NZ IPY-CAML Voyage 2008

6 – 9 MAR Scott Island & beyond

John Mitchell

After completion of the first abyssal station in the northern part of our survey – at a depth of 3500m – we moved on to our last seamount station next to Scott Island. Scott Island is very small (400m by 200m) and isolated, lying about 310 nautical miles northeast from Cape Adare. Its companion – Haggit's Pillar – is an impressive 62m high volcanic stack sitting 200m northwest of the island. We are sampling in this area to compare the biodiversity with that of the Balleny Islands some 500 nautical miles to the west that have been sampled in earlier expeditions by *Tangaroa*. Scott Island was first discovered in December 1902 by Lieutenant Colbeck on the vessel *Morning* while heading south to supply Scott's 1901-04 expedition on HMS *Discovery*.

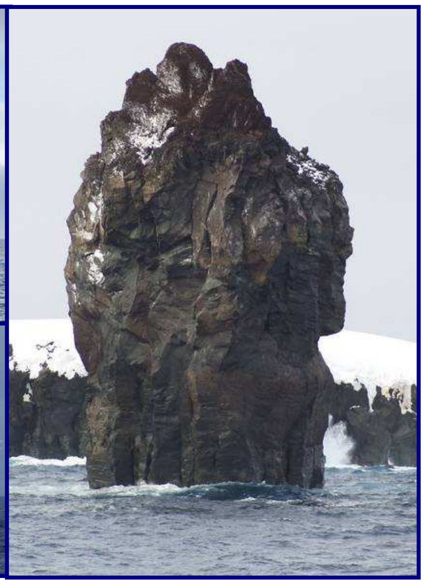

Fig. 1. Scott Island with Haggit's Pillar to the left.

Fig.2. Haggit's pillar in a moderate swell.

Fig.3. Haggit's Pillar with Scott Island in the background. (Photos 1-3: John Mitchell)

The benthic community around Scott Island is very abundant compared to the seamounts that we sampled further south on this chain last week. The seabed in waters shallower than 400m is covered with numerous sea pens, brittle stars, anemones, and sea stars (Fig. 4). A seabed of solid volcanic rock and rubble in some areas often made the sampling difficult (Fig. 5).

We've now finished sampling in this area and are moving west to the Admiralty Seamount chain about 250 nautical miles to the west, in between the Balleny Islands and Scott Island.

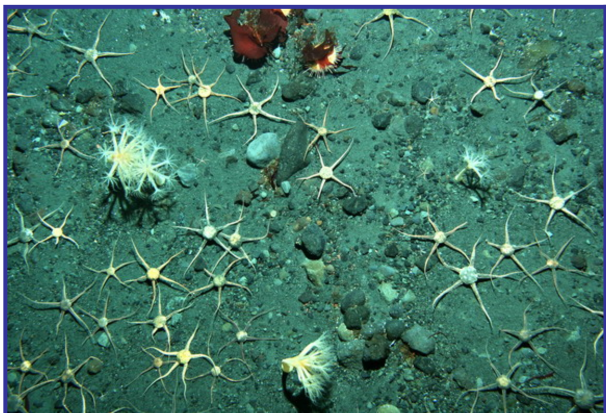

Fig. 4. Typical soft-sediment seabed community at Scott Island, with numerous brittle stars. (Photos 4 & 5: DTIS)

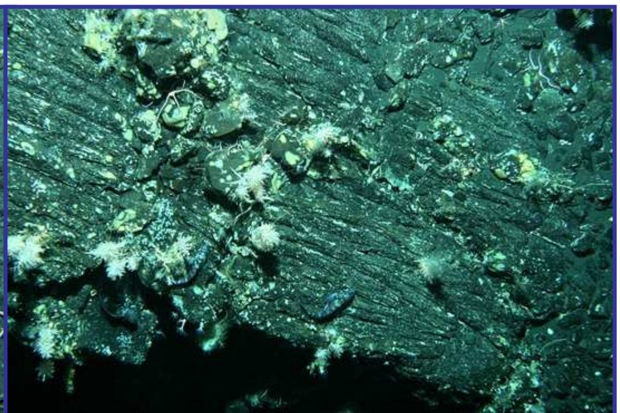

Fig. 5. Exposed volcanic rock on the seabed of Scott Island, showing flow structures in the rock formed during eruption.

