

Farnham GEOLOGICAL Society



(A Local Group within the Geologists' Association, London)

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NEWSLETTER - DECEMBER 1989

For this forth edition of the Newsletter we are indebted to Tony Brown and Peter Cotton for the report on the field trip to Pembrokeshire and to Cath Clemesha for two reports on independent trips to N.W. Scotland and the Isle of Arran.

In October we bade a fond farewell to one of the Society's most stalwart members, Marjorie Outlaw. Marjorie has been a member of the Farnham Geological Society since 1973 and has in that time been a most valued worker on the Society's behalf in many roles. Marjorie served for 14 unbroken years on the committee, providing crucial continuity and keeping the rest of the committee on their toes. Marjorie served for two years as Secretary, but perhaps her most notable contribution was the seven years spent as Field Secretary during which the Society ranged far and very wide in its search for the meaning of rocks. During her tenure as Secretary, Marjorie was responsible for recruiting ('press-ganging', in the nicest possible way) a great many of our current membership from the adult education geology classes. In recognition of all the time given to the Society, Marjorie was made the first recipient of the Wareing-Whittaker Award for services to the Society. Whilst we shall all miss Marjorie's work for the Society, I believe that what we shall miss the most is that infectious laugh and indomitable sense of humour. We wish Marjorie, and her husband Robin, every happiness in their new home in Somerset.

David Caddy (Editor)

FIELD TRIP TO N. W. SCOTLAND

Wally and I recently took part in a geological study tour of this area, organised by the Bristol University Extra-Mural Department, led by Dr. Peter Hardy and based on Ullapool, and Tarbert on the Isle of Harris. We had exceptionally good weather, mostly sunny with no rain during the day.

We studied Lewisian, Torridonian, Moinian and Cambrian rocks, saw evidence of the Moine thrust and numerous basic and pegmatitic dykes. Of special note was a road section near Laxford Bridge through Scourian gneisses cut by dykes of Laxfordian age and two quarries, one near Loch Assynt where an attractive rock called borolanite (a type of nepheline syenite) was found, and an anorthosite/garnet quarry on the Isle of Harris.

We didn't ignore other features of the region. On the Isle of Lewis we visited a black house at Arnol, a broch at Carloway and the standing stones at Callanish. We saw many golden eagles, red deer, seals and otters and enjoyed the wonderful scenery and kind hospitality which we experience everywhere.

We referred to the Geologists' Association guide number 21 to N.W. Scotland and to a guide to the Assynt District published by the Edinburgh Geological Society. If you go there yourselves, a hand lens is more important than a hammer, and a camera is absolutely vital, also picnic gear.

Wally and I would be happy to discuss the trip with anyone interested, and show them our numerous photographs. (Perhaps we can persuade Cath to share the pictures with us at the next Members' Evening in July...Ed.)

Cath Clemesha

FIELD TRIP TO PEMBROKESHIRE

(15th - 19th March 1989)

This trip was organised by the Waverley Adult Education Institute and led by Dr. Paul Olver, but the Farnham Geological Society was well represented. It was refreshing to meet a number of new enthusiasts or potential enthusiasts, including a group of five students from the Farnham Sixth Form College. Their boundless energy was a tonic to everyone except the unfortunates who were below one of their rooms in the hotel and who found that liveliness until the small hours of the morning was wearing after a few days. It cannot be stated as a fact, but the under-twenties seemed to become aware that the over-sixties were not all staid fuddy-duddies with no life left in them!

The coach left on time, nearly missing one member who had to go home to park his car and arrived somewhat breathless as the coach was pulling out, his better half having only realised his absence as the wheels started turning! We made good time to the Leigh Delamere services for late breakfast and early coffee, afterwards going on to the first exposures at Aust Cliff.

This was a pleasant change from past routine when Aust has usually been fitted in on the return journey and the visit rather rushed. At this first exposure it was clear that we were indeed fortunate, for not only did we have an excellent volcanologist as leader, but an extremely good sedimentologist (Dave Taylor) and a superior structural geologist (Ian Josie) also in attendance. Here, and throughout the rest of the trip it was fascinating to hear how different specialists saw different things in an exposure. It must be said that they rarely differed about the essentials of the geology!

