# DEEP-SEA NEWSLETTER

No. 14, April 1988

## FIFTH DEEP-SEA BIOLOGY SYMPOSIUM

Brest, France, 26 June - 1 July 1988

In February a registration circular was sent to 300 scientists, including 139 expected participants. The resulting large number of preregistrations is undoubtedly due to the two announcements in Deep-Sea Newsletter numbers 12 and 13.

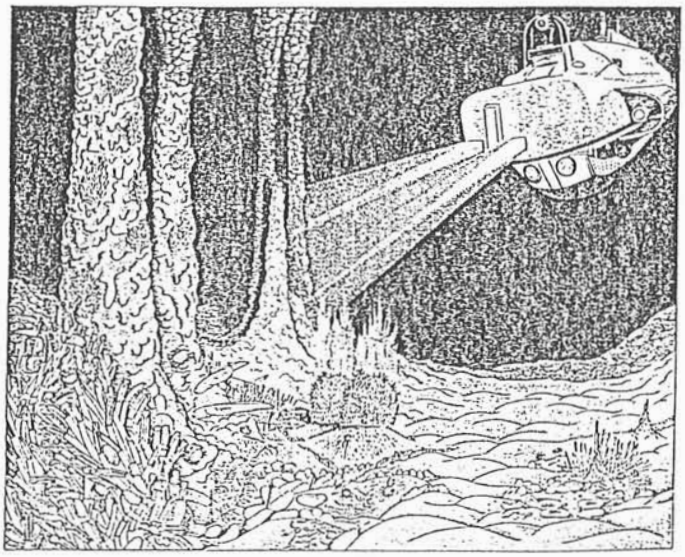
March 31st was indicated as deadline for both accommodation and application forms. So far (19 April) 126 participants are registered. Their geographical distribution is as follows: Australia 1, Belgium 1, Canada 3, Denmark 3, France 44, FRG 16, Iceland 1, Japan 3, Netherlands 2, Norway 2, U.K. 20, USA 30.

Each participant will soon receive detailed information on their hotel accommodation, which has been arranged by a specialized organization SODAP. It is now urgent that other expected participants send in both forms, completed correctly.

The four main themes encountered in the deep-sea environment are the following:

1 - Biogeography, Evolution, Genetics
2 - Structure and Distribution of Deep-Sea Assemblages
3 - Biology, Metabolism, Ecophysiology
4 - Benthic Fluxes, Processes and Food Webs

The successive sessions will cover these four themes, probably in the same order as announced here. The scientific committee is still looking for lecturers willing to introduce each theme with an overview speech.



At present 94 summaries have been received - an unexpected success! They include research in the various deep-sea environments, bathyal, abyssal and hadal, including hydrothermal and cold-seep communities. Fascinating new findings are announced in the summaries that were sent and will surely turn the symposium into an exciting event.

The following topics have been proposed for the round table meetings:

1) Methodological aspects of deep-sea still photography and video tape recordings and their taxonomic implications.
2) In situ instrumentation for biological activity - sampling and pressurized incubation.
3) Other subjects such as global ocean flux, impact assessment in mining deep-sea beds or in disposal of radioactive waste.

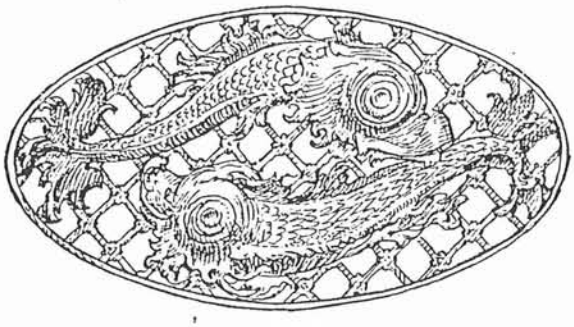
The organization of these smaller meetings will depend on the schedule of the oral communications. Considering the great number of oral communications proposed, the agenda seems already quite tight.

A majority of scientists have approved publication of the Proceedings of the Symposium. Dr. Martin Angel, Editor in Chief of "Progress in Oceanography", has suggested that the Proceedings be published in this journal by Pergamon Press.

On May 15th the final program of all communications (titles and authors) will be issued and sent to each participant.

Looking forward to seeing you i Brest,

Myriam Sibuet
for the Scientific Committee



Submersible Operations at Discovery Bay, Jamaica

The Discovery Bay Marine Laboratory of the University of the West Indies is situated on the north coast of Jamaica. The site was chosen by Prof. T.F. Goreau because the extremely narrow island shelf gave easy access to coral reefs throughout their depth range. It also gives easy access to deep water. The shelf break, at 60 m depth, is only 300 m from the entrance to Discovery Bay. A vertical wall drops to about 130 m, from whence the island slope runs down at 45° towards the Cayman Trough. The proximity of this steep narrow profile to the Laboratory makes it an ideal site for low-cost operation of small submersibles, without the need for an expensive mother ship. NEKTON Gamma was used here in 1972, the Perry PC-8 in 1984-85, and PISCES-2 in 1987.

