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EDITORIAL:

Once again the heavy hand of politics (what a dirty word that is becoming nowadays) intrudes on our caving activities. This time the subject is road pricing. Our enlightened government, eager to demonstrate its commitment to green policies, proposes to blanket Britain's roads with a variable, mileage charging system dependent on vehicles being satellite tracked. In short, visits to caving areas for us in Scotland, where cavernous limestones invariably lie at some distance from big cities, will be penalised. I shudder to think what London cavers, speeding to Mendip or South Wales along the M4, would have to pay.

Needless to say, I object strongly to this proposal - you wouldn't expect me not to! - and I'll tell you why. *Prima facie*, implementation of this scheme will, allegedly, reduce congestion and carbon emissions by cutting down the number of vehicles on our roads. Unfortunately, human beings are not only persistent, they are also incredibly adaptive, and I am convinced if such a tax were introduced, car journeying would not decrease significantly, it would merely result in yet more income for the exchequer. (This is the big red herring: making things more expensive does not automatically reduce their use, it only increases income). Not that I'm against pollution reduction. If politicians are serious about global warming, then there are a number of avenues to be explored. Petrol rationing is an obvious one. Reinstating goods trains and city centre distribution depots is another. One long goods train between say, London and Manchester, could remove a huge number of articulated lorries from our motorways and who is going to carp about that (apart from the late Dr Beeching of infamous reputation?). Expanded research and development of alternative fuels and engines is another.

When I started caving in the late 1950s, I regularly travelled back and forth to Settle by train, sharing local transport to the caves themselves. Nowadays, ticket pricing is ludicrously high, the rail system requires astronomical investment to redress neglect dating back to World War II, and country 'halts' have all but disappeared. Who says we are moving forward?!

More sinister is the methodology required to run the taxing scheme. 'Galileo' GPS devices are now, by law, being fitted to all new cars produced in the EU. This is how you will be tracked and charged. It does not take a quantum leap to realise what a powerful tool this could be for a totalitarian state. How much of your private life do you wish the authorities to oversee? Don't forget, some years ago an assassination was arranged through tracking a mobile phone call. The response to a petition against road charging has been massive but the government says it will proceed anyway. What price democracy now?

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Making life complicated seems to be an endemic human condition. Thanks to those in authority who have our 'best interests' at heart, their insistence on public liability insurance has resulted in a labyrinthine masterpiece for membership of our national body. With *DIMS, CIMS,* choices of whether or not to belong to BCRA as well as BCA (*individual membership* only available to *direct individual members* of BCA), blah, blah, blah, I am told there are over 70 (!) permutations of subscription level for an increasingly desperate treasurer to cope with. And, of course, none of it is particularly cheap, thanks to the insurance premium. Given all that however, even when faced with a renewal form that aspires to mirror the dreaded income tax assessment form, I would urge readers to consider becoming individual members of BCA. Our pastime is shrinking; problems are increasing, and if we are to possess any 'clout' in dealing with access, conservation or misplaced ligitation, we need to make our national body as representative and powerful as possible. This requires your vote, your input and your support. Don't be parochial - take an interest in our national situation before something happens that could quite literally make what you enjoy doing, illegal. If you think that's far fetched, remember what has happened to shooting clubs.

Ah well, happy caving!

Alan L. Jeffreys, Editor

AREA MEET REPORTS (To 25.2.06) (Edinburgh logs only)

This has been a quiet half year, with the emphasis on sport caving and persistent digging at Rana Hole, which ever promises to 'go' almost immediately. Note that much of this activity is recorded in the Sutherland hut log not in the Bulletin. The 2005-6 log will be published soon.

ARGYLL

A trip to the loose new sections of Hibernian Hole in October allowed eight members to survey the recent discoveries and use a scaling pole to reach an aven which unfortunately was choked with boulders. There were also visits into Draught Caledonian and Treefeller's Pot.

CLACKMANNANSHIRE

In February there was a flying visit to Alva silver mines to check some measurements, followed by another abortive attempt to find a Covenanter's Cave near Kippen.

INVERNESS-SHIRE

En route home at the end of January, Derek Pettiglio stopped at Slochd on the A9 to look at rock shelters in the cliffs there. Although they look promising from the road, they only extend for some three metres.

PEEBLESSHIRE

A Mountain Rescue Seminar was held at West Linton in November. Before the field exercises Ivan Young walked around Harbourcraig, identifying a group of old coal mine shafts (all filled in), none of which offers any potential.

ROSS AND CROMARTY

In December there was a trip to Kishorn with visits to Heretic's Cave, Wee Beastie and Triangle Cave. (Note: local members carry out many trips to caves here, at Applecross and on Skye which do not appear in the log-books).

SOUTH WALES

Conveniently the Group's Annual Dinner was held at Blaenarvon, allowing trips into some classic Welsh caves in November. On Saturday there were visits to Agen Allwedd and Ogof Draenen and similarly the next day both these caves were revisited by different parties.

SUTHERLAND

Digging in Rana Hole in early December resulted in a major refettling of the scaffolding and 34 skipfulls removed. On the way back down the valley the team visited the Bone Caves and the next day, after de-rigging Rana, three members carried out a trip through Allt nan Uamh Stream Cave.

The New Year weekend witnessed a lot of activity, especially at Rana Hole where many skiploads of spoil were excavated and brought to the surface. There were also several walks over the moors above Knockan Crag. On 29th December A. Jeffreys identified a major sink not far from Knockan Pot which will repay clearance. A new hole, which may or may not be Tillson's Dig, was also examined by Derek Pettiglio. Work at Rana wound up on 2nd January.

On 27th January four members continued surveying the Farr Series in Allt nan Uamh, tackling the multi-level vertical rift as far as Thunderghast Falls. Although not a great distance as the crow flies, this work took five hours, taking in vertical pitches and passages beneath passages. Simultaneously a party dug at Rana Hole, hilti capping some rocks and rigging more stemples. Rather plentiful water was left draining well into gravel at the bottom. Derek Pettiglio followed up his examinations at Knockan Crag, finding a small rising cave near the concrete water catchment, and walked between Knockan and Strathcanaird, finding nothing of interest. At the beginning of February a strong team assembled to dig Rana, but on arrival found the shakehole filled with snow and powerful spindrift making life impossible so instead there were trips into ANUS Cave and the Bone Caves. Also in February, a return to Rana saw repairs due to the snow and some digging.

WEST LOTHIAN

On a request from the farmer concerned, a party of six explored what was probably part of a mill's water system at Ratho Mains Farm in October, discovering some 60 metres of interesting tunnels. Downstream the passage continued for a considerable distance but was not attempted owing to fine displays of straws which would have been damaged. (See this issue).

YORKSHIRE

At the end of October three members descended Alum Pot direct to the top of the last pitch and followed up with a trip through Long Churn to the Main Shaft.

The following month a party carried out a thorough exploration of Heron Pot (too wet to exit from the bottom) and the next day enjoyed a through trip from Calf Holes to Browgill Cave.

On 27th January three members bottomed Ireby Fell Cavern and in February, discouraged by iced-up roads, a party bent on Wretched Rabbit made other arrangements and went into Kingsdale Master Cave instead. On return they crawled up the Milky Way, decided to give up on Toyland and went a considerable distance along Carrot Passage before terminal boredom set in. The next day conditions had eased, so two carried out a trip down Wretched Rabbit to Stop Pot and Eureka Junction but judged the main streamway too hazardous for extended exploration.

In the middle of February there was a descent of Lost John's Cavern by a party of five who were foiled at the very last pitch due to an error with rope lengths. The following day they investigated a few caves at Ribblehead in sunny weather, some of the sites unidentified but obviously flood prone.

The last weekend of February witnessed a descent of Bubbles Route in Ireby Fell Cavern and a foray into Rift Pot.

Book Review: **Not For The Faint-Hearted (50 Harder Caving Trips in Yorkshire). Mike Cooper. Purprise Press, Hebden Bridge (2006) 210pp, 54 illus. Hardbound, £20. ISBN 978-0-9554139-0-2**

There have been several 'personal' guides to caving in the UK over the years but this book must feature top of the list. Within greater Yorkshire (ie including Leck and Casterton Fells) the author has selected the cream of Britain's great potholes and explains trips down them in terms of SRT - something not adequately covered in the 'Northern Caves' series.

The author carefully describes his route down each cave, with suitable rigging advice, in a readable, easy to follow manner. Clear location maps are supplied for each region and the book is attractively bound with an A5 hard cover. In fact this is a quality production, rounded off with a comprehensive exploration bibliography for each cave covered. It is available from all good caving shops, and strongly recommended for the collector of Yorkshire classic trips.

A. Jeffreys

ADDITIONS TO THE LIBRARY (to 25.2.06)

1. BOOKS:

Proudlove, G.S. (2006) Essential Sources in Cave Science. BCRA Cave Studies Series No.16
Crunden,B. (1948-1950) Gaping Gill Hole. [Transcript of MS in CPC Library]
Cooper, M. (2006) Not For The Faint-Hearted. (50 Harder Caving Trips in Yorkshire)

2. SHEET SURVEYS:

	approx. scale
Tham Yai Nam Nao, Thailand	1" = 200m

3. CAVING JOURNALS:

BEC Belfry Bulletin	No. 526 (2006)
British Caver	Vol. 129 (2007)
BCA Newsletter	No.7 (2006)
BCRA Cave and Karst Science	Vol. 33 No.1 (2006)
BCRA Cave Radio Group, Journal	Nos. 64,65 (2006)
British Caver	Vol. 29 (1958)
Cave Diving Group, Newsletter	Nos. 161,162 (2006-7)
Chelsea Speleological Society, Newsletter	Vol. 48 Nos. 10,11,12
	Vol. 49 Nos.1,2 (2006-7)
Craven Pothole Club, Record	Nos. 84,85 (2006-7)
Derbyshire Caver	No. 125 (2006)
Descent	Nos. 192,193,194 (2006-7)
Hereford Caving Club, Newsletter	No.15 (1962)
Leicester & Nottingham Univs. Caving Assoc. Journal	Vol.1 (1964)
Mendip Caving Group, Newsletter	Nos. 333-337,339 (2006-7)
Morgannwg Caving Club, Journal	No. 5 (1995)
Mountain Rescue Committee of Scotland, 'Casbag'	Nos.12,13 (2006)
NAMHO Newsletter	Feb. (2007)
National Speleo. Soc. of the USA, News	Vol. 23 No.7
	Vol. 63 Nos.9(2),10,11,12
	Vol. 64 Nos.3,4,5,6,7,8 (1965-2006)
Peak District Mines Historical Society, Special Publ.	
The Magpie Mine, Sheldon, Derbyshire	No.3 (1967) *& rep.* (1971)
Red Rose Cave & Pothole Club, Newsletter	Vol.43 Nos.1,2 (2006)
Scottish Mining Museum, 'Coalface'	No. 4/06
Shepton Mallet Caving Club, Occ. Publ.	No.10 (2006)
Speleologia (Italian Spel. Society)	Year 27 No. 55 (2006)
Subterranea Britannica, Newsletter 'Subterranea'	Nos.11,12 (2006)
Subterranea Croatica	Vol.6 No.4 (2006)
Sydney Speleological Society, Journal	Vol. 50 Nos. 9,10,11,12
	Vol. 51 No.1 (2006-7)
UBSS, Proceedings	Vol. 24 No.1 (2007)
Wessex Cave Club, Journal	No. 302 & Index 2004-2006 (2006)
	Vol.29 No.1 (2007)
Westminster Spelaeological Group, Newsletter	No. 2006/4
Yorkshire Subterranean Society, Occ. Publ.	
'Snap Shot of the Last Forty Years'	(2004)

4. MAPS

Landranger 1:50,000
Sheet 9 Cape Wrath
Sheet 41 Ben Nevis
Sheet 42 Glen Garry & Loch Rannoch
Sheet 49 Oban & East Mull

5. CAVE GUIDES, ABSTRACTS ETC.

Cave Guide Leaflets:
Beer Quarry Caves, Devon
Cleveland Ironstone Mining Museum
Hack Green Secret Nuclear Bunker, Cheshire
Crag Cave, C. Kerry
Les Grottes du Cerdon
Grotte de la Glaciere
Gouffre de Poudrey
Rio Camuy Cave, Puerto Rico
Ovens Natural Park, New Zealand
World War II Tunnels, Gibraltar

Rights of Access to the Outdoors in Scotland. A Brief Overview of the Law.
Scottish Natural Heritage (2006)
Abstract: Curious Caves in Western Australia. (C.P. Conigrave) Black & White Budget Vol.6 No. 105 pp 77,83,85. No. 1035
West, R.M. (1985) Wookey Hole Divers. List 1935-1985. 7pp No. 1036
Abstract: The Changed Route of the Grand Arch Stream, Jenolan - More Evidence. T.R. Shaw.(1990) Helictite, Vol. 28 No.1 pp 15-17. No. 1037
Guide: Redcliff Caves. Axbridge Caving Group (1996) 7pp No. 1038
Abstract: Raging Danger. N. Shea. National Geographic Vol. 210 No.3 (2006) pp 94-109. No. 1039
Abstract: The Lamb Bottom Caverns at Harptree, Somerset. J. McMurtrie.(1880) Proc. Som. Arch. & Nat. Hist. Soc. New Series Vol.6 Part II pp 1-16. No. 1040
Abstract: The Joys of Caving. L. Steel. Earth Heritage No. 26 (2006) pp 22-23. No. 1041
Abstract: Captivating Caves. K. Thompson. Geico Direct Magazine (Fall, 2004) pp 14-18. No. 1042
BCA Handbook 2006-7. Ed. D. Judson (2006) No. 1043
Abstract: In the Dark for 75 Years. H. Beck. Dalesman Magazine Vol.66 No.5 pp 38-41. No. 1044
Focus on Bats. A Guide to Conservation and Control. Leaflet. No. 1045
Abstract: The Mendip Caverns. H.E. Hippersley. Proc. Som. Arch. & Nat. Hist. Soc. (1880) Part II, 11pp. *also in* The Times 10.8.1882
Abstract: A Visit to the Mendip Caves at East Harptree, Somerset. W. Richards. Downside Review Vol.3 (1884) pp 102-107. No. 1047
Abstract: Underground Treasures. K. Stephen. The Scots Magazine New Series Vol. 165 No.5 (2006) pp 464-468. No. 1048
Mining Heritage Guide. R.W. Vernon (Ed) NAMHO (2006) 122pp. No. 1049
Abstract: 100 Years of the MNRC. D. Irwin. Mendip Times Vol.2 No.1 (2006) p.32 No. 1050
Abstracts: 1. Ashwick Grove & St Dunstan's Well. D. Irwin.
2. Going Under. C. Binding. Mendip Times Vol.2 No.2 (2006) pp 24,40. No. 1051
Abstract:Richard Gough's Cave. D. Irwin. Mendip Times Vol.2 No.4 (2006) p.31. No. 1052
Abstract: Lamb Leer Cavern. D. Irwin. Mendip Times Vol.2 No.5 (2006)p.38 No. 1053
Abstract: Keeping Warm. D. Irwin. Mendip Times Vol.2 No.6 (2006) p.26. No. 1054

Abstract:Alum Pot Meet. R. Gray. The Rucksack Club Jnl Vol.VI No.4 (1930) pp452-456. No.1057
Abstract: Further Scratchings Underground. S.F. Forrrester. Rucksack Club Jnl Vol. VIII No.2 (1936) pp 179-187. No. 1058
Abstract: Some Caves in South Wales. P. Wild. Rucksack Club Jnl Vol ix No.4(1941)pp 277-281. No.1059
Abstract: Excursions Underground. P. Wild. Rucksack Club Jnl. Vol.x No.1 (1944)pp 8-10. No. 1060
Abstract: A Mendip Weekend. P. Wild. Rucksack Club Jnl. Vol.x No.3 (1946)pp 163-166. No. 1061
Abstract: Caves, Climbs and Excursions.P. Wild. Rucksack Club Jnl. Vol. xi No.1 (1948)p 77-80 No. 1062
Abstract: Caving in County Clare. P. Wild. Rucksack Club Jnl. Vol. xi No.2 (1949) pp126-129. No. 1063
Abstract: Caving in County Fermanagh.P.Wild. Rucksack Club Jnl. Vol. xi No.4 (1951)p360-362. No. 1064
Abstract: The Underground River of Labouiche. J.R. Hastings. Rucksack Club Jnl. Vol. xiii No.1 (1956) pp. 34-43. No. 1065
Abstract: Cave Exploration in Tanzania. H.J. Cooke. Rucksack Club Jnl. Vol. xv No.4 (1967)p 244-248. No. 1066
Abstract: Cave Exploration in the Kalahari Desert. J. Cooke. Rucksack Club Jnl. Vol. xvii No.1 (1972) pp 12-20. No. 1067
Abstract: Aberlady Cave. A. Derrick. East Lothian Life No. 57 (2006) pp 30-31. No. 1055
Mendip Cave Bibliography & Newspaper Catalogue. D. Irwin. Mendip Cave Registry (2005) 2 vols. No. 1056 a,b
+ a large collection of copied newspaper reports donated by M.T. Mills

6.<u>CDs, VIDEOS ETC.</u>
DVD:
No.13. Trailer for 'The Descent'(2005)
No.14. Fight for Life. The Neil Moss Story (2006)
No.15 Speleo Vertical. Manual by A. Sparrow (2006)
No.16 Alum Pot. (Yorkshire Underground Classics) Bradford Pothole Club
No.17 The Descent (Film) (2005)
No.18 The Cave (Film) (2005)

Meet Report: **Glen Clova, Angus**

On some OS maps of Glen Clova there are two interesting names: The first, 'The Laird's Chamber' lies at approximately NO 325 744. I searched for this expecting some kind of cave, either a fissure or boulder type cave. I found nothing at all! The other name is 'Hole of Weems', NO 297 754 which I didn't visit but was informed by the lady who owns the tea shop adjacent to the Clova Inn that this latter is in fact a boulder cave. She further stated that the Laird's Chamber is not a cave, simply an overhanging rock. She also said that there is another cave in Corrie Kilbo but didn't know which side of the corrie so the information is not a lot of use!

I paid a solo visit to a fissure at the top of the cliff on the west side of Loch Brandy, NO 335 757. This had 'pleasant' memories for me. A number of years ago Pete Price and I drove up from Edinburgh to do this fissure, only to find knee deep snow on the top of the hill. After digging away a snow drift that hadn't quite obliterated the entrance we took it in turns to lifeline each other down - this while spinddrift was blowing around us.

On this occasion the entrance, which is easily spotted, proved too tempting so good resolutions went by the board. The fissure has a vertical range estimated at 15/17 metres to the top of a two and a half metre pitch that I didn't descend. The overall length (on a roughly 40 degree slope) was approximately 20 metres.

Jim Salvona

----oOo----

JOHN HOME'S 1774 SURVEY OF ASSYNT FARMS

By Dick Grindley

John Home's Survey of Assynt Farms for the local landowner, the Duke of Sutherland, gives a vivid description of the land conditions in Assynt around the last quarter of the 18th century as well as being a superb example of early map-making. I have transcribed descriptions and observations for six of the farms with speleological and/or recreational interest for those of us who cave in Assynt, each area of the farm being described along with its area in Acres (Scots), Roods amd Falls, followed by general observations about the farm and its land. (1 Acre (Scots) = 1.26 Acre (English) = 4 Roods = 160 Falls). As far as I can tell from individual farm maps Taigh nam Famh was actually part of the Ailfin farmstead, the Alt is on a site of one of the sheelings belonging to Ledmore Farm, there was a mill on the site of the late fish farm by the Allt nan Uamh car park and, although not mentioned in its descriptions, the map for Kirktown Farm shows Traligill River to be running partially underground. The spelling, punctuation and capitalisation is John Home's not mine, the whole Survey is reproduced on the National Library Map Library web site www.nls.uk/digitallibrary/map/index.html and well worth a visit if only to admire the art of a superb cartographer.

Farm of Ledmore (with areas)

Infields North from the Houses above the Road to Ledbeg upon the Hill side [Cnoc na Sroine] having a good South Aspect in three disjointed Fields enclosed by Dykes the Contents of each are marked upon the plan containing in all - 10A 1R 7F

Infields marked in five places next the Houses and betwixt the Burns from Ledbeg and Loch Boralan [Rivers Ledbeg and Ledmore] - 9A 2R

Three Corn Folds next Loch Boralan below the Road - 10A 2R 30F

Infields in six places on the South Side of the Burn from Loch Boralan - 29A 2R 10F

Infields subset to two Tenants next the March [boundary] with Ailfin [Elphin Farm] markt in three places - 11A 1R 32F

Meadow Grass along the Burn from the Infields next the Houses to the March with Ailfin yielding excellent Grass and Corn when in Tillage - 15A

Sheelings [summer pastures]

No.1 Lies on the North Side of Loch Boralan adjoining the March with Balnagowan [farm to the east] - (site currently occupied by the Alt) - 1A 3R
No.2 Lies on the South side of Loch Boralan in the middle of the natural wood - 3A
No.3 Lies on the North side of Loch Urigill having a fine South Aspect and declivity - 10A 3R 12F
No.4 Lies East of the last and upon the same side of Loch Urigill - 6A

Fine Sheeling Greens on the East side of Loch Urigill and along the March Burn with Cromald [Cromalt Farm] - 11A

Patches of natural Wood on the South Side of Loch Boralan - 24A

The South Side of Crock-na-Stroan Hill including the pasture interjected with the Corn Land North from the Burn of Loch Boralan to the March along the summit of the Hill with Ledbeg [Farm] the greatest part of which is green and excellent dry pasture - 679A

Hilly pasture Grounds to the North and West of the gross dotted Line [on the map] including all from the West End of Loch Boralan to the March with Ailfin comprehending all the most valuable pasture and Grass Grounds - 503A 3R 21F

Wet Moss to the South and East of the said dotted Line yielding very poor pasture - 600A

Loch Boralan - 97A

Observations

Ledmore Farmstead is very commodiously situated betwixt two Burns and on each Side the principal Road to Tain and Dornoch;

The Corn Lands or Infields lye on each Side the Burn from Loch Boralan and are of a rich black loaming Soil having a gentle declivity and South all the Sheeling places except No.3 and No.4 upon the side of Loch Urigill lye within the view of the Farmstead and have all a good South Aspect except No.2 which lies among the Birch Wood on the Edge of Loch Boralan; All to the North and West of the dotted ink Line yields pretty good pasture particularly the South Side of Knock-na-Stroan Hill being all sweet green swairded Grass growing on the Remains of a natural Wood; South and East of the dotted Line [on the map]the pasture is good for nothing being all wet sogged Moss excepting about the Edge of the Loch and Burn where there is a narrow Stripe of good Grass.

.....

