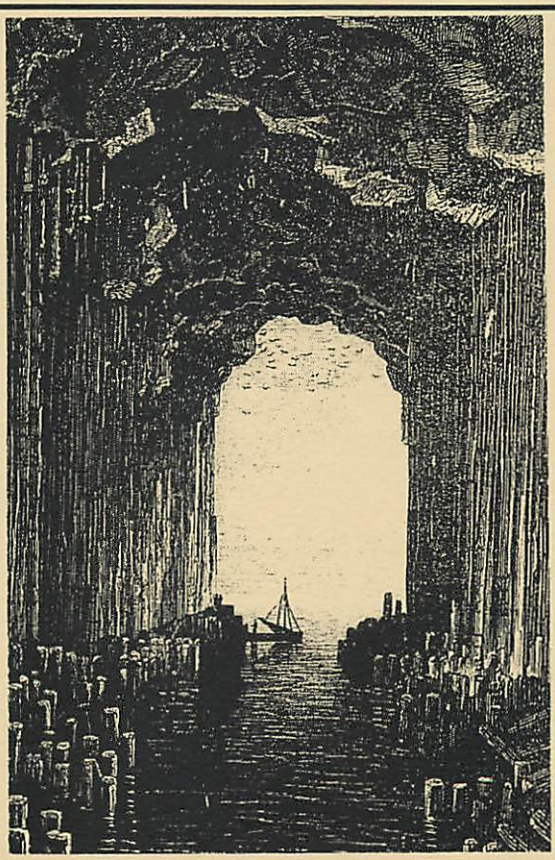
The Edinburgh Geologist

Magazine of the Edinburgh Geological Society

Issue No. 32 Spring 1999



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Issue No. 32 Spring 1999

Cover Illustration

The cover illustration shows an old engraving of Fingal's Cave on Staffa, reproduced from *Scottish Pictures* by S C Green, London nd c. 1885.

(see article on the Smithsonian Institution on page 20)

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Editorial

by Alan Fyfe

Welcome to this, my second issue of THE EDINBURGH GEOLOGST. I have to admit that it was touch and go as to whether this was really going to be a Spring edition, but I think I have just made it: at least it has gone to press before the first day of Summer! The reason for the delay is that, as some of you will know, I have left BGS and I have taken time to get myself sorted. Please note my new contact address for any correspondence... or even contributions.

I should first like to announce that, in response to my appeal in the last issue, this edition sports both a crossword and a poem! These will be found near the end of the magazine, but before the Proceedings. I am glad to say that Angela Anderson, who contributed the crossword, is happy to provide more puzzles on a regular basis. Rather more optimistically, I have put the poem in a section that I have entitled POET'S CORNER. I hope that readers with talent may like to continue the tradition. This one is of trans-Atlantic origin, contributed by Donna Balin and Michelle Othon.

Also from across the Atlantic, we have a contribution by Ellis L Yochelson, together with our own Gordon Craig, on the Smithsonian Institution in Washington. If you want to know what this has to do with Edinburgh, or even Scotland, then I advise you to read the article and discover for yourself!

While on the track of famous institutions, we have a short piece by Stuart Monro on the new Dynamic Earth exhibition... well, more than just a exhibition, this is intended to be more of an experience. Those who have had a preview of Dynamic Earth have come back with glowing reports, but if Stuart's article doesn't encourage you to get yourself down there, then I don't know what will!

In similar vein to the POET'S CORNER, I have started what I hope will become a regular column, which I have called WHAT'S IN A NAME?. The first in the intended series is an article by Ken Hitchen on the naming of geographical and geological features in the North Atlantic. It is quite an illuminating read - it is quite amazing what supposedly serious-minded geologists get up to!

This issue also sees an article by David Land on furniture and silverware once owned by Alexander Rose and now in the care of the Society. Alexander Rose, according to David, may be considered as the father of the Edinburgh Geological Society.

We also have a contribution by President Bill Baird on the Garleton Haematite Mine. The original of the mine plan was provided by Richard Gillanders from the

archives of the British Geological Survey. Bill has detailed the discovery of the mine and given its development a historical and economic perspective.

Lastly, Phil Stone has given me an article that puts the coming of the new millennium into a geological perspective and at the same time announces a symposium on the Southern Uplands to take place in September of this year. It looks like an interesting meeting and details are available from the sources listed. I expect that it will also be announced in the Society billet nearer the time.

At this stage, however, I should like to point out that, at least as far as the editor of THE EDINBURGH GEOLOGIST is concerned, the new millennium does not begin until 1st January 2001. The advantage as far as you are concerned is that it gives you all the greater chance of having an article published in this magazine during the present century and millennium. But only if you set yourself down and put pen to paper... or preferably finger to keyboard. There's plenty of time in the next millennium!

As I said earlier, this issue sees the start of a series called WHAT'S IN A NAME? The point of a series is that there should be more than one article and I am therefore appealing to all those who might have a bright idea to send in a contribution. I felt that this particular series might lend itself to an article by an amateur member and if any of you would like to send me something, I'd be doubly delighted. And don't worry if you feel that you don't know enough... I am willing to help you... or point you in the direction of someone else if it is beyond me.

I look forward to receiving contributions...

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The Garleton Haematite Mine

text by Bill Baird
mineplan by Richard Gillanders

In 1874 the mine at Garleton about 2 miles north-west of Haddington produced 10,283 tons of high quality iron ore. By the 22nd of September 1876 the *Haddingtonshire Courier* was advertising a roup at the mine. All the plant was to go, including chimney stacks and cans, buildings, bricks, timber and even firewood. Perhaps the most telling phrase used in the advert is the one which reads: 'The whole of the material has only been a few years in use'.

Within a decade of its initial discovery the mining of iron ore at Garleton had become an important factor in the economic status of the county and then almost without pause, ceased. What is the story that lies behind such a period of frantic activity which is now only represented by two holes in the ground partly filled by old farmyard rubbish?

The oxide of iron called haematite [Fe_2O_3] is known from several sites in East Lothian. Its bountiful occurrence is possibly connected with Carboniferous volcanic features such as dykes, which in some places, cut through overlying Old Red Sandstone. I have collected specimens from a pond excavation near Woodhall Dean, and it has been recorded from other localities such as Moreham. It seems probable that our Stone Age ancestors, with their predilection for the use of haematite as an artistic material, would readily recognise and collect fragments exposed at the surface. As the soil cover in the Garleton Hills is extremely thin, and the original ore vein was very near the surface, it is most likely that fragments were from time to time found and collected. It therefore seems reasonable to suppose that the Garleton Hills were known as a source of haematite in ancient times even if our ancestors had no idea just how much of the valuable material lay buried just beneath their feet.

The modern discovery of haematite was made by the son of Mr R. Scott Skirving who in pursuing his juvenile geological researches, found a number of specimens of haematite on the farm of West Garleton in the Spring of 1866. The attention of the proprietor, Sir Thomas B. Hepburn of Smeaton, having been drawn to the probable existence of a source of this mineral, he began to work the site. This is according to a letter published in *The Scotsman* of 17th February 1868. Or is that the true story at all? According to a subsequent letter published in the *Haddingtonshire Courier* on 21st February 1868, the find is attributed to Mr Robb of Haddington who, we are assured, had alerted Sir Thomas some three years previously. The *Haddingtonshire Courier* 21st February 1868, printed both letters and an editorial footnote saying that it had relied on information with which it had been furnished. It also decided that it was outwith its powers to settle the dispute as to who had discovered this most

valuable addition to East Lothian's mineral wealth. It may well be the case that the new tenant of West Garleton, Mr Aitchison, was ploughing rather deeper than usual on the hillside where the pieces of ore occurred and was therefore bringing up substantially more and larger pieces than had ever been seen before. Certainly this is the original explanation given in *The Scotsman* of 15th February 1868. It seems likely that all claims were at least partly correct, with Mr Aitchison's finds during ploughing being the deciding factor. In any case, when Sir Thomas had been alerted to the find, workmen were set to digging on the hillside and eventually discovered a major vein only a few inches beneath the soil surface. This crossed the hillside in a slanting fashion dipping E.N.E. at about at 80 or 90 degrees and running north-north-west for around three hundred yards. Mr Geddes, the well known mining engineer, visited the site and was expected to report soon. In the meantime enthusiastic comments were made on the quality and potential reserves and worth of the ore (18 to 20 shillings per ton). Things were definitely buzzing in the Garleton Hills and the neighbouring landowner, the Earl of Hopetoun engaged a West Country iron company to extend the search for ore on to his adjoining property.

Within a year the lessees of the haematite vein Messrs Christie of Gladsmuir had extracted an immense quantity of ore from the upper levels of the vein. They were reported as being under contract to mine not less than 5,000 tons per year. A large proportion of the ore went to the Gladsmuir Ironworks where it was mixed with the ordinary blackband iron ore to improve the quality of the pig iron produced. Some of the output went as far west as Gartsherrie in Lanarkshire to help improve the end product at the smelters there because of its high purity. Although water was not a major problem in the upper levels of the mine, Christie's had installed a steam engine for working the shafts. They were now employing about thirty men, but already there were few warnings regarding the irregular and capricious character of the vein.

After all the enthusiasm of the initial years it comes as quite a surprise to read, in the *Haddingtonshire Courier* of 7th April 1871, that Christie's had failed. This meant a change of lessees to the Coltness Iron company, but the tone of enthusiasm as to the quality and likely reserves seems undimmed. In fact Coltness deepened and extended the mine so that output was greatly increased and indeed considerable difficulty was found in providing enough cartage for the ore to the railway siding. This was at Coatyburn [otherwise Cottyburn or Coatieburn] on the North British Railway's branch line to Haddington. It seems that Coltness may have brought in miners from Cumberland, who were familiar with working haematite which enabled them to step up their production. There was mention of the vein having improved in quality and an intention of the lessees to build more accommodation for their workers (*Haddingtonshire Courier* 24th May 1872). Further efforts to find either a

continuance of the vein or other veins went on, both in contiguous properties and further afield, without success (*Haddingtonshire Courier* 16th May 1873).

By 1874 a report of progress at the mine is still very positive and estimates that in the previous Summer, weekly output to the railway station had been on average not less than 300 tons. However, in that same report (*Haddingtonshire Courier* 27th March 1874), notice is given of a miners' strike. We are told that working at Garleton continued but at a reduced rate of pay. We are also informed that the scale of remuneration of 7 shillings per day for a labourer at the mine is not to be despised. *The Iron Ores of Scotland* informs us that 1874 was the best ever year for extraction at Garleton with an output of 10,283 tons. By 1875 Garleton and Sandlodge (in Shetland) together were only producing 6,568 tons, and although all but a few hundred tons of this probably came from Garleton, it was a substantial reduction.