The 1987 programme included the following projects:

1. Community patterns on the Deep Fore-reef, 60-130 m. W.D. Liddell, S.L. Ohlhorst (Utah State University) and J.D. Woodley (U.W.I.).
2. Functional morphology of slit-shells. R. Linsley (Colgate University).
3. Behaviour of deep-sea brittle-stars and echinoids. R.H. Emson (University of London) and J.D. Woodley (U.W.I.).
4. Functional morphology and behaviour of stalked crinoids. M.C. LaBarbara, T.K. Baumiller (U. of Chicago) and J.D. Woodley (U.W.I.).
5. Deep sediment collection. W.D. Liddell, S.K. Boss (Utah State University).

PISCES-2, which is operated by Research Submersibles Ltd., has a depth range of 1000 m. I would like to bring her back again, probably not before the Autumn/Fall of 1989, but earlier if sufficient research funds were available. Any interested investigators should write to me for details (address: Discovery Bay Marine Laboratory, P.O.Box 35, Discovery Bay, St Ann, Jamaica, West Indies).

J.D. Woodley

## Directory of Deep-Sea Biologists

The questionnaire which appeared in the last issue of the Deep-Sea Newsletter elicited responses from the biologists listed below. While I am grateful to each of these scientists, I cannot believe that there are not many more who should be, and would wish to be, in the Directory. Accordingly, on the reverse of this sheet (page 4) I am reproducing the original questionnaire. If your name is not on the list, please complete a copy of the questionnaire. Similarly, if your deep-sea biologist colleagues are not included, please bring it to their attention.

Tony Rice

| | | | |
|---|---|---|---|
| Alayse-Danet, Anne-Marie | Brest | Knudsen, Jørgen | Copenhagen |
| Allen, John A. | Millport | Lampitt, Richard S. | Wormley |
| Angel, Martin V. | Wormley | Levin, Lisa A. | Raleigh |
| Armstrong, John D. | Aberdeen | Lloris, Domingo | Barcelona |
| Bertelsen, Erik | Copenhagen | Maciolek, Nancy J. | Duxbury, Mass. |
| Billett, David S.M. | Wormley | Manning, Raymond B. | Smithsonian |
| Blake, James A. | Duxbury, Mass. | McFall-Ngai, Margaret | Scripps |
| Boudrias, Michel Andre | Scripps | Merrett, Nigen R. | Wormley |
| Clark, Ailsa M. | Haywards Heath | Morita, Richard Y. | Corvallis |
| Cutler, Edward B. | Utica, N.Y. | Mullineaux, Lauren S. | Woods Hole |
| David, Bruno | Dijon | Nielsen, Jørgen | Copenhagen |
| Deming, Jody W. | Seattle | Ohta, Suguru | Tokyo |
| Desbruyères, Daniel M. | Brest | Patching, John W. | Galway |
| d'Hondt, Jean-Loup L. | Paris | Pugh, Philip R. | Wormley |
| Dinet, Alain H. | L'Houmeau | Rex, Michael A. | Boston |
| Ellis, Celia J.H. | Wormley | Rice, Anthony L. | Wormley |
| Ellis, Derek V. | Victoria B.C. | Rucabado, Jaume | Barcelona |
| Emig, Christian C. | Marseille | Schafer, Charles T. | Dartmouth, N.S. |
| Ferrari, Frank | Smithsonian | Shirayama, Yoshihisa | Tokyo |
| Fiala-Medioni, Aline | Banyuls sur Mer | Sibuet, Myriam | Brest |
| France, Scott C. | Scripps | Siebenaller, Joseph F. | Baton Rouge |
| Gage, John D. | Oban | Sieg, Jürgen | Vechta, Germany |
| Gartner, John V. | St. Petersburg | Soetaert, Karline | Ghent |
| Geistdoerfer, Patrick | Paris | Svavarsson, Jörundur | Reykjavik |
| Gooday, Andrew J. | Wormley | Tendal, Ole S. | Copenhagen |
| Gordon, Malcom S. | Los Angeles | Thurston, Michael H. | Wormley |
| Hansen, Bent | Copenhagen | Torres, Joseph J. | St. Petersburg |
| Harvey, Fay | Oban | Tunnicliffe, Verena | Victoria, B.C. |
| Harvey, Robin | Oban | Turley, Carol M. | Plymouth, U.K. |
| Hendler, Gordon | Los Angeles | Van Dover, Cindy Lee | Woods Hole |
| Herring, Peter J. | Wormley | Williams, Ruth | Swansea |
| Hessler, Robert R. | Scripps | Williams, Susan J. | Ventura, Ca. |
| Hulsemann, Kuni | Hamburg | Wilson, George D.F. | Scripps |
| Jannasch, Holger W. | Woods Hole | Wilson, Raymond R. | St. Petersburg |
| Kirkegaard, Jørgen B. | Copenhagen | Wishner, Karen | Narragansett |
| Khripounoff, Alexis | Brest | Wolff, Torben | Copenhagen |

## DIRECTORY OF DEEP-SEA BIOLOGISTS

One tangible outcome of the deliberations of SCOR Working Group 76 (see Deep-Sea Newsletter nos. 8 & 11) is the intention to produce a simple directory of biologists (both benthic and mid-water) interested in, and involved with, deep sea problems. Such a directory might be of value to scientists, governmental and intergovernmental agencies, industry and so on. If you would like to be included in this directory, please complete the questionnaire and return it to Tony Rice, Institute of Oceanographic Sciences Deacon Laboratory, Wormley, Godalming, Surrey GU8 5UB, U.K.

