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FARNHAM GEOLOGICAL SOCIETY 11th.

Newsletter - September 1974

During the many months that have elapsed since the publication of the last newsletter we have had quite a number of meetings and events to which members were invited. If you can remember the year 1973, our last function was the Wine and Cheese party on 7 December. This again was a most enjoyable occasion. We had some excellent food provided and Ted Finch's quiz was as challenging as always.

The lecture given by Ted to the Royal Aircraft Establishment Photographic Society on 10 January was entitled "A Geologist's Photography". The society members who attended, besides being outnumbered 15 to 1 by obviously enthusiastic photographers, saw a great selection of slides covering many aspects of geology. One of these that I found very interesting was the intricate miniature world as seen on the pictures taken via the electron microscope.

We again saw some more of this world when Ted gave us a lecture on Petroleum Palaeontology on 28 January. The subject was fossils and microfossils, their identification and use in the search for oil. The fantastic and artistic forms of some of these remains of microscopic plants and animals are so unlike the muddy broken-up specimens that I usually find that it is difficult to imagine them being related in any way. The strangest group must be the Dinoflagellates which can be classified as either plants or animals. It must be a very rewarding occupation to see these relics of a long-dead miniature world, sometimes being the first person to do so.

From the microscopic to the macroscopic was the jump to our next lecture and discussion on the Island of Rockall. This was presented by Dr. Hawkes on 8 February. This unique and enigmatic lump of intrusive rock 300 miles out in the Atlantic Ocean has been, and still is, a source of controversy. The submerged bank of which the island is a part is thought to be continental crust. It is an unusual granite containing two pyroxenes and one amphibole which is assumed to have been intruded through Tertiary basalts. One of the minerals, barium zirconium silicate is only known to occur in this rock.

The Annual General Meeting was held on 25 February on a bitterly cold evening in a schoolroom which was at a temperature only a few degrees above ambient. It was not well attended, but the membership present was pleased with the way the society was progressing and also with the number and balance of events held throughout the previous year. The meeting was brought to an abrupt halt at 10.00 p.m. sharp by the caretaker who didn't share our interests.

One of our own members, Ian Carolan, gave us a talk on 8 March about his work with the Forestry Commission. The lecture was entitled "An Introduction to Soils". Once again, this amply illustrated talk proved that nothing is as straightforward as you first imagine it to be. Ian explained to us about the formation and composition of many types of soils, the way humidity and climate effects the formation and about the many downward and upward processes such as leaching and salinization that occur. He then went on to explain about the various horizons that occur within the soil and how the profile of a particular soil is determined.

March 17 was the date of our second chauffeur driven field trip to the Isle of Wight. On this occasion we attempted to see the sections we did not manage to get to on our first trip. Despite the rain, we visited Freshwater Bay and

Compton Bay, but once again we were beaten trying to look at the Atherfield section, even though it was a low tide. I am beginning to believe that this section is very rarely safely accessible. With its short, steeply sloping shingle beach and very slippery mud and numerous landslips, this is certainly one to treat with respect.

The next field excursion members were invited to attend was the WEA evening class week long trip to the Isle of Arran on 21 to 27 April to examine some of its many and varied dykes and sills. Three society members came along with us. The weather was perfect for the whole of the week and we were kept busy all day and every day except for one day off. Needless to say everyone enjoyed this trip immensely and, thanks to the untiring efforts of Ted Finch who coped with an endless stream of questions, the week was a resounding success.

1974

"The Search for Metals" was the subject of Mr. Colvine's lecture on 10 May. This well illustrated talk was about his travels in Scotland and Africa looking for various metals. It seems that the two major requirements for this task are lots of luck and the ability to walk and walk and walk.

West Pembrokeshire was the venue for our first long weekend field trip. Two fewer people than expected attended this outing, but those who went had a very pleasant three days judging from the photographs our chairman took. The rocks looked at ranged in age from the Pre-Cambrian through Cambrian and Ordovician sediments, Ordovician intrusives and extrusives to the Silvrian and Carboniferous. There was quite a range of rock types dealt with and both the fossil and igneous interests were catered for. I think the area should be worth visiting again.