Specimens from nearly all the exposed beds were obtained. Previous visitors found it sad that the Keuper Marls, which sound intriguing, were now the prosaic Mercia Mudstone Group and the Tea Green Marls had become the Blue Anchor Formation. At least the Aust Bone Bed had not changed its name, but neither had it ceased to be elusive!

After this morning foray in the Triassic and Jurassic strata, an afternoon stop at Amroth on the coast near Tenby gave the opportunity to study a section in the Upper Carboniferous exposing typical Coal Measure cyclothems. Some interesting structures, including boudinage, were also seen in this section.

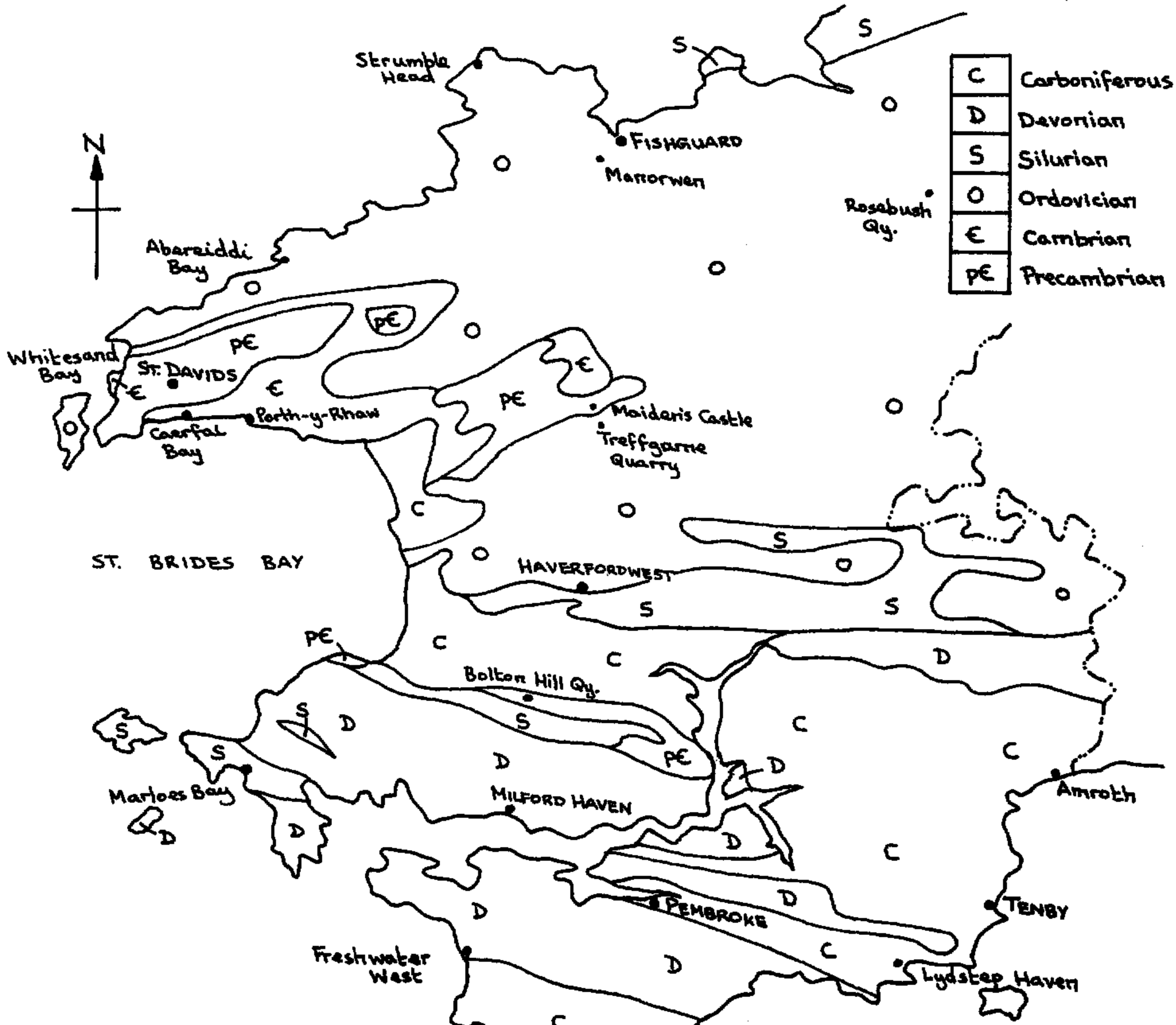
We arrived at the County Hotel, Haverfordwest after six o'clock and were a bit put out to find that it lay in the edge of a busy roundabout, and looking a little run down next to the new highway constructions. However, the rooms were comfortable, if noisy, the food good and plentiful but the public rooms non-existent.

