

S.H.S Report 1972
Part 2 (Picture from centre spread. Greg Surrel)

PART II

ARCHAEOLOGY

SANDHILL CROFT, MUCKLE ROE — O.S. Sheet 2. 304657

An early nineteenth-century building, with two attic bedrooms, surrounded by the usual barns and a byre. Occupied until recently it was possible to list the more interesting contents. Having visited the reconstructed croft, meticulously done by the County Museum, it was clear that some of the items at Sandhill would be of significance to the professional collector.

Inventory:

Canole lantern diameter	Leather Sieve 20"
27" Awl	Box bed
Work bench	Metal ploughshare
Shelves	Lobster-pots
Rush basket	Spinning-wheel frame
Adze	Leather lid 30" diameter
Dumper mallet	Rush and rope basket
Dressed seal-skin	Cast iron copper

Inpress:

1. National Insurance Card 1940. L. Murray, Pinchdyke, Nethesta, By Brae.

2. Letter from Scottish Land Court, March 1939. Lawrence Murray, Hams Voe, By Brae.

3. Receipt for 1939:- Nov. 11. To Rent Croft £10.

Dec. 11. By Cash £10.

from: Trustees of Thomas M. Adie Horrible creditors in possession

of Busta Estate.

4. Receipt for 1942 to Miss G.C.H.I. Scott of Busta £10 from Busta Estate Office.

5. Receipt for 1941 as 4 add. B.P.M.I. Scott

6. Receipt for 1945 from The Hon. William Fraser of Burta £10.

7. Receipt for 1936 to Rent Croft £2.15 Hillfence 2. from Trustees of Burta Estate.

8. Certificate of Exemption from Duty. Dogs 29 October 1945

9. Receipt from Irvine and Hughton. Brae.

to Fences to 27.11.36. 6 shillings.

10 Holographic Receipt for I.Murray, August 24th 1942

E5.10 from Mr Charles Williamson, Loch Roe for
8 sheep and 7 lambs.

11 Notice of Hearing Applications for Common Grazing.

Edinburgh. 24th June 1939. Land Court to
Laurence Murray app.No.4526 Form 26.

RAY WINTER

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AIRD BHEAG, 1872 A Sociological Report

(retrospective)

Despite expeditions to Aird Bheag in the past, nobody seems to have thought in terms sociological about the settlement before. What could life have been like here in 1872? Who lived here? What did they do all day? How did they survive let alone prosper and where are they all now? These questions were posed to the interested group and prompted several imaginative reconstructions, the surveying of the ruins, and the Parrott excavation six feet deep in search of human bones in a possible graveyard site. (How were we to know it was Megalithic rather than Victorian?)

Subsequent research has revealed no direct mention of the settlement at Aird Bheag, but *I* found some information on the Parish of UIG and the life of its inhabitants. The oldest detailed map of the area dates from 1892 and shows the village to have four buildings, and the road from the pier to continue on through the village and over the hill to the mouth of the river Tamanavay. It must have been similar twenty years earlier.

In 1845 the Isle of Lewis was bought for £190,000 by the young millionaire James Mathieson. He was later to spend in excess of half a million pounds on the island attempting to improve the social conditions and the destitution of the people – but in the end many of them were to emigrate.

In 1836 the New Statistical Account of Scotland was published providing a fairly accurate detailed description of the land divided by its parishes. The Parish of Uig (a solitary place) it describes as *'the most mountainous part of Lewis. The soil is partly clay and principally mossy and is everywhere*

capable of producing forced crops with the assistance of seaweed manure. It even goes as far as recommending roads to be built to the outlying farming communities (of which Aird Bheag would have been a good example) to facilitate the liming of the soil to increase the agricultural potential of this area, and the education of the natives. As if to add weight to their case they went as far as calculating the surface area of each parish and the area within each parish under cultivation, so that Dig compared very poorly with every other parish in Ross-shire with only 2840 acres cultivated in the total area of 91618 acres. This account also describes the livestock *'black cattle and sheep and horses of the small Highland type often not much larger than dogs.'* These had been in the parish for ages, and it was at this time that *'the recent immigration of flocks of Cheviot and Black-faced sheep'* were proving themselves capable of withstanding the hardest Hebridean weather, and becoming a profitable business.

Kelp was the only manufacturing industry in the parish and was in dire trouble. In 1840 in Harris the 78th Highlanders were summoned to remove sub-tenants from the area when the Proprietor found he was paying them £2.12.6d. per ton for kelp they were harvesting while the market price had slumped to £2.10.0. in Liverpool. (In 1810 = £20 ton).

By 1871 the population of Lewis was 23,483 of whom 11,000 were on the Destitution Fund, and the emigration which had occurred in large numbers had not controlled the population explosion *'because people were marrying younger and were much attached to their native country, living also to great age.'*

Life at Aird Bheag one hundred years ago is now easy to complete. They were deeply religious people often without formal education or religious guidance, who worked hard on the land cultivating lazy beds to produce potatoes and oats. They lived in thick-walled 'black' houses which typically they shared with their domestic animals. They had a central peat fire for cooking and heating, the smoke often finding its own way out through the thatched roof. They were fishermen too, although none could swim, and doubtless had illicit stills which would be used as required.

It was a truly hard life and they can have had few amusements. Every member of the family team would have their own contributions to make to the running of the family unit and the provision of essentials, e.g. clothing.

Most of these people were cleared off their ancestral homes by their chieftains and landlords to make way for the greater profits of sheep farming. Many drifted into the big cities and the industrial revolution to earn a living. Many others congregated at the docks to await an emigration vessel. Frequently a whole community would emigrate together to Canada or even Australia, leaving behind the old and the infirm. This process continues to this day, so fewer and fewer young people are returning to the Isles where they were born, once they have sampled the easy life of city folk today, and been trained in special skills they could not use at home. Who can blame them? Can we help them?

KEN HUNTER

A MEGALITHIC MONUMENT - (perhaps) - LEWIS

An exciting discovery was made towards the end of the expedition when we found what may turn out to be a Megalithic Stone Circle on the point close to the campsite.

It was initially noticed as a series of small stones that appeared to form a circle around a series of bumps in the turf. We, therefore, removed some of the turf very carefully, made a survey of the stones, and then plotted them very accurately. We were somewhat limited in what we could do since Dave Vale, who knows more about megalithics than anyone else on the expedition, had already had to leave early, and we were afraid of doing any damage that might hinder later investigations. Nevertheless, the results were fascinating:

a) We found six stones, all of which lay on a circle, the diameter of which was 22ft. One of the commonest megalithic formations is a circle of diameter 8 megalithic yards, of 21.76ft.

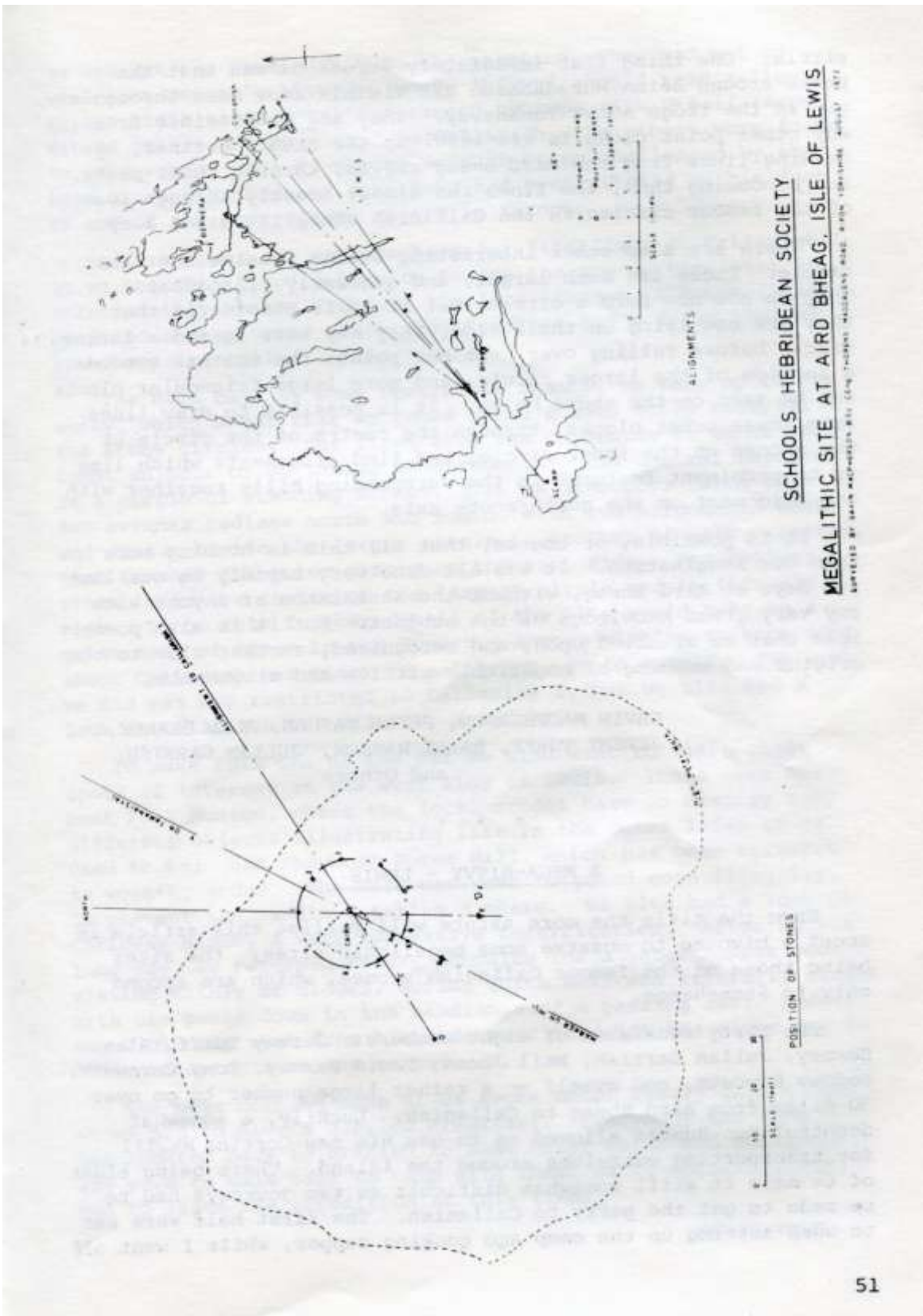
b) If it is assumed that originally there were nine stones on the circle, then these nine, including the six we found, were equally spaced around the circumference.

c) The nine stones were arranged to form three equilateral triangles. The side of these triangles is 19ft. 19.04ft is 7 megalithic yards.

d) The series of bumps in the turf turned out to be caused by an area, approximately 9ft x 7ft of small stones just under the turf, which could conceivably be a chamber or cairn. The highest-point of these stones was the centre of the circle. They were entirely contained within the circle, but were not symmetrical about the centre.