Dr. Walker's lecture on 14 June was on the visually exciting subject of volcanoes, and the slides and film we saw were just that. One could almost feel the heat. To heighten the atmosphere further, Dr. Walker went on to produce his own table-top volcano to demonstrate the transportation of volcanic ash by air currents. I believe it is the first time we have had a demonstration, and it was very effective.

There are some geologists and some members of the society who believe that geology stops at the Cretaceous and the only exposures worth seeing are in Scotland, Wales or Cornwall where the rocks are hard and generally clean! It broadened our horizons, therefore, on 12 July to hear Mr. Ward describe the work of the Tertiary Research Group. This group consists of a very dedicated band of people who confine themselves to working in the muds and clays of the Tertiary. Their enthusiasm for their research was beyond question, as we were told that they often work from early morning to late evening without stopping for lunch breaks or even tea breaks. This, I know, would not appeal to a lot of our members. It came as a surprise to me to hear Mr. Ward talking of finding sharks teeth in the Bracklesham Beds exposed in a gravel pit in Yately - not a million miles from my front door, as they say, and a place I had never previously considered going to visit. Which just goes to prove how easy it is to overlook things that you see every day and never stop to think about.

The last event was the Members' Evening on 2 August. I was not able to be there on that occasion, but I gather that I missed a great deal. There was a competition to guess the identity of 25 geological specimens of which the winner knew 18. There were a number of presentations made with slides on a number of subjects which included the island caldera of Thera in the Aegean Sea, A Climber's View of Geology, A Field Trip to South Kensington, Glaciers and Glacial Scenery and the Island of Mull. There were also displays of fossils and fluorescent minerals and a talk about one of our forthcoming field trips. It was certainly a very informative evening, and I apologise if I have omitted anyone's contribution.

After the chronicle of past events, what does the future hold in store? The next event is a lecture with the title "Dating of Quarterniary Deposits". This is on a Monday evening, 23 September and the speaker will be Dr. Thorely. A field trip led by our new Field Secretary, Rab Colvine, is to take place the weekend of 27 to 29 September. The location is Church Stretton and you should already have had some further details of this trip. The lecture following is being given by Dr. Gurr on the subject "The Natural History of Dinosaurs". This is to take place on 11 October. "Aspects of Crystallography and Mineralogy" is the subject of Dr. Bishop's talk on 8 November. The final meeting of 1974 is the Wine and Cheese party on 6 December at the usual place "The Cricketers' Inn" in Lower Bourne. All these meetings start at 8.00 p.m. and unless otherwise stated they all take place at the Adult Education Centre in South Street, Farnham.

The final item of this newsletter is an article written by our secretary, Pamela Crosby, describing a trip that she and Jean Smith made to Scotland last year. This is just the sort of article that is needed, so if you have something of interest to write, why not put pen to paper so that it can appear in the newsletter.