Pembrokeshire lies in the Palaeozoic province of the country and the older rocks have been massively folded and subsequently eroded. There is plenty of evidence of the Pleistocene 'ice age'.

For our first day in Pembrokeshire we concentrated on Ordovician formations together with a few Precambrian volcanic outcrops. Ordovician rocks occur roughly north-east of a line joining St. David's Head, Haverfordwest and Narberth. We started our day at the disused Treffgarne Quarry (SM 959240) where the products of a volcano of Arenig age can be seen. Crystal tuffs and agglomerates predominate in the pyroclastic fall deposits, and we were persuaded that certain areas of the rock face were andestic lava flows.

We then moved on up the Treffgarne Gorge to Maiden Castle (SM 954249), one of a series of prominent castellated outcrops on the skyline above the gorge. These outcrops are formed from dark flinty rhyolites of Precambrian age, and are the oldest rocks in Pembrokeshire. Standing on the top of Maiden Castle looking at the view in all directions to the other outcrops, one tried to imagine them as islands in the seas of later geological periods.

Another exposure we examined on the roadside at Manorwen (SM 93753682) showed interesting layering within the Goodwick Volcanic Formation, the uppermost unit of the Fishguard Volcanic Group. The bottom layer of the ash flow unit contains mudstone clasts, the middle layer reveals compressed banding and the top layer shows banding of pyroclastic pumice fragments.



A SIMPLIFIED GEOLOGICAL MAP OF PEMBROKESHIRE

After an excellent lunch at the Farmer's Arms at Mathry followed by a little souvenir shopping in the village we drove to Strumble Head (SM 89564131) where we had quite a long walk to look at the classic cliff sections of pillow lavas to the east of the lighthouse. These were of the Strumble Head Volcanic Formation, the middle unit of the Fishguard Volcanic Group. The pillow lavas are basaltic, an exception to the more usual rhyolitic lavas of the Llanvirn, thought to have been caused by graben faults tapping into the upper mantle and thereby avoiding contamination of the magma by slow uprise through silica-rich crustal rocks.

For a while we sheltered from the wind and rain in the Strumble Head bird lookout which had been opened by Bill Oddie some months earlier after the conversion of the old building, which was a war-time radar post. A display inside tells you that this lookout is on the line of a 'sea motorway' along which as many as 30,000 Kittiwakes, 10,000 Razorbills and Guillemots and many other species have passed in a single day!

The final stop of the day was at Abereididi Bay (SM 795305). Those of us with no head for heights were delighted that the paths had received a lot of attention since the last trip to Pembrokeshire. Unfortunately, the changes include modifications to the car park and the covering up of some of the areas noted for their rich graptolite fauna. In the quarry on the north side of the bay the search for graptolites was not very successful; however we were able to look at the bedding/cleavage relationships and deduce (with help) that the strata must be overturned as the cleavage, at 60°, is steeper than the bedding, at 40°.

On the Friday the weather was a little dull as we set out for Whitesands Bay at the beginning of a 'Cambrian day'. On the north side of Whitesands Bay, at Trynhwrddyn (SM 73182733), the Upper Cambrian *Lingula* Flags are exposed on the foreshore. *Lingula* is a shallow water inarticulate brachiopod with a phosphatic shell; it is a successful organism, as evidenced by the fact that it continues to thrive in tidal mud-flats in some parts of the western Pacific. The presence of *Lingula* together with the sedimentary structures place these sediments as having been accumulated on a shallow tidal shelf, and not as deep water turbidites, as previously interpreted.

