon and Dorset coast, in March 1819. This paper, accompanied by a geological map and coastal sections, was published in the Society's Transactions in 1822. The colouring of De la Beche's map and sections, and of others that were to follow, generally conforms with those employed on the Greenough map. Indeed, De la Beche is credited in the *Memoir* as being one of those who had assisted Greenough in the compilation of his map. These colours were largely chosen to match the prevalent tints of the rocks themselves, a practice recommended by Abraham Werner and advocated in Britain by Robert Jameson. William Smith, as stated in the *Memoir* that accompanies his 1815 map, likewise chose colours that 'are in some degree assimilated to the colour of each stratum, except the chalk, which, being colourless, seemed best represented by green'.

In May 1832, De la Beche secured a three-year grant of funding from the Board of Ordnance to add geological information to the eight sheets of the one-inch Ordnance map of Devon, an initiative that would lead in 1835 to the formal establishment of the Geological Survey. One condition of this grant was that the index of colours should be referred to the Council of the Geological Society for their approval. Greenough was at that time engaged in preparing a second edition of his *Geological Map*, but had yet to come to a firm decision on his final choice of colours. A small subcommittee, which included both Greenough and the Society's president, Roderick Impey Murchison, was formed to consider the matter. A scheme of 16 formation colours was approved on 16 May 1832. Subsequently, as fieldwork progressed, the agreed table of colours proved inadequate and had to be amended and expanded.

Colours agreed between De la Beche & the GS Council for colouring the proposed one-inch map of Devon, approved 16 May 1832. The colours 'are the same as those at present adopted by G.B.Greenough Esqr for the 2nd Edition of his Geological Map of England & Wales preparing for publication'. *(BGS © UKRI)*

De la Beche died in April 1855 and was succeeded as Director of the Geological Survey by Murchison. One of Murchison's first acts was to revise the scheme of colours employed on Survey maps. Thus: 'All rocks of igneous origin are now represented in various tints of the same bright red colour, and each great division [=System] of the sedimentary rocks has its own peculiar colour'. In the process, the colours of the Geological Survey map of Britain came to resemble more closely those employed by William Smith in 1815. Thus, the Cretaceous System is still today represented predominantly by shades of green, inspired no doubt by the Upper and Lower Greensands and by Smith's choice of green to represent the Chalk. Interestingly, by 1851 De la Beche had come to recognise the desirability of employing 'given colours to represent certain divisions of the geological series'.

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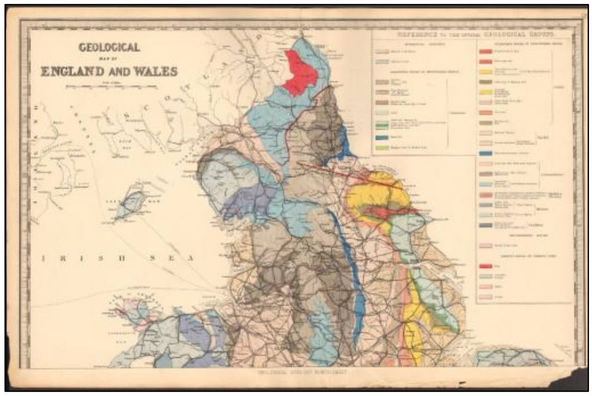
Paper 10 Manifestations of Greenough's 1820 geological map: a 'standard' for the future?

Duncan Hawley

The Geological Society's map of 1820, compiled and edited by George Bellas Greenough, inspired, influenced and was replicated in a variety of guises across a range of published geological maps in the 19th century, including maps beyond England and Wales. The most obvious manifestations are those where Greenough is acknowledged directly, as in the second and third editions, whilst for a number of others it is key aspects of a map's details that demonstrate origin in the 1820 map.

Analysis of colouring, classification of rock types/stratigraphic units, style (topographic base, labelling, annotation) and geological details help to identify the derivative maps and indicate the extent to which each of these owe their own lineage to Greenough's map, providing insight into how and why one or more of the features of Greenough's map was adopted. Using this approach, it has been possible to identify at least fifteen derivative maps. The presentation evaluated the legacy of Greenough's 1820 map and to what extent it might be considered a 'standard' for subsequent geological maps. The following images illustrate just three manifestations of Greenough's 1820 map:

1824 Carte Geologiques du Cornouilles
(Duncan Hawley Collection CC BY-NC-ND)



c.1880 Geological Map of England & Wales in G.Bacon New Large Scale Atlas of the British Isles. (Duncan Hawley Collection CC BY-NC-ND))

1826 Map reduced by permission of the Geological Society
(Duncan Hawley Collection CC BY-NC-ND)

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From the Geological Society's website:

One of the most important collections in the **Geological Society's** archive is the geological map collection of George Bellas Greenough. After nearly 200 years, many are in very poor condition, and being too fragile to be handled, are currently closed to public view. To enable future researchers to access these rare and important maps, we are seeking donations to fund their digital preservation.

What we plan to do

When we have digitised each map they will appear on a special exhibition page which will build up a picture of Greenough's vision of the geology of the world in the first half of the 19th century. To launch the project, we are concentrating on the maps of Scotland, England & Wales and Ireland. Help us colour in Greenough's World by sponsoring the digitisation of a particular country!

Please go to http://www.geolsoc.org.uk/Greenoughsworld to find further details of this important project.

Paper 11 *General Sketch of the Physical and Geological Features of British India* (1854, 1855): its production, distribution, variants and survivorship

Christopher Toland

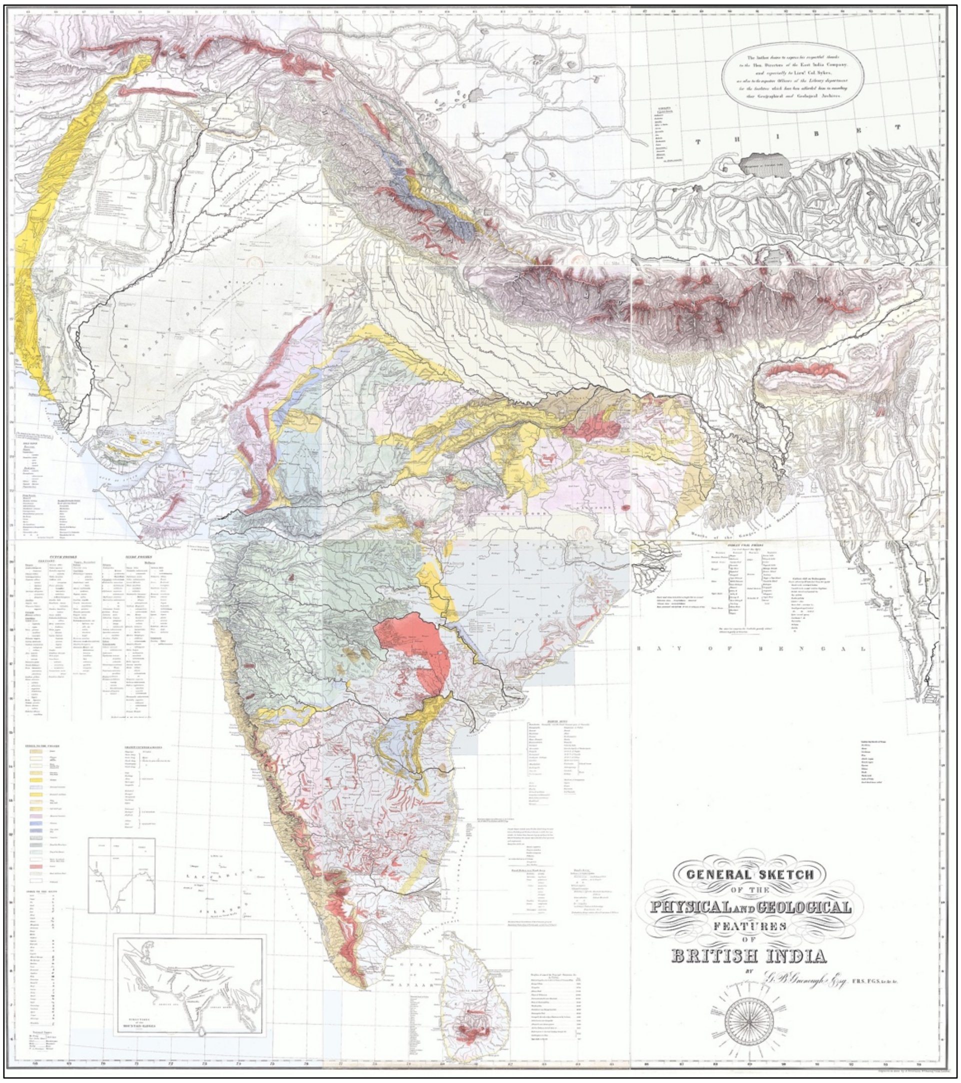
George Bellas Greenough is, today, best remembered for his *Geological Map of England and Wales*, the first edition of which was dated November 1819 (but not actually issued until May 1820). What is less well known is that Greenough also published a large-scale geological map of the Indian sub-continent in 1854, this map being the major occupation and achievement of his later years.

Greenough's India map is a work of extraordinary compilation, undertaken over a period of 11 years, commencing in or about 1843 (i.e. shortly after publication of the 2nd edition of his *Geological Map of England and Wales*). It is significant in being the first detailed, and to this day the largest, geological map of the entire sub- continent.

The map depicts the main lithological divisions of the Indian rock record and captures many of the key elements of Indian geology including:

1. the five main Archaen cratons that make up the Indian Plate,
2. the surrounding Proterozoic mobile belts,
3. the main Mesozoic and Tertiary intercontinental rift systems,
4. a trans-continental megasuture,
5. the Deccan Trap province,
6. the Himalayan suture and foredeep

This presentation looked at the construction of Greenough's India map, Greenough's sources of data, the map's engraving and printing, and the (three) main variant map states. The map's distribution and survival were examined – of 200 copies produced, 24 complete and four incomplete surviving copies have been located in a recent survey. Finally, the reasons why an intended revised edition never appeared were discussed.



Greenough's India map was arguably a far more ambitious undertaking than his England and Wales map, and one of no less pioneering status. It deserves to be better known.

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Greenough's General Sketch of the Physical and Geological Features of British India *1854*
(Dimensions: 195cm x 162cm) *(Public Domain)*

Kensal Green Cemetery: in search of Greenough & his contemporaries

Sunday 23 May 2021 — Phil James

Shortly after the online Greenough conference, HOGG members John Henry & Diana Clements (who is also active in the London Geodiversity Partnership) led a fascinating afternoon in Kensal Green Cemetery (KGC) to look at, *inter alia,* the gravestone of the man himself. Five other HOGG members came along and we were also fortunate to be joined by Henry Vivian-Neal, a Trustee of The Friends of KGC.

KGC is the oldest of the Magnificent Seven 'garden style' cemeteries in London. Opened in 1833, the 72 acre site is the resting place of 250,000 individuals in 65000 graves. Listed Grade 1 on the Register of Historic Parks and Gardens, its wonderful architecture is mainly a mix of Gothic and Grecian. It was *the* place to be buried for the rich and famous!

The photomontage above shows some of the architecturally impressive monuments in the cemetery. Our group is shown in the centre, clustered (in a Covid-secure way!) around George Bellas Greenough's tomb.

John, Diana & Henry conducted a superb walking tour, chatting about each grave in turn. There was much discussion on the personalities of the occupants and their links to each other, as well as the nature and stone of the monuments.

In the following four photos Greenough's pink Peterhead granite chest tomb is striking, although he is actually interred in the catacombs below the Anglican Chapel. Charles König, Curator of Mineralogy at the British Museum, also has a headstone of Peterhead granite. But while the Revd. Frederick Blake, President of the GA and 'Precambrian' author, is commemorated by a curious lighthouse – complete with rock crystal lantern – Sir Henry De la Beche, the first Director of the Geological Survey of Great Britain, must remain content with his simple Cornish granite slab.

George Bellas Greenough *1778-1855*

Charles Koenig *1774-1851*

Rev Frederick Blake *1839-1906*

Henry De la Beche *1796-1855*

We also saw the graves of cartographer James Wyld, and his son, James Wyld Jr, who published Murchison's 1843 Geological map for the SDUK; the palaeontologists George Busk and Hugh Falconer; landscape gardener John Claudius Louden, whose patented method of making curved wrought iron glazing bars helped to establish the great age of glasshouses and conservatories (one of which, built for Greenough, survives at Grove House); William Broderip, a founder of ZSL and with whom William Buckland famously took his 'first lesson in field geology'; and John Morris, geologist and founding member of the London Clay Club. Finally, we looked at the graves of Isambard Kingdom and other members of the Brunel family; Decimus Burton, the architect who designed and built Grove House for Greenough; and John Murray II, publisher of both Charles Lyell and John Phillips (his son later published both Murchison's and Darwin's work). Alarmingly the area around John Phillips' grave was infested with Japanese knot-weed!

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Treasures in the Sedgwick Archive

Online talk, June 2021

Sandra Freshney

Archivist Sandra Freshney gives a taste of some of the many treasures in the extensive Sedgwick Museum Archive, University of Cambridge. http://www.sedgwickmuseum.org/ @SedgArchivist (Twitter)

It was my pleasure to speak with HOGG for the first time in June about the treasures in the Sedgwick Museum Archive. For those not familiar with the Museum, the Sedgwick is part of the Department of Earth Sciences, University of Cambridge. It is also part of the University of Cambridge Museums consortium: www.museums.cam.ac.uk. There are now over 1.5 million specimens in the museum and over 2000 boxes of records in the archive. The museum (in non-Covid times) is visited annually by nearly 150,000 people, including more than 5000 school children.

Sedgwick Museum of Earth Sciences, re-opening in October 2020

The lunchtime talk provided attendees with a brief overview of the collections before we had a 'rummage in the archive' where we were able to look at Museum records including specimen catalogues, the papers of Woodwardian Professors and Curators, records of those whose specimen collections are on display in the museum or in the stores, the Sedgwick Club Archive, and the Cambridge Svalbard Exploration Coll-ection Archive. There was also time to look briefly at how staff are caring for the records, supporting research through providing access, and taking part in public engagement.