It was also interesting to consider the position of the circle. One thing that immediately struck us was that the peaks around Beinn Mheadhonach are visible from here through a gap in the ridge above Tamanavay. They are not visible from any other point close to sea-level in the area. Further, by drawing lines from the Aird Bheag circle, through these peaks, and producing them, the lines run almost exactly through four of the famous circles in the Callanish area, 14 1/2 miles away.

Megalithic site at Aird Bheag.



There are also other interesting stones outside the first circle. These are much larger, and generally triangular. They do not now form a circle, but if it is considered that they are now lying on their side, they may have formed a larger circle before falling over. At one point, the sea has eroded a section of the larger circle, and more large triangular blocks can be seen on the shore below. It is possible to draw lines from these outer blocks, through the centre of the circle or the stones on the inner circle, and find alignments which line up to prominent features in the surrounding hills together with one alignment on the north/south axis.

It is possible, of course, that all this is nothing more than our imagination. It was all done very rapidly in our last two days at Aird Bheag, without the assistance of anyone with any very great knowledge of the subject. But it is also possible that we stumbled upon, and recognised, another clue to the origins and meaning of megalithic circles and alignments.

GAVIN MACPHERSON, PETER TATHAM, ALAN BEANEY, JEREMY
TURFF,

BARRY WATSON, JULIAN GARRISH, and Others

A MEGA-BIVVY -LEWIS

From the title the more astute will realise this article is about a bivouac to observe some megalithic sites,- the sites being those of the famous Callanish stones, which are second only to Stonehenge.

The party consisted of eight members: Jeremy Turff, Alan Beaney, Julian Garrish, Neil Jones, David Barney, Tony Carnwath, Rodney Fawcett, and myself - a rather large number to go over 30 miles from Aird Bheag to Callanish. Luckily, a somewhat doubtful Ken Hunter allowed us to use his new Cortina Mk.III for transporting ourselves around the island. There being eight of us made it still somewhat difficult as two journeys had to be made to get the party to Callanish. The first half were set to work setting up the camp and cooking supper, while I went off to collect the remainder.

In the meantime, they had met up with Alan Evison's bivvy – where 'bivvy' should read a 'luxurious night in an hotel!', arranged by Rupe with Uigail (Expedition joke!) On my return to Callanish, the others were found to have supper well on the go despite being challenged by the head gamekeeper because our tents had been pitched within feet of one of the best salmon rivers in Europe.

After supper, we went to have our first look at Callanish 1, as we thought it would be nice to see the sun setting over it. Unfortunately we arrived just too late, though in compensation we found a shop open, where real tomatoes and a fresh-loaf of bread were purchased.

The next day, by some remarkable chance, we were up fairly early, which meant that we could spend a good while studying the stone circles. Our first stop was Callanish 1, where we spent an hour or so taking measurements. The central feature is a circle of standing stones, 37ft in diameter; from this two avenues radiate north and south, with two alignments east and west. Inside the larger circle is another of 21ft diameter, that touches the outer circle on the east side. The tallest stone is in the centre of the largest circle and is 15ft 7in high. To go into further detail of the site would take up a great deal of space in the Report. Anyone wishing to know more about Callanish can refer to a library, or to myself. The work we did was not restricted to Callanish I, but we also had a look at Callanish II, III, IV, V and VII.

To make full use of the car we also went to visit other spots of interest on the west side of Lewis. These were Shaw-bost Folk Museum, where the local school have on display many different objects illustrating life in the Outer Isles as it used to be; and Shawbost Norse Mill, which has been restored to working order. The mill was used to grind corn illegally, to prevent the landlord taking a share. We also had a look at Carloway Broch, a very impressive fortification. After such a long day, we returned to our campsite for a large supper consisting mainly of midges, during which Neil was literally caught with his pants down in the headlamps of a passing car!

Rodney was violently sick from his endeavour to drink the river dry in order to catch a salmon or two.

The next morning none of us awoke until nearly 11 o'clock, so we had to have a hurried breakfast. Everybody was then transported back to Brenish to meet Peter Smith and Cullybags, who were to walk back to camp with them, as I, unfortunately, had to leave the expedition at this time.

DAVID VALE

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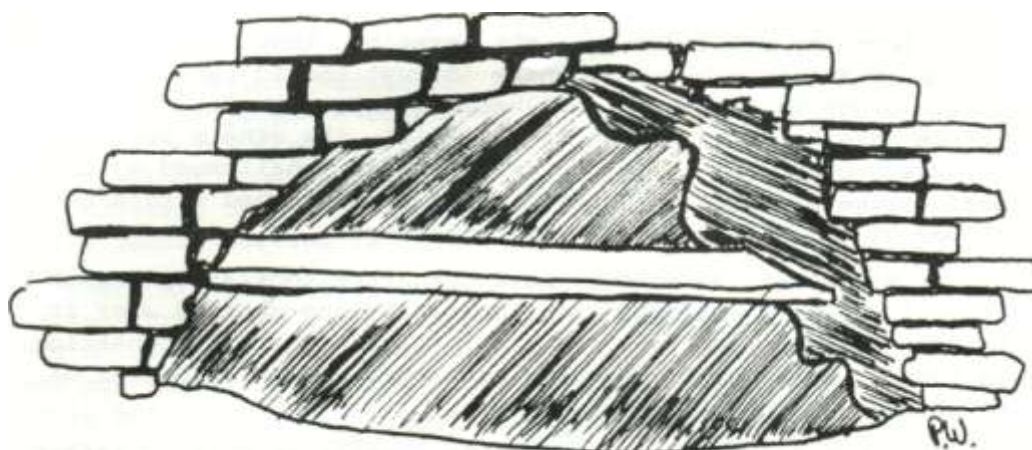


Diagram 1. OPEN-HEARTH STRUCTURE

BROCHEL CASTLE - RAASAY

The word 'Brochel' is gaelic for a 'small fortification or castle'¹. The castle itself is built on and around two volcanic plugs which helped its fortification. Also, there are cliffs on one side. The castle used to be round with a surrounding outer wall, and also there are the remains of two very small buildings which measure approximately eight yards long by three yards wide. The walls are now only about two feet high. About twenty boys have helped to uncover the walls which were covered by the bracken. From the top of the castle, if you look down, you can see the outline of where the outer wall used to run, but there are many loose rocks which have fallen from the castle - one source of information on the castle states that it was blown up in the days of Bonnie Prince Charley.

So far, inside the castle we have managed to identify, a set of steps leading up to a small room which could possibly be a 'lavortree', living quarters, a recess which when uncovered of a bed of rocks, we found a small hole leading out of the castle. Also, we have found

what could be a well, and what is like an open-hearth structure which could be either a fireplace or a bench. If the hypothesis that it could be a fireplace is correct, then the large stone slab which is across the middle (see diagram 1) would act as a 'heat ring" with the fire underneath. The hearth is surrounded by rectangular stones and has an interior made up of smaller, irregular-shaped stones. They are all held in place by means of a rough mortar which is comprised of very small pebbles, shells and a cement substance. This substance however, is very flimsy and is easy to break.