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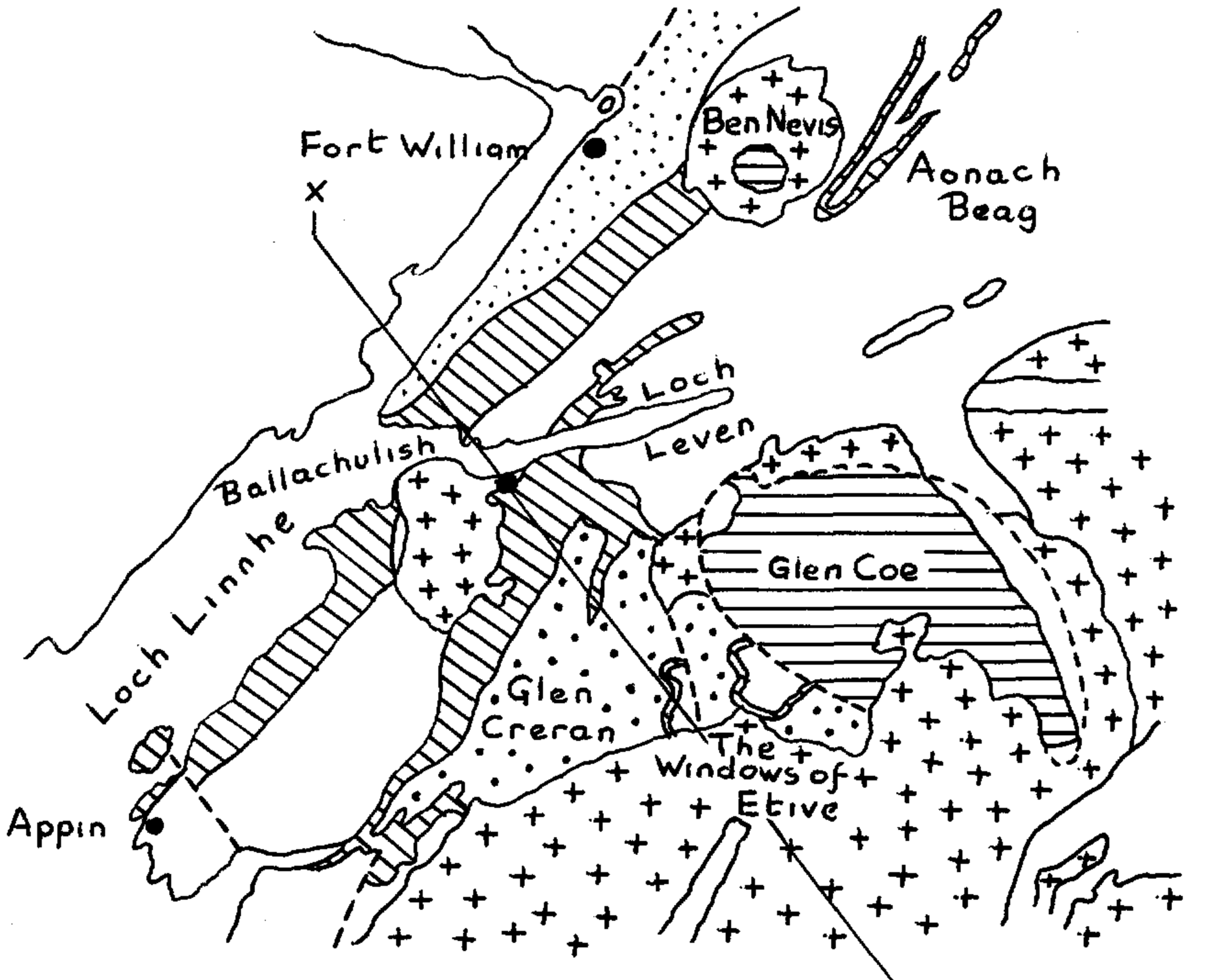
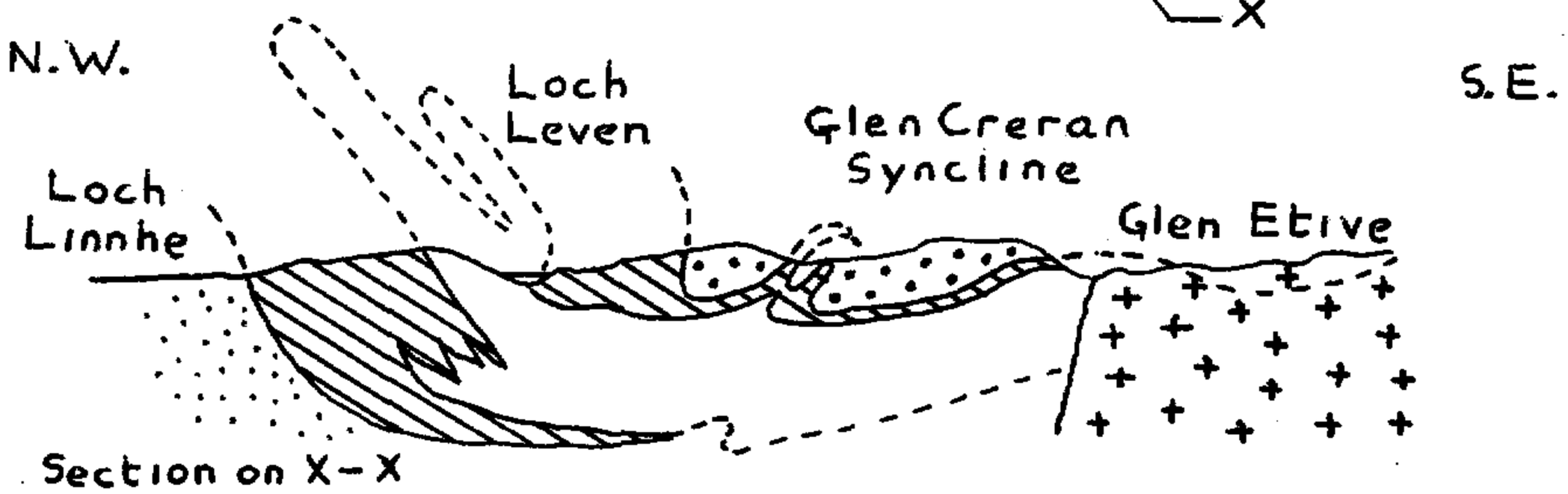
Geological Map and Section of Area around Glencoe