Farm of Ailfin

Infield North from the Farmstead including the Cot Town Houses and yards hanging pretty much Westwards

Infield South from the Farmstead in three disjoined pieces upon the North side of the March Burn [Abhainn a' Chnocain] with Knockan declining gradually Southwards

Haugh Ground betwixt the Burn in the East Corner adjoining the Marches with Ledmore and Ledbeg [Farms]

Rich Meadow Ground extending along the March Burn with Ledbeg from said Haugh to Cama Loch most part of which has been tilled

Sheelings

No.1 Lies upon the Edge of the Road to Ledbeg next Cama Loch presently in Corn
No.2 Lies South from the last on the North West side of the Hill [Cnoc Breac] adjoining the Wood
No.3 Lies East from No.2 on the Edge of the Wood being close arable Land and in Corn
No.4 Lies on the South Edge of Loch Urigill presently in Corn
No.5 Lies at the junction of the burn from the Cama Loch to the long Loch [Loch Veyatie] that divides Assint from Cogyoch [Coigach] being haugh Ground disjoin'd [divided] by the Junction of the two Burns

Rocky green pasture on the Edge of the Loch and betwixt No.4 and the Wood supposed to be Sheeling Ground

Natural Woods upon the North and East sides of Ailfin including a large piece of Wood next Loch Urigill and Aultnachie [Farm]

Hill pasture mostly green swarded yielding a variety of sweet Grass interspers'd with Lime Craigs including some patches of peat Moss partly covered with Heather

High mossy Ground yielding short Heather upon the South side of Cama Loch next the March with Ledbeg at the West disjoin'd from the rest of the Farm by the burn from Cama Loch to the long Loch

Wood on the South Edge of the Cama Loch

Observations

Ailfin Farmstead lies below the West Side of the Hill about the middle of the Infield Grounds which hangs pretty steep above them; The Soil is very free and fertile and stands upon Lime Stone with which the whole Hill [Cnoc Breac] abounds. All the East and North Side of the Hill is cover'd with Birch Wood, which with the whole Hill yields excellent sweet grassy pasture, and (except the flate soggie Moss next the West End of Loch Urgil and the high Ground lying betwixt Cama Loch and the March Loch with Cogyoch), nothing can excel the richness of the pasture upon the whole of this Farm which is esteem'd the best and finest grazing Farm, next to the Kirktown upon the Heights of Assint.

.....

Farm of Knockon

Infield a rich black Loam very much interjected with Lime Stone hillocks and Baulks [unploughed ridge] yielding excellent Grass including the stances of Houses and All within the Dykes

Infields disjoined from the Farmstead by meadows and moss Ground and their Contents separately markt upon the plan each of which are enclosed by Dykes declining pretty much Westward and pretty close with scarce any Stones or Baulks to interrupt the tillage

Sheelings

No.1 Lies towards the West End of the blind burn
No.2 Lies East of the last about the middle of the Burn

No.3 Lies at the East End of the blind Burn being low flate Ground

Natural Wood on the Braes along the March burn with Ailfin and Aultnachie

Wet meadow Ground South of the Farmstead

Grassy pasture Ground interjected among the Infields including all to the North and West of the gross dotted Line being mostly all green swarded and interjected with Rocks and some patches of Moss mixt with Heath

Hill pasture consisting mostly of Moss covered with short Heath and coarse Grass in the Dens and Braes including all from the above dotted Line to the marches with the Farms of Aultnachie and the Cronm [Cromalt Farm]

Observations

Knockon Farmstead lies among a Groupe of lime Stone Craigs at the North End of the Farm next the March with Ailfin. The Corn Lands are very much interjected with Rocks and Baulks that yield excellent Grass which is preserved and cut for Winter provender. The Corn Land is often exceeding good quality being all of a black free loamy Soil. All that part of the Hill Ground lying next the Corn Lands and within the dotted ink Lines is mostly all fine green sweet Grass with very little mixture of Heath and Moss. The Blind Burn is so called because the Water runs in a subterraneous passage under Ground so that the Burn is only known in many places by the prodigious noise it makes when one passes over it; This Burn seperates into two branches which divides the Farm into four quarters.
All the Sheeling places lye on the North Side of the above Burn and are pretty centrical to the hill pasture, the greatest part whereof is very rugged barren Heath with very little mixture of other Grass excepting in the Hollows and Braes.

.....

Farm of Stroncruby

Infields in sundry Windings disjoined by grassy Baulks South East from the Farmestead including four Tenaments or subset [subleased] houses

Infields in two Enclosures in the Brae below the hanging Craigs North from the Farmstead sloping southward being markt in two places

Sheelings

No.1 Lies next the March with Inchnadaff adjoining the Burn being flat Meadow Grass
No.2 Lies South of the last and next the Farmstead on a green Hillock
No.3 Lies opposite to the Mill and on the North side of the Burn having a fine South Aspect
No.4 Lies East of the last and betwixt it and the remarkable Spring also on the North side of the Burn
No.5 Lies in a hollow surrounded with a large Tract of Moss

Hilly pasture Ground including part of the Hills of Binuran [Beinn an Fhuarain] and Braeback [Breabag] and all to the East of the Burn from Loch Ha [Loch Awe] to the March with Balnagowan

Part of the North east End of the Canusp Hill [Canisp] extending Westward from the Great Burn to the highest Top of Canusp Hill being rugged rocky and barren Ground with some patches of Moss towards the foot of the Hill

Six Lochs as markt upon the plan [containing in all]

Observations

This Farm is esteem'd the best for Corn of any in the Heights of Assint. The Farmstead is situated on a rising Hillock pretty centrical to the Cornfields about it. The Soil is an exceeding rich fertile black Loam and is easily ploughed having a gentle declivity except the two inclosed Fields in the Brae next the rocks in which there are some stony Baulks. All the Grounds interjected with the Corn Lands and all within the square of them yield the finest natural Grasses which are cut and made Hay of for Winter provender. There are sundry pieces of fine Meadow Grass on each side the Burn from Loch Ha and all from the Top of the Brae above the Kirk Road abounds with greenish pasture, likewise the Braes on each side of the Mill Burn [Allt nan Uamh] to the head thereof along the March with Balnagowan.
The top of Braeback Hill is almost one continued Cairn of loose Stones along the Summit of the Hill, which is reckoned the March with Balnagowan. There is not so much as a pile of Grass or Heather among the stones but here and there a few plants of Sea Thrift, and a sort of slimy weed like Dulse, which the Country people say has remained there since Noah's Flood.

Although this great Hill is much lower than either Conivel Canusp Quinack, or the Sugar Loaf, it commands a vast extent of view- of part of the several Counties of Ross, Inverness, Murray, and the head of Banf Shire, as well as the East and West Coasts of Sutherland.

The air is so thin and pure that there is no possibility of approaching the Top of the Hill except in the best of Summers, and even then when the Surveyor travelled along the Top of the Hill, he and those along with him found it as cold and penetrating, as the most intensive frost in Winter, and this Survey of the Hill was made on the seventeenth of July about midday when the Weather was fair and serene.

There are sundry fine green patches of Grass towards the North End of Braeback Hill and upon the Side thereof. The three caves below Craig-nan-uvagan are remarkably curious extending forabout fifteen feet under the Rock: both Sheep and Goats resort to these Caves in Winter where they remain in the Stormy Weather. The famous Spring above the Mill is the principal Source of Water which keeps the Mill a going, as the Bed of Channel of the Burn above this spring is almost quite dry all Summer except in very great Rains.

All the Hill Ground West of the Burn from Loch Ha to the top of Canusp is very barren and rocky cover'd with short Heather affording the poorest sort of pasture.

.....

Farm of Inchnadaff [Inchnadamph]

Infield South East from and adjoining the Farmstead lying pretty flat

Infield in the Braes bounded by stone Dykes Eastward from the Farmstead adjoining the Burn of Trarigil with stony Baulks hanging pretty steep Northwards

Haugh Ground at the junction of the Burns of Trarigil and Stroncruby in Sundry Windings on each side the Burn of Stroncruby being all close and level ground without Baulks

Sheelings

No.1 Lies at the East End next Glendu on top of a Brae pretty flat and close Wood
No.2 Lies near No.1 and opposite to it on the west Side of a Burn
No.3 Lies next the march with Tubeg by the Edge of Loch Assint and the Natural Wood
No.4 Lies at the March burn with Duchlash called Ault Fileoidge [Allt Feith an Leothaid] mark't in two places
No.5 Lies East of No.3 opposite to Calda house on the Edge of the natural Wood

Moss interjected with Patches of meadow Grass lying betwixt the steep hanging Rocks and the Burn of Stroncruby

Moss and pasture Grounds East of the Farmstead and steep hanging Rocks enclosed by an Earthen Dyke and Ditch

Natural Wood in the North lying Braes along the South side of Loch Assint yielding Birch and grassy pasture

Veigngarrow [Beinn Gharbh and Reidh] and Led-Ladncah [Leathad Lianach] Hills cover'd with short Heath interjected with Rocks including the Braes around said Hills which abound with Springs and a variety of Hollow Slacks yielding good Grass all lying West from Stroncruby Burn

Observations

Inchnadaff Farmstead lies pretty much exposed to the Westerly Winds coming off Loch Assint; The out Skirts of the Infields adjoining the Houses are very Wet as they border upon the Moss, but the Haughs along the Burn from Loch Ha are pretty dry yielding good Corn and when in Grass make rich Meadow Ground; The Brae Eastward from the Farmstead hanging Northward is a thin sharp Soil all upon Lime Stone but a good deal broke with craigy Baulks and large Stones. The Sheeling next Glendu are much in the same situation and quality with the last mentioned Infield. All the rocky Braes next Glendu both above and below the high hanging Craigs yield good Grass and Clover intermixt with some piles of Heather, but there are many patches of Grass that are cut for Hay in the braes betwixt the Infield and Sheelings. Veigngarrow Hill and all the Braes around it yield good dry heathery pasture with Greens about the Sources of the Springs and sides of the Braes. The East End of the Hill called Led-Ladnach abounds with long heather. In the lower part of the Hill there are a great many Breaches made by rapid course of the Waters issuing from the Hill and running upon a rocky channel making great depredations and a hideous noise which is heard and seen on the Road from the opposite side.

.....

Farm of Kirktown

With the Ox-gates of Culack, Camore [Ben More Assynt] and Glendu [Oxgate = 1/8th ploughgate, the area of land that could be ploughed by an 8-oxen plough in a year - usually taken as 104 acres (Scots)]

Infield Ground around the Manse House including all below the Craigs and betwixt the Burn of Trarigil and the March Burn to the West, the most part of which is Arable, and Meadow Grass

Infield in two Folds adjoining the Burns of Trarigil [Traligill] and Pollandrain [Poll and Droighinn] yielding good Corn

Sheelings in three Folds East of the last along the North side of the Burn of Trarigil adjoining the Grass of Canmore hanging pretty much southwards

Infield Grounds below the Ridge of Rocks including the Steadings of Three Tenaments and a piece of Arable Land at the Inver of the Burn of Trarigill with Loch Assint part of which belongs to the Glebe and was formerly in Run Ridge [run rig - form of rotating strip farming worked communally]; These Grounds are so much interjected with Baulks and rocky Hillocks that only one fourth may be reckon'd Corn Land

Grass of Camore East of the Sheelings and North of the Burn of Trarigill about one third whereof along the Burn yields good Grass but the Hill part is steep and rocky

Sheelings in the Hollow of Glendu mostly arable yielding fine Grass

Moss interjected with Braes and Slacks cover'd mostly with Heather yielding grassy pasture including the South Side of Conivel Hill being mostly inaccessible

Sheelings belonging to the Glebe and Culach

No.1 Lies above the Green Ridge of Rocks North from the Manse and Glebe markt in two places
No.2 Lies West of the last and North of Cullach
No.3 Lies next to the March with Ederahalda called Poldubra [Poll Dubharach]

Fine sweet grassy pasture interjected among the Lime Stone Craigs betwixt the arable Land and the Hill

Rocky Hill with the Den upon each side the Burn of Pollandrain and Sheeling at the head thereof together with the braes at the South Side of the Hill along the Marches with Lord Rae yielding Heather with sundry patches of coarse gray pasture

Observations

Kirktown comprehending the Manse, Culack, Camore and Glendu, the Infield of which lies partly in Run Ridge with each other. The Glebe Infields lie about the Manse House and betwixt it and the High Ridge of Lime Stone Craigs which shelter it from Northerly Winds. Part of the Corn Lands next the Loch South from the Kirk are said to be in Run Ridge with the Oxgates of Camore, but as both Culack and Camore are presently let to the Parson and have been let to his predecessors these distinctions have not been much attended to.
Nothing can excel the goodness of the Grass throughout the Ridge of Lime Stone Craigs which extends the whole length of the Farm; From the March at the west End to the head of Glendu at the East, the pasture is remarkably fertile abounding with the finest sweet Grass; with a vast variety of hollow Slacks and grassy Banks like so many Terraces hanging mostly Southwards.
The Sheeling places have all a rich and sharp soil, with few parts in them so stoney as to prevent their being laboured with a plough; They are also greatly enriched by touthing [tathing - manuring land by turning sheep and cattle on to it]. The only Hill Sheeling lies at the head of the Burn of Polandrain, where there is a spacious Corry bounded by the Conivel on the North and East; but the sides of which Mountain, and along the Burn of Polandrain, there are several patches of Greens and coarse Grass, mixed with long Heather, lying betwixt the head of the Burn, and the remarkable Linn or Waterfall [Eas na Saighe Caime], which is surprisingly grand, and dreadfully awful. As the Corry lies a great way up the Hill it affords no grazing but in the sumemr Season. The Sheeling at the upper end of this Corry likewise affords little or no pasturage but in the Summer season. There is no Farm in the height of Assint that can weigh with the above possession if consider'd as a grazing Farm having the best Aspect to the Sun and being one continued Tract of Lime Stone; The Snow lies less than any of the neighborouring Farms, and if under management of an industrious and skillfull Tenant might be of double I may safely say triple value to the proprietor and yield a genteel living to such a Tacksman after all.

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The farm maps can be found in all their cartographic glory under:
Recent Additions - John Home's Survey of Assynt in 1774 at the National Library of Scotland Map Library web site
http://www.nls.uk/maps/index.html

100,000 HOURS OF LIGHT FOR SIX QUID!

by Ivan Young

"A mini worklight that sits on the ear as light as a feather, has a focused beam - no hot-spot in the middle - a battery that lasts for 100,000 hours, and an LED unit that never needs replacing." on-line review - unattributed to spare the blushes.

One of the many LED torches that have appeared over the last year is the LED Ear Lite. This hooks onto your right ear (no left-eared version) and its single LED casts a good even purplish-white focused beam when first switched on. The beam direction is easily adjusted, it fits quite comfortably and weights about 20 grams. It could be found for about six pounds pre-Christmas 2006. It would be superb value if, as that review above claims, it lasted 100,000 hours between battery changes.

Laura models the Ear Lite

The advertising blurb does make a point of the LED lasting 100,000 hours, which as the astute reader will instantly realise does not mean that the batteries will last as long. Not every reviewer appreciates the difference! The unit is powered by two CR-2016 lithium cells in series. When first switched on the current drain starts at 80mA or more but drops to 60mA within a few tens of seconds and continues downwards. That is probably just as well as a continuous current of 80mA would soon shorten the claimed 100,000 hour LED life by a couple of orders of magnitude! CR2016 cells are specified for a maximum continuous current drain of 0.1mA and peak current of 10mA. Supplying this sort of current must be well outside their comfort zone. So how long will a set of batteries last?

The specified capacity of a CR2016 cell is 90mAhr ie at its standard load of 0.1mA it will run for 90/0.1 = 900hr. At a drain of 50mA it would last for 90/50 = 1.8hr. In fact as the load increases the battery becomes less efficient and the available capacity drops. The specification data doesn't extend to such high current drains, but the available capacity at 3mA drops to 75mAhr so at 50mA it is probably very much less and the burn time would be less than one hour.

The burn time claimed by several suppliers is 18 hours. For this to be true the current at end of life must have dropped to only a couple of milliamps and the light output decreased by the same factor. Possibly enough to read a book up close, but I wouldn't recommend it for navigating your way through a long cave especially as it makes no claims for water resistance.

The CR2016 lithium cells are common items, but if you are buying them in quantity for your Ear Lite a careful choice of supplier is essential. Cells meeting the CR2016 specification can be bought from £0.30 to over £1 each plus postage. Go to a high street store and you'll pay even more. And you need two of them.

Time Trial

The two CR2016 cells that came with my Ear Lite after four and a half hours burn time were still giving a good enough light to read a book, but barely adequate for navigating even a small cave. After nine hours it was still possible to read, but the remaining glow proved to be completely useless in Valley Entrance.

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THE SKYE BENEATH YOUR FEET

By David Morrison

One Sunday after a solo trip down Vampire Cave I was standing near the entrance enjoying the silence when I became aware of the sound of falling water nearby. A look around soon found a small grass covered hole about 6 to 8 inches in diameter with a tiny stream disappearing down it. As I just happened to have a folding shovel and an old ice axe with me I started to dig. The digging was easy, and with 12 to 14 inches of peat overhanging a small pot I soon had a hole big enough to enter. Turning on my light I dropped feet first down the vertical entrance and once my feet hit the rubble floor I sat down and ducked under a limestone lip to enter a slanting chamber about four metres long and three to four metres wide. With crouching passage continuing to the right I followed this for a few metres but being along I decided to retreat and seek help.

Running down the hill to a phone box, I called Ritchie but he still could not make it (hence the solo trip down Vampire Cave) but he was very keen to go out once his wife got home from work. Hours later I was back at the entrance. With Ritchie leading we crawled and stooped through a couple of low dry chambers, which have a pit between them, to reach passage of walking height but this soon lowered. Then to our surprise we were stopped by a short pitch with a waterfall. This obviously needed tackle and having none we were forced back to the surface. By now it was dark and we wandered back to the car taking the longest route we could find. Four days later (Thursday evening to be exact) we were again at the entrance. This time we had a ladder, 15 metre static rope, slings and various other bits of gear. Rigging the ladder I descended first and as it was short and easy no lifeline was necessary. The passage snaked on, narrow but about five metres high but it soon ended at a complete choke with the cave stream disappearing between stones in the floor.

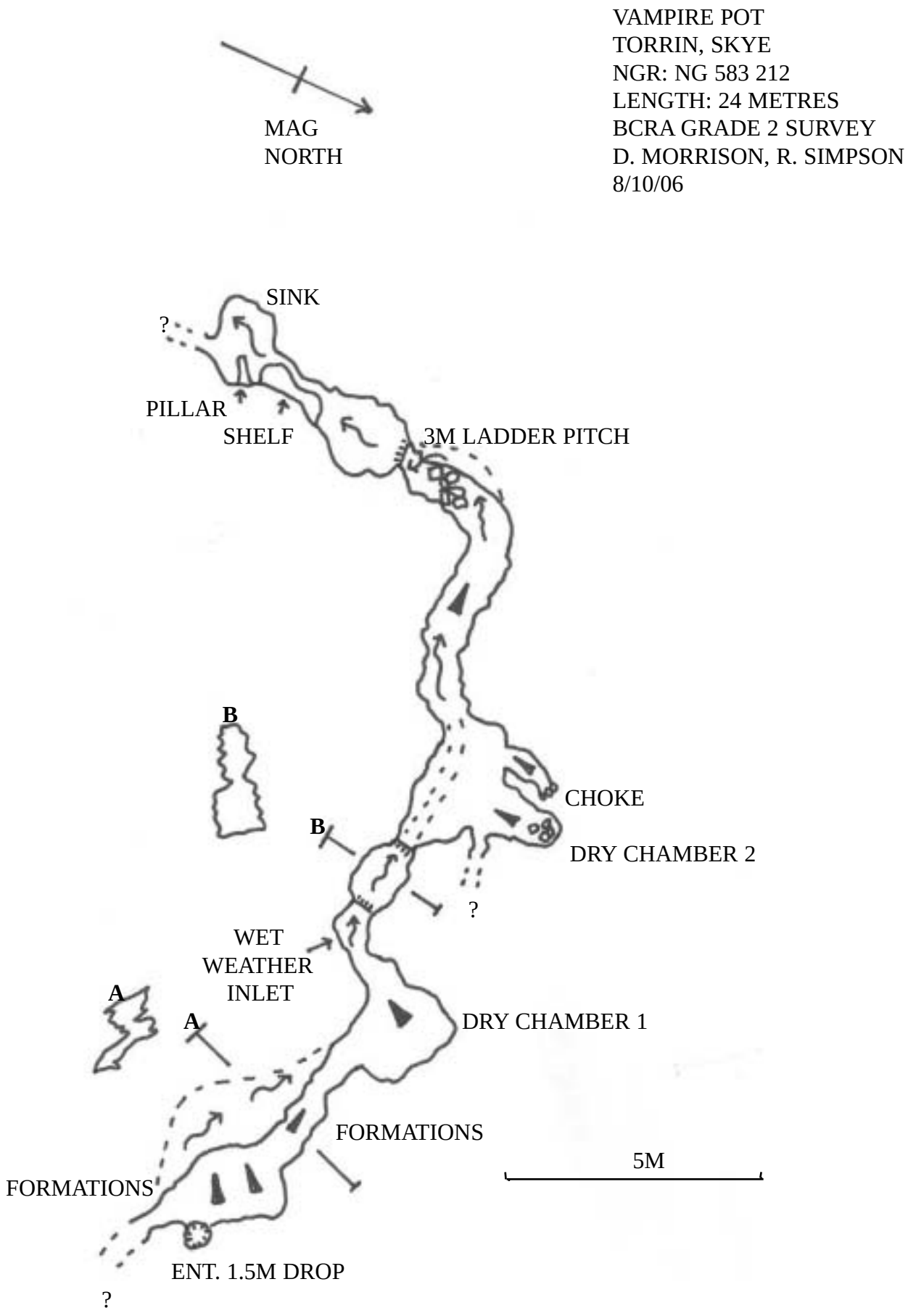
On the way out Ritchie took a closer look at some black stuff that was scattered about in the dry chambers and thought it looked like charcoal. The cave also seemed to have a lot of small bones in it and looking about we noticed some stones that appeared to be cracked through heat. Taking some samples we did some surveying before we headed out. Again it was dark and again we wandered off to the car taking the longest route possible.

On the way home we stopped at Steve Birch's house but he was not there so we left our finds with his wife. Later a phone call from Steve confirmed that we had found charcoal and a fire cracked pebble. He was keen to have a look at the cave but not for a week or two due to work commitments. In the meantime Ritchie and I returned and finished surveying the cave during which we noticed more archaeology. One bone, a scapula showed obvious scratch marks where meat may have been removed from it and more cracked stones.

We also went for a wander around Kilchrist and the Allt an Inbhire area and after looking at a couple of sites we found a hole below a little cliff next to a tree just opposite to the resurgence mentioned in Caves of Skye, page 71, appendix 1 No.3. A bit of digging here eventually gave access to eight metres of passage which we called Sink Cave as the cave stream sinks just inside the entrance. A survey and description are included with this report.