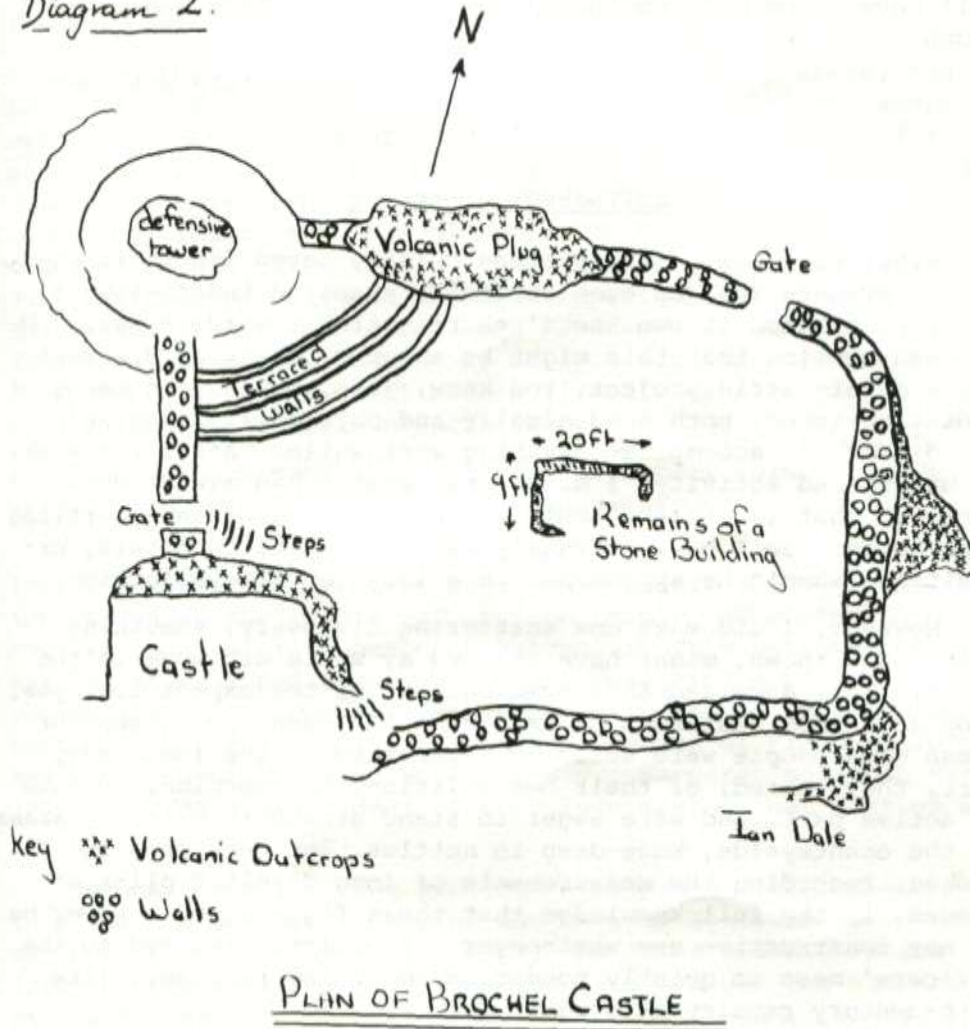
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As there is not much of the castle left nowadays, it is very difficult to see where the rooms, doors and windows used to be, but on a close inspection, we have been able to find - three doors, three rooms and five windows.

Diagram 2 shows the castle in relationship to the wall which makes use of a small hill and a volcanic plug, in its defensive policy. The wall, which enclosed a large area suitable for living in in time of siege, is very uncommon.

There is no sign of a tower on top of the hill but the top is extremely flat and has not been excavated. The volcanic plug is unscaleable so no battlements were ever built on it, yet it probably formed a vital part in the castle's defence.

Diagram 2.



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There is a steep drop from the hill to the centre of the 'Settlement Area' so the terraced walls were probably built to act as steps and also to improve the battlements by acting as a form of buttress. At the entrance to the landward side of the castle there are traces of steps, but these have not been excavated.

It is not known what the small stone building was and no traces of other buildings have been found. The only real thing linking it with the other remains is the mortar which is made of small stones, shells and a cement. One possible theory is that the building was a chapel and all the other buildings were made out of wood.

There is only one thing for certain : many more excavations will have to be made on the castle to get anywhere near the truth.

SETTLEMENT - Raasay

After four S.H.S. expeditions chiefly noted for their inactive preparation, or even carefully prepared inactivity, I was precipitated at two weeks' short notice towards Raasay. It crossed my mind that this might be an opportunity to discreetly try a quiet little project, you know, just to see if someone as indistinguished, both academically and physically, as myself could actually accomplish anything worthwhile. After two weeks of unprepared activity, I discovered what I had always suspected; that is, that I could achieve nothing of any startling importance. So I have privately resolved that, in future, expeditions should be approached in a lazy (or lacey) fashion.

However, I did make one shattering discovery, something which, who knows, might have changed my whole attitude to the S.H.S. It transpired that some members of the expedition, yes, people on whom vast sums of hard cash had been spent, some of these good people were actually interested in the idea, nay, more, they wanted, of their own volition, no coercion, to take an active part, and were eager to stand around in desolate areas of the countryside, knee-deep in nettles, and neck-deep in midges, recording the measurements of long derelict piles of stones, in the full knowledge that these figures would never be of any constructive use whatsoever. I promptly retired to the officers' mess to quietly ponder on something relevant, like 17th-century cavalry strategy.

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I still have not recovered, and have done nothing since we returned, over a month ago now, except for writing to Steve Southworth "Could you reconcile your plan of Arnish with the O.S.map?" (This is technically termed 'delegation'). But then I got this letter from Paul; well, I should write something, and so in absence of anything to write about settlement . . .

The Settlement Project was inspired by 2h separate occurrences. One - the prime mover - was the settlement on South Rona last year. I thought, foolishly, that we might do better with more material. The next seven-eighths was hearing Hugh Williams in Fort William last year recounting the extent of project work on Mingulay, and the apparent ease of completing complex projects. The remaining five-eighths is from Alan

Fowler's continual exhortations ... What does Alan Fowler continually exhort?

I had the advantage of having visited Raasay before, and so had a fair idea of what I was coming to. I therefore, envisaged a complete survey of every building or ruin north of a menagerie lion drawn from Manish More to South Screapadal. Of course, it came nowhere near completion but, in fairness to all concerned, I must take the blame for this, for not having encouraged people sufficiently. Nevertheless, some interesting work was carried out, and the most important points covered, in that Brochel, Arnish, Torran, and Fladday were mapped. Our method was to make a sketch-map of each settlement, marking the size and rough position of each building. We also classified them according to their present state:

- | | |
|--------------|----------------------|
| a) Habitable | d) Completely ruined |
| b) Roofless | e) Underground |
| c) Derelict | |

(The last category does not refer to air-raid shelters, but was introduced at the request of certain people who wanted to map molehills and similar humps at Brochel.) This part may be of use to future expeditions, who might well find a distinct change over a period of time; especially if the proposed ferry terminal is built. It might stagger members of Fladday '70 to see the present state of No.4 Fladday. Margaret and John MacLeod have put a great deal of work into making that cottage most extremely comfortable.

The next stage of the project - at present incomplete - is to produce a definitive map of the various settlements to show our work fully, and using, I hope, the 'Rona classification' (see SHS Report 1971, p.19), and then to analyse the number, size and state of the buildings in each settlement. This will result in a full-scale report which will appear by the Conference.

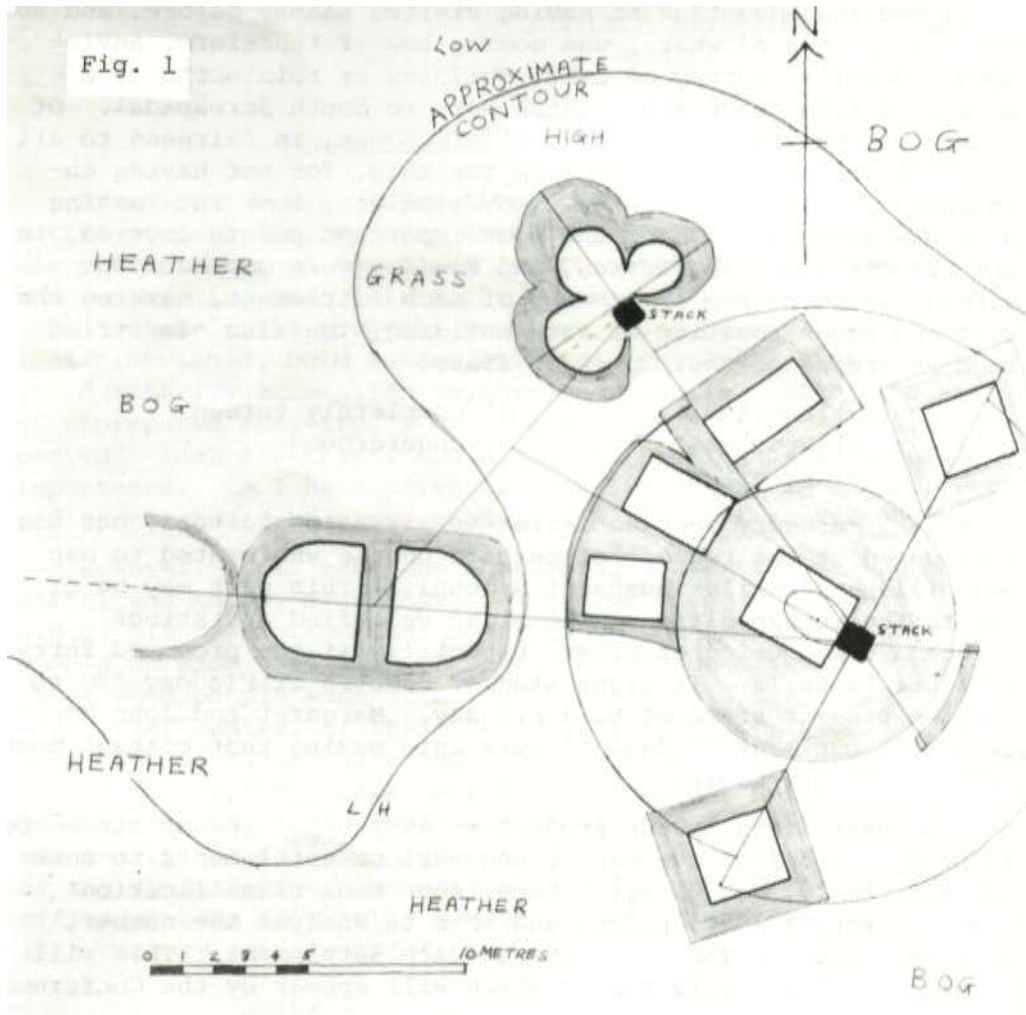
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I must publicly thank all those who showed such unbounded enthusiasm in the project: without naming names, many thanks to all of you. This year's super-prune award is, however, reserved for 'Brave Dadshaw', whose team mapped Manish More. If you happen to be on Raasay, and come upon a curious map of Manish More reposing in the heather, please forward it to this address . . .

