Abstracts of speeches and posters

Grethe Bruntse, Tor Eiliv Lein and Leif Christian Stige

Dominant species abundance related to environmental factors on rocky shores in the Faroe Islands

Abundance data on 22 species of algae and invertebrates were recorded at 159 intertidal sites with hard substrate in the Faroe Islands. A biological exposure scale (cf. Dalby *et al.,* 1978) was developed for rocky shores with mean tidal amplitude larger than 0.4 m. Significant response curves were obtained for 15 of the 22 dominant species that were investigated; *Aglaothamnion sepositum*, *Alaria esculenta*, *Corallina officinalis*, *Fucus distichus* ssp. *anceps*, *Himanthalia elongata*, *Mastocarpus stellatus*, *Polysiphonia stricta*, and *Porphyra umbilicalis* were predominantly found on exposed shores, *Ascophyllum nodosum*, *Cladophora rupestris*, *Pelvetia canaliculata*, *Verrucaria mucosa*, *Littorina obtusata*, and *Nucella lapillus* were predominantly found on sheltered shores, and *Semibalanus balanoides* had the largest abundance on moderately exposed shores (Bruntse *et al.,* 1999). The results confirmed earlier descriptions of the distribution of littoral organisms in the Faroe Islands.

The method used relies on the presence of one factor, typically wave exposure, causing most of the species variation. The obtained data on abundance and environmental variables were analysed using Canonical Correspondence Analysis (CCA) and related ordination techniques to test the relative importance of wave exposure and other environmental variables and to investigate the nature of unexplained variation. In addition, the data from the stations with tidal amplitude 0.4 m or less that were left out from Bruntse *et al.*'s (1999) analysis were explored using this method.

Wave exposure was found to be the most important structuring factor. Substrate type and the position within the fjords were the other major variables, possibly through indirect effects on wave exposure. Current and tidal amplitude had minor effects while no effects were detected of slope, geographical direction of the slope or local protection. The results also indicated the presence of an unknown factor responsible for some of the variation. The biological exposure scale developed was shown to resemble the first axis in Detrended Correspondence Analysis (DCA). The analyses support the interpretation that the biological scale mainly reflects wave exposure (Lein *et al*., 2001).

References

Bruntse, G., Lein, T.E., Nielsen, R. and Gunnarsson, K. 1999. Response to wave exposure by littoral species in the Faroe Islands. *Fróðskaparrit* 47: 181-198.

Dalby, D.H., Cowel, E.B., Syratt, W.J. and Crothers, J.H. 1978. An exposure scale for marine shores in Western Norway. *Journal of Marine Biological Association of United Kingdom* 58: 975-996.

Lein, T.E., Stige L.C., Bruntse, G. 2001. Dominant species abundance related to environmental factors on rocky shores in the Faroe Islands. *Fróðskaparrit* 48: 105-124.

Ruth Nielsen

Seaweeds of the Faroe Islands

Investigation of marine benthic macro-algae was included in the BIOFAR 2 programme with collections made between July 1994 and August 2000.

Algae were collected selectively by hand in the littoral and by Scuba-diving at sublittoral levels down to 30 m. Most of the larger islands are represented within the 71 localities visited. The material from a total of 265 stations includes collections from different seasons.

The results are summarised in "Seaweeds of the Faroe Islands. An annotated checklist" (Nielsen and Gunnarsson 2001).

In total 6,703 specimens were recorded; identified to species were 113 Rhodophyceae, 83 Phaeophyceae, 4 Xanthophyceae, 64 Chlorophyceae and 18 Cyanophyceae. Comparison with records of marine algae published since 1896 reveal 42 new species records for the Faroe Islands. Many of these are small species that may have been overlooked in previous investigations and only a few are likely newcomers.

Voucher specimens have been deposited in the Botanical Museum Copenhagen, Denmark, and duplicate collections at the Faroese Museum of Natural History, Tórshavn, the Faroe Islands, and at the Marine Research Institute, Reykjavik, Iceland. The comprehensive collection of marine algae from the Faroe Islands in Copenhagen includes older material e.g. the collection of H. C. Lyngbye from 1817 and of F. Børgesen from 1896-1902. Recently 3.479 of the old specimens have been registered. For information see http://www. botaniskmuseum.dk/bot/VIP/nielsen.htm, and for type specimens see also http://130.225.211.33:1591/databases.htm.

Reference

Nielsen, R. and Gunnarsson, K. 2001. Seaweeds of the Faroe Islands. An annotated checklist. *Fróðskaparrit* 49: 45-108.