PLEASE ALSO BRING THE QUESTIONNAIRE TO THE NOTICE OF ANY COLLEAGUES WHO MIGHT OTHERWISE NOT SEE IT.

FORENAME(S) OR GIVEN NAME(S) .....

FAMILY NAME .....

TITLE (Dr, Mr, Mrs, Miss, etc) .....

WORK ADDRESS (including any post code) .....

.....

.....

.....

TELEPHONE NO. .....

AREAS OF INTEREST/EXPERTISE (including taxonomic group(s))

.....

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See DSN no. 13

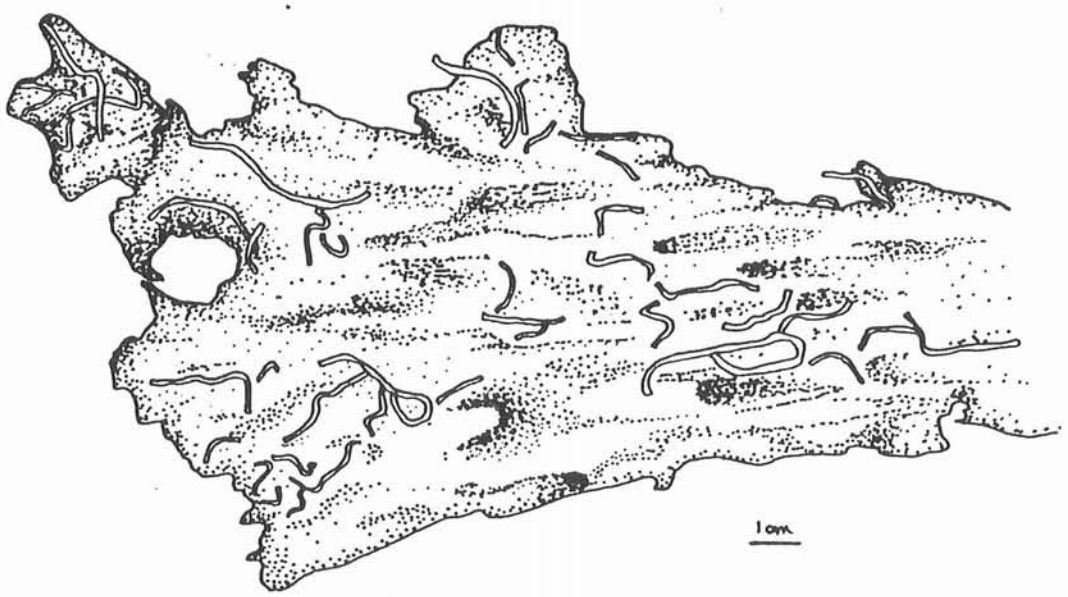
## Wood Island Community Discovered on ALVIN Dive 2000

A recent ALVIN/ATLANTIS II expedition (Cruise 118, Leg 32) focused on geological exploration of the East Pacific Rise between 10°55'N and 11°55'N. This region of the ridge axis includes a topographic high with active hydrothermal vents, a small deval (deviation from axial linearity), and a major overlapping spreading center (OSC). Small fields of past and present hydrothermal activity were encountered sporadically along the length of the axis in this region. A detailed description of the biological and geological settings of these vent fields is in preparation.

Samples of biological specimens from both non-vent and vent environments were collected throughout the dive series. One of the most interesting collections, a piece of wood colonized by a variety of invertebrates, was made on ALVIN Dive 2000, 22 March 1988. Ralph Hollis was the pilot, W. Bryan (Woods Hole Oceanographic Institution) and R. Hekenian (IFREMER) were the scientific observers. The dive was made on the western limb of the OSC near 11°52'N, 103°51'W.

The wood was encountered in the middle of an extensive field of pillow basalt covered with a light dusting of sediment, at a depth of 2750 M. Covered with white animals, the wood contrasted sharply with the surrounding black basalt, and so was observed despite its small dimensions (approximately 30 cm by 15 cm). The entire piece of wood was placed in a collection box and carried to the surface.

