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Newsletter of the Association of Meiobenthologists

PSAMMONALIA is sent to individuals interested in the study of the minute biota of aquatic sediments.

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EDITORIAL

The great success of Psammonalia as a vehicle for communication between meiobenthic workers, stems from the enthusiasm of its originators Bob Higgins, Duane Hope and Don Zinn. We all owe them a debt of gratitude for the conception and growth of their child.

Now that the Association of Meiobenthologists has grown to a membership of 152 (at the last count), its informal nature is becoming unwieldy. During the transference of the Editorship to England a number of problems arose, largely due to the fact that the Association was run informally. To further the advance of the Association, the Board of Editors feel that a more formal structure is necessary. Therefore, a draft Constitution has been drawn-up and is included in this issue. I would be extremely grateful for any comments or alterations that you, the members of the Association, feel are needed to this Constitution. In the next issue I hope to include the finalised version of the Constitution.

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I hope to be able to publish reports of meiofaunal projects currently being pursued. To this end two reports are included in this present issue. One is from Dr. R.M. Warwick and concerns a productivity study being investigated at the University of Newcastle, England, and the second is a report of work on pollution being undertaken in our laboratory. I trust these reports will stimulate additional items. We would welcome reports of work currently in progress.

John S. Gray.
Editor.

FINANCIAL REPORT

April, 1970.

To date only 36 subscriptions have been received. Clearly Psammonalia cannot survive without financial support. Please send in your subscriptions without delay as this issue has already overspent the existing balance.

British banks charge ten shillings (~~£~~ 1.20c.) for each cheque cashed. So please will you send all subscriptions in INTERNATIONAL MONEY ORDERS. These can be cashed at face value.

NEWS FROM MEMBERSHIP

MME. A. FIZE, Lab. de Zoologie, Place E. Bateillon, 34, Montpellier, France.

For the past three years I have been studying the Nematalycidae (Interstitial Acarines) from beach sands on the French Atlantic coast. In this last year I have changed orientation slightly and am working with a team of Protistologists at a new laboratory at Montpellier. I am studying Astasia a Euglemid, parasitic on fresh-water Copepods. Our studies are orientated towards all the parasites of copepods of our region.

H.M. FEDER, College of Biological Sciences, University of Alaska,
College Alaska 99701.

I have moved from Hartnell College and will be at the University of Alaska for at least two years. I hope to do some work on interstitial fauna this coming summer. Does anyone know of work done in this part of the world (or in similar latitudes, Ed.)? I would appreciate any suggestions from anyone with experience of similar areas.

PH. BODIN, Station Marine d'Endoume, C.R.E.O. Allee des Tamains, 17,
La Rochelle, France.

Can I request that authors of papers on marine Harpacticoids send me their reprints as quickly as possible? La Rochelle is rather isolated and therefore I have difficulty in keeping my bibliography up-to-date.

P. SCHMIDT, II. Zoologisches Institut, Universität, 34, Göttingen, Germany.

Studies of the systematics and ecology of the interstitial fauna in beaches at the Island of Sylt have been continued by several graduates.

E. HARTWIG will probably complete his study of the Ciliata this year.

K. SCHILKE and S. HOXHOLD have completed their studies of Kalyptorhynchid, Turbellaria and several papers are in preparation.

B. SOPOTT is doing work on the otoplanidae and Nematoplanidae.

U. EHLERS is studying the Typhlopanidae and Dalyellide

We are trying to do similar work in other areas for comparative purposes. Dr. Westheide is continuing work in Tunisia and I myself have worked in northern Norway last summer, and will continue this coming summer. Professor Ax worked in Tvärminne last summer.

Laboratory experiments have been done by Dr. Westheide and myself in order to evaluate the influence of temperature on the reproduction of the Archiannelid Trilobodrilus axi.

