PSAMMONALIA

Newsletter of the International Association of Meiobenthologists



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INTERNATIONAL ASSOCIATION OF MEIOBENTHOLOGISTS FOUNDED 1966

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Dues are \$5 per year and may be paid in US currency or a check or money order in \$ to David Thistle

"This newsletter is not deemed to be a valid publication for formal taxonomic purposes"

EDITORIAL

The last editorial in the term of a newsletter editor must surely be the easiest to write. This is my twelfth and final issue of Psammonalia, and it becomes an opportunity to tie up some loose ends and thank and acknowledge everyone involved with Psammonalia for the last three years. One loose end is the cartoon contest. I asked for volunteers to send in cartoons with the hope of winning a free one year membership to IAM and Psammonalia. We've had some good cartoons over the last three years, and I especially want to acknowledge Ludo Jacobs, Tom Shirley, Al Decho, Judy Williams-Howze, and Gary Fitzhugh. I hereby proclaim Rudy Hermans and Hans-Uwe Dahms as contest winners. Rudy has contributed numerous cartoons over the last few years. One cartoon in this issue is by Hans-Uwe, the other is from a suggestion by Theresa Radziejewska.

More significantly, I thank students and helpers at LSU for their time in producing Psammonalia. Mike Murrell, Al Decho, Flip Rutledge, John McCall and Bin Sun all are (or were) graduate students in my lab enlisted to help find references etc. Hoc Nguyen, Phong Nguyen, Jana Kloss and Marie Blanchard typed references or mailing addresses. I also thank the efforts of the Board of Correspondents for sending references to me at regular intervals. Special thanks must go to two individuals. Nicki Mathews did the lion's share of entering and managing references over the last three years, and Flip Rutledge was indispensable in teaching me how to use a word processor to sort a mailing list and format the final version of the newsletter. They receive my special thanks and recognition. All these people made the last 12 issues (and 2000 references) possible.

What's next for IAM? Our membership is stable. We have roughly the same number (320) today as when I took over in 1987. Our finances are stable and reserves have remained largely unchanged over the last three years. Our strength is still enthusiasm in what we do and the interaction and support generated between members. We should always look forward however. The Eighth International Meiofauna Conference will hosted by Margaret Palmer in 1992 (see announcement).

Psammonalia is on the move again. It's crossing the Atlantic from Louisiana and the banks of the Mississippi River to the Devon coastline of southwest England. Richard Warwick and friends in Plymouth will generate the Psammonalia for the next three years. I wish them the best of fortunes, and hope to see IAM continue to prosper in the future.

John Fleeger

NEW OFFICERS FOR IAM:

The results of our elections begun in May are in! Not surprisingly, Richard Warwick and Mike Gee have been elected chairperson and treasurer by landslide margins (they were the only candidates after all!). They will serve for three year terms and Richard will assume the duties of Psammonalia Editor. Marc Bergmans and Margaret Palmer have been elected to the Executive Committee for six year terms. Terms begin on January 1, 1990 for all new officers.

EINCO ANNOUNCEMENT

The Eighth International Meiofauna Conference will be hosted by Margaret Palmer on campus at the University of Maryland, August 9 - 15, 1992 so everyone can plan well in advance. Margaret is asking for suggestions or volunteers to organize symposia at EIMCO. Stay tuned for future announcements.

NEWS FROM THE MEMBERS

From Ilse Bartsch:

Are you interested in Halacaroidea? There are the mites crawling around in aquatic habitats, almost everywhere, in +5000 m as well as -5000m depths. I am preparing a key to the marine genera. Do you want to test the key? Please contact me and you will receive a copy of a first draft, but, in return I expect to hear from you and your experiences with the key.

Ilse Bartsch Biologische Anstalt Helgoland Notkestr. 31 2000 Hamburg 52 FR GERMANY

From Bryan Burnett:

Bryan writes to remind us that he was a graduate student at Scripps Institution of Oceanography (1971-1975), and that he investigated the nano- and meiobenthos of the deep sea (1975-1980). "Those days were indeed a joy, and my long hours peering though the compound microscope produced interesting observations and hypotheses. What am I doing now? Immediately upon leaving SIO I became involved in a project which assessed the inorganic particle burden of healthy and diseased lungs (a highlight of which was a discovery of a lung nematode). This project led to development of my skills in particle analysis by scanning electron microscope/energy dispersive X-ray spectroscopy. now operate my own laboratory in that capacity. My research efforts are the quantification of particulates in lung and the characterization of gunshot residue." He wants to thank in particular (there are many others) Hjalmar Thiel, David Thistle, Peter Jumars, George (Buz) Wilson and Olav Giere.

From Rudi Novak, a final word on SVIMCO:

Funds from the sponsors of SVIMCO (including IAM, Austrian officials, University of Vienna) amounted to approximately 6400 \$ US. From this amount, 3500 \$ US were used to support participation of members (2400 \$ US provided by IAM, 1100 \$ US provided by our fundings). The rest of the money covered part of the organization expenses.

The congress fee paid by participants and accompanying persons was entirely used to cover costs for social events (welcome party, symposium's dinner, coffee breaks, video-party, etc., as well as printing of the congress brochure).

NEW AND REINSTATED MEMBERS These members were recruited at SVIMCOI

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Patrick J. S. Boaden Marine Biol. Station, Portaferry BT22 1PF, NORTHERN IRELAND, U.K.

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J. Lambshead Dept. Zoology, British Museum Natural History, Cromwell Rd, London, ENGLAND - UK

J. V. Ward Dept. Biology, Colorado State Univ., Fort Collins, CO, USA

Rogelio Lalana Centro de Investigationes Marinas, 1st Avenida Miramar, Habana, CUBA

Santiago Torres Curbelo
Deptamento de Biologia, Facultad de Ciencias Del Mar,
Campus de Tafira S/N, Canary Islands, SPAIN
"The aim of my research is focussed on the importance
of meiofauna in the nutrient regeneration processes
(mainly in the form of ammonium) in coastal
ecosystems. During the recent METEOR cruise No. 10.4
(J.G.O.F.S. Pilot Study), with Prof. Hjalmar Thiel, we
tried to measure enzymatic Glutamate DeHydrogenase
(GDH) activities in benthic organisms as an index of
potential ammonium excretion rates".