Eventually we teamed up with Steve and explored for archaeology what is now called Vampire Pot . Various bits of bone, charcoal and fire cracked stones were found and after descending the pitch we made our way out. We took a couple of finds with us, an antler which may show signs of being worked and a pig's jawbone similar to those found in High Pasture Cave.

Back on the surface Steve pointed out the foundations of a roundhouse that he and Martin Wildgoose had noticed on a quick trip to find the cave entrance. It seems likely that the cave entrance was more prominent in the past and the residents of the roundhouse used it as a rubbish tip. A proper archaeological investigation may be needed. The cave is open for exploration but please <u>be careful.</u>


VAMPIRE POT
TORRIN, SKYE
NGR: NG 583 212
LENGTH: 24 METRES
BCRA GRADE 2 SURVEY
D. MORRISON, R. SIMPSON
8/10/06
MAG
NORTH
SINK
?
PILLAR
SHELF
3M LADDER PITCH
B
B
CHOKE
DRY CHAMBER 2
?
WET
WEATHER
INLET
A
A
DRY CHAMBER 1
FORMATIONS
FORMATIONS
5M
ENT. 1.5M DROP
?

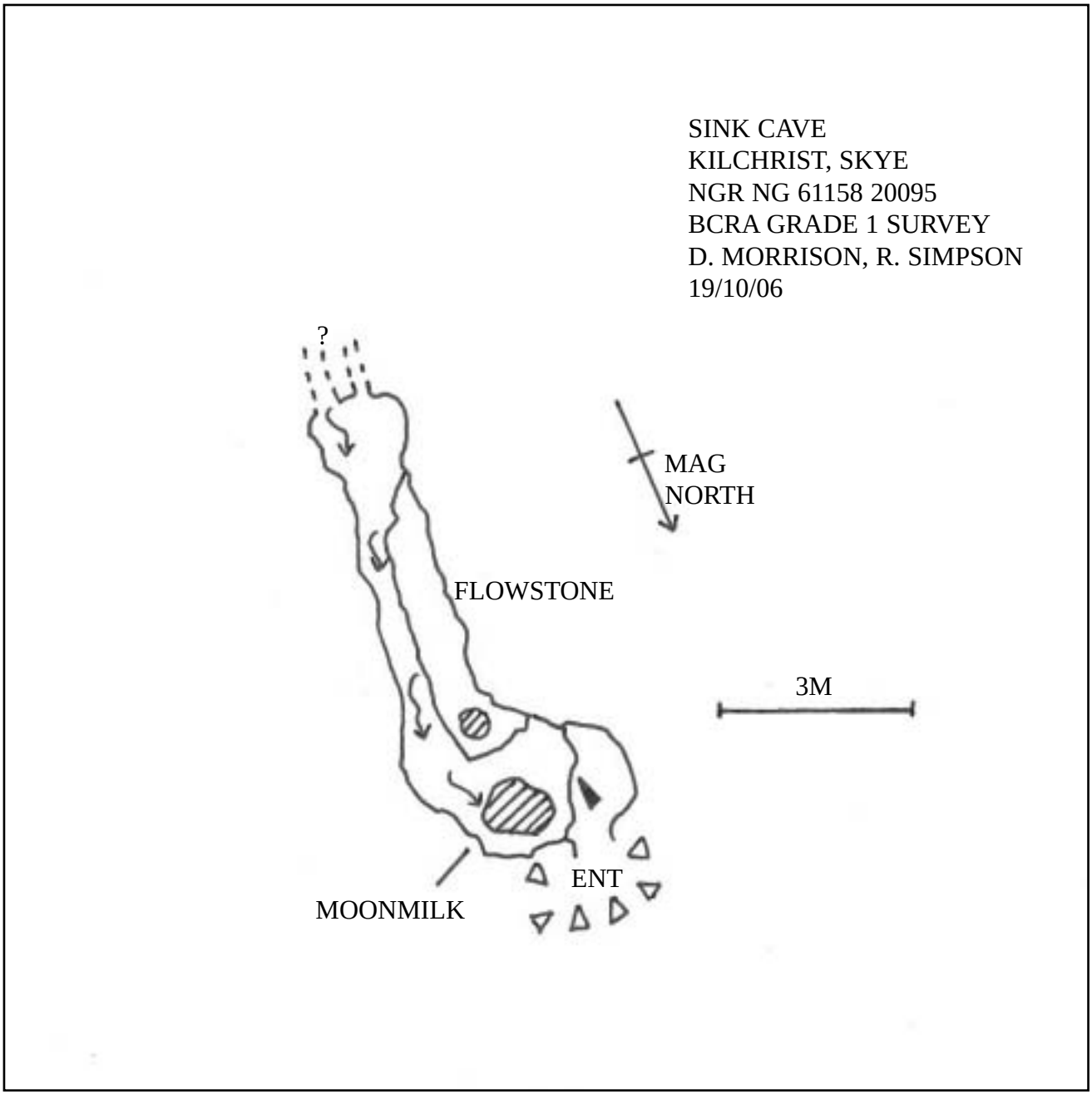
VAMPIRE POT

A fence post and boulder cover the entrance to safeguard livestock.

A 1.5 metre drop enters a slanting chamber, left shows small passage blocked by boulders and some columns with flowstone on the walls. Going right the narrowing passage soon enters a dry chamber with bones and charcoal scattered about. Going left a one metre waterfall takes the cave stream via a pit to a lower passage which is too tight. The pit is easily traversed and a second dry chamber with more bones etc is reached. Winding passage continues until a wet three metre pitch is reached. At the bottom, the passage winds for a metre or two and ends in a 1.5 metre by 1.5 metre chamber which is at least five metres high. The stream sinks to the far right. There is a thread belay on the left wall above the pitch. A five metre ladder is required.

SINK CAVE

Slide down mud to land in a stooping chamber with a pool in the floor where the stream sinks. A flat-out crawl leads to a second chamber with four holes in the back wall. They seem to be connected and could possibly be pushed with some hammer work.



THE ALVA SILVER MINES

By Alan L. Jeffreys

Amongst the metalliferous mines scattered throughout Central Scotland, the silver workings at Alva possess an historic interest greater than their sizes - which are rather small - but curiously, previous to this current investigation, only two visits by the club are traceable, a short peek in November 1995 and a more thorough exploration in March 1964 before access was curtailed by steel grids. On this first occasion, sketch drawings of six tunnel systems were published in the Bulletin (1) but since they were done from memory they cannot be relied upon to be in any way accurate as regards scale. Since then, only one publication is known to have reproduced plans of any kind (2) but these are extremely diagrammatic, giving no true representation of passages or shafts. It was therefore with a view to updating and improving our records that I inspected Silver Glen in November 2005, locating at least some of the mines to establish that entry was still possible. It is worth recording that in 1964, nearly all the entrances lay on open grassland with only a few isolated trees, used to belay ladders, whereas today everywhere is densely overgrown, not only by mature ash and sycamore but a particularly vicious form of hawthorn with long, needle sharp thorns projecting from their trunks. Having inoculated myself several times grasping for handholds on the slippery slopes, I advise caution when thrashing through them down to the river!

Historical Summary

In the early 18th Century, the estate was owned by Sir John Erskine (*c*. 1672-1739) of Alva House, a prominent dwelling at the foot of Silver Glen demolished in the early 1940s, and in 1715 he engaged miners from Leadhills to conduct an investigation of his extensive lands to ascertain whether there were any minerals worth removing. Their survey revealed fifteen ore bearing veins in the vicinity. Round about Christmas, they identified a promising mineral vein not ten minutes walk from the house and began excavations. As they worked down, strings of metallic ore became evident and at a depth of some six metres a mass of solid ore - the biggest ever found in the British Isles - yielded 12 ounces of pure native silver. Samples were sent to the Assay office in London where they were verified by no less than Sir Isaac Newton, then Master of the Mint, and within three months over £40,000 of silver had been won.

Life would appear to have been a bed of roses for Erskine, but contemporaneously with his mining activity, the 1715 Jacobite rebellion broke out and Sir John cast his lot with the Stewart cause. Rather than simply fight and possibly end up falling at the battle of Sheriffmuir, Erskine journeyed to France where he laboured to raise funds for Jacobite resistance and carried out a good deal of gun-running. Meanwhile his wife Lady Catherine Erskine ensured that mining continued apace, under the supervision of one James Hamilton. While open warfare raged, more than 40 barrels of ore were excavated and hidden near Alva House against a more peaceful time. When the rebellion was crushed by Hanoverian forces, Sir John Erskine became a wanted man and was forced to remain abroad, but in 1716 he was betrayed by Hamilton who travelled to London with specimens of ore and gave notice of the mine and its wealth in an affidavit to the Lord Mayor of London.

Learning of this stab in the back from his wife, Erskine ingeniously turned the situation around by recourse to an ancient Scots law which stated that a tenth of all proceeds from any gold or silver mine had to go to the crown. He argued that if allowed to return home and work the mine, he would guarantee this income for George I. Always with an eye to profit, the crown agreed and appointed Dr Justus Brandshagen, a German expert, to travel to Alva and assess the possibilities. In November 1716 an inspection commenced. As is the way of the world however, when the hidden barrels of ore were sought at Alva House, all were found to have gone 'missing', and a further set of casks hidden in the garden were likewise revealed to be full of worthless rocks - evidently workers on the estate had not wasted their time during Sir John's absence! However, work re-commenced to clear and open up the mines and build furnaces to separate any ore won. Dr Brandshagen was very encouraged with a 6% yield and notified London that good silver was certainly there for the taking.

Ivan Young at the entrance to a trial winze uphill from the main mine. (This is a gated entrance)

Photo. A. Jeffreys

For several years, excavation continued profitably, with Sir John making many improvements to his estate, but gradually the silver ores began to dwindle and, ultimately finding only copper and lead, the family abandoned the mine. John Erskine died in 1739 after falling from his horse. In 1758 Sir John's brother Charles, Lord Tinwald, who had become Lord Justice-Clerk in 1748, determined once more to try for silver at Alva and he dug extensively beyond the then limits of the main mine on the east bank of the river, significantly driving an adit to connect with the former winze accessing a chamber. A deep trial shaft sunk into the floor of this chamber extended to three more levels but because there is no artificial exit at the base, water from the top workings has flooded this whole area. Most of what he found was cobalt ore which yielded a little silver (said to be "29lb in the tonn weight") and some gold, but neither in very profitable quantities. Most of the ore went to an Edinburgh pottery to make a deep blue decoration for porcelain. Nothing further was attempted. In the late 18th Century, the estate passed to John Johnstone whose line came to an end before the Second World War, the estate being broken up to pay crushing debts. It is said (2) there are only three known relics of the Alva silver, a piece of silver ore, 'formerly part of the Smith Institute in Stirling' and two communion cups in Alva Church.

Fenced-off Shaft of Mine 2. L.-R. Jim Salvona, Mark Lonnen, Peter Ireson

Photo. A. Jeffreys

There are reports (2) that some desultory prospecting occurred in the 1880's and again at the beginning of the 20th century but as nothing profitable was discovered, this work was abandoned. Thus while a labour-intensive enterprise operated in the glen for some 50 years it is an inescapable fact that despite early successes, mining at Alva ultimately absorbed far more money than it produced, and a series of barren trial adits are mute witness to the disappointing yield.

Geology

The Ochils are children of Devonian volcanic activity, being mostly basalts and agglomerates associated with the Caledonian Orogeny (that is to say, when the earth's surface was locally compressed by plate tectonics, creating volcanic fissures which spewed out much

of the laval material the Ochils are made from). As the Midland valley of Scotland subsided and was subsequently covered with eroded sediments, stocks of quartz-dolerite came into place, penetrated by significant dykes - Silver Glen is a good example. This period, probably the Permo-Carboniferous, also saw extensive mineralisation of the region, deposits of lead, silver, copper, cobalt and iron being the most prevalent. Coal measures are also found. It is as a result of this prolific mineralisation that there are so many small mining concerns along the Ochils southern reaches, particularly from Bridge of Allan to Dollar, prominently at Alva, Blairlogie and Airthrey Hill.

The specific rock of Silver Glen is andesitic lava ('Claystone porphyry'), lying not far from a quartz-dolerite intrusion along the Ochil Fault. All the silver bearing veins are contained within the andesite. For a detailed study of the mineralogy encountered readers are referred to Stephen Moreton's article. (3)

Exploration

Since all the mine entrances were of easy access and no attempt made to seal them, visitors will probably have been numerous over the last two hundred years but speleological or industrial archaeological examinations appear to be less well documented. The first such I have sourced was by the Glasgow Spelaeological Society, in January 1964 - although this text states it was regularly visited during 1960-61.(4) Following this there was our own, which took place in March 1964. (1) Glasgow SS carried out a series of explorations, commencing in December 1964, (5, 6) itemising eight sites, mistakenly citing the shaft and related downhill adit on the west bank as two separate workings. They returned in January 1972 in very wet conditions but were rewarded by spotting a Long Eared bat in one of the levels. Also in the 1970s, members of the Clackmannanshire Field Studies Society were active in the area.(2) They reported an excavation in the main working during 1974 to clear the winze from the top chamber to the day level but no published results of this work are known. This is the last account in which all the mines were freely accessible. At some point before November 1995 an enlightened establishment decided to gate or wall off all entrances, rendering this present account incomplete, as access to the largest mine is denied by a rusty locked gate for which the key lies in nowhere land, and others are blocked by concreted walls with only holes for bats to negotiate.

Mark Lonnen climbing the ladder in the main shaft. View from upper level.
Photo. A. Jeffreys

The Mines

(1) Currently Accessible Workings [update on this in square brackets]

There are three enterable mine workings, all situated on the west bank of the Silver Glen Burn between two parallel tracks running east-west along the hillside. Describing them from north to south, they comprise:

Mine 1: NS 8917 9768
An impressive, rift-like entrance extending to the full height of the workings, lies below and just adjacent to the public footpath extending from the car park half a mile eastwards, up into the Silver Glen proper. This rift is closed off by a metal fence which is easily surmounted, although access to the upper level requires a ladder belayed to trees across the path above.

Mine 1, Lower adit (Mark Lonnen) Photo. A. Jeffreys

The base of the void commences with two short vertical climbs down, separated by a huge lump of rock. To the left a rubble slope (which falls steeply down to the end of the rift) also continues underneath the entrance for a metre before choking off. To the right, a short climb down the large boulder merges with the general slope which continues for 4 metres when it pinches out where stones meet the walls. A dribble of water from a higher level dampens the final few metres.

Above and to the right of the large block near the entrance, a two metre climb accesses a short blind adit, 2.62 metres long and of comfortable dimensions. It ends at a solid rock wall.

Just before the bottom end of the rift, a cross-cut passage is currently bridged by a section of narrow gauge railway line. On the left is a cavity two metres deep and wide, cut out of the rock, while to the right an adit three metres high and 1.5 metres wide runs off, bending slightly to the west for 19 metres before ending at a blank wall. A very short right hand fork is encountered just before this point. Seeping water, possibly leakage from the surface stream, is responsible for a light cascade spray from the roof and shallow puddles. In 1964, samples of small stalactites from here were analysed by Glasgow Spelaeological Society and found to be a mixture of calcite and witherite, minerals picked up as water passed through the andesite.

Situated vertically above the floor of the main rift at a height of 6.8 metres is the loftiest passage in the system. Only achievable by pendulum with a ladder from above, this series comprises a commodious alcove on the west wall and a step across the void over jammed boulders to a handsome adit with the ore-bearing seam clearly visible high along the right hand wall. This level stops abruptly at a run-in some 8.5 metres in, probably associated with a square depression beside the path above. Current opinion maintains that this entire excavation is of later date than the silver explorations, and was most likely a source of copper ore.

Mine 2: NS 8916 9760 - NS 8917 9759

Walking downhill from Mine 1 for 79 metres, a square shaft will be found, fenced off and capped by a rigid steel grid. This shaft, rough enough to be almost free-climbable, is 8.5 metres deep and drops into an adit measuring 50 metres in total.

Peter Ireson on ladder, 8.5 metre shaft into Mine 2 Photo. A. Jeffreys

To the north (ie, 'uphill') a passage 31.18 metres long wanders at comfortable dimensions until it ends at a blank wall. At the foot of the shaft, a shallow climb over rubble is necessary and much of the way is occupied by standing water varying from 0 .1 to 0.4 metre in depth.

Southward from the shaft a continuation of the adit extends for 17.75 metres to daylight, gradually losing head height. The floor at the start is covered in viscous black mud but this gives way to drier rubble as the lower entrance is approached. There is an alcove, 2 metres by one metre on the right just before the exit, which is a low, irregular aperture more or less fenced off with a heavy iron grid. Apparently little or no silver was gained from this site, the level being driven, in the words of Dickie and Forster [2] as a 'ramifying measure after the silver vein was not located'. I am not sure exactly what this explanation means, but possibly the passage represented an attempt to extend the search north-south

from the shaft in case a silver vein should be intercepted. [Now re-sealed]

Mine 3: NS 8920 9760

This little level lies just above the river on the west bank 30 metres downhill from Mine 2, and was driven to explore the ore bearing vein running west from the main mine on the east bank. A small elliptical entrance half choked with boulders, gives access to a wide passage averaging less than one metre in height, with rubble and rocks on the floor. The passage can be followed for a distance of 15 metres and at the far end the floor rises gently into a run-in choking off an abrupt narrowing of the dimensions. [Now sealed]

Inside Mine 3, Looking out of entrance.
L-R Peter Ireson, Mark Lonnen.
Photo. A. Jeffreys

(2) Currently Inaccessible Workings

(These descriptions are necessarily cobbled together from published accounts. Distances are not accurate)

1. NS 8916 9778
Once again commencing from the north, there is an entrance lying in a rocky valley face on the west bank of the river. It is bricked up and there is no extant record of entry, or how far the passage extends. It, along with the next level southward, was but a trial excavation and yielded no ore. An extract from the Glasgow S.S. Journal (5) hints at identifying with this site, but with no NGR or accurate location, I cannot vouch for this. Certainly the description does not match any other mine, and it is reproduced here.

"…*The mine in the Silver Glen lies high in the Glen on the western side between the main path and the burn. The entrance is extremely small and is surrounded by a small rock face. Inside, it breaks into two branches. That on the left goes into the hill for about 15 feet. It is rather uninteresting. The second has a total length of about 300 feet and rises to two levels. Immediately after entering, the floor rises on a curvature of twenty feet. From then on the mine runs level, but on a curve. Nearly 250 feet inside the mine is a pile of rocks and mud which rises to within 5 feet of the roof. From this point to the head of the mine there is a vein of bluish clay which has an extremely fine texture. The height is 6½ feet, the width 4 feet*."

2. NS 8919 9771
A few metres uphill from the public footpath on the east bank, a grassy scramble leads to a south facing entrance, just over a metre high, also bricked up. It was explored by the GSG in 1964, who found a low tunnel extending northwards (ie along the silver vein) for roughly 12 metres.

3. NS 8921 9765
On the east bank of the river just below a waterfall and situated in a corner, is the gated and locked entrance to a level which was explored in 1964 for some 70 metres. The whole distance was flooded with 15 cms of standing water and just inside the entrance was a shaft, completely submerged, whose depth could not be ascertained.

4. NS 8922 9763 - NS 8921 9762
The Main Mine (where most of the silver was won) occupies pride of place on the east bank, some 20 metres downstream from Hole 3 described above. There are two points of entry, a shaft, solidly closed by a heavy iron grid, and at river level an adit, gated and locked. Entering by the lower level, a short distance gives onto two shafts, one of which runs into the other. The most spacious was 8.5 metres deep and when laddered in1964 was found to be choked at the bottom with domestic refuse and rubble. A dam constructed on the

river for Alva's water supply has led to the lower levels of this mine becoming flooded, although there must be some sort of outflow because water does not issue from the gated entrance. It was to investigate this phenomenon that Clackmannanshire Field Society attempted to clear the winze from the top chamber in 1974. The heart of the mine is a chamber with three short blind adits running off and a further shaft rising some 8 metres to the surface where it is secured by the iron grid. According to records, this mine extends much deeper, that is to a fifth level but all that is now under water. The 'Day Level'(NS 8926 9755), lying at the furthermost location downhill, which once connected to the main winze, is now comprehensively filled in, and although the site is fenced off, offers absolutely no chance of entry unless one possesses a JCB - and could magically transport it down the river valley!

Jim Salvona Emerging from Lower Entrance of Mine 2
Photo. A. Jeffreys

An intention to examine the accessible workings for itinerent wildlife such as bats revealed nothing of any note, notwithstanding the Glasgow Spelaeological Society's encounter with a long eared bat in 1972, but there were some splendid spiders and also signs of foxes using tunnels for dens.

We had hoped in the future to gain access to the main workings on the east bank of Alva Burn but a visit in March to check survey details revealed mines 2 and 3 had been re-sealed, obviously a direct result of our contact with the Woodland Trust. This modern, hysterical fixation with 'public safety' has done a grave injustice to industrial archaeologists and certainly does not encourage us to enter into polite negotiation with land managers. The mines have existed harmlessly for two hundred years but have apparently become 'dangerous' in the last 20, despite their good state of repair. Evidently the public are all imbeciles who have to be protected despite themselves. In the meantime perhaps this article will go some way toward placing these small but interesting mines into their proper context.