John Woodward and Agostino Scilla

The museum's founding collection is the 'Woodwardian collection'. Dr John Woodward was a collector of rock, mineral, fossil and archaeological specimens from around the world. He was also the founder, by bequest, of the Woodwardian Professorship of Geology at Cambridge University.

In Woodward's archive is a copy of Italian Artist & Palaeontologist Agostino Scilla's '*Vain Speculation Undeceived by Sense*' (1670). Agostino Scilla (1629-1700) put forward an argument for fossils being the remains of once-living organisms rather than geological phenomena. Scilla's fossil collections were purchased by Woodward, and are recorded in his manuscript catalogues in the archive.

At the back of the copy of *Vain Speculation* are Scilla's exquisite original pencil drawings. The text has been translated into English for the first time, and the illustrations have been digitised, funded through an Arts Council England Designation Development Fund grant. You can access this resource online. If you visit the museum, you can use an i-pad to click on the Woodwardian cabinets/drawers to see the specimens, manuscript and published catalogues & drawings. https://tinyurl.com/yvbhjwpv

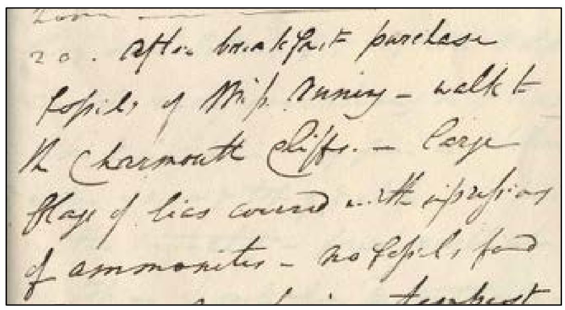
Plate 27, 'Vain Speculation Undeceived by Sense' Agostino Scilla, 1670.
Reference: SCLA 01

Adam Sedgwick

Adam Sedgwick was the seventh Woodwardian Professor. He undertook serious acquisitions of specimens and the new museum, which opened in 1904, was named after him in recognition of his efforts.

In 2018, which was the 200th anniversary of Sedgwick becoming Woodwardian Professor, we started to spend some time looking at Sedgwick's 'paper time capsules', getting to know him, and his handwriting, a little better.

We catalogued just a handful of notebooks, but they already tell us a great deal about Sedgwick and his activities. This includes information about places he visited including many working copper, lead and tin mines and quarries, people he met, specimens he collected or bought from others including Mary Anning, the structural geology of the areas he frequented, his expenses, health, and also some social history.



'after breakfast purchase fossils of Miss Anning...' Sedgwick's notebook from 1820 Reference: ADSW 01/01/05

Other records include transcripts of some of Sedgwick's journals, annotated maps of his field work, manuscript drafts of his lectures (his 'syllabus' for teaching), photographs, sketches and paintings of Sedgwick throughout his life, and his specimen 'catalogue' – a collection of 1200 specimens, 1819-1820.

Treasures in the Sedgwick Archive

Sandra Freshney

You can read more about Sedgwick's archive here: https://tinyurl.com/bxpcrcfm An online exhibition is also available on the SM website: www.tinyurl.com/p4zstcnp

The Sedgwick Club Archives

Referred to as *'a party of stonebreakers'* in 1893, The Sedgwick Club was the first student geological club to be established in the world in 1880. It still exists today. *'The object of the club be to promote the study of geology by the reading and discussion of papers thereof'* was strictly adhered to, and talks took place regularly during term time.

The records provide a unique insight into the history and development of earth sciences and student learning during the nineteenth and early twentieth centuries, with many eminent geologists serving as active members.

The archive includes many volumes of club minutes, which document the talks given in member's rooms – these varied in topic from '*The motion of Glaciers*' read by Alfred Harker in 1882 to *'The Great Rift Valley of Africa'* read by Gertrude Elles in 1951.

There are also a number of scrapbooks (or diaries) written during club expeditions which took place at least once a year. These include signed lists of participants, maps and plans, accounts of geological and social activities, sketches, limericks and poems, newspaper cuttings, and photographs.

The archive has provided us with a lot of information about female students, who did not officially become members of the club until 1896. However, many of the early student expeditions included women. They were chaperoned by Mary 'Clara' Hughes, a diarist, photographer, artist & amateur geologist who was also the wife of the eighth Woodwardian Professor, Thomas McKenny Hughes.

Malverns, 1892. This trip included 4 of the first 6 female fellows of the Geological Society (Margaret Chorley Crossfield, Ethel Gertrude Skeat, Ethel Wood and Gertrude Elles). Reference: SGWC 02/02/10

Preservation, Research & Public Engagement

To ensure that the collections are accessible for as long as possible, we have used conservation grade materials to repackage many of them. Racking was installed in 2011 and 2014 to improve storage, and our new store in the Colin Forbes building enables us to control temperature & humidity. In 2010-2012 staff undertook listing work which 'unlocked' the records and saved on wear and tear.

Conservation grade boxes

There are now a number of avenues for people to access the collections – via the *Archives Hub* at: tinyurl.com/3ab3ea92
The National Archives *Discovery* facility at: tinyurl.com/huxpfzvx
and more recently *ArchiveSearch* at: tinyurl.com/3zr74xku

We plan to undertake further cataloguing projects and to add more data in the future.

Friends of the Sedgwick Museum visit the AG Brighton Building in 2014

We welcome researchers and groups of visitors on site, and regularly collaborate with colleagues in Cambridge and elsewhere to bring the collections to a wider audience.

In 2012 the museum opened its first archive exhibition, and in 2015 a new exhibition explored the stories that we have uncovered about Sedgwick Club members and World War 1. This was a great opportunity to bring specimens and records together in the gallery for the first time. In 2020 we developed our first online archive exhibition, looking at women's learning experiences and contribution to Geological science from 1885 until the First World War.
https://tinyurl.com/yt9bkv9y

There are many different records & voices which all contribute to our understanding of the history of geology. The stories that are being uncovered are inspiring us to think about our collections in different ways.

You are all very welcome to get in touch if you would like more information about the collections or would like to arrange a visit in the future.

Sandra Freshney
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Geological Drugs & Prophylactics

Online talk, July 2021

Christopher J. Duffin

Throughout history and in almost every culture, geological materials have been used for protection against disease or as therapeutic agents. Material evidence for this includes archaeological finds and surviving apothecaries' cabinets, but mostly our information has been gleaned from written sources ranging from Assyrian cuneiform tablets, through Egyptian medical papyri, to Western publications such as lapidaries, encyclopaedias, and medical texts.

God created the world and, having provided all the resources required for his health and survival, populated it with mankind. In 1584, Ivan the Terrible summarised the situation regarding precious stones very nicely – '*All these are God's wonderful gifts, secrets in nature, and yet reveals them to man's use and contemplation, as friends to grace and virtue and enemies to vice'*. But how could God's 'secrets in nature' be identified and their potential functions discerned? The answer lay in the Doctrine of Signatures. This theory described how, to the properly initiated magus, the different elements of the natural world could be read as 'books and magick signs', their external characters (shape, colour, taste, smell etc.) indicating their hidden or occult properties.

The humoral theory, widely followed until the 19thC, took bodily health to be determined by the balance of the four humours (blood, phlegm, black and yellow bile), with imbalances in these producing symptoms such as a change in skin colour, or the suppuration of fluid. Various interventions were used to rebalance the humours; for example, bleeding could eliminate excess blood. However, natural remedies – often prescribed according to astrological principles – provided a less drastic approach. This is where geological therapies come in. The following examples illustrate the vast range of geopharmaceuticals used and the wide variety of conditions treated.

Toadstones were supposedly harvested from the heads of large, old toads. They were allegedly collected by placing the toad on a red cloth and staring at it until it coughed up the stone, which should be caught, as hitting the ground caused a loss of efficacy.

The collector then needed to be very nimble and quickly make himself scarce before the toad lunged in an attempt to retrieve the stone.

Extracting a Toadstone. Hortus Sanitatis (1491), (De Lapidibus, cap. xxvii)

Conrad Gessner (1565) helpfully provided an image showing that these stones were in reality the teeth of the Mesozoic durophagous bony fish, *Scheenstia*. Credited with the power to resist poisons, they were often worn as amulets in rings and pendants, and sometimes swallowed whole in a bid to 'cleanse the bowel of filth and excrements', or to treat conditions ranging from tumours and plague to diarrhoea and epilepsy. These stones could be retrieved from the faeces and potentially passed down the family as a medicinal heirloom.

14th C Italian toadstone ring. AF. 1023, British Museum. Author's photo, used with permission.

Glossopetrae or 'tongue-stones' are fossil sharks' teeth, especially large triangular, serrated examples belonging to *Otodus megalodon*. Also ascribed alexipharmic (anti-poison) virtues, these fossils were commonly mounted in gold and worn as pendants.

Petrus Christus, 'A Goldsmith in his shop, possibly St Eligius' (1449). Note the glossopetrae hanging on the back wall of the shop. (Robert Lehman Collection at the Metropolitan Museum of Art., 1975. © The Metropolitan Museum of Art Repository.)

Sometimes hung on ornate items of tableware known as *Natternzungenbaum* ('adder's tongue trees'), glossopetrae were used to assay the drinks at important feasts; if the tooth didn't change colour, the beverage was deemed safe to drink.

Natternzungenkredenz, (K-037), Schatzkammer und Museum, Vienna (Author's photo.)

Lapis lazuli, a complex skarn rock, came from NE Afghanistan. The distinctive heavenly blue colour of its lazurite, speckled with star-like crystals of pyrite, proclaimed its wide-ranging therapeutic potential. In Egypt it was the base for blue eye shadow mixtures which may have protected against sunburn and skin parasites – malachite produced a similar green paste, whilst galena and stibnite made a black one. The Ebers medical papyrus (circa 1534 BC) recommends lapis in the treatment of cataracts, conjunctivitis and hysteria (wanderings of the uterus around the body). Cuneiform Assyrian texts on clay tablets from Assurbanipal's Library at Nineveh (circa 650 BC) also recommend it for the treatment of eye diseases and tinnitus. In the Indian Tantric medical text *Rasaratna Sammucaya* (13th century), lapis was mixed with other ingredients and delivered in either cow's urine or fermented apple juice to treat haemorrhoids, tuberculosis and many other conditions. Around 1250, Alfonso X of Castile commended it in the treatment of bladder pains, controlling menstruation and making the hair curl.

De la piedra del azul.

El .xxii. grado del signo de capricornio es la piedra del azul. Esta es muy conocida. & fallan la en muchos logares. De color es muy cardena. & la meior de todas: es la q̃ fallan en tierra de horacé. Et la mas preciada es aqlla en q̃ parecé uenas o gotas de color doro. Ligera es de quebrantar. & quando la ponen çerca de oro. o los buelven en uno: parece cadauno mas fermoso por si. Et su uertud: es atal q̃ si ponen los poluos della en los oios: p̃sta mucho. & otrossi poniendo un pedaço della en el fuego que sea sin fumo alça se della llama cardena & recibe en si grand calentura & grand agudez: como quier que ella sea de natura fria & seca. Et otrossi recibe fuerça de uerenamiento. Et si dieren los poluos della a beuer: purga todo humor gru

Entry for Lapis lazuli (piedra del azul) in the Lapidario of Alfonso X of Castile, 81r (circa 1250). Facsimile, 1881. (Author's copy)

Crushed cinnabar, the commonest ore of mercury, was first used internally for worming sheep. The animals tolerated it, so small doses were soon being given to children. Midwives began using it to control labour and before long, it was being used, in doses of a pound or more, as an abortient. It was smuggled from the mines by miners who swallowed it, and later retrieved it from their faeces. This dangerous activity reduced their average life expectancy to 3 to 4 years and caused them to suffer horrible deaths, with 'palsies', 'tremblings of the limbs', diarrhoea and terrible ulcers. The unprocessed ore was known as *Cinnabaris nativa*, while *Cinnabaris factitia* was a processed concentrate in which the mercury levels were much more standardised. In addition to use as a worming agent it was used in large quantities to eliminate obstructions of the gut, by inducing severe vomiting and intestinal spasms. It was also commended for 'the Itch' and venereal ulcers – hence the immortal words 'A night with Venus and a lifetime with Mercury'.

Perhaps the most widely used and versatile geological material was Baltic amber. Unprocessed, it was used as amuletic necklaces and pendants, worked into lozenges, troches and pessaries, and sometimes taken in draughts of liquid or inhaled as a fumigant. Its range of application increased even further after alchemical processing; salts, oils, tinctures and powers of amber were added to the apothecary's arsenal by the distillation, sublimation, rectification and dissolution of the raw material.

Amber pendant, Sweden, 18thC. A crucifixion scene on the back enhanced the supposed powers of the amulet. © The Victoria & Albert Museum, London.

18th C (?) cake of Terra sigillata from Malta, stamped with image of St. Paul. Pharmaziemuseum Basel (Author's photo.)

Rock from the walls of St Paul's Grotto at Rabat (Malta) allegedly derived therapeutic power from the time the saint spent there, leading to a lucrative export business in small cakes of this '*Terra melitensis*'. But perhaps the most famous and long-lived of the healing earths was *Terra lemnia*, a smectitic clay from the Island of Lemnos (Greece). Harvested with great ceremony on one day only, tablets of the baked clay, were impressed with authenticating seals to form so-called *Terra sigillata*, which were incorporated into a bewildering array of medicines.

Clearly, a good, representative collection of rocks, minerals and fossils could act as a handy medical kit in the historical past.

