

THE FARNHAM GEOLOGICAL SOCIETY

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One of the problems of having an active interest in geology is that it takes up a lot of time. So much so, that there is not very much time to write about it after one has been on all the field trips and attended all the lectures. However, before the onslaught of Christmas and all that entails, at last a few hours seem to be spare.

First there comes the bad news. Subscriptions became due in January. It would be a great help to the treasurer if they could be paid as soon as possible in the New Year. Still on the same subject, when field trips involve the field secretary booking accommodation for members, the hotels often require a deposit. So please, always include the deposit when you return the booking slip.

The first event since the last newsletter unfortunately had to be cancelled. This was the lecture on June 29th by Mr. Montford, on the geology of north-west Scotland. But all is not lost, Mr. Montford will lecture to us in the New Year.

Despite an absolute downpour on the Sunday morning, the day trip to Lyme Regis on July 15 turned out to be quite a successful day. Alastair Ramsey has written a report on the trip for this newsletter.

On September 28th we heard a very lively lecture entitled "The Vagaries of Petroleum Geology", presented by Dr. G.V. Woods from British Petroleum. People who attended will agree that we heard about an aspect of geology that we have not previously come across, namely the business of finding and extracting oil. We heard about the four essentials for oil production, a source rock, a structure within which the oil can accumulate and a cap rock to stop it escaping. We saw maps and cross-sections of structures found in the oil-fields of Iran and the Persian Gulf, and slides of the oil provinces of Alaska and the North Sea.

The next field trip was the weekend of the 13th and 14th October, when we studied the metamorphic and volcanic rocks of the Malvern Hills. A full account of this trip is being prepared by one of our members and will appear in the next newsletter.

"Britain and the Plates" was the title of the lecture given by Mr. Roberts on October 25th. This was an excellent lecture with some superb slides to illustrate the theme. It brought together two aspects of geology which up until then had not been directly connected in most people's minds, that is the theory of plate tectonics and continental drift, which some of us have studied in some detail, and the features, structures and rock types we have seen on our field trips. We saw slides showing evidence of a Pre-Cambrian subduction zone running through the island of Anglesey when parts of Britain were on two plates separated by an ocean. We also saw how, at the end of the Silurian, this ocean had disappeared and the Caledonides were formed. Then a repeat of the process occurred resulting in another Continental collision with the formation of the Hercynides during the Permian. There was a lot of information presented during this lecture and I would

not mind hearing it again to try and take in what I missed first time round.

The field trip to the Clevedon-Portishead area on November 4th was organised by Ted Finch for one of his evening classes and members, particularly beginners, were invited to go along. It was not well attended by members, which is a pity, because the area is very interesting geologically and is fairly straightforward to study. I feel this would have been of interest to beginners and old hands alike. This was the first area that I have revisited on a field trip and I can recommend the practice. It is not such a shock to the system when one arrives there knowing something about what you are going to see and the things you didn't see or understand on the first visit suddenly fall into place.

Finally, our last lecture was given on November 9th by Mr. Jobbins, Keeper of Gems at the Geological Museum. The subject was the fascinating one of jade. He demonstrated with slides the various types of jade, nephrite and jadeite, the different colours it exhibits and even more perplexing, the number of minerals that look like jade, but are not. We were shown some slides of thin sections of these various minerals and some beautiful carved objects in jade from the past and present.

The next event on our calendar is the wine and cheese party at 8 pm at the Cricketers Inn, Lower Bourne, Farnham, on December 7th. After that there is a lecture on January 10th given by Ted Finch to the Royal Aircraft Establishment Camera Club on the subject of "A Geologists Photography". Members will be able to go to this meeting if they contact Julian Bentick, whose telephone number is Farnham 4445. On January 28th Ted will be talking to us on Petroleum Palaeontology. Following that on February 8th we have a lecture by Dr. Hawkes on "The Island of Rockall". All lectures with the exception of the one on January 10th, will be held at 32, South Street, Farnham, and start at 8 pm.

As well as the field trip report, there is in this newsletter, an account of a visit to one of the Shetland Islands by one of our members, Stanley Smith, earlier this year. To whet your appetite for the next newsletter, there will be an article about a visit to the Island of Skye by another of our members. If there is anyone else who would like to contribute any sort of article of geological interest, I would be happy to include it with the newsletter. You do not have to be an expert - a beginner's-eye view would be just as useful.

Report on a Society visit to Lyme Regis, Dorset, on Sunday 15th July 1973.

This was primarily a mineral collecting trip, and was led by Jack Shepherd. About a dozen optimistic members set off in the heaviest rain I can remember in the Farnham area to make the 3 hour journey to Lyme Regis. We were rewarded when the skies cleared only a mile or two from the coast and it luckily stayed fine for the rest of the day.