The next thing we know is an advertisement for the roup. In one year things have gone from a downturn in production to closure, What ever happened to the dream? Well one of the reasons behind the closure was the failure of the reserves. The vein had always been fickle, sometime eight feet wide at other times only a few inches. In quality it was also variable. Sometimes it was of high purity; Professor Stevenson McAdam on chemical analysis said it was equal in quality to the best English haematite and contained 97 per cent peroxide of iron. However, there were places in the vein where the great mass of material was not haematite with its gangue barytes but angular fragments of brecciated wall rock.

It is possible that even with all these problems production could have continued but now the vein started to pinch out at depth. By 200 to 260 feet from the surface the vein was only 20 inches wide and by 280 feet it was nowhere of workable thickness. It is probable that the lack of proven reserves was not the only factor that brought the work to anend. An experienced quarrymaster in East Lothian has been quoted as saying: 'When you could bring in iron ore from Sweden at 16 shillings per ton Garleton was finished.'

Whatever the reason, East Lothian's Eldorado had been and gone within 10 years, leaving only memories and a hole in the ground.

Further reading:

The Scotsman, Edinburgh, 15th, 17th, 22nd, 27th February 1868.

Transactions of the Geological Society of Glasgow, Vol III, 1871. Published by the Society at their rooms in Anderson's University Buildings.

Haddingtonshire Courier, Haddington [now The East Lothian Courier published by Croal Ltd] (Various dates including: 14th, 21st February 1868; 5th, 13th, 20th March 1868; 1st May 1868; 14th August 1868; 21st May 1869; 7th April 1871; 24th May 1872; 16th May 1873; 27th March 1874; 22th September 1876).

The Iron Ores of Scotland, 1920, by M. Macgregor et al, Special Reports on the mineral resources of Great Britain, Vol. XI Iron Ores (continued). Memoirs of the Geological Survey of Scotland. Printed by His Majesty's Stationery Office, Edinburgh.

Geology of the Haddington District by A.D. McAdam and W. Tulloch, 1985, published for British Geological Survey by Her Majesty's Stationery Office, London.

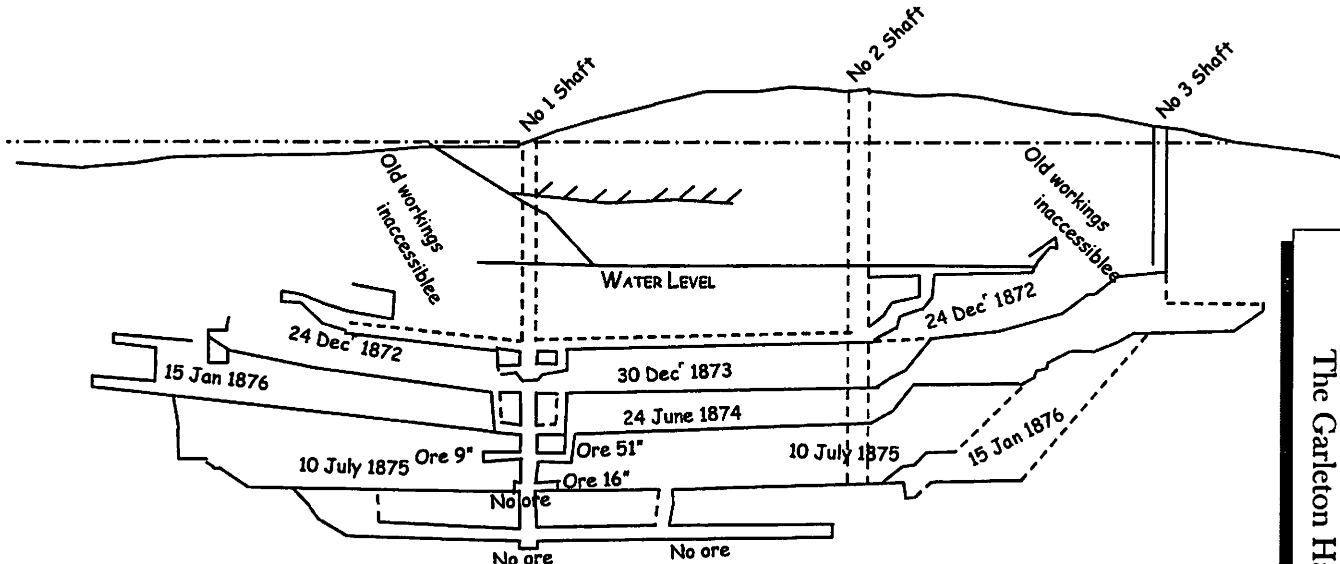
Lothian Geology edited by A.D. McAdam and E.N.K. Clarkson, 1986 published by Scottish Academic Press for Edinburgh Geological Society [Garleton Hills Volcanic Rocks by B.G.J. Upton and R. Mcdonald].

The Haddington, Macmerry and Gifford Branch Lines by A.M. Hajducki, 1994, published by the Oakwood Press, Oxford.

Bill Baird is the President of the Edinburgh Geological Society and previously worked for the Royal Museum of Scotland. Richard Gillanders is Records Officer of the British Geological Survey Land Survey (Scotland).

The mine plan shown opposite is redrawn from an original held by BGS and is published here with permission of the Director.

Section of Surface and Plan of Workings on Plane of Red Ore Vein



Peach and Horne in the Southern Uplands

a centennial for the millennium

by Phil Stone

From the perspective of the distant future, it is unlikely that the imminent start of our new millennium will be recognisable in the geological record. Unless, that is, the millennium bug proves more virulent than in our wildest imaginings and precipitates a mass extinction. Whilst we wait with bated breath there is ample excuse for some geo-reminiscing on various time scales. Taking a multi-millennium view, only ten thousand years ago Scotland had an ice cap, with glaciers even in the Southern Uplands. One thousand years ago, Scots, Vikings and Angles skirmished and marauded across a landscape we might have partially recognised, but they probably gave little thought to the rocks beneath. Down to the deci-millennium scale and one hundred years ago; well, some would argue for that as a golden age of Scottish geology.

The geological achievements of that late Victorian period are epitomised by a Geological Survey memoir published in 1899. The work largely of Ben Peach and John Horne, *The Silurian rocks of Britain, 1: Scotland* proved a seminal account of Southern Uplands geology and since it was conceived and born out of controversy it established the pattern of things to come. Even the title, giving prominence to *Silurian*, was a shot in the war between Murchison (Mr. Siluria) and Sedgwick, of the Cambrian persuasion.

The problems began soon after the primary geological survey of the Southern Uplands had been completed, when Charles Lapworth completely changed the rules of the game with his radical concepts of graptolite biostratigraphy, published in 1878. The Survey interpretation was shown to be flawed and Archibald Geikie, then the Director of the Survey's Scottish operations, was forced to redirect two of his big hitters into the Southern Uplands to rescue the situation. So Peach and Horne arrived on the scene and used the new ideas in a revolutionary application of biostratigraphy to the unravelling of a complex structural terrane, frequently working in the field through the winter months. The measure of their success is the half century that their interpretation remained unchallenged. It was only in the 1950s that the full significance of sedimentary features which indicated the way-up of beds began to be generally appreciated: grading, cross-bedding, bottom structures and the like. This factor provided another breakthrough in the Southern Uplands, where so many of the beds were vertical, and stemmed from an appreciation of the turbidity flow mechanism which deposited those beds in the first place. So, Southern Uplands geology went through another revolutionary phase as sedimentology was added to graptolite biostratigraphy as a means of sorting out complex structure. Before the

dust could settle came the plate tectonic iconoclasm of the late 1960s and early 1970s. Soon thereafter the Southern Uplands was being interpreted in terms of subduction zones and accretionary tectonics.

The interplay of biostratigraphy, sedimentology and structural analysis created fresh controversies and as the data piled up so that things became even more complicated. So much so that in 1986 the Geological Society of London devoted one of their meetings to *The Southern Uplands Controversy* and carried the papers presented in a subsequent part of their Journal (1987). Since then, models have been tested, PhDs completed and new methods of investigation applied. Systematic remapping by the British Geological Survey proceeds apace and the problems have been studied on all scales from that of the individual sand grain to that of the satellite image. As geographical information systems and massive computing power have developed, so they have been wheeled in to help. Stubbornly, the controversy refuses to go away. Indeed the most recent developments would seem to introduce novel interpretations rather than discriminate between the old ones.

When scientists are faced with a wealth of data and a plethora of ideas as to how that data should be interpreted, their natural instinct is to convene a symposium. When offered a convenient, eve-of-millennium centenary to celebrate, the pressure becomes irresistible, and with a dramatic new venue on offer any residual resistance crumbles. No surprise then that in 1999 there will be a Peach and Horne centennial symposium: *The Southern Uplands Terrane: tectonics and biostratigraphy within the Caledonian Orogen.* It is to be jointly organised by the British Geological Survey, the Royal Society of Edinburgh, the National Museums of Scotland and the University of Edinburgh. It will be held at the soon-to-be opened Dynamic Earth Centre on September 23rd and 24th, 1999. The proceedings will be published by the Royal Society of Edinburgh in a dedicated part of their Earth Science Transactions. I wonder how that volume will be regarded in 2099?

For some background to the Southern Uplands Controversy you could try the following:

Armstrong, H.A. *et al.* 1996. Evolution of the Northern Belt, Southern Uplands: implications for the Southern Uplands controversy. *Journal of the Geological Society, London*, Vol. 153, 197-205.

Lapworth, C. 1878. The Moffat Series. Quarterly Journal of the Geological Society, London, Vol. 34, 240-346.

Oldroyd, D.R. 1990. *The Highlands Controversy.* The University of Chicago Press. (see especially Chapter 8. *Charles Lapworth: Digressions and Diversions to the Southern Uplands and the Alps*).

Peach, B.N. and Horne, J. 1899. The Silurian rocks of Britain, 1: Scotland. *Memoir of the Geological Survey of the United Kingdom.*

Stone, P. (editor). 1996. *Geology in south-west Scotland.* British Geological Survey. (see especially the Introduction, 3-15).

Various authors. Journal of the Geological Society, London. 1987. Vol. 144, part 5. (This carries a series of papers discussing various aspects of *The Southern Uplands Controversy*).

For further information on the Southern Uplands centennial symposium contact:

Jim Floyd, Emrys Phillips or Phil Stone,
British Geological Survey, Murchison House, Edinburgh.

Euan Clarkson,
Grant Institute of Geology, Kings Buildings, University of Edinburgh.

Liz Hide,
National Museums of Scotland, Chambers Street, Edinburgh.

Phil Stone is on the field staff of the British Geological Survey and specialises on the rocks of southern Scotland and the Lake District. He is a joint organiser of the Southern Uplands centennial symposium.