Lavas

Granite

---- Faults

Ballachulish Limestone and Younger forming Cores of the Ballachulish and Appin Recumbent Folds

Leven Schist and Older above Ballachulish Fold Core

Leven Schist and Older between Ballachulish and Appin Fold Cores

Leven Schist and Older below Appin Fold Core

Highland Schists

GLENCOE

On the morning of June 14th 1973, in the pouring rain, Jean and I arrived in Ballachulish, Argyll for a two day stay before journeying to Mallaig and crossing over to Skye. We had done a fair amount of work studying the Geology of the area, which included a trip to the Geological Museum. A brief itinerary was made and we set off on our holiday with certain "musts" to collect. I had visited Glen Coe a few years earlier and so the spectacular scenery was not new to me and I knew my way around (a little). It was, however, Jean's first trip and I am afraid our stay in Ballachulish spoilt for her the magic of Skye!

Glencoe originated as a valley in Tertiary times and received its final trimming within the last million years, in large measures at the hands of glaciers, but some of the rocks in which it is carved acquired their present character as much as 400 million years ago. These rocks are divided into three major catagories :

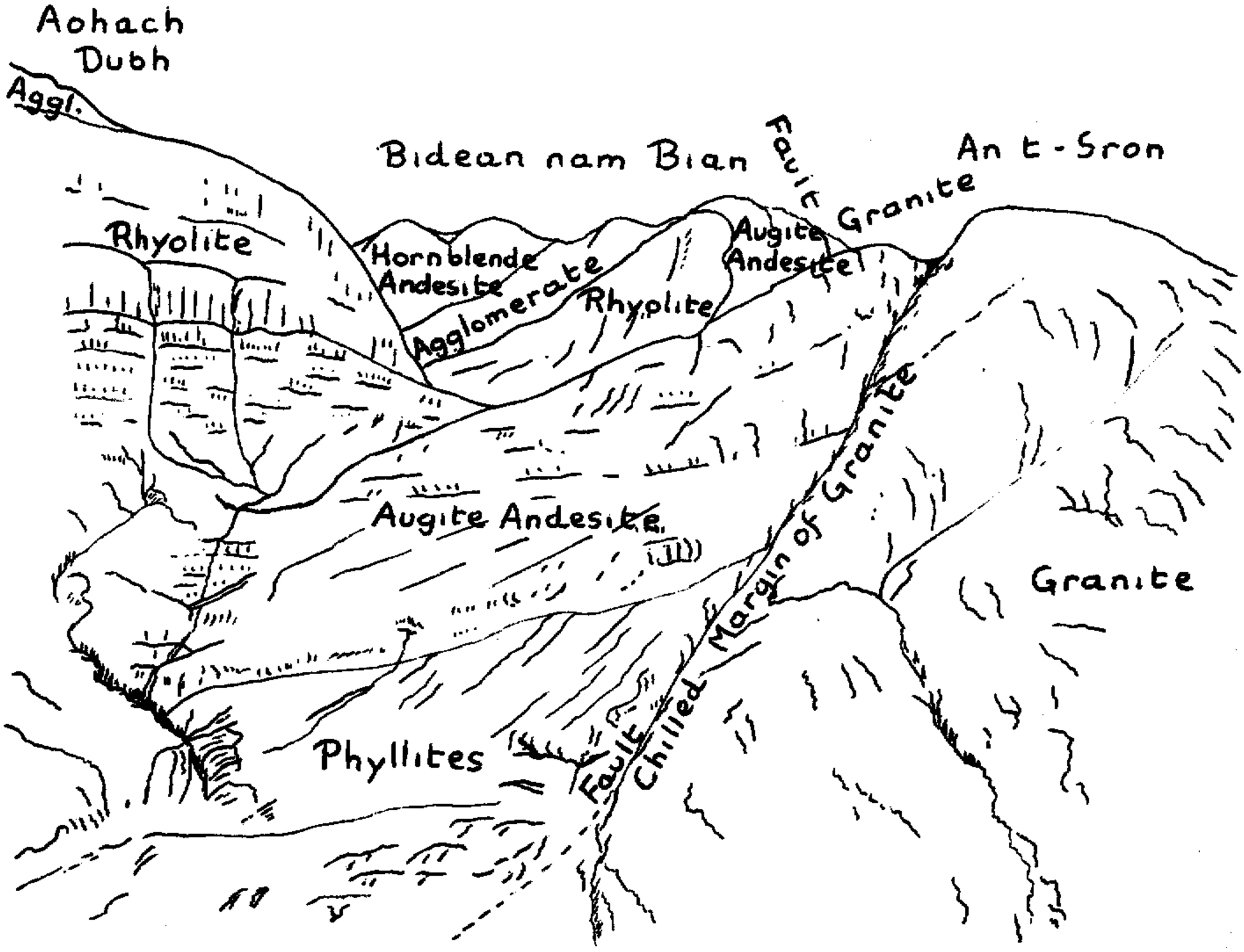
> Schists - Granites and Lavas. The Schists are of unknown antiquity while the granites and lavas belong to the Old Red Sandstone period. Their dating depends on a find of fossil plants in sediments associated with the Glencoe Lavas at the foot of Stob Dearg, Glen Etive. (The last afternoon we spent here searching in vain - we did, however, have a clear view of this beautiful glen.)

Schists

The local representatives are all of sedimentary origin - deposited on a sea-bottom as successive layers of sand, clay and calcareous matter. They retain no fossils as their age is uncertain, but they probably formed in Pre-Cambrian times more than 500 million years ago. Long afterwards they came to be greatly altered or metamorphosed so as to become Schists