Susse Wegeberg, Ronnie N. Glud and Michael Kÿhl

Short-term temperature effects on respiration and photosynthesis in the coralline red algae *Lithothamnion glaciale* and *Phymatolithon tenue* (Corallinales, Rhodophyta) from the northern North Atlantic

A comparison of short-term temperature effects on respiration and photosynthesis in arctic (Greenland) and temperate (Denmark) specimens of the coralline red algae *Lithothamnion glaciale* and *Phymatolithon tenue* (Corallinales, Rhodophyta) was performed. Dark respiration and net photosynthesis as total oxygen exchange rates were measured by the use of oxygen microsensors. The experiments were performed at light intensities of 5 to 300 µmol photons $m^{-2}s^{-1}$ and at temperatures of 0, 6, 12 and 18 °C.

The plots of net oxygen consumption/production of *L. glaciale* and *P. tenue* from Denmark and Greenland as a function of increasing scalar irradiance showed P-E_0 curves without indication of photoinhibition. In general, net photosynthesis and dark respiration increased with increasing temperatures.

However, P_m, R_{dark}, and E_c, derived from the P-E_0 curves, showed different patterns of temperature response for *L. glaciale* and *P. tenue* from the two habitats. Plots of P_m, R_{dark}, and E_c as function of increasing temperature for *L. glaciale* for each habitat showed increase in the parameters at temperatures similar to habitat temperature. No such pattern was recognized for *P. tenue*, but the level of saturated photosynthesis in this species was higher for the specimens from Greenland than for those from Denmark.

This tendency was not observed in *L. glaciale.*

Torleiv Brattegard

Mobile benthic crustaceans in heterogeneous environments

The sea area around the Faroe Islands is heterogeneous and this is in many ways important for bottom-living animals. Large and small scale heterogeneity is reflected in topography, compostion of sea-bed surface, currents and water masses.

One of the sampling gears employed during BIOFAR was the modified Rothlisberg & Pearcy epibenthic sledge. This gear yielded diverse and rich catches of macrobenthic peracarid and decapod crustaceans.

Most mysids, amphipods and natant decapods move around and many leave the bottom every night to make short or long excursions into the water column. Strong water mass movements and tidal currents in the area may impose problems for species to stay in a particular habitat.

The paper discusses whether commonly caught species in the Faroe area have a preferred habitat or if they are adapted to a wide range of habitats.

Comparisons of selected, mobile hyperbenthic mysids, amphipods and natant decapods in the Faroe area are made with data on the same species collected with the RP-sledge from less heterogenous environments in Iceland, Norway and Svalbard.

Torleiv Brattegard

The ridge across the Atlantic – barrier or bridge for benthic animals?

The existing Norwegian Sea (or GIN Sea) was formed about 50 million years ago.

A summary of our knowledge of the processes forming the Scotland-Faroe-Iceland-Greenland ridge and its topographical features from its creation to present is given.

The possibilities of present day dispersal into this relatively young sea area are discussed and related to the hydrographical regime as we know it today.

Gaps in our knowledge necessary to understand and reconstruct the exchange of benthic faunal elements across the ridge and along the ridge across the Atlantic, as well as through the Fram Strait, since the formation of the Norwegian Sea are presented.

Examples of ways and routes of disper-

sal are given as well as examples of some puzzling distributions.

Jean-Claude Dauvin and Carole Vallet

An overview of the suprabenthic macrofauna in the English Channel

More than one hundred and fifty suprabenthic hauls with a modified Macer-GIROQ sledge were taken over the period 1988-1996 in 15 sites in the English Channel from the Roscoff and Plymouth waters to the Dover Strait, including the Bay of Morlaix, the Bay of Saint Brieuc, the Bay of Seine and the Seine Estuary. The sledge permitted to collect the permanent suprabenthos defined by Brunel *et al.* (1978) as all the swimming bottom-dependent animals (mainly crustaceans: peracarids, leptostraceans, decapods and pycnogonids) which perform with varying amplitude, intensity and regularity, seasonal or daily vertical migrations above the sea floor and the 'near bottom zooplankton' subdivided into mesozooplankton (copepods, crustacean larvae), and macrozooplankton (chaetognaths, ctenophores and post-larval fish).

The number of suprabenthic species collected was very high except in the Seine estuary. Numerically, mysids were the dominant group of organisms collected with the sledge, followed by amphipods, cumaceans, isopods and decapods. Abundance and biomass of the fauna were very high in the Seine estuary where the specialized mysids *Neomysis integer* and *Mesopodopsis slabberi* occurred in very high abundance. At other sites, the abundance and biomass were moderate. Abundance reached its maximum when mysids or swarms of amphipods of the genus *Apherusa* were collected, and during the reproduction of the amphipods of the genus *Ampelisca* as in June in the Bay of Morlaix. The number of species, abundance and biomass showed seasonal changes in all sites with, in general, lowest values in winter or spring, and highest values in autumn. For the open sea sites, two main geographical gradients were identified: 1) in spring, a higher number of species in the western part of the Channel and, in autumn, a higher number of species in the eastern part of the Channel and 2) an increasing abundance gradient from west to east at spring and an inverse decreasing during the autumn. The Seine estuary supports a typical suprabenthic estuarine community.