R.M. WARWICK, Dove Marine Laboratory, Cullercoats, North Shields, England. Work at this laboratory is mainly concerned with the offshore mud and sand deposits, which provide a relatively stable habitat for the animals living in them. The nematode fauna at three stations off the coast of Northumberland has recently been described by Dr. Warwick and Dr. Buchanan (J. mar. biol. Ass. U.K. vol.50), and its dependence on sediment type discussed. The offshore mud community is the most faunistically homogeneous and environmentally stable, and has been selected for an intensive study on meiofaunal production. Dr. Warwick has been sampling at monthly intervals in this area throughout an entire annual cycle. These samples indicate that the population remains remarkably stable throughout the year, both with respect to the species composition and the age structure of the nematode population. This makes production estimates difficult, and cultures will now have to be established in the laboratory to determine the generation time of the animals. Any suggestions as to suitable culture medium for marine nematodes would be gratefully welcome, as attempts to date have been unsuccessful.

Several new and interesting species of nematodes are present in these sediments, some of which Dr. Warwick has already described, whilst others await description. An interesting Kinorhynch fauna also appears to be present. Mr. Bodger has studied the relative abundance of the various groups of meiofaunal animals in these sediments, and Dr. Buchanan has identified the Foraminifera. A paper on this group is now in preparation. At present the most obvious gap in our programme is lack of knowledge of the Copepoda, but we are anticipating taking on an additional worker next year who we hope will specialise in this group. Our ultimate aim is to obtain production figures in terms of gms/m²/year for the total meiofauna, and to obtain information on the population structure and dynamics of the major meiofaunal groups.

Dr. Warwick and Dr. Chia have investigated the uptake of dissolved organic substances from seawater by marine nematodes. The species investigated took up these substances, especially glucose, through the gut wall. Glucose was subsequently assimilated to glycogen and stored in the tissues. We suspect that other meiofaunal animals may also utilise this food source, and also that the concentrations of these dissolved substances may prove to be quite high in rich silt deposits. It is hoped that we will be able to measure these concentrations some time in the future.

Future work will also include an investigation of the dispersion patterns of the animals, and their depth distribution in the sediment. In view of the high faunal diversity, niche size must be

small, and we hope to be able to demonstrate some aspects of niche diversification, especially with reference to the nematodes.

Problems have arisen in the determination of the organic content of the sediments because of the large amounts of coal dust present, and Dr. Buchanan and Dr. Longbottom have a paper in press describing a new method based on the colourimetric estimation of protein. In addition to this offshore work, Mr. Welsby is studying the effects of pollution on the meiofauna of selected sandy beaches near outfalls in Tees Bay.

T. FENCHEL, Marinbiologisk Laboratorium, University of Copenhagen,
DK-3000 Helsingør, Denmark.

At the moment three projects concerning the ecology of meiobenthos are running at the laboratory :

Ebbe Kanneworff and Willy Nicolaisen are studying the population dynamics, microdistribution, respiration rates and relation to environmental factors (oxygen, salinity) of two sand dwelling amphipods of the genus Bathyporeia.

Birthe Straarup is studying the population dynamics and ecology of turbellarians in a shallow water bay. A report of this work will soon be published in Ophelia.

Tom Fenchel is studying the chemical nature of "detritus" and decomposition processes in sediments and especially the degradation of structural polysaccharides. The study will be extended to cover as well aerobic as anaerobic conditions. In close connection with this work Jørgen Hylleberg Kristensen is studying the occurrence of digestive enzymes and the utilization of the food by "detritus feeding" benthic organisms.

J.S. GRAY, Meiofaunal Studies at the Wellcome Marine Laboratory,
Robin Hood's Bay, Yorkshire, England.

Some three years ago the Universities on the east coast of England (Newcastle, Durham and Leeds) together with the Ministry of Fisheries and representatives of the University of Liverpool, joined forces to form the N. East coast pollution group. The east coast of England suffers from localised but heavy industrial pollution. The idea of the group programme was of coordinating individual projects. The Newcastle work is concerned mainly with productivity (see Dr. Warwick report), whilst Durham and Liverpool are working on algae. The Ministry have been studying tidal currents and hydrographic conditions. Our projects fall into four main categories. One under the direction of Dr. J.R. Lewis is studying long-term fluctuations of rocky shore species (Patella, Mytilus, Balanus) in order to separate natural from pollution determined population fluctuations. A second project under my personal supervision and conducted by Mr. A.J. Newton is concerned with a feasibility study for a proposed potash mine effluent. We have been making extensive studies of the hydrographic conditions likely to disperse the effluent, the suspended solid loading of the water naturally for nearly two years and also the nature and stability of the bottom deposits and fauna, including meiofauna. Naturally the biological data is as yet not as well studied as the other aspects. But some interesting meiofaunal species have been located,