CHANGE OF ADDRESS

Fred Dobbs Hawaii Institute Geophysics, University Hawaii, 2525 Correa Road, Honolulu, HI 96822, USA

Kevin Carman
Department Zoology and Physiology, Louisiana State
University, Baton Rouge, LA 70803, USA
I recently completed my Ph.D. at Florida State

University, under the guidance of David Thistle. In August, I began a 2-year postdoctoral position at Louisiana State University. While at LSU, I will collaborate with John Fleeger on a study of the interactions between tube-dwelling harpacticoids and the microorganisms associated with their tubes. I also hope to work with Ken Brown in his study of freshwater snails; specifically, I'll be trying to determine the types of microbial-food resources that they are exploiting. Farther from home, I'm currently involved in a collaborative study with Jim Guckert and D. C. White (Univ. of Tennessee) on microbial activity and microbial-meiofaunal interactions in Antarctic sediments. In my spare time, I plan to take a closer look at the metabolic activity of epicuticular bacteria associated with benthic copepods.

Don Webb Marine Science Center, Univ. Texas, Port Aransas, TX 78373, USA (Bitnet = WEBB@UTMSI)

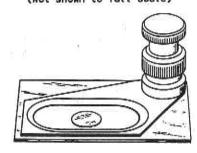
Jacques Soyer (will perform new administrative functions at) Observatoire Oceanologique, Bp 28, 06230 Villefrancesur-Mer, FRANCE

Decho, Alan U.S. Geological Survey (WRD), Mail Stop 465, Menlo Park, CA, 94025, USA

Thomas M. Iliffe
Texas A&M University, Department of Marine Biology, PO
Box 1675, Galveston, TX 77553, USA

SPECIAL EQUIPMENT AND REVIEW SECTION

THE TAYLOR MICROCOMPRESSOR (Not shown to full scale)



The MICROCOMPRESSOR is designed to restrict motion of living organisms as small as 5 micrometers, to roll even smaller specimens of all kinds and to serve as a live cell. It is compatible throughout the full range of the light microscope equipped with high aperture substage condenser and parfocal objectives mounted on revolving nosepiece. It is shown above in right-hand position as it would be used with a nosepiece inclined toward the observer. The Microcompressor is reversed for use with a nosepiece inclined away from the observer.

The 12 mm diameter specimen stage is mounted on a 75 X 50 mm glass base with a combined thickness of under 1.2 mm. The precision adjusting column is located at a corner of the base where it is clear during objective interchanges. The Microcompressor is handled entirely with the two knurled controls of the adjusting column. The upper knob provides sensitive and positive vertical adjustment. The hub which

supports the arm controls the lateral displacement. An internal isolation system prevents the transfer of unwanted motion from one control to the other. A #1 24 X 50 mm coverslip is mounted under the large opening in the arm by means of a novel procedure which ensures perfect parallelism with the specimen stage. This procedure easily is duplicated by the user if required in maintenance.

The Microcompressor is designed to be lifted by its hub for transfer to and from the research microscope, even with the most delicate specimen gently restrained. The entire area of the specimen stage can be scanned without mechanical interference. The glass base enables the user to recover a specimen which may have worked its way over the edge of the specimen stage. All types of specimen can be retrieved from the instrument for transfer to further procedures.

The Microcompressor has been engineered for long lasting reliability and ease of maintenance through judicious choice of materials, finishes and manufacturing methods of its high precision parts. The instrument comes with detailed instructions for it use and maintenance and with accessories for coverslip replacement.

The Taylor Microcompressor is priced at \$365.00 plus shipping. Please make payment in U.S. Dollars only, by U.S. funds drawn on a U.S. Bank or by International Postal Money Order. Order directly from:

Howard L. Taylor 1812 Wood Hollow Court Sarasota, Florida 34235, U.S.A.

From Paul Turner:

Review of the Taylor Microcompressor: (taken partly from Rotifer News No. 16-17)

First of all, I like this compressor. It is easy to use, practical and adjustable. It is big enough for large specimens, and small enough for the tiniest. The precision crafted into the design is adequate for most practical precision work.

Initially, I had trouble getting used to the glass base of the device, thinking it a bit fragile. But after what I considered harsh treatment for several days, carrying it in my briefcase wrapped in a handkerchief (forgive me), I am impressed that the compressor can withstand what I consider reasonable knocking about!

I used it no less than twenty times on separate specimens of rotifers. Each time I used it I became a little more dependent on the utility of its design and the practicality of its use for little-creature manipulations.

After using it in my laboratory at home and at the Museum, there was little doubt that it was as useful as it could be. The Rousselet compressors I am familiar with and depend on, paled in comparison. No longer did I have to rotate the compressor 180 degrees in order to avoid banging the objectives on the five objective nosepiece of my Olympus CH. No longer did I have to slide the stage forward to rotate a higher magnification objective into place, the slide it back in hopes the specimen was still there.

The placement of the adjustment screw is out of the way for all revolving nosepieces I tried, and the breadth of the arm opening is practically perfect. One problem item I did encounter is that when I used an AO planapochromat 40/.66 objective (on a AO microscope not my own), since the shape of the objective is quite flat on the operational end, the arm of the compressor positively had to by in the closed position in order for the swivel of the objective not to bang the compressor. This was the only operational problem I encountered, however, and virtually all other lenses worked fine in a variety of compressor arm positions.

When Howard sent me the compressor for a trial, he suggested that I try to replace the coverslip using the new technique and instructions he developed. Through the procedure I had no trouble except for the epoxy application. The droplets of epoxy used to secure the coverslip needed to be much smaller than I first envisioned prior to entering the procedure. Thus, the first attempt at this item left several blobs of annoying and interfering glue on both coverslip and baseplate. Never fear though, proper solvent and enough epoxy and away we go again. I purposely and scrupulously followed the details of the instructions the second time, with the benefit of experience, and had little trouble replacing the coverslip after the first miserable abort. The instructions for replacing the coverslip were clear, and with some minor modification to the order of steps, were quite adequate.

