North Eastern Geological Society

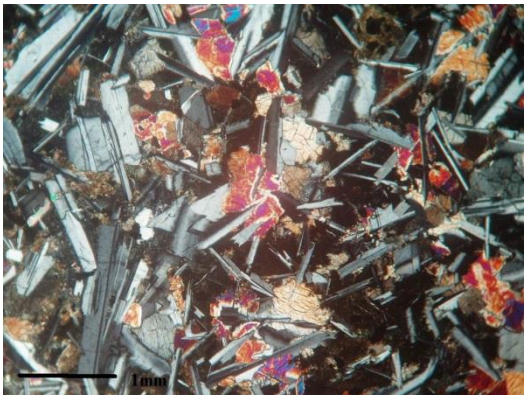
Members evening 13.12.13

Two members made presentations to the substantial group of members in attendance.

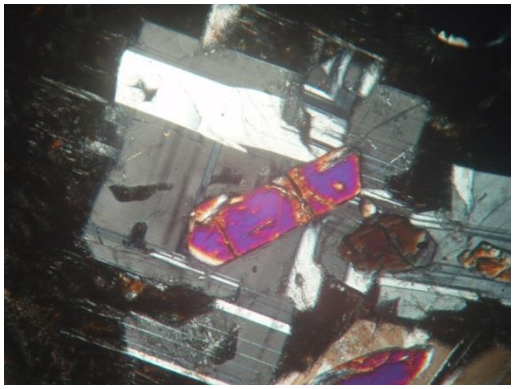
John Waring outlined the essentials of an amateur making a thin section of a rock specimen. Starting with a catalogued specimen a diamond saw is used to take a thin slice, the thinner the better. This is then mounted on a glass plate and fixed with a resin. A 220 grade grit is used to reduce the thickness of the slice, the aim being 30 microns (0.03 mm). When the rock slice begins to reveal high order interference colours through crossed polars a finer 600 grade grit is used. Frequent monitoring of the slice takes place until the appropriate thickness is achieved where maximum interference colours of pale straw yellow of quartz or plagioclase feldspar are observed. The slice is then cut around the edges to produce a rectangular shape, placed on the hot plate and carefully transferred onto a microscope slide coated with a mounting medium, e.g. Numount, with a refractive index of 1.54. A cover glass, also coated with mounting medium is placed above the thin section. The mounting medium is then left to harden prior to a study of the thin section being made.

There are many elements to the exploration of a rock slide. John introduced the polarising microscope with its polariser, analyser and Bertrand lens (for interference figures). Images of slides he has made demonstrated actual colour of some minerals. Glaucophane for example can have a bluish colour. Some minerals change in colour when rotating the stage under plane polarized light. Other characteristics of minerals include habit, relief, cleavage, isotropism, extinction angles as well as the appearance of twinning under crossed polars, a distinctive feature of a few minerals, especially plagioclase feldspars. These diagnostic features can help in the identification of the minerals in the thin section.

Case studies completed the presentation which was warmly received.



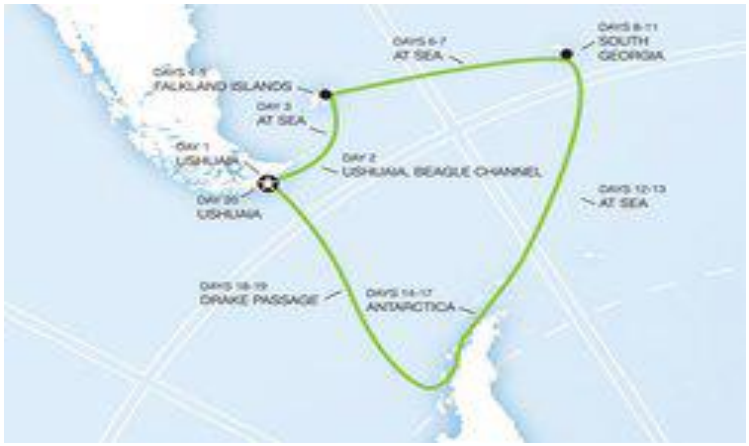
Thin section of TertiaryTynemouth Dyke Mainly plag. Feldspars and augite in a glassy
Mesostasis (cross polarised light)



Thin section of a xenolith in a sill from the Isle of Mull: sapphires (corundum) set within plag. feldspar

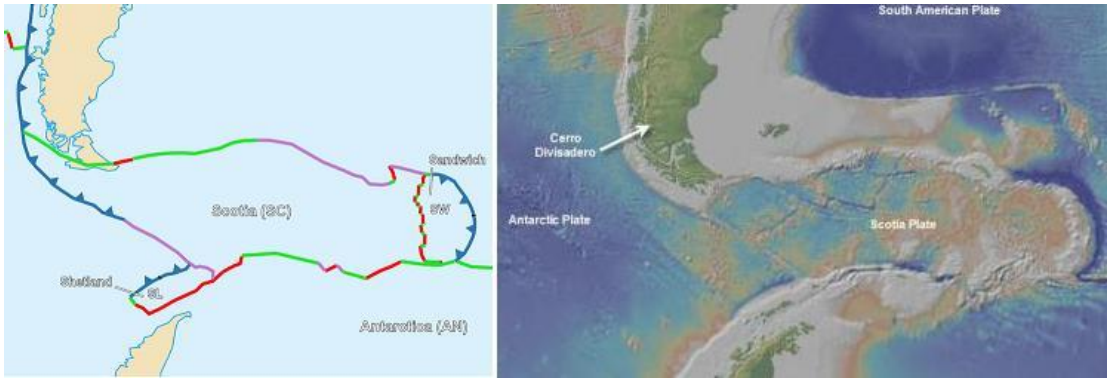
Christine Burridge followed with an illustrated journey to the South Atlantic and Antarctica.

The route:



The journey took the party across the Antarctic Region Convergence, a marked drop in sea temperature reflecting the unique circulation system of the area. Leaving Tierra del Fuego the first landfall was the Falkland Islands. The evidence of Gondwana fossils was outlined helping to support the break up of that massive continent. The islands themselves rotated 180 degrees during the separation from Africa.

The position of the Scotia Plate was noted:



(Wikimedia Commons user: Sting)

This has the characteristics of a plate margin of course. The next land was South Georgia with spectacular coastal scenery built from the largely volcanic material of the island. Jurassic and Cretaceous Andesitic turbidites was noted as an example of the country rock. Grytviken, the location of the grave of Shackleton and Frank Wild, key members of the expedition, were visited. The party did the Shackleton walk across the island, presently infested with rats and reindeer. Both groups are being removed with the Sunni (brought in for the task) collecting the reindeer meat for sale! The landscape was spectacular with freeze thaw processes and their products in abundant evidence together with large fjords. The wildlife, of course, was abundant with various penguin species observed and great care being taken to avoid contact. A visit to Gold harbour recalled the abundant iron pyrite that gave the area its name. Glacial retreat was especially clear with three glaciers retreating rapidly in this area.. A visit to Elephant Island reinforced the work of Shackleton's geologist: James Wardie.
Moving along the Trinity Peninsula of Antarctica and observing Deception Island, a caldera still active with rapid floor movement and seismic activity reinforced the geologically active character of the area. Christine even enjoyed a brief swim in volcanically heated seawater. A visit to Petermann Island allowed the mass of basaltic dyke activity to be noted whilst watching the hump back whales!

The presentation was again very warmly received by the members.

Reports by Gordon Liddle