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Of the Ochils. Clackmannanshire Field Studies Society. 43pp. p.7-13

(3) Moreton, S. (1996) The Alva Silver Mine.
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(5) Milligan, J. & S. Plazalski (1964) Description of the Mines in the Tillicoultry and Alva Areas.
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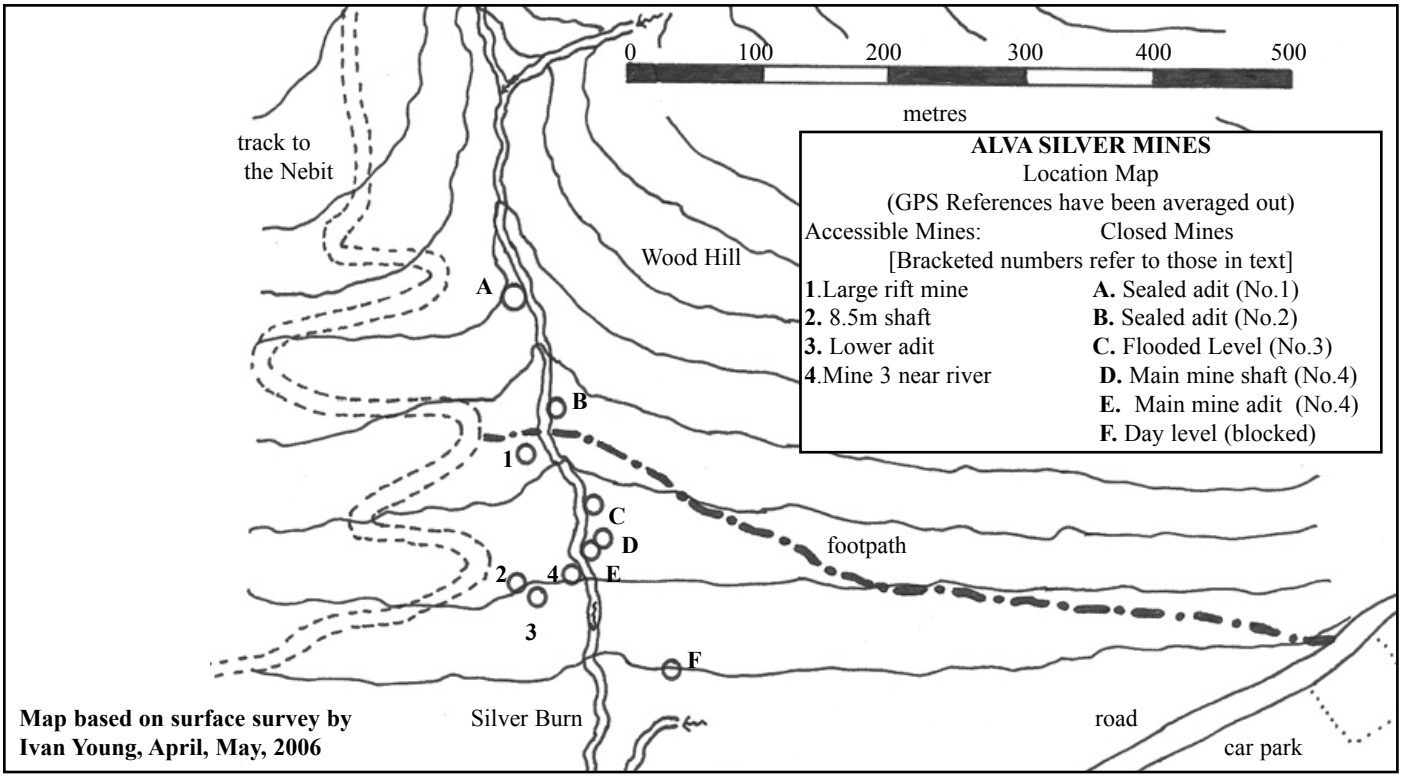
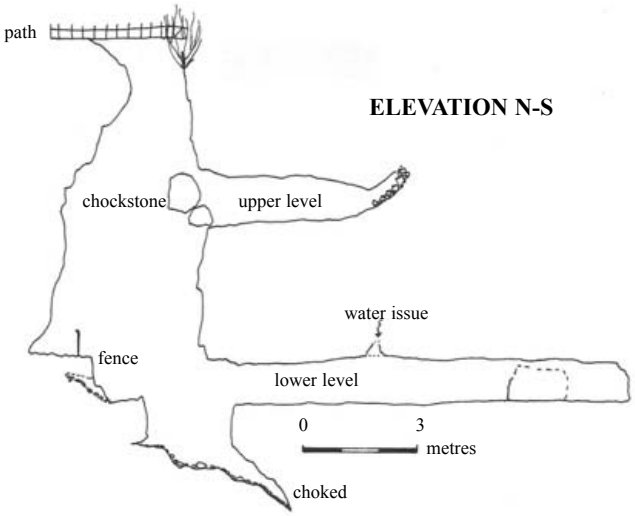


ALVA SILVER MINES
Location Map
(GPS References have been averaged out)

Accessible Mines:	Closed Mines
[Bracketed numbers refer to those in text]	
1.Large rift mine	**A.** Sealed adit (No.1)
2. 8.5m shaft	**B.** Sealed adit (No.2)
3. Lower adit	**C.** Flooded Level (No.3)
4.Mine 3 near river	**D.** Main mine shaft (No.4)
	E. Main mine adit (No.4)
	F. Day level (blocked)



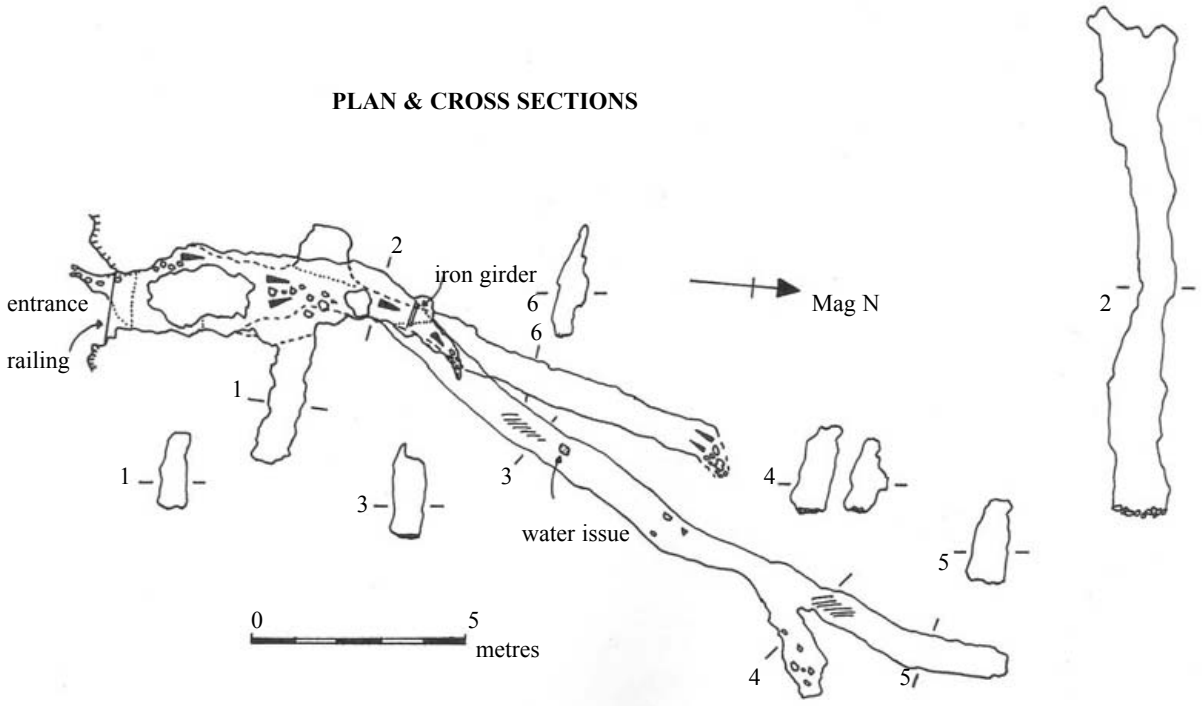
ALVA SILVER MINE 1

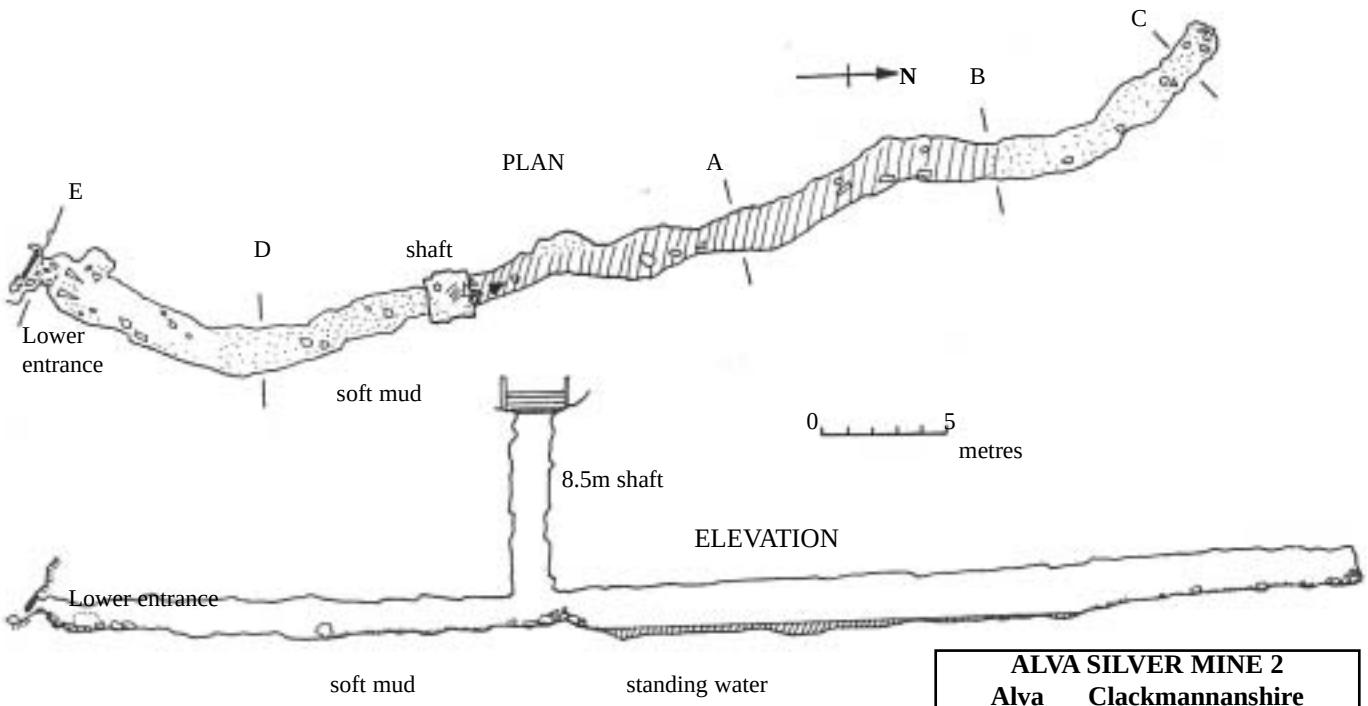
Alva Clackmannanshire

NGR NS 8917 9768
Alt. 135m (approx)

Surveyed April, 2006; March 2007.
A. Jeffreys, P.Ireson, M. Lonnen, I. Young
BCRA Grade 4D

PLAN & CROSS SECTIONS

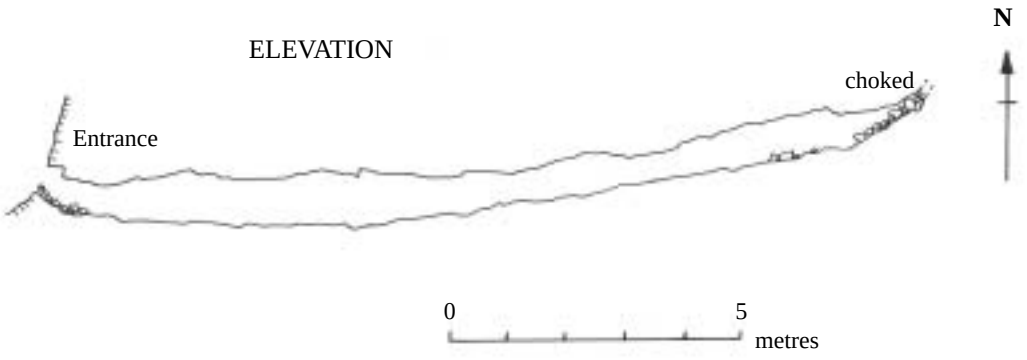




ALVA SILVER MINE 2
Alva Clackmannanshire
NGR NS 8916 9760 - NS 8917 9759
Alt. 112m (approx)

Surveyed April 2006
A. Jeffreys, P. Ireson, M. Lonnen
BCRA Grade 4D

CROSS SECTIONS

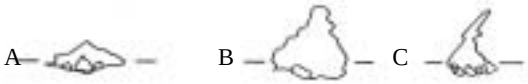


ALVA SILVER MINE 3
Alva Clackmannanshire

NGR NS 8920 9760
Alt. 100m (approx)

Surveyed April, 2006
A. Jeffreys, P. Ireson, M. Lonnen

CROSS SECTIONS



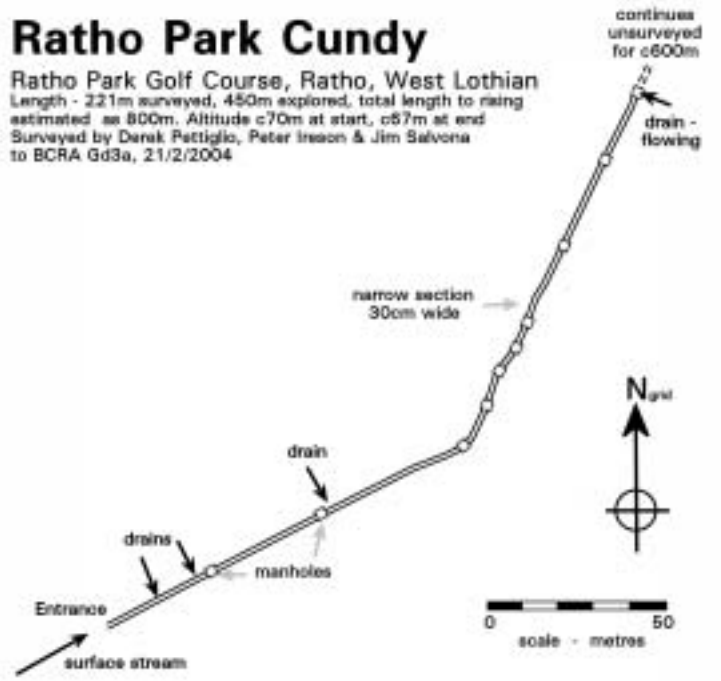
THREE TUNNELS UNDER WEST LOTHIAN

By Ivan Young

Over the course of the last three years the GSG has found itself exploring three tunnels under the West Lothian countryside. All are associated with drainage though one came with stories of monastic bolt holes, one carried more than just water, and one contains evidence of the effect of the early years of the industrial revolution on agriculture. They are described below in the order that they were explored.

February 2004 - The Ratho Park Golf Course Cundy

CUNDY - drain at the side of a road. Dundee word - from www.urbandictionary.com



The GSG were approached by committee members of Ratho Park Golf Course and asked if we could inspect their 'Cundy' - a large drainage tunnel running under their land - and report on its condition. We did so, and our report was mentioned in the Environmental Statement submitted to support their entry for a Scottish Award for Environmental Excellence on Golf Courses. We don't know if they succeeded as the awards now appear to be defunct: at least there is nothing recent available on the Internet.

GSG members Derek Pettiglio, Peter Ireson and Jim Salvona explored the cundy on the 21st January 2004. Derek was ideally suited for the job since he works at the nearby Turnhouse Golf Course and was able to talk knowledgeably to the golf course greenkeepers. The Cundy starts on the western boundary of Ratho Park at NGR NT 14807053 and runs in a shallow 'S' curve to an outlet below the eastern bank of the Union Canal at NT 15457080 after approximately 800m underground.

The GSG trio entered at the western end of the cundy and surveyed the first 220m. Derek and Peter then looked at a further 230m. Derek reported that the general structural integrity of the passage is good except for a couple of places where roof slabs appear to be misplaced and protruding. It is of solid sandstone construction and the rectangular passage is mostly 60cm wide though it does narrow to 30cm at one point. The height varies from 1.25m to 1.70m and there are frequent manhole access points - ten in the first 220m.

In the unsurveyed section Derek and Pete encountered one inlet on the left with a strong smell of sewage and disturbing the sediment on the floor released yet more aroma. They saw a large number of female sanitary products and some condoms. Despite this our intrepid members ploughed on hoping they would find an exit and wouldn't have to retrace their steps.

After c400m the form changed to an arched passage which appeared older. Towards the end the layer of silt on the floor deepened and Derek and Peter were forced onto hands and knees. They thought their wishes had been answered when they found an opening to the surface on the left of the passage. They were, however, disappointed as it was covered by an immovable metal grid. The air space by now was down to 70cm and didn't appear to increase. In fact when they looked ahead it appeared to reduce. Because of the lessening air space, the softness of the silt, and the noxious atmosphere they decided it was unsafe to continue, turned

Entrance to Alva Silver Mine 1 April 2006. L-R: Jim Salvona, Ivan Young.

Photo: A. Jeffreys

A. Jeffreys on Ladder climb, Alva Silver Mine 1, Feb. 2007

Photo: Jim Salvona

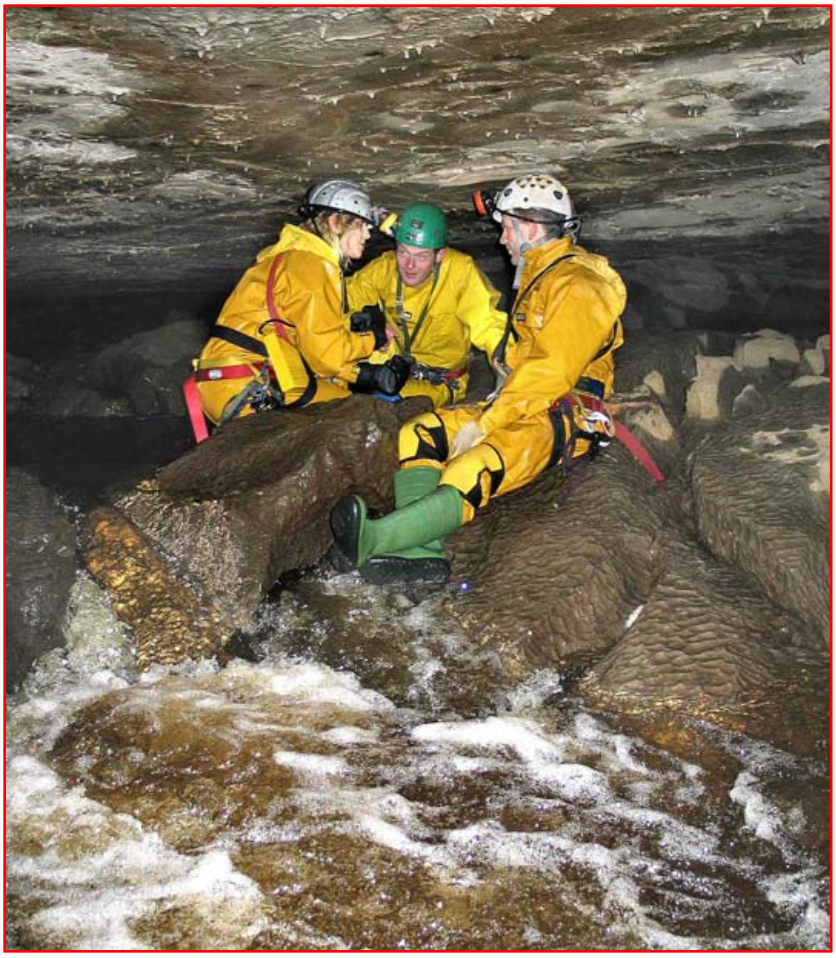
Rock Bridge Cave, Staffa

Photo: John Crae

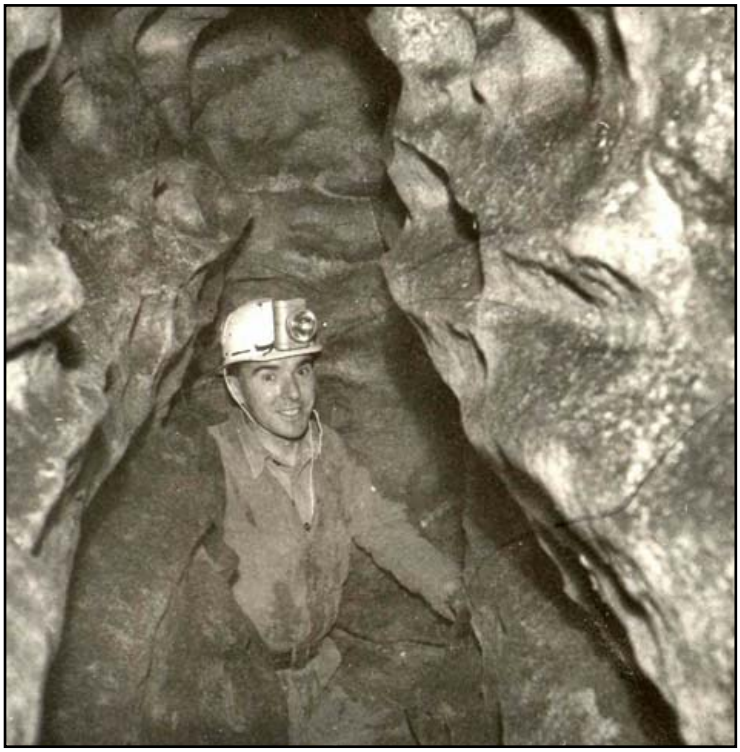
Measuring Columns at Fingal's Cave, Staffa, Aug. 2006 R. Mehew, L. Goehring.
Photo: John Crae

Roof Tunnel, Kingsdale Master Cave, February 2007
L-R: A. Jeffreys, R. Huggins, I. Erchova

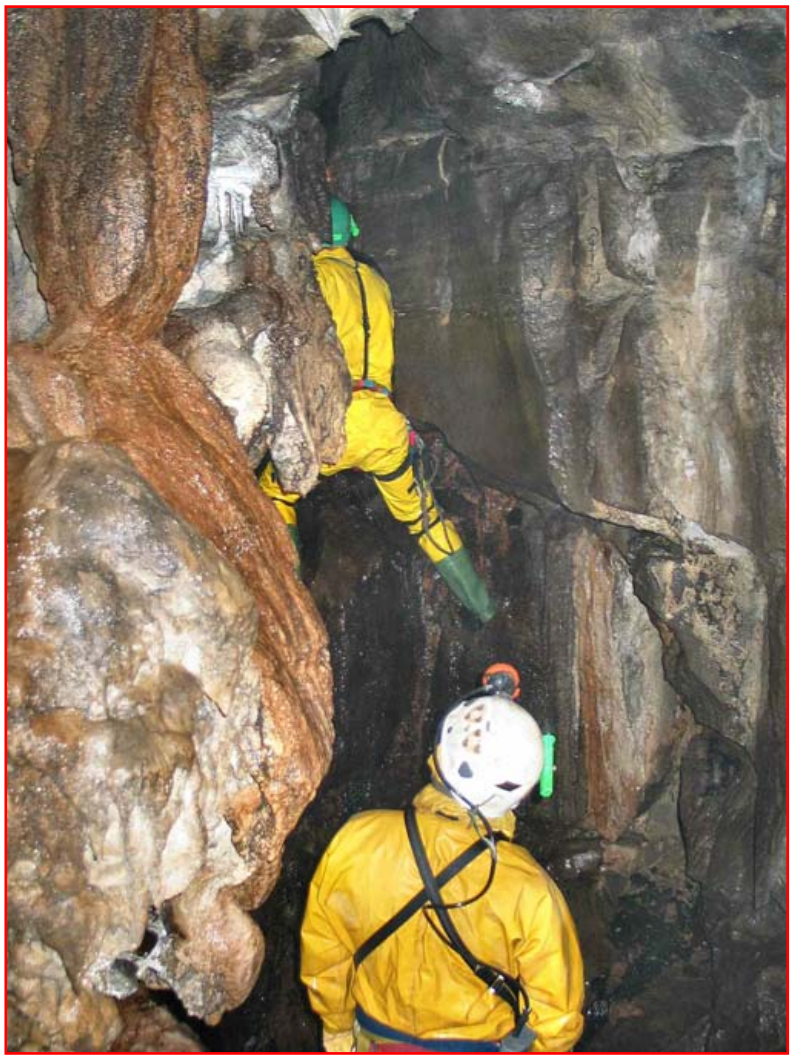
Photo: Mark Lonnen



In Browgill Cave, Yorkshire, November 2006.
L.-R. R. Huggins, P. Ireson, M. Lonnen.
Photo: Ivan Young