The figure opposite shows the title page from Peach and Horne's 1899 memoir. On September 23 and 24, 1999, at Dynamic Earth, a centennial symposium will celebrate 100 years of geological investigations in the Southern Uplands of Scotland. Reproduced by permission of the Director, British Geological Survey.

MEMOIRS OF THE GEOLOGICAL SURVEY

OF THE

UNITED KINGDOM.

THE

SILURIAN ROCKS

OF

BRITAIN.

VOL I.

SCOTLAND.

BY

B. N. PEACH, F.R.S., A.R.S.M., F.G.S.,

AND

JOHN HORNE, F.R.S.E., F.G.S.

WITH

PETROLOGICAL CHAPTERS AND NOTES.

BY

J. J. H. TEALL, M.A., F.R.S., F.G.S.

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Our Dynamic Earth

by Stuart Monro

Our Dynamic Earth forms the centrepiece of a major urban regeneration plan, the **Holyrood Project,** steered by Lothian and Edinburgh Enterprise Limited, which will bring new vitality to the former industrial land at the lower end of the Royal Mile. In place of the buildings of the former Holyrood Brewery and the old gasometers of British Gas, new houses, offices, shops, hotels and workshops are already taking form. This is also the area where the new Scottish Parliament will be built, bringing a new interest and excitement into this part of Edinburgh. Prominent within these new developments will be a landmark building, the William Younger Centre housing the **Dynamic Earth** which has attracted a substantial funding contribution from the Millennium Commission. This is to be a permanent exhibition and education centre, which will help deliver a better public understanding of the processes that have shaped the Earth.

The Dynamic Earth concept

The primary objective of the Dynamic Earth exhibition is to present a holistic view of the planet Earth, demonstrating the interaction of forces which, through time, have created and shaped the Earth as we know it today. The approach adopted within Dynamic Earth focuses on many areas of science including geography, geology, astronomy, biology and oceanography, making the exhibition unique not only in its breadth but also in communicating the complex relationship between these subject areas. It is an exhibition that is more concerned with 'process' than 'product' and as such artefacts are few but audio-visual presentations which re-create a process or translate the visitor into the heart of an environment are used extensively. The intention is to use technology to extend the visitor's experience, for example, taking them into volcanoes such as those in Iceland and Montserrat, and across the glaciers of Norway.

The Dynamic Earth exhibition

The aim of the exhibition is to emphasise the dynamic nature of the planet. It begins by showing the ways the Earth is being monitored at the present day set against a backdrop of geological time. This is followed by presentations on the main processes - geophysical, atmospheric, hydrological and biological, culminating in an examination of anthropogenic influences on the planet. The integrated role of these processes is demonstrated in the Earth's major environments.

Equally significant is the second objective of the Dynamic Earth, to create a national

and international educational resource. The subject matter integrates well with the national curricula of both Scotland and England and Wales and this will be supported by an educational team and dedicated 'discovery rooms'. The rapid evolution of information technology provides exciting opportunities not only to explore related areas but also to disseminate the activities of Dynamic Earth.

The State of the Earth is the first section of the exhibition and will look at the ways in which the Earth is being continually monitored to build up a picture of a dynamic planet. It will raise many questions in the mind of the visitor about the processes that cause this continual change.

The Time Machine will convey the concept of the immensity of geological time, taking the visitor from their present familiar surroundings, through familiar history to the World Wars, the Roman Invasion, the Stone Age, human origins, the age of dinosaurs, early life forms, to a planet devoid of life and finally to the beginnings of the universe in the Big Bang **where the story begins!**

How it all started takes the visitor from the Big Bang and the start of the physical universe to a planet capable of sustaining life. It will demonstrate the relative place of the Earth within the Universe and the vast distances involved. ***The restless Earth*** is concerned with the internal processes on the planet: what causes volcanoes and earthquakes, how mountains are built up and why continents move. ***Shaping the surface*** examines the surface processes sculpting the landscape, particularly glaciation which has been an important agent in moulding the scenery of Scotland. ***Casualties and survivors*** looks at the biological processes that make the planet as it is today. The evolution of the skeleton left fossilised evidence of a wide range of life-forms. Some of these still have living relatives: these are the survivors. Others are only preserved as fossils and are the casualties. Mass extinctions have taken place in the past and will undoubtedly be a feature of the future. In this context will *Homo sapiens*, ***The Human animal*** be a casualty or a survivor?

The exploration of ***The oceans*** has been moved on immeasurably by remote sensing of the ocean floor. The use of satellite technology has greatly increased the understanding of the linkages between the oceans and the atmosphere and the transfer of momentum, energy and matter at the ocean-atmosphere interface. ***The polar regions*** represents the extremes of cold climate yet, while the Arctic and the Antarctic are superficially very similar, one is oceanic and the other continental. ***From tundra to tropical*** portrays the contrast between areas of extreme climate and

emphasises that it is within these zones that human need has significantly modified the landscape. In ***The tropical regions*** the visitor will experience the hot, wet environment of the tropical rain forest where the Sun's energy encourages the greatest diversity of plant and animal life.

The Showdome is a summary of the exhibition highlighting the dramatic processes that have shaped the planet Earth many of which may be regarded as 'hazards' but, nevertheless, many of these are also the processes of renewal which rejuvenate the planet. The exhibition will also have an **external dimension**. Links will be made, where appropriate, with other sites in Edinburgh such as the Zoo, the Botanical Gardens and The Royal Museum of Scotland, as well as The Helix in Newcastle, the National Space Science Centre in Leicester and other sites across the globe so that the visitor can extend the voyage of exploration into the planet, how it formed, what it is made of and the plants and animals which live on it.

The Dynamic Earth, a resource for the next Millennium

The Dynamic Earth is a project for the Millennium in that it is one of five major science centres which have been financially supported by the Millennium Commission. Recognition of the importance of science lies in the fact that approximately one third of the Millennium Commission's budget has gone to scientific proposals, not least because of their fundamental significance for the future but particularly because of the need to encourage understanding and appreciation among the public. It is one of the objectives of the Dynamic Earth Charitable Trust 'to encourage and support the dissemination of knowledge on the Dynamic Earth...' This broadly based educational goal is a keystone of the **Dynamic Earth**.

Stuart Monro is the Scientific Director of *Our Dynamic Earth* and is seconded to that post from the British Geological Survey, where he has worked since 1970.

— What's in a Name? —

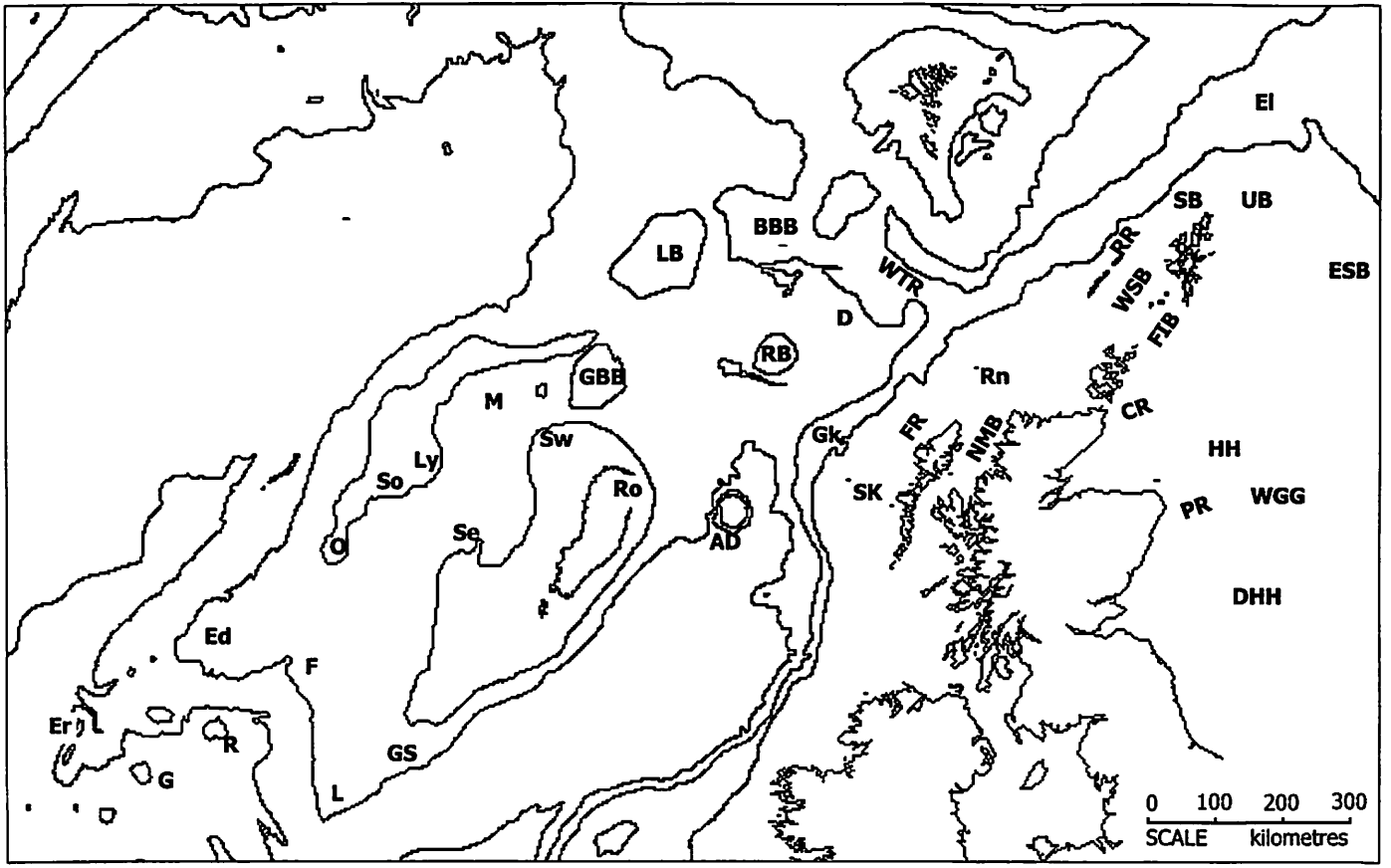
In the first of a series of articles, Ken Hitchen of B.G.S. takes a light-hearted look at the naming of offshore topographic and geological features.

How plagiarism, imagination, frustration and luck have contributed to offshore geological nomenclature

When mapping onshore, geologists have often resorted to local place names in order to identify structural features, rock units and rock types. Examples are commonplace: the Ballantrae Complex, the Portree Shales, appinite and so on. Offshore, however, where location names are restricted to a few bathymetric shoals or deeps, the naming of new features is more problematical. Fishermen have been responsible for naming many offshore bathymetric features but exploration geologists in the hydrocarbon industry have found it necessary to coin many new names for features which are not apparent at the sea bed and indeed, in the nether regions of the North Atlantic Ocean, have even had to name sea-bed features as well.