Also, as far as I can tell, its high mechanical performance suffered no significant deviation from the precision standards the compressor arrived with. As it turned out, Howard wrote me about the coverslip-to-stage contact after its trip by registered mail back to his laboratory... it was within 0.0025 mm overall.

Without exception, every individual at the Museum who works on small critters and to whom I showed the instrument, applauded its utility. They subsequently asked how much it was and where and when they could procure one for themselves.

Herein lies part of the difficulty with the instrument, its price. All of us feel fiscal and budgetary constraints, and with a price of \$365.00, it could be difficult to acquire. It is, however, a small price to pay for a high caliber instrument in today's world. And to the innovation of individuals such as Howard Taylor, we owe at least fair and equitable recognition and price.

JOURNAL ANNOUNCEMENT

STYGOLOGIA

International Journal of General and Applied Groundwater Research

Due to a change in policy of the actual publishers of STYGOLOGIA, the publication of the journal will be continued by SPB Academic Publishing BV, P.O. Box 97747, 2509 GC The Hague, The Netherlands, as from Volume 5.

The scope of the journal will remain unaltered: Presenting results of all kinds of studies devoted to subterranean waters, irrespective whether of continental or marine origin. Cave and other karst waters, phreatic waters and their outlets in porous substrates, hyporheal and marine interstitial waters,

as well as new developments in processing such water resources, fall within the scope of the journal.

STYGOLOGIA aims at being a focal point for scientists of different disciplines, both biological (e.g. microbiology, physiology, ecology, marine biology, limnology, population dynamics, taxonomy, and evolution theory), and non-biological (e.g. karstology, speleology, hydrology, hydrochemistry). Papers of an integrating nature, combining results of different subdisciplines, will receive high priority.

Descriptive and experimental results, which are essentially new and not published elsewhere, as well as review articles, will be considered for publication. Taxonomic papers will be published only if they contain also important data on, for instance, ecology and biogeography, or are monographic or phylogenetic in essence. Applied studies will be considered if general principles are elucidated and/or basic biological and other scientific results are used for applied purposes.

The journal has an international board of editors, and although the main language will be English, it also accepts papers in French, German, or Spanish. All papers will contain an English and (usually) French Abstract.

As from Volume 5, the format of the journal will change, both as to page size (16.2 X 21.0 cm) and layout. Potential authors are invited to request the (new) instructions to Authors, available from the Managing Editors, in order to assure that their manuscripts are in close agreement with the new style. Potential authors are invited to submit their papers.

The subscription price will be Dutch Guilders 205.00 (U.S. \$ 105.00), postage and handling included, per volume of four issues of approximately 68 pages each.

The Editors-in-Chief of STYGOLOGIA

J. H. Stock & L. Botosaneanu
c/o ITZ, P.O. Box 4766, 1009 AT Amsterdam
The Netherlands



"Whatever it is, it's very, very little."

MEETING ANNOUNCEMENTS

Fourth International Conference on Copepoda Karuizawa Seminar House of Nihon University, Karuizawa 16th-20th September 1990

The Fourth International conference on Copepoda will be held at Karuizawa Seminar House of Nihon University, Karuizawa, Nagano Prefecture, from September 16 (Monday) to 20 (Friday), 1990, under the following host and sponsors.

Host: World Association of Copepodologists (WAC)
Sponsors: Plankton Society of Japan
Oceanographical Society of Japan
Japanese Society of Scientific Fisheries
Zoological Society of Japan
College of Agricultural and Veterinary
Medicine Nihon University

The aim of this conference is to provide a forum where all aspects of scientific research relating to copepods can be communicated and discussed in a pleasant and open atmosphere. This conference is of special significance since it will be the first to be held in Asia. The organizing Committee invites participation of copepodologists from all countries.

Co-sponsors: Karuizawa Town

SIXTH INTERNATIONAL SYMPOSIUM ON AQUATIC MEMATODES Yerseke, August 6-10 1990

FIRST ANNOUNCEMENT

Topics

The International Symposia on Aquatic Nematodes have been organized since 1977 and are the principal forum for discussions on the ecology, morphology and systematics. Previous meetings were held in Gent, Plymouth, Roscoff, Vienna and Banyuls.

For the forthcoming meeting the organization committee especially welcomes papers on the following aspects:

Ecology:

- interactions between nematodes and protozoans and/or bacteria
- predation on nematodes
- variability in space and time
- community patterns and their application in biomonitoring

Morphology and Systematics:

- advances in phylogeny
- ultrastructure

Papers on other topics are also welcome Presentation

Participants are free to present their research either as posters or 20 minute lectures. Shorter or longer lectures are also welcome provided the organizers are informed in advance. If too many lectures are proposed, the organization committee will make a choice on the basis of the abstract. A special poster session will be organized. Abstracts have to be submitted before April 1, 1990.

The symposium will be held in the Delta Institute for Hydrobiological Research in Yerseke, The Netherlands. Participants will be lodged in hotels in the neighborhood. The approximated price per person and per night for a single room is 80 Dutch guilders, for a double room 60 Dutch guilders including breakfast. Yerseke is situated on the Oosterschelde in the delta area of the rivers Rhine, Meuse and Scheldt in the province of Zeeland and is renowned for its aquaculture.

The dates have been chosen so as to allow interested participants to attend the Second International Nematology Congress in Veldhoven, the Netherlands (August 11-17). Information: Department of Nematology, Agricultural University, P.O. Box 8123, 6700 ES Wageningen, NL. Fee

A symposium fee of 130 guilders (approx. 60 US dollars) for full participants and 65 guilders (approx. 60 US dollars) for students will be charged, which does not include the symposium dinner. Participants from countries with exchange restrictions may request to be exempted from the symposium fee. Publication

Formal publication of high quality papers in a book or a journal is being considered. speculative or preliminary or otherwise unpublishable results may be presented as well. The second announcement will contain more details concerning publication.