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Book Review

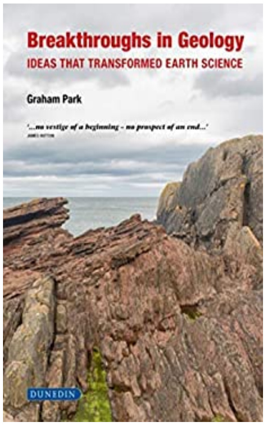
Duncan Hawley

Breakthroughs in Geology: ideas that transformed earth science

Graham Park
Dunedin Press 2019 220pp
ISBN 9781780460765 £24.99

"To understand a science, it is necessary to know its history"
Augustus Comte (1798-1857)

Scientific knowledge is gained by an intellectual struggle towards a better understanding or interpretation of the evidence. A 'human angle' often helps make connections with abstract or complex ideas. This is commonly seen in stories about the development of plate tectonics and the (then) 'maverick' ideas of Alfred Wegener for continental drift. Or in Iain Stewart's TV Series 'Men of Rock' (still available online). So, I opened *Breakthroughs in Geology: Ideas That Transformed Earth Science'* with great anticipation. Did it do the job? Did it highlight key 'breakthroughs' and the 'human angle'? Well, the answer is no and yes.



There are certainly other recent books that do a better job of explaining how the important ideas in our science came about (e.g. Kieran D. O'Hara's 'A Brief History of Geology', or Martin Rudwick's 'Earth's Deep History'), whereas Park gives the 'heroic' period, the infancy of our science, only cursory attention. However, for 20th century ideas about tectonics and structural geology this book is a useful read. This is unsurprising, since the author, an Emeritus Professor in Tectonics Geology, readily admits that "My list is somewhat biased towards my own interests … many other ideas could be chosen."

The book starts with James Hutton and 'Uniformitarianism'. It highlights Hutton's different take on the process of lithification and is an informative introductory read. However, Hutton's influence on Lyell and the idea of uniformitarianism is dealt with less impressively, with several factual errors creeping in, e.g. it was Whewell, not Lyell, who popularised the term 'uniformitarianism' and Lyell was briefly a professor at King's College London, not UCL.

The second chapter is on Evolution and Darwin's key discoveries and understanding of variation for natural selection, but it is hard to get a sense from it of why this was a significant breakthrough for geological understanding. There is no mention of adaptive radiation, or the idea of punctuated radiation, or Lagerstätte, and how these have influenced and developed palaeontology and subsequent geological thinking and understanding.

To help the reader navigate the detail, each chapter would benefit from a synopsis emphasising the big idea being tackled and explaining why it was a 'breakthrough' and its significance for today's geological thinking.

In many ways the early chapters are disappointing, and I nearly didn't read past them; but after Chapter 2, the book begins to take off, with a further ten chapters covering a range of topics from an overview of 'Continental Drift' to the details of 'Fault system kinematics'. Only the chapter on 'Sequence Stratigraphy' is not explicitly concerned with tectonics.

The relatively narrow focus on structure and tectonics means that some key geological ideas are not tackled, e.g. petrology and the experimentation that resulted in Bowen's Reaction series and interpretations of metamorphic facies. The chapter on 'Ophiolites' does refer to the range of rock types in oceanic crust, but the process of magma generation and its relation to rock types is not explained. I was disappointed to find no reference to Wager's discovery and interpretation of Greenland's Skaergaard intrusion – possibly one of the most significant single contributions to igneous petrology. Also lacking are focussed chapters on radio-metric dating and its implications for understanding climate changes through geological time. In the Chapter titled 'Plate Tectonics', plate boundaries are labelled as 'Constructive' and 'Destructive' with no reference to the now preferred and more explanatory terms 'Divergent' and 'Convergent'.

Each chapter is rather like the 'Previous work' section of a scientific paper: summarising key work and stages that have led to the current state of understanding plus a bit of biographical detail about who did what. In this sense the chapters are historical. The book does however include a good range of diagrams, and charts. These are colourful and appropriately schematic to illustrate important ideas with informative captions. There is also a useful glossary and references to enable more detailed follow-up. Although there is some cross-reference between chapters, each could be read on its own.

So how useful is this book for those interested in the history of geology? My overall verdict - this book is a 'Curate's Egg' – it does not fully do what it says on the cover; it's essentially a geology textbook and does not comprehensively chart the important 'breakthroughs in geology'. It certainly does not, as claimed, 'serve as a paradigm for the history of science across many disciplines'. Despite clear division of chapters into sections it is all too easy to lose the bigger picture in the 'narrative'. However, the book contains a wealth of information which, with careful navigation, could help the reader to understanding the epistemic ascent of key geological ideas – at least those within its own self-confessed bias to structural and tectonic geology.

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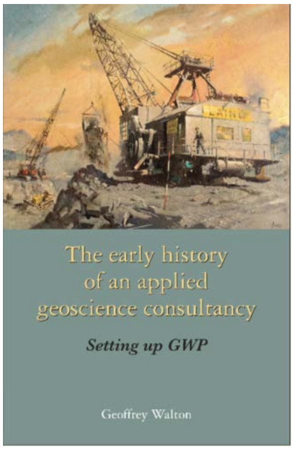
Book Review

John Henry

The early history of an applied geoscience consultancy; Setting up GWP

Geoffrey Walton
Down Stone Books 2021 £15.00
ISBN 978-1-9196048-0-0 280pp



As a history of geology, this unusual book strays far from the golden age of Smith to Murchison. Walton relates the gestation, birth, and development of his consultancy, GWP, the Geoffrey Walton Practice, within the economic and social trends of the last half century. As Hugh Torrens observes in the foreword, much geological knowledge and experience develops in the corporate sector – beyond the reach of most historians. This is particularly true in applied geology. Although written in the first person, there is very little personal history. The emphasis is on the activities of the firm, types of work and working conditions. The character of the man behind this history comes through in his reflections and his actual achievement.

Walton's formative early career experience began with the Opencast Executive (OE) of the National Coal Board (NCB). While largely office and lab-bound, describing and quantifying coal deposits, curiosity led him to visit operating quarries in his free time. He saw that extraction was hugely affected by lithologies, structures and past workings that were not part of the plans he prepared for contractors who had to accept all the risks. The recent Aberfan disaster had revealed basic geotechnical and organisational shortcomings at the NCB regarding the safe deposition of spoil and had set the stage for reform, and cracked open the door for reformers; Walton recognised that a similar situation prevailed at the OE. His work for the Executive had introduced him to university mining departments as well as private British and American mining contractors, and Walton saw the opportunity for an independent consultancy to serve the industry. In 1973 he founded GWP to provide specialist geotechnical advice to the quarrying industry.

A hectic decade followed, with large and small projects mainly in the UK and US, but also in Indonesia, South Africa, Brazil, Australia, Cyprus, Finland, and Spain. Walton reflects on the then less regulated nature of the extractive industry and the differences between American and British approaches. Expansion both resulted from, and led to, academic collaboration and also dictated the need for shrewd hiring and the establishment of an office base. GWP moved to Charlbury in Oxfordshire, acquiring the first of the several 18th and 19th century buildings that were converted to offices as the firm expanded. The realities of eighties telephony, the hand drawing and colouring maps and sections, the arrival of the first photocopier, and early hand-held HP computers all reminded this reader how much we now take for granted.

How and why did GWP survive its first decade? Three long term clients provided sufficient continuity of business, while remaining small and linking with specialists in related fields also proved a good strategy. Diversifying into other stratified materials – bauxites, iron, gypsum, aggregates – presented similar opportunities. Maintaining academic connections kept GWP abreast of current research and provided recruits,, and supporting staff on MScs and PhDs in project-related research undoubtedly benefited the firm. Expert-witness work for public enquiries and industry litigants both provided new insights and was lucrative.

Coverage of the intervening decades is more topical and less chronological. Mergers and takeovers closed some doors and opened others. New concern for environmental and safety issues required advice on necessary regulations and their implementation. The UK Dept of Environment championed good practice, and commissioned several GWP handbooks.

Innovative computer modelling of excavating and backfilling sequences within the constraints of geological structure, lithology and jointing led to clearer appreciation of potential problems and enabled better designs. Examples of several projects give a flavour of the complexities and problems encountered, not all of which were geotechnical.

Countering the decline in the UK coal sector, GWP's work expanded abroad and into other mineral sectors. Assignments in China, India and Russia were both interesting and challenging. In 1993, the British Geological Survey invited Walton to become a non-executive director and to chair the review of the BGS's on-shore mapping programme. The final chapter deals with Walton's retirement and gradual disengagement from GWP. Although there is little detail, it was evidently a difficult time with a younger generation wanting more independence. A diplomatic solution was found; Walton established a new niche, and GWP continues.

A satisfying history of an active firm requires a balance of compression in outlining the breadth of activity, and expansion of detail for representative projects and clients to reveal the technical, social, political, and personal aspects of working life. Walton manages this compromise well to make a rewarding and enjoyable read.

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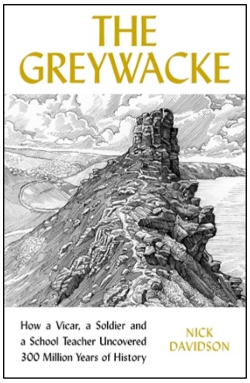
Book Review

Douglas Palmer

The Greywacke: How a Priest, a Soldier and a School Teacher Uncovered 300 Million Years of History

Nick Davidson
Profile Books Ltd 2021 £20.00
ISBN 9781788163774 280pp



Few people outside the world of geology will have heard of ‘greywacke’, or know the saga of the mapping, description and subdivision of the ‘greywacke’ rocks of the British Isles. Nick Davidson’s *The Greywacke* tells the complex story of how these rocks, representing a significant chunk of ‘deep’ geological time (now known to be around 541-359 million years ago), were carved up into systems of strata and periods of time by a select band of 19th century British geologists. It makes for fascinating reading.

The early decades of the 19th century saw the mapping of the geological strata and a growing understanding of the processes which transformed them from soft sediment into hard rock. From the pioneering work of William Smith (1769-1839) and his contemporaries, in Britain and abroad, there was an awareness of the distribution of the strata in space and relative time, from the youngest surface deposits down to the Coal Measures of Carboniferous times. But the older strata, found in northern and western Britain, were largely geological *terra incognita*.

Smith lumped these older strata together as ‘Killas and Slate’, using the vernacular of British miners and quarrymen. However, more academically-minded geologists, such as G. B. Greenhough (1778-1855) and William Buckland (1784-1856) preferred the Wernerian term ‘Transition’ strata. The ‘Transition Series’ were considered to lie on and above the oldest Primary rocks and were largely seen as ‘Greywacke’, or ‘Grauwacke’ in the original German, meaning ‘grey sandstone’. Even by the early 1830s much of Wales, the Lake District, Southwest England and Southern Scotland were still mostly unmapped ‘Greywacke’.

That is, until the unlikely duo of a Cambridge don, the Revd Professor Adam Sedgwick (1785-1873), and a wealthy geological neophyte, Roderick Murchison (1792-1871), set out to ‘tame’ the vast tracts of Welsh Greywacke. By combining the intricacies and problems of the geology with an account of the relationships between the main players – Sedgwick, Murchison, Henry De la Beche (1796-1855) and later on Charles Lapworth (1842- 1920) – Davidson turns an interesting history into an intriguing one.

This biography of ‘The Greywacke’ is enhanced by the author’s knowledge of the terrains of Wales and the Scottish Southern Uplands, worked respectively by Sedgwick and Lapworth. Outcrops can be few and far apart and the structure complicated by folding and faulting. Worse still is the rarity, in North Wales, of the distinctive lithologies and fossils that would have helped Sedgwick to more easily establish a stratigraphy. Sedgwick, however, compounded the problem by failing to characterise his Cambrian system with the few fossils that he did find. In contrast, Murchison had the easier task of differentiating the younger, less disturbed and more fossiliferous strata in the southeast, where he could argue that he was applying the ‘modern’ Smithian method of differentiating his relatively younger Silurian strata by their characteristic fossils. It was eventually Lapworth’s rigorous application of the Smithian method to the more fossiliferous Southern Uplands that enabled him to establish the ‘Ordovician’ and allow for the modern tripartite differentiation of these early strata into the Cambrian, Ordovician and Silurian systems.

Meanwhile, in Southwest England, the Greywacke was the centre of another drama. With hindsight, we can appreciate how the post-Silurian (Hercynian) structural deformation made the strata of southwest England look superficially like the greywackes of Wales. Were these rocks of Cambrian, Silurian or possibly younger age, as argued by Henry De la Beche? Eventually, it was realised that their fossils characterised another post-Silurian phase in Earth history. Murchison and Sedgwick placed the strata in a new ‘Devonian’ System, correlating them with the undeformed Old Red Sandstone strata of Wales and northern Britain.

Given that geology might seem to be one of the less emotionally charged areas of academic pursuit, ‘Greywacke’ reveals an extraordinary Victorian scientific drama. Exacerbated by fundamental differences in personality, relations between the erstwhile friends and collaborators – Sedgwick and Murchison – soured, as Sedgwick’s Cambrian was reduced almost to oblivion by the ambitious Murchison’s aggrandisement of ‘his’ Silurian System, with the latter using his social status and position to convince the geological world at home and abroad of the correctness of his claims. Davidson tells us how the ‘rights’ and ‘wrongs’ of the matter were finally resolved by the discoveries made by a new generation of geologists and especially by the self-effacing Charles Lapworth, a man refreshingly more concerned with scientific evidence than personal status.

Whilst the geological intricacies of all this might elude the general reader, Davidson carries the story forward with a warts-and-all view of the drama. Some of the text may cause geologists to wince, but on the whole Davidson has done an excellent job, telling the story and dealing with the geological concepts without falling into the trap of writing an account so technical as to put off the general reader.