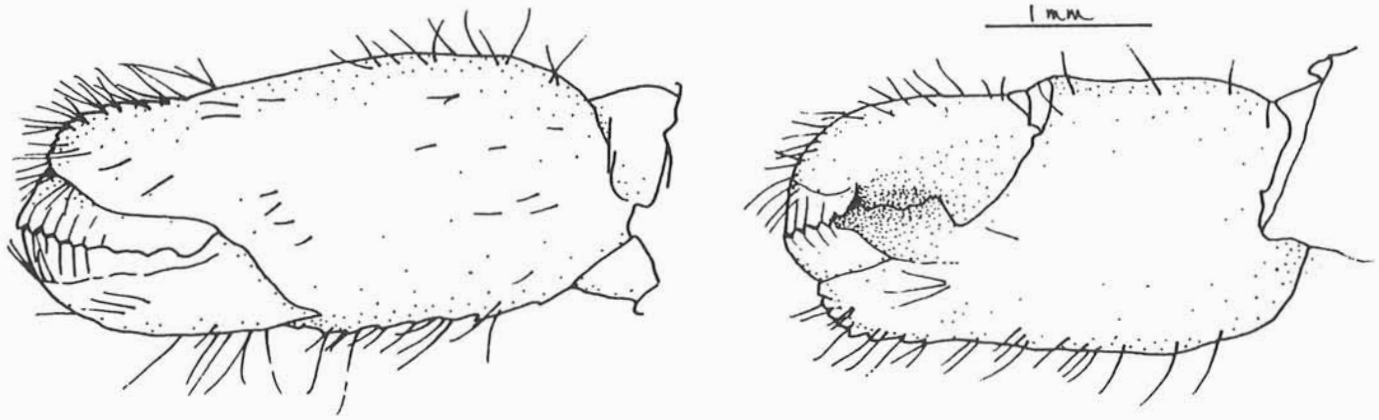
At least 11 species in 5 phyla were recovered from the wood. Dozens of serpulid worms and galatheid squat lobsters dominated the fauna. A small white ophiuroid was also abundant, as were a limpet and two species of coiled gastropods. A third species of coiled gastropod and a chiton were represented by single individuals. There were several large polynoid polychaetes, an isopod, and a pogonophoran.




Piece of wood, ca. 30x15 cm, with serpulid worms, etc.

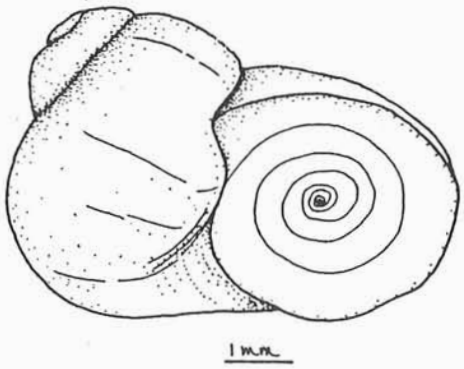
None of the species colonizing the wood have been immediately identified as species also known from hydrothermal vents. The serpulid worm fits neither of the descriptions of known vent-associated species.

Even the galatheid squat lobster appears to be quite different from Munidopsis subsquamosa: the wood galatheid is armed with distinctive rasp-like fingers on its chelipeds that seem ideally suited for scraping up wood. The gut of several galatheids were packed with "sawdust".

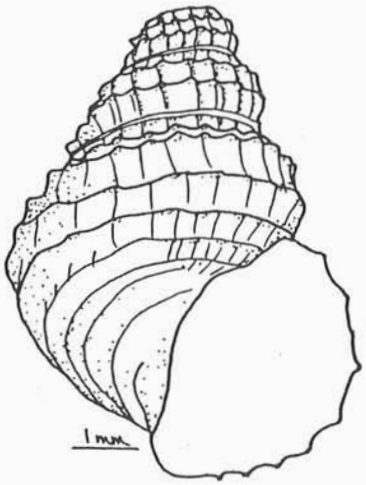


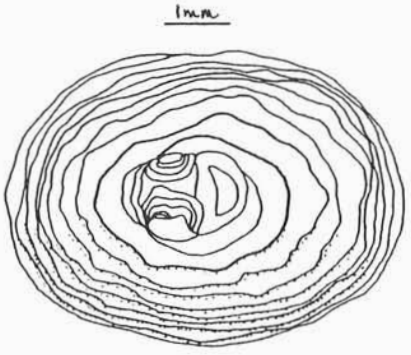

Rasp-like fingers on galatheid squat lobster

One of the coiled gastropods, a globose form, superficially resembles a snail collected at 21°N vents on the East Pacific Rise, but there are significant differences in the region of the umbilicus that distinguish the two. A second coiled gastropod resembles members of the genus Provanna, but a specific designation has not been made yet. There is also some similarity between McLean's "transparent limpet" known from East Pacific Rise vents and the limpet that colonized the wood island, but the soft parts of the two species are distinctive.