It is easy to understand that the Wyville-Thomson Ridge and George Bligh Bank are named after famous explorers but who was the Rosemary of Rosemary Bank? And why was Lousy Bank so called? Perhaps the fishing was always poor here or the weather consistently rough. Or was someone suffering from sea-sickness, a hangover or just having a bad hair day? The adjacent bank to the NE of Lousy Bank is Bill Bailey's Bank, reputedly named after the song of the late 1950s. But this begs the question: who was Bill Bailey?

The first references to Rockall Island appear as Rocol, Rokol, Rookol or Rochol on early seventeenth century maps although the actual location of the island on the early maps is some distance away from its known position today. Certain ferromagnesian-rich patches of the main Rockall granite were originally christened '*rockallite*' but this has subsequently been recognised as being no more than a feldspar-deficient variety of the main granite and the name rockallite has fallen into disuse. However, many of the sea-bed sediments west of Scotland are sands comprised largely of the shells of dead foraminifera and of these, *Nummulites rockallensis*, one of the largest forams of its type, is a primary constituent. So in geological circles the name Rockall lives on as a major igneous centre and a tiny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SCALE kilometres

microfossil. In shipping circles it is known for causing the demise of several vessels as well as being mistaken (under peculiar lighting conditions) for the sails of a yacht and a submarine conning tower. Apparently it has also been used by the navy for target practice (still bearing the scars today) and as the temporary home for such inhabitants as Tom McClean, a former paratrooper who, in 1985, camped on the rock and painted a 6' by 4' Union Jack to "emphasise its Britishness". In 1997 activists from Greenpeace placed a survival capsule on the rock, lived there for several weeks and declared the existence of the new state of "Waveland" for which they issued 'passports'. This action was a protest against further oil exploration on the Atlantic margin. Three kilometres ESE of Rockall is Helen's Reef from which an unusual, but as yet unconfirmed, Late Cretaceous age has been obtained for the microgabbro recovered from it. The reef takes its name from the Dundee brigantine *Helen* which struck it on 19 April 1824 with the subsequent loss of 16 passengers. The crew of 12 escaped in a long-boat and was rescued. Whatever happened to women and children first?

Many shallow bathymetric features on the south-western edge of Rockall Plateau have been christened with place names borrowed from J.R.L.Tolkien's famous books ***The Hobbit*** and ***Lord of the Rings***. Hence we have the Rohan, Gondor and Eriador Seamounts and the Lorien, Fangorn and Edoras Banks. But there is only one feature which is named after a person from these novels. Gandalf's Spur takes the name of the wizard who helped Bilbo Baggins (the hobbit) and the twelve dwarves in their many adventures as they searched for the

AD	Anton Dohrn Seamount	**G**	Gondor Seamount	**R**	Rohan Seamount
BBB	Bill Bailey's Bank	**Gk**	Geikie Igneous Centre	**Rn**	Rona Island
CR	Caithness Ridge	**GBB**	George Bligh Bank	**Ro**	Rockall Island
D	Darwin Igneous Centre	**GS**	Gandalf's Spur	**RB**	Rosemary Bank
DHH	Devil's Hole Horst	**HH**	Halibut Horst	**RR**	Rona Ridge
Ed	Edoras Bank	**L**	Lorien Bank	**Se**	Sandastre Igneous Centre
El	Erlend Igneous Centre	**Ly**	Lyonesse Igneous Centre	**So**	Sandarro Igneous Centre
Er	Eriador Seamount	**LB**	Lousy Bank	**Sw**	Swithin Igneous Centre
ESB	East Shetland Basin	**M**	Mammal Igneous Centre	**SB**	Sandwick Basin
F	Fangorn Bank	**NMB**	North Minch Basin	**SK**	St. Kilda
FIB	Fair Isle Basin	**O**	Owlsgard Igneous Centre	**UB**	Unst Basin
FR	Flannan Ridge	**PR**	Peterhead Ridge	**WGG**	Witch Ground Graben

mighty treasure guarded by the fiery dragon in a cave under the mountain.

More recently the BGS Geophysical Image Atlases have christened several igneous complexes in the same general area utilising names taken from a series of four books by Antony Swithin, a former geology lecturer at Leicester University. As a boy, Swithin was fascinated by the remote Rockall Island which, in his imagination, became a continent of magical places and beings. His novels, about the mythical continent (!) of Rockall, and written in a similar vein as *Lord of the Rings*, have provided names for the Lyonesse, Owlsgard, Sandarro and Sandastre igneous centres. Swithin has been honoured (?) by having a centre named after him. It is one of the larger ones in the area and may be at least partially responsible for the prolongation of the NW part of Rockall Bank.

As far as buried features such as basement ridges, sedimentary basins and volcanic centres are concerned borrowing names from onshore has been a very popular solution. Hence around Scotland's coast we have understandable, if rather unimaginative names, for such structurally high features as the East and West Shetland Platforms, the Caithness Ridge and the Peterhead Ridge etc. Many geological basins have been similarly christened: the East and West Shetland Basins, Unst Basin, Fair Isle basin etc. Occasionally existing bathymetric, fishing or Admiralty terms have been applied to offshore structures. Hence the North Minch Basin, a large half-graben filled with Torridonian, Permo-Triassic and Liassic sediments and with its western margin defined by the Minch Fault, takes its name from The Minch seaway with which it is approximately coincident. The Witch Ground Graben, Devil's Hole Horst and Halibut Horst are names taken from existing fishing charts, the latter after Halibut Bank.

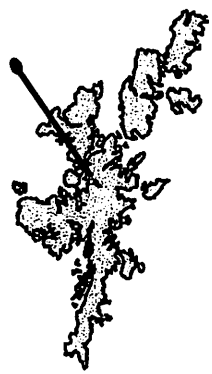
Using existing onshore or island names has occasionally resulted in confusion. It may be wholly applicable for the Flannan Ridge to be so called after the Flannan Islands as these are the only subaerial expression of the NE-SW trending, Lewisian basement feature. However the island of Rona, the subaerial expression of a small fault-bounded basement block and after which the 100km-long basement Rona Ridge is named, is not actually situated on the ridge at all but is quite some distance from it. This was only realised after further subsurface offshore mapping by which time the name of the ridge had become too well established to change. On a similar note, the West Flannan Basin is west of the Flannan Islands, but why is the West Lewis Basin actually north of Lewis?

There are far more Tertiary central igneous complexes offshore than the few in the Inner Hebrides. A variety of methods has been used to name them. St Kilda and Rockall utilise the islands of the same name. Geikie and Darwin are taken from the

BGS map sheets of those names (which in turn were called after famous scientists). Erland (north of Shetland), as originally spelt by geologists in Britoil, was renamed Erlend *'after the Norse king, rather than the anglicized version previously proposed'* in the subsequent definitive paper on the complex. The result, of course, is confusion and both spellings are now seen on maps. A granite, geographically associated with Erlend, but Caledonian (c.400Ma) in age rather than Tertiary, has been called the Rendle granite. Crossword fanatics might see the connection. Should it have been the Randle granite? The Anton Dohrn seamount was named after the research ship of that name which, in turn, had been named after a German marine biologist of the last century. Further afield, the Mammal Complex, 190km WNW of Rockall Island in the Hatton-Rockall Basin, was so-called because on certain seismic cross-sections the profile of the feature appears *'similar to that of the female breast'*. One wonders if the geologists in question had seen a mermaid or merely spent too long at sea.

Finally, if naming features appears to be a random process, can it ever be worse than using the pin method? Hold a pin over a map (in this example, one of onshore Shetland), shut one's eyes, stick pin in map, name feature after hamlet nearest to pin-prick. Eureka! This is how the Sandwick Basin, a small half-graben NW of Unst containing mainly presumed ?Devonian rocks, got its name. Is this true? I should know. I held the pin.

Author's note: After writing this article, and purely for the sake of nostalgia, I unearthed a map of Shetland to locate the hamlet after which the Sandwick Basin was named – only to find that there were several locations called Sandwick or Sand Wick, something that I hadn't realised at the time. In fact the gazetteer lists a total of fifteen. It is somewhat ironic therefore that the actual hamlet after which the basin was named cannot now be unquestionably identified unless I can find the original map with the original pin-prick!



Ken Hitchen is the geologist in charge of the B.G.S. Rockall Project and appeared in print in the last issue of THE EDINBURGH GEOLOGIST with a piece on a missing volcano. He agreed to write this article after being asked just how the existing volcanic centres were named.

Do the roots of the Smithsonian Institution extend to Edinburgh?

by Ellis L Yochelson
and Gordon Craig

Introduction

The name James Lewis Macie may ring no bells, but that of James Smithson does to some extent resonate, if only in terms of his namesake, the Smithsonian Institution. On February 16, 1801, the Prime Minister of Great Britain, acting in the name of the King, granted the petition of Macie, a natural son, to assume his father's name, Smithson. As Macie, he had published one paper in the *Transactions of the Royal Society of London*, but as Smithson he has a record of eight more publications in that respectable periodical, and more than a dozen in other journals. Accordingly, we judge him a gentleman scientist, rather than a 'scientific gentleman'. Some historians of science view him as a chemist, but most of his writings are those of a mineralogist and geologist, and geologists can claim him with pride.

The aim of this article is not to review Smithson's career. This would be a nearly impossible task, for in 1865 a fire at the Smithsonian Institution destroyed his diaries and papers. Even with that loss, some aspects of his life are documented. It is not generally known that the young Macie visited Scotland and met James Hutton. That, at least, may be of interest.

Background

James Lewis Macie is shrouded in mystery, though a few details are known (Carmichael and Long, 1965). His mother, Elizabeth Keate Macie, a widow, and perhaps twice widowed, was heir of the Hungerford estates. During 1764 in Bath, England, she met Sir Hugh Smithson, a rising power at court destined to become the first Duke of Northumberland. One significant result of the meeting was James Lewis Macie, born in France in 1765, date unknown. The parting of his parents must have been amicable for, six years later, James had a brother. One trace of Macie is a petition to the crown when he was about nine years old, asking that he be naturalized as a British citizen. Birth in France, out of wedlock, may have clouded that issue; the petition was granted. A subsequent trace of the youth is May 7th, 1782, when he matriculated at Pembroke College, Oxford University. As the son of a wealthy mother, one might have expected him to be a wastrel, but in fact Macie applied himself to his studies, particularly in natural science, or more accurately for that time, natural philosophy.

Among others, Davies Gilbert, later of the Royal Society of London, was a classmate of Macie. He recorded that on May 20th, 1786, Macie received a degree as a Master of Arts. Less than a year later, Macie was elected a member of the Royal Society of London, one of his five sponsors being Henry Cavendish. Clearly, he knew the right people, but equally clearly he must have been an able investigator at an early age. However the Scotland connection occurred while Macie was still an undergraduate.