including Monobryozoon ambulans. We will have long-term quantitative data on meio- and macrofaunal communities before and after discharge. The third project of Mr. P.G. Moore is a study of the meiofauna associated with the alga Laminaria along a pollution gradient. Both rock and bottom deposits change rapidly along the gradient and thus for comparative purposes are difficult to study. We therefore, decided to use Laminaria as a uniform substrate and note changes in the fauna associated with pollution. The gradient runs from St. Abb's Scotland, down through the Durham coast (which is heavily polluted from the rivers Tyne and Tees and from dumpings of coal dust directly on the beaches), finally down to unpolluted Yorkshire waters which contain large amounts of naturally derived suspended material. From the Yorkshire stations, Geoff Moore has identified over 220 species of animals associated with Laminaria.

Initial results indicate significant changes in faunal and numerical compositions in polluted areas. The great complexity of the trophic relationships of such an apparently confined meiofaunal community is intriguing.

Fourthly, I am studying various aspects of pollution and sand-living meiofauna. The beaches of the North-east coast are highly exposed from wave action and thus in order to detect pollution effects it is essential to know the effects exposure has on the meiofauna. Together with Dr. Reinhard Rieger we investigated as quantitatively as possible the fauna of an exposed and a relatively sheltered beach. We determined as far as possible, species composition of meio- and macro-fauna and spatial distribution patterns. This work is being prepared for publication. With this knowledge, two broadly similar beaches were selected for detailed long-term analyses, one near the mouth of a heavily polluted river and one in an unpolluted area. Monthly analysis of environmental parameters and faunal densities are in progress.

Secondly, in a laboratory study, we are analysing the growth rate potential of a number of sand-living elements in relation to stress conditions. Bacteria have been little studied and may be the most significant elements in sand food-chains. Thus, R. Ventilla and I are studying the growth rates of isolated sand-living bacterial species in relation to salinity, temperature, and oxygen changes using a Coulter Particle Counter. We ultimately hope to test the effect of common pollutants on the bacteria. After development of suitable and reliable techniques our results are significant and encouraging. Surprisingly the species at present under test grows rather slowly at normal ambient sea temperatures and has optimal growth at less than full strength sea-water.

Using isolated meiofaunal species we are studying growth rates of Dinophilus (Archiannelida) Paraleptastrea and Amphiascus (Harpacticoida) in culture in various combinations of salinity, temperature, oxygen and ultimately chemical pollutants. Our most successful culture method to date is using small solid watch-glasses and ballotini (glass beads) adding ground deep frozen spinach (really !) as a source of organic food. The water is changed every three days. The Wellcome Marine Laboratory has Hostel Accommodation and laboratory space available for visiting workers. We would be happy to receive any visitors interested in our projects or engaging in work for which this coast is suitable. We, fortunately, do not have polluted seas here, but within easy reach.

I trust this report will stimulate further reports from other projects.

N.B. The North East Coast Pollution Group started a newsletter which has created an immense interest and has now 'gone public'. It is known as the "Marine Pollution Bulletin", appears monthly and is available from MacMillan (Journals) Ltd., Brunel Road, Basingstoke, Hants, England, price 5s. Od. per copy.

J.B.J. WELLS, Extraction and storage of tropical meiofauna.

Dept. of Natural History, Marischal College, Aberdeen, Scotland. Having just spent 3 months in India on secondment to the International Biological Programme at Ernakulam, I would like to provide some information on extraction and treatment of tropical meiofauna. It seems likely that many tropical species react differently from their temperate counterparts. Here sea-temperature is a steady 28-30°C and interstitial temperatures are 38°C at 10cm depth and over 40°C at the sand surface. Metazoa exist at all depths in the beach I have looked at. Problems of extraction and storage are quite different from temperate latitudes.

1) Uhlig technique.

- a) This works as well in the tropics as in colder climates. Melting time is of course, shorter. If ice is available this is a good method.
- b) Cold water at 4-6°C is quite effective. It is, however, essential to put a fine pore filter over the sand to slow down the water flow rate. Very small ciliates are removed far less well than with ice.
- c) If cooling facilities are not available water at 50-60°C is reasonably effective. However, ciliates are less well extracted and many animals are killed and washed out passively by this process.