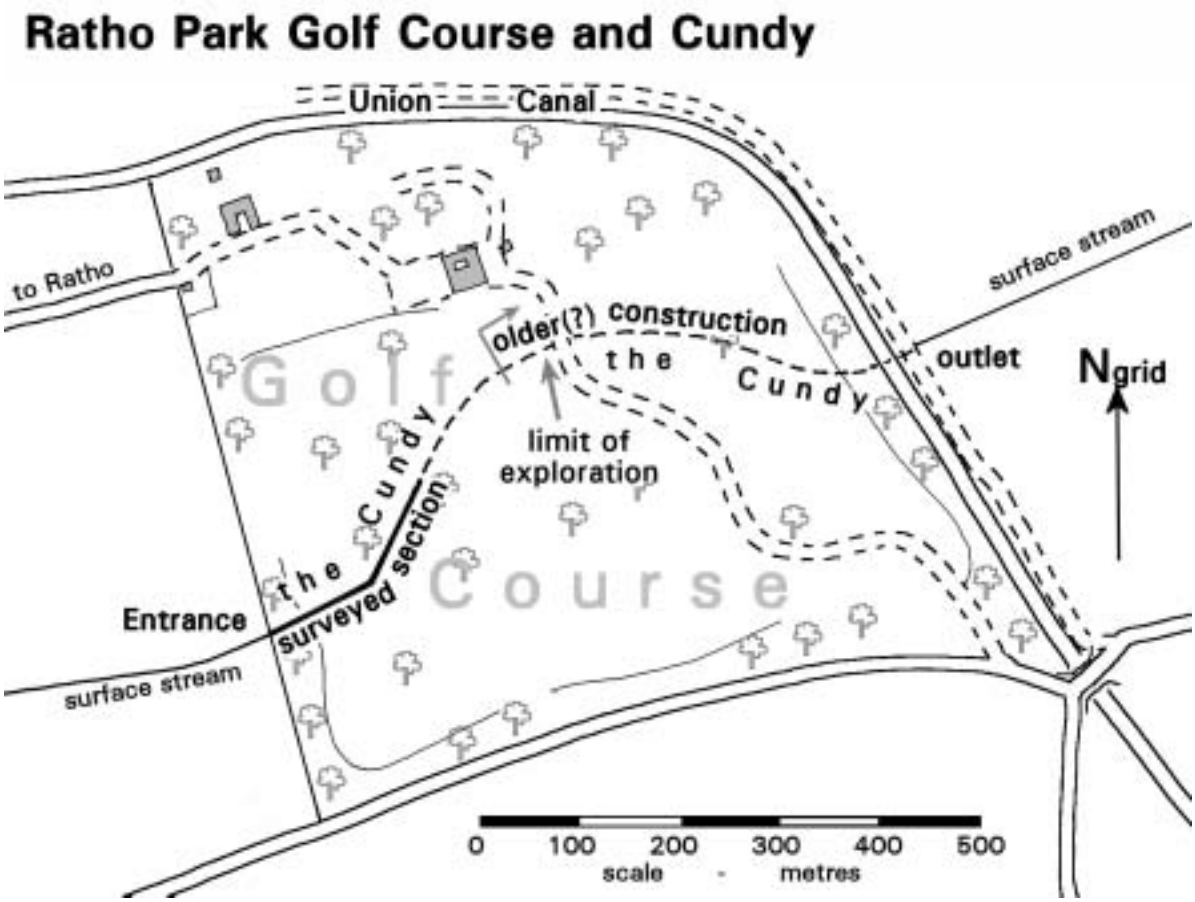
From the Archives:
Jim Salvona in Cleaves Cove, Ayrshire,
***c.* 1955-56.**
Photo: John Jenkinson



Phreatic Inlet, Heron Pot,
November 2006
L-R P. Ireson, M. Lonnen
Photo: Ivan Young

round with some difficulty and headed back.

Later, on the 17th March, Derek borrowed the GSG's camcorder and 50W video light and traversed the cundy again recording as he went. The bright light revealed three more manholes for a total of seven in the unsurveyed section. A copy of the video was given to the golf course. He also examined the outlet below the east side of the Union Canal. This was very similar to the entrance both in form and construction.



April 2006 - Park Farm Bistro Medieval Tunnels

In March 2005, newspaper and TV reports of a tunnel under the building site of the Park Farm Bistro near Linlithgow aroused my interest. What was described was an arched and possibly medieval tunnel 1m wide and 1.5m high. It was said that it might have been built by monks as an escape route and might run for a mile to the site of the now mostly demolished Kingscavil village. Other suggestions were that it was a 17th century mill lade pre-dating the nearby Union Canal or it was associated with farm improvements during the early 19th century. Television pictures showed what appeared to be a large arched passage, though it was significant that there was nothing in view to give any idea of scale.

One year later on the occasion of a lunch at the now open bistro I made contact with the owner, Peter Waddell. He said that though the downstream tunnel had been investigated, upstream was still unexplored. I offered the GSG's services, he accepted, and on Saturday 15th April 2006 the team of Alan Jeffreys, Jim Salvona, Roger Galloway, John Crae and I arrived. Peter showed us the entrance - a modern manhole leading down 3m to a rectangular section sandstone culvert with slab floor and ceiling. Alan and I looked upstream while Roger and Jim turned downstream.

Downstream the rectangular passage continues 60cm wide and 90cm high for 15m to where the character changes to an arched tunnel, but still only 1m high. This is somewhat less than the press reports and Peter's description, and the cause of some grumbles from the senior member of the party. Sorry Jim. This section is older, built of roughly squared stone, 60m long and showed evidence of many modern incursions. Several

PARK FARM DRAINAGE TUNNEL
Linlithgow, West Lothian, EH49 6QY

NGR:- NT 02907 77042, Altitude c73m, length:- 135m

Surveyed to BCRA Gd 3 on 15 April 2006
by I Young, R Galloway, & AL Jeffreys
of the Grampian Speleological Group

(1)

(3)

(2)

(5)

(4)

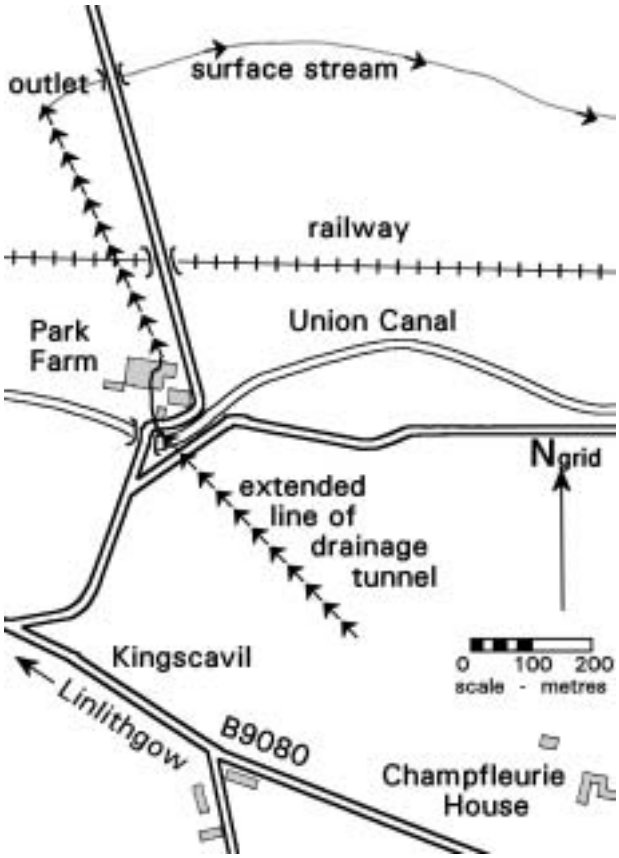
(6)

(7)

(8)

(1) – Alan Jeffreys in pipe at downstream end
(2) – Roger Galloway in corrugated iron roofed section
(3) – Ivan surveying, (4) – Looking upstream at transition into c1820 section
(5) – Jim at bottom of entrance shaft, (6) – John Crae, Jim Salvona, Alan Jeffreys and Ivan Young by entrance manhole, (7) – Alan at bottom of manhole shaft, (8) – Alan in passage upstream of entrance

pipes - glazed and plastic - poked through its walls, and it had been disturbed by building work at the farm at several points. One section several metres long is now roofed by corrugated iron and concrete. We began to suspect that this wasn't a new discovery, and that publicity for the new Bistro was the real motive for the press releases.



The passage ends in a blank wall with a 45cm internal diameter glazed pipe taking the stream onwards. It is large enough for a small person to slide down, but I wouldn't recommend it as returning uphill along such a slippery surface would not be easy. A small boy (or girl - we aren't sexist) with a rope tied around the ankles was suggested. The pipe curves away to the left and it most probably takes a fairly direct line from there to the outlet at the bottom of the slope beyond the railway 400m to the NNW. After we left we looked briefly at this and the water resurging there did seem to have the right flow rate to be that flowing through the tunnel. It also looked to be muddy as a result of our crawling about underground. Not as certain an identification as a dye test, but I wouldn't bet against it.

Upstream from the manhole the passage is consistently 90cm high and 60cm wide (3 x 2 feet) and well built with dressed sandstone blocks up to 1m long and 25cm high. The slab roof is decorated in places with a few short straws and the slab floor has the occasional stone and a light sediment covering. There is a small opening high on the left after 22 m which may be an old drain from the building that is now the Park Bistro. A couple of metres further along on the same side a ~10 cm diameter clay pipe enters at roof level.

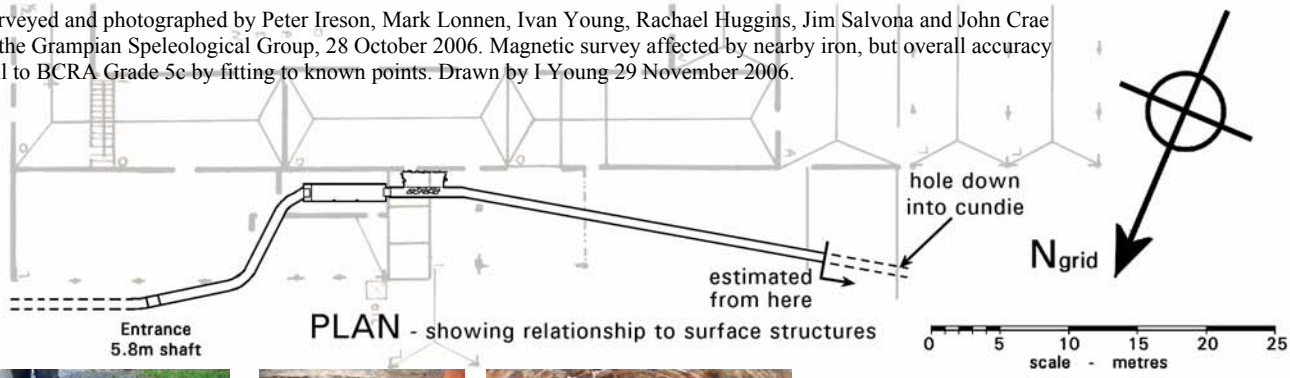
After 25m the passage curves to the left and then starts descending - not a good sign when you are trying to travel upstream! In steadily deepening water Alan, the only one wearing a wetsuit, stopped with the airspace down to 30cm. About another 7 metres further on the water could be seen to approach within a few centimetres of the roof. The airspace did continue, however, because the sound of flowing water could be heard echoing down the passage. When we plotted the survey the furthest point reached proved to lie under the nearby Union Canal. This was built from 1818 and opened in May 1822 and was 5 feet deep.

We quickly surveyed the passages, took a few photographs, and walked across the canal bridge to view the field opposite. We saw no sign of any culvert entrance there, so assume that it continues under the fields in a south-easterly direction towards Champfleurie House. This could be checked by returning during a dry spell with a length of hose and a bucket to siphon and bale the ponded section under the canal. A wet-suited caver would then be able to pass the low point and investigate what lies beyond.

Some investigation of old maps by John Crae found evidence of surface streams above and below the farm well before the Union Canal was built. At that time the stream was probably the farm's water supply and possibly its sewage outflow as well. The culvert would have been constructed to protect it and keep it separate from farmyard mud and manure. The section under the farm is probably the oldest as the upstream section - constructed with the canal (1817-1820) - widens to meet this arched section. Maps after the construction of the Union Canal no longer show any surface streams, so by the early 19th century drainage had been installed in the fields north of the farm and southeast of the canal. From the data found we can't prove whether the

RATHO MAINS - Thrashing Mill chamber and tunnels

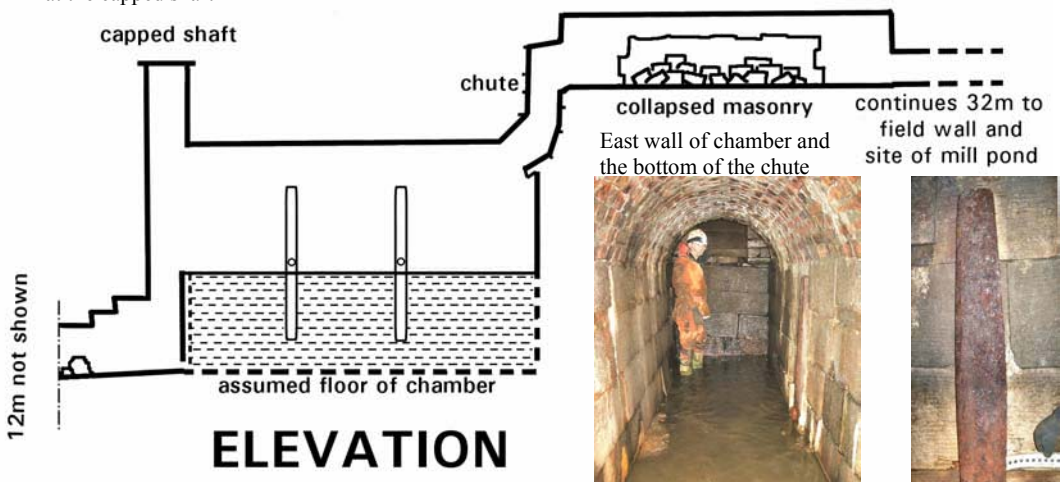
Surveyed and photographed by Peter Ireson, Mark Lonnen, Ivan Young, Rachael Huggins, Jim Salvona and John Crae of the Grampian Speleological Group, 28 October 2006. Magnetic survey affected by nearby iron, but overall accuracy still to BCRA Grade 5c by fitting to known points. Drawn by I Young 29 November 2006.



Above:- looking upwards at the capped shaft

L:- View of W end of chamber over top of 'dam' and its sediment fill

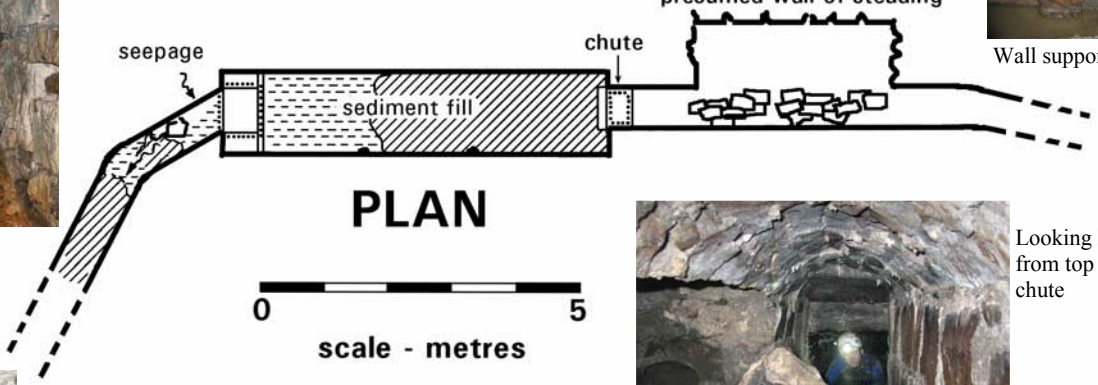
R:- View towards top of chute over the collapsed wall



East wall of chamber and the bottom of the chute

Wall support

Passage near chamber



Passage downstream of entrance shaft

Looking up the chute

Looking E from top of chute

Inlet passage leading to site of former mill pond after approx 32m.

canal or the field drains came first. Whatever the sequence, John thinks that the stream was passed under the canal to preserve its flow both to the farm and to water mills further down the water course and that this section is of c1820 vintage. The sound of flowing water heard upstream is most likely caused by falling water where the relatively shallow field drain drops into the deep canal culvert.

I completed the project by producing a one page photomontage of the survey and photographs of the tunnels (reproduced here) and presenting it to Peter Waddell with an implicit offer to come back and investigate further upstream. The map accompanying this article has had the survey superimposed, and the assumed route to the outflow and the projected upstream line are indicated by arrows.

October 2006 - Ratho Mains Thrashing Mill

In mid-October 2006 Peter Ireson was contacted by Mr Joe Barry of Ratho Mains farm about an underground stream at his farm associated with a 15 foot long chamber he'd found under the farm buildings. He wanted to know if we knew of an archaeologist who might be willing to look at it and tell him what it was. Peter explained that the GSG would be happy to explore and survey it, but we weren't archaeologists so probably wouldn't be able to offer any definite answers to its use. We all agreed that it sounded a fine use of a Saturday afternoon so arranged to meet at the farm on October 28th. A little pre-meet research showed that the stream was the same one that flowed through the cundy under Ratho Park Golf Course further downstream.

At 1pm the team assembled at the farm. Peter had persuaded Mark Lonnen, Jim Salvona, John Crae, Rachael Huggins and me along. Joe showed us his entry point - a 60cm square shaft descending 5.8m to a now familiar rectangular drainage channel 60cm wide and 1.1m high. An extending ladder tied off to the tow ball on Peter's van allowed entry. While the others descended carrying surveying gear and an SCRO Heyphone with a newly build smaller diameter loop aerial, Ivan set up the other Heyphone and awaited developments.

Ratho Mains Farm on mid 19th Century OS Map showing millpond and thrashing mill

The Heyphone was used for two tasks. First we used it for 'radiolocating' where the passages lay. Second, Peter and Mark used it to transmit survey data for me to record in comfort on the surface. Peter also took a series of photographs so between them and the survey and radiolocation data I was able to draw up a reasonably high grade survey despite the mass of ironwork in and under the building affecting compass bearings. This was combined with photographs into an A3 colour poster that is reproduced here in greyscale.

The tunnel at the foot of the entrance shaft was almost dry when we explored it. Downstream it runs east for 400m to surface below the far side of the minor road heading south from Ratho. We didn't explore in this direction. It does have a fine collection of straw stalactites up to 40cm long just downstream from the shaft. Going upstream the roof lowers until it is 70cm high then steps upwards just before entering the chamber found by Joe. This is 15m from the entrance shaft and is well built of dressed sandstone blocks. It is 6.13m long and 3.45m high to a poorly constructed arched brick ceiling. Just above the entrance there is a capped shaft in the roof that was radiolocated to a room built onto the side of the main steading. Thumping the capping from below with a length of timber confirmed the location.

The builders obviously had some subsidence problems during the building of the chamber. The sandstone

blocks at the west end of the chamber slope down to the north by 6 degrees, and the north wall has two vertical iron plates that were possibly added to reinforce it.

The most puzzling aspect of this chamber is the 1.55m high dam. The volume behind it is now full of sediment. This was probed by Jim with a sharp rod and the bottom seems to be level with the bottom of the dam. The sediment does make it easier to access the inlet to the chamber. This is a chute near the ceiling at the far end. It is passable with some difficulty by a compact caver (Mark) given a helping hand from below, or by a larger caver (Pete) being hauled from above by Mark and pushed from below by John armed with a baulk of timber. I believe Pete's arm has now returned to its normal length after Mark's vigorous assistance.

The chute starts off with a slab at an angle of 42 degrees and then turns vertical. At the top it enters what we termed the second chamber. This is 5.2m long and 60cm wide with an arched sandstone roof. The true right wall has at some time in the past collapsed, and what must be the main wall of the steading can be seen beyond. Surprisingly the arched roof still stands despite lack of a supporting wall. I expect both this and the collapse are due to building work involving copious amounts of concrete directly overhead. Upstream of the chamber Mark crawled 28m along the 40cm high passage and could see for another 5m to where a slab appeared to sag from the roof. This is almost certainly a slab noted by Joe just below the field wall when he broke into the channel during building work.

When I drew up the survey, it required very little warping of the bearings to match the compass version to the radiolocated points, the building's walls and the field wall. This placed the first chamber directly under the middle of the room built onto the side of the steading. It also placed the end almost directly under the wall separating the farmyard from the field where at one time Joe told us there was a reservoir.

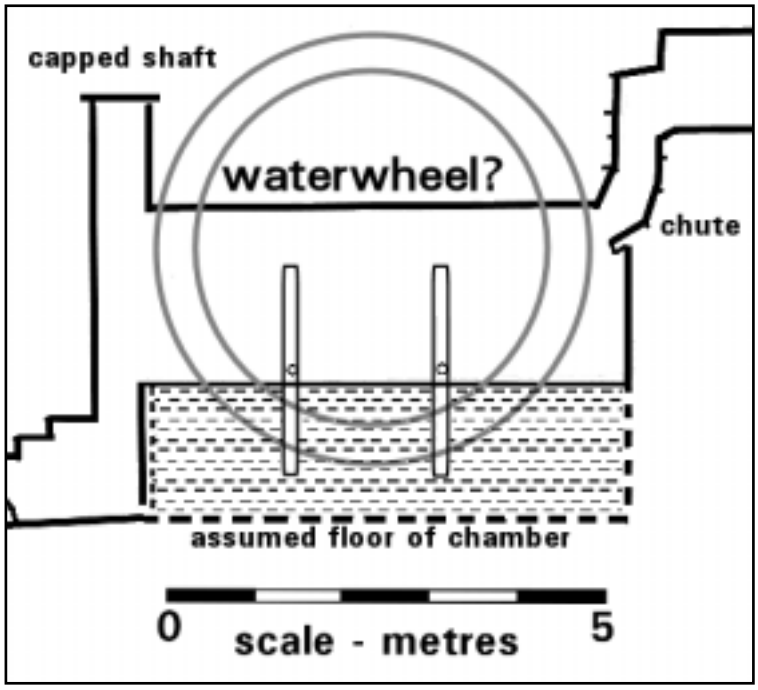
Further research

Mid-18th century OS maps (ref 1) clearly label the room projecting from the side of the steading as a thrashing mill and show the reservoir in the field. Prompted by John Crae I visited the National Archives of Scotland in West Register House, Edinburgh to view an 1829 set of plans of the Ratho estate (ref 2). This includes plans for both Ratho Park (now the golf course) and Ratho Mains Farm. It shows the reservoir as a 0.262 acre millpond and includes the course of the underground drainage along to the Ratho road. The cundy under Ratho Park was added to these plans in 1856. Only the western part has been inked in, with a vague pencilled line indicating the eastern part of the cundy's route. The completed section shows a detailed layout of all field drains in the western part of Ratho Park, but for some reason the eastern section was never added. Perhaps the surveyor by then had drawn up a new plan of the estate and no longer needed to keep the 1829 plan updated.