From Whitesands we went around the corner to the northern shore of St. Brides Bay to look at the Lower Cambrian exposures in Caerfai Bay (SM 76152436); unfortunately the tide was too far up for ideal viewing. The basal conglomerate of the Cambrian (Caerfai Conglomerate) does not outcrop in the bay but a number of pebles and boulders of this rock were found. The succeeding St. Non's Sandstone and the Caerfai Bay Shale formations were also present as boulders and outcrop at the head of the bay. Some of the boulders of the Caerfai Bay Shale contained thin tuffaceous bands; the only evidence of Cambrian volcanicity in Pembrokeshire. An interesting feature of the St. Non's Sandstone, which shows rather dramatically why rock colouration can be deceiving, is the existence in the same area of the beach of the normal green colouration and, on the other side of a small fault, rock which is almost white as a result of percolating water leaching out the iron.

Back to the delightful city of St. David's for lunch and an opportunity to visit its cathedral and the nearby ruins of a medieval Bishop's Palace. Before boarding the coach some of us had a pleasant bask in the sunshine which had brightened up the day by mid-morning. Our next location was further east along the St. David's coast at Porth-y-Rhaw where we walked down one of the typical deep-cut river valleys of the Pembrokeshire coast formed by rejuvenation of the rivers following the lowering of sea level during the Pleistocene.

On the way down the valley we paused at a quarry (SM 78712455) to examine the effect on the original Menevian laminated sandstones of a quartz-dolerite intrusion. With considerable guidance from our leaders we were able to pick out layers of the original sandstone higher up in the rock face and the dolerite sill at a steep angle in the middle of the exposure. On either side of the sill were layers of baked Menevian sandstone with its original lamination and colouring completely destroyed. Further down the valley we were into the Middle and Lower Menevian strata with massive bedded sandstones and cleaved mudstones.

We climbed up to the road again and some of us sat by the roadside quarry exposure (SM 79162478) indulging in the popular pastime of 'hunt the trilobite'. Joined by some of the sixth form students we were asked "what's this?" and handed a piece of shale. "It could be the pygidium of a trilobite" was the answer. After about 30 seconds another specimen was produced and this was clearly a pygidium. In five minutes young eyes had picked out 4! The older searchers had the choice of deciding whether their eyesight was failing or whether it was a case of beginner's luck.

For our final stop on Friday we left the Cambrian exposures to visit Bolton Hill Quarry (SM 918115), midway between Haverfordwest and Milford Haven. As a result of a massive thrust episode at the northern edge of the Variscan fold belt, Precambrian rocks have been pushed up close to the surface. Subsequent erosion of the overlying Devonian and Carboniferous has exposed these Precambrian rocks in the cores of thrust-anticlines in the area around Johnstone. In this working quarry excellent exposures of the Precambrian quartz-diorites can be seen intruded by pegmatitic aplites and younger dolerite dykes. The large fallen blocks on the floor of the quarry showed beautiful examples of the various intrusions together with the original diorites, whose colouring varied between green and white depending on the hornblende content.

On any trip to Pembrokeshire it must rain on one day at least. Saturday was the day and Marloes Sands (SM784075) was the place! The rain sheeted down and few even reached the sands before being soaked. However, as usual, the trip was well worthwhile. The Silurian strata are well exposed with impressive structures, especially the extensive ripple marks, cleavage refraction, shear zones and tension gashes. The Skomer Volcanic Group, of Llandovery age, gave some interest for the volcanologists, and the palaeontologists could also find worthwhile specimens, all along a relatively short stretch of beach.

Thoroughly wet but not downhearted we repaired to a local pub for lunch. There was an excellent fire in the bar, and the normal 30 minute lunch-break extended to 2 hours while most of the party took turns to dry out in front of the fire. In view of the continuing heavy rain the planned afternoon programme was abandoned and we went directly to the Rosebush Slate Quarry (SN 005290) in the Presceli Hills. Even here we were not spared the rain but conditions improved enough for us to look at interesting structural features in the Ordovician slates. The presence of light-coloured reduction spots allowed some estimate of the enormous deformation these rocks have undergone. These once spherical features now appear as highly flattened ellipses.

Finally, on return to Haverfordwest we had to make the geologist's equivalent of the Mecca pilgrimage, a visit to the gasworks site (SM 957155) with its Lower Llandovery exposures of siltstones and shales containing a fauna of rugose corals, and brachiopods with such exotic names as *Costistricklandia lirata* and *Katastrophomena scotica*.