2) Storage and pre-treatment.

It is often stated that animals must be kept cool prior to extraction. Keeping tropical meiofauna at 10-15°C resulted in deterioration after only 12h. It is far better to keep the samples at ambient interstitial temperature (26-30°C in this case).

3) In order to prevent Nematoda from casting it has been recommended that immersion in water at 50-55°C is effective. In the tropics 60-70°C seems better as many remain alive at the lower temperature. This technique also works well for Oligochaeta, short Turbellaria (not long ones) and Gastrotricha. It is useless for Archiannelids.

WATER POLLUTION ABSTRACTS

This is a very valuable publication appearing monthly. It has useful, long abstracts covering all aspects of pollution. Examples of titles cited in the latest issue :

"Pollution and eutrophication problems of Great South Bay, Long Island, New York, Fochrenbach, J. J. Wat. Pollut. Control. Fed. 41 1456-66, 1969.

"An ecological study of south Biscayne Bay in the vicinity of Turkey Point. Bader R.T. U.S.Atom. Energy Comm. T1024951, 1969.

"Effects of pollutants on marine organisms : improving methodology of evaluation - a review of the literature. Waldichuk, M. J. Wat. Pollut. Control Fed. 41 1586-1601, 1969.

"Phosphorous turn-over by coral reef animals. Pomeroy L.P. and Kuenzler E.J. Proc. 2nd natn. Symp. Radio ecol. 1967, 474-82.

"Capillary methods of investigating micro-organisms.

Perfilied B.V. and Gabe D.R. Oliver & Boyd, Edinburgh, 1969.

638 pp.

In all 225 abstracts appear in the December 1969 issue and the price is 5s. Od. per month. It is available from Her Majesty's Stationery Office, 49,

CHANGES OF ADDRESS

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OTHER NEWSLETTERS

Don Zinn has brought to my notice a list from "Ascidian News" of similar newsletters. Some of you may be interested in these, or know of colleagues who may be interested.

Ascidian News. Dr. L. Eldredge, Department of Biological Sciences,
Univ. of Guam, Afano, Guam.

Echinoderm Newsletter. Division of Echinoderms, Museum of Natural History,
Smithsonian Institution, Washington D.C., 20560.

Cirripedologists Newsletter. V. Zullo, California Academy of Sciences,
San Francisco, California.

Mysidacea Newsletter. W.D. Clarke, Westinghouse Ocean Research Lab.,
San Diego, California.

Cladocera Newsletter. D.G. Frey, Department of Zoology, Indiana University,
Bloomington, Indiana.

Polychaete Newsletter. David Dean, Ira C. Darling Research Center, Walpole,
Maine 04573.

Australian Marine Sciences Newsletter. B.M. Campbell, Queensland Museum,
Gregory Terr., Fortitude Valley, Queensland, Australia.

Aquatic Microbiology Newsletter. Samuel P. Myers, Dept. of Food Science &
Technology, Louisiana State University, Baton Rouge, Louisiana 70803.

Directory of Indo-Pacific Marine Invertebrate Zoologists Pacific Scientific
Information Center, Bishop Museum, Honolulu, Hawaii.

NEW MEMBERS

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ANDREW G. CAREY, Jr.,
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Interests : Benthic ecology.

Recent publications :