Local Organizing Committee

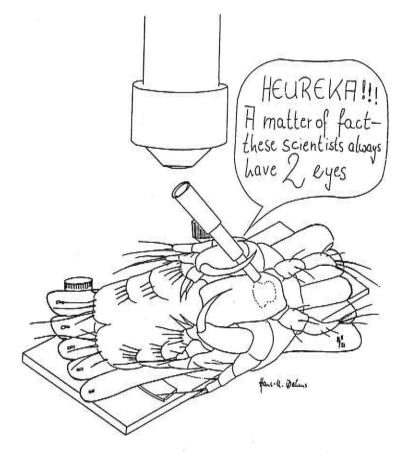
Fax:

C. Heip, M. Hemminga, R. Alkemade, E. Nieuwenhuize Secretariat

All information concerning the 6th ISAN can be obtained from:

ISAN Secretariat Mrs. E. Nieuwenhuize Delta Institute, Vierstraat 28, NL-4401 EA Yerseke, The Netherlands Phone: Int. (31)-1131-1920

Int. (31)-1131-3616



INSCRIPTION FORM - 6th ISAN YERSEKE 1990

naik:		
Address:		
Zip Code:	Town:	Country:
Phone:	Fax:	

- I will be accompanied by ___ people
- I will/will not submit a paper/poster

Preliminary title:

- I am a student/subject to exchange restrictions

CURRENT LITERATURE

- Adrianov, A.V. 1989. The first report on Kinorhyncha of the Sea of Japan. Zool. Zh. 68: 17-27.
- Albani, A.D. and Yassini, I. 1989. Taxonomy and distribution of shallow-water lagenid Foraminiferida from the southeastern coast of Australia. Aust. J. Mar. Freshwat. Res. 40: 369-402.
- Allen-Morley, C.R. and Coleman, D.C. 1989. Resilience of soil biota in various food webs to freezing perturbations. Ecology 70: 1127-1141.
- Aller, J.Y. 1989. Quantifying sediment disturbance by bottom currents and its effect on benthic communities in a deep-sea western boundary zone. Deep-Sea Res. 36: 901-934.
- Alongi, D.M. 1989. Benthic processes across mixed terrigenous-carbonate sedimentary facies on the central Great Barrier Reef continental shelf. Cont. Shelf Res. 9: 629.
- Armonies, W. 1989. Meiofaunal emergence from intertidal sediment measured in the field -Significant contribution to nocturnal planktonic biomass in shallow waters. Helgolander Meeresuntersuchungen 43: 29-44.
- Austen, M.C., Warwick, R.M. and Rosado, M.C. 1989a. Meiobenthic and macrobenthic community structure along a putative pollution gradient in southern Portugal. Mar. Poll. Bull. 20: 398-404.
- Austen, M.C. and Warwick, R.M. 1989b. Comparison of univariate and multivariate aspects of estuarine meiobenthic community structure. Estuar. Cstl. Shelf Sci. 29: 23-42.
- Austen, M.C. 1989c. Factors affecting estuarine meiobenthic assemblage structure: a multifactorial microcosm experiment. J. Exp. Mar. Biol. Ecol. 130: 167-188.
- Barnett, P.R.O. and Watson, J. 1989. A comment on "Laboratory studies on core sampling with application to subtidal meiobenthos collection" (Rutledge and Fleeger). Limnol. Oceanogr. 34: 1142-1143.
- Bartsch, I. 1989. Marine mites (Halacaroidea: Acari): a geographical and ecological survey. Hydrobiologia 178: 21-42.
- Basford, D.J., Eleftheriou, A. and Raffaelli, D. 1989. The epifauna of the Northern North Sea (56 Degrees- 61 Degrees N). J. Mar. Biol. Ass. U. K. 69: 387-408.
- Bingham, C.R. and Miller, A.C. 1989. Colonization of a manmade gravel bar by Oligochaeta. Hydrobiologia 180: 229-234.
- Bird, G.J. and Holdich, D.M. 1989. Recolonisation of artificial sediments in the deep Bay of Biscay by

- Tanaidaceans (Crustacea, Peracardia), with a description of a new species of <u>Pseudotanais</u>. J. Mar. Biol. Ass. U. K. 69: 307-318.
- Biserov, V.I. 1989. A key to fresh water Tardigrada (water bears) of the USSR. Zool. Zh. 68: 56-65.
- Boaden, P.J.S. 1989. Meiofauna and the origins of the Metazoa. Zool. J. Linn. Soc. 96: 217-227.
- Bodin, P. and Jackson, D.F. 1989. A comparison of the intertidal harpacticoid copepod assemblages of sandy beach in Galway Bay (Ireland) and Northern Brittany (France). J. Mar. Biol. Ass. U. K. 69: 573-588.
- Bonacina, C., Bonomi, G. and Monti, C. 1989a.
 Population analysis in mass cultures of <u>Tubifex</u>
 tubifex. Hydrobiologia 180: 127-134.
- Bonacina, C., Bonomi, G. and Monti, C. 1989b.
 Density-dependent processes in cohorts of <u>Tubifex</u> <u>tubifex</u>, with special emphasis on the control of fecundity. Hydrobiologia 180: 135-142.
- Bouguenec, V. and Giani, N. 1989. Biological studies upon <u>Enchytraeus variatus</u> Bougeuenec & Giani 1987 in breeding cultures. Hydrobiologia 180: 151-166.
- Bozhenova, O.V., Stepanjants, S.D. and Sheremetevsky, A.M. 1989. The first finding of the meiobenthic Cnideria <u>Boreohydra simplex</u> (Hydrozoa, Athecata) in the White Sea. Zool. Zh. 68: 11-16.
- Brinkhurst, R.O. and Gelder, S.R. 1989a. Did the lumbridulids provide the ancestors of the branchiobdellidans, acanthobdellidans and leeches?. Hydrobiologia 180: 7-16.
- Brinkhurst, R.O. 1989b. <u>Varichaetadrilus angustipenis</u>
 (Brinkhurst and Cook, 1966), new combination for
 <u>Limnodrilus angustipenis</u> (Oligochaeta:
 Tubificidae). Proc. Biol. Soc. Wash. 102: 311-312.
- Bruggemann, J. 1989. Ultrastruktur des Exkretionssystems von <u>Vejdovskya pellucida</u> (Plathelminthes, Rhabdocoela). Microfauna Marina 5: 227-242.
- Carlotti, F. and Sciandra, A. 1989. Population dynamics model of <u>Euterpina acutifrons</u> (Copepoda: Harpacticoida) coupling individual growth and larval development. Mar. Ecol. Prog. Ser. 56: 225-242.
- Carman, K.R., Dobbs, F.C. and Guckert, J.B. 1989. Comparison of three techniques for administering radiolabled substrates to sediments for trophic studies: uptake of label by harpacticoid copepods. Mar. Biol. 102: 119-126.
- Casellato, S. and Negrisolo, P. 1989. Acute and chronic effects of an anionic surfactant on some freshwater tubificid species. Hydrobiologia 180: 243-251.