This was the Saturday of the England versus Wales rugby match at Cardiff (won in fine style by the Welsh). That evening, the English visitors kept a low profile amongst the celebrating Welsh. Drinking in the dining room to avoid the singing crush in the bar, a group of us was joined by 'mine host' who regaled us with doubtful, yet colourful, tales recounted in a broad Welsh accent.

Alas, the following day we had to load the coach for the return home, though two exposures were visited in the morning. The first was at Freshwater West (SR 885994). This was new location for all concerned and was devoted to the uppermost Silurian and basal Devonian outcrops. One of the marker beds at this exposure is the Townsend Tuff Bed and the first task was to locate it; a task not simplified by the masses of seaweed growing over the slippery rocks on the foreshore. However, the bed was located; being the marker bed defining the base of the Devonian we were now able to position ourselves in the section. Locating the remaining members of the Milford Haven Group now became relatively easy. Although there is one reputed 'fossil locality' within the section, no-one was able to find it!

Our last bit of geology was at Lydstep Haven (SN 091978). Here the beach pebbles of Carboniferous Limestone yielded the usual abundant fossils, particularly the rugose corals *Dibunophyllum* and *Lithostrotion*. As ever it was difficult to get the party back to the coach when fossil finds were being made, but this was eventually achieved and we sadly started our journey home. We arrived back in Farnham a little early (something of a precedent!) as it was decided not to make a detour to a locality on the edge of the Forest of Dean before leaving the Principality.

This was an enjoyable and instructive trip and it is to be hoped that through it the Society's name is known to a wider public and hopefully some new members to the Society recruited. As usual the efforts of the leader and his two helpers were greatly appreciated and ensured that "a good time was had by all".

Tony Brown and Peter Cotton

BOOK REVIEWS

Since the last edition of the Newsletter in March of this year there have been a number of books published which may be of interest to members of the Society. We are grateful to Dave Taylor for providing the following brief reviews of three of these new books.

THE MACMILLAN FIELD GUIDE TO GEOLOGICAL STRUCTURES by John L. Roberts.

There have long been guides to minerals, rocks and fossils all lavishly illustrated with colour photographs, and I have often felt that there was room for a similar book illustrating geological structures. Well, that book has now been written. The author has adopted a broad definition of 'structure' and has covered both tectonic structuring as well as field scale textural structures of sedimentary, igneous and metamorphic rocks. The book is illustrated with more than 250 excellent colour photographs, each of which is accompanied by clear and well explained captions. The photographs are alternated with text and sketches which further describe and interpret the various structures. There appears to have been a conscious effort to minimise the use of technical jargon. Where the use of geological terms has proved inescapable their meaning and derivation have been included. At £12.95 this field guide is excellent value and I am sure would be of use to anyone studying rocks in the field.

LIFE PULSE: Episodes from the Story of the Fossil Record by Niles Eldredge.

First published in 1987, this very readable walk through the story of the fossil record has recently been released as a paperback by Pelican at £4.99. The book is arranged in chronological order from the earliest beginnings of life, through to the Pleistocene. The author has written the book as a series of stories, or essays, each of which illustrate a part of geological time. The section on the rivalry between Edward Drinker Cope and Othniel Charles Marsh in the late 19th century as each strove to collect and discover the most dinosaur fossils in America is particularly interesting. Many of the fine museum collections of vertebrate fossils are due to the single-minded work of these two collectors. The book also includes an objective look at the explanation for mass extinction events and the way in which the surviving fauna and flora quickly repopulate and recolonise the planet. As well as being an interesting read from an anecdotal view point, the author has cleverly used many of the stories to illustrate the scientific method and how palaeontologists have worked to unravel the history of life on Earth.

THE WINES AND WINELANDS OF FRANCE: Geological Journeys by Charles Pomerol.

Following Professor Jake Hancock's excellent talk to the Society on the Geology of Wine in December 1988, I overheard many a plaintive cry of "Is there a book on the subject?". Three years ago such a book was published in French. Earlier this year a couple of very public spirited (no pun intended) geologists published a translation of this French text. After a brief introduction into wines and soils and wine regulation, the book is divided into a series of chapters, one on each of the wine growing regions in France. Each chapter starts with a colour geological map of the region followed by a discussion on its geography and brief notes on the history of wine making in the area and on each of the wine varieties. The reader is then invited to discover the wines for themselves by undertaking one of the fifty itineraries included in the book. Each itinerary takes you to several vineyards and explains a little of the geology along the way. Each chapter concludes with suggested recipes which complement the wines of the area. Whether you take this book with you on a trip to the vineyards of France, or just dip into it to learn more about the wine you bought at Augustus Barnet for the Sunday lunch I'm sure that you will find it a mine of fascinating information; just reading the suggested menus at the end of each chapter will make you put on weight! The book is priced at £17.95 (plus £1.95 p+p) and is currently available only from Robertson McCarta, 122 Kings Cross Road, London WC1X 9DS (Tel: 01-278-8276).