For the open sea sites, mesozooplankton taxa richness showed no significant difference between seasons. Nevertheless diversity (H') and evenness (J) were higher in autumn than in spring at each site except offshore Plymouth where *Calanus helgolandicus* dominated in both seasons. Copepods dominated in abundance at each site in spring while crustacean larvae were dominant in autumn except at site 2 offshore Plymouth, where copepods remained dominant and in the Dover Strait, where no significant difference occurred between copepod and crustacean larval abundances. Depending on the season, four taxa assemblages were distinguished: taxa present in spring; taxa collected at both seasons; organisms more abundant in autumn, and taxa collected in autumn. In addition, mesozooplankton abundance was higher during the day than at night. In the Seine es-

tuary, the community was dominated all year by the estuarine copepod *Eurytemora affinis* which showed an annual cycle with peak in spring and low abundance from July to February.

The macrozooplankton was little diversified for the open sites and reduced to fish larvae in the Seine estuary. Marine species as the chaetognaths *Sagitta elegans* and S. *setosa*, and different fish larvae (Callionymidae, Clupeidae, Gadidae, Gobiidae, and Soleidae) are abundant only in spring in the coastal zone in the Bay of Seine. The ctenophore *Pleurobrachia pileus* shows very high spring abundances (May-June) in salinity > 15 per mille with a maximum abundance > 80,000 ind.$(100\ m)^{-3}$ and is more abundant in the Seine estuary than in any other European shallow waters.

The results are compared with those existing for suprabenthic (hyperbenthic) fauna in other part of the north-eastern estuary in terms of demographic parameters (species richness, abundance and biomasses), assemblages and swimming activities above the sea bottom.

Reference

Brunel, P., Besner, M., Messier, D., Poirier, L., Granger, D., and Weinstein, M. 1978. Le traîneau suprabenthique MACER-GIROQ: appareil amélioré pour l'échantillonnage quantitatif étagé de la petite faune nageuse au voisinage du fond. *Internationale Revue der Gesamten Hydrobiologie* 63: 815-829.

Grete E. Dinesen

Biodiversity of horse mussel beds: Is the plethora of species on the Faroese Shelf unique in the NE Atlantic Ocean?

On the Faroese shelf and in the fjords, the horse mussel *Modiolus modiolus* (L.) forms patches and extensive beds at depths between 0 and 210 meters. The mussel aggregations are inhabited by a diverse invertebrate fauna. The *Modiolus*-associated fauna can roughly be divided into two groups. The sessile epizoans that live attached to the shell of live mussels, and the remaining fauna of motile, sedentary, and infauna species that live among the mussels. More species have been found associated with *Modiolus*-aggregations on the Faroese shelf than are recorded in the literature from elsewhere in NE Atlantic waters. These surveys originate from shelf areas of Iceland (3 surveys), the Faroe Islands (2 surveys), Norway (1 survey), and United Kingdom (5 surveys). To investigate differences of fauna diversity, measures of taxonomic distinctness are examined using the software package PRIMER v/5.2.9 (PRIMER-E Ltd, Plymouth). The molluscan fauna from the Faroese shelf is compared with literature records from Iceland, N. Ireland, and Shetland. Total fauna from all surveys are compared using cross-phyletic analyses. The preliminary results suggest that the genuine biodiversity of *Modiolus*-associated fauna is equally high throughout the NE Atlantic area and that the variation of species numbers between surveys is most likely caused by differences in sampling methods and taxonomic resolution.

Danny Eibye-Jacobsen

The biogeography of phyllodocids (Polychaeta: Phyllodocidae) found in Faroese waters

The BIOFAR material studied contains 32

of the 35 species of Phyllodocidae (Polychaeta) that are known from the Faroe Islands. Of these 32 species, 12 are new records for the Faroe Islands and one species is new to science. The distribution of the 16 species found at 4 or more BIOFAR stations has been studied in relation to the occurrence of the three main water masses that characterize the ocean bottom around the Faroe Islands: North Atlantic Water (NAW), North Icelandic-Arctic Intermediate Water (NI/AI) and Norwegian Sea Deep Water (NSDW). Five species appear to be restricted to NAW and four others display a similar pattern of distribution but also have isolated occurrences in NI/AI. Two species occur mainly in NSDW, with a few records from NI/AI. Finally, 5 species occur in all three water masses; of these, *Phyllodoce groenlandica* is the only one that shows no clear preference for a particular water mass. The results from the Faroe Islands will be published together with similar data from Iceland based on material collected during the BIOICE Project.