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Lost Books

Hugh Torrens and Christopher Toland

Lost Books – a history (part 2)
Hugh Torrens

Hugh Torrens continues his 'progress report' on the results of various ***Lost Books*** *appeals made over the years in the HOGG Newsletter.*

Lost Book No. 3 was sought in Newsletter 37 (October 2009). It had come to my attention when it I saw it in the same 1957 bookseller's catalogue that had offered for sale the unique copy of Smith's **Norfolk** book (*see Lost Books No. 2, GeoHistories 71*). It was a previously unknown ***Guide to the Landslip near Lyme Regis by an Eminent Geologist***, 1840.

Now Chris Toland takes up the story of Lost Book No. 3…

Lost and Found: *A Guide to the Land-slip, near Lyme Regis, Dorsetshire: With a Geological and Philosophical Account of its Nature and Causes, by an Eminent Geologist*

Issue No.37 of the History of Geology Group (HOGG) Newsletter, for October 2009, contained the following notice by Hugh Torrens regarding a book that was known to have been published but of which no copy apparently remained:

"LOST BOOKS No. 3

In Catalogue No. 84 of Stanley Crowe [for March 1957] …, he listed the following item:

'29. *A Guide to the Land-Slip near Lyme Regis, with a Geological and Philosophical Account of its Nature and Causes, by an "Eminent Geologist".* Published Lyme [Regis, Dorset], 15 pp. Original printed wrappers. Very scarce.'

How right he was! Who was 'the geologist' and can anyone now find us a copy?"

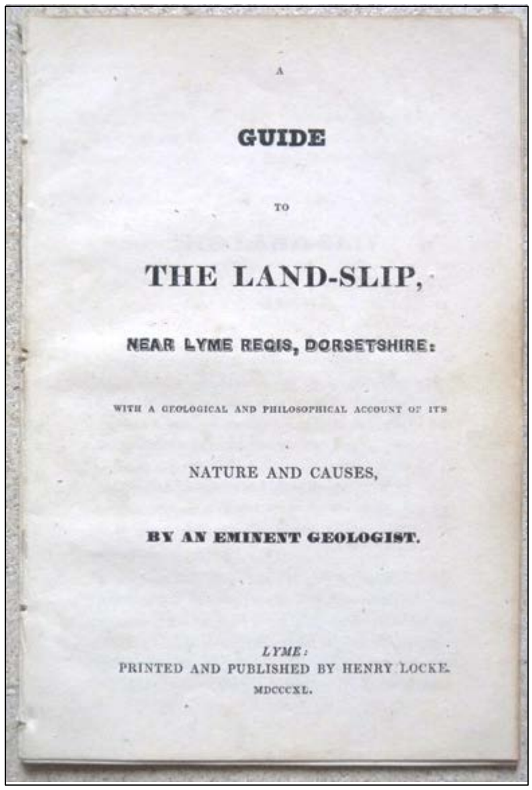
***

No surviving copy of this 'lost' work was located until very recently when the Bristol-based bookdealer Ivor Cornish of Ambra Books offered the following item in an online catalogue for November 2020:

"A GUIDE TO THE LAND-SLIP, near Lyme Regis, Dorsetshire: With a Geological and Philosophical Account of its Nature and Causes. By an Eminent Geologist. 15pp, small 8vo, lacks wraps. *Printed and Published by Henry Locke, Lyme: 1840.*

* *RARE. Not on Copac, and not in Mayo's Bibliotheca Dorsetiensis."*

An examination of this newly rediscovered copy enables us to record additional details of this 'lost' work, and to establish the identity of the 'Eminent Geologist' referred to in the title.



A

GUIDE

TO

THE LAND-SLIP,

NEAR LYME REGIS, DORSETSHIRE:

WITH A GEOLOGICAL AND PHILOSOPHICAL ACCOUNT OF ITS

NATURE AND CAUSES,

BY AN EMINENT GEOLOGIST.

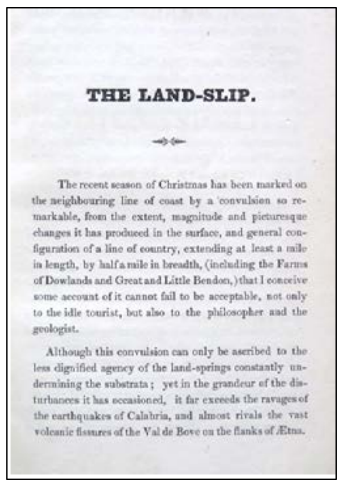
LYME:
PRINTED AND PUBLISHED BY HENRY LOCKE.
MDCCCXL.

Page 3 of the newly rediscovered publication
(photo C. Toland CC BY-NC-ND)

The booklet is a slim small quarto (159mm x 106mm) volume, and collates as follows:
[p.1] Title page, [p.2] blank, [pp.3-15] text, [p.16] blank

The publisher and printer was Henry Locke of Lyme [Regis, Dorset] and the publication date was 1840.

The first part of the main text, from p.3 up to the end of the first paragraph on p.9, is a re-typeset but otherwise verbatim copy of an article by William Conybeare that was written on 31 December 1839 and printed in the *Edinburgh New Philo-sophical Journal* Volume XXIX pp160-164 for April-October 1840.



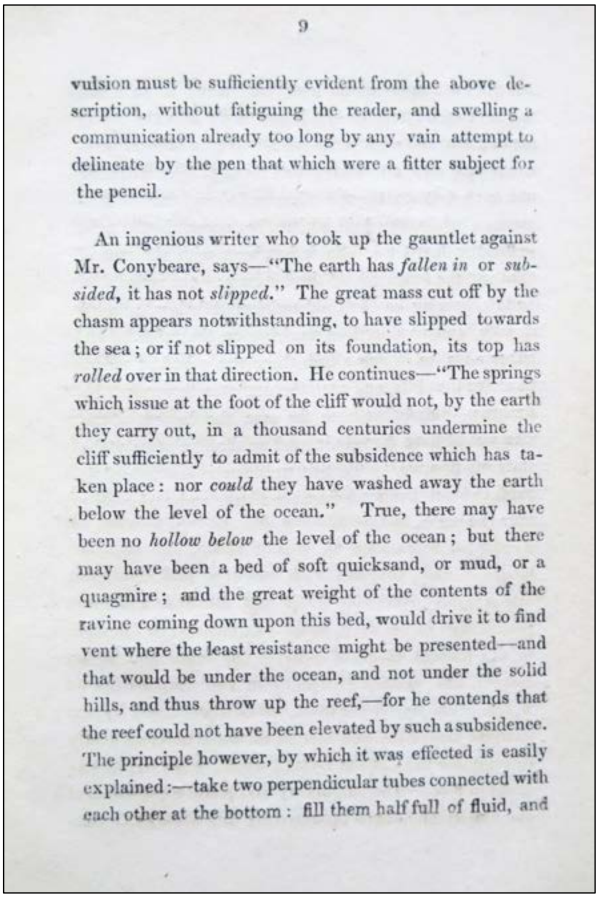
THE LAND-SLIP.

The recent season of Christmas has been marked on the neighbouring line of coast by a 'convulsion so remarkable, from the extent, magnitude and picturesque changes it has produced in the surface, and general configuration of a line of country, extending at least a mile in length, by half a mile in breadth, (including the Farms of Dowlands and Great and Little Bendon,) that I conceive some account of it cannot fail to be acceptable, not only to the idle tourist, but also to the philosopher and the geologist.

Although this convulsion can only be ascribed to the less dignified agency of the land-springs constantly undermining the substrata; yet in the grandeur of the disturbances it has occasioned, it far exceeds the ravages of the earthquakes of Calabria, and almost rivals the vast volcanic fissures of the Val de Bove on the flanks of Ætna.

Title page of the newly rediscovered publication
(photo C. Toland CC BY-NC-ND)

The 'Eminent Geologist' referred to in the title of the anonymously published *A Guide to the Land-slip, near Lyme Regis, Dorsetshire* is thus, undoubtedly, William Conybeare.



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vulsion must be sufficiently evident from the above description, without fatiguing the reader, and swelling a communication already too long by any vain attempt to delineate by the pen that which were a fitter subject for the pencil.

An ingenious writer who took up the gauntlet against Mr. Conybeare, says—"The earth has *fallen in* or *subsided*, it has not *slipped*." The great mass cut off by the chasm appears notwithstanding, to have slipped towards the sea; or if not slipped on its foundation, its top has *rolled* over in that direction. He continues—"The springs which issue at the foot of the cliff would not, by the earth they carry out, in a thousand centuries undermine the cliff sufficiently to admit of the subsidence which has taken place: nor *could* they have washed away the earth below the level of the ocean." True, there may have been no *hollow below* the level of the ocean; but there may have been a bed of soft quicksand, or mud, or a quagmire; and the great weight of the contents of the ravine coming down upon this bed, would drive it to find vent where the least resistance might be presented—and that would be under the ocean, and not under the solid hills, and thus throw up the reef,—for he contends that the reef could not have been elevated by such a subsidence. The principle however, by which it was effected is easily explained:—take two perpendicular tubes connected with each other at the bottom: fill them half full of fluid, and

P.9 of the newly rediscovered publication

(Photo C. Toland CC BY-NC-ND)

The middle part of this work, starting at the second paragraph on p.9 to the end of the final paragraph on p.12, is taken word for word, but again re-typeset, from pp.16 (starting at the 2nd paragraph) to p.19 (end of first paragraph) of the following publication by Peter Orlando Hutchison [writing under the pseudonym P.O.H.Sidmouthensis]: **A Guide to the Land-slip, near Axmouth, Devonshire: together with a geological and philosophical enquiry into its nature and causes, and a topographical description of the district**.
Printed and sold by John Harvey , 1840.

The subsequent part of *A Guide to the Land-slip, near Lyme Regis, Dorsetshire*, from the start of the 2nd paragraph on p.12 to line 5 of p.14, provides directions to the would-be traveller, including specific instructions for 'Delicate persons and those who cannot endure much walking over a rough and uneven country', to the site of the [Bindon] landslip. This is again taken verbatim from p.20 (start of 2nd paragraph) to p.22 (line 15) of Hutchinson's 1840 *Guide to the Land-slip, near Axmouth, Devonshire*.

The final part of *A Guide to the Landslip, near Lyme Regis, Dorsetshire*, from p.14 (Line 5) to p.15 (end of final paragraph) provides a brief account of a similar landslip at Whitlands.

Based on the above, it seems highly probable that Peter Orlando Hutchison was the co-author (together with William Conybeare) and compiler of the newly re-discovered *A Guide to the Landslip, near Lyme Regis, Dorsetshire* volume.

Christopher Toland, 2021

Lost Book No. 4, sought three ephemeral items by geologist and curator Edward Charlesworth (1813-1893) in Newsletter 38 (February 2010). He was among those who founded our *Society for the Prevention of Cruelty to Children* (much later, be it noted, than that to prevent cruelty to animals...). As far as I can recall, none of these have since turned up. If they do, please tell the Library at Saffron Walden (where he died), which has found a home for my Charlesworth Collections, where they will soon be re-located.

Lost Book No. 5, sought the 1802 printed ***Elegy, sacred to the memory of Lady Wright*** who had died at Bath in 1802. She had married Sir James Wright, First Baronet, 'a diplomatist and art collector', who manages to get a much better treatment in *Wikipedia* (where his dates are correct (baptised 1730, died 1804), than in the *ODNB,* which – confusing him with another – has him baptised in 1717. Sir James was also a major industrialist, making artificial roof slates in Essex where he was succeeded by his only son George, who later founded the amazing 'Stone Pipe Company', which made water pipes bored out of supposedly solid Cotswold Stone and intended for use in London and Manchester. George also set up a similar enterprise, using Irish rock, to supply pipes to Dublin. In 1812 the London business failed catastrophically, causing major financial and personal problems. A description of the activities of the seemingly incredible Stone Pipe Company is given at http://www.uwlhs.uk/prj_spc.html.

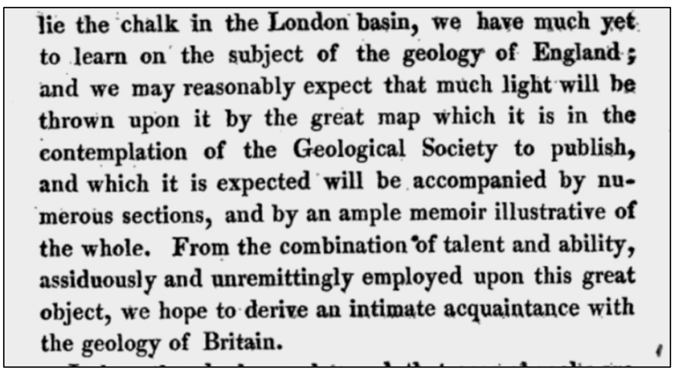
This **Elegy**, despite having been reviewed in the *Critical Review*, the *Anti-Jacobin Review* and the *British Critic* in 1802, and the *Monthly Review* in 1803 has seemingly failed to survive. Its discovery would help me persuade the *ODNB* that it has a false idol in its ranks.

Lost Book No. 6, sought in the first of the new series of HOGG Bulletins (February 2021): copies of the rare 1908 **Family Biography,** constructed by two sisters Isabella (1834-1932 – see *Times,* 22 June 1932) and Catherine Scott (1836-?) who were sisters to Charles Prestwich Scott (1846–1932), newspaper editor and proprietor of the *Manchester Guardian* (see *ODNB*), whose uncle was the geologist Joseph Prestwich for whom this book becomes a welcome new source. Through a recent article in the *Guardian,* I was able to trace a descendant of the *Manchester Guardian*'s founder, who has a first edition of this book, with the illustrations found only in the first edition of 50 copies. These include a fine one of Prestwich. She also confirmed that the First Appendix must comprise all the sections listed under Appendix in this edition (pp. 443-462), much of which is missing "all after p. 456" in the New York Public Library copy which has been digitized, but which is seriously incomplete. The only other new copy to turn up is one in the Koninklijke Biblioteek in the Hague. Clearly only two Appendices were ever printed that in this book (1908) and the second (June 1917).