- Churchill, F.B. 1989a. The guts of the matter -Infusoria from Ehrenberg to Butschli - 1838-1876. J. Hist. Biol. 22: 189-214.
- Churchill, F.B. 1989b. Toward the history of Protozoology - introduction. J. Hist. Biol. 22: 185-188.
- Coates, K.A. 1989a. Preliminary investigations of hybridization/reticulate evolution in Guaranidrilus (Enchtraeidae: Oligochaeta). Hydrobiologia 180: 35-46.
- Coates, K.A. 1989b. Phylogeny and origins of Enchytraeidae. Hydrobiologia 180: 17-34.
- Corliss, J.O. 1989. The Protozoon and the cell a brief 20th-century overview. J. Hist. Biol. 22: 307-324.
- Couch, C.A. 1989. Carbon and nitrogen stable isotopes of meiobenthos and their food resources. Estuar. Cstl. Shelf Sci. 28: 433-442.
- Coull, B.C., Palmer, M.A. and Myers, P.E. 1989. Controls on the vertical distribution of meiobenthos in mud: field and flume studies with juvenile fish. Mar. Ecol. Prog. Ser. 55: 133-139.
- Dashchenko, O.I. 1989. Remarks on genus <u>Chromadorita</u> and rehabilitation on genus <u>Allgeniella</u> (Nematoda, Chromadorida). Zool. Zh. 68: 15-22.
- Dauvin, J.C. and Joncourt, M. 1989. Energy values of marine benthic invertebrates from the Western English Channel. J. Mar. Biol. Ass. U. K. 69: 589-596.
- de Eguileor, M., Valvassori, R., Lanzavecchia, G. and Di Lernia, L. 1989. T-system in muscles of microdriles. Hydrobiologia 180: 109-114.
- Decraemer, W. and Soetaert, K. 1989. Peculiar new deep-sea desmoscolicid species of the genus <u>Protricoma</u> (Nematoda) from Corsica. Zool. Scr. 18: 223-230.
- Diaz, R.J. 1989. Pollution and tidal benthic communities of the James River Estuary, Virginia. Hydrobiologia 180: 195-212.
- Drewes, C.D. and Zoran, M.J. 1989. Neurobehavioral specializations for respiratory movements and rapid escape from predators in posterior segments of the tubificid <u>Branchiura sowerbyi</u>. Hydrobiologia 180: 65-72.
- Ehlers, U. and Sopott-Ehlers, B. 1989a. Interstitielle fauna von Galapagos. XXXVIII. <u>Haloplanella</u> Luther und <u>Pratoplana</u> Ax (Typhloplanoida, Plathelminthes). Microfauna Marina 5: 189-206.
- Ehlers, U. 1989b. The protonephridium of <u>Archimonotresis Limophila</u> Meixner (Plathelminthes, Prolecithophora). Microfauna Marina 5: 261-275.
- Ehlers, U. and Sopott-Ehlers, B. 1989c. Drei neue Rhabdocoela (Plathelminthes) von der franzosischen Atlantikkuste. Microfauna Marina 5: 207-218.

- Ehlers, U. 1989d. Duo-gland adhesive systems of Schizochilus caecus L'Hardy (Plathelminthes, Kalyptorhynchia). Microfauna Marina 5: 243-260.
- Ellis, M.J. and Coull, B.C. 1989. Fish predation on meiobenthos: field experiments with juvenile spot <u>Leiostomus</u> <u>xanthurus</u> Lacepede. J. Exp. Mar. Biol. Ecol. 130: 19-32.
- Erseus, C. and Diaz, R.J. 1989. Population dynamics of <u>Tubificoides</u> <u>amplivasatus</u> (Oligochaeta, Tubificidae) in the Oresund, Denmark. Hydrobiologia 180: 167-176.
- Fenchel, T. and Finlay, B.J. 1989. <u>Kentrophoros</u>: a mouthless ciliate with a symbiotic kitchen garden. Ophelia 30: 75-93.
- Ferraguti, M., Grassi, G. and Erseus, C. 1989. Different models of tubificid spermatozeugmata. Hydrobiologia 180: 73-82.
- Ferris, V.R. and Ferris, J.M. 1989. Why ecologists need systematists - importance of systematics to ecological research. J. Nematol. 21: 308-314.
- Fleeger, J.W., Shirley, T.C. and Ziemann, D.A. 1989. Meiofaunal responses to sedimentation from an Alaskan spring bloom. I. Major taxa. Mar. Ecol. Prog. Ser. 57: 137-145.
- Fleischak, P.C. and DeFreitas, A.J. 1989. Physical parameters influencing the zonation of surf zone benthos. Estuar. Cstl. Shelf Sci. 28: 517-530.
- Flossner, D. 1989. <u>Bryocamptus pilosus</u> n. sp. (Copepoda: Harpacticoida) from North America. Hydrobiologia 179: 129-134.
- Forge, T.A. and Macguidwin, A.E. 1989. Nematode autofluorescence and its use as an indicator of viability. J. Nematol. 21: 399-403.
- Fricke, H., Giere, O., Stetter, K., Alfredsson, G.A., Kristjansson, J.K., Stoffers, P. and Svavarsson, J. 1989. Hydrothermal vent communities at the shallow subpolar Mid-Atlantic ridge. Mar. Biol. 102: 425-430.
- Gagarin, V.G. 1989. New and rare species of the family Tobrilidae (Nematoda, Enoplida). Zool. Zh. 68: 18-25.
- Galleni, L., Canovai, R., Esposito, A. and Stanyon, R. 1989. Characterization of turbellarian chromosomes. II. C-banding in <u>Drugesia lugubris</u> (Tricladida: Paludicola). Trans. Am. Microsc. Soc. 108: 304-208.
- Gallo, M.D., Delucia, R.M.M. and Dezio, S.G. 1989. Two new species of the genus <u>Tyraconyx</u> (Tardigrada, Heterotardigrada). Cah. Biol. Mar. 30: 17-34.
- Gee, J.M. 1989. An ecological economic review of meiofauna as food for fish. Zool. J. Linn. Soc. 96: 243-261.