John D.M. Gordon

Aspects of the ecology of the deep-water demersal fish assemblages of the western European margin

As many of the stocks of shallow water fish species become depleted there has been increasing interest in the development of new deep-water fisheries on the continental slopes. This has involved the expansion of existing artisanal fisheries of southern Europe. However, it is the new fisheries of northern Europe, especially the Rockall Trough (Gordon *et al*., 2003) that are most important in terms of landings and value. These trawl fisheries developed rapidly before there was adequate information on the species being exploited. Our knowledge of the biology and ecology of the deep-water fishes has improved considerably in recent years. The slopes to the west of the British Isles and around Iceland were investigated during the EC Deep Fisheries Project and the fish assemblages of the Norwegian slope as part of the Norwegian Mare Cognitum Project. The fish and fisheries of the Rockall Trough were reviewed by Gordon (2003). The underwater ridge that runs between the Shetland Islands and Iceland via the Faroe Islands forms a major faunal barrier for deep-water fish species. In the warmer Atlantic, where temperature decreases gradually with depth, there is a steady depth related change in species composition. Biomass remains high until about 1,000-1,500 m and is probably linked to the efficient transfer of energy from the surface by the daily vertical migration of a component of the mesopelagic fauna. Pelagic and benthopelagic prey are dominant in the diets of demersal fishes. In the Norwegian Sea the upper few hundred metres comprise Atlantic Water but below about 600 m there is a rapid change of temperature and a significant decrease in fish biomass associated with a distinct coldwater fish assemblage (Bergstad *et al*.,1999). A study of the diet of the coldwater assemblage (Bjelland *et al.,* 2002) has shown that benthic (hyperbenthic) feeding is much more common than in the Atlantic water. The significant difference in biomass between the warmer

Atlantic and the colder Norwegian Sea waters is probably related to food availability. The cold water interface probably restricts the downward vertical migration of the mesopelagic fauna and hence limits the efficient transfer of energy to the continental slope. The ultimate source of food is the primary production in the surface waters. Pelagic species such as herring, mackerel and capelin are widely dispersed over oceanic waters of the Norwegian Sea compared with the Atlantic where herring and mackerel tend to be associated with the continental shelf. Could it be that these species utilise a high proportion of the Norwegian Sea production before it can reach the deep sea thereby accounting for the lower demersal fish biomass?

Reference

Bergstad, O.A., Bjelland, O. and Gordon, J.D.M. 1999. Fish Communities on the slope of the eastern Norwegian sea. *Sarsia*, 84: 67-78.

Bjelland, O., Bergstad, O.A. Skjaeraasen, J.E. and Meland, K. 2000. Trophic ecology of deepwater fishes associated with the continental slope of the eastern Norwegian Sea. *Sarsia*. 85: 101-117.

Gordon, J.D.M. 2003. The Rockall Trough, North East Atlantic: the cradle of deep-sea biological oceanography that is now being subjected to unsustainable fishing activity. *Journal of Northwest Atlantic Fishery Science*. 31: 57-83.

Gordon, J.D.M., O.A. Bergstad, I. Figueiredo and G. Menezes, 2003. The deep-water fisheries of the Northeast Atlantic: I Description and current trends. *Journal of Northwest Atlantic Fishery Science*. 31: 137-150.

Bogi Hansen

Faroese waters as a habitat for benthic organisms

The Faroe Islands are situated on the border between the cold waters of the Norwegian Sea and the more temperate Atlantic waters, and the exchanges between these two domains dominate Faroese waters at all depths. In the deep layers, cold waters of northern origin encircle the islands on their way into the Atlantic, while the upper layers are influenced by a return flow of warm Atlantic water. This induces a separation of the bottom areas into two regions, one cold, and the other warmer. The exchanges involve currents, which in some areas may become very strong and the boundaries between the two regimes will generally show large temporal variability in temperature.

Majken Them Jensen

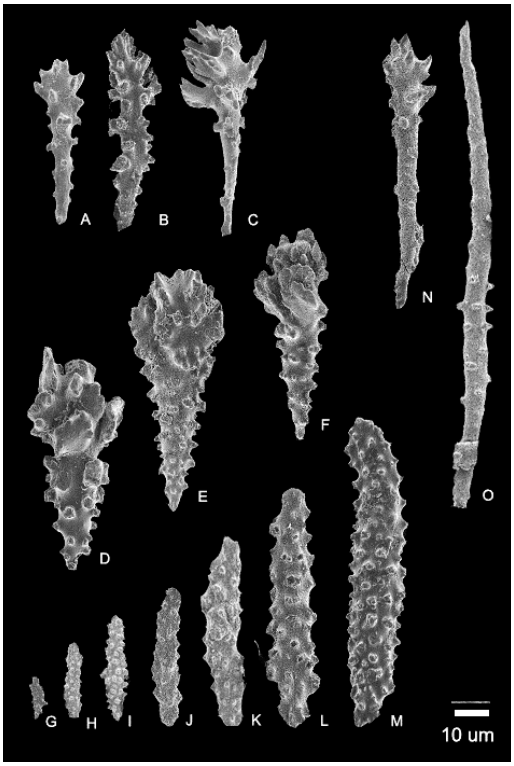
Faroese octocorals, and some problems with cauliflower corals (Nephtheidae)