Globose gastropod



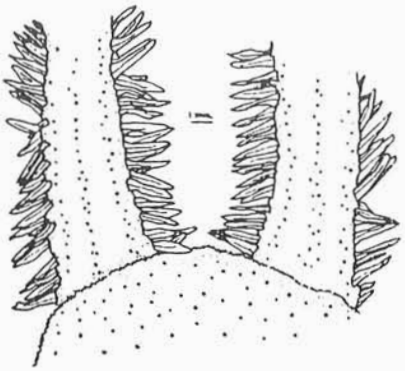




Transparent limpet

Gastropod, cf. Provanna

Polynoid polychaetes are of course known from hydrothermal vents; the specimens from the wood island will have to be examined closely to determine if they belong to a species described from vent communities. Chitons and pogonophorans are not yet described from hydrothermal vents, and ophiuroids, while observed at vent sites near 10°45'N on the East Pacific Rise, have not been collected from vents.

Part of crinoid



There are several casual observations about the wood community that are immediately striking:

1) The wood serves as more than a hard surface for colonization. In a soft-sediment environment, one might argue that hard surfaces are scarce and so epifaunal species might be expected to exploit any available substrate (Wolff 1979). But the wood collected on Dive 2000 was surrounded by hard basalt; some character of the wood itself, presumably its organic carbon content, attracts an abundant fauna. The extent to which this fauna differs in composition from that colonizing the surrounding basalt is unknown. The cheliped of the galatheid may provide some hint that the fauna of the wood island may be adapted to its habitat, though one could argue that a rasping cheliped is of use wherever food must be scraped off a surface.

2) The wood was collected from an area known to be not too far removed from areas of hydrothermal activity, yet no obvious vent species colonized the wood, despite the fact that many vent species are thought to be opportunistic. Particularly noticeable in their absence were brachyuran crabs and Munidopsis subsquamosa. These animals are known to range some distance away from active vent areas and were seen along much of the ridge axis explored during this dive series.

3) Despite any obviously shared species between vent communities and this wood island, there is a remarkable similarity in the kind of taxa that occur at these sites. Serpulids, galatheids, limpets, polynoid polychaetes appear on species lists from vents, cold seeps, and wood islands. In organic-rich oases of the deep sea, are there patterns in species composition that my be predictable?

4) Many of the species looked like they were feeding directly on the wood. The guts of the limpets, galatheids, and serpulids seemed to be filled with the same type of sawdust-like material. This observation remains to be confirmed. The food-web of the community is difficult to interpret at this time. The carbon isotopic composition of the wood should be distinct from that of particulate organic carbon derived from surface primary production. Because of this distinction between the two potential sources of organic carbon, it should be possible to determine the relative contributions of each carbon source to the diet of individuals and taxa using isotopic techniques.

Cindy Lee Van Dover
Woods Hole Oceanographic Institution
Woods Hole, MA 02543, USA

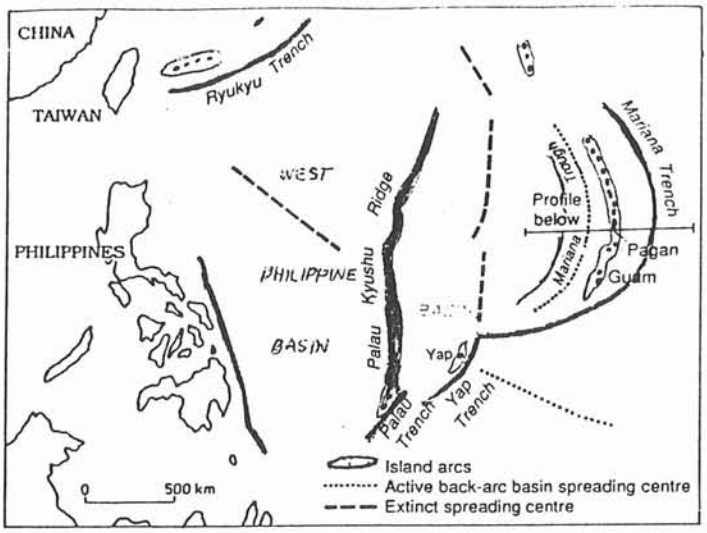
Reference

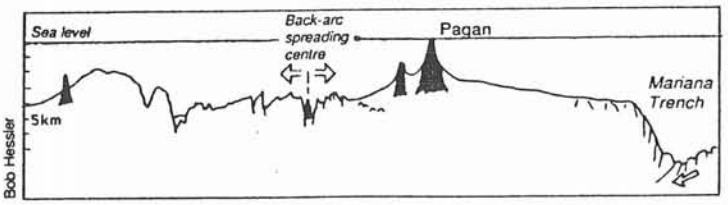
Wolff, T. 1979: Macrofaunal utilization of plant remains in the deep sea. Sarsia 64: 117-136.

## A Hydrothermal Vent Community in the Western Pacific

Last year, ALVIN visited the western Pacific for the first time. One of the goals was study of the spreading center in the Mariana Back-Arc Basin (MBAB). We (Michel Boudrias and Scott France, both students in my lab, and Suguru Ohta, University of Tokyo) participated in that program because the chance of discovering hydrothermal vents was very high. Since this spreading center is completely separated from those on mid-ocean ridges, it seemed possible that a completely different hydrothermal vent fauna might have evolved there.