PETER FORSAITH

NORTH UIST ARCHAEOLOGY

Unlike the case on many Hebridean islands much archaeological work has been done on North Uist before the S.H.S. appeared on the scene. This is largely due to Erskine Beveridge who surveyed almost the entire island in the early part of this century;



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and at some sites, notably Udal, his work has been followed up by more recent excavations. North Uist is rich in antiquities, dating from the Megalithic tombs of the third mil-lenium to the present day. As far as we, and Erskine Beveridge, could tell, this is as true of the Eaval region as of the more hospitable and thickly-populated regions further afield.

A sizeable proportion of the expedition took part in the 'settlement' survey, which involved detailed measurment of the croft cottage and its immediate vicinity. There were the remains of a wall, some odd outbuildings; and behind the cottage, next to where a

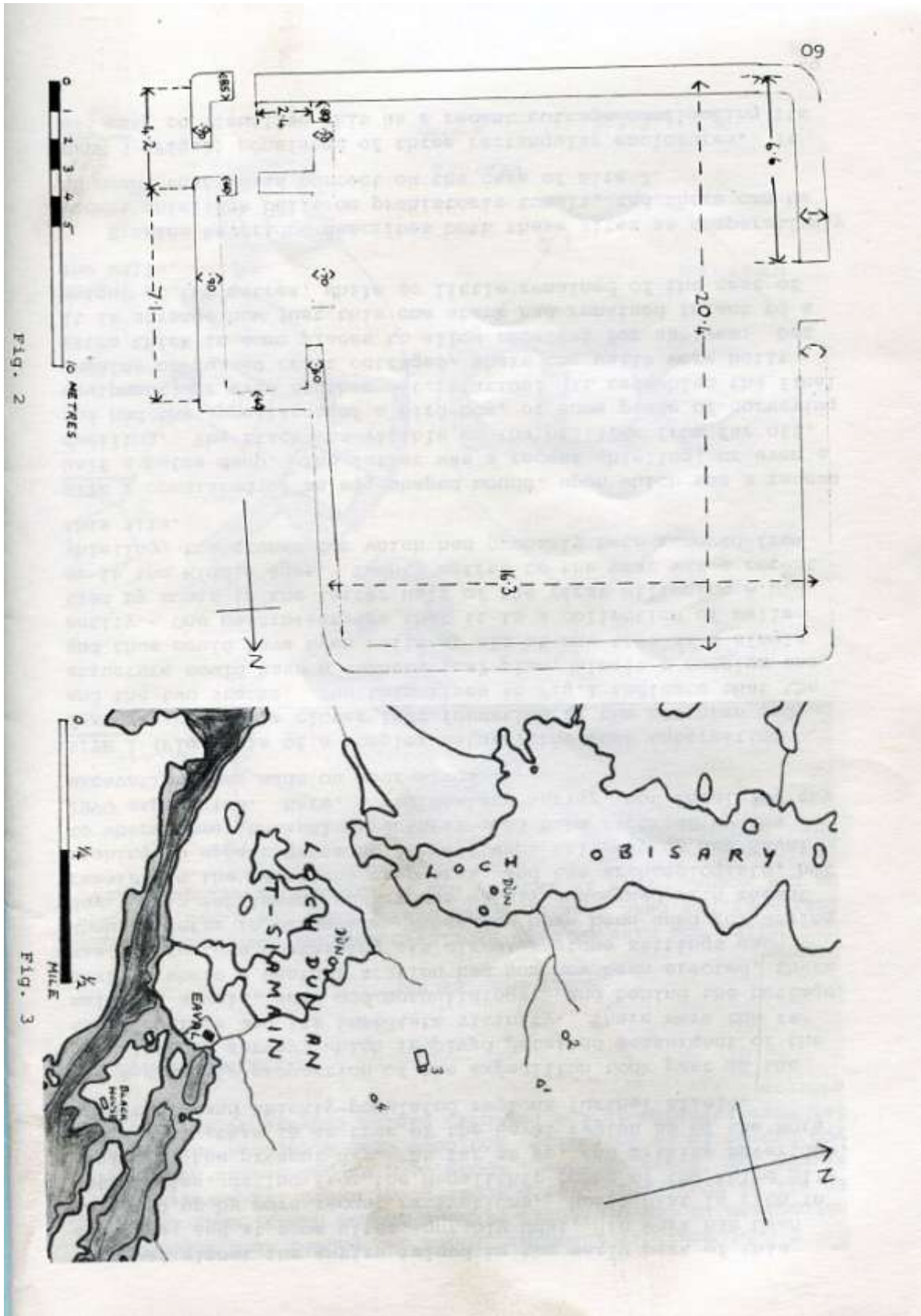
weather-station had somehow been erected, there was a structure containing six circular stone settings each about a metre in diameter. These may have been used for drying hay. This settlement survey was mainly concerned with recent remains in the immediate camp area, and the archaeologists, not wishing to appear quite so lazy(!) went half-way up Ben Eaval to where some 'unusual structures' had been reported by the 1970 expedition. Here, a rudimentary survey, not involving any excavation, was made on four sites.

SITE 1 (Fig.1) is of a complex nature, the most interesting features being the clover-leaf formation at the northern end, and the two stacks. The thin lines in Fig.1 indicate that the structure could have a mathematical plan, albeit a complex one, and thus could have been built up all at one time as a single entity. One possibility is that it is a collection of cells used by monks in the latter half of the first millenium A.D. or in the Middle Ages. Twenty metres to the west was a recent shieling, the stones for which had probably been removed from this site.

SITE 2 consisted of an egg-shaped mound, upon which was a recess half a metre deep. The latter was a recent shieling, or even a dwelling. The stack was visible on the hillside from far off, and had the appearance of a bird-box, or some piece of surveying equipment, or even another met. station! It resembled the final remains of ruined croft cottages, where the walls were built extra thick in some places to allow recesses for shelves; but it is strange how just this one stack had remained intact to a height of two metres, while so little remained of the rest of the walls.

Erskine Beveridge describes both these sites as comparatively recent shielings built on prehistoric tumuli, and there can be no doubt that he is correct on the case of Site 2.

SITE 3 (Fig.2) consisted of three rectangular enclosures. It was easy to visualise this as a recent cottage overlooking its plot of land which was used for cultivation.



Just outside the front gate was a heather-clad mound which may have been a tumulus from which stones were taken for the walls.

SITE 4 was simply a shieling. The positions of Sites 1-4 are shown on Fig.3.

STEPHEN DAVID, RICHARD LANDER, PHILIP
PARSONS,

ALEX RYBA, NICHOLAS SMITH

(This Report is part of a lengthy and more detailed document which is available in the Society files)

ORNITHOLOGY

BIRDS, FLOWERS, FUNGI and the SEASHORE - MUCKLE ROE

Muckle Roe - 'the big red island' - seemed at first glance to be one large colony of Fulmars. Almost every cliff-ledge had one representative of this, the world's most rapidly advancing bird. Interestingly, of several hundred birds observed at points as far apart as Hermaness and Sunburgh, Fanta and Lerwick, not one was seen of the Northern 'blue' form. This is in distinct contrast to James Fisher's comment in 1940 that 26% of Shetland Fulmars were of this race. Another bird that is making giant strides in Shetland is the Great Skua, although these are much commoner on Foula and Unst than Muckle Roe. Wheatears, Rock Pipits and Twites were the most widespread of the smaller birds, and there was a large colony of resident Starlings around the campsite. Stonechats, which in the similar country of Kerry (Eire) , vie for supremacy with the Wheatears, were notable by their absence.

Cormorants and Shags both breed on Muckle Roe, but in different sites, and they seldom mixed. Only one Gannet was seen on Muckle Roe, but we had the thrill of peering down through the gloom to the gannetries on Hermaness. The Red-throated Divers, common enough throughout North Shetland, had proved elusive to approach closely until we surprised a pair in the mist near Burna Firth. Perhaps the most notable of all the bird sightings, however, was a Willow-warbler only three miles from Muckle Rlugga - the most northerly point of the British Isles.

The Flora was influenced by three major factors, the acid peaty soil, the wind, and the sheep.

There were no wild trees at all, but willow, elderberry and sycamore fared reasonably well when protected from the

sheep. The extent of the suppression of flowers caused by the sheep's habit of close grazing was demonstrated by comparison of a small island on one of Muckle Roe's lochs – the Cooser. Although only 15 yards by 6, the island housed 18 species of flowering plant, compared with 7 by an area of adjacent mainland. The Flora on Unst, which has a higher proportion of cattle, was more varied, and included several fruiting heads of orchids.

We found a varied selection of the smaller Fungi – particularly the colourful Hygrophorns comians. One specimen on Unst was a particularly bright scarlet, compared with its normal orange colour. We were disappointed in finding no butterflies at all.

The Seashore, as usual, provided the greatest number of species, in spite of a relative sparsity of rock-pools. The species list here would do credit to any stretch of western and south-western coastline. Whilst only two types of sea anemone were present, the size and colour of some of the dahlia anemones was breath-taking.

In the process of exploring the coastline, a new S.H.S. seaweed record was established – 35 species. We also found two species of stalked jellyfish – *Haliclystus auricula* and *Lucernaria campanulata* – which may be previously unknown in Shetland.

All in all a rewarding and enjoyable expedition.

KEITH HOWARD

ORNITHOLOGICAL EXPLOITS - Lewis

This year on Lewis we were lucky enough to have with us two very experienced ornithologists – Julian Upton and Richard Hellier – whose knowledge was invaluable to all of us. This was particularly so on our bivouac when we saw many birds, from tiny wrens to large, graceful golden eagles.