- Gelder, S.R. 1989. Histophysiology of digestion and observations on the structure of the alimentary canal in the ectosybiont <u>Chaetogaster Limnaei</u> <u>Limnaei</u> Baer, 1827 (Annelida: Oligochaeta). Hydrobiologia 180: 115-126.
- Gilron, G.L. and Lynn, D.H. 1989. Estimates of in <u>situ</u> population growth rates of four tintinnine ciliate species near Kingston Harbour, Jamaica. Estuar. Cstl. Shelf Sci. 29: 1-10.
- Goolish, E.M. and Burton, R.S. 1988. Exposure to fluctuating salinity enhances free amino acid accumulation in <u>Tigriopus californicus</u> (Copepoda). J. Comp. Phys. B 158: 99-105.
- Gourbault, N. and Renaud-Mornant, J. 1989.
 Micro-meiofauna distribution assemblages and
 trophic strategies in a semi-closed atoll (Eastern
 Tuemotu Archipelago). C. R. Acad. Sci. Ser.
 III-Vie 309: 69-76.
- Graf, G. 1989. Benthic-pelagic coupling in a deep-sea benthic community. Nature, Lond. 341: 437-439.
- Grahame, J. and Hanna, F.S. 1989. Factors affecting the distribution of the epiphytic fauna of <u>Corallina officinalis</u> (L.) on an exposed rocky shore. Ophelia 30: 113-130.
- Hatcher, A. 1989. RQ of benthic marine invertebrates. Mar. Biol. 102: 445-452.
- Healy, B. 1989. Preliminary report on the Enchytraeidae (Oligochaeta) of West Florida. Hydrobiologia 180: 47-56.
- Heyns, J. and Coomans, A. 1989. A new freshwater species of <u>Theristus</u> from south west Africa/Namibia (Nematoda: Xyalidae). S. Afr. J. Zool. 24: 95-98.
- Higgins, R.P. and Storch, V. 1989a. Ultrastructural observations of the larva of <u>Tubiluchus</u> <u>corallicola</u> (Priapulida). Helgolander Meeresuntersuchungen 43: 1-12.
- Higgins, R.P. and Korczynski, R.E. 1989b. Two new species of <u>Pycnophyes</u> (Homalorhagida, Kinorhyncha) from the Canadian coast of the Beaufort Sea. Can. J. Zool. 67: 2056-2064.
- Holt, P.C. 1989. Comments on the classification of the Clitellata. Hydrobiologia 180: 1-6.
- Hornung, H., Krom, M.D. and Cohen, Y. 1989. Trace metal distribution in sediments and benthic fauna of Haifa Bay, Israel. Estuar. Cstl. Shelf Sci. 29: 43-56.
- Huys, R. 1988a. Rotundiclipeidae fam. nov. (Copepoda, Harpacticoida) from an anchihaline cave on Tenerife, Canary Islands. Stygologia 4: 42-63.
- Huys, R. and Kunz, H. 1988b. On the generic boundaries within the marine interstitial Latiremidae (Copepoda: Harpaticoida). Stygologia 4: 292-305.

- Huys, R. and Coomans, A. 1989. <u>Echinoderes higginsisp.n.</u> (Kinorhyncha, Cyclorhagida) from the southern North Sea with a key to the genus <u>Echinoderes</u> Claparede. Zool. Scr. 18: 211-222.
- Hyvonen, R. and Huhta, V. 1989. Effects of lime, ash and nitrogen fertilizers on nematode populations in scots pine forest soils. Pedobiologia 33: 129-144.
- Ivanova-Kazas, O.M. 1989. Ways of establishing bilateral symmetry in the ontogenesis of nematodes and gastrotrichs (Nemathelminthes). Zool. Zh. 68: 5-14.
- Jacobs, N.X. 1989. From unit to unity protozoology, cell theory, and the new concept of life. J. Hist. Biol. 22: 215-242.
- Jellyman, D.L. 1989. Occurrence of the nematode <u>Hedruris</u> <u>Spinigera</u> in the stomachs of freshwater <u>eels. N. Z. J. Zool. 16: 185-190.</u>
- Juget, J., Goubier, V. and Barthelemy, D. 1989. Intrinsic and extrinsic variables controlling the productivity of asexual populations of <u>Nais</u> spp., (Naididae, Oligochaeta). Hydrobiologia 180: 177-184.
- Kaster, J.L. 1989. Observations of predator-prey interaction on dispersal of an oligochaete prey, <u>Limnodrilus</u> <u>hoffmeisteri</u>. Hydrobiologia 180: 191-194.
- Kastoro, W., Aswandy, I., Hakim, I.A., De Wilde, P.A.W.J. and Everaarts, J.M. 1989. Soft bottom benthic community in the estuarine waters of East Java. Neth. J. Sea Res. 23: 463-472.
- Kornicker, L.S. 1989. The adult male of the troglobiotic Ostracod <u>Spelaeoecia</u> <u>bermudensis</u> Angel and Iliffe, 1987, from an anchialine cave in Bermuda (Crustacea: Ostracoda: Halocypridoidea). Proc. Biol. Soc. Wash. 102: 313-323.
- Kristensen, R.M. and Higgins, R.P. 1989. Marine Tardigrada from the southeastern United States coastal waters I. <u>Paradoxipus orzelicoides</u> n. gen., n. sp. (Arthrotardigrada: Halechiniscidae). Trans. Am. Microsc. Soc. 108: 245-261.
- Kudinova-Pasternak, R.K. 1989. A suplement to the fauna of Tanaidacea (Crustacea) of Kurile Islands and the description of <u>Zeuxo beringi</u> sp. n. (Commander Islands). Zool. Zh. 68: 128-129.
- Lanzavecchia, G., de Eguileor, M., Valvassori, R., Di Lernia, L. and Cambiaso, C. 1989. Morphogenesis of body wall muscle fibers in <u>Enchytraeus minutus</u>. Hydrobiologia 180: 91-98.
- Lazim, M.N., Learner, M.A. and Cooper, S. 1989. The importance of worm identity and life history in determining the vertical distribution of tubificids (Oligochaeta) in a riverine mud. Hydrobiologia 178: 81-92.
- Lazzaretto, I. and Libertini, A. 1989. Chromosomes of two species of <u>Tisbe</u> (Copepoda, Harpacticoida)