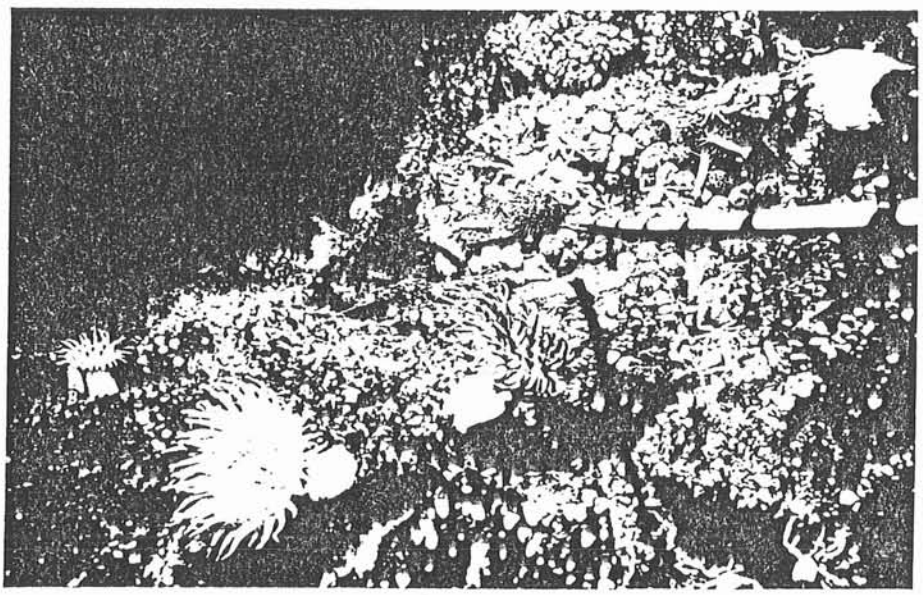
Hessler, Lonsdale & Hawkins,
New Scientist, 24 March 1988




We succeeded in finding vents, and they were richly populated. The vent openings were clogged with a kind of coiled gastropod that sequesters sulphur-oxidizing bacteria in its gill; this is the first such gastropod known. Rocks at the opening were encrusted with limpets, a sessile barnacle, or paralvinellid polychaete tubes; there were also occasional mussels. The dominant limpet is a neomphalid, as in the eastern Pacific. The mussel looks similar to vent mussels elsewhere, but a careful study has yet to be made. The barnacle is very special, being the most primitive sessile barnacle living today. Shrimps and crabs bustled around these sessile animals. The shrimp is Remicaris (previously known only from the Atlantic), and the crab is probably Bythograea - both new species. The field around vent openings had a dense population of large anemones. Galatheid crabs, polynoid worms and a whelk crawled among them.

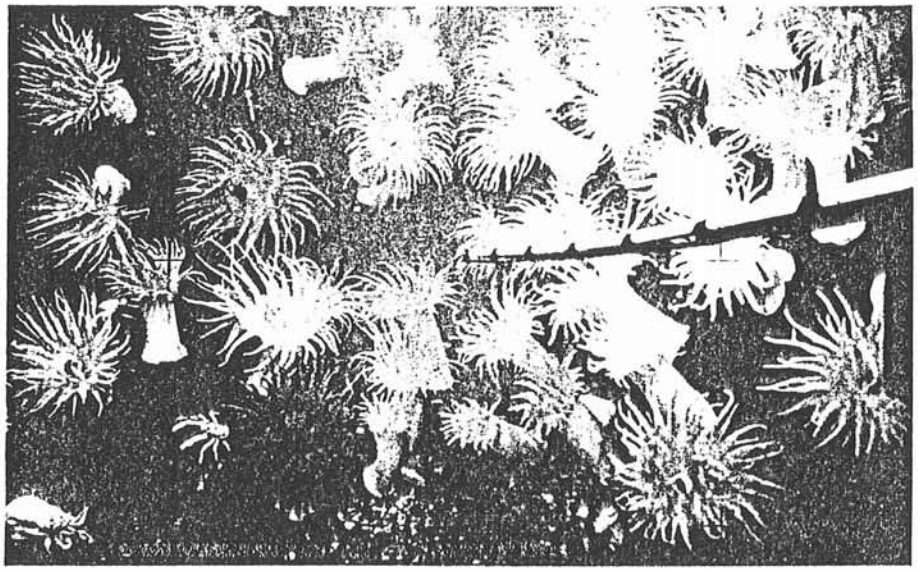
Thus, the fauna is a mixture of really new taxa and old friends. We collected lots of animals and took many pictures, some of which I will show at Brest. The animals have been farmed out as follows: (next page)



Coiled hairy snails clustering around the vents harbour chemo-autotrophic bacteria. The snails may play the part of the giant vestimentiferan tube worms that live at other vents.

Bob Hessler phot.

