

Weekly report no. 6./7. (ANT XXI/2) RV "Polarstern" 22.12.2003 - 04.01.2004

This is a two-week report, because the posting would have been difficult between the public holidays. The report starts two days before Christmas Eve, when we were commuting between the iceberg resting place Austasen and the "Hilltop" station in brilliant sunshine, always on the lookout for an open area of water where we could deploy our gear; and it finishes today, on the first Sunday of the New Year, with the start of our return journey. In between lie many busy days and nights, during which we went on studying the benthos disturbance by icebergs, investigating the biodiversity and comparing the happenings in the water column with the patterns at the sea bottom. Also to report are the pelagic trawls in front of the Drescher Inlet and their connection to the studies of the five seal and whale scientists from the inlet. And at last the readers might be interested in how crew and scientists spent Christmas and New Year in Antarctica – not hungry and freezing, to mention it in advance.

Fine weather was favouring the concluding work on the disturbance of the bottom fauna in Austasen before and after Christmas, on one hand; on the other, the constant wind- and tidal-driven shift of the pack ice fields strongly obstructed it. Affected by this especially were the bottom trawl (BT), whose wires might get damaged in the pack ice and the underwater video (ROV) from Bremen, which needs a much larger deployment area free of ice than its predecessor. The BT could only be deployed in a narrow depth range between 250 and 340m, which had negative effects on both the invertebrate and fish catches. It also did not enhance the characterisation of the fauna in disturbed and undisturbed areas.

The ROV was in use at the "Hilltop" a couple of times and showed again how interesting and diverse the colonisation of this shallow underwater hill is. On its top, 60-70m under the water surface are big rocks, which change into narrowly packed stone layers reminiscent of cobblestone pavements. Their surfaces are green-brown, maybe by a film of diatoms that might feed the numerous red sea urchins. Seaweeds were not visible although the light conditions should be sufficient for them. The gravel sand zone continues downhill and is ruled by sea cucumbers with impressive tentacle rings and delicate cnidarians. On finer sediments horny corals and long-fingered sponges are found. One path that seemed to have been formed by earlier iceberg scouring is now overgrown by a monoculture of young colonies of the soft coral *Ainigmaptilon*. Continuing downhill, deeper than 100m, the soft, detritus-rich bottoms are dominated by round and vase-like sponges, sea anemones with fleshy white tentacle crowns, worms with delicate crowns, "Lollipop" sponges and those red guys (Hemichordata) which are thought to be our closest relatives within the invertebrates. Crinoids dance over this diverse scenery by moving their multiple arms in a changing rhythm through the water.... The "Hilltop" ecosystem is really unique.

The video system of the heavy multibox corer can be used in nearly every

ice condition and samples can be drawn. Hydrography and plankton gear were also only marginally affected by the ice condition so that the sampling on the continuous station could go on. This proved to be especially interesting because we were hit by a northeasterly gale at Christmas that changed the hydrography completely.

Our meteorologists had announced the storm some days in advance and it arrived on time at Christmas Eve. At lunchtime we still had only wind speed of force 4, which put some white horses onto the water surface of our lagoon. For precaution we retracted behind some huge icebergs to avoid the pressures of the ice and put the bow, facing the wind, into a large, flat ice float. And then it started: the barometer fell distinctively, the wind increased quickly to a speed of 7, and it started snowing. The contours of the icebergs around us faded. Snow was blown into the water from the edge of our ice float, creating long lines of soft ice, forming small pancakes that were drifting away.

Now Christmas Eve can come! The celebrations started with a formal reception in the "Blue Saloon", then the Christmas speech by the captain, multilingual Christmas carols by the "Polarstern Carol Singers", and self-baked cookies and mulled wine. Then, expecting a feast, instead was the traditional German Christmas Eve dinner of sausage and potato salad served in the messes and afterwards a party of everybody in the hold, spiced by a modern Christmas play. Outside the wind was crying, having increased to a speed of 9; there was more or less nothing visible.

On Christmas Day the storm picked up to gale forces, in peaks the wind speed was more than 39m/sec (140km/h). At night the vessel slipped a couple of times from its ice float and the officer of the watch, Steffen Spielke, had to reposition again and again ("in waltz beat" as his colleagues gossiped, looking at the cruise plot). Captain Domke forbade entering the outer decks. There was no way of thinking to work outside, we "weathered down" and dedicated ourselves to the delicious foods from the kitchen, which were served in the festively decorated mess rooms. We even had Christmas trees, and really nice ones! You were not able to look out of most of the beautifully frost covered windows but outside was a complete whiteout anyway. The exception was the dark area of water, which could be overlooked from the not snow-covered port window on the bridge and the protected bridge-wing. The water showed a fascinating play; the snow blown off the sea-ice edge formed long, deep fronts in which pieces of ice seemed to float against the current's direction. With enormous speed the small surface waves were blown away from the ice edge giving the water surface a tiled roof structure. They were similar to waves that are blown over the mudflats of the North Sea by strong winds. It is an indescribable feeling to stand comfortably on the wide bridge of the big "Polarstern", to listen to the howling of the gale and to follow the play of the waves next to the ice edge. It is a weird feeling for us humans to be on this perfect island of safety in this wild nature of the Southern Ocean.

Our thoughts were with our colleagues in the Drescher Inlet who had to weather it out in their igloos. From Neumayer we received the calming notice that they “only” had wind speeds of force 10 out there. At some time Jochen called from Drescher; yes, they can not do anything, but the wind speeds stopped at a force of 9, the igloo anchors were holding, as well as those for the “Scott’s tent”, the toilet tent. Only the generators they had to stop because the fine snow was penetrating them but they had gas sup---plies (for heating, cooking,...).

In the afternoon of Boxing Day the wind speeds slowed down to below 20m/sec for the first time, force 8. The forced, longer Christmas break was over; we started work again and finished the work at Austasen and Hilltop by the 30th of December. Some well sorted Agassiz trawls and one bottom trawl eased the need of material, even if selected organisms like the lollipop sponges needed for filtration experiments were rarely caught. The multibox corer visited again the crinoid station at 1500m. We also got some good photo sledge transects from the Hilltop. Especially interesting was sam---pling in the water column after the storm that produced a deep mixing of the surface water with the deeper layers. The phytoplankton concentrations on the seafloor were very high; a large part of the plankton bloom had rushed down directly after the stable layering was lost. This could not remain without consequences on the benthos