Octocorals are conspicuous members of the benthic fauna and are sampled, sometimes in large numbers, at all depths and on various types of substrate. At the Faroe Islands, 3 orders of octocorals are present. The total number found in the literature was 23 species – 8 alcyonaceans, 7 gorgonaceans and 8 pennatulaceans. The contributions of the BIOFAR cruises have increased this number to at least 29 – the additional species being mainly pennatulaceans.

Special attention was paid to the alcyonacean family of cauliflower corals, Nephtheidae, which is, as to occurrence of specimens, the most abundant group of octocorals in the Nordic Seas. Generally, the octocoral species are quite easily distinguished, but this particular group has posed taxonomical problems to various investigators for more than a century. Because of the great variability within the family, there has

been much disagreement as to how many species are represented in the NE Atlantic.

In the latest revision (Madsen, 1944) of the Nephtheidae, two genera are referred to the family: *Gersemia* and *Capnella*, the former comprising only one species (*Gersemia rubiformis*), while the latter contains two species (*Capnella florida* and *C. glomerata*). Within *C. glomerata*, Madsen distinguishes between three forms, *C. glomerata* f. *lütkeni, C. glomerata* f. *flavescens, and C. glomerata* f. *groenlandica*.



In the current revision, sclerites were examined using scanning electron microscopy (SEM) combined with light microscopy and morphometry. Based on the anthocodial sclerite types and their length/width index, it is evident that the forms of *C. glomerata* proposed by Madsen, should be regarded as distinct species, raising the number of Nordic species within *Capnella* to four (fig. 1 A-O). In regard to *Gersemia*, the preliminary measurements indicate that Madsen did right in referring all of the earlier described species to *Gersemia rubiformis*. The extremes of this species do appear very different. When presented with the large material from BIOFAR and the collections of the Zoological Museum, it is clear that intermediate states are present, making it difficult to keep up a distinction as separate species.

All of the above mentioned species of Nephtheidae occur in Faroese waters.

References

Madsen, 1944. *The Danish Ingolf-Expedition. Octocorallia*. Vol. 5:13, p. 23-31, figs. 21-22.

Ámundur Nolsøe

Solitary ascidians (Ascidiidae and Cionidae) of the Faroe plateau

The ascidians from BIOFAR 2 have been examined, and the results covering the families Ascidiidae and Cionidae are presented here. Sampling was achieved by scuba diving between 5 and 25 m water depth (65 % of the stations) and by triangular dredge between 26 and 102 m water depth. Ascidiidae and Cionidae were represented in 13 % of the stations (88 of 680) with a total of 336 individuals. One species new to the area, *Ascidia mentula*, was found. All the other formerly encounted species from these families are also represented in the

BIOFAR 2 material. All together seven species were collected: *Ascidia callosa*; *A. conchilega*; *A. mentula*; *A. obliqua*; *A. virginea*, *Ascidiella scabra* and *Ciona intestinalis*). The most common species was *C. intestinalis* (n = 217; 63 stations), while the three most common representatives of Ascidiidae were *A. obliqua* (n = 36; 19 stations), *A. conchilega* (n = 34; 14 stations), and *A. scabra* (n = 26; 14 stations). The preliminary study of the remaining BIOFAR 2 material has not resulted in any other new species to the area, but expectations are higher regarding the not yet studied BIOFAR 1 material, sampled in deeper water. The majority of the individuals were collected in the northern part of the study area, which was also most intensely sampled. The preferred substrate is shell fragments, bryozoans and in shallow waters also algae. Bryozoans have to my knowledge not been mentioned earlier as substrate for ascidians. Ascidiidae and Cionidae formed substrate for epifauna, bryozoans being most frequent. Foraminiferans, polyps and on Cionidae also polychaete tubes, were common epifauna organisms.

Eivind Oug

Polychaetous annelids of the order Eunicida from the Faroe Islands

The polychaetous annelids of the order Eunicida collected in the BIOFAR 1 programme have been partly worked up. Presently the material from 70 stations at depths from 75 to 1533 m has been examined (Table 1, p. 252). About 30 species belonging in the families Eunicidae, Onuphidae, Oenonidae, Lumbrineridae and Dorvilleidae have been recorded. Several of the species of Lumbrineridae and Dorvilleidae are currently inadequately described and need to be taxonomically revised. One species of *Augeneria* (Lumbrineridae) and one species of *Ophryotrocha* (Dorvilleidae) are probably new to science. The material of Onuphidae, in particular, is extensive and has been very incompletely treated. A further 5-10 species are expected to occur in the material. The majority of the species had not been reported from the Faroe Islands previous to the BIOFAR investigations.