An alternative explanation is that the eastern section of the cundy had been built before 1829 and no plan existed for it. This would make sense as I'd imagine the sensible way to construct a drainage channel is to start at the downstream end and work upstream. Doing it in reverse means you'd be up to your armpits in mud and water all the time. That would also allow the then existing drain to pass under the canal in a conduit built c1820 when the canal was constructed. This sequence is supported by Derek's observation that the arched section of cundy appeared older then the western section. However the 1855 Ordnance Survey map while clearly showing the surface streams to either side of Ratho Park has no surface drainage in Ratho Park so the whole length of the cundy must predate the map and most probably the canal. This leads to my final hypothesis that the 1856 additions to the 1829 plan recorded the rebuilding of an existing cundy and installation of new field drains over the western half of Ratho Park.

Ratho Mains appears to have been unique in the area. On the mid 19th century maps almost every farm has a thrashing machine, but only Ratho Mains had a thrashing mill. Was this a one-off experiment that failed, or did nobody else have enough water to run a mill? If we ignore the dam then there is room in the chamber for a 5m diameter water wheel. This could have been a breastshot wheel with the water filling buckets at

about the level of its axle. The 1820s were a period of great advances in waterwheel technology and the initial drop to an angled chute could have been an experimental design. The dam is very puzzling. By reducing the available drop for the water it must have reduced the amount of power that could be generated by about a third. We didn't notice any evidence of it being a later modification.



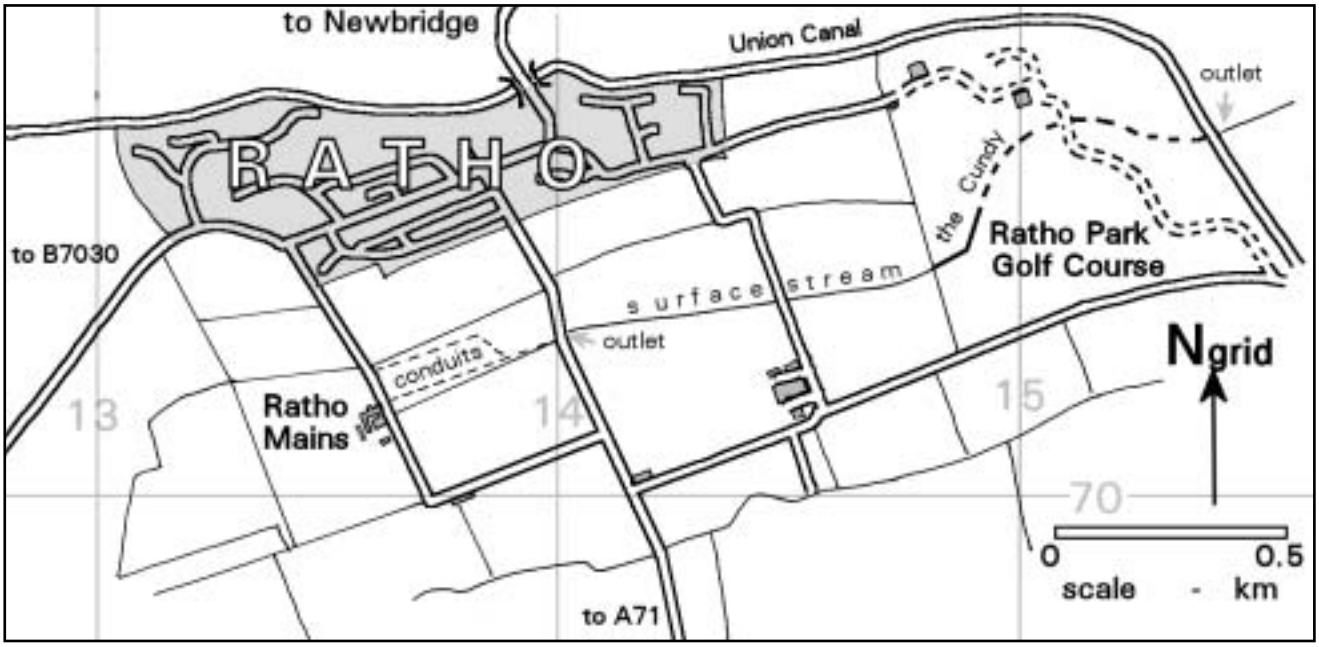
The water wheel chamber would originally have been an open pit in the floor of the room above. When it fell into disuse the machinery was removed, the chamber roofed by a quickly constructed brick arch, the shaft capped, and the whole area filled level with the surface. Joe has talked about opening up the shaft for access there and allow him to reseal the shaft in the farmyard.

More research may turn up details on when the thrashing mill was built, what type of water wheel was employed and when it was removed. The New Statistical Account of Scotland of 1834-35 notes that steam engines had by then replaced horses to power the thrashing mills at two unnamed farms in the Parish. It could be that a progressive estate owner wouldn't have delayed long in changing from what must have been a limited amount of water power to more reliable steam. John is attempting to contact experts within Historic Scotland or English Heritage, but has no luck as yet.

References

1) Ordnance Survey, 1:10,560 County Series 1855, Edinburghshire available as a low resolution scan online at www.old-maps.co.uk

2) Gainer & Miller, surveyors (1829): Bound set of plans (6) of the estate of Ratho, the property of John Bonar: National Archives of Scotland Reference Number RHP40825



RUCKSACK CLUB CAVING

By Martin T. Mills

This article results from a chance visit to a second hand book fair in the Autumn of 2005. Kirsty and I had debated whether to go as we had not previously been rewarded with many finds for our efforts. However, on this occasion a dealer from the Isle of Man had a long run of Rucksack Club Journals, not often seen, especially unsealed and individually priced. I already had a couple of photocopy articles from the journals so we went through the contents page of each and came away with 11 journals, at a much reduced price on account of quantity. There was also a long run of members' handbooks from 1923 to the 1960s; but as these contained nothing of caving interest, largely members' addresses, we said we did not want to buy them. However the dealer insisted on throwing them in at no extra charge. Oh well! When we got home we thought they were too good to just throw away and they must be of interest to Rucksack Club members. The internet came up with Mike Dent as the Rucksack Club contact and as he lives only a few miles from us he was delighted to call and collect. As he had a complete run of their journals to date this provided the chance to check out each and provide a definitive list of all the articles and their subject matter in their journals relative to caving. There are a couple of items where the pagination is not known; I am happy to leave this to others. Under each article in italic typeface are listed which caves, etc are mentioned if not immediately apparent from the title. Photocopies of all, or annotated extracts, are now in the GSG Library. My thanks to Don Mellor (Craven Pothole Club) for omissions and corrections.

The Rucksack Club was founded on 13th October 1902. There have been 93 issues of the Rucksack Club Journal, and three Annual Reports: 1904, 1905 and 1906 (the latter two of these are, in reality, indistinguishable from a journal in concept). The first 'Journal' was published in 1907 and the most recent for 2003/4 published in May 2005. One of the Club's most well known members was Ernest Baker who was a member from 1904 to 1908. At that time his address was Edale, Withens Lane, Liscard, Cheshire. He resigned on taking up a prestigious librarian appointment in London.

Annual Report	1904	Entwhistle, J.H.	The Club Below Ground *Owl Hole, Giants Hole (photo), Speedwell Mine (Peak district)*
Annual Report	1905	J.R.C.[Corbett, John Rooke]	Underground Work in 1905 *Bagshawe Cavern, Giants Hole, Perryfoot Swallets, Manifold Swallet, Jackdaw Pit Swallet (Peak District)*
		E.A.B. [Baker, E.A.]	Recent Work in Somerset, Yorkshire and Ireland. *Swildon's Hole, Caves at Compton Bishop and in the Quantock Hills, Great Hillgrove Swallet, Wookey Hole (Mendip)* *Pillar Pots, Long Kin West, Cross Pot, Rosebay Pot, Thorn Pot, Bridge Pot, Nick Pot, Long Kin East, Mere Ghyll, Sulber Pot, Bruntscar Cavern (Dales)* *Mitchelstown Cavern (Eire)* *Nant y Ffrith Lead Mines (Wales)*
Vol.II	No.3 1913	Baker, Ernest A.	Recent Cave Campaigns. pp 173-180 *Hillgrove Swallet, Wookey Hole (photo) Hyaena Den, Ebbor Caves, Swildon's Hole, Eastwater Cavern, Lamb's Lair (Mendip); Mitchelstown Caves (photo) Marble Arch Cave, Cave of the Wild Horses, Poulawillin, Pollnagollum-*

				Poulelva System, Noon's Hole, Ooboraghan Cave (Eire)
Vol. IV	No.4	1930	Gray, Robin[1]	Alum Pot Meet, pp. 452-456 *Alum Pot, Long Churn Caves, Hull Pot (photo) (Dales)* Proceedings of the Club, p.466 *Giants Hole, Lathkill Cave (Peak District)*
Vol. VIII	No.1	1935	Forrester, S.F.	Scratchings Underground, pp 61-68 *Carlswark Cavern, Hillocks Mine, Tacho Cave, Silica Cave (Peak District)*
	No.2	1936	Forrester, S.F.	Further Scratchings Underground, pp. 179-187 *Odin Mine, Bull Pit Shafts, Giants Hole, Gautries Hill Rake (two photos, including Treak Cliff Cavern) (Peak District)*
	No.3	1937	Forrester, S.F.	Manifold Scratchings Underground, pp. 323-325 *Thor's Cave, Darfur Crag Swallet (?) Mill Cave (?), Redhurst Swallet, St. Bertham's Cave, The Big Level, Ecton Copper Mines (Peak District)*
Vol. IX	No.1	1928	Solari, Frank	Th'Ole. pp 56-61 *Rowter Hole (Peak District)* *Gaping Ghyll (Dales)*
	No.2	1939	Wild, P.	Some Caves in North Wales, pp 212-213 *Gop Caves, Mines near Halkyn, Brynbella Caves, Dulas Cave, Cefn Caves (North Wales)* *Oxlow Cavern, Speedwell Mine, Thor's Cave (Peak District)*
			Forrester, S.F.	The New Passage in Giants' Hole, pp. 214-215
	No.4	1941	Wild, Peter[2]	Some Caves in South Wales, pp 277-281 *Dan yr Ogof (photo), Butter-tubs Pot, Porth yr Ogof, Llygad Llwchwr, Pant Mawr Pot.*
	No.5	1942	Forrester, S.F.	The Potter on the Hearth *Caves in Deepdale, Oxlow Mine, Blue John Mine, Treak Cliff Cavern, Speedwell Mine (Peak District)* *Mines at Cross Fell and Nenthead (Cumbria); Gaping Ghyll (Dales); Mammoth Cave (Kentucky)*
			Moss, E.	A Historical Note on the Alderley Copper Mines
Vol.X	No.1	1943/4	Wild, P.	Excursions Underground, pp 8-10 *Ceirog Cave (North Wales)* *Magpie Mine (Peak District)*

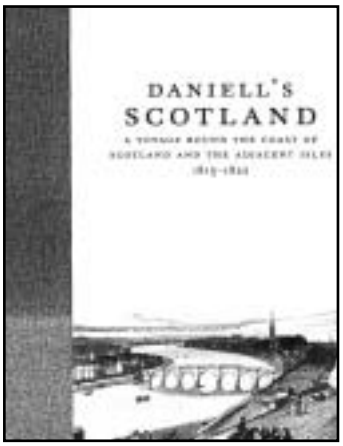
1. Spelt Grey in Contents list, Gray in article.
2. Spelt Wyld in Contents list, Wild in article.

		Forrester & Wild	Proceedings of the Club: Recent Underground Explory, p.35. *Dan yr Ogof (South Wales)*
	No.3 1945/6[3]	Wild, Peter	A Mendip Week-End, pp 163-166 *GB Cave, Wookey Hole, Sidcot Swallet, Goatchurch Cave, Reade's Cavern, Swildon's Hole*
		Moss, E.	Proceedings of the Club/Outdoor Activities, p.194 *Carlswark Cavern (Peak District)*
	No.4 1947	Forrester, S.F.	Holes and Corners - May 1946, p.279 *Whitbarrow Cave, Fairy Cave, Witherslack, Strickland Hill Cave and two other unidentified sites (Furness)*
Vol. XI	No.1 (1948)	Wild, Peter	Underground in Denbighshire pp [72]-78 *Afon Meirchion, Dell, Dulas and Castle Mawr Caves*
		Wild, Peter	Eldon Hole, p.78
		Humphreys, A.	Swildon's Hole, Somerset. pp 78-80 and photo opp. p.80
	No.2 1949	Wild, Peter	Caving in County Clare, pp 126-129 *Pollapouka Ballyelly, Faunarooska, Pollnagollum (photo) caves*
		H[umphreys?],A.	Proceedings of the Club/Outdoor Activities, p.163 *Bagshawe Cavern (Peak District)*
	No.3 1950	Forrester, S.F.	Cave near Grange-over-Sands, p.278 *Merlewood Cave (Furness)*
	No.4 1951	Wild, Peter	Caving in County Fermanagh, pp 360-2 *Marble Arch Cave, Boho Caves, Cat's Hole, Monastir Sink, Cradle Hole Cave, Malham Cave (Dales)*
Vol. XII	No.1 1952	Wilding, John	The Club's 50 Years, pp. 17-18 *Gaping Ghyll, Alum Pot (Dales)*
Vol. XIII	No.1 1956	Hastings, J.R.	The Underground River of Labouiche pp 34-43 *Gouffre de Terrefort, Grotte de le Plagne (Ariege, France)*
	No.2 1957	F[orrester?], S.F.	Proceedings of the Club/Outdoor Activities, pp 155-156 *Gaping Ghyll, Bar Pot (Dales)* *Tailpiece illus by C.H. French*
Vol. XV	No.4 1967	Cooke, H.J.	Cave Exploration in Tanzania, pp 244-8 *Caves near Tanga (photo)*
Vol. XVII	No.1 1972	Cooke, Joe	Cave Exploration in the Kalahari Desert, pp. 12-20 *Caves in the Aha Hills, and Drotsky's Cave (Botswana)*

3. Cover and title page state 1946, Contents list states 1945/6

Vol. XIX	No.2 1981	Beatty, John	Life's Ups and Downs *Nettle Pot, Suicide Cave, Perryfoot Cave, Virgin Pot (Peak District)*
	No.4 1983	Hostford, George	In Search of the World's Deepest Cave *Eldon Hole (Peak District); Pozu del Xitu, F2/Fu56/Pozu Jorcada Blaca, B U 56, Pazu del Cantu del Hombre (Picos de Europa, Spain)*
Vol. XXI	No.2 1991	Sinclair, Stephen	You Little Tinker *B15 Fuente de Escuain (Spanish Pyrenees).*

BOOK REVIEW



Daniell's Scotland: A Voyage Round the Coast of Scotland and the Adjacent Isles. 1815 - 1822. Edinburgh. Birlinn Limited in Association with The National Library of Scotland. 2006. 2 Vols. xxx + 322pp; and 157 aquatints. Hardbound in slip case. Vol. 1 ISBN 10: 1 84158 317 0. ISBN 13: 978 1 84158 317 4, Vol 2. ISBN 10: 1 84158 318 9, ISBN 13: 978 1 84158 318 1. Limited Edition of 600. £100.

There have been several mentions in recent Bulletins of the aquatint engravings of William Daniell. These magnificent 2 volumes, each 275mm x 362mm contain in volume 1 a facsimile of the original text written by Daniell, and in Volume 2 the 157 aquatints themselves in full colour. Of particular interest to us cavers are pages 96 - 110: the description of Staffa and its caves, and plates 28 - 36 (inclusive) the six engravings of the caves, including that stated to be "The Cormorant's Cave", depicting in fact McKinnon's Cave, and three other island views; and pages 226 - 230 the description of Smoo Cave (then spelt Smowe), and plate 85, the engraving of the entrance (see Bulletin October 2006, p12).

The original text by Daniell in Volume 1 is preceded by a Foreword by Elizabeth Bray, which incidentally states that the aquatints are "no reduction in size", and an essay about William Daniell, Walter Scott and the Vision of the Scottish Coastal Voyage by William Gordon Brown. Walter Scott made all his knowledge of Scotland available to Daniell with suggestions of where to go and what to see.

The publishers have done us a great service by producing all the Daniell aquatints in full colour of the coast of Scotland and its magnificent scenery in one work, which weighs in at 5.5 kg. With regard to the aquatints being full size unfortunately this is not totally true: each has been nominally cropped by about 4 or 5 mm in both width and height. This is readily apparent if one looks at the Smowe Cave plate where the two people on the top of the cliff have disappeared. Despite this minor shortcoming, what a stunning work, expensive unless you were in on the pre-publication offer like us (we have No. 332). But there is consolation in the fact that the whole thing is less than the cost of one original even supposing you can find the one you want.

MTMills
December 2006

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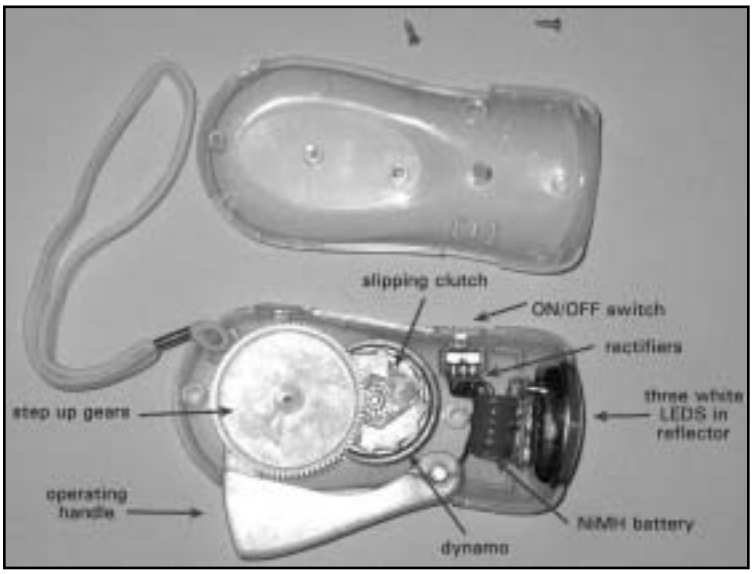
THE EVERLASTING TORCH

by Ivan Young

A caver has more than the average interest in lighting technology, especially when there is a promise of something that might be applicable underground. I spotted an advert for a LED Dynamo Torch in a Christmas catalogue for £4.99 and just had to buy one. It doesn't need batteries: just squeeze the handle to set a small dynamo spinning, generating power and lighting the three blue-white LEDs. It does contain a small rechargeable battery and this can be charged by a minute or two of squeezing before switching the LEDs on. Once charged, the battery powers the LEDs for half an hour or more depending on when you consider it too dim to use and begin charging it up again.



The LED dynamo torch partly dismantled

The mechanics involve a handle with a curved and toothed section that engages with a gearwheel. This has a larger gear on the same axle which in turn connects with a gear and clutch on the midget dynamo. Each stroke of the handle turns the dynamo 5 revolutions and the slipping clutch and built-in flywheel keep it rotating for another couple of seconds. It is possible to squeeze the handle about three times per second so the dynamo probably hits about 2000 rpm.

The torch includes a three cell nickel metal hydride battery - 3 x B40H from Powerplus Technology Co Ltd, China. It doesn't have a high capacity: just 40mAhr at its standard discharge rate of 12mA with a rated maximum discharge of 20mA. When freshly charged the battery can push about 35mA through the three LEDS. This soon drops to about 20mA and after a few minutes it is down to about 10mA from which point a long slow decline continues until it is too dim for the user and they pump some more charge into it.

When compared with the EarLite (see page 14), this torch's light output when fully charged is comparable though not in such a tightly focused beam. It also drops off faster. However it never needs new batteries. Neither torch claims to be weather resistant in any way and should be kept well away from water.

The Old and The New

The LED Dynamo torch had an additional interest for me because in the distant past, probably a couple of decades ago, I was given a Yicko Dynamo Flashlight. This too had a handle that when squeezed rotated a small dynamo, except that it powered a filament bulb and had no battery. Comparing it to the LED version, it has an uneven but more focussed beam, a yellowish light and less output for the same input. You also need to keep pumping two or three times per second to get light which decays away within a second when you stop.

The two dynamo torches compared

I connected a multimeter to the dynamo and measured the output at 2.5 to 3 volts - ac of course as it has no rectifiers. Output power into the bulb appears to be about 100 to 150mW if you pump the handle rapidly. The mechanics and dynamo in the two torches version are very similar and I wouldn't have been surprised if they'd come from the same company. The old version came from Hong Kong while the LED version is distributed by Tobar Ltd of Norfolk with no indication of origin. Looking at the components, however, I think China would be a very good guess.