Lost Book No. 7 has not, until now, been sought through the pages of any HOGG newsletter. On 1st September 2021 I wrote to ask Wendy Cawthorne, sadly no longer at the GSL Library, 'if you can please help with another **Lost Books** query?' I explained that: 'In a review of the GBG Map dated 15 May 1820 in *Phil. Mag.* vol. 55 for 1820, pp. 379-380, John Farey *twice* refers to a recent publication by William Phillips as his July 1816 **Appendix to the First edition of his Outlines of the Geology of England,** citing page 29 as having given a highly laudatory note on the vast superiority of this Map over Smith's of 1815. These **Outlines** first appeared (appended as pp 181-226, and with a reduced Smith Map) in the second edition, July 1816, in his book **Outlines of Mineralogy and Geology,** but with no such note on GBG's map.

But on an un-numbered Advertisement sheet at the front, Phillips adds that 'this [addition] may be had separately', which, as his own printer, he could easily produce. I feel sure that Farey was quoting from a copy of this separate version, which explains the different [29] pagination he quotes. But can anyone find us a copy of it?'

Four hours later Wendy replied: 'I am not sure whether it may be this item I have found online. Not, it seems, in the GS Library or BGS.' Attached to the email was this image:


lie the chalk in the London basin, we have much yet to learn on the subject of the geology of England; and we may reasonably expect that much light will be thrown upon it by the great map which it is in the contemplation of the Geological Society to publish, and which it is expected will be accompanied by numerous sections, and by an ample memoir illustrative of the whole. From the combination of talent and ability, assiduously and unremittingly employed upon this great object, we hope to derive an intimate acquaintance with the geology of Britain.

Part of page 29 of William Phillips' Appendix. (*Public Domain*)

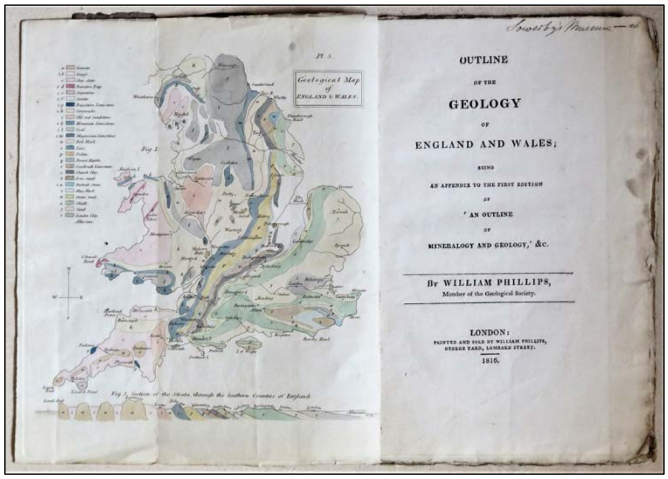
It was taken from page 29 of the very document I was seeking, which had, it seems, been hiding in plain sight on Google Books! Entitled *Outline of the geology of England and Wales: being an appendix to the first edition of 'An outline of mineralogy and geology, &c.'*, it does indeed make much of the potential of the Geological Society's map.

My response, an hour or two later, speaks for itself:

Dear Wendy.
You have found it! THANK YOU!
This is the item I sought, kindly (& uniquely?) preserved in the StadtBibliothek of Berne (in Switzerland). It is an item I had never even heard of – even after I had done WP's ***ODNB*** *entry.*
It has the same text as WP's ***Outlines*** *(second edition) except that now some text has had to be reset (to allow cross references to be consistent) and so some pages are now longer to allow a little condensing of this text. So well done and many thanks.*

But the question remained: did anyone know of another copy?

Postscript to Lost Books No. 7
As this item was being prepared for press, Chris Toland was shown a draft and immediately responded that he did indeed know of another copy. It was in his own collection: 'A nice untrimmed copy in original plain brown paper publisher's wraps, the title page inscribed "Sowerby's Museum 1816". The front wrapper is inscribed "L.R. Wager, 1949". Chris surmised that this copy may have been acquired at Hodgsons' Templeman sale which was held 6 May 1949 and which included a large collection of unspecified Geological Pamphlets and Offprints (Lots 619 through 621).



Chris Toland's copy of the Phillips1816 'Appendix'. *(photo. C. Toland CC BY-ND-NC)*

Chris has also discovered that there is a copy of the *Appendix* in the geological library at the Museum National d'Histoire Naturelle in Paris.

So, thanks to the collaborative efforts of HOGG members, Lost Book No. 7 is now well and truly found.

My thanks to all who have helped to discover this and other 'Lost Books' over the years. I'm sure there will be more to come ...

Hugh Torrens
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Rediscovering a 'lost' Mary Anning fossil

Sue Newell & Tom Sharpe

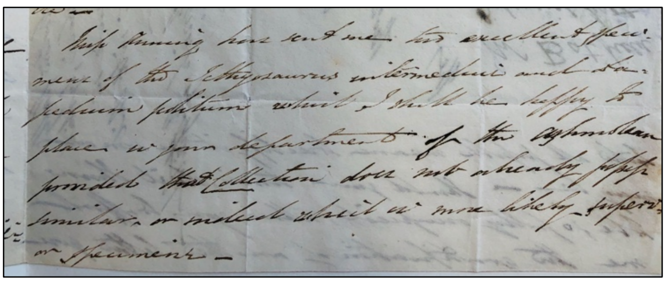
Archival research in the collection of Oxford University Museum of Natural History (OUMNH) has led to the rediscovery of a previously unrecognised specimen collected by Mary Anning.

On 19 March 1813 the Rev. William Buckland was elected a member of the Geological Society of London, the same day that Thomas Botfield (1762–1843), a metallurgist and ironmaster of Hopton Court, Bewdley (Shropshire) was proposed as a member. The association of the two men at Geological Society meetings may have been the start of a curious train of events. When Thomas's brother Beriah (1768–1813), of Norton Hall, Northamptonshire, died in the same year it seems that Thomas took his young nephew, Beriah junior (1807–1863) under his wing. Thomas was a man of substance and young Beriah was sent first to Harrow and then, in December 1824, to Christ Church Oxford where, from 1825, Buckland was a Canon.

While at Oxford Beriah Botfield junior signed up for Buckland's Geology and Mineralogy courses and in April 1828 was elected a Fellow of the Geological Society, nominated by Buckland, Charles Lyell and Charles Daubeny. Graduating BA in 1828, Botfield then made an extended geological tour of Scotland in the summer of 1829 and had the account of his travels, *Journal of a Tour Through the Highlands of Scotland*, privately printed in 1830.

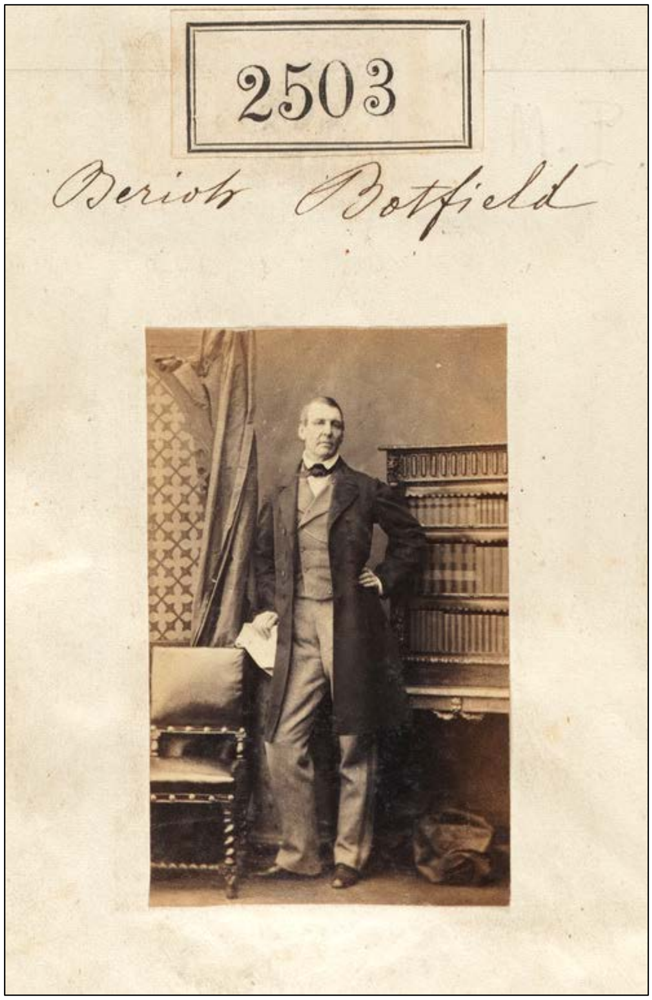
Heir to a considerable fortune, Botfield was able to pursue his interests as an antiquarian, geologist, art collector, genealogist and bibliophile. He also engaged in politics and twice served as Conservative M.P. for Ludlow. Eventually his early passion for natural history waned, but not before he had amassed considerable collections. He went on to present a suite of British minerals to the Royal Collection in Dresden, and a collection of taxidermy specimens of British birds to the Natural History Museum in Brussels.

However, a letter in OUMNH reveals that his philanthropy may have started closer to home.


Miss Anning have sent me two excellent speci-
mens of the Icthyosaurus intermedius and Da-
pedium politum which I shall be happy to
place in your department of the Ashmolean
provided that Collection does not already possess
similar or indeed which is more likely superior
specimens –

Extract from Beriah Botfield's letter to William Buckland, 3 September 1829 (Courtesy OUMNH)

On 3 September 1829, on the return leg of his Scottish tour, Botfield wrote to his old geology teacher. He recounted the details of his itinerary, including his visit to see the puzzling



Beriah Botfield by Camille Silvy, albumen print, 13 March 1861 (© National Portrait Gallery, London)

surface scratches at Brora, then believed to be the result of diluvial action. He also reported enthusiastically about specimens he had bought from the Edinburgh geologist and mineral dealer Alexander Rose (1781–1860). What concerns us here however is a comment, included without preamble, in the main flow of Botfield's letter to Buckland:

> *Miss Anning has sent me two excellent specimens of the Icthyosaurus Intermedius and Dapedium politum which I shall be happy to place in your department of the Ashmolean provided that Collection does not already possess similar or indeed which is more likely superior specimens.*

One of Botfield's two specimens from Mary Anning has now been discovered – predictably while looking for something else – in storage at OUMNH. Mounted, unusually, in a thick decorative frame of a polished, black, fossiliferous limestone, probably Lower Carboniferous Ashford black marble from Derbyshire, it is obligingly engraved:

'Presented by BERIAH BOTFIELD Esq.' and
'DAPÆDIUM POLITUM, Lyme, Dorset'.

The stone has been expertly bevelled and polished by William Blundell (1779–1865), a stone and marble mason recorded in Northamptonshire trade directories of the day, who signed and dated the side of the frame 'W. BLUNDELL, FT. FRAMES, DAVENTRY 1830'.

The mounted Dapedium politum *at OUMNH* *(Courtesy of OUMNH)*

The fossil itself is a fine example of a large *Dapedium*, about 30 cm in length. Interestingly, contemporary newspapers report that in late 1828 Anning found 'a large perfect specimen of the Dapedium Politum … The specimen is unrivalled'. This may well have been the example purchased by Botfield.

The Lias block containing the fish is much fragmented, especially in the region of the head. When the roofing slate forming the back of the frame was removed, the pieces were seen to be set within a brown cement which was painted grey in front to match the colour of the rock. It seems likely that the cement, and probably also the painting, are Anning's work.

The back of the specimen *(Courtesy of OUMNH)*

The specimen was probably originally surrounded by a wooden frame made by Anning (or more likely, her brother). If so, this was removed by Blundell, as was the brown cement on either side of the specimen where metal rods, presumably part of the stone frame's structure, were inserted.

We don't know whether Botfield visited Lyme Regis or sought specimens from Anning by correspondence, but it would have been characteristic of Buckland to have encouraged his student to visit Lyme and to patronise his friend Mary Anning. Botfield must have commissioned Anning to find suitable specimens for him to present to Buckland for his teaching collection. He had presumably received news of these specimens' arrival at Norton Hall in his absence.

The ichthyosaur mentioned by Botfield in his letter has not yet been identified in Buckland's collection. No similarly framed example has survived. Of course, a stone frame could easily have been broken or been too heavy, and further research may yet allow an ichthyosaur from the historical collection to be linked to Anning.

Botfield's fascination with fossils and Buckland seems to have reached a climax with his commission of a portrait of Buckland by the artist Thomas Phillips RA in 1830. One of five portraits of Buckland by Phillips, it is discussed by Buckland in a letter to the artist of 27 April 1831 (National Portrait Gallery Archive). It hung at Norton Hall and its present location is the subject of ongoing research.

Botfield was clearly proud to be associated with his gift of *Dapedium*, and we owe our knowledge of the specimen's provenance to his concern to memorialise his patronage of his old university, combined with personal ties of loyalty and admiration for his old teacher. Fortunately, the archival evidence also allows us to recover Anning's fundamental role in this narrative: as the original finder, vendor and identifier of the fossil.

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Tom Sharpe: tom@tomsharpe.co.uk

Acknowledgements: We are most grateful to Eliza Howlett, Karen Bell and Phil Powell of OUMNH for their examination of, and opinions on, the specimen and its frame and to Caroline Lam at the Geological Society for archival assistance.

(All photos unless otherwise stated by S. Newell courtesy of OUMNH Historical Collections and Library and Archives.)

Sue Newell is an AHRC CDP student at the University of Leeds and OUMNH

William Speirs Bruce (1867-1921)

a centenary appreciation

Phil Stone

The geological contributions of the Scottish Polar explorer William Speirs Bruce

I became interested in the career of William Speirs Bruce while researching the geological work of the 1902–1904 Scottish National Antarctic Expedition (SNAE) to the Weddell Sea. Bruce had organised this, the *Scotia* expedition, as a nationalistic enterprise to coincide with Scott's *Discovery* expedition to the geographically opposite Ross Sea coast of Antarctica. Bruce saw his venture as complementing Scott's; the London-based scientific establishment saw it as unwelcome competition and were not best pleased. This set the tone for Bruce's career as a scientific outsider.