The 1794 Thomson Letter

William Thomson (1761-1806), then at Oxford, wrote from London, dated August 28, 1784, to Joseph Black in Edinburgh.

> I send you my friend Mr. Macie, who is about to take the same tour that I did two years ago. His proficiency is not only already much beyond what I have been able to attain to – but must of course continue such, as the cause that has already retarded my progress in Mineralogy, must (I hope at least) continue to operate every day more & more – I mean the duties of an active profession. Notwithstanding Mr. Macie will tell you that I have undertaken a work of some trouble, that of reading in Oxford some introductory lectures, with a view to make mineralogy more known than it is among gentlemen in this country. Such a task w[oul]d not be so easy in Scotland, where your country gentlemen are much better informed than ours.
>
> (Edinburgh University Library gen 873/11/184-5)

Thomson received a Bachelor of Arts degree from Oxford in 1780. "He then came to Edinburgh and matriculated at the University in medicine for the years 1780-81 and 1781-82." During one trip he saw the crozier at Killin, but "it is unfortunate that we know nothing more about Thomson's travels in Scotland during the summer of 1782" (Waterston, 1965: 123, 124). Thomson apparently had an interest in mineralogy which was honed at Edinburgh. He returned to Oxford for additional degrees and, among other subjects, taught mineralogy. In 1790, he abruptly left Oxford and moved to Italy for the remainder of his life. Almost certainly when Macie visited Italy in 1792 and 1793, it was in part to see Gugliemo Thomson.

When Thomson died, he willed his mineral collection and estate to Oxford, which refused the bequest. It then went to the University of Edinburgh; Dr. Waterston's investigations, cited above, were responsible for Thomson's bequest being restored to the original intent of the donor.

It is reasonable to assume that Macie was a favoured student to have been recommended by his tutor to the eminent Joseph Black. At nineteen, Macie may well

have wanted adventure and it is an equally reasonable surmise that Thomson suggested a trip to Scotland. As to the remainder of the letter, the complaint that "my students interfere with my research" is not an invention of the present generation of academics.

The Travellers

The party was composed of a man named Thornton, who wrote travel pieces, Faujas de St. Fond, a French geologist, and Count Andrioni, an Italian (Carmichael and Long, 1965 : 68). An account of the trip was published by Faujas de St. Fond:

> Count Paul(o) Andreani [sic], of Milan, William Thornton, M. de Macies [sic], and myself set off from London at six o'clock in the evening, in three post-chaises; two of which were occupied by ourselves, and the third by our servants . .... M. de Macies, of London, had been introduced to us a few days before our departure, by Mr. Thompson [sic], a very good naturalist as a studious young man, who was much attached to mineralogy; we admitted him, with pleasure, into our party.
>
> I had known Count Andreani at Paris; he loved the sciences, and had made a very fine aerostatic experiment in Milan, at his own expense; he went up in a large balloon, which he caused to be constructed on the plan of Montgolfier.
>
> (Faujas, 1797 : 123)

Seemingly the Count had no particular interest in geology as such, but was interested in seeing new places with interesting companions. He does not enter significantly into the story, though it is possible that the contact provided Macie with yet another inducement to travel to Italy in 1792.

> William Thornton is a very worthy and intelligent American, who, after prosecuting his studies with advantage, under Doctor Cullen at Edinburgh, had come to finish them at Paris, where he received a taste for natural history. The journey could not be but very agreeable with such pleasant companions
>
> (Faujas 1797 : 123)

Thornton (1759-1828) deserves further comment. He was a Quaker born on Tortola in the British West Indies, and therefore a North American. In 1765, he was sent to England and from 1781 until 1784 he attended Edinburgh University, though his M.D. degree was from Aberdeen. In 1786 he returned to Tortola, then moved to New York the following year and in 1788 became a United States citizen. He assisted John Fitch in work on the first steamboats, designed buildings, including the original plans for the U.S. Capitol, and became one of the commissioners of the city

of Washington in 1794. In May 1802, President Thomas Jefferson appointed him as clerk in charge of patents. Thornton remained head of the Patent office until his death sixteen years later. "He was a scholar and a gentleman-full of talent and eccentricity... a man of infinite humor..." (Malone, 1935 : 504-508).

Bartomay Faujas de Saint Fond also deserves further comment. He was a lawyer turned geologist and at the time a professor at the *École de mine* in Paris. If he was not in the forefront of those studying ancient volcanoes, he was a highly respected student of this branch of earth science. Faujas may have been known to James Hutton through his 1778 book on volcanics.

With two carriages for three travellers on the road to Scotland, a reasonable surmise is that the older Faujas and the Count would travel together, at least most of the time, until they reached Edinburgh. How many servants were crowded into the third carriage is unknown. Macie had a man, and likely both Faujas and the Count were each accompanied by a servant.

The Trip Through Scotland

The party set out from England in September 1784 and travelled through Newcastle, Edinburgh, Glasgow, Dunbarton, Tarbert, Inverary, Oban, Arran, and the island of Staffa (Carmichael and Long, 1965: 68).

Even today, to travel from London to the Hebrides is no mean task. It is about 250 miles from London to Newcastle and over another 100 miles to Edinburgh. If one assumes 40 to 50 miles a day, which is probably a high estimate for that century, this means a full week bouncing along in a post-chaise. There is no evidence as to where Thornton joined the group, but reasonable speculation is that Edinburgh is the most likely place, for Faujas is quite clear that three persons set out from London.

From Edinburgh to Glasgow is another 45 miles. To Tarbert at the head of Loch Lomond is another forty miles and the same distance from there to Oban. The latter part of this trip would have been through much rougher country, so travel time of about four days is a likely estimate. From Oban the group would have to cross to the Island of Mull and go across to the western side of the island before engaging a boat to go to Staffa. This may well have taken two days.

According to Macie, September 24th marked the day of departure for Staffa. Figuring backwards and allowing for unanticipated problems en route, the group should have left Edinburgh between September 14-18. Figuring the other direction, if they left London at the start of September, the party probably would have arrived

in Edinburgh on September 8th; the city would have been the logical place to rest and recoup for a few days.

Even allowing for the minimum number of days in the city there would have been time to meet James Hutton and possibly to go with him to Arthur's Seat. Hutton and Faujas could have had a great deal to discuss in the light of Hutton's developing ideas on the theory of the Earth and Faujas' study of ancient volcanoes in southern France. Young Macie would have been a most interested listener.

Staffa

Upon his return from a trip to Iceland, in 1772 Sir Joseph Banks had visited Staffa and had written of the basalt columns exposed there and at Ardtun. Before the end of the century, the zeolites of Staffa were well known and, indeed, most of the finer specimens had been collected; whether these minerals were known to collectors before Banks brought scientific attention to the island is not clear.

Hutton (1795: 282-283) briefly mentioned Staffa:

> Let us take examples of this kind [perpendicular mountains in the sea] near our coast, and of known rocks. Staffa and Ailsa, on the west coast, and the Bass, upon the east, are mountains of either whin-stone or granite, similar to such mountains within the land; and they are perpendicular around, except on one part. It is demonstratable that such basaltic rock as contains zeolites and calcareous spar, as most of our whinstones do, could not have been the eruption of a volcano, consequently those rocks must have been masses produced in a fluid state, under an immense cover of earth at the time of their production; and they could not have risen immediately out of the seas, with all their various minerals, their veins and cutters, their faces and their angles.

Without attempting to make a pun, by 1784 basalt was a 'hot' topic. The great arguments between Wernerian Neptunists and Huttonian Plutonists were yet to come, but the origin of this curious rock was a puzzle. From Hutton's quotation above, he interpreted columnar basalt as intrusive rather than extrusive. Faujas is not clear as to why the group wanted to go to Staffa, though it is probable that he knew of the occurrence of columnar basalt. No one knows if Faujas had reasoned out the significance of columnar basalt; obviously, if he had, he did not share this knowledge with Hutton. Formation of mud cracks by the drying of mud is an everyday phenomenon and it might not take too much of a imagination to equate this process with the cooling and shrinking of a molten rock, yet this argument does not seem to have been used in discussion of the columns.

The Trip to Staffa

One of Thornton's diaries contains a small sketch of the basalt columns and another of the entrance to Fingal's Cave, both apparently drawn from some distance away. There are no details of the trip in his diary and Dr. T. Crouch (oral communication, 1998), suggests that these may have been copied from Boswell's account of his 1773 trip with Samuel Johnson. Because of rough water, those two literary gentlemen did not land on Staffa. Thornton later wrote President George Washington suggesting cannon balls might be made of basalt and urged him to read the 1778 book by Faujas on volcanic rocks.

Though Smithson's papers were destroyed by fire, it is known that several persons consulted them during the three decades that they were extant in Washington. In particular W.J. Rhees, chief clerk of the Smithsonian Institution, read his diaries and copied a few extracts. Incidentally, if there had been any statement within the diaries as to why Smithson decided to donate his fortune to America, this would certainly have been copied and saved for posterity.

Macie gave a pithy account of his trip to Staffa:

> Mr. Turtusk got me a separate boat, – set off about half-eleven o'clock in the morning, on Friday, the 24th of September, for Staffa. Some wind, the sea a little rough, – wind increased, sea ran very high, – rowed round some part of the island, but found it impossible to go before Fingal's cave – was obliged to return, – landed on Staffa with difficulty, – sailors press to go off immediately, – am unwilling to depart without having thoroughly examined the island. Resolve to stay all night. Mr. Maclaire stays with me; the other party which was there had already come to the very same determination, – all crammed into one bad hut, though nine of ourselves, besides the family; – supped upon eggs, potatoes, and milk, – lay upon hay, in a kind of barn.
>
> 25th. Got up early, sea very high, wind extremely strong – no boat could put off. Breakfasted on boiled potatoes and milk; dined upon the same; only got a few very bad fish; supped on potatoes and milk, – lay in the barn, firmly expecting to stay there for a week, without even bread.
>
> (Rhees, 1880: 140)

The writing suggests this nineteen year-old was having the time of his life. It was high adventure to be marooned in an exotic locale. Then as now, field work is more fun and far more enlightening than studying geology in a classroom. There is a footnote to this trip. In a mineralogical study of zeolites years later, Smithson (1811:

171) wrote: "I had many years ago found soda in what I considered to be zeolites, which I had collected in the island of Staffa, ..." Presumably, the material was obtained during his trip to Staffa and indicates that Macie was a serious collector, and a good curator of his collections.