- belonging to different groups of sibling species. Zool. Scr. 18: 279-282.
- Mackensen, A. and Douglas, R.G. 1989. Down-core distribution of live and dead deep-water benthic Foraminifera in box cores from the Weddell Sea and the California continental borderland. Deep-Sea Res. 36: 879-900.
- Manicardi, G.C. 1989. Two new species of soil moss Eutardigrades (Tardigrada) from Canada. Can. J. Zool. 67: 2282-2285.
- Marcogliese, D.J. and Esch, G.W. 1989. Experimental and natural infection of planktonic and benthic copepods by the Asian tapeworm, <u>Borthriocephalus</u> <u>acheilognathi</u>. Proceedings of the Helminthological Society of Washington 56: 151-155.
- Marsh, A.G., Gremare, A. and Tenore, K.R. 1989. Effect of food type and ration on growth of juvenile <u>Capitella</u> sp. I (Annelida: Polychaeta): macro- and micronutrients. Mar. Biol. 102: 519-528.
- Meyer-Rochow, V.B. 1989. A re-investigation and re-interpretation of the cumacean photoreceptor. Zool. Scr. 18: 283-288.
- Mezhov, B.V. 1989. Two new species <u>Macrostylis</u>
 (Isopoda, Macrostylidae) from the trenches of the Pacific Ocean and comments on the morphology of <u>M. galatheae</u>. Zool. Zh. 68: 33-40.
- Mielke, W. 1989a. Interstitielle fauna von Galapagos. XXXVI. Tetragonicipitidae (Harpacticoida). Microfauna Marina 5: 95-172.
- Mielke, W. 1989b. Interstitielle fauna von Galapagos. XXXVII. Metidae (Harpacticoida). Microfauna Marina 5: 173-188.
- Miller, D.C. 1989. Abrasion effects on microbes in sandy sediments. Mar. Ecol. 55: 73-82.
- Modlin, R.F. and Harris, P.A. 1989. Observations on the natural history and experiments on the reproductive strategy of <u>Hargeria rapax</u> (Tanaidacea). J. Crust. Biol. 9: 578-586.
- Moore, C.G. and Bett, B.J. 1989. The use of meiofauna in marine pollution impact assessment. Zool. J. Linn. Soc. 96: 263-280.
- Morselli, I. and Mari, M. 1989. Halacarids (Halacridae, Acari) of the Leghorn Coast. 5. Anomalohalacarus <u>singularis</u>, a new interstitial species. Boll. Zool. 56: 105-108.
- Nagasawa, S. 1989. Bacterial epibionts of copepods. Sci. Prog. 73: 169-176.
- Noldt, U. 1989a. Kalyptorhynchia (Plathelminthes) from sublittoral coastal areas near the island of Sylt (North Sea). II. Eukalyptorhynchia. Microfauna Marina 5: 295-329.
- Noldt, U. 1989b. Kalyptorhynchia (Plathelminthes) from sublitoral coastal areas near the island of Sylt

- (North Sea). I. Schizorhynchia. Microfauna Marina 5: 7-85.
- Noury-Srairi, N., Justine, J.L. and Euzet, L. 1989. Implications phylogenetiques de l'ultrastructure de la spermatogenese, du spermatozoide et de l'ovogenese du Turbellarie <u>Urastoma cyprinae</u> ("Prolecithophora", Urastomidae). Zool. Scr. 18: 175-186.
- Ottman-Shag, K. and K.K. Hathaway. 1989. Infragravity energy and its implications in nearshore sediment transport and sandbar dynamics. Technical Report CERC-89-8. Coastal Engineering Research Center, Department of the Army, Washington D.C..
- Pani, S.C., Hota, P.K., Pradhan, G.B. and Senapati, B.K. 1989. Soil nematode biomass in relation to vegetation production and environmental factors in tropical irrigated upland and lowland rice fields. Pedobiologia 33: 173-182.
- Paoletti, A. 1989. Cohort cultures of <u>Tubifex</u> <u>tubifex</u> forms. Hydrobiologia 180: 143-150.
- Plante, C.J., Jumars, P.A. and Baross, J.A. 1989. Rapid bacterial growth in the hidgut of a marine deposit feeder. Microb. Ecol. 18: 29-44.
- Platt, H.M. 1989. Meiofauna: recent advances and economic assessment. Zool. J. Linn. Soc. 96: 213-216.
- Preston, A. and Moore, P.G. 1989. Seasonal cycles of abundance of the flora and fauna associated with Cladophora albida (Huds.) Kutz in rockpools. J. Nat. Hist. 23: 983-1002.
- Radziejewska, T. and Drzycimski, I. 1988. Meiobenthic communities of the Szczecin Lagoon. Kiel. Meeresforsch. Sonderh. 6: 162-172.
- Railkin, A.I. and Seravin, L.N. 1989. The reversible blocking (narcosis) of mobility and contractility of metazoan invertebrates by ions-antagonists of calcium. Zool. Zh. 68: 19-29.
- Rees, H.L. and Eleftheriou, A. 1989. North Sea benthos: a review of field investigations into the biological effects of man's activities. J. Conseil 45: 284-305.
- Riaux-Gobin, C., Douchement, C. and Treguer, P. 1989. Microphytobenthos de deux sediments subtidaux de Nord Bretagne. III. Relations avec les sels mineraux azotes de l'eau interstitielle et deux facteurs hydroclimatiques. Hydrobiologia 178: 11-20.
- Richmond, M.L. 1989. Protozoa as precursors of Metazoa - German cell theory and its critics at the turn of the century. J. Hist. Biol. 22: 243-276.
- Rieper, M. 1989. Microbial degradation of North Sea macroalgae: Field and laboratory studies. Botan. Marin. 32: 241-252.
- Rodriguez, P. and Giani, N. 1989. New species of Phallodrilus (Oligochaeta, Tubificidae) from caves