TEMPORARY EXPOSURE IN THE BARGATE BEDS AT GODALMING

At the Annual Reunion of the Geologists' Association in November 1988 part of the exhibit of the Farnham Geological Society was a display of photographs and specimens from a temporary exposure in the Bargate Beds at Godalming, Surrey.

My interest in this exposure lay in the fact that it was less than 10 minutes walk from my house. In the summer of 1979 Bovis Homes Ltd. began the development of a large housing estate called Bargate Woods on the south side of Shackstead Lane, Godalming. The first operation was the cutting of a valley for an access road to the site from Shackstead Lane. The spoil of Bargate Beds was laid in a huge hog-back near by.

One day I cracked open a fist-sized nodule which had rolled to the bottom of this hog-back and found inside a beautiful hexactinellid sponge. Testing with hydrochloric acid proved it to be non-calcareous. Hence forward sponges were sought and found. Lithistid sponges were also obtained, all lying loose in the sand. Sometimes they were visible on broken surfaces of Bargate Stone concretions. Huge excavations were made for drains in the new roads and these also yielded specimens. Samples of the Bargate Stone and chert were also collected, and in addition part of a nautiloid and a parahoplitid ammonite were found.

Later on, part of a north-south trending valley was cut back in a series of terraces, on the east side of what is now the lower end of Fox Dene, so that the houses could have larger back gardens. A full thickness of Bargate Beds was exposed with, towards the northern end, the dark brown pebbly basal conglomerate and even some of the underlying Hythe Beds. These Hythe Beds also contained concretions, though much more rounded than those of the Bargate Beds.

The basal conglomerate was often in several layers with a total thickness of up to 4 feet. This conglomerate was most interesting. From it numerous fossils were obtained, both contemporaneous and derived. Of the former, terebratulid brachiopods were plentiful; both whole and disarticulated drifted valves. Rhynchonellids were scarce, only a few disarticulated valves being found. The derived fossils were mainly (?) phosphatised fragments of ammonites, occasional fish and reptile teeth plus bone and wood fragments. The pebbles within the conglomerate were mostly dark grey chert and milky white vein quartz, very uniform in size and mostly ½" or less in diameter. The brachiopods were restricted to the basal conglomerate and the sponges to the layers of cross-bedded sands above. No fossils were found in the underlying Hythe Beds.

I am indebted to the Palaeontology Department of the British Museum of Natural History for the following identifications:-

Sponges -	Hexactinellid	<i>Exanthesis labrosus</i>
	Lithistid	<i>Siphonia tulipa</i>
Brachiopods	Terebratulid	<i>Vectella monisi</i>
		<i>Platythyris fittoni</i>
		<i>Arenaciarcula minor</i>
	Rhynchonellid	<i>Burrirhynchia cantabridgensis</i>

These exposures have now been grassed or built over and although no measured sections were taken my photographs and rock and fossil specimens bear witness to some five years of interesting collecting.

David Caddy

FIELD TRIP TO THE ISLE OF ARRAN, SCOTLAND

(1st - 8th July 1989)