The beach to the west of the Cob car park is strewn with boulders, many of them more than one foot across. The source of these is the fragile-looking cliffs of the blue lias above the beach. The cliffs have gently dipping, well defined layers of varying hardness; indeed, the term "lias" is quarrying jargon for "layers". In places where there are no boulders the beach is seen to consist of some of the harder layers which have been exposed by wave action. Many large ammonites can be seen on these exposed surfaces. Many of the boulders on the beach consist of the same bluish-grey lias; these are relatively soft, and sometimes contain ammonites and veins of crystalline calcite.

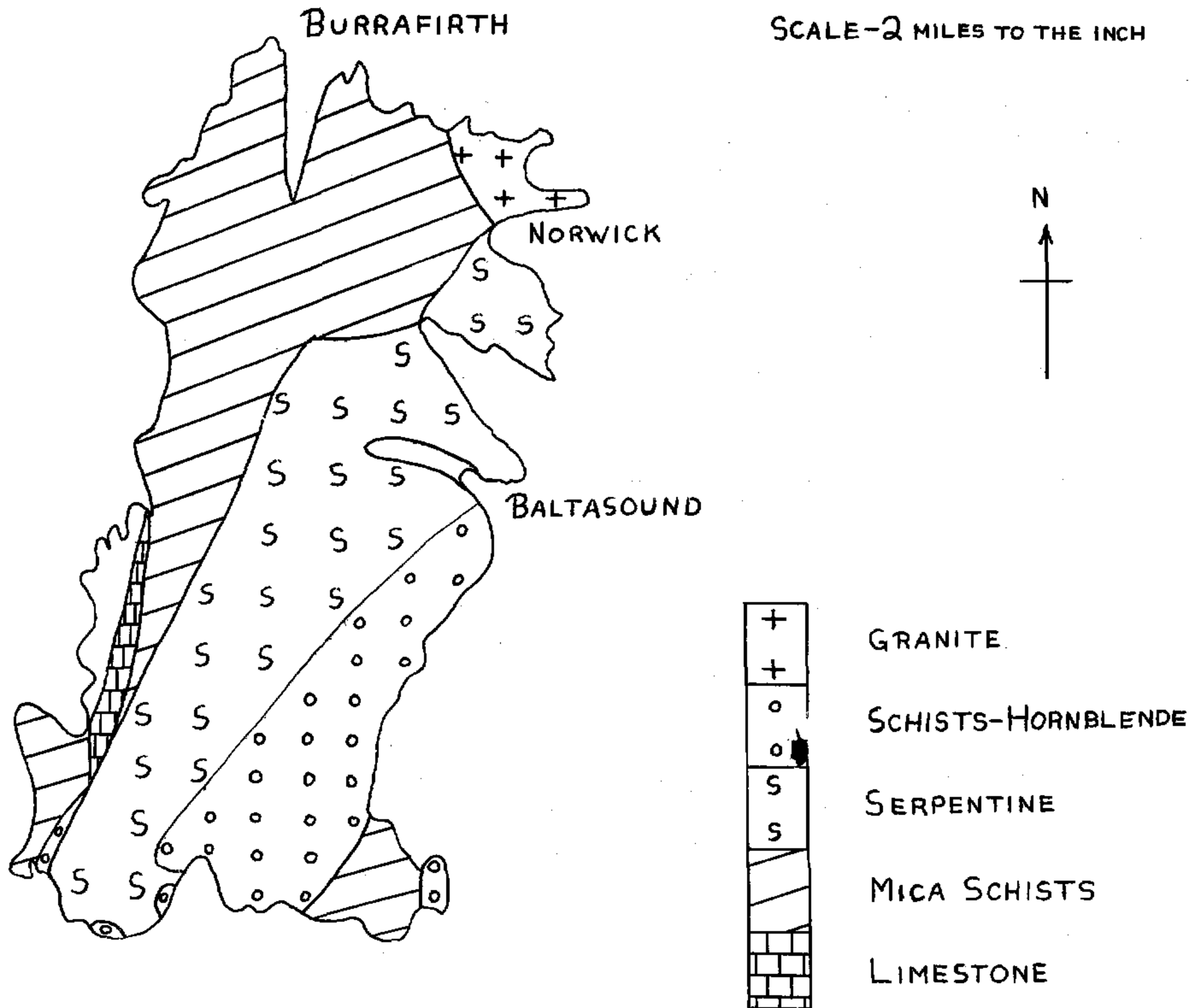
Flat slabs of "beef" can easily be found among the boulders. These split readily to reveal that they consist of numerous parallel fibrous crystals of calcite, dark grey in colour.

The more interesting boulders are those of chert, distinguished from the Lias by being lighter in colour (yellowish brown or light grey), and a great deal harder. Chert is a cryptocrystalline form of silica and is the general name for the rock type of which the familiar flint is a special case. It is often hard to distinguish between chert and flint, but chert tends to be brownish rather than black or grey, and the conchoidal fracture characteristic of flint is less well developed. The chert is understood to occur in bands within the cliffs, although none was seen in situ. Some of the chert boulders contain cavities which have become partly infilled by secondary silica, either in the form of chalcedony or quartz crystals or both. A small hole at the surface of a boulder is often the clue to the presence of a larger cavity inside.