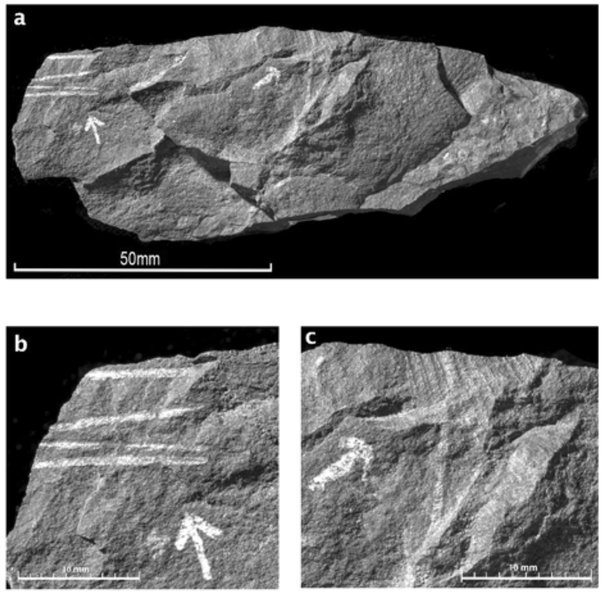
The Antarctic

The SNAE aboard the *Scotia* was Bruce's second Antarctic venture. Earlier, he had abandoned his final year medical studies at Edinburgh University in 1892 and joined a Dundee whaler as a ship's surgeon. The *Balaena* took him to the South Shetland Islands and the northern tip of the Antarctic Peninsula. Bruce collected many geological and natural history specimens, but, to his disgust, during the return journey the ship's captain decided that the vessel was over-loaded and had most of Bruce's collection thrown overboard. Nevertheless, the experience made him determined to return to the Antarctic, an ambition fulfilled in 1902.

Geology got off to a bad start during preparations for the *Scotia* expedition. Bruce had recruited a geologist, a Mr Campbell Brown, but they fell out and Brown was dismissed. Instead, the geological role fell to the expedition's doctor, James Hunter Harvey Pirie (1879–1965) who had studied the subject as part of a general science course at Edinburgh University. Pirie described the lithologies of rocks dredged from the sea floor and provided the first account of the geology of Laurie Island, one of the South Orkney archipelago, where the SNAE set-up a main base. His notebooks and specimens are now held by National Museums Scotland (NMS). He also published several papers describing aspects of geology, glaciology and oceanography.

Sadly, Pirie's generally competent work has been overshadowed by an error for which he was not entirely responsible, the misidentification of Permo-Triassic plant fragments as Lower Palaeozoic graptolites.

Pirie's tentative field observation, influenced by the superficial similarity of the Laurie Island rocks to the indisputably Lower Palaeozoic greywacke and mudstone of the Scottish Southern Uplands, was subsequently supported by no lesser authorities than Ben Peach and Gertrude Elles – and 'graptolites' continued to be found until the 1950s, albeit in the face of increasing scepticism. Delighted by their discovery, Bruce and Pirie gave the name 'Graptolite Island' to the small offshore island where the fossils had been found. The Permo- Triassic age of the rocks, and the true nature of the fossils, was not established until 1979, but by then the name 'Graptolite Island' was well established and will probably survive in perpetuity as a geological anomaly at 60° 43´ S, 44° 27´ W.



The infamous 'graptolitic' specimen of slaty mudstone recovered by Pirie from Graptolite Island; the fossils are now regarded as Permo-Triassic plant material. NMS specimen 1954.2.29: a) The whole specimen; b) Detail of features that may have been regarded as graptolites; c) Detail of the feature most probably identified by G. Elles as Pleurograptus sp., which overlies an area interpreted by B.N. Peach as the carapace impression of a phyllocarid crustacean. Image © BGS (UKRI).

All of the Scotia expedition's geological results were discussed and summarised in my paper published in *Scottish Journal of Geology* in 2017, and not long after I was contacted by Silvia Carrasquero, a curator at the Museo de La Plata, Argentina, with the surprising news that her museum also held a collection of rock specimens from the *Scotia* expedition. After some discussion, Silvia wrote a follow-up paper for *Scottish Journal of Geology* describing the specimens and discussing their history. They played a small part in a controversial geopolitical episode, and it was highly appropriate that Silvia's paper was published earlier this year, the centenary of Bruce's death.

In the austral summer of 1903–1904, Bruce needed to reprovision his expedition and his ship, *Scotia*, was in need of repair. Accordingly, and leaving a small party – including Pirie – to continue with scientific observations on Laurie Island, Bruce took *Scotia* to Buenos Aires via the Falkland Islands. He had no personal contacts in Buenos Aires but knew, by reputation, Francisco Moreno, an eminent Argentinian geographer and explorer of Patagonia, who was also the Director of the Museo de La Plata which he had opened in 1888. Bruce appealed directly to Moreno for assistance and was rewarded beyond his wildest dreams. Through Moreno's influence and introductions Bruce became an overnight celebrity whilst arrangements were made for *Scotia* to be restocked with coal and repaired free-of-charge in the Naval dockyard.

A cartoon of William Speirs Bruce published in the Buenos Aires magazine El Gladiator, Number 110, January 1904. Moreno's patronage ensured that Bruce was fêted as a Polar celebrity during his time in Buenos Aires. From original held by the Centre for Research Collections, Edinburgh University Library, reproduced under a Creative Commons CC-BY licence

Best of all (from Bruce's perspective), the Argentinian Government agreed to take over the Laurie Island base and maintain the meteorological observations that Bruce had initiated. Establishing this continuity had been a major objective but, despite Bruce's urging, the British Government had shown little interest in the remote Antarctic island. That changed a few years later when in 1908 Britain moved to formally claim a swathe of Antarctic territory that included Laurie Island – conveniently overlooking the established presence there of the by-then-Argentinian scientific base.

Bruce had little to offer Moreno in return for his support and assistance. Perhaps in desperation he turned to Pirie's geological specimens, presenting eleven Laurie Island rocks to Moreno for the Museo de La Plata. As described by Silvia Carrasquero, this initiated the museum's Antarctic geological collection which today comprises some 250 rock and mineral specimens. A few rock specimens seemed scant reward for Moreno's help, so as an additional mark of respect Bruce named a Point Moreno on the SNAE's map of Laurie Island: the name is still valid at 60° 44´ S, 44° 41´ W.

The Arctic

After the *Balaena* disappointment, Bruce turned his attention north, to the Arctic, first with the 1896–1897 'Jackson-Harmsworth Expedition' to Franz Josef Land, then in 1898 with another private expedition to Novaya Zemlya. A legacy of the latter is his collection of Carboniferous fossils now held by NMS. Later in 1898, by transferring to a third expedition, Bruce was able to make his first visit to Spitsbergen, the principal western island of the Svalbard archipelago. There he noted the presence of coal and gypsum and thought there were good prospects of finding oil shale. More visits to Svalbard followed and areas of interest were surveyed and geologically assessed. An Early Palaeozoic shelly fauna and Cenozoic plants collected from Prince Charles Foreland (the westernmost island of the Svalbard archipelago) during this phase of exploration are also held by NMS. Encouraged by early success, in 1908 Bruce launched the Scottish Spitsbergen Syndicate, a commercial enterprise to exploit the economic geological materials. Although the Syndicate continued to explore until 1928, and was not wound-up until 1953, it was economically unsuccessful.

It is a measure of Bruce's stature that he was able to recruit high-calibre geologists for his Spitsbergen field teams, several of whom published accounts of their work. Two were veterans of Shackleton's ill-fated 1914-16 Antarctic expedition: James Wordie from the Weddell Sea (*Endurance*) party and Alexander Stevens from the Ross Sea (*Aurora*) party. Wordie (later Sir James) went on to become Chairman of the Scott Polar Research Institute and Master of St John's College, Cambridge; Stevens became the first professor of geography at Glasgow University. Another, Henry Cadell had worked for the Geological Survey in the 1880s, before leaving to manage his family's coal and oil shale interests in central Scotland. Cadell was well placed to judge the commercial viability of the Spitsbergen enterprise and though initially cautious, had joined the Syndicate as a Director in 1919 and made two visits to Spitsbergen. Douglas Allan was Director of the Royal Scottish Museum (now National Museum of Scotland) from 1945 to 1961. John Charlesworth became professor of geology at Queen's University, Belfast. George Tyrrell enjoyed an eminent career at Glasgow University. There were many others.

Epilogue

Despite his extensive travels and experience in both Polar regions, Bruce never achieved the fame of contemporaries such as Scott, Shackleton and Amundsen. In part that reflects his character: he was never given to self-promotion and was generally regarded as 'difficult'. It also reflects his concentration on scientific work rather than the headline-generating explorations of his peers. William Speirs Bruce died in the Liberton Hospital, Edinburgh on 28 October 1921 and it seems appropriate in this, his centenary year, that some of his geological contributions should be recognised. I'd be delighted to learn of any other geological specimen collections that might have arisen from his endeavours.

Basic Bibliography

Carrasquero, S.I. 2021. The geological collection from the Scottish National Antarctic Expedition (1902–04) in the Museo de La Plata, Argentina. *Scottish Journal of Geology*, **57**, 60–66.

Pirie, J.H.H. 1905. On the Graptolite-bearing Rocks of the South Orkneys. *Proceedings of the Royal Society of Edinburgh*, **25**, 463–470.

Stone, P. 2017. The geological work of the Scottish National Antarctic Expedition, 1902-04. *Scottish Journal of Geology*, **53**, 71–87.

Williams, I.P. & Dudeney, J. 2018. *William Speirs Bruce – Forgotten Polar Hero.* Amberley, Stroud.

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Geology in Humphry Davy's Notebooks

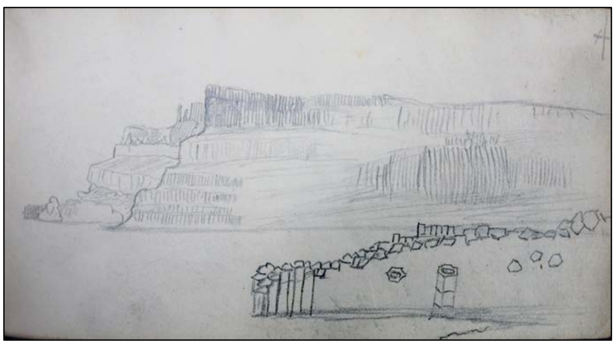
A note about the Davy Notebooks Project

Frank James

Humphry Davy (1778-1829) is generally regarded as a chemist, coining words such as electro-chemistry and isolating chemical elements such as sodium and potassium for the first time. But from a very early stage and throughout his scientific career Davy also undertook significant geological studies. His interest in science, particularly chemistry and geology, was inspired by Gregory Watt (1777-1804), the son of the famous Birmingham engineer and chemist James Watt (1736ns-1819), who lodged with Davy's mother in Penzance during the winter of 1797/8. Watt and Davy would geologise in West Cornwall, collecting minerals and visiting copper and tin mines in the area, some of which were drained using steam engines provided by Watt's father and his partner, Matthew Boulton (1728-1809). Watt would later use his father's furnaces in attempting to recreate the processes that produced basalt.

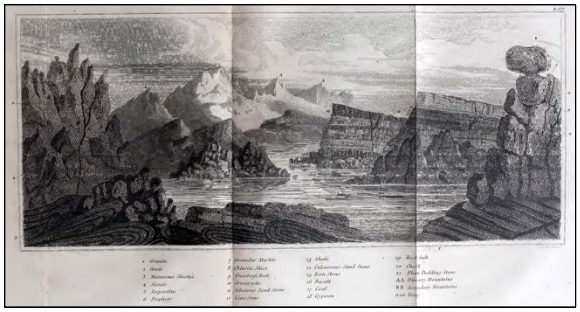
Davy had been an apprentice apothecary when he met Watt, but after Watt's stay at his home he turned his attention to science, writing an essay in which he contradicted the chemical theory and nomenclature of Antoine Lavoisier (1743-1794). On the basis of that text and with Watt's strong backing, in the autumn of 1798, the 19-year-old Davy was appointed Superintendent of the new Medical Pneumatic Institution in Bristol, where amongst other things, he discovered the remarkable physiological properties of nitrous oxide. Two and half years later he moved to the recently founded Royal Institution in London where, as lecturer and researcher, he established his national, indeed international, reputation.

Part of Davy's work involved forming a mineral collection for the Royal Institution. That required him to undertake three extended expeditions around Britain and Ireland between 1804 and 1806. In Ireland he twice visited Giant's Causeway and in one of his geological notebooks he portrayed the basalt columns and the headlands beyond.



Davy's drawing of Giant's Causeway, 1805 or 1806, *RI MS HD/15/A*

Those seem to have reappeared in the drawing (made probably by Thomas Webster (1772-1844) – architect of the Royal Institution and later the first paid employee of the Geological Society) of rock formations that Davy included in his 1813 *Elements of Agricultural Chemistry*.



'a general idea of the appearance and arrangement of rocks,' Humphry Davy, Elements of Agricultural Chemistry, *London: Longmans, 1813, opp. p.172*

Davy was fascinated with volcanoes and much of his geological research was directed towards understanding their causes. For example, following his isolation of potassium in 1807, he suggested that volcanoes were composed of potassium which when exposed to water erupted.

Still from Dr Peter Wother's demonstration of Davy's idea of potassium being the causal agent of volcanic action. Wother's video, which was part of a MOOC on Davy, can be accessed at https://www.youtube.com/watch?v=nxRHQ1xfnWc

He spent much of his European tour, accompanied by his wife Jane, Lady Davy (c.1780-1855) and assistant Michael Faraday (1791-1867), between 1813 and 1815 studying volcanoes such as the Canigou in the French Pyrenees (about which he wrote a poem) and Vesuvius near Naples. There they heard of the allied occupation of Paris and in his diary Faraday graphically described the victory celebrations held on Vesuvius.