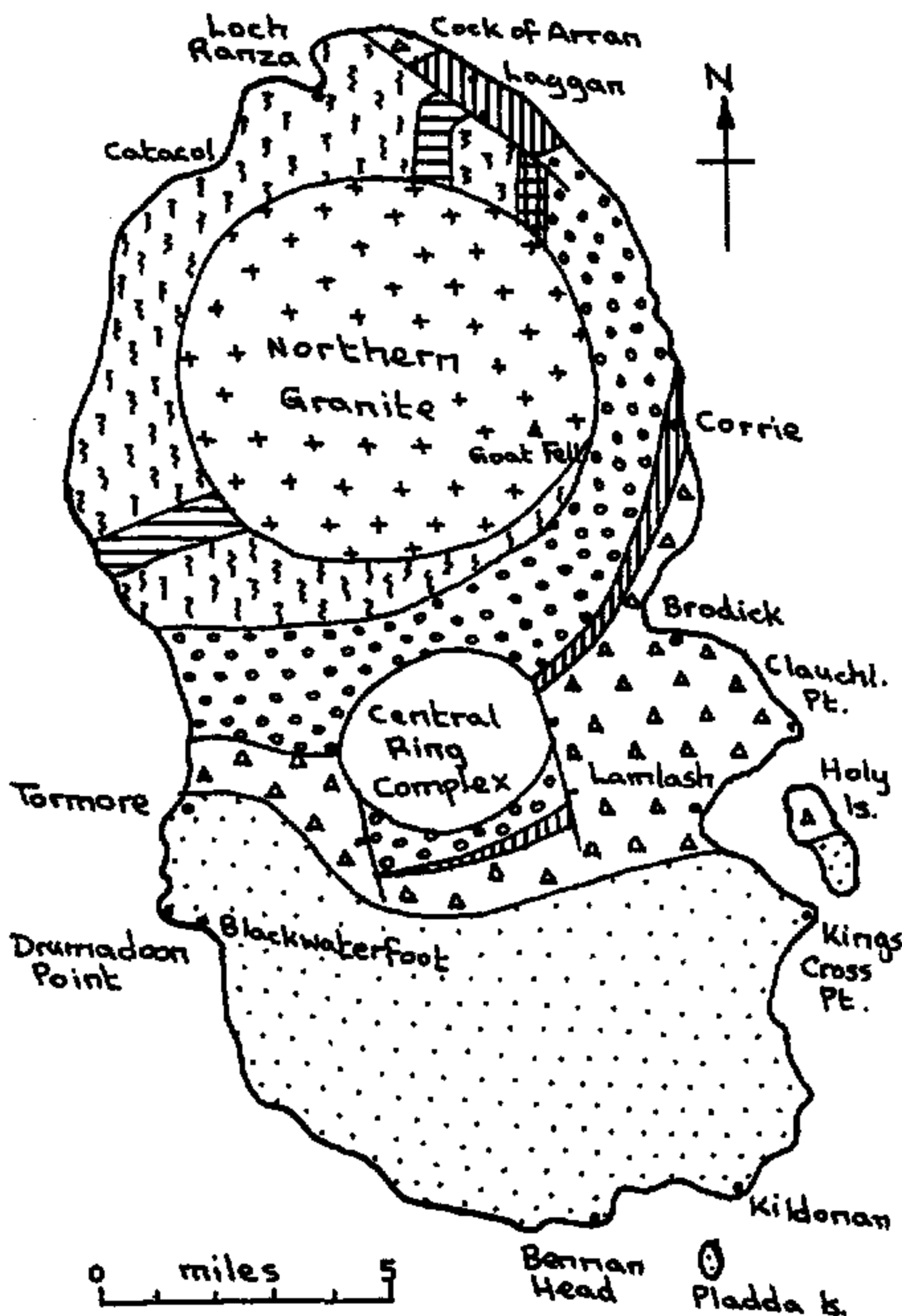
On Friday 30th June Alan & Mary Darling, Wally and I set off on a week's study tour of the Isle of Arran. It was organised by Bristol University Extra-Mural Department under the leadership of Dr. Peter Hardy. The party numbered 16, spread around the various hotels and guest houses in Loch Ranza, in the north of the island. The weather was hot, sunny and dry, as it was elsewhere in the U.K. There is no shade on the Arran beaches where we spent most of our time.

Arran is a compact area in which to study strata from Dalradian to Cretaceous age, both sedimentary and metamorphic; Tertiary volcanics, including the northern granite intrusion, dykes and sills, ring dykes, ring dykes and the Central Ring Complex; and post-glacial raised beaches.

Inland the main interest, in the north, is finding the contact of the granite with the country rock, mainly in stream sections. Most of the rocks younger than Permian are found as foundered blocks within the Central Ring Complex, which we did not investigate.

We started off by studying the Dalradian schists in the north-west of the island and saw how they had been tilted upwards when the granite was forcibly pushed up through them. Part of this trip was along the lowest raised beach in Arran, with low cliffs of Devonian conglomerates with caves about 100 yards inland.