For our bivvy, we had to get from camp to a small community known as Brenish, and on the second day we ahd to meet Ken Hunter, the expedition's doctor. We walked around Loch Tamana-vay, with our packs as our transport, in the form of the 'MAY', had been swiped by some fishermen. We made our way up a stream and spent a considerable length of time looking at two beautiful stonechats; we also made numerous stops to look at wrens.

Our bivvy-site was by a ruined croft, and having walked over the mountains, passing a beautiful loch on which we saw a dipper, we were pretty tired and were looking forward to our meal. Having washed-up and talked for some three hours, we went to bed. In the morning, we packed up our tents, and left our packs, and walked down to the road which ran along by the sea. We could see gannets and shags winging their way to the off-shore islands as well as oystercatchers calling excitedly among the rocks. Having reached Brenish we rested, and then set off for Islivig, the next village along the road. We had just set off when somebody shouted "Golden Eagle!" and, on looking round, we saw a large graceful bird flying slowly over the ground not fifty feet from the road. We rushed to a little hillock to get a better view but the bird had flown well away.

During our lunch at Islivig, an army land-rover stopped near us and the driver offered us a lift to Ardmoil where there was a store. Here, we met Ken, and after a few introductions, we piled into his car and drove back to Islivig. When Ken had changed and we had had a cup of tea with the postmaster, we set off back with Ken and his medical chest. We soon reached our bivvy-site, and collected our packs.

We followed the shepherd's path, marked by cairns, for the cloud was thickly about us. Eventually, we reached the shore, where we lit a fire and whistled. Back in camp our whistles were interpreted as a distress call and eight people piled into the boat which raced across to meet us. They were extremely annoyed to find that we were not injured or suffering from exposure and they would only take Ken and our bags, leaving us to walk. When eventually we arrived back in camp we had had two very enjoyable days in the company of the Birds of Lewis.

TIM JEANS

RAASAY BIRD REPORT - 1972

The birds on Raasay this year were many and varied and a total of 61 species were identified or heard during the expedition. The area covered by the survey was mostly on the north of the island, but also on the road to Inverarish which was used frequently as a contact with the outside world!

Perhaps the two sections of the Raasay Forest were the most fruitful area for ornithology but, unfortunately, there was no ornithologist 'occifer' on the expedition to

organise proper ornithological expeditions to these places.

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A good start was made when a male red-throated diver was seen on the loch above camp on the second day, as well as a black-throated diver out in Brochel Bay. Many other interesting birds were spotted, including a sparrowhawk, a kestrel, a short-eared owl, a storm-petrel, and several ravens.

During a wide game, three of our 'uninitiated' claimed to have seen fifteen quail, in a covey, but this is greatly disputed and it seems probable that these were really partridge.

The most common birds inland were meadow-pipits and chaffinch, as well as a lot of hooded crows. Common seabirds were herring gulls, black guillemots, greater black-backed gulls, common and arctic terns and, although spread a lot about the island, oystercatchers as well as shags.

No eagles were seen on Raasay despite the known existence of at least two pairs in the north of the island; but buzzards were seen on Dun Caan and near Brochel.

Snipe, puffin, spotted flycatcher, yellowhammer and siskin were spotted at various times and places on the island but, surprisingly, no tits were seen on the whole expedition apart from a pair of long-tailed tits in Raasay Forest, and a disputed sighting of a coal-tit.

Despite the presence of a lot of grouse droppings on the northern moors of the island, only one bird was seen, on Fladday. A very unusual bird was spotted in Inverarish by Nick King - a tree-creeper, searching for insects in the bark of a tree.

Yet more unusual was the incredible sighting of 254.62^ great auks, flying in a 'V formation at 601,597 feet by I.Notlob (Camp Fool and General Idiot).

Wrens were abundant in almost every bush on the island, quite often near meadow-pipits, and rock-pipits were also seen quite often on the rocks.

Waders were disappointingly thin on the ground, and apart from oystercatcher, only curlew, turnstone, common snipe, ringed plover and redshank were spotted. Two ringed plovers were seen foraging and wading near South Screapadal, and one redshank was seen flying above Manish

Island on the last day. A turnstone was also noticed picking in the seaweed near North Screapadal where the only snipe was also flushed from cover. Fladday and the mountains opposite it were the places where curlew were quite common.

The only nesting birds found were shags – at Manish Point and at Eagles' Cave, Fladday, and at both places one could get

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within a few yards of the birds without undue disturbance.

All in all it was a very rewarding holiday bird-wise, and although a few of the expected species were not seen, many unexpected finds were made, and despite an 'ornithological officer' not being present, we feel the project has gone quite well.

BRUIN THOMPSON and CALUM MacKENZIE

(A complete list of birds seen on Raasay is available in the Society files)

NORTH UIST ORNITHOLOGY

Any birdwatcher on the expedition was in for a good time; there were very few people who returned without an addition to their species list. Perhaps we did not see all the species we might have seen, but this deficiency was more than made up by the fine birds we did. The chief ornithological project undertaken by us was that of helping to compile the B.T.O's atlas project; for which they rely on contributions by amateur ornithologists throughout the U.K. They supply cards to be filled

in by birdwatchers, to indicate where, when and what birds were seen. In addition, they also ask whether the bird was breeding, and if so, whether possible, probable or proven.



Most of the areas to which we had immediate access, although of reasonably varied habitat types, contained similar species; thus we were slightly

limited in the number
of different

species we could see. This taken into account we did incredibly well. Apart from the occasional bivvy (which could not really go far enough) , our only chance to visit different parts of the island came with the one-day tour of the island by means of a hired coach. The only place of ornithological interest we visited was the R.S.P.B. Reserve at Balranald, on the west coast of the island. Unfortunately, we could only remain there for a matter of minutes and we were unable to contact the warden, whereas one really needed at least a day with the warden to guide you.

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Nevertheless we saw a male hen harrier – the only time during the whole time we were on N.Uist.

Perhaps the most successful event was the discovery of two Golden Eagle eyries. We also discovered considerable numbers of black-throated diver (including a bird of the year), a species which is not meant to occur (let alone breed) in N.Uist.

Our best department was, without doubt, the birds of prey, of which we saw seven of the eight that commonly occur (breed).

On the list of birds seen on the expedition by all members those

underlined were only seen on the journey to or from N.Uist.

MAX WHITBY, MURRAY PARTRIDGE, PATRICK
THOMPSON, PETER ROGERS, and JOHN KALISH.

(A complete list of birds seen on North Uist is available in the Society files)

'... just as the sun was rising'

At about half-past six one morning about fifteen of us set off on our ornithological trip along the shore line. (Before we had started we had a hot cup of coffee.) First, we saw two ravens and some stonechat, and as we moved along we saw two common gulls. They did a fantastic set of acrobatics, something I have never seen them do before. We

had a beautiful view of a kestrel hovering for at least fifteen seconds, and we noticed a rather shabby-looking grey heron.

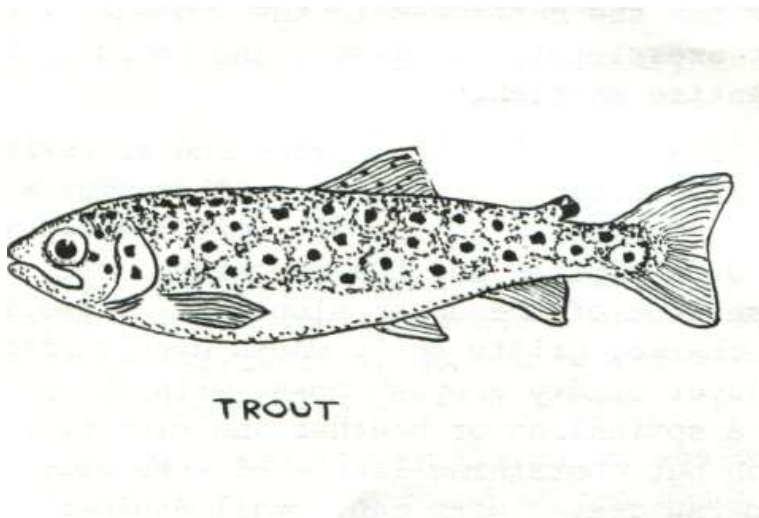
Further along the shore we saw a peregrine darting about; we saw wheatears and thrushes. Meadow-pipits and wrens were plentiful. We saw and heard some curlews, redshanks and hooded crows. I then saw a herring gull stumping up and down – this is one of their means of getting food. We saw cormorants drying their wings and beside them was a great black-backed gull. Then from nowhere a small duck dived and we never saw it again. We also saw our first buzzard. We were back just in time for breakfast.

PATRICK THOMPSON

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FISHING ON NORTH UIST

The fishing in the lochs around Eaval varies greatly. In some lochs there is an abundance of small trout around the h Ib. mark (e.g. Loch Dun). In other lochs there are a few large trout especially in a weedy dog-bone shaped loch which lies unnamed, at O.S. Ref.880597. Loch Obisary contains a fair amount of brown trout which have adapted themselves to the salt water and it also holds a vast amount of small pollack around the 2/3rd Ib. mark.