Mary E. Petersen

Some new Fauveliopsidae (Annelida: Polychaeta) from the Faroe Islands, with a review of the family's biology and its distribution in the Northeastern Atlantic

The polychaete family Fauveliopsidae Hartman, 1971 is currently a small one, with only about 21 described species in two genera: *Fauveliopsis* (17 spp.) and *Laubieriopsis* (4 spp.). However, descriptions of additional species in both genera are in preparation and some generic assignments may change. Species of *Laubieriopsis* are relatively small, apparently free-living infaunal forms, with a smooth cuticle streamlined for burrowing, and parapodia with few chaetae. Known species have segment constancy, with a fixed number of segments in adults. Most species of Fauveliopsis are larger and apparently epifaunal, often inhabiting empty gastropod or scaphopod shells or empty tests of tubular foraminife-

Table 1. *Polychaetous annelids of the order Eunicida from the Faroe Islands.*

Provisional list of recorded species:	No of records	Depth	Bottom temp, °C
Eunicidae			
Eunice dubitata Fauchald, 1974	2	250 - 272	7.0 – 8.6
Eunice norvegica (Linnaeus, 1767)	5	250 - 800	7.0 – 8.6
Eunice pennata (O.F. Müller, 1776)	15	90 - 400	4.7 – 8.6
Lycidice ninetta Audouin & Milne-Edwards, 1833	3	650 - 702	7.9 – 8.2
Marphysa belli (Audouin & Milne-Edwards, 1834)	1	336	7.9
Nematonereis unicornis (Grube, 1840)	2	700 - 702	7.9
Onuphidae			
Hyalinoecia tubicola (O.F. Müller, 1776)	1	191	8.3
Kinbergonuphis sp.	2	394	5.5
Nothria conchylega (M. Sars, 1835)	2	645-675	-0.6
Paradiopatra quadricuspis (M. Sars in G.O. Sars, 1872)	1	-	-
Lumbrineridae			
Abyssoninoe spp.	16	320 - 1533	-0.9 – 7.9
Augeneria tentaculata Monro, 1930	2	277 - 655	5.8 – 7.8
Augeneria sp. (probably undescribed)	1	342	8.9
Lumbrinerides crassicephala (Hartman, 1965)	1	1200	4.0
Lumbrineris agastos Fauchald, 1974	5	252 - 655	4.0 – 7.8
Lumbrineris cf. *gracilis* (Ehlers, 1868)	7	200 - 367	7.0 – 8.1
Scoletoma fragilis (O.F. Müller, 1776)	1	75	7.9
Scoletoma magnidentata (Winsnes, 1981)	11	98 - 1061	5.1 – 9.1
Scoletoma funchalensis (Kinberg, 1865)	4	277 - 405	0.0 – 6.3
Scoletoma sp.	2	201 - 317	7.0 – 8.0
Oenonidae			
Drilonereis sp.	1	320	5.1
Dorvilleidae			
Dorvillea erucaeformis (Malmgren, 1865)	6	252 - 515	5.3 – 7.3
Iphitime cf. *paguri* Fage & Legendre, 1934	1	252	7.3
Ophryotrocha sp. (probably undescribed)	1	763	-0.6
Protodorvillea kefersteini (McIntosh, 1869)	2	150 - 1200	4.0 – 7.9
Schistomeringos cf. *rudolphi* (delle Chiaje, 1828)	3	560 - 703	-0.6 – 0.0
Schistomeringos sp.	1	1032	-0.8

rans. Such worms might be considered the ”hermit crabs” of the polychaete world. No other polychaetes appear to utilize empty shells or tests in this way. Their cuticle is usually finely papillate, sometimes also with a ventral ”shield” that may help the worm retain its position inside a shell or test, and chaetae are often numerous, especially posteriorly. The number of segments usually varies. Some examples of the two genera are shown and the distribution of the family in the northeastern North Atlantic is given. Two new species from the Faroes are presented.

Jon-Arne Sneli

Why do some species seem rare, even on the background of many samples?

Molluscs have the largest diversity of any phylum in the marine environment. In the

North Atlantic species richness has not been numbered but recently Brattegard and colleagues published a list of marine species along the Norwegian coast. Here molluscs count for 655 species of a total number of about 3400 marine invertebrate species (19 %).