Return

> Sunday, the 26th. The man of the island came at five or six o'clock in the morning, to tell us that the wind was dropped, and that it was a good day. Set off in the small boat, which took water so fast that my servant was obliged to bail constantly – the sail, an old plaid – the ropes, old garters.
>
> (Rhees, 1880: 140)

The Sabbath was held dear in Scotland in the 1780s and would have been sacrosanct in such a remote spot as Staffa. That the farmer would awaken the group at dawn or before and urge them to leave the island is some indication of how this invasion of foreigners must have strained the resources of the island. At nineteen, one is immortal and thinks not of the prospects of drowning.

> I forgot to mention that M. de Macies, after visiting Fingal's Cave, the principal object of his journey, left us at Mr. Macleans, in the Isle of Mull, and returned to London, to which business called him. Our second travelling companion, the interesting and worthy William Thornton, intending to pass some months with his family in America, remained in Edinburgh, where he had friends and acquaintances, and where he could await the departure of a vessel. We parted from him with pain, but resolved to cultivate his friendship, for his moral qualities as well as his passion for science made him a most estimable man, well worth of the attachment of those who made his acquaintance.
>
> (Faujas 1797: 124)

one more fragment of Macie's diary germane to this story was copied and saved, written from Oban.

> September 29. This day packed up my fossils in a barrel, and paid 2s. 6d. for their going by water to Edinburg [sic]. Mr. Stevenson charged half a crown a night for my rooms, because I had brought 'stones and dirt,' as he said, into it.
>
> (Rhees, 1880: 140)

The narrative of Faujas is not always clear on the sequence of events. Although he indicated that Macie left the group on the Island of Mull, there are other comments

about them all being at Loch Lomond and recounting their adventures to the landlady of the local hotel. Unfortunately when they arrived, the hotel was occupied by a judge on circuit. As a result the Count slept in the carriage, and the landlady contributed two mattresses from her bed. Faujas and Thornton shared one, and Macie had the other.

The group went on to Dalmally, to meet 'The Macnab', the blacksmith who allegedly had manuscripts of the poet Ossian. Apparently, it was after this visit that they went their separate ways. Faujas and Andrioni may have gone to Chelsea, England, to witness a balloon ascent on October 16th.

Whether Macie returned to Edinburgh to collect his specimens and met Hutton or whether they were forwarded to him is not known. In the light of the remarks by Faujas about Thornton's plans, a second visit to Edinburgh by Macie seems unlikely. In another saved diary entry, Macie records a visit to a salt mine in Northwich on October 28th. From that date, it seems most likely that the 'business' in London was simply a polite way of disassociating himself from the older man so that he could pursue his interest in mineral collecting.

The 1788 Macie Letter

From London, on April 14th, James Macie wrote to James Hutton.

> I did myself the pleasure, a considerable time ago, of writing to you to know how I should dispose of the money remaining in my hands, since a total remove from Oxford put it out of my power to avail myself of any discoveries at Steinsfield, [this might be Stonesfield in the original] to procure for you such bones as I wished to do, but I _ch that the badness of my writing has been the means of carrying the letter to a wrong direction, accordingly it has never reached you – I desired our common friend, Dr. Thomson, who is resident in the university, to obtain frequent information of what the quarry-men met with, that in case anything, likely to suit you, had been found, he might immediately lay hold of it, but he writes me word, that after repeatedly going & sending to Stonesfield, which is at some distance from Oxford, he finds all his excursions terminate only in labour & expense. We must therefore for the present, I am afraid, relinquish the expectation of procuring such distinct & perfect bones as you desire, should any however happen hereafter to present themselves, I will desire, if you chose it, some of friends at Oxford to procure them for you. In the meantime, I wish to know whether I should lay out the four & [?] five and twenty shillings, remaining of the 2 guineas, in foreign fossils, are to be procured here of some of the dealers in

minerals at about 4 or 5 shillings per specimen, or whether I shall send you back the money by some convenient opportunity.

(Fitzwilliam Museum, Cambridge, Percival Collection, J. 8)

Inasmuch as Macie probably left Oxford the latter part of 1786 and Thomson was at the University until 1790, the date seems accurate. One point to know for those who might wish to pursue Smithson was that his published writings were concise and clear, not at all as loquacious as the sentences above.

There are several intriguing aspects to this letter. Perhaps the most important is that the letter was written to Hutton. Indirectly, it conveys the message that Hutton was impressed enough with this young man to ask a scientific favour.

Even more significantly, Hutton entrusted to this total stranger a large sum of money to carry out his request. That certainly reflects on both Macie's knowledge of geology and on his character; he must have made a very impressive first impression on Hutton. Hutton was born in 1726 and if Macie met him during the trip to Scotland he would have been 57. Few men that age today are much impressed with nineteen-year old youths.

Acknowledgements

Dr. Roy Clarke, Department of Mineral Sciences, National Museum of Natural History (retired), kindly supplied one of us (ELY) with a copy of the Thomson letter quoted, though he in turn had received it from others; apparently it has not heretofore been published. Similarly, Sally Hoffmann, National Museum of American Art, contributed a summary of Macie from Geikie's book, which she in turn had obtained from another source. Dr. T. Crouch, National Air & Space Museum, contributed extracts from Thornton's papers.

A grant from the Director, NMNH allowed ELY to attend the 1997 Hutton bicentennial and reinforced the possible importance of the Scotland trip to Macie's future career. The Macie letter to Hutton, also to our knowledge not heretofore published, was discovered by Jean Jones of Edinburgh. Hugh Torrens, Keele University, directed her attention to the point that Macie and Smithson were one and the same.

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Gordon Craig is well-known to members of the Society, having held the Chair at the University of Edinburgh and as compiling author of *The Geology of Scotland.*

Alexander Rose and the Society's furniture and silver

by David Land

Alexander Rose (1781-1860), though not the founder of the Edinburgh Geological Society as is sometimes stated, may certainly be regarded as its father. He began his career as a wood and ivory turner, following in his father's footsteps, but soon added to this by becoming a dealer in mineral specimens; and later a lecturer in geology and mineralogy.

In 1834 eleven of his students met in Robertson's Tavern, Milne's Close, on Thursday 4th December and resolved to start a geological society "for discussion and mutual instruction". Their first scientific meeting was held on the following Monday, when they argued successfully that Arthur's Seat was of volcanic origin. Thereafter they met every Monday evening at Alexander Rose's house, no. 2 Drummond Street. One of them, John Castle, was elected first president, with James Brodie as secretary whose neat hand records all this in the Society's first minute book. A few months later, Alexander Rose became president and led the Society for the next eleven years. During this time he was presented with a silver trophy cup as a mark of the members' esteem. This in itself is an indication of Rose's remarkable character.

Rose's father John, who came from Cromarty before settling to his craft in Edinburgh, undoubtedly passed on his skills to Alexander who became an outstanding craftsman in his own right, as may be seen in the specimen cabinet he made and used himself.

A no doubt apocryphal story, told by Alexander's grandson Robert, demonstrates his confident skills. "During the final years of the 18th century there was excitement in the neighbourhood of Blackfriars and Niddrie streets, caused by the report of a 'brownie' busy in one of the old houses there. Morning after morning a local turner, on entering his workshop, was astonished to find that the work he had left unfinished the night before, was all beautifully completed. Curiosity got the better of fear and a watch was set. In the grey of an early morning, the 'brownie' was discovered entering the window of the workshop! He was a small boy: Alexander Rose."

In the 1830s Alexander Rose became a lecturer in geology and mineralogy in Queen's College. This was a teaching association, not a building nor part of the university. Little is known about Queen's College, and it would be interesting to learn more about this institution. Rose was an excellent and inspiring lecturer, of unassuming disposition and warm affections, who was held in the highest regard by

his students, who at different times presented him with a silver tea service and a silver snuff box. This last, together with the silver cup mentioned earlier, was gifted to the Society in October 1945 by Rose's grandson's widow Mary Tweedie-Stodart Rose, who also gave us his specimen cabinet and arm chair. The silver is now on display in Murchison House, while the furniture is presently in the care of the writer of this article.

In 1816 Rose married Isabella Boyne and they had three sons and six daughters. William, the eldest son, died in infancy. The second son Alexander helped his father as a turner. He never married. He was killed by a runaway horse the year after his father died. John (1828-1894) was the third son, who worked in a stationery business. He first met Ann Trail, whom he was to marry, at the home of Hugh Miller. Ann and John had five children, the middle one being christened Robert Traill after his maternal grandfather. Robert (1861-1942), who was an artist, married Mary Tweedie-Stodart, but they had no children. After she was widowed, Mary presented the Society in 1945 with the priceless mementoes of her husband's grandfather, which are described below.

In 1838 the Society presented the silver cup to its president, as the inscription states:

Presented
to
Alexander Rose, Esqr
by the MEMBERS of the
Edinburgh Geological Society
As a sincere expression of their
esteem
and a small acknowledgement of
his Valuable Service as their
President
March 1838

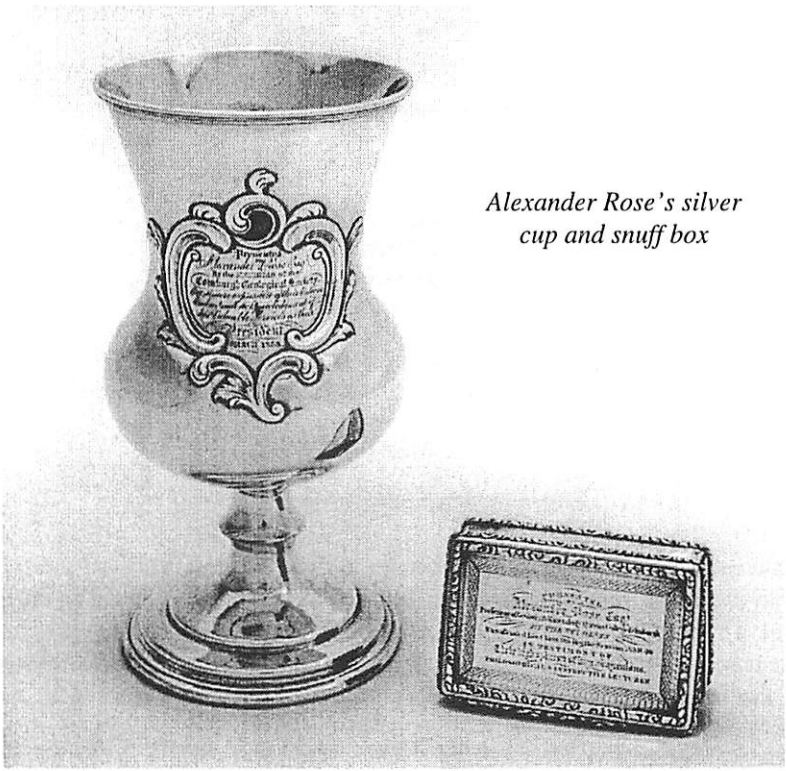
It is a thistle shaped trophy cup, 202 mm tall with a top diameter of 105 mm. Its capacity is 800 ml and it weighs 505 g. It has a ribbed lip and is gilded on the inside. Outside it is plain polished with two opposite repousséed fat-scroll edged reserved cartouches. One of these carries the inscription, and the other encloses an engraved crest, the Baird crest of an eagle's head, 'erased proper'[†] surmounted by a scroll

[†] Heraldic terms meaning 'torn off so as to leave a jagged edge' and 'in its natural colours'.

bearing the motto of Clan Rose: 'Constant and True'. The eagle's head is erect with open beak. The cup has a short stem with a central moulding and a triple-stepped pedestal foot.