The most interesting thing about Loch Obisary is the feeding habits of its fish,

and to study these we conducted experiments, not with the usual bait of small, silvery, dark-hackled flies (e.g. Butcher, Black Fennel, Peter Ross), but with spoons or

spinners. The pollack showed a marked preference for silver baits which imitate small pollack. They do not particularly like gold spinners, imitating small trout. The same thing applies to the trout, preferring to eat pollack than their smaller brethren. This theory could explain why the general size of the pollack is so stunted. Had the pollack and trout preferred gold spoons the situation would have been reversed, with small trout and large pollack. In the 'dog-bone' loch there is a lot of weed, suggesting plenty of natural food for the trout to grow large and healthy on, not needing to eat their own kin. In the bleak Loch Dun however, the small trout will readily take a gold spinner not much smaller than themselves, showing that they are cannibal. This theory tries to show that the positioning, shape and natural vegetation can greatly affect the size of fish in that loch.

Lastly, a note that we were very grateful to the North Uist Estate for making available facilities for fishing, and that fly-fishing was considered the norm on the expedition, as requested.

SIMON ANDERSON

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BOTANY

RONAS HILL

At 1486 feet, Ronas Hill is the highest point in the Shetlands and consists of an outcrop of hard red granite which has been ground by ice into a smooth almost symmetrical cone, rather like a foreshortened sugar-loaf, whose tawny bulk is visible for miles around. From the summit, which unexpectedly is usually free of cloud, one can see Hermaness to the north; Fitful Head to the south; Out Skerries to the east; and Foula to the west - in short, the entire Shetlands.

Ronas Hill is classified as being of outstanding scientific interest on account of its arctic-alpine flora. This starts at about 700 feet on the south side, with the attractive creeping Alpine Clubmorr (*lycopodiura alpina*) and the stockier, more erect *J. selage*. The surface of the upper slopes is of two distinct types, firstly a coarse, gritty soil, whose even surface is covered by a dense layer of dry greyish moss, with dwarf grasses and sedges and a sprinkling of heather and clubmoss. Very pleasant to walk on but containing little

of interest. The second type is a coarse gravel with many small boulders, the vegetation is very thin in the unstable soil. A striking feature is that the gravel is arranged in terraces of varying width, separated by steep 18" banks of the preceding type of vegetation. Looking up the hill, only the banks are visible, giving a deceptive impression of greenery.

However, it is on the gravel and between boulders that the more interesting plants are to be found. The dwarf willow, *Salix herbacea*, abounds, with *Alchemillia mollis* and an odd succulent plantain. The northern bearberry, *Arctostaphylos alpina*, was fairly common, as was wild thyme at the very summit, which is surprisingly flat, where there were several cushions of the hill's speciality, the dwarf azalea (*Loiseleuria procumbens*).

Two other interesting features of the hill are the well preserved chambered cairn on the summit, which makes an excellent shelter, and an accumulation of wind-blown soil N.E. of the summit.

Altogether Ronas Hill is a fascinating place and invites comparison with Sneug of Foula, Shetland's only other hill of comparable size.

TIM BELL

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BOTANICAL OBSERVATIONS ON THE SAND-DUNES OF BALESHARE
(South Uist)

(Note: The area observed lies between grid lines 780 - 580 - 800 - 600 on O.S. Sheet 23)

The unspoilt sand-dunes at Baleshare provide an excellent opportunity for the study of a xerosere succession; i.e. the ecological succession exhibited as a change in nature and increase in complexity of the plant community from the unstable, shifting sand to the firmer, longer established 'grey dunes'.

On the shoreline itself, primary succession is begun by the establishment of salt-tolerant species such as marram grass which exerts a strong stabilising influence by means of its very complex interwoven rhizomous rooting system which effectively binds the sand.

The very open community consisting entirely of marram grass is known as the 'yellow dunes', and at Baleshare forms a surprisingly narrow strip 40 - 50 metres wide around the perimeter of the enclosed area of grey dunes.

Much more variety in the flora was observed in the well-sheltered areas to be found at the bases of many of the dunes (these are known as 'dune slacks'). Many of the species found here were quite common and their presence was quite surprising considering the dry conditions: e.g. clover (red and white), buttercup, daisy, kidney vetch and birdsfoot trefoil.

The extensive grey dunes with a higher humus content and ability to retain water contained many other species besides these found in the dune slacks. They were, in fact, covered in a very dense carpet containing silverwood, butterwort, viola tricolour, sorrel, hemlock storks-bill, birdsfoot trefoil, selfheal and several other species which we were unfortunately unable to identify (two of them may have been treacle mustard and wild mignonette).

It should be mentioned that the farmers on Baleshare allow many cattle to roam freely on the stable dunes, as it promotes very rich pasture. This grazing, no doubt, has a certain effect on the vegetation and probably prevents the succession from progression to its natural climax. This was especially noticeable where areas had been fenced off; the growth of many taller grasses, various umbellifers, marsh marigold and ragged robin was not prevented, these species being quite profuse in these areas.

I would like to point out that the survey which we made was

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by no means a thorough one, and that the plant communities to be found on the grey dunes were very varied and complex. The sand-dunes at Baleshare deserve a much better organised, less superficial survey than we were able to perform.

IAN SMITH

A BOTANICAL REPORT - AIRD BHEAG 1972

Two factors govern the botanical life on Aird Bheag - the underlying Geology and the overhanging Climate - but

many species remarkably survive where the animal inhabitants must find life very hard.

Geologically Aird Bheag is founded on Lewisian Gneiss which breaks through the peat cover frequently on the exposed mountainsides. It is not unreasonable to presume that in Pliocene times this area would have had a favourable temperate climate, not unlike south-west England today. During the Pleistocene period that followed there was a succession of perhaps four glacial periods separated by short interglacials, when great ice sheets formed in the Highlands and glaciers flowed down to the west across the Minch and Outer Hebrides, that now bear their scars, to the edge of the Continental Shelf where the icebergs broke free into the Atlantic.

Present climatic conditions probably began about 700 B.C. with the decline of the Sub-Boreal woodlands and the spread of sphagnum at the onset of the Sub-Atlantic period. This really was the prime remover of the Hebridean trees, and without these trees for shelter many species found protection in the gullies and the nooks and crannies of the cliffs to create in the countryside of Aird Bheag a desolate appearance, while a wealth of species persists in sheltered corners. The present climate shows little variation in temperature $47^{\circ}\text{F} \pm 10^{\circ}\text{F}$ throughout most of the year, and a steady annual rainfall of 40 - 60 inches spread over 250 rainy days is guaranteed by the prevailing saturated Atlantic south-westerlies encountering the mountains of South Lewis and North Harris.

Almost any plant that can survive these conditions and the acid soil is probably present had we only time to search it out. Regrettably, with less than ten days, any survey can only reflect the superficial glance of the scanning eye which compiles it. I spent most of my time within sight of the camp, not merely because here lay the wealth of the flora, but after my forced march from Islivig with all my equipment (a journey of at least seven miles over a 1200 ft. pass in the clouds) my blistered feet could carry me no further for a week.

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Basically, four different habitats exist for the flora of Aird Bheag:

- 1) The moorland is the single largest but varies in composition according to the drainage of the area. On the hillsides it was a mixed heather moor with purple and white ling and bell heather, cross-leaved heath, purple

moor grass, spotted orchids, wavy-hair grass, creeping soft grass, mat grass, sheep's fescue and various sedges sprouting frequently from beneath the heather cover. As one's gaze approached the more damp and acid moorland, so the heather became sparse and the sphagnum dominant. Here sundews and butterworts thrived well, nourished by the myriad midges, and bog asphodel, cotton grass and other sedges abounded. The narrow gullies frequently carved by the mountain torrents through the moor were the site of rich flora not unlike the sea cliffs.

2) The sea cliffs on the east of Loch Tamanavay provide a well-drained, shallow less acid soil and the flora there enjoys some freedom from grazing. Here honeysuckle, holly, aspen and willow trees, bilberries, brambles and bracken survive, while in the sheltered crannies several delicate species from St. John's-wort no milkwort flourish besides a variety of ferns and mosses.

3) The seashore – especially the tidal area in the bay is covered by a thick turf of thrift, silverweed, sea plantain, seablite and red fescue grass which merges often abruptly with the exposed moorland scarred by old lazy beds.

4) From the settlement the adjacent hillsides are scarred by parallel rows of green turf elevated between ditches full of sphagnum. These are the remains of the lazy bed cultivation and extended over the peninsula of Aird Slelienish. None showed any evidence of cultivation within the last ten to fifteen years, but the area they covered must have provided for a sizeable community when they were cultivated.

The settlement itself was studied fairly closely to attempt some reconstruction of the existence the inhabitants had to endure one hundred years ago. Here numerous signs of recent habitation and cultivation were found in the form of beds of nettles (excellent vintage), dock, a few wild oats, ragged robin, ragwort, dandelions, daisies, buttercups, groundsel, and even a solitary potato plant! The turf at the centre of the settlement, on which we pitched most of our tents and created the gaelic football pitch, was a very hard-wearing mixture of rye grass, sheep's fescue, meadow grass and mat grass, and supported numerous buttercups, daisies, tormentil and plantains with only a few patches of sphagnum and sedges remaining. The whole area

is a lasting tribute to the men who constructed the tunnels under the green turf and diverted the mountain burns through them to provide for the efficient drainage of the settlement area – but doubtless used them as domestic drains, too. In these channels' mosses and sedges abounded with willow-herbs, forget-me-nots and marsh penniwort.

These, then, are the botanical features of the area – all well catalogued from the 1967 expedition, but this sheds little light on the occupations and livelihood of the inhabitants of Aird Bheag in 1872 which it had been intended to do. This I shall attempt to reconstruct, with the aid of some facts unearthed by research, in the sequel Aird Bheag 1872.

KEN HUNTER

METEOROLOGICAL REPORTS

THE WEATHER - LEWIS '72

The weather station was set up on one of the rare dry days at the beginning of the expedition. It consisted of a barometer, rain gauge, max/min and wet/dry thermometers. Two readings were taken each day, one at 9.0 am. and one at 9.0 pm.