Coiled gastropods, taxonomy (Okutani) - Symbiotic host gastropod, detailed anatomy (Ohta) - Limpets (McLean) - Mussel (Turner) - Paralvinellid (Desbruyères) - Polynoids (Pettibone) - Galatheids (Williams) - Shrimp and brachyuran (Hessler) - Barnacle (Newman) - Anemone (Fautin) - Solenogastres (Scheltema) - Isotope analyses (Van Dover) - Chemoautotrophy physiology (Felbeck, Vetter, Childress, Somero et al.). - Some material has not yet been sent out.



Left: Large sea anemones at the edge of the community take advantage of the nutrients that settle from vent water as it drifts from the opening of the vent.

Bob Hessler phot.

Below: Crabs, squat lobsters and shrimps scavenge over the less mobile.

Bob Hessler phot.

A general description of the vents is in the 24 March issue of New Scientist (Hessler, Lonsdale & Hawkins). For those who prefer Japanese, try a March issue of Newton Magazine. Jeff Stein et al. have written an article on the snail's cheomoautotrophy for Biological Bulletin. Bill Newman has submitted a manuscript on the barnacle to the Bulletin of Marine Science. I hear that the descriptions of the host gastropod and the paralvinellid are nearly finished.

This expedition was a bit of a test to see how much one could learn about a vent community on a one-shot basis. I was quite encouraged by the results. It does seem possible that biologists will be able to accompany physical scientists to the corners of the globe and learn enough in a brief visit (we only had five dives) to have a solid understanding of the vent community.

Robert R. Hessler
Scripps Institution of Oceanography

## Canadian and US East Coast Xenophyophores

At the Fourth International Deep-Sea Symposium, held in Hamburg 1984, I called the attention to the fact that members of the class Xenophyophorea (Protozoa: giant rhizopods) were very poorly known from the Northwest Atlantic. The contrast to the Northeast Atlantic was striking, as more and more samples appeared there during investigations from the mid-seventies on (Gooday 1983, 1984; Gooday & Nott 1982; Gooday & Tendal 1987; Tendal 1980, 1985; Tendal & Gooday 1981; unpublished records).

In my talk I called for the support from those present who might have samples or bottom photographs showing these animals, or who could drop me a hint about persons or institutions that might have such information.

Already during the meeting a number of people came to me showing *in situ* photographs on which scores of specimens could be identified, and even offering some samples originating from the area.

Since then corresponding and enquiring have resulted in further information being gathered. The following is a summary of the present knowledge.

As to the literature, only few details have been given. It has recently been shown that some of the species of *Aschemonella*, hitherto placed among the Foraminifera, are in fact xenophyophores (Gooday & Nott 1982); *Aschemonella* species have been recorded several times in the western Atlantic (Cole 1981; Cushman 1920, Schröder 1986; Kaminski & Swift pers. comm.). Unidentified xenophyophores were recorded from two stations during the 2nd cruise of the Soviet research vessel "Vitjaz" (Vinogradova *et al.* 1984). A nice *in situ* photograph undoubtedly showing a "xenophyophorid" (probably a *Syringammina*) seems to be the latest contribution (Swift *et al.* 1985, p. 314).

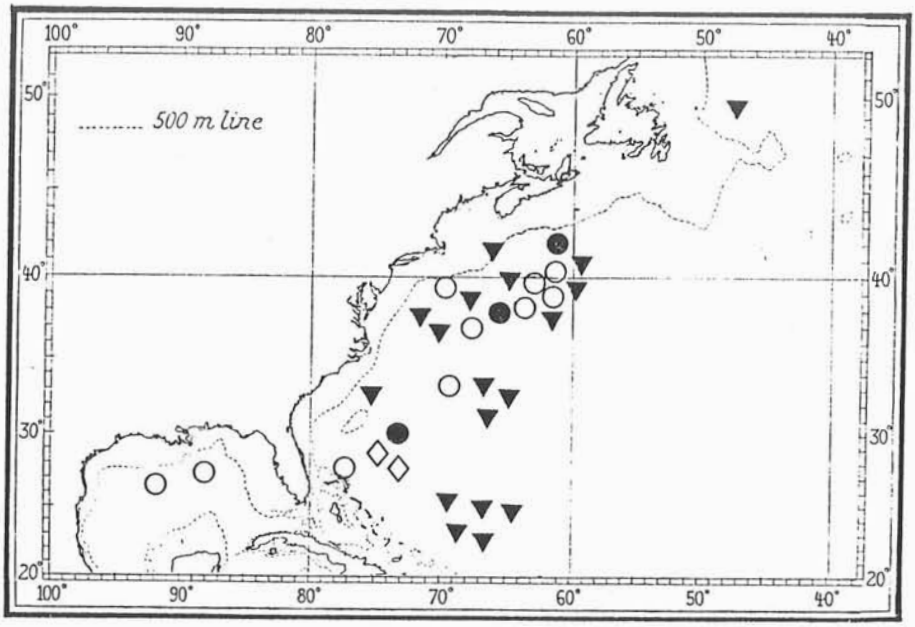
The available samples (provided by B.T. Hargrave and L.A. Levin) represent the genus *Syringammina*, and most of the numerous *in situ* photographs (placed at my disposal by B. Hecker and B.E. Tucholke) seem to show members of this genus too. With these samples and photographs at hand it is possible to identify a number of organisms shown in earlier published photographs from this part of the Atlantic (Athearn 1967, fig. 16-3; Owen & Emery 1967, fig.15-3a; Pequegnat *et al.* 1972, figs. NE-15, NE-20c, C-2b and C-5a; Pratt 1962, fig. 2) as probably also being xenophyophores of the genus *Syringammina*.