Hall marking was done in Edinburgh in 1837, the marks being the sovereign's head, the thistle, the maker's mark 'AGW', the castle and the date letter 'f'. In 1993 the cup was valued for insurance at £800. AGW, the maker, was A G Wighton, an Edinburgh silversmith and jeweller who was active between 1823 and 1863.

In 1840 Rose was presented with a silver snuff box by his students. The box is rectangular with rounded corners, 88 by 54 mm, and 22 mm high. Around the top and base are double beadings of highly stylised leaves and flowers. The sides are reeded and the base is engine-turned in alternating bands of beaded and wavy lines. The top has a reserved, inscribed panel (as above) surrounded by ornament similar to that on the base. Inside the box is gilded. Its weight is 147 g. It was hallmarked in Birmingham in 1839, the marks being the anchor, the maker's mark FC, and year



Alexander Rose's silver cup and snuff box

letter Q on the inside of the base; and the sovereign's head, maker's mark FC, and lion passant on the inside of the lid. FC is the mark of Francis Clark. In 1993 the insurance value was £700. The inscription on the lid reads:

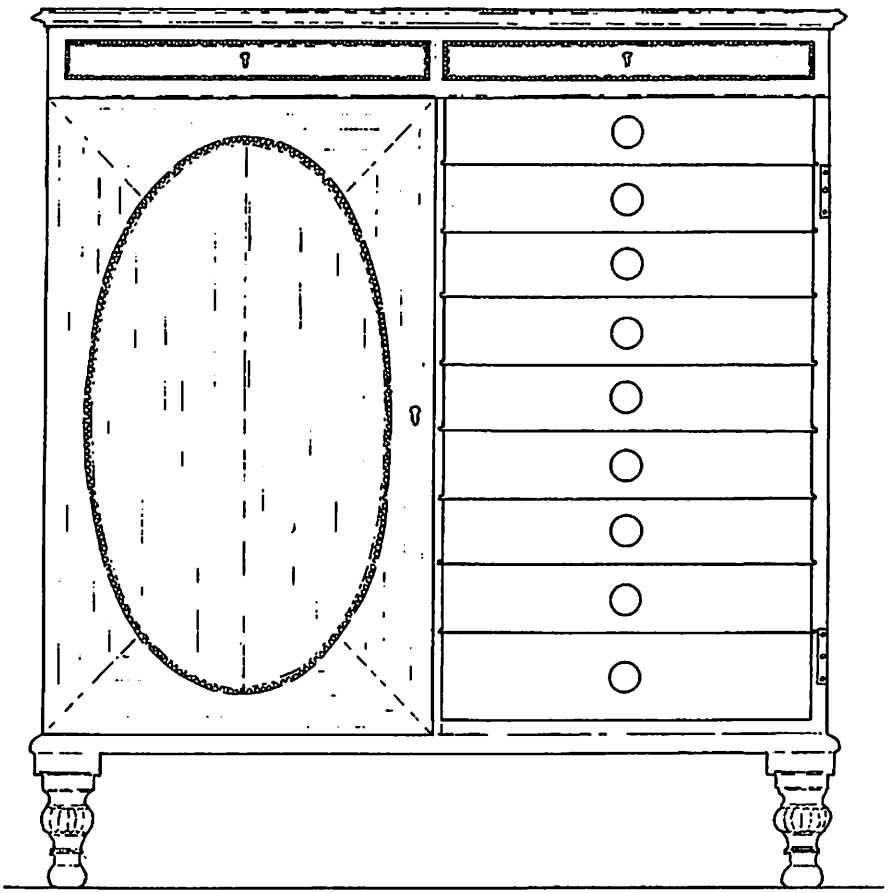
Presented
TO
Alexander Rose Esqr
Professor of Geology and Mineralogy, Queen's
College, Edinburgh
BY THE STUDENTS
Who attended his Class During the Session 1839-40
IN TESTIMONY OF
Their high opinion of him as a zealous
PHILOSOPHICAL & INSTRUCTIVE LECTURER

Rose's specimen cabinet, made and used by himself, is an individually designed piece, probably made sometime between 1810 and 1830, in a style typical of the Regency period, characterised by functional elegance and restrained ornamentation. It comprises 18 specimen drawers in two tiers, with double doors, above which is a frieze.

The carcase is made of veneered Cuban mahogany on pine. The top is flat, 956 by 540 mm, with a moulded edge forming a 20 mm cornice to the frieze, which incorporates the fronts of two shallow lockable drawers which are recessed with quarter barrel moulding. A narrow reed moulding finishes off the base of the frieze.

Each door has a central recessed oval panel edged with barrel beading to match the frieze drawers. Inside, the oval is also recessed but edged with plain quarter moulding. The door frame is quartered and mitred with concealed joints, the grain of the wood running horizontally and vertically as shown in the drawing. The left-hand door has brass bolts top and bottom, recessed into the front edge, and has a blind keyhole to match that for the lock in the other door. A strip of moulding attached to the right-hand door conceals the gap between the closed doors and adds a touch of ornament to the cabinet. A simple quarter-moulded 23 mm-deep front finishes off the base of the cabinet which rests on turned and reeded bun feet.

Inside there are 18 specimen drawers, each 70 mm inside vertical depth, with the two lowest 88 mm deep. Drawer fronts are lacewood (quarter-sawn London plane) with concealed dovetail joints to the sides which are made of chestnut. Drawer bases are pine and extend 15 mm beyond the sides to engage in horizontal slots in the sides of the cabinet, so enabling the drawers to be pulled out part way while remaining firm. Turned handles of ebonised beech screw into the front of each drawer.



Front elevation of Alexander Rose's mineral cabinet (right-hand door removed to show drawer arrangement

An inscription plate 122 by 75 mm, on top of the cabinet reads:

This mineral cabinet
was made and used by
Alexander Rose
Founder of the
Edinburgh Geological Society
Professor of
Geology and Mineralogy under
Queen's College – Edinburgh
and also, in his day, a well known
wood and ivory turner

Presented to the
Edinburgh Geological Society
by the widow of
Robert Traill Rose, artist
grandson of the above

In 1994 the insurance value of the cabinet was £2800. As the Society has no premises of its own, the cabinet is looked after by one of the officers. At present this is the writer of this article, who has the pleasure of admiring it as a piece of furniture and of using it for its original purpose. It is most gratifying that this cabinet, made and used by Alexander Rose himself, is now the Society's property.

Rose made a Windsor armchair for himself. A plate fixed to the top of the upper splat reads:

This chair, made by himself
belonged to
Alexander Rose, FRSA
b. 1781 d. 1860
Founder of the Edinburgh
Geological Society in 1834

Presented to the Society, Oct 1947
by Mrs R T Rose, widow of the
Grandson of the above.

The chair is of traditional design with a stylised-vase splat, the upper part of which is of either beech or cherry, and the lower part cherry or walnut. The seat, arms and bow are made of ash and the turned pieces are either ash or sweet chestnut. Slight irregularities in the turning and joining betray the fact that this is not a factory product, but a hand-made article imbued with the spirit of its maker. In 1994 the chair was valued at £350.

It will be noticed that the inscription plates on the chair and cabinet refer to Rose as founder of the Society. While this is not strictly correct, as noted earlier, the Society was founded by a group of Rose's students meeting without him. However, the fact that they decided to meet weekly in Rose's house, implies that their initial meeting was with his blessing. Without him there would have been no Society, and he was its guiding spirit and mentor through many of its earliest years. The Society is fortunate to have these mementoes of Alexander Rose, particularly perhaps the furniture which he himself made and used; and we are deeply indebted to Mary Rose for these gifts to our Society.

Bibliography

Monro, S K. 1981. Reflections on Alexander Rose. *Edinburgh Geologist* No. 10, p. 2-4.

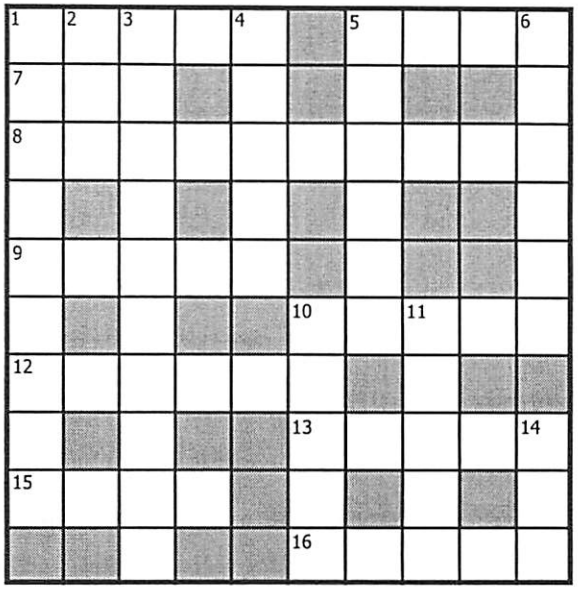
Rose, Mrs M.T-S. 1953. *Alexander Rose, Geologist and his grandson Robert Traill Rose, artist.* Edinburgh, C J Cousland & Sons Ltd.

Watson, J.A. 1934. General History [of the Edinburgh Geological Society]. *Transactions of the Edinburgh Geological Society*, Vol. 13, p. 231-241.

David Land is well-known to members, having worked on the staff of the British Geological Survey and been the President of the Society from 1995 to 1997. He is currently the Publications Officer on Council and also has the good fortune to be the custodian of the Alexander Rose furniture and silver.

We have tried in vain to trace the copyright holder of Mrs Rose's book. She died a few years after it was published; and the publishers are no longer in business. The Society trusts that it will be excused any inadvertent breach of copyright in quoting from this book.