Max. Temp 19°C

Min. Temp 6.5°C

Max. Rainfall 33 mm

Max. Relative Humidity 100%

Min. Relative Humidity 75%

ALAN BEANEY

WEATHER ON RAASAY

First, the good news. Two really hot days heralded the start of the camp. This provides me with two claims for records. The first is a shade temperature of 29°C, which must be a S.H.S. record, on the day that the Very Reverend Peter (more tea?) Forsaith earned himself the title of Mr Beetroot 1972; and I claim the other record of the slowest walk to the pier – 5 hours 20 minutes, accompanied -by Donald Gillies and Steve Wilson (well, we were there before the ferry).

Now, the bad news. The rest of the camp was mostly wet and cloudy with very rare appearances of the sun. A total of 1.52" of rain fell in 9 days, and it was always humid.

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The good weather was caused by a low over Holland which brought dry air off Russia and Norway, but then a front moved in from the Atlantic, which had been forecast by use of the shipping forecast and Metmaps. That day the Orienteering was held in the rain. The low was replaced by a high which brought a wet airstream from the Atlantic and rain onto Raasay. Towards the end of the expedition another front moved in from West of Ireland, bringing yet more rain. I had thought that Skye would precipitate much of the rain, but I was wrong.

Max. Temp 29°C Average Day Temp. 18°C

Min. Temp..... 7°C Average Night Temp. 11°C

Total Rainfall 1.52" Max. Rain in one day 0.57"

Wind: no strong winds. Maximum about Force 4-5

ANDREW HOWARD

NORTH UIST MET. REPORT

We hoped to establish two weather stations: one on the summit of Ben Eaval, and the other at the campsite. The idea was to study the differences in weather with the change in altitude.

But disaster struck first! A maximum and minimum thermometer was strangely destroyed in the depths of our leader's tent. Next, at that evening's meeting, somebody sat on the glass measuring cylinder belonging to Roger's rainfall gauge. The same evening a wet and dry thermometer also went to the wet pit. The consequence was that we made only one set of recordings, inside a 'Screen¹' behind the cottage. The rather dull and wet weather throughout the expedition is summarised in the figures below; a graph with all the recordings is also available.

Pressure variations : 30.25 - 30.55 inches of Hg.

Wind speeds : 0- 4 on Beaufort scale

Temperature range : 64°F - 50°F

Total precipitation : 27-5mm

Average cloud cover : 75%

GEOLOGY and GEOMORPHOLOGY**GEOMORPHOLOGY IN GLEN HELLISDALE - SOUTH UIST**

The present Glen Hellisdale was probably a pre-glacial valley, with its source being Bienn Mhor and Feaveallach, flowing in the same direction as it is now, roughly N.E. - S.W.

The valley has been affected by two major glaciers. The first glacier occupied the valley during most of the Great Ice Age when most of the area was covered by ice from the Scandinavian and Scottish ice-sheets. This flowed, under pressure, up over Bealach Hellisdale, producing an over-deepened col at the height of 950ft. O.D. The evidence to support this theory is provided by the large number of striations running S.W. - N.E.

The second glacier to affect the valley was a glacier presumably formed during the Scottish Readvance. This was fed by two incipient corries, one on the north face of Bienn Mhor (G.R.325565), the second at the top of Bealach Hellisdale (G.R.333567).

The corrie on the north face of Bienn Mhor produced a broken back wall of well over 500ft. Above this corrie there is evidence of ice fretting. Therefore, at this period of time the summit of Bienn Mhor was not covered in ice. There is no evidence of a corrie lake or moraine. The reason for this is probably the fact that the gneiss was very resistant to the over-deepening scarring agents of the ice. In fact, what remained was a great expanse of polished bare rock, now slightly covered in vegetation.

In this corrie, striations were found facing E - W. The glacier from the corrie must have joined the glacier from the corrie at Bealach Hellisdale further down Glen Hellisdale, producing a very small hanging valley.

The incipient corrie at Bealach Hellisdale must have been much smaller. The evidence now left of this corrie is a very small back wall facing S.W. and a very shallow basin. Here, also, there is evidence of striations in line with the general direction one would assume the ice flowed.

Where the two glaciers met a classical U-shaped valley has been formed. Further down the valley, where a band of finegrained dolerite offered resistance to the glacier, a small lake has been formed – Loch Hellisdale. The glacier eventually entered the Minch, probably just south of the Rudha Hellisdale peninsular.

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Nowhere in this valley is there evidence of moraine. One possible reason is that the length of the valley is so short that the moraine was deposited in the Minch.

There is evidence of peri-glacial weathering on both sides of the valley. There is fossilised scree on the N.E. side and large deposits of clitter (large angular boulders that have fallen off the main cliffs as a result of frost shattering) occur on both sides of the valley.

There is very little evidence of post-glacial weathering probably due to the resistance of the gneiss to present weathering and erosive agents. Some marine erosion has occurred on the Rudha Hellisdale peninsular, leaving steep cliffs and a stack, the cliffs being vertical with a height of about 30ft.

The only evidence of deposition is a small delta formed at the S.W. side of Loch Hellisdale.

This valley is typical of most of the glacial valleys on the east coast of South Uist between Loch Eynort and Usinish Bay.

PHILIP BROWN, RICHARD OSBORNE, STEVE HILL-
JONES

GEOLOGICAL REPORT - RAASAY

Although the geologists were unable to fulfil all of their early plans, a full appreciation of the variety and local complexity of Raasay's geology was achieved. A large part of the work was to have been the drawing up of a geological cross-section of the coast from Rubla na'Leac to Brochel "as seen from the sea". Several reconnaissances were made, but the early failure of 'VINGA's¹ engine meant that it could not be completed. A hand dredger was constructed out of tin cans for a study of coastal sediments, but for the same reason, could not be put to use.

Much field-work was, however, conducted with visits to most of the difficult geologies of the island where relationships between rocks and relief were studied. Of particular interest in this respect was the geologists' bivouac. Following the 1200ft. contour south across the limestones of the Great Estuary series to the flat-topped Dun Caan – the remains of exterior Tertiary plateau lavas. Certainly the most gruelling bivvi of all. One of many other trips was that to Manish Point and its environs within the Torridonian where swarms of dykes of differing resistances provide spectacular local relief.

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A collection of rock samples was made in which most out-cropping surface rocks are represented and which will be contributed to the Society's collection.

DAVID BRADSHAW

GEOLOGY on NORTH UIST

Geology as an active project was somewhat subdued for the most part of the expedition as it was assumed that the island was predominantly Lewisian gneiss, punctuated only by several tertiary dykes. However, the notion of this apparently simple structure was shattered by the arrival of Mr Rick Sibson, a geological researcher from Imperial College, who was working on the island and who kindly trekked to Eaval cottage one evening to enlighten us.

We were not only camped virtually astride an olivine-dolerite dyke but within sight of the Outer Hebrides Thrust Fault Zone, and had actually walked over the brittle-ductile transition, although it wasn't painful at the time! The O.K. Thrust Fault Zone developed between the Caledonian uplift (400 million years ago) and the Tertiary dyke swarms (60 million years ago), and stretches from Barra, through South and North Uist into North Harris. It had a lateral throw of 7 - 10 km. and a vertical throw of about 2 km, and it is now possible to examine the dead fault at a depth of five miles on the present erosion surface (see Diagram 1).

The fault zone also incorporates the brittle-ductile transition. Increased pressure on rock makes it stronger, but with still greater depths, increased temperatures produce greater fluidity. Thus rock tends to crack or be

brittle near the surface and sheer at depth like plasticine (it is then said to be ductile). In the Thrust Fault Zone, the pseudotachylyte is brittle and the mylonite is ductile. The contorted structure in the mylonite was produced by the release of pressure or basal stress by the later Moine Thrust on the Scottish mainland which caused increased buoyancy, and the crust bounced back out of the mantle (see Diagram 2).

Mr Sibson also showed us examples of fossil earthquakes, which showed up as black streaks of pseudotachylyte across gneiss, caused by the rapid jerking of the brittle rocks. We, too, managed to find minor examples together with local faults clearly visible in hand specimens. We did not knowingly find any magnetic deviation (palaeomagnetism) in the pseudotachylyte, as on South Uist, but according to Mr S. we should have done! Apart from being overawed by Mr Sibson's geological knowledge,

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many of us were stimulated to look more profitably at the rocks around us.