Xenophyophores have been recorded from Nova Scotia to the Gulf of Mexico, at depths from 800 to 5800 m. The impression from reports and other information is that the species within local distributions are patchy, ranging in the photographs from only one specimen in a whole series to "very common".

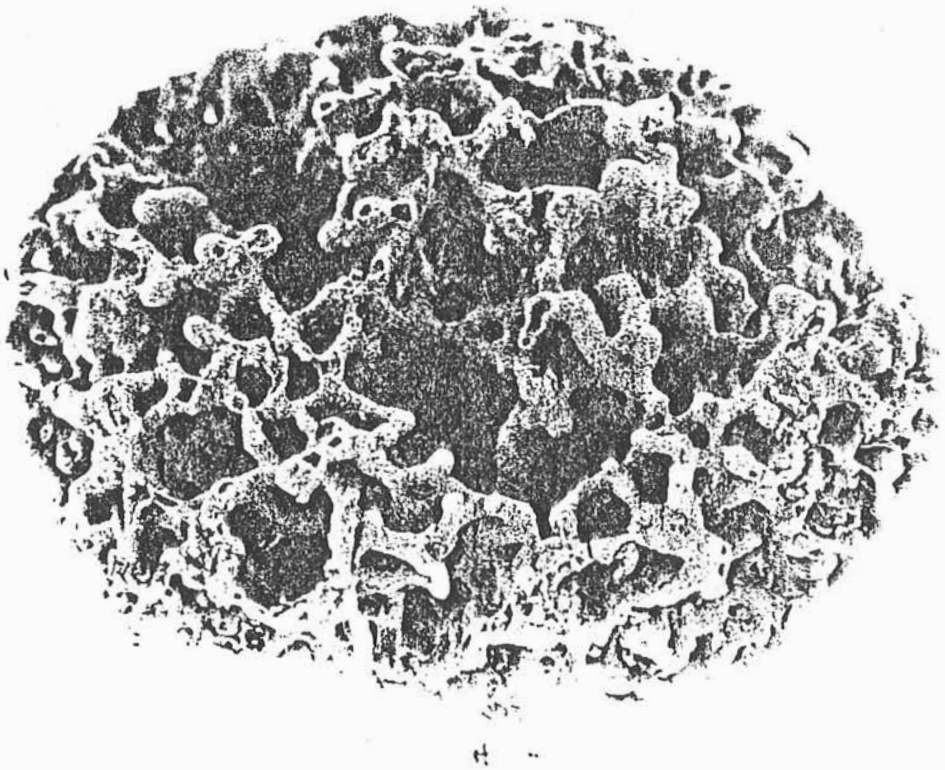
I heartily thank the following colleagues and friends for providing the separate pieces without which this puzzle could not have been done: Thomas M. Church, Barry T. Hargrave, Barbara Hecker, Michael A. Kaminski, Lisa A. Levin, Nancy Maciolek, Eric L. Mills, Claudia J. Schröder, Stephen A. Swift, and Brian E. Tucholke.

Ole S. Tendal
Zoological Museum, Copenhagen

*Note*: The organisms referred to as xenophyophores "netted in the deep waters off the Carolinas" by Church ("Marine Barite", PhD Thesis, University of California, 1970) were probably not xenophyophores at all, according to description (Church, pers. comm.), but rather belonged to the superfamily Komokiacea of the Foraminifera (O. Tendal & R.R. Hessler, 1977, Galathea Report *14*: 165-194).




Distribution of xenophyophores in the Northwest Atlantic. ▼ Aschemonella sp. (from the literature); ● Syringammina sp. (samples); O Syringammina sp. (from photographs); unidentified xenophyophores (from the literature).



Syringammina sp. from 800 m depth off Nova Scotia. It is built as a 3-dimensional network of hollow tubes containing the living part of the animal. The specimen measures about 4 cm maximum diameter. E.L. Mills phot.

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Athearn, W.D., 1967: Estimation of relative grain size from sediment clouds. - In: J.B. Hersey (Editor): Deep-Sea Photography. Johns Hopkins Oceanographic Studies 3, p. 173-176.

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Pratt, R.M., 1962: The Ocean Bottom. - Science 138: 492-495.

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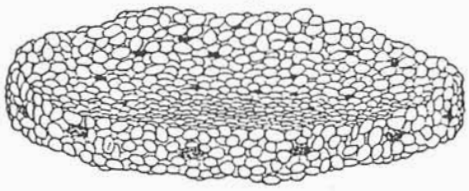

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