Some of Davy's notebooks are entirely devoted to geology, while many others contain geological references. All this material will become freely available as part of the **Davy Notebooks Project**, a consortium of a number of institutions led by the University of Lancaster and funded by the AHRC, which should draw more attention to Davy's geological work.

Further details of the project can be found at *https://wp.lancs.ac.uk/davynotebooks/* and if you would like to help transcribe the notebooks please go to: *https://www.zooniverse.org/projects/humphrydavy/davy-notebooks-project*

Frank A.J.L. James: frank.james@ucl.ac.uk

Frank James is a Professor of History of Science at University College London

The Cabinet of Curiosities

John Henry

HOGG's Cabinet of Curiosities is a chimerical space combining the personal passion of the classic radio show 'Desert Island Discs' with the broadly educational intentions of the newer programme, 'The Museum of Curiosity'. This exhibit, from John Henry, whose firm, **19th Century Geological Maps** *will be familiar to most readers.*

How it all started

Some might say that I live in a cabinet of curiosities. Yet I don't consider myself a collector. Maps and books are treasured, either framed on the wall or frequently reached for, but they come, and they go. As I wondered what to focus on for this article, I realised that at most meals for the past quarter century, I've looked at the same pair of maps on the wall. My wife chose them, because, as she says to guests, 'they don't look like maps; they look like abstract paintings'. I suppose they are curiosities. Certainly, it's been more than simple inertia that has kept them there. They represent the starting point of my intense interest in the history of geology, and also of our map business.

For much of my life I worked in an international firm of consulting engineers, producing preliminary geological maps for proposed transport routes or prior to the development of tracts of land. Unforeseen ground conditions are the main cause of litigation in construction, and desk studies are critical for the design of ground investigations: to identify potential problems to be avoided altogether or mitigated by design. Ground conditions are not only geological. Archaeological features and historic land uses – industry, reclamation, or mineral extraction – also impact on the design and programming of projects. Air photos, maps and other such documents were, you might say, my stock in trade. In 30 years, I accumulated a large corporate library of maps and aerial photographs. All were georeferenced and many were often consulted.

In 1996, a retired engineer knocked on my door. He had rescued three boxes and several rolls of old maps from a skip, and wondered whether my firm would be interested. They were nineteenth century one-inch-scale Geological Survey maps. I had never seen such amazing maps, hachured and hand-coloured. For the uninitiated I should explain that the Geological Survey only introduced colour printing in 1900, three to four decades after Europe and America. In my work I had used only modern maps for the geology, though of course, for past land uses, I had used maps of all dates – but only at large scales. I told my visitor that my firm wasn't interested, but that I might be. What did he want for them?

He didn't know.

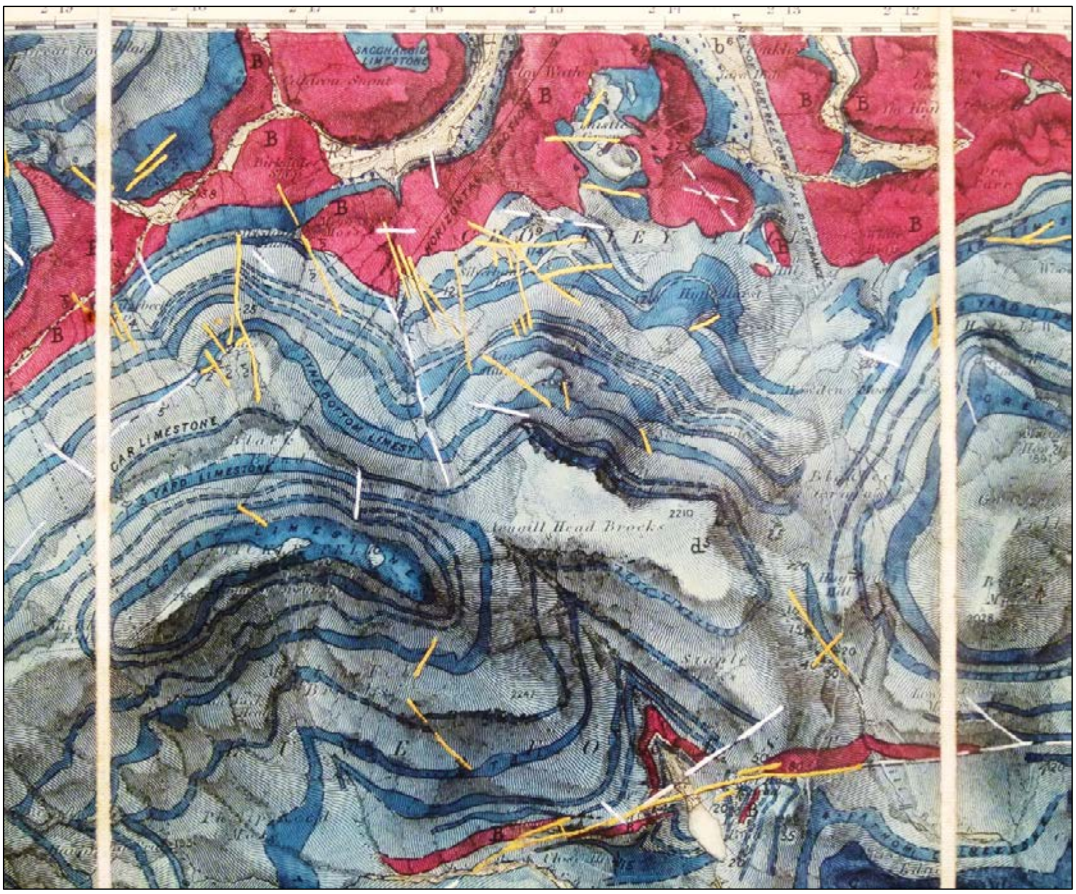
'Make me an offer', he suggested.

'How many are there?'

'About 400', he thought.

'How 'bout £400?'

'*Done!*'



Old Series 102se (New Series 31) 'Brough under Stainmore'. Base map 1863, geology 1895 (detail) *(photo by John Henry)*

Old Series 97sw (New Series50) untitled. Base map 1860, railways inserted 1879, geology 1889. Flat. (detail) *(photo by John Henry)*

I took the 400 maps home to my fairly new wife who said, ‘they don’t look much like maps, but I do love these ones; they’re just like paintings.’ Eight maps duly went up onto the walls. But that left 392 to be dealt with. What to do? I reckoned a fair concentration of rock-minded people would pass through the popular ‘Rock n’ Gem’ fair held on three weekends each year at nearby Kempton Park. So along we went and duly set out our stall. Annie, it turned out, could sell refrigerators to Inuits. This was just the start. We had found something we could manage from home and maintain deep into retirement. Along the way we met like-minded people and I joined HOGG. I have learned so much. I became interested in the economic and social context of early geology, the interplay of characters and ideas, the map resources before the OS, the derivative popular geological maps and graphics that fed the burgeoning Victorian public interest. The scope of our home business expanded to maps of other countries and to related books. After a few printed catalogues, and as fairs became physically challenging, we went online.

That initial trove and the subsequent opportunities happened against a backdrop of the mergers of small consulting firms and the closure of several geology departments, as well as increasing digitisation in the late twentieth century, all leading to the disposal of maps and ‘obsolete’ books. For us, there was a thin silver lining.

The two maps that I see every morning at breakfast are especially attractive. Blue shades distinguishing the nearly horizontal strata marry the delicate hachuring of the topography in a way that suggests a fabric, a paisley scarf perhaps. The watercolours have a velvety depth, absent in print. Gold ink lines, depicting metalliferous veins, glint intriguingly. The patterns are intricate and the colouring to a high standard. The marginalia give the names of the seven geologists who made the survey, and when. They state when the OS surveyed the topography, who was in charge, the three engravers of the lines, the hills, and the lettering, when the railways were inserted, and the publication dates for the base map and for the geology – three decades apart. An embossed stamp dates the issue of the engraved sheet and a rubber stamp on the reverse records the colourist’s initials and when the paint dried. On earlier Survey maps, watermarks revealed the paper’s source and year of manufacture. They showed not only the geology, but a historical landscape and a narrative of the map-making process. Nowadays, the BGS no longer publishes maps; it prints on demand. But then, my maps were coloured on demand. *Plus ça change*.

The beautiful maps on our wall represent geology at a time of vigour and expansion and great public interest. They happen to be there due to retrenchment and consolidation in my industry – images from the past in a cabinet of curiosities that also mark a turning point in our lives.

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A HoG's Life

Consuelo Sendino

A column where historians of geology tell us something about their experiences in the field. We are delighted that for this edition, Consuelo Sendino, a curator in the Earth Sciences Department at London's Natural History Museum, has agreed to answer our questions.

Consuelo, can you please begin by telling us a little about your job?

Consuelo in the field: at work on the cliffs at Scarborough © C. Sendino

I am in charge of the fossil bryozoans, sponges and worms, and also the historical collections of Hans Sloane, Charles König, Thomas Pennant and Charles Lyell: in all approximately 2 million specimens, half of which are fossil bryozoans. As well as taking care of the specimens and carrying out research on them, an important part of a curator's work is the reorganisation of the collections and maintaining a database with updated taxonomic identifications and as much information as possible for each specimen. I also send and receive loans, promote the collections and help – and often collaborate with – visitors in their research. I am also involved in academic publishing, reviewing manuscripts and organising specialist monographs. I give seminars on 'my' collections and present my research at international meetings. I also sometimes supervise PhD and Masters students. Currently I have a postdoc working on sponges and have recently been given funding for an assistant curator to digitise some of these specimens.

So, how did you first become interested and involved in the History of Geology?

It began when, as an undergraduate, I was impressed by one of my lecturer's great enthusiasm for Charles Lyell. Then, when my PhD work at NHM gave me access to collections established by Lyell and other important historical figures, I felt encouraged to write about them and later I began to concentrate more specifically on some of the female researchers involved with the museum.

The history of the NHM collections really starts in 1753, with the foundation of the British Museum. The very earliest collections were the 'cabinets of curiosity' assembled as the result of large exploratory expeditions. It is so impressive to hold specimens collected by figures like Sir Hans Sloane or Sir Charles Lyell that it seems impossible to avoid being captivated by them. One of my first tasks when I arrived at the NHM was to curate the Sloane, König and Pennant collections. This gave me the opportunity to match the specimens with catalogues and publications. It was like assembling the pieces of a big puzzle and watching with delight as it slowly began to take shape.

What was your first HoG research publication?

My first proper HoG publication was not long ago, in 2018. It was an article co-written with Erik Ducker and Cynthia Burek on Ida Slater, a Victorian researcher interested in the same palaeoscyphozoans as me. She published the first monograph on conulariids from the UK, one of the first studies on museum fossil collections. It was exciting to follow her steps. She was a very advanced woman for her time, a pioneer not only in palaeontology, but also in geomorphology. She believed that U-shaped valleys were not always shaped by ice action, an idea not confirmed until the end of the 20th century.

I've just checked out that article – absolutely fascinating. There must surely be more women geologists whose story deserves to be told?

There are so many…. Whenever I have time to spare, I work on my list of women who have contributed to building the NHM collections. I now have more than 130 names – all women who have made an important contribution to the history of palaeontology. Recently I have been researching Dorothea Bate, the first woman employed by the NHM. Although there are already several books about her, there is so much more to discover about her work at the Museum and how much she had to fight at the beginning of her career.

Is there one thing in your career so far that has given you the most pleasure?

There are certainly some projects which have pleased me. Reorganising the historical Charles Lyell Collection was a real hit for me. The specimens were spread through other collections, most of them unidentified and with very basic information. Even with the help of a postdoc, it took me a whole year to organise and photograph the entire collection of about 1,100 specimens. This is now accessible from the NHM Data Portal.

I was also very happy when I managed to find a few specimens belonging to the Duchess of Portland. Most of her specimens are type specimens which were curated by Linnaeus' disciple, Daniel Solander. Historical collections have almost always passed through various hands before being segregated in museum collections and, as very few specimens are databased, it is almost impossible to completely reassemble these collections. However, I am sure that, as the digitisation of collections is advanced, many of today's lectotypes will be displaced as the syntypes/holotypes are discovered.

Do you have a favourite HoG-related book?

I would choose *James Hutton and the History of Geology* by D.R. Dean. This comprehensive study provides details of Hutton's career and his scientific ideas. It reviews Hutton's publications and manuscripts, his debates with contemporaries and explains how his ideas made a difference in geology. It gives us a clear justification of Hutton's nickname, 'the founder of modern geology'.

What about a favourite character from the HoG?

Here I must choose Dorothea Bate, the first woman to be hired by the NHM, then the British Museum (Natural History). This pioneer of zooarchaeology, an expert on Pleistocene vertebrates, worked for more than 50 years at the NHM.

'Miss Bate and a workman clearing two teeth in main pit at Bethlehem (© The Trustees of the Natural History Museum, London, CC-BY)'

Dorothea first travelled abroad to collect specimens which helped her to continue financing her excavations. She had no formal academic training but, as she herself liked to joke, her education was briefly interrupted by her schooling. It was her own tenacity that enabled her to reach her goals. As a self-taught palaeontology enthusiast who became internationally recognised, she is, even today, a brilliant example for aspiring female palaeontologists.

I would also mention Miss Etheldred Benett who is considered the first woman geologist. She was an untiring fossil collector who left an important legacy distributed in several British museums. Her collections have never been properly studied and I am sure that eventually they will help to unveil aspects of invertebrate evolution. Although some papers have been written about her, most of her collections remain unresearched.

As a palaeontologist you regularly come face-to-face with the reality of extinction. What are your greatest hopes and fears for the future, for the job you do, for the institution you work in, and for the wider world…?