During the BIOFAR 1 programme more than 600 stations with 790 deployments were sampled. The number of molluscan species was 344 within the Faroese economic zone. Only 50 species known to live in Faroese waters were not recorded, mainly because these species live in the littoral zone and in shallow water.

Of the 118 species exclusively found during the BIOFAR 1 programme, 39 species are only found at one of the 600 sampled stations even though 1 to 3 litres of sediment from the deployments were sorted out in the Kaldbak laboratory using magnification microscopes. Two of the species were even found far away from their generally known distribution area. About 20 species extended their known distribution area either further north or further south.

Why are so many of the species recorded at one station only if the species are established in Faroese waters as a part of their common distribution area? An explanation could be inadequate sampling, especially of stenoecious species that have highly specialised diets or habitats. But using three different gears during sampling should to some extend compensate for this. Also the sorting technique should prevent overemphasis on sorting out macromolluscs.

The paper will discuss several explanations to understand the number of species found at the sampled stations as well as the distribution pattern of the species only recorded during the BIOFAR 1 programme.

Jon-Arne Sneli

Echinodermata, Asteroidea in the Faroe Area

Before BIOFAR 31 species of asteroids had been reported from the Faroese economic zone. The BIOFAR 1 sampling increased the number of species to 42.

A total of 2,287 specimens spread over 42 species, 32 genera and 16 families was found in 40 % of the BIOFAR stations (316 stations with 790 deployments of sampling gear). The number of species includes species and species groups from the genera *Odontaster* and *Henricia*. Of the 42 species found, 30 are not recorded in »The Zoology of the Faroes». Still, 20 of them are recorded from deep water near the Faroe Islands from earlier expeditions as ”Lightning”, ”Porcupine”, and ”Michael Sars” among others.

Neomorphaster margaritaceus, Novodinia cf. *pandida, Odontaster* sp., *Pedicellaster typicus, Pseudarchaster gracilis, Pteraster (Apterodon)* sp. aff. *P. acicula, P. obscurus, P. pulvillus, Stephanasterias albula, Stichastrella rosea* and *Tremaster mirabilis* are for the first time recorded at the Faroe Islands.

Many of the species seem to manage a large range in bottom temperature as 15 species are distributed in all the main categories of water masses. Ten species have their occurrence only in Atlantic water and

two species in Norwegian Sea water only. Two of the species, *Luidia ciliaris* and *L. sarsi*, were found only on the Faroe Bank while 30 species were found on the Faroe plateau and on the slope down to 1,000 m depth, 14 of them prefering slope depths between 300 and 1,000 m depth.

Jörundur Svavarsson

Exploring the benthos on a large scale – from BIOFAR to BIOICE

The BIOFAR 1 project in 1987 to 1990 is among the most successful large scale studies of benthic animals in the NE Atlantic. Through the BIOFAR project extensive data were collected on the distribution and species composition of the benthic marine invertebrate fauna in the area around the Faroe Islands, an important biogeographical area, where the Nordic Seas (Norwegian, Greenland, and Iceland Seas) meet the North Atlantic proper. Furthermore, numerous new species were described and the material was used in many taxonomic revisions. International authorities on taxonomy of most major invertebrate groups participated, leading to high quality taxonomic work. Personal contacts of the organizers/ leading researchers were very important during the build-up of this net of participants. Another important factor was the Nordic rooting of the project, with participation and funding from many parts of the Nordic research community.

The success of BIOFAR led to a another large scale project in adjacent waters, the BIOICE (Benthic Invertebrates of Icelandic waters), within the Icelandic EEZ. The BIOICE project started informally with a pilot cruise onboard the Norwegian research vessel *Håkon Mosby* in 1991, and formally in 1992 with participation also of Icelandic and Faroese vessels. Sampling ended in 2004, and the total number of stations is around 580, taken in all 18 cruises. The project was run under the auspices of the Ministry for the Environment in Iceland, with extensive Nordic and international participation, and several Icelandic institutions (University of Iceland, Marine Research Institute, Icelandic Institute of Natural History, Town of Sandgerði) supporting.

The project benefited greatly from the experience accumulated during the BIOFAR project, the interest and involvement of leading researchers, and the contacts obtained within the scientific community. The BIOICE project has been as successful as its predecessor. The project has resulted in >70 publications in international journals, in descriptions of numerous new species and in a wealth of information on the distribution and diversity of benthic invertebrates around Iceland. Jointly, the BIOFAR and BIOICE projects will lead to extensive areas of the Greenland-Iceland-Faroe Ridge, from shallow waters to considerable depths (1500-3000 m), becoming among the best known marine areas in the world.

Programmes like BIOFAR and BIOICE are very valuable for the scientific community. Within these programmes researchers around the world have had access to a wealth of species, of which some were in large quantities and many were before poorly known. This has led to a variety of taxonomic, phylogenetic, zoogeographical

and ecological studies. This type of project should be applied to other parts of the North Atlantic, in particular to the extensive waters around Greenland.