GREG SURRELL

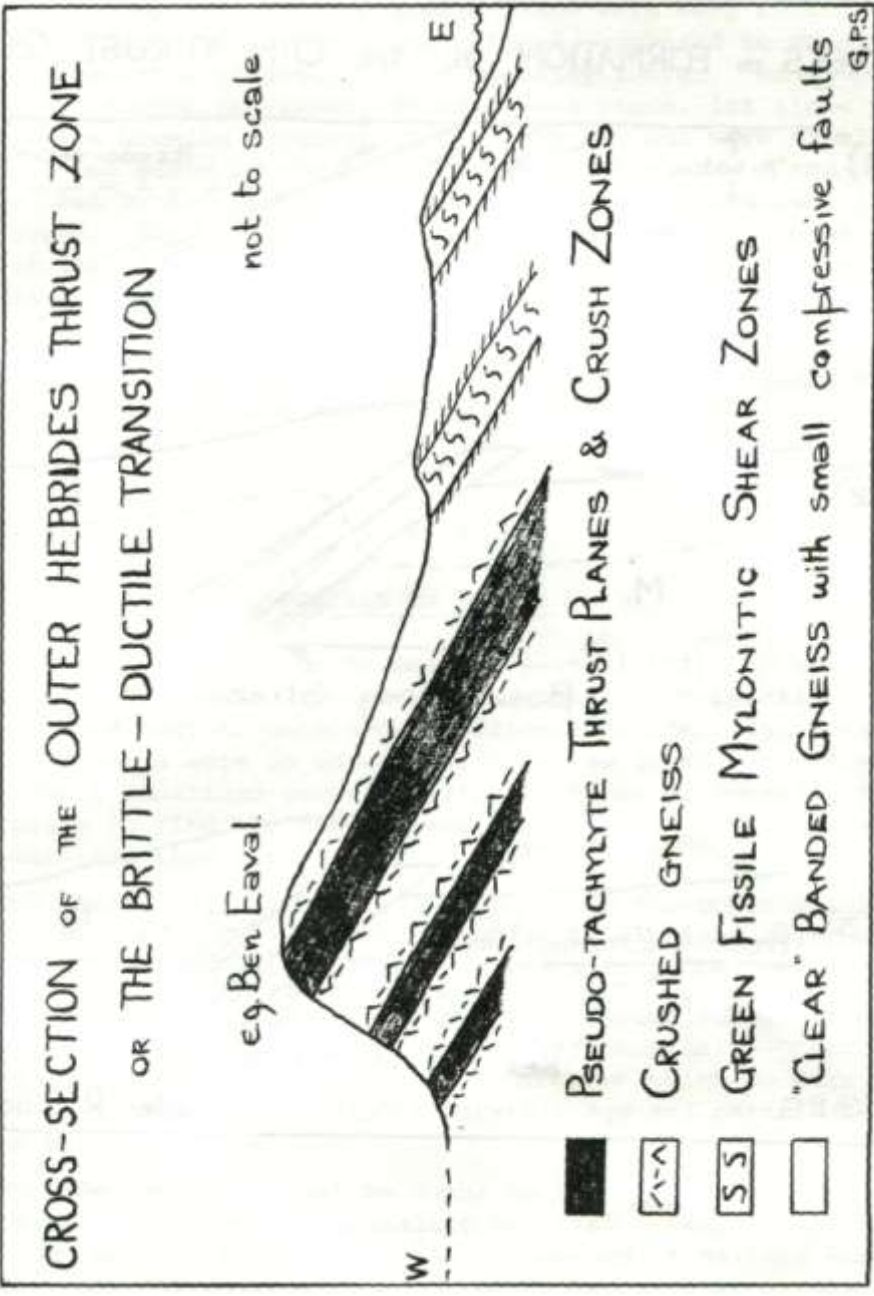
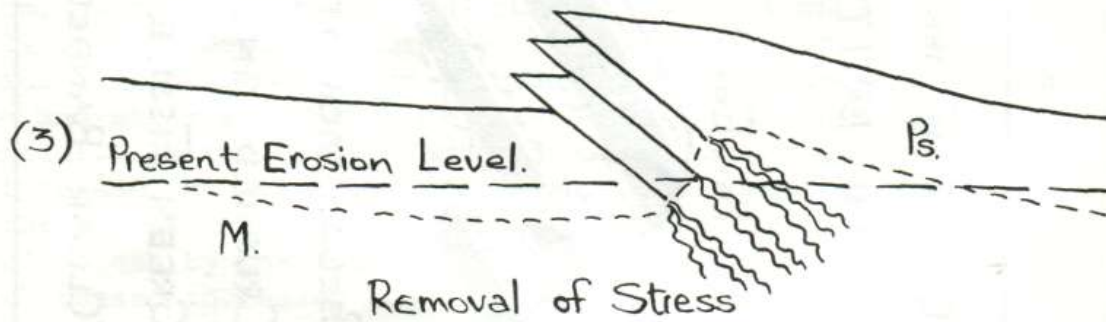
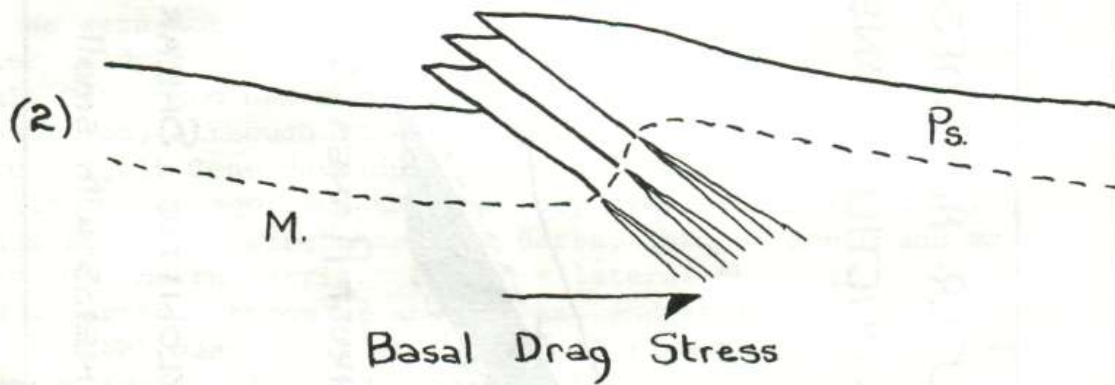
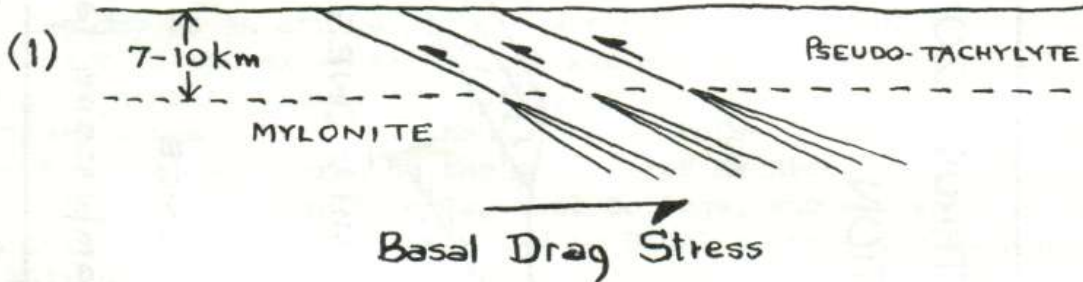


Diagram 1

STAGES IN FORMATION OF THE O-H THRUST ZONE



G.P.S.

after R. Sibson.

Diagram 2

ORGANIC REMAINS

SHELLS AT AIRD BHEAG

With few exceptions, the shells found were very rough, coarse and sometimes cracked and chipped, compared to an almost glazed appearance of shells found on sandy shores. Scallop shells are common but rarely found in one piece, let alone in pairs. Sea Urchins flourish on the loch bed but were rarely found in one piece on the shore. Most of them were a red/purple colour, but broken specimens of deep blue and scarlet urchins were found. Plenty of mussels and limpets are found under seaweed at low tide, and our fishermen found that limpets are useless as bait but mussels are comparatively successful.

Shells, such as pairs of cockles, were common but were usually cracked and chipped, probably due to the constant banging they receive on the rocks from the sea.

STEPHEN MIDDLETON

FOSSILS ON RAASAY

During the expedition to Raasay, several trips to the limestone areas of the island were made in search of fossils. These proved easy to obtain but difficult to identify. The first two trips were to Screapadal where we found sandy limestone which contained several different types of fossil. The best place to find the fossils was on the beach where the sea had weathered them out.

The best fossil found was a bivalve of the Upper Jurassic (Oxfordian) age which was identified as *Plagiostoma Rigidum*. Several of these were found and one was almost complete.

The other fossil identified was *Plagiostoma Subcardiiforme* found in Great Oolite Middle Jurassic (Bathonian). Other fossils found at Screapadal included a bivalve which we were unable to identify, of the Middle Jurassic Age and parts of a *Belemnite*.

The 'Geological Bivvy' to Rubha na Leac gave us a huge number of different fossils to add to our list. Large numbers of bivalves were to be found in the stream-bed of Hallaig Burn, but the rock was so crumbly that it was impossible to take samples of these. Also, several large oysters were found on limestone boulders in that area.

The beach at Rubha na Leac was also a source of several different fossils, limpets and mussels being most common.

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Particularly notable were the weathered-out remains of what we took to be an ammonite of at least 1 foot diameter. Unfortunately this was far too big to carry 10 miles back to camp. Belemnites were also found on this beach. In the cliffs above the bay were also identified crinolites.

A lot of the fossils could have been more accurately identified had we possessed a good text on the subject with accurate scale drawings, but *I* was unable to find such a book. Without a geologist on the expedition who could identify the fossils for us we had great difficulty in doing more than describe the basic family of each specimen.

BILL DICKINSON

FRESHWATER ECOLOGY FRESHWATER ECOLOGY of MUCKLE ROE

As the land surrounding the lochs and bogs within a two-mile radius consisted almost entirely of peat, the project was carried out mainly on one loch (Fown Loch) — although others by Mill Loch and Burki Waters were also sampled, but to a lesser extent — and two adjacent bogs.

The samples were obtained by throwing a jam-jar, attached to a fishing-line into the water, allowing it to sink, then dragging it back to the shore.

The investigation was severely limited by (a) lack of equipment, e.g. high-power microscope; (b) lack of reference books, notably one for microscopic animals — several species remain unidentified. The freshwater flora has been even more limited, for various reasons, the main one being the difficulty involved in obtaining the plants as we did not have a boat.

The lochs appear to have an almost similar pH and life content to English ponds and lakes, though the variety of animals in the lochs is slightly less. The reasons for this may be that the pH is not the optimum for supporting the animals, or that predator (there were a large number

of brown trout, tho¹ it is probable they would eat something larger) have caused the extinction of certain species; this, however, is rather far-fetched.

GRAHAM HOLDUP