SCIENCE REPORT

Neuston Sampling — Julie Hall (NIWA)

Neuston is the name for zooplankton that live in the top few centimetres of the ocean. To sample these organisms we have a specialised net which is towed, right on the surface at about 1.5 knots, from the side of the ship. We've had limited opportunities to deploy the neuston net during the voyage because of the sea and ice conditions we've encountered. In rough seas, the net bounces from wave top to wave top and does not sample the neuston effectively. When the sea is cold (as it has been), newly forming grease ice fills the net, sometimes creating a giant seawater slushy! (Fig. 6). When we have succeeded in sampling, the dominant organisms have been salps (planktonic relatives of sea squirts; Fig. 7 & 8) and amphipods, (small crustaceans that are related to sandhoppers).

Fig. 7 (right). Salp from the neuston net (Photo: Stefano Schiaparelli)

Fig. 8 (right). String of colonial salps seen in their natural habitat. (Photo: DTIS)

Fig. 6 (above). Dave Bowden with the neuston net full of grease ice (Photo: Julie Hall).

Into deeper waters — David Bowden (NIWA)

Moving progressively away from the central and southern Ross Sea, the contrast between benthic communities on the shelf and the deeper slope and abyssal environments is pronounced. Shelf habitats were characterised by densely-populated assemblages of organisms that filter plankton and detritus out of the water (suspension-feeders) and organisms that ingest sediments rich in microbial food (deposit-feeders). These have now given way to a visually monotonous seabed of uniform fine mud scattered with glacial drop stones in the abyss. These depths are sparsely populated compared with the shelf and the conspicuous inhabitants are now deposit-feeding organisms and their predators. Similar changes are found with depth at all latitudes, but the dominance of suspension-feeding taxa in shallow habitats of the Ross Sea makes the contrast particularly striking.

The DTIS camera deployment at our first abyssal sampling site in the northern part of our survey area revealed a seabed of fine mud scattered with black stones. The most conspicuous organisms were large holothurian echinoderms (a group which includes sea cucumbers Fig. 9) distinctly different to those from the shelf and slope.

Fig. 9. Deep-water Elipiidae species holothurian, related to the *Scotoplanes* species common in the Ross Sea (Photo: Stefano Schiaparelli).

Fig. 10. *Oneirophanta* species. holothurian on sediments at 3300m depth. (Photo: DTIS)

These are deep sea animals found over a wide latitudinal range, rather than the exclusively Antarctic fauna we have seen up to now. Even those that look like the familiar *Scotoplanes* sp. 'sea pigs' of the Ross Sea, are actually from a different family (Elipiidae), which is widespread in the deep sea below 2000m. These deep-water holothurians often have bizarre protuberances, such as the dorsal spike on the *Phsychropotes* sp. specimen (Fig. 11). We can only guess at the purpose of these appendages at this stage.

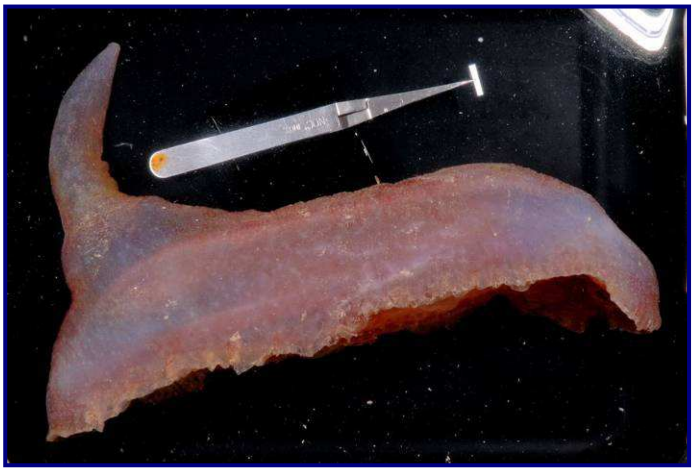

Fig. 11. *Phsychropotes* species. displaying its characteristic dorsal spike. Caught by the beam trawl at 3300m depth (Photo: Stefano Schiaparelli).

New species and records continue to flow…

Malcolm Clark (NIWA) and Stefano Schiaparelli (Italian National Antarctic Museum)

Our last few days in the Ross Sea have seen continued discoveries of new species or new records of invertebrates. Invertebrate taxa are so diverse that experts onboard can only identify some of the groups with certainty. It is therefore likely that many new species or records for the Ross Sea will remain unconfirmed until samples are sent to experts around the world after the voyage. However, there are a number of animals that have been caught or photographed that we are confident are new species, new records, or are adding a lot of information about poorly known groups. These include a crinoid (or sea lily) of the genus *Bathycrinus* in shallow waters, a sea urchin *Pourtalesia* species and the gastropod (snail) *Miomelon turnerae* at 2200m. More on those in the next installment.