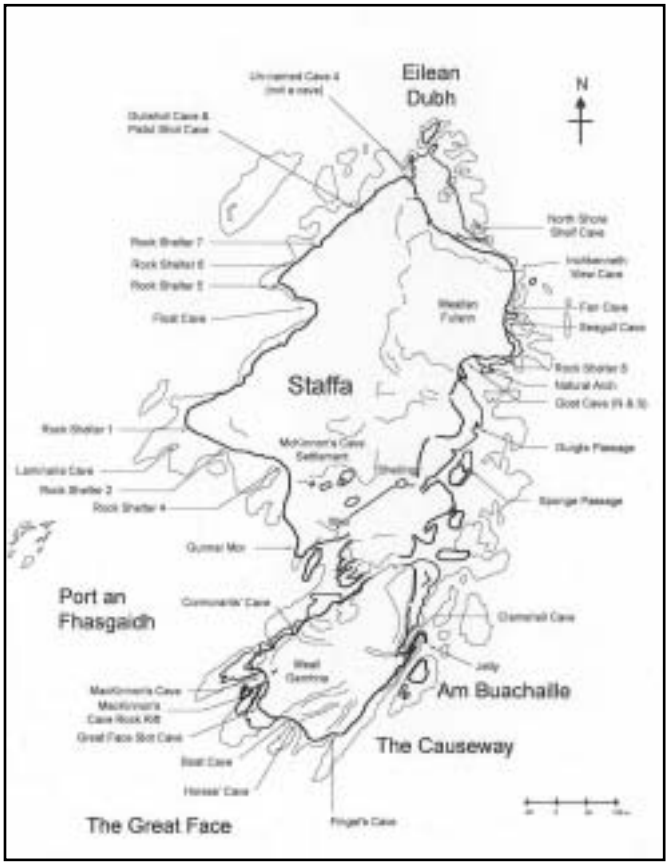
UPDATING OSSIAN

By John Crae

Like the efforts of historians to pick the truth from James McPherson's largely fictional tale of Ossian, the 2006 expedition to Staffa, organised by Bob Mehew, was an attempt to clarify perceived knowledge about the island and to complete a baseline survey of the island's coast required by the National Trust for Scotland. Following the 2005 Staffa Expedition (1), which identified most of the major caves, the 2006 expedition explored some sections of coastline covered by the previous expedition and completed a circumnavigation of Staffa identifying caves and rock shelters. Rifts and undercuts, which from a distance appeared as possible caves, were investigated to provide a clear indication of the location of Staffa's caves.

As in 2005, the expedition was timed to coincide with low tides and avoid the nesting season of the island's sea birds. The nesting season was not entirely over however and perches in some caves were still occupied by young birds (mostly cormorants and shags but also gulls and sparrows). There were also whole areas of the island where the adult birds were training youngsters to feed. These areas were - of course - on the main paths around the coast and meant that some birds could be aggressive in defence of their young.

The team in 2006 consisted of Bob Mehew (GSG/SMCC), Tony Boycott (GSG/UBSS), Duncan Butler (BEC/RUCC), John Crae (GSG) and Lucas Goehring, a student of Professor Morris (2). Our efforts were assisted by a flying visit by Milche - Martin Mills - and Kirsty Mills returning from holiday in Iceland sans luggage (which remained in Reykjavik).



Assistance from David Kirkpatrick, of the 'Iolaire of Iona', packing his boat with gear and with loading and unloading was invaluable. Unfortunately, attempts to include geologists in the expedition proved impossible as funding was unavailable (already allocated this year) but a proposal has been made by Cambridge University for an expedition in 2007. Efforts to supply pictures of the wildlife on the island (a request from the National Trust for Scotland) met with limited success due to camera problems and a lack of botanists and zoologists.

Most of the major caves were covered in 2005 and have been omitted from this report. The previously surveyed sections were revisited only where better information was obtained or where correction was needed (e.g. islands off the coast of Mull have appeared on maps since 1715 and Staffa is shown on James Dorret's 1751 map of Scotland's west coast (3). This does not diminish Sir Joseph Banks' 'discovery' of Staffa in 1772, which popularised it as a scenic destination but confirms that its existence was well known before that time. Conversely, as Clamshell Cave, Float Cave, Gunnar Mor and Fingal's Cave were ade-

(1) Crae, John, 2005, 'Ossianic Endeavours', GSG Bulletin 4th Series, Vol.2 No.5. pp. 38-51
(2) Professor Stephen Morris, University of Toronto.
(3) National Library of Scotland, Map Library, 'A Correct map of Scotland from new surveys', http://www.nls.uk/digitallibrary/map/early/record.cfm?id=707

quately recorded in 2005; slight improvements to the detailed surveys were not included (4).

At **Clamshell Cave** (NM 32574,35117 - re-surveyed by John Crae, 13 August 2006), the original plan was to survey a small oxbow, at high level on the north of the cave above the entrance. This did not occur as David Kilpatrick told us that cormorants nesting in the upper section currently had one chick. Unfortunately, this fledgling did not survive. It is unclear if visitors disembarking on the jetty disturbed the birds or if it did not survive its attempts at flight but a body, probably the same bird, was found at the mouth of the cave. The survey was carried out after the death of the young bird but the upper levels were still occupied by the adult birds. The entrance to Clamshell Cave appears to cut directly across an area of columnar basalt exposing polygonal faces on both sides of the cave. Exactly how the curvature of the columns affected the formation of the cave is a matter for geologists but the structures show a variety of forms. South of the cave, the columns curve extremely producing the clamshell features at the cave entrance but to the east, at the jetty, the columns become vertical and on the east side of Am Buachaille, the columns curve in the opposite direction. The direction of the columns seems not to have affected how erosion has formed channels as both Clamshell Cave and the channel between Am Buachaille and the main island cut through columns in varying alignments.

Previously mentioned, the inscription 'VESNYOM SYMLIELYG, AD1850, DVLCISSIMA SOLITVDO' (NM 32543,35107) on the cliff along the Causeway was re-translated as 'most sweet solitude', This and the shallow recess in the cliff, little more than one column deep, known either as the pulpit or the wishing chair (NM 32527,35086) were plotted using GPS.

Near Fingal's Cave, the columnar cliff starts straight but upper parts of the columns lean westward. Vertical and horizontal measurements were taken of the columns outside Fingal's Cave and along the Causeway in 2005 and 2006. As recording techniques have improved, more columns were recorded in 2006 and if future visits record more columns, the data will allow a better understanding of basalt cooling.

Fingal's Cave (NM 32450,35039 - re-surveyed by John Crae, 13 August 2006), remains a major draw for tourists and the unusual survey techniques employed by Bob and Lucas proved an additional attraction. All involved stopped frequently to explain why a house ladder was used to measure striae high on the columns (See centre pages). More dimensions were recorded to improve the survey of the cave and Tony Boycott again dived in the cave determining categorically that the ash layer underlying the basalt columns emerged at the inner end of the cave. A narrow crevice at low level (2.0 m long by 0.25m wide reducing to nothing) with the v-shaped ceiling structure and a depression on the surface of the island above the cave may indicate that the cave formed along a pre-existing fracture.

East of the entrance to Fingal's Cave, the basalt extends below the water line, with the lower ash layer emerging only at low tide. This layer is often referred to as a compacted red ash but an accurate classification from a geologist would be appreciated. A separating layer between the ash and the basalt appears as a 0.5 m thick band of darker ash, which may be a baked ash contact layer. The interface between the ash and the basalt slopes at approximately 5^{o} falling to the east, the gentle slope typical of the collapse of horizontal lava flows into an empty magma chamber under Mull's central caldera (the collapsed base of a volcano) (5). This collapse might have caused fracture lines crossing Staffa and contributed to later cave formation by wave action.

Along the ash shelf, Horse's Cave and Boat Cave formed in the ash layer below the Fingal's Cave lava flow. The ceilings were examined and no exposure of columnar basalt was detected. Small areas of flat ceiling in Boat Cave may represent the separation layer between the ash and the basalt. Extreme low tides allowed the end of both caves to be reached.

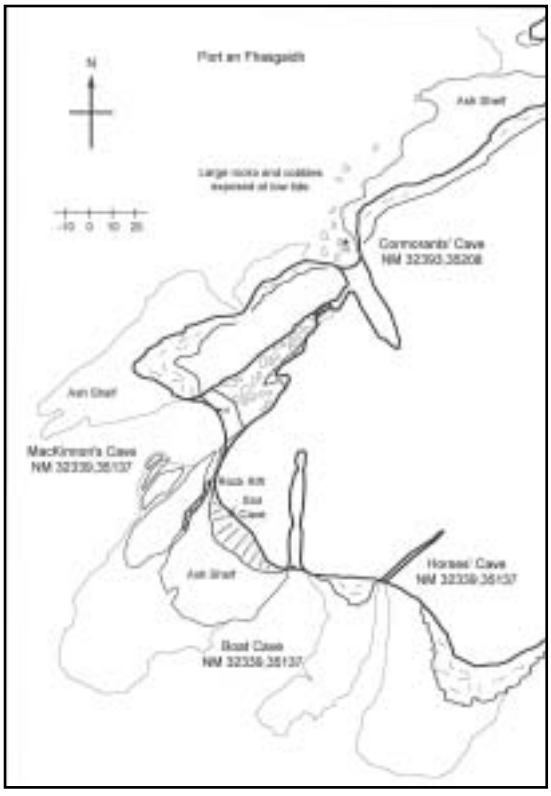
(4) Included in the finished baseline survey for NTS and in a future GSG publication on the caves of Staffa

(5) Jones, Rosalind, 1997, 'Mull in the Making, p.19

Accurate measurement of **Horse's Cave** (NM 32409,35052 - re-surveyed by Tony Boycott, 12 & 13 August 2006) confirmed the alignment of the 33.4 m long cave at 226-235^{O} altering some 35-45^{O} from the 190^{O} channel at the entrance (6). Although the bend had been indicated on the initial surveys in 2005, it did not appear correctly on the published plan (7). Tony's survey also indicated the existence of a fracture at the entrance and end of the cave. This does not appear in the basalt columns or entablature above the cave but a surface depression follows the same alignment and may indicate an inherent weakness in the rock.

Boat Cave (NM 32384,35058-35039 - re-surveyed by Tony Boycott, 12 & 13 August 2006 (8)) was also accurately measured producing an overall length of 49.7 m. No signs of a pre-existing fracture are visible within the cave but a depression is visible on the surface.

The ash shelf to the west of Boat Cave rises to about 12m above sea level, east of MacKinnon's Cave. This was carefully examined for any caves and, although several crevices were investigated, no new caves were found. **Un-named Cave 1**, now re-named **Slot Cave** (NM 32344,35080 - surveyed by Tony Boycott, 12 August 2006 (9)) was examined in more detail. It was confirmed to be a 2 m high by 1 m wide entrance with a 3 m long slot, narrowing rapidly to nothing, cut into the ash layer immediately below the base of the columnar layer. The full length of the cave is visible at the entrance although it is 2m above the accessible part of the ash shelf, the base of the cave sloping up at 35^{O}. A second depression at the top of the ash slope near Slot Cave was simply a small overhang with the undulation in the cliff exaggerated by shadows. A shallow slot at water level (possibly a continuation of the weakness that formed Slot Cave) has no overhang.



At the entrance to MacKinnon's Cave, the ash shelf breaks down into a group of large rocks separated by narrow rifts (possibly still being attached to the ash shelf below water level. The easternmost rift, next to the ash shelf is choked with boulders. Between the top of the rock and the low water line, a narrow entrance leads under a boulder ruckle into a 9 m long, 1 m wide passage. Named MacKinnon's Cave Rock Rift (NM 32335,35094 - surveyed by Tony Boycott, 12 August 2006), this passage is water eroded between two ash walls with the rift narrowing above. Erosion on the seaward and MacKinnon's Cave sides of the rock has formed similar recesses at a lower level but no passage yet. Two further slots in the rock to the west are open to the sky.

Most of MacKinnon's Cave and Cormorants' Cave were surveyed in 2005 but several high level shelves were out of reach (10). The 2006 expedition brought long ladders to reach these upper levels. This was only partially successful as the 8 m ladder (by siting it on a large 1.5 m high boulder) reached 8.5 m up to the base of the main rift at the back of MacKinnon's Cave but the steep slopes were coated with a layer of crumbling guano which seemed unlikely to provide secure hand holds. The level floor of the upper rift was out of reach a further 2-3 m up. Bolting

(6) The previous GPS location was estimated from the cliff above and the cave's details and dimensions estimated by eye. The current dimensions were accurately measured with tape, disto and clino.
(7) 'Ossianic Endeavours', p.44.
(8) Previous GPS location estimated from cliff above the cave; current locations taken either side of tidal channel.
(9) The previous GPS location was estimated from the cliff above the cave.
(10) 'Ossianic Endeavours' , p.44-45; Error in 2005 map coordinates for Cormorants' Cave (picked up coordinates for Boat Cave) Actual coordinates are NM 32393, 35208.

would allow access to the upper level but permission would be required from the National Trust for Scotland and Scottish Natural Heritage. As 95% of the upper level was visible from below, it is unlikely that there is any connecting passage to Cormorants' Cave. Between the upper levels and the lower connecting passage, a sloping shelf on the southeast side of MacKinnon's Cave allowed access to the middle section of the rift (visible but not accessible from the lower passage). This was free climbable to a height of approximately 7 m above the floor of the cave. Starting at 1.5 m wide at the base of the slope, it narrows to 0.6 m wide 5 m up with the rift closing to 0.3 m wide below and to nothing above head height - a 100 mm wide strip in the rift above head height was probably infilled with guano. The roof of MacKinnon's Cave main chamber is a single sloping plane of rock formed by erosion of the ash from below the columnar basalt but there is little evidence of columnar lava showing in the roof except in isolated sections where more of the roof has fallen away. The rift at the back of MacKinnon's Cave linking to Cormorants' Cave may be formed along a fracture invaded with what appears to be quartz. A second line of 'quartz' appears to the southeast of the connecting passage and may have helped to widen MacKinnon's Cave. Several small and narrow rifts appear on the southeast wall but these do not extend more than 0.3 m. The upper sections of the cave are obviously a regular nesting site for sea birds (probably cormorants) and some small ledges in the northwest side of MacKinnon's Cave were still occupied. Within Cormorants' Cave, a rift in the northeast side approximately 6 m above the floor of the cave increases from 0.3 m to 1.2 m deep as it rises to near the 14 m high roof of the cave. A pinnacle of ash forms a narrow squeeze to a wider rift with small ledges deeper within the cave. Although the rift itself may be free-climbable, it cannot be reached without a ladder and the upper levels were not investigated due to nesting birds. At the far end of the cave, a further high-level ledge extends into a rounded space on the southwest of the cave (towards MacKinnon's Cave). It is likely that this closes down just out of view but this needs to be verified. There is no clear evidence of a joint or fault within Cormorants'Cave but the flat south wall might be the result of collapse from a fracture and a depression on the surface above suggests a fracture running east/west to Clamshell Cave. The section of ash shelf, between MacKinnon's Cave and Cormorants' Cave, was examined and revealed no caves.

The boundary between the columnar basalt and the underlying ash drops rapidly from MacKinnon's Cave to Port Fhasgaidh. From 20 m, above sea level at MacKinnon's Cave, the boundary drops to 14-15 m at Cormorants' Cave and reaches ground level at the shore at Port Fhasgaidh. The thickness of the columnar basalt also decreases becoming only 0.5 - 1.0 m high at the shore and inland of Port Fhasgaidh, it disappears entirely. Between Cormorants' Cave and the Port Fhasgaidh shore, a series of shelves have been formed in the boundary layer but there are no caves and it is not possible to traverse along these shelves into the upper levels of Cormorants' Cave.

Between the north and south sides of the shore at Port Fhasgaidh, there are three valleys leading inland. The southernmost is a major rift crossing Staffa from east to west and is marked as the major fracture across the island by the British Geological Survey. A large ridge of rock separates this rift from a smaller valley and a tiny hanging valley (leading onto a rock shelf). A wider valley slopes down from the cultivated centre of the island to the north side of Port Fhasgaidh. In the past, each of these valleys might have had a cave at the end but they were most likely open to the sky and no trace of any caves exists now.

Not explored during the 2005 expedition, the cliffs east and north of Port Fhasgaidh held the most promise of new caves. Exploring this section of coast (10 August 2006) was carried out in three phases. First, Tony and Duncan (equipped with wet suits) traversed round past Gunnar Mor [(11)], descending into the water and swimming/wading round to the ash shelf to the north. This allowed them to locate and survey interesting features and make the most of the time available at low tide. John and Lucas remained at Gunnar Mor with the heavy equipment (a 3.5m ladder) until lower water allowed a dry traverse to be completed or at least waded in wellies (clambering along a cliff while carrying a ladder is an unusual experience). The ladder was required to ascend the smooth sides of a shallow undercut (NM 32445,35335) onto the ash shelf. Bob, Milche and Kirsty arrived later (Milche and Kirsty having arrived on the boat from Fionnphort).

(11) 'Ossianic Endeavours', p.46.

The cliff, just north of Port Fhasgaidh, is formed from one lava flow. This may be the Fingal's Cave flow - as it is immediately above the ash layer which is exposed north of Gunnar Mor - but this should be confirmed by chemical analysis. Further north a second flow is exposed with two columnar layers separated by an irregular entablature.

The base of the cliff has been eroded by wave action creating a scalloped effect on the exposed shore line columns separating from the cliff while the more stable entablature remains cantilevered over wide but shallow recesses. Erosion of the ash has formed a depression at the base of the cliff, filled with rounded rocks or cobbles. The features at the base of the cliff were named Rock Shelters 1,2 & 4.

Rock Shelter Cave 1
Photo: John Crae

Rock Shelter 1 (NM 32236,35534 surveyed by Tony Boycott) is a 1.0 m wide, 2.5m long and 0.5 m high slot at the back of a wider scalloped feature, 15-20 m wide, 8.8 m deep and 13.5 m high. The visible structure is within the columnar layer - polygonal sections forming the roof and walls - but the lower levels are concealed by rounded rocks and pebbles. The deeper recess may have been formed by the separation layer eroding between ash and basalt, undercutting columns which then fell away. The broken columns, however, are at the bottom of a fracture (extending to the top of the cliff and infilled with white material) representing a weakness in the cliff.

Rock Shelter 2 (NM 32313,35496 surveyed by Tony Boycott) is a similar feature, 6.5 m wide, 4.0 m long and 2.36 m high, in the basalt cliff, although no columnar structures are visible within the rock shelter itself. The recess's roof extends up into irregular basalt of the entablature above while, to the west, some columns are exposed above the ash layer. Lower parts of the recess and its eastern side are hidden by erosion rubble from the cliff above.

Rock Shelter 4 (NM 32379,35428 surveyed by Tony Boycott) is a roughly triangular slot, 7.9 m wide, 5.0 m deep and 1.4 m high (reducing to nothing) at the base of the cliff. Its visible upper section is within the irregular basalt of the lower entablature and its lower section is concealed by rocks and pebbles. Other similar features appear along this shore but none are of any depth. Any one of these features may have been mistaken for a cave by the Ordnance Survey, if only viewing the coast from a boat, resulting in the misplaced MacKinnon's Cave (NM 32372,35481) on the 1876 map, previously referred to as **Potential Un-named Cave 2** but Rock Shelter 4 is closest to the marked coordinates (12).

The ash shelf, in front of the cliff, extends from 50 to 60 m north of Gunnar Mor to the western end of the cliff and is deeply cut by open channels. At its west end, 20-25 m from the cliff, the shelf is cut by an open channel ending in a large hollow, referred to as **Rock Shelter 3** (NM 32198,35552 surveyed by Tony Boycott). A 10.4 m wide, 3 m deep and 2.4 m high hollow has been eroded from the ash. Secondary erosion has carved another smaller hollow, 7.5 m wide, 2.3 m deep and 1.5 m high, at the back of the first. At extreme low tide, a rock/cobble shore was visible within the channel with a ledge of rock stepping up from the shore to form the floor of the cave. Tony Boycott later renamed the cave, **Laminaria Cave**, after the seaweed growing in the channel.

Laminaria Cave
Photo: John Crae

(12) 'Ossianic Endeavours', p. 47.

Beyond the western end of the south facing cliff, the ash shelf along the west coast has been eroded back to the foot of the basalt cliff. In this area, the shelf breaks up into huge boulders supported on the eroding shelf and a large rock pool (NM 32213,35560) has been formed. Approximately 3.0 m in diameter and 2.0 m deep, this is full of water with sides eroded back to form an overhang making it impossible to see the base of the walls from the surface. It is unlikely that there is any passage at the base of this feature but this has not been investigated.

Along the narrow ash shelf and a short section of weed-covered shoreline with a rock/cobble beach, it is possible to reach the sloping ledge on the west coast, south of Float Cave, and from there enter the cave. The cliff on this section has the two columnar layers seen north of Port Fhasgaidh but the lower layer appears to disappear where it meets the underlying ash, which forms a ledge rising to half the height of the cliffs.

Float Cave was surveyed in 2005 (13) but it is necessary to correct the impression that there were two chambers to this cave. The cave forms a huge undercut, within the ash layer. The irregular ceiling shows no indication of columnar structure but is close to the separation layer. It is lower to the south but nothing indicates the separate chamber mentioned in the 2005 survey. The cave walls are smooth with signs of scalloping where wave erosion continues. In the north wall, two scalloped areas converge and a short 0.5 m passage has formed between them. To the south, rubble eroding from the cliff and collecting on the ash ledge has blocked part of the cave mouth forming a 3-5m long 0.5-1.0 m wide and 0.5 m high passage, with bedrock to the east and a rubble wall to the west. Traces of similar undercutting, blocked by rubble, can be seen along the top of the ash ledge but there are no features of any depth. Similar undercutting continues on the ledge north of the cave.

West of Float Cave, the ash shelf forms a cliff rising steeply to about 10 m above water level and the separation layer of 0.5-1.0 m of baked ash continues level to the west end of the south facing cliff where the ash layer drops onto a flat shelf at the shore. Above this, the lower basalt entablature, the upper columnar layer above and a section of upper entablature are exposed.

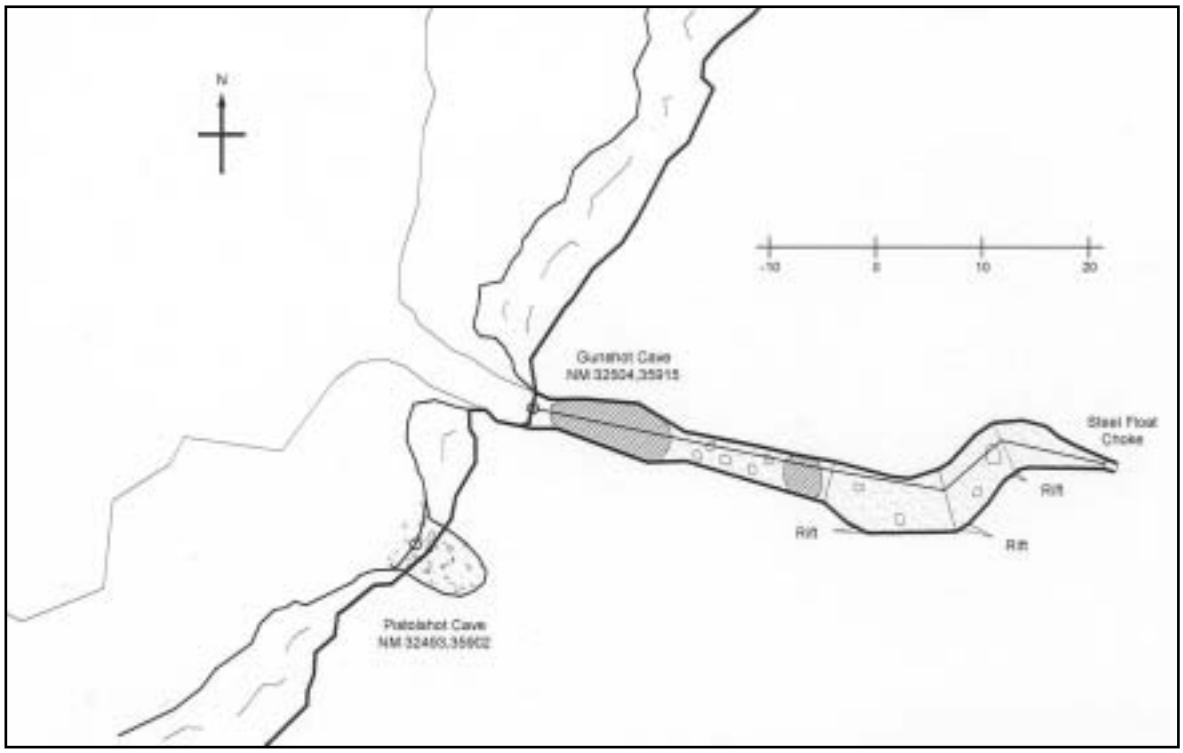
Rock Shelter 5 (NM 32391,35761 surveyed by Tony Boycott) near the west end of the cliff consists of a ledge, 5 m above the ash within the eroded lower entablature and two pockets on the line of the separation layer. The ledge is 8 m wide, and 4.0 m deep at its deepest but about 3.0 m deep elsewhere. Its roof shows some columnar features although apparently below the upper columnar flow. The rest of the ledge was in irregular basalt. It was not possible to free climb into this recess. The two pockets below the ledge were each about 2.0 m wide and 1.0 m deep, cut into vertical ash at the separation layer about 1.0 m above ground level.