through being violently disturbed and at the same time raised to a moderately high temperature far below the surface of the ground as it then existed. The disturbances in which they were involved gave birth to a great mountain chain reaching through Norway, Scotland and Ireland. This happened not much less than 400 million years ago. Three main groups of the Highland Schists enter into the scenery of the Glen. They are from oldest to youngest - The Glencoe Quartzite, The Leven Schist (a metamorphosed clay) and The Ballachulish Limestone (a metamorphosed impure calcareous rock) well exposed in the river bed at Bridge of Coe. The Glencoe Quartzite consists of hard white rocks such as those that make the Pap of Glencoe. They are metamorphosed sandstones. (Here we spent a lovely afternoon, battling with midges!, collecting from seams at the foot of this mountain.)

The grey or black shiny rocks such as the black slates of the great Ballachulish Quarries were originally mud. They are now either mica-schists or slates. The cleavage, which allows the Ballachulish slates to be used as roofing material is a metamorphic character due to compaction by pressure. It is easy in the slate quarries to see that this cleavage often cuts across the original layering or bedding of the slate, now much contorted. (These quarries are a splendid sight and we collected pieces containing quite large pyrite crystals. Walking is very unpleasant along the shore due to the slates which make the going very slippery at this end of the Loch.)

The remaining rock type among the local schists is Limestone. The Geological Museum had specimens of this Dolomitic Limestone which I was determined to find with the help of locals and in sheets of rain we found the only known exposure tucked away near the old railway station. This attractive limestone seemed to vary in colour and texture due to varying stages of metamorphism. Some of the fallen blocks contained layers of pyrite crystals, some very small and some larger ones that had been distorted by pressure.