SIMPLIFIED GEOLOGIC MAP OF ARRAN



On several parts of the coast our main exercise was identifying the dykes and sills mentioned in McGregor's field guide to Arran, published by the Glasgow Geological Society. Compositionally they were basalt, dolerite, crinanite, crainurite, pitchstone, quartz porphyry, quartz-feldspar porphyry, felsite, or combinations of two types where a later, typically more acidic, lava intruded into an earlier, more basic lava. Pitchstone dykes abound in the west, around Tormore, and in the east around Lamlash Bay. The porphyrys were fairly widespread but we encountered them mainly around Lamlash Bay in the east, in the south around Bannan Head and in the west near Drumadoon.

Lamlash Bay exhibits a cone sheet centred in the bay, around Holy Island. From Lamlash Bay you get a good view of Holy Island, and its sills of riebeckite-trachyte show up very well. We looked at the crinanite sill at Clachland's Point, to the north of the bay and walked back to Brodick across Permian sandstones, ticking-off the dykes as we passed them.

The last part of the walk was past the town's rubbish dump, with accompanying smells, fires and distasteful sights. The day had been particularly hot and we were grateful for weak, expensive tea at the Harbour Snack Bar. Most people carried plenty of drink and fruit, but sometimes, in my opinion, tea seems to be the only answer.

We saw the southern part of the cone sheet at Kings Cross Point, to the south of Lamlash Bay. It should have been dipping north but seemed to dipping south-west. Our leader shrugged his shoulders. It was too hot to argue with the guide book.

From Brodick past Lamlash Bay the dykes and sills are intruded into Permian rocks showing spectacular dune cross-bedding, millet-seed sand grains and an abundance of dreikanter wind-faceted pebbles of varying sizes.

Bennan Head was an interesting place. There is a disused quarry in a quartz porphyry sill and we walked along the sill to the Head, from where you get a marvellous view east along the south coast to Kildonan. The beach is cut by at least 26 dykes that can be easily seen. You look along the lowest raised beach with low cliffs. The high land in the south of the island is mainly sills. Behind the Kildonan Hotel there is an obvious platform which is the 50 ft raised beach. From Kildonan you can trace the quartz porphyry sill to Pladda Island, about 1 mile out to sea.

Drumamdoon Point is another interesting place. It is a headland where the columnar jointing of the sill is visible for miles. We approached it from Blackwaterfoot, looking at the numerous different dykes, looking for contacts, deciding on the mineralogy, and which came first in the case of composite dykes.

To the east of Loch Ranza there is one of James Hutton's famous unconformities. It is supposed to show Dalradian schists dipping to the south-east overlain by conglomerates of Lower Carboniferous or Upper Devonian age dipping north-west. The unconformity is so indistinct that even after much discussion nobody was really convinced.

One has to walk the 'Corrie Section', a mile of beach passing from Lower Devonian, through Carboniferous to Permian. It is a favourite section for undergraduates to map. We met one student who planned to take a week over it. The beach is covered with green and black deposits, seaweed and other slime which make it difficult to see the strata underneath. The Devonian conglomerate is easy to identify but even the Carboniferous rocks are reddish.

There are some interesting rounded boulders up to 1 metre across, showing spheroidal (onion skin) weathering. They had greenish interiors and the peeling 'skins' were reddened due to oxidation of iron minerals (these are the weathered remnants of columnar jointed basaltic lavas...Ed.).

The only energetic part of the trip was a walk around the north-east part of the shore to where, during his recent TV series, David Attenborough showed a slab with myriapod (a terrestrial arthropod resembling a millipede) footprints with parallel tracks about a foot apart. We then climbed over a col about 1000 ft high and walked back to Loch Ranza, a total of eight miles. No-one suggested climbing Goat Fell (2866 ft) or the Central Ring Complex (1679 ft). Peter Hardy wistfully commented that he usually got his students up them. However, five of us, one evening went to a slide show about Arran at Corrie Church, so we, at least, saw views from the tops of these mountains, in all weathers.

The trip was well organised and, although leisurely, we felt that we had really covered the main geological features of the island. We met together for a celebration dinner on the last evening and bade everyone 'au revoir'.

Cath Clemesha