Beyond this promontory, the 15-20 m wide ash shelf continues at the base of the cliff with a wide area of shallow water between the shore and shoals to the west. 40 m north, **Rock Shelter 6** (NM 32430,35834 surveyed by Tony Boycott) is a small recess in the columnar material 2.4 m wide, 2.7m deep and 2.5 m high with an adjacent ledge, 20m to the south, 4 m wide, 2.3 m deep and 1.0 m high. Both these features are 10m above Mean Tide Mark. Further north, **Rock Shelter 7** (NM 32462,35860 surveyed by Tony Boycott) consists of three linked areas of undercutting, the largest (to the north) 7.0 m wide, 6.0 m deep and 2.0 m high. The deepest part is a smaller 3.0 m wide recess at a slightly higher level with most of the hole only about 3.0-4.0 m deep. The other two holes immediately to the south and about 1.5 m lower have a combined width of 5.5 m and are both 3.8 m deep and 2.0 m high. All three holes are eroded into the lower entablature - which shows the bubbling suggestive of water being present at the time of the flow - although there are small sections of columnar features (possibly the top of the lower entablature layer) below the largest hole.

Sixty metres north of these small holes, Pistol Shot Cave (previously Un-named Cave 3) and Gunshot Cave

(13) ‘Ossianic Endeavours’, p. 49.

are larger features cut into the cliff [14]. **Pistol Shot Cave** (NM 32493,35902 re-surveyed by Tony Boycott, 10 August 2006), smaller and south of Gunshot Cave, is a wide but shallow cave, 5.5 m wide, 7.4 m long and 3.3 m high, cut into the ash layer, a rounded undercut with a 'beach of rounded rocks, cobbles and pebbles exposed at low tide'. It is possible to climb over the mouth of the cave to Gunshot Cave although cormorants nest in crevices above the entrance.



Gunshot Cave (N M 32504,35915 re-surveyed by Tony Boycott, 10 August 2006 [15]) is a 56.5 m long, 3.5 m wide and 11.7 m high passage through both the basalt cliff and the ash below. The entrance - an inverted v shape between steep sided walls emphasised by a long, open channel seaward - leads through two tidal pools over rounded rocks, to a slightly wider (6.1 m wide by 6.0 m high) inverted v-shaped chamber, 29.0 m into the cave. This chamber is slightly rounded initially but becomes triangular as it diminishes towards its end. The floor is covered in smaller rocks and pebbles as well as some larger boulders. Some short and narrow rifts appear in the south wall. A steel float blocks a 1.0 m by 1.0m passage at the end of the cave. Cormorants (or possibly shags) occupy the entrance and sponges, barnacles and laminaria inhabit the floor of the cave. The cave's steep sides extend out as the sides of the open channel and are almost vertical with no handholds making it necessary to walk to the water line and swim/wade back before entering the cave or crossing the cave mouth. Beyond Gunshot Cave, the ash shelf slopes steeply rising at 40-60º to the foot of the basalt cliff about 10 m above the shore although the ash shelf falls away towards the north of the island.

At the north end of the cliff, the columnar basalt is below water level even at low tide. The rebate in the cliff at the northwest corner of the island, previously marked as Un-named Cave 4 has been closely examined and despite what is claimed by the Ordnance Survey, it has been confirmed that there is no cave at this location [16].

The exposed rock shelf on the north shore of Staffa, a raised beach above high tide level, is formed largely from the irregular basalt columns of the lower flow. The upper flow, seen on the cliffs elsewhere, is missing leaving a steep escarpment southwest of the raised beach. Four large fissures, one previously used as a land

(14) There was some confusion in reporting the 2005 survey. This reversed the names of these caves attributing the location and description of Gunshot Cave to Un-named Cave 3.

(15) 'Ossianic Endeavours', p. 49-50; The previous GPS locations were estimated from the cliff above and the cave's details and dimensions estimated by eye. The current dimensions were accurately measured with tape, disto and clino.

(16) 'Ossianic Endeavours', p. 49 - the small rock bridge, in the crevice to the north, was also described previously, as was the small island. Eilean Dubh.

ing point for small boats, cut the relatively flat foreshore. Only one fissure ends in a cave, located near the east end of the raised beach.

North Shore Shelf Cave
Photo: John Crae

North Shore Shelf Cave, previously called **Un-named Cave 5** (NM 32716,35867 surveyed by Tony Boycott [17], is cut into the lower columnar layer and entablature near the waterline. To the northeast is **North Shore Shelf Eyehole**. This tiny crevice links the main cave inlet with another branch to the north. Between the cave and the eyehole, there is a narrow open passage. The whole area is flooded at high tide but at low tide, the floor of the cave can be reached by climbing down either in the narrow open passage or at the side of the eyehole. The basalt floor of the cave and the main inlet is thinly covered by rough white sand (with black specks). The north inlet has a rock/cobble beach. The lower columnar flow can clearly be seen to the southeast of the cave. Several narrow but deep crevices are cut into the rock east of the cave as well as deep holes eroded by wave action grinding boulders within tidal pools.

East of North Shore Shelf Cave, the basalt shelf slopes down to sea level and the upper level of the basalt cliff is again exposed. Between the upper and lower lava flows, another separation layer appears consisting of several thin layers of a soft ashy material. This has been undercut by wave erosion but not to any depth. Although impossible to traverse around the short stretch of cliff to the promontory to the east, it is easy to swim to where climbing back out of the water is possible.

Inchkenneth View Cave
Photo: John Crae

Beyond the point, on the east coast, is **Un-named Cave 6** (NM 32763,35783 surveyed by Tony Boycott [18]). Re-named **Inchkenneth View Cave**, the rounded entrance of the 9.0 m wide, 29.0 m long and 5.3 m high passage looks out across the Sound of Ulva to Inchkenneth and Mull. The cave is located between two protruding points of irregular basalt and the steep sides make it difficult to climb to the entrance without going farther out and making swimming back necessary. Inside the irregular basalt is broken into large boulders lining the floor of the cave.

South of this cave, the irregular basalt continues forming a steep but climbable shelf at the base of cliffs at Meallan Fulann and a small pinnacle has formed just off shore. Further south the basalt shelf reduces but at extreme low tide a shelf of horizontal polygonal basalt is exposed. This shelf continues in one form or another along the east coast. As a horizontal shelf, it forms shoals visible as far as Clamshell Cave where it rises into the cradle-like hollows north of Clamshell Cave.

Un-named Cave 7 (NM 32757,35744), which has been re-named **Fan Cave** reflecting the columnar feature south of the cave entrance, has a floor formed from this material although rounded stones collect in the 15.0 m long passage. The fan is part of the same columnar flow, curving up into the basalt of the entablature above. The 8.4 m wide, 7.5 m high overhang enclosing the fan quickly narrows 1.5m in to a 4.3 m wide, 3.0 m high opening, which in the cave widens to 5.6 m before the roof curves to meet the floor. Above Fan Cave another separation layer of ashy material 1.0-1.5 m thick can be seen marking the base of a third lava flow. This

(17) 'Ossianic Endeavours', p.49; Previous GPS location estimated from cliff above the cave.
(18) 'Ossianic Endeavours', p.48; Previous GPS location estimated from cliff above the cave.

rises to the north disappearing above Inchkenneth View Cave and falls to the south.

Beyond the next promontory, also part of the horizontal columnar flow, is **Un-named Cave 8** (NM 32753,35717). 6.3 m wide, 9.0 m deep and 7.8 m high, it is formed in the same basalt as Fan Cave but here the flow is more irregular breaking down into short poorly defined facets running in random directions. The basalt shelf forming the floor of the cave is covered in small rounded rocks, cobbles and pebbles. This cave has been re-named **Uamh na Fulann** or **Seagull Cave** after the hill above [19].

South of Meallan Fulann, close to Goat Cave and the adjacent rock arch, the 20 m high cliff appears irregular. The basalt of the lower entablature [20] merges with the separation layer and a short columnar layer above - possibly an indication of considerable erosion between lava flows. Above the lowest layer but below the small and irregular columns of the middle lava flow, there is a diagonal rift in the cliff face (NM 32760,35585). At 45º, following the slope of the cliff, an 8.0 m wide, 5 m deep and 1.0 m high overhang rapidly closes to 4.5 m wide. Due to confusion in the numbering system during the 2006 survey, this was referred to as Un-named Cave 9 but should more properly be called **Rock Shelter 8**.

Goat Cave and its adjacent rock arch were recorded in 2005 so little needs to be said. However it should be clarified that both the north opening (previously Un-named Cave 9) and the south opening (previously called Goat Cave) are considered by the Ordnance Survey to be the same cave and should therefore be called **Goat Cave**, North Chamber (NM 32752,35535) and South Chamber (NM 32682,35525). The rock arch (NM 32719,35565) is a separate feature. A possible eyehole in the gulley, to the south of Goat Cave, proved to be non-existent [21]. Goat Cave and the rock arch are both formed above the 100-150 mm deep separation layer also seen at the north shore and seem largely to be in irregular basalt. Columnar basalt only appears in isolated areas (within the rock bridge and at the mouth of Goat Cave North) as short columns with small cross sections. The separation layer forms an undercut within the rock arch which bangs when the tide is at the right level (one possible source for the banging attributed to Gunnar Mor although other features on the west coast produce the same effect).

Gurgle Passage

Photo: John Crae

Although there were no other caves on the east coast of Staffa there were some other interesting features. South of Goat Cave, level with the separation layer, there is a small plateau formed on the upper surface of the irregular basalt. **Gurgle Passage** (NM 32705,35545 surveyed by John Crae and Tony Boycott, 9 & 11 August 2006) off a wide circular tidal pool cut into this, is 0.6 m wide, 8.8 m long and 2.2 m high although it is not a cave as for most of its length it has a narrow 0.1 m wide rift open to the sky. It narrows to nothing at its far end where a 0.5 m stretch is closed over and at high tide waves gurgle through a 0.3 m by 0.1 m blowhole.

A similar feature, **Sponge Passage** (NM 32696,35482 surveyed by John Crae and Tony Boycott 9 & 11 August 2006) can be found on the east face of a rocky tidal island at the foot of the gully leading down from the east sheiling (see map). A high-level crevice on the north face of the gully appeared to have an opening at its far end. This was investigated but went nowhere. The tidal island shows signs of irregular basalt at its base, a plateau at the level of the separation layer and columnar cliffs above. A 1.9 m wide, 10.2 m long and 3.5 m high passage narrowing to 0.6m at its far end, has vertical sides and an opening above which narrows from the full width of the passage to 0.1 m at the far end. The walls of the passage are home to orange and

(19) 'Ossianic Endeavours', p. 48 - for translations of 'Meallan Fulann'

(20) The lower entablature here would seem to be the same layer as the upper entablature at Float Cave

(21) 'Ossianic Endeavours', pp. 47-48

green sponges.

Between the sheiling gulley and the major rift which separates Meall Gamhna from the rest of the island, another fissure has been cut into the rock face. This opens into a short ravine running parallel to the coast. At its south end, this ends in a vertical rock face but to the north, it forms a small hanging valley over the rock shore. Although potentially a cave site, no openings were found, however the remains of a dry stone wall, several steel beams and pieces of bituminous roofing felt suggest this may be the site of the 1960-70s rescue hut.

Sponge Passage
Photo: John Crae

At the east end of the major rift crossing the island, a short gulley, enclosing a grassy slope, leads up to a v-shaped undercutting (NM 32595,35350), 5.0 m wide, 0.4 m deep and 0.5 m high. This is too short to call a rock shelter much less a cave but a longer passage may exist below a roof collapse (now the grass slope).

Between the major - island crossing - rift and the jetty at Clamshell Cave, the shore consists mainly of columnar basalt rising in curved columns following an s-shape - rising vertically at the shore, sweeping horizontally (and hollows at the scalloped features called the quarry) and returning to vertical at the top of the cliff. Where the columns have been eroded at the shore this forms a relatively level shelf at or below sea level and a vertical face of polygonal sections. The twisted columns above continue to Clamshell Cave and beyond straightening further to the south to form Fingal's Cave lava flow.

Completing the circumnavigation of the island and having plotted most of the cave features on Staffa, a few points remain which have to be resolved. The upper levels of Clamshell Cave, MacKinnon's Cave amd Cormorants' Cave have still to be explored. This may not require a major expedition but permissions for bolting will be required from the National Trust for Scotland and nesting birds may prove an unsolvable problem. The geology of the island still needs to be properly investigated (although the proposed Cambridge University expedition in 2007 will help) and the flora and fauna of the islands should be studied. While not strictly within the remit of speleological research, groups studying these subjects will require assistance accessing the caves and perhaps the assistance of GSG members or other cavers will be required.

From the Archives: (*GSG Bulletin, 2nd Series 1(1) (1974) pp 27-28*)

HELLOT HOLE

Casterton Fell Westmorland

By Alan L. Jeffreys

(Being a long-winded discourse on next to nothing).

There are several small (and not so small, *cf* Bull Pot of the Witches) cave systems occupying the western flanks of Casterton Fell, owing their origin to proximity to the Dent Fault. Restricting one's imagination to an upstream limit in Aygill Caverns, this perhaps neglected end of the 'three counties' system still holds many problems. Linking Aygill to B.P. of the W. via a long sump appears practicable, but a high-level route, presumably via Casterton Pot, would be more satisfactory. The search for a similar system into Lancaster Hole from B.P. led to the opening of Gale Garth Pot by the Red Rose. Constructive use of the Provisional I.R.A. in Burnett's Great Cavern, B.P., and the northern choke of Gale Garth Pot would probably yield good results, and should be attempted.

Following the line of Gale Garth south-east, one encounters Hellot Hole, lying near the pathway wall in a group of shakeholes about 200 metres south of the Cow Pot style. This pot, opening under a lump of clinty limestone, was first descended in September 1946 by the now famous explorers of Lancaster Hole (1) the weekend before that momentous find. Naturally, interest waned quickly over Hellot and today it is not the most frequently visited hole.

Fired by a note in a R.R.C.P.C. Journal (2) which suggested that bang could open a terminal constriction, and bang being a plentiful commodity in the Group just now, we resolved to convert Hellot Hole into a huge linking cave system sprawling under western Casterton Fell.

At about midnight on Friday 17th May [1974], returning from an exploration of Pegleg Pot, five members laddered the shaft and commenced operations.

Initially John Tillson, first man to descend, had queer thoughts about the pitch's narrowness, but these proved unfounded, and 18 metres of ladder provided a technically enjoyable climb amidst eroded flakes and fissures, a good half of which is free-climbable. At the bottom the topography departed somewhat from the Red Rose account. We had expected to find about five metres of good-sized phreatic passage. Instead (excluding the part actually under the shaft) the place rapidly diminished in both directions along the joint in which the cave lies. To the left, facing the ladder, a most horrid belly-flop through water and aqua-mud led upwards into a rubble floored, rising rift. This gained height and the top end is said to correspond with a small shakehole near the cave entrance.

Following the right-hand route, a downward sloping pile of rocks turned immediately sharp right into a phreatically enlarged cross-joint. About two metres on, another joint, parallel to the entrance passage, abruptly ended the cave. This was the impassible rift where bang might 'yield results'. Although it apparently takes whatever water flows into the place, its width (about 10 cms) and general appearance leads me to consider it a complete write-off. Things are not made any easier by the fact that spoil from a dig on the opposite side has been thrown into it, obscuring the fissure at floor level. This dig follows a roomy phreatic tube completely sealed with thick hard mud and looks like a demoralising navvying job.

We found nowhere worth banging in Hellot Hole. Its base depth, corresponding roughly to the end of Gale Garth Pot, is about 70 metres immediately above Montagu South Passage in Lancaster Hole. It appears to be a late vadose inlet which by happenstance has opened out a section of sediment-filled phreatic passage from some other hydrological system.

In conclusion, Hellot Hole displays a minute fragment of old phreatic cave, seen in larger scale in such places as Gale Garth and Pegleg Pots. Undoubtedly extensive amounts of deserted cave lie at a depth of 20-35 metres under this lower section of Casterton Fell, although it would seem that much of it is completely filled with mud. We can only hope that present-day vadose drainage will have entered key parts of it and washed this sediment away.

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References:
(1) Taylor, R.W. (1947) The Discovery of Lancaster Hole. BSA 'Cave Science' Vol.1 No.2, p.34.
(2) (Cready, D.) (1972) Take Two Caves. Red Rose Cave & Pothole Club Journal No.6, p.21.

Postscript:
In the thirty odd years since I wrote that piece, it is instructive that little or no successful digging has taken place on south-west Casterton Fell, ie: no new caves. The network that comprises Pegleg Pot occupies some of it, indicating that there is cave to be found here, and now that technology has provided us with efficient methods of drilling and spoil removal, a fresh assault on Hellot Hole might pay dividends. After all, "Caves be where you find 'em"!

Goon

MINE SITES IN SCOTLAND

By Alan L. Jeffreys

It seems likely that NAMHO (the National Association of Mining History Organisations) will hold their prestigious annual conference in Central Scotland in 2008, and members of the Group will be called upon to act as guides to popular mine sites - the GSG being a member society of NAMHO.

It may be well known to ourselves, but certainly not to visitors, that Scotland possesses a huge number of old metalliferous mines and limestone quarries. In 1968, the Glasgow Spelaeological Society published, in part 4 of their journal, an attempt to provide a catalogue of all mines known to themselves but, apart from their own work around the Greater Glasgow district, this list is woefully lacking in references to workings in the east of Scotland. Significantly, earlier issues of this same journal itemise many mine levels in Leadhills and Wanlockhead that are now completely inaccessible due to local authority 'landscaping'. Even within the relatively short life of our native caving clubs, documents have become valuable historical reference material!

I have suggested that, given the long-defunct nature of the Glasgow S.S., we undertake a revised edition of their journal catalogue, adding in as many other sites as we can provide information for. As mentioned above, the intervening 40 years will have taken their toll, and most of the original references will need revisiting to confirm whether access is still possible. A preliminary list, taken from the journal, is reproduced below. Members at a loose end could help enormously by taking on some of these, and also GPS'ing all our old favourites like Levenseat, Cults, Ninelums, Bowden Hill etc etc.

Aberfoyle: Barytes Mines 3km S.W. of Aberfoyle Station and Gartloaning Mines 600 metres N.W. of Gartloaning Farm.
Afton. Lead mines at NS 624006
Auchalton Lime Works NS 330040 (mines flooded)
Auchenlongford Haematite Mine NS 602299
Balgreggan Limestone Mine NS 348048
Bannockburn Limestone Mine NN 766906
Barjarg Limestone Mine NX 822903 (may be typo for NS)
Barraston Burn Level NS 602758
Benston Lime Works NS 581158
Blairmore, near Strone: lead mines 186834
Bridgend Limestone Mine NS 350456
Bridge of Weir Limestone Mines NS 404656
Carnshalloch Limestone Mine NS 408100
Carsphairn Iron Mine, 4 km west of Carsphairn
Carswinning Copper Mine NS 282530
Cessnock Limestone Mine NS 510356
Clonbeith Limestone Mine NS 336455
Corrie Limestone Mines, Isle of Arran
Craigdullyeart Limestone Mine NS 664155
Craigman Graphite Mine NS 541125
Darnley Limestone Mines NS 524588
Dunaskin Ironstone Mines, Waterslide approx. 450087
Duntocher, flooded levels NS 490725
Eaglesham Barytes Mines NS 569462
Gass Water Barytes Mine NS 670213
Gateside Limestone Mine NS 370536
Glencrerran. Old copper mines on hill behind post office
Glen Sannox Barytes Mine, Isl of Arran NS 008452
Goldcraig (Crofthead) Limestone Mine NS 318447
Gourock Copper Mines NS 250762
Guiltreehill Lead MInes about NS 356108
Har Hill Antimony Mine NS 657105
Howwood-Tor Bracken Limestone Mine NS 409601
Inchgottrick Limestone Mine NS 414337
Inchinnan (small mine) NS 480696
Kaim Copper Mines, Lochwinnoch NS 348613
Kerelaw Limestone Mine NS 270430
Killoch Limestone Mine NS 514315
Kirkcudbright (se vol.3 of the journal for these)
Lannielane Lime Works NS 313018
Lennoxtown, complex of shaft workings near the town
Linn Caves Limestone Mines NS 590755
Lylestone Mines NS 324464
Mansefield Limestone Mines NS 640146
Millhill & Charleston Limestone Mines NS 930419
Muirshiel Barytes Mine approx NS 650290
Nethan Crags NS 818466
Nutberry Hill Lead Mines NS 744329
Queenzieburn Limestone Mine NS 684784
Rotten Calder, East Kilbride NS 655519 & 658538
Sandwick Lodge, Shetland. Ironstone Workings
Sevenacres Bauxite Mine NS 347455
Smithstone, Kilwinning NS 279455
Spearsbridge Drainage Level NS 547591
Stair Honestone Mines NS 436236 approx
Strathaven Area Limestone Mines NS 620394; NS 728460; NS 739460
Strontian Lead Mines
Thorntonhall Limestone Mines NS 594547
Todglen Limestone Mine NS 344046
Toward Talc. Mines NS 144688
Treesbank Limestone Mine NS 430330
Trochain Limestone Mine NS 377098
Waulkmill Glen drift mines NS 522580
Wiston Limestone Mines from 93130309 to 925320
Woodhead Lead Mines, 3km west of Carsphairn

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