I am a very positive person and I have faith that we can stop climate change. New generations are very aware that our planet has been mistreated and our own survival is at risk. I do hope that governments realise that scientific collections are important in understanding these risks. They help to foresee where we are going. Palaeontological collections are useful for studying past climates and foreseeing future ones and also in understanding the evolution of organisms. Maintaining them is expensive, but it is vital that we do so. But times are hard; staff have been reduced in the last 20 years and the trend continues. When I arrived at the NHM I was told that 10 years earlier the Fossil Porifera Collection had two curators. There is now just one curator for several collections. I would urge that more investment is needed.

On a brighter note, is there a single book or film that you would recommend for a young teenage girl who is considering the possibility of a career in science or specifically geoscience?

A book to recommend is *Wonderful Life* by Stephen Jay Gould. This book had an influence on me at least! Life must have been amazing in Cambrian times, about 500 Ma ago, its diversity exceeded anything we can possibly imagine. For a film, David Attenborough's *First Life*, or in fact any of his documentaries. He is the best ambassador for natural history. His progammes still grab my attention and I never miss them when they are broadcast.

Finally, do you have a funny HoG-related story to share with readers?

I don't have my own funny HoG-story, but when I was working on the NHM Charles Lyell Collection I found that some of the specimens definitely have strange histories.

At the beginning of the 20th century, the NHM's Keeper of Geology, Arthur Smith Woodward, had asked Lyell's descendant, Leonard Lyell, to look out for a lost type specimen of *Dictyopyge macrurus* that Lyell had collected from the Upper Triassic of Virginia.

Eventually Leonard found the specimen – covered in a thick layer of black-lead and sitting on the floor of the kitchen at Kinnordy House, where, for more than 66 years the priceless holotype had been used as a doorstop!

The holotype of Dictyopyge macrurus: used for 66 years as doorstop at Kinnordy House. (© The Trustees of the Natural History Museum, London CC-BY)

That's an amazing story, thank you so much Consuelo.

Tailings…

Nina Morgan

A happy accident

Geologist and science writer Nina Morgan muses on the geological results of a surprise double wedding.

It was a Cambridge romance.

She had been an undergraduate at Newnham College but had migrated in 1903 to University College London – "that Godless Institution in Gower Street" according to Thomas Arnold – to study botany with Francis W. Oliver (1864 – 1951) and geology with Thomas George Bonney (1833 – 1924). He was a palaeobotanist, who, in 1899, had been appointed by Professor Thomas McKenny Hughes (1832 – 1917) as a demonstrator in Cambridge's Woodwardian (later Sedgwick) Museum.

But it was in Cambridge that the pair, Edward Alexander Newell Arber (1870 – 1918) and Agnes Robertson (1878 – 1960), met, fell in love and, in 1906, became engaged.

The absent-minded professor

They were married in Cambridge in 1909. Thanks to Bonney, who was also an ordained clergyman, their union was 'doubly blessed'. As their daughter, Muriel Arber (1913 – 2004) later described it:

> *Professor Bonney returned to Cambridge, and as a friend of both my parents he officiated at their wedding. Indeed he married them with great thoroughness, for not being in the habit of conducting the service, he accidentally went back instead of forward after the vows, so that my father twice endowed my mother with all his worldly goods as she for the second time promised to love, honour and obey him... Professor Bonney then gave a charming little address in which he said that the happiest marriages that he knew were those in which the man and woman remained lovers.*

Bonney, himself, never married.

The wedding gifts, were unusual too:

> *I still have the wedding present that the Curator of the [Sedgwick] Museum, Henry Keeping, then aged 82, gave to my parents: it is a box containing some excellent fossil specimens of his own collecting, lying on pink cotton wool: Belemnites oweni, split to show the phragmacone, together with a pair of interlaced crayfish from the Wealden, and a fine palatine tooth of a Cretaceous fish. Pasted on a piece of cardboard was a little poem on love cut out of the Daily Chronicle.*

Academic riches

Demonstrators were poorly paid, and in the early days of the marriage money was tight. It was, Muriel recalls 'only [Newell's] consulting fees that made the marriage in 1909 possible... I owe my own existence to the Kent Coalfield."

But in the academic sense, the Arbers were very rich. Her mother went on to become a plant morphologist and anatomist. She was also a historian and philosopher of botany. She was elected a Fellow of the Royal Society in 1946, the first female botanist and only the third woman to receive that honour. And before his early death, Newell wrote more than 6 monographs on palaeobotany and geology and published the book, *The Natural History of Coal* as well as more than 90 papers and articles. He later became well known for his studies of the geomorphology of the Devon coast described in his book, *The Coast Scenery of North Devon,* published in 1911.

A chip off the same block

Their daughter Muriel took after them. She graduated from Newnham College, Cambridge in Geology (BA 1935, MA 1938), and from 1942 to 1962, she was on the staff at The King's School in Ely, where the little boys she taught referred to her in private as 'Ish'. To them she was an enigma – an adult of indeterminate age with a majestic presence, functional unglamourous clothing, heavy plastic-framed glasses and a mischievous twinkle around the eyes. One of her pupils from that time remembered her fondly: "Young and very different as we were from our teacher, I like to think that we recognised that Miss Arber was an ally. We were fortunate to have her."

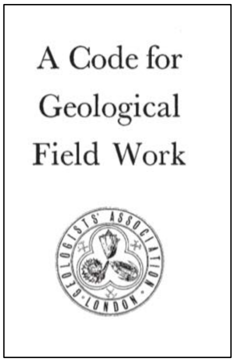
Muriel Arber, King's Scool Ely School Photograph 1961

And so were the many other organisations that Muriel became involved in. As her friend Eric Robinson (born 1929) recalled:

> *Muriel joined the Geologists Association in 1935 while an undergraduate and fully exploited Law 3 of the very enlightened GA charter adopted in 1858 which states that 'Ladies shall be eligible for election as Members and shall enjoy all the rights and privileges of either Town or Country Members as the case may be.'*

Muriel went on to play a central role in the Geologists' Association, she served as a member of the GA Council and eventually, from 1972 – 1974, as President. "Muriel lived up to the spirit of 1858 and the early years of the GA", Robinson says. "Her drive through the GA was to present earth history where you were, in the most succinct way, in terms that the general public could understand. In GA publications she would always quote another early law that advised authors to 'avoid hard words!' This was her approach to the GA Council, where her contributions were measured and firm, but at the same time diplomatic."

Fieldwork code



Among other things Muriel was a key architect of the GA Code for Geological Fieldwork, a code developed in the wake of a national outcry when the Norber erratic in Crummackdale was daubed with paint in the initials of a well-known university, and geological field parties became open to accusations of mindless vandalism. Under her guidance the proposed list of 'Don'ts' suggested for the Code were transformed into a list of 'Dos' and the GA Code for Geological Fieldwork remains one of the neatest, most succinct and well used codes for field geology today.

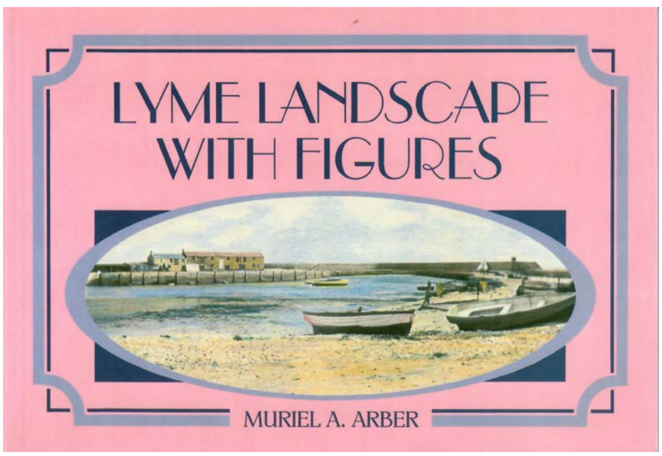
Love affair

Although in body Muriel was Cambridge-based, in her heart she lived in Dorset. She formed an attachment to the county at a very young age. After her father's early death, Muriel, then not quite five, and her mother visited Lyme Regis. On seeing the view from the top of Silver Street for the first time Muriel recalled:


In 1927, on Dowlands shore below Mrs Gapper's cottage (From MAA's Lyme Landscape)

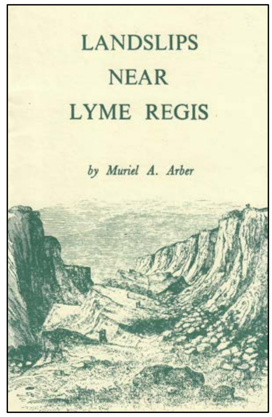
I let out a loud shout of rapture, but this was 1922, and I can still hear my mother saying "Darling you really mustn't make so much noise". I supressed my ecstasy, but I have been shouting about Lyme ever since. My mother did not know that at that moment I had found the key to the whole future of my life.

She visited Lyme often throughout her life – and the area around Lyme became the centre for much of her geological research.



In 1988, Muriel put her 'Memoiries' of Lyme into a small book. (Author's Collection)

As well as studying fossil brachiopods, inspired by her father's work, she also published a series of papers on geomorphology, with special reference to sea-level change, cliff profiles and active land slipping on the coasts of South Devon and Dorset. She also played a key role in early days of the development of what has now become the very popular Lyme Regis Museum. Muriel was, above all, a sharer of knowledge, and in 1970 the Geological Society recognised her outstanding contribution by presenting her with the coveted R.H.Worth Award.



M.A.A.'s Presidential Address to the GA,. delivered 2 March 1973 (Author's Collection)

Back in Lyme, she was, said the late John Fowles, 'the genius of the place' who provided the geological background for his novel, *The French Lieutenant's Woman*. But the highest accolade perhaps came from the local newspaper, which towards the end of her life dubbed her 'Lyme's Oldest Tourist'!


Muriel Agnes Arber in Cambridge in 2003.
(Photo courtesy & © Mena Schmid)

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Sources for this vignette include: The Papers of E.A.N. Arber at https://archiveshub.jisc.ac.uk/data/gb590-arbr ;
Obituary of E.A. Arber, *Geol.Mag,* **5,** 426-341, 1918
Obituary of Muriel Agnes Arber by Eric Robinson, *Proc. Geol. Assoc.* **116**, 61-63, 200;
Early Memories of the Sedgwick by Muriel Arber, *GeoCam,* **7,** 5-7, 2003
and personal memories provided by Eric Robinson, and Peter Lincoln in *Ten Views of a Landslip*, available for download from the Lyme Regis Museum at https://tinyurl.com/vpw3c3m7

Nina Morgan is a geologist and science writer based near Oxford. Her latest book, *The Geology of Oxford Gravestones*, is available via www.gravestonegeology.uk.

Future HOGG Meetings

Fri 19th November 2021 ONLINE (13.00-14.30) – HOGG AGM followed by
The 'Discovery' of the Silurian: following in the footsteps of Murchison with Duncan Hawley

A full programme of events for 2022 is currently being arranged.

Online lunchtime talks:
Plans are in place for talks on one of the Thursdays in the latter parts of February, March, April, June, September, October and November 2022. Dates and details will be communicated as soon as they are confirmed via JiscMail and the HOGG Bulletin. HOGG members will receive email invitations with the exclusive codes for free admission.
Provisional topics (subject to change) are:

- *Arthur Young and the first geological map of Norfolk and Suffolk*, with Peter Riches
- *Lyell, Darwin and the principal of reasoning in geology*, with Gordon Chancellor
- *The archive papers of Andrew Crombie Ramsay*, with Anne Barrett
- *The Great Bindon Landslip of 1839*, with Richard Edmonds
- *The Lapworth Letters*, with the Project Archivist at the Lapworth Museum of Geology
- *The A to Z of toxic rocks across time*, with Tim Carter

Field Meetings
Two field meetings are in the pipeline in the hope that conditions allow. They will be safeguarded with appropriate social distancing measures but will run only if numbers are sufficient to make them viable.

- *Malvern Rocks: Geology in a Victorian Health Resort*, Convenor: Tim Carter. May 20th - 22nd 2022
- *Pioneer geological mapping of Anglesey: the work of John Stevens Henslow, Andrew Crombie Ramsay and Edward Greenly.* Convenor: Prof Cynthia Burek in association with GeoMôn Geopark. July 16th – 18th 2022.

HOGG Website & Social Media

Our main website at http://historyofgeologygroup.co.uk provides easy access to all aspects of HOGG including details about our meetings together with facilities for online registration and payment. It also includes a link for subscription renewal.
We also have a presence at https://www.geolsoc.org.uk/hogg where you will find some useful resources.
Our Twitter feed (@HOGGroup) can be accessed through these websites.

HOGG Bulletin

The HOGG Bulletin provides up-to-date news of current and forthcoming events of interest to historians of geology. It is sent out to HOGG members and associates approximately every six weeks via the HOGG JiscMail list.
Please forward all news of events etc. for inclusion to the Bulletin Co-ordinator, Andrew Hopkins at bulletin.hogg@gmail.com

GeoHistories is issued in April and October.

Please address all queries regarding submissions to the editor: Peter Lincoln at hoggnewsletter@gmail.com. Deadline for copy 10th of month preceding publication.

Past editions available at http://historyofgeologygroup.co.uk/newsletter/ and https://www.geolsoc.org.uk/hogg-newsletters .

Front Cover: Composite image based on George Bellas Greenough's Geological Map of 1820.
Image courtesy of Duncan Hawley under CC BY-NC 4.0

The geological map used as the backdrop to the ***GeoHistories*** title was published in 1875. It is a French map from the *Atlas Universel en 67 feuilles* by Brue´ and Levasseur (plate No.18.) and is unusual as the projections are centred on Paris and its antipode. The geology on the map is from Jules Marcou's 1861 *Carte Geologique de la Terre* – the second world geological map to be attempted (the first was by Ami Boué in 1843). The great blank areas are due to Marcou insisting he only publish geology that was known rather than based on conjecture. As such, it is an interesting view on the state of geological knowledge in the mid-nineteenth century.
Image courtesy of Duncan Hawley under CC BY-NC 4.0