Rocksword Puzzle No. 1



compiled by Angela Anderson

Clues across

1. A boggy thrust in N.W. Scotland (5 letters)
5. Initially the Geological Survey of Great Britain (4)
7. Run around (3)
8. A rather backward metamorphism (10)
9. see 1 down
10. A weighty bit of rock (5)
12. Mineral slept in without tea (6)
13. A sub-continent on a collision course (5)
15. A very ardent lava flow (4)
16. "- - - - - has not anything to show more fair:" Wordsworth (5)

Clues down

1, 9 across. Follow the yellow brick road to this abode in West Mains Road (9, 5)

2. In primary or else secondary state (3)
3. Pushy sorts of magma (10)
4. Wear (5)
5. Ran up to get this gemstone (6)
6. A mix of zinc ore? (6)
10. Land election victory (5)
11. Not younger in cold era (5)
14. Bash away the bee for this deposit (3)

The Editor would like to thank Angela for sending in this puzzle, which, as she says, has a strongly geological theme. It turns out that Angela was the compiler of one of the crosswords early on in the life of The Edinburgh Geologst, but that readers found it too difficult. I share her hope that this one is not too obscure. The answers (for readers who are absolutely stumped) are on page 40.

Poet's Corner

Sam the Shale

by Donna Balin and Michelle Othon © 1995

I'm just a common country rock,
nothing high-falutin,
Checking out the dikes and sills
residing by my pluton.

I like the sedimentary life,
drying and compacting.
I shrink and swell as I please
and show no signs of cracking.

I have my eye on Xenolith.
What a composition!
She's very untraditional --
Likes multiple positions.

I used to like lil' Rhyolite,
took her on the town.
She used to be a hot rock
but now she's cooling down.

Poet's Corner

Sometime I'd like to take a trip
down into the mantle,
And see some rocks I've never seen,
much too hot to handle.

There's just so much to choose from,
It messes up my mind.
Metamorphic, igneous --
They're both so superfine!

But if I could find the perfect rock,
I think she'd have to be
A simple kind of country rock,
similar to me.

Donna Balin and Michelle Orthon both work as geologists in Texas. Donna's PhD (from Cambridge) was a study of the Old Red Sandstone of the east coast of Scotland and northern England.

Rocksword Puzzle No. 1

Solution

Clues across

1. MOINE
5. GSGB
7. URN
8. RETROGRESSIVE
10. STONE
12. SPINEL
13. INDIA
15. NUEE
16. EARTH

Clues down

1, 9 across. MURCHISON HOUSE
2. ORE
3. INTRUSIVES
4. ERODE
5. GARNET
6. BLENDE
10. SLIDE
11. OLDER
14. ASH

Proceedings of the Edinburgh Geological Society for the 164th Session 1997-1998 No. 28

Compiled by David Land

Proceedings of the Edinburgh Geological Society for the 164th Session 1997-1998 No. 28

Membership:
Total membership on 30th September 1998 was 583, a welcome increase from 557 last year, in the following categories:

Honorary Fellows	8 (8)	Senior Fellows	23 (23)
Corresponding Fellows	12 (11)	Family Fellows	36 (32)
Life Fellows	18 (20)	Glasgow Associates	11 (9)
Ordinary Fellows	464 (449)	Junior Associates	11 (5)

With great regret, we record the deaths of **Professor P. McL. Donald Duff** and **Ranald Elliot**. Professor Duff was a trustee of the Society. He made many contributions in the study of coals and their associated sediments. He was editor of several journals, and author and co-editor of several major geological texts. Ranald Elliot, sometime Chief Petrographer (Scotland) with the Geological Survey, was the author of many reports on the petrography of Scottish rocks.

Council, elected on 19th November 1997, was as follows:

President	William J Baird
Vice-presidents	Andrew A McMillan A Caroline Paterson
Secretary	J Michael Dean
Treasurer	David Gould
Membership secretary	Mary M Leitch
Excursions secretary	A David McAdam
Lectures secretary	Donald I J Mallick
Assistant secretary	D Ian Jackson
Proceedings and Edinburgh Geologist editor	J Alan Fyfe
Librarian	W Barrie Heptonstall
Sales secretary	David H Land
Scientific editors	Philip Stone and Peter G Hill
Ordinary members of Council	William J Coppock, R Angus Harkness, Tom S Kerr, Tom McMillan, Suzanne Miller, Averil H Hope Smith
Trustees (not on Council)	P McL Donald Duff, William G W Harper and W D Ian Rolfe (Prof. Duff was succeeded by S Ian Hogarth)
Independent examiner	M McLeod

Proceedings

Lecture meetings were held as follows:

8th October 1997	**Dr. M Smith** Flowers in the desert – the Pan African Orogeny in Egypt.
22nd October	**Dr. R Coope** Taking the temperature of the Ice Age: a beetle's eye view.
6th November	**Dr. B J Taylor** Geology and the Grand Tour of Europe.
19th November	**Dr. B R Bell** Aspects of Palaeogene volcanic activity of the north-east Atlantic (followed by A.G.M.).
3rd December	**Dr. A H F Robertson** Tibet: Roof of the World.
14th January 1998	**Dr. P Wignall** Black shale: fossils, facies and formations.
28th January	**Prof. B E Leake** Geological evolution of Connemara.
11th February	Fellows' night.
25th February	**Dr. N J Soper** The New Highlands controversy.
	Dr. Soper was presented with the Clough Medal at this meeting.
11th March	**Dr. B J Jackson** Gemstones of Scotland.
25th March	**Mr. N E Butcher** Devonshire – tasting the cream of English geology.

Proceedings

Field meetings were held as follows:

2nd May 1998	**Dr. P Stone** Coldingham
9th - 16th May	**Mr. N E Butcher and others** Devon
20th May	Torness Power Station
27th May	**Mr. A Kirk** Blinkbonny opencast
30th May	**Dr. J G Macdonald** The Whangie and Auchineden
3rd June	**Mr. D H Land & Mr A A McMillan** Calton Hill
6th - 7th June	**Dr. G A L Johnson & Mr. B Young** Hexham
17th June	**Mr. N E Butcher** Redhall
20th June	**Dr. P Rose** Dunkeld
11th July	**Dr. M C Akhurst & Mr. A A McMillan** Lochmaben
22nd July	**Mr. P J Brand & Mr. A D McAdam** Wardie and Granton Shore
1st August	**Dr. A R MacGregor** Wormit
22nd August	**Mr. W J Baird** Oxwellmains
12th September	**Dr. D G Woodhall & Mr. M A E Browne** The Binn and Burntisland
3rd October	**Dr. S Rigby & Prof E N K Clarkson** Thirlestane Burn and Mountbenger Burn

Proceedings

Scottish Journal of Geology: Volume 33 part 2 and Volume 34 part 1 were published during this session.

Clough Medal: The Clough Medal was awarded to Dr. Jack Soper for his contributions to understanding the geology of the Highlands and the English Lake District.

Web: The Society now has a web site, accessible through the Internet at **http://www.glg.ed.ac.uk/egs**

Publications: no new publications were produced during the session, but four are in an advanced state of preparation and should appear in the next session. They are *Building Stones of Edinburgh*, 2nd edition by Andrew McMillan, Richard Gillanders and John Fairhurst, *Braid-Blackford*, leaflet by David Land, *Stirling*, field guide by Mike Browne and *Ballachulish*, guide by Ben Harte.

Mykura Fund: Grants were made from the Mykura Fund to support work in north-east Ireland and south-west Scotland.

Billets: The new design, prepared by Caroline Paterson, for billets, letterheads, etc came into use with the first billet of the session. This new look is a great improvement on the old, and has been warmly approved.

Membership Application Form: The form was completely redesigned to a more attractive and friendly format.

Law Changes: Consequent on recent charity legislation, minor changes were made in the Society's laws dealing with auditor and trustees.

Accounts: The summary for the year ending 30th September 1998 follows this report.

EDINBURGH GEOLOGICAL SOCIETY

REVENUE ACCOUNTS FOR THE YEAR ENDED 30th SEPTEMBER 1998

	General	Public-ations	Clough	Mykura	Total	
					1998	1997
INCOME	£	£	£	£	£	£
Gross income from investments	1,499	885	593	161	3,138	3,210
Net gain on disposal of investments	58	33	22	6	119	(94)
Bank interest	345	203	136	37	721	427
Subscriptions	5,707	-	-	-	5,707	5,713
Tax recoverable on Deeds of Covenant	541	-	-	-	541	541
Legacies and donations	267	-	-	-	267	260
Donations for Hutton plaque	-	-	-	-	-	750
Grants for publications	-	-	-	-	-	2,414
Miscellaneous	4	-	37	-	41	6
Sale of publications	-	3,269	-	-	3,269	3,241
TOTAL INCOME	8,421	4,390	788	204	13,803	16,468
EXPENDITURE						
Administrative Costs						
Printing, stationery, postage	148	43	-	-	191	359
Insurance	270	-	-	-	270	270
Bank charges	584	-	-	-	584	513
Reception	56	-	-	-	56	58
Miscellaneous	73	-	-	-	73	189
Independent examiner's fee	550	-	-	-	550	550
Depreciation	303	-	-	-	303	305
	1,984	43	-	-	2,027	2,244
Direct Charitable Activities						
Lecture costs	1,445	-	-	-	1,445	1,428
Billets	1,640	-	-	-	1,640	1,387
Award and medal expenses	-	-	518	-	518	223
Excursions	991	-	-	-	991	1,269
Scottish Journal of Geology	-	2,000	-	-	2,000	1,500
Edinburgh Geologist (including Proceedings)	-	513	-	-	513	649
Books for library	198	-	-	-	198	-
Hutton Plaque and leaflet	-	-	-	-	-	1,620
Grants made	-	-	450	400	850	690
	4,274	2,513	968	400	8,155	8,766
Cost of Publications Sold	-	876	-	-	876	4,897
TOTAL EXPENDITURE	6,258	3,432	968	400	11,058	15,907
SURPLUS (DEFICIT) for year	2,163	958	(180)	(196)	2,745	561

EDINBURGH GEOLOGICAL SOCIETY

BALANCE SHEET AT 30th SEPTEMBER 1998

	1998		1997	
	£	£	£	£
FIXED ASSETS				
Investments at market value		72,585		78,284
Tangible		423		726
		73,008		79,010
CURRENT ASSETS				
Stock of publications	20,853		21,429	
Other stocks	109		163	
Debtors and prepayments	160		155	
Taxation recoverable	237		274	
Bank accounts	16,626		10,016	
	37,985		32,037	
Less:				
CREDITORS DUE WITHIN ONE YEAR				
Sundry	993		966	
Scottish Journal of Geology Vol. 33	2,000		1,500	
	2,993		2,466	
NET CURRENT ASSETS		34,992		29,571
NET ASSETS		108,000		108,581
REPRESENTING				
FUNDS				
Permanent endowment		55,565		56,721
Unrestricted		52,435		51,860
		108,000		108,581

Prepared by David Gould, Treasurer, approved by M McLeod, Independent examiner, and adopted by Council on 18th November 1998.

Foootnote: In the published proceedings for the 163rd session, the date in the last sentence (Edinburgh Geologist No. 31, p. 42) should read 30th September, not 30th November.

THE EDINBURGH GEOLOGIST

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