View of Bidean nam Bian within the Cauldron Subsidence of Glencoe

Lavas of Glencoe

Any view up Glencoe from the west, whether from Loch Leven side or from across Loch Linnhe, shows beyond the turn of the Glen scenery that is very different from that afforded by the Schists and Granites. These are the Lavas of Glencoe building Aonoch Dubh, the first of the famous Three Sisters. An-t-Sron is a mountain over 3,000 ft. in height, mostly made of granite. When the granite rose into position it was in the form of molten magma. This consilidated deep underground and the resultant granite has been revealed by erosion that has removed thousands of feet of solid rock. This tremendous erosion can be matched anywhere in the Highlands. There is nothing unusual about it; there is also nothing unusual about the western margin of the An-t-Sron granite which lies beyond the right-hand edge of the sketch. This western margin is well crystallised and thoroughly irregular, sending veins into neighbouring baked schists. The eastern margin is quite different. The granite here ends smoothly against a vertical plane called a fault, and where it meets this fault it becomes very finely crystalline showing that the magma has chilled against the rocks that lie to the east. The fault seen at An-t-Sron is the western boundary of a subsidence of more than 4,000 feet called the Cauldron Subsidence of Glencoe. When it formed in Old Red Sandstone times it developed a yawning cauldron-shaped hollow in the landscape. Erosion has obliterated all topographical expression of the cauldron apart from the fact that most of the rocks preserved inside are different from those now exposed in the surrounding country. The volcanic rocks inside, the andesites and hyolites and agglomerates, have up to now escaped complete erosion owing to subsidence having afforded them relative protection. Chilling of the granite against the downfaulted rocks within the cauldron shows that the subsidence was of the same date as the marginal uprising of magma along the boundary fault. The sinking rock-cylinder carried down with it relatively low temperatures, and thus chilled the ascending stream of magma. The phyllites belong to the schists that serve as basement to the Glencoe lavas. Above them come groups 1-4 of the Volcanic series :-

	Thickness
Group 4 - Hornblende - andesite lavas	900 ft
Group 3 - Agglomerate (ash)	250 ft
Group 2 - Ryolite Lavas	450 ft
Group 1 - Augite - andesite and basalt lavas	1,500 ft

The andesite are of types very prevalent in the Andes of South America. The ryolites derive their name from a Greek word implying "flow" since they generally show conspicuous flow-banding. They occur in thick massive beds which provide the finest scenery and finest climbing of the Glen. Three miles to the east south-east the magnificent Stob Dearg is built of Ryolite flows from base to summit. These rest almost directly upon the Schist foundation. (We spent a sunny afternoon in the fast flowing streams at the foot of An t-Sron. This is a beautiful spot and the scenery is magnificent.)

While river erosion has been responsible for the general plan of Glencoe and its tributaries, glacial erosion of comparatively recent times, during which man was living in Southern England and France has made a notable contribution to the scene. At the maximum of glaciation the ice-shed of Scotland lay across the Moor of Rannoch. To this date we may attribute the carry of boulders of the Moor's distinctive granite. During this stage also and for long afterwards a great current of ice poured westward through the glen. It opened up the latter providing it with what is called a typical U-shaped cross-section.

"There is little or nothing to soften the asperity and gauntness of Glencoe and with few trees, little heather and only a tiny lochan there is a certain lack of colour; a mono-chromatic atmosphere that deadens brilliance. Whether in winter or summer mood Glencoe has its own particular charms to offer the

wanderer among its rugged slopes. To those who are not addicted to the 'innocent and amiable occupation of going up and down hills' Glencoe has a radically different distinction. Gloom, horror, weeping, anguish and a generally depressing mournfulness has overpowered many observers of "that nightmare of gulf and eminence, of gash, and peaks afloat upon swirling mists ... ... haunted for ever with wailing and rumours, ghosts calling in the deeps of dusk and melancholy, legends of horror and remorse. The morbidity, of course, rightly belongs to the lowland part of the glen where it merges with Loch Leven, for it was here that most of the population lived at the time of the massacre, not among the mountains. Mountains never kill by treachery." Quoted from an account by A. C. Small - Glencoe's Pround Mountains.

I hope I have managed to whet your appetities. If so, have a word with your committee members for a possible future trip!