- 1963 Acceleration of sinking rates of radionuclides in the ocean. *Nature* 200 (4913) : 1276-1277. (with C. Osterberg and H. Curl, Jr.).
- 1965 Preliminary studies on animal-sediment interrelationships off the central Oregon coast. *Oc. Sci. and Oc. Engr.* 1 : 100-110.
- 1965 An anchor-box dredge for deep-sea sampling. *Deep-Sea Res.* 12(6) : 983-984. (with D.R. Hancock).
- 1966 Artificial radionuclides in marine organisms in the northeast Pacific Ocean off Oregon. *Disposal of Radioactive Wastes into Seas, Oceans and Surface Waters.* International Atomic Energy Agency (Vienna), p. 303-319. (with W.G. Percy and C.L. Osterberg).
- 1966 Artificial radionuclides in marine organisms in the northeast Pacific Ocean off Oregon, p. 275-276. *In Abstracts of Papers, No.320--Sym. IV. Second International Oceanographic Congress (Moscow).* (with C.L. Osterberg and W.G. Percy).
- 1966 Studies on the ecology of benthic invertebrate fauna in the northeast Pacific Ocean off Oregon, U.S.A., p. 36. *In Abstracts of Papers Related with Oceanography. Proc. 11th Pac. Sci. Congr. (Tokyo) Vol. II, Sci. Coun. Japan, Tokyo.*
- 1967 Energetics of Long Island Sound benthos. I : Oxygen utilization of sediment. *Bull. Bingham Oceanogr. Coll.* 19(2) : 136-144.
- 1967 Echinoidea of Oregon. *J. Fish. Res. Bd. Canada* 24(6) : 1385-1401 (with J.E. McCauley).
- 1968 A modification of the Smith-McIntyre grab for simultaneous collection of sediment and bottom water. (with R.R. Paul), *Limnol. Oceanogr.* 13(3) : 545-549.
- 1969 Zinc-65 in echinoderms and sediments in the marine environment off Oregon. *Second National Radioecology Symposium, Ann Arbor. Symposium Volume. Symp. Radioecology Proc. Second Natn. Symp., Ann Arbor, Mich. 1967 (Conf. 670503) :* 380-388.
- 1969 Deep-sea sedimentation and sediment-fauna interaction in the Cascadia Channel and Abyssal Plain. (with G.B. Griggs and L.D. Kulm). *Deep Sea Research* 16 : 157-170.

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 of marine Dalyelloida and
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STEJEPKO GOLUBIC,
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Interests : Ecology of endopsammic
microflora : Cyanophyla and
other algae, sulfur bacteria.

Recent Publications :

GAMULIN-BRIDA, H.G., G. GIACCONE, and S. GOLUBIC. 1967. Contribution to investigations in subtidal biocoenosis under influence of pollution, (French with English summary). *Helgoländer wiss. Meeresunters.*, 15: 429-444.

GOLUBIC, S. 1967. Die Algenvegetation on Sandsteinfelsen Ost-Venezuelas (Cumana), *Int. Rev. Ges. Hydrobiol.*, 52(5) : 693-699.

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GOLUBIC, S. 1969. Cyclic and Noncyclic Mechanisms in the Formation of Travertine, *Verh. Int. Ver. d. Limnol.*, 17 : 956-961.

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GOLUBIC, S., Biological Indication of Pollution in Marine Coastal Environment (referate on 3. Europ. Symposium of Marine Biology, 1968) - Accepted for publication.

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GATTRALL, M. and S. GOLUBIC. Comparative Study on some Recent Endolithic Fungi using Scanning Electron Microscope, *Geol. J.*

In Preparation :

- with A.G. FISCHER, Structure and composition of recent intertidal algal mats and stromatolitic heads.
- with A.G. FISCHER, Ecology of calcareous nodules forming in Little Conestoga creek near Lancaster, Pa.

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9 - April 1970

Dr. Bodin has provided the following Supplementary Bibliography to the Harpacticoid Copepods.

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COULL (B.C.) et LINDGREN (E.W.), 1969 - Harrietella simulans (Copepoda, Harpacticoida) associated with Limnoria tripunctata (Isopoda) in North Carolina. J. Elisha Mitchell Scien. Soc., 85, p. 73-75.

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TITLE : MARINE NEMATOLOGY COLLOQUIUM

An informal colloquium on Marine Nematology is planned as an integral part of The Second International Congress of Parasitology (6-12 September 1970 : Mayflower Hotel, Washington, D.C., USA). Persons active or interested in marine nematology are encouraged to participate. The colloquium will be organised and scheduled to meet the interests of participants. Please advise Dr. D.G. Murphy, Adult Development and Aging Branch, National Institute of Child Health and Human Development, Building 31, Room 2A16, National Institutes of Health, Bethesda, Maryland 20014, if you are able to attend the Congress, including 1) the dates you will be available for the colloquium and 2) issues and concerns you recommend as agenda items.

Additional information on the Congress can be obtained by writing :

Dr. Gilbert F. Otto, Secretary General, 2nd ICP,
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