Chalcedony, like chert, is described as a variety of cryptocrystalline silica, but it is perhaps more accurate to call them quartz mixed with opal which is amorphous hydrated silica, containing up to 10% water. The form of the chalcedony is botryoidal; exposed surfaces within cavities consist of many small round hummocks; in appearance they are rather like bubbles on the surface of a liquid. The size of the hummocks is in the range 0.1 to 0.5 inch. Frequently the chalcedony is covered with a thin layer of small quartz crystals which give it a sparkling "sugared" appearance. The chalcedony is translucent and its colour ranges from pale grey to a most attractive pale blue.

To break open and investigate a chert boulder requires a heavy hammer and a considerable degree of determination. When it does break, it tends to shatter. Gloves and goggles should therefore be worn as a protection against flying splinters. A further reason for wearing gloves (strong ones) is that newly exposed edges are razor sharp; this is a rock to be treated with respect. There is however, no shortage of good specimens.

A. Ramsay.



A VISIT TO UNST

Unst is the most northerly of the Shetland Islands and is better known to the ornithologist than the amateur geologist, a fact which is (to the misfortune of your amateur correspondant) reflected in the available literature.. The islands are worth visiting for their peace and scenery alone - both now threatened by North Sea developments - and some account of the geology of one of them might stimulate Members to visit there before it is too late.

The geology of Shetland shows strong affinities with that of the Scottish Highlands and Norway. It is divided by several faults, one of which is thought to be the northern extension of the Great Glen Fault. The grain of the islands is north-south with an accentuated back-bone of schist, gneiss and blue-grey limestone of the Dalradian series, ancent sea-floor sediments having been folded, uplifted and re-crystallised during the Caledonian orogeny.. In Unst, an east-west thrust has brought gneisses into contact with serpentine, gabbro and metamorphosed sediments of which the mica schist, exposed in the voe-or fjjord of Burrafirth in the northern part of the island are the most dramatic.

There, the cliffs and sandy fore-shore shine like silver. The thrust line can be most clearly seen across NorWick Bay at the North West corner of the island, where a granite mass has been brought into contact with the schist and is marked by a long fault-line running up the hill with different coloured vegetation on either side.

The history of Shetland during the Ice Age differs somewhat from the Mainland, as it remained covered by ice during the recessions which temporarily liberated the land further south. Furthermore, while other land freed from the ice is rising slowly, the Shetlands appear to be sinking, since peat and tree roots are occasionally recovered from off shore sites during harbour excavations. It has been suggested that the depression of Britain and Scandinavia by the enormous weight of ice pinched Shetland upwards and the balance is only now being restored. This may be true, though the extensive faulting over the whole of the Shetlands, including the extension of the Great Glen Fault, could I suppose, provide an explanation requiring less assumptions.

The whole of the Shetlands, more especially Unst, offer much to the rock collector, though not surprisingly, little to those specialising in fossils. Splendid samples of serpentine can be found in quarry exposures, and at the base of cliffs. The rock is found both as fibrous chrysotile (a mineral which provides the bulk of commercial asbestos) and massive lizardite, the latter often having the green mottled snake skin appearance, which is said to account for the generalised name.

Associated with the serpentine is the mineral chromite, which has been worked for 150 years, though extraction has now ceased. Attractive specimens of this rock can be picked up on the spoil heaps. Soapstone, a massive variety of talc, which is itself a hydrated silicate of magnesium and may be represented by the formula $(OH)_2 Mg_3 Si_4 O_{10}$ (C.F. Serpentine $(OH)_4 Mg_3 Si_2 O_5$) is in great abundance and forms a major export of the island. It has a variety of uses, both as French Chalk and as a constituent of paint, paper, lubricants, roofing felt and absorbents. For the specialist collector, there is Tourmaline, Kyanite (if you're lucky, you may find beautiful deep blue crystals of gem quality and up to 2" long - I wasn't) garnet, actinolite and the occasional nugget of gold. The most recent gold rush appears to have been in Phoenician time, but I came across an article in a recent issue of Gems, which refers to " quite a large piece " having been found last year near Baltasound in Unst. The relative abundance of actinolite is an attraction to collectors, It is a metamorphic contact product of impure calcareous rock, often of fibrous habit, very similar in appearance to chrysolite.

Even in a geological article, one cannot dismiss the Shetlands without referring briefly to the bird life. I know of nowhere else where you can spend an afternoon on a cliff top watching scores of predatory Great and Arctic Skuas attacking the gannets and smaller sea birds to make them disgorge their food, or see such great numbers of puffins, guillemots and razorbills nesting on the cliff ledges, or journey by boat to see a pair of nesting snowy owls (absent from the British List for many years). But if I depart from my brief to write about the birds, I should logically go on to describe the archaeological wealth of the islands, and the glories of the bronze excavations of Jahrlshof would take me into very deep water indeed !