Ole Secher Tendal

Going west. The idea of a BIOGREEN Project: Investigation of the composition and distribution of the bottom fauna off southern Greenland, and the amphiatlantic distribution patterns

It followed as a natural impulse after BIOFAR that an effort should be made to investigate the Icelandic bottom fauna. The idea came true as the BIOICE Programme. Now, that BIOICE is coming to an end, the need for an investigation of the southern Greenland bottom fauna becomes clear.

The concept of a BIOGREEN Project was discussed during long night-watches onboard the Faroese "Magnus Heinason", the Icelandic "Bjarni Sæmundsson" and the Norwegian "Håkon Mosby" in the summer months of 1993-1994 while waiting for gear coming on deck. The idea was publicly announced on the 8th Meeting for Danish Marine Scientists and the 1st Nordic Marine Sciences Meeting, both in 1995, and was received with sympathy, albeit with some hesitation.

A number of scientific expeditions worked around southern Greenland, but considering the large area sampling is sparse. By far the largest number of samples are from depths shallower than 100m. About 20 are from between 200 and 400m, and a similar number from around 2000m or deeper. The continental margin and the slope are left virtually unsampled. With five water masses of different origin and four major currents, the hydrography of the area is complicated, as is probably also local fauna composition and distribution. At a larger geographic scale southern Greenland has a central position in some amphiatlantic distribution patterns.

As a tool for the BIOGREEN project and a help to promote the whole idea may serve the first draft of a catalogue "Greenland marine benthic animals, diversity and geographic distribution" recently finished at the Zoological Museum (Copenhagen). The project was funded by the Danish Environment Agency, Arctic Environment Programme. The main purpose is to establish a modern, comprehensive checklist of the marine benthic macrofauna off Greenland, from the shore to 1000m depth. This was done through a compilation of the information available in publications, reports, collections, etc. For each species is given the correct name, author, year, synonyms used within the Greenland area, and sampling sites. The catalogue so far comprises 2275 species, and the bibliography has about 500 entries.

Ole Secher Tendal

What controls fauna dynamics along the northeast Atlantic shelf-break?

The Atlantic continental margins developed as socalled passive areas through steadily sinking and loading with thick layers of sediment. Besides common weathering, breaking down and washing out of rock materials, the Ice Ages were the periods of greatest influence in the northern part of the Atlantic. Calving glaciers trans-

ported enormous amounts of both fine and very coarse materials from the icecovered land, and depending on local topographic conditions and melting time of the icebergs, they were delivered all over the nearby shelf and slope areas. Another kind of trace from the Ice Age is iceberg plow marks, up to 2 m deep, 25 m wide and several km long. They have been found at depths of 150-650 m, from Northern Norway, around the Faroes, in the Denmark Strait off southeast Greenland, and along the slope from the Shetland Islands to west of Ireland.

The shelf break and the upper slope are highly diverse as to local topography, bottom configuration, and substrate type and composition. They are also hydrologically dynamic areas, to varying degrees influenced by tidal forces, currents, upwelling, internal waves and water mass distribution. Accordingly animal assemblages here live in a complex pattern of stable geological conditions and quite dynamic hydrological forces.

Over the last decade this part of the ocean margin has been found to be biologically quite spectacular in many places. There are big concentrations of biomass, dominated by large-sized, long-lived, slow-growing and probably also slowly reproducing species, which create biologically defined habitats for numerous smaller species.

The large species seem sensitive to the effects of climatic changes and vulnerable to man's doings.

Murina Vantsetti and Jan Sørensen

Biogeography of the Sipuncula of the Faroe Islands within the North Atlantic

From the BIOFAR programme, investigations of the marine benthic fauna of the Faroese fishing territory, 6 new species of sipunculans were added to the 4 previously known sipuncula species from the region. There is a comprehensive list of all the found species and maps showing the distribution. The BIOFAR material contains 5,140 specimens of sipunculans recovered from 253 stations. For each of the species were present depth range, measured temperature and salinity range, bathymetrical, and geographical distribution in north Atlantic and in the world oceans. Zoogeographical distribution of these 10 species in the world ocean is the following. Three species: *G. vulgaris*, *N. minutum* and *Ph. strombus* are cosmopolitan. Three species: *N. abyssorum*, *N. lilljeborgi*, *P. tuberculosum* are mainly arctic-boreal. Three species *A. muelleri*, *O. steenstrupii* and *O. squamatum* are boreal-tropical. One species *N. eremita* is bipolar. Sipunculan fauna of North Atlantic (more 60 ^{o}N) consists of 16 species, percentage of common with the Faroe area species is 62.5 %.