- of northern Spain and southwestern France. Hydrobiologia 180: 57-64.
- Roembke, J. and Knacker, Th. 1989. Aquatic toxicity test of enchtraeids. Hydrobiologia 180: 235-242.
- Rothschild, L.J. 1989. Protozoa, Protista, Protoctista - Whats in a name?. J. Hist. Biol. 22: 277-306.
- Roubal, F., Rohde, K. and Watson, N. 1989. Ultrastructure of flame bulbs, sense receptors, tegument and sperm of Udonella (Platyhelminthes) and the phylogentic position of the genus. Zool. Anz. Suppl. 222: 143-157.
- Rutledge, P.A. and Fleeger, J.W. 1989. Rely to comment by Barnett and Watson. Limnol. Oceanogr. 34: 1143-1144.
- Sanchez, E. and Munilla, T. 1989. Ecological study of the first littoral <u>Pycnogonida</u> from the Canary Islands (Spanish). Cah. Biol. Mar. 30: 49-68.
- Sarkka, J. 1989. Meiobenthic naidid and aeolosomatid oligochaetes from the profundal zone, and relations of species to eutrophication. Hydrobiologia 180: 185-190.
- Shirayama, Y. and Horikoshi, M. 1989. Comparison of the benthic size structure between sublittoral, upper-slope and deep-sea areas of the Western Pacific. Int. Rev. Gestamen Hydrobiol. 74: 1-14.
- Sopott-Ehlers, B. 1989a. Zur ultrastruktur von <u>Bulbotoplana acephala</u> Ax (Proseriata, Plathelminthes). Microfauna Marina 5: 219-226.
- Sopott-Ehlers, B. 1989b. <u>Coelogynopora visurgis</u> nov. spec. (Proseriata) und andere freilebende Plathelminthes mariner Herkunft aus Ufersanden der Weser. Microfauna Marina 5: 87-93.
- St. John, J., Jones, G.P. and Sale, P.F. 1989. Distribution and abundance of soft-sediment meiofauna and a predatory goby in a coral reef lagoon. Coral Reefs 8: 51-58.
- Storch, V., Higgins, R.P. and Morse, M.P. 1989. Internal anatomy of <u>Meiopriapulus fijiensis</u> (Priapulida). Trans. Am. Microsc. Soc. 108: 239-244.
- Sundberg, P. 1989. Classification of the family Plectonenertidae (Nemertea): a phenetic comparison. Zool. J. Linn. Soc. 97: 57-68.
- Talbot, M.M.B. and Bate, G.C. 1989. Beach morphodynamics and surf-zone diatom populations. J. Exp. Mar. Biol. Ecol. 129: 231-242.
- Terhívuo, J. 1989. The Lumbricidae (Oligochaeta) of southern Finland: species assemblages, numbers, biomass and respiration. Ann. Zool. Fenn. 26: 1-25.
- Thrush, S.F., Hewitt, J.E. and Pridmore, R.D. 1989.

 Patterns in the spatial arrangements of polychaetes and bivalves in intertidal sandflats.

 Mar. Biol. 102: 529-536.

- Toda, T., Suh, H. and Nemoto, T. 1989. Dry fracturing: a simple technique for scanning electron microscopy of small crustaceans and its application to internal observations of copepods. J. Crust. Biol. 9: 409-413.
- Tudorancea, C. and Zullini, A. 1989. Associations and distribution of benthic nematodes in the Ethiopian Rift Valley Lakes. Hydrobiologia 179: 81-96.
- Valvassori, R., de Eguileor, M., Lanzavecchia, G. and Scari, G. 1989. Body wall organization in enchytraeids. Hydrobiologia 180: 83-90.
- Vanreusel, A. and Vincx, M. 1989. Free-living marine nematodes from the Southern Bright of the North Sea III. Species of the Monoposthiidae, Filipjev, 1934. Cah. Biol. Mar. 30: 69-84.
- Verdonschot, P.F.M. 1989. The role of oligochaetes in the management of waters. Hydrobiologia 180: 213-228.
- Vincx, M. and Gourbault, N. 1989a. Desmodoridae from the Bay of Morlaix (Brittany) and the Southern Bight of the North Sea. Cah. Biol. Mar. 30: 103-114.
- Vincx, M. and Furstenberg, J.P. 1989b. <u>Namibnema</u> <u>papillata</u> gen. et sp.n. and <u>Axonolaimus deconincki</u> sp. (Nematoda, Axonolaimoidea) from marine and estuarine beaches of southern Africa. Zool. Scr. 18: 231-238.
- von Nordheim, H. 1989. Six new species of <u>Protodrilus</u> (Annelida, Polychaeta) from Europe and New Zealand, with a concise presentation of the genus. Zool. Scr. 18: 245-268.
- Warwick, R.M. 1989. The role of meiofauna in the marine ecosystem: evolutionary considerations. Zool. J. Linn. Soc. 96: 229-241.
- Wellner, G. and Reise, K. 1989. Plathelminth asemblages from an exposed and a sheltered Sand Beach of the island of Sylt in the North Sea. Microfauna Marina 5: 277-294.
- Zajac, R.N. and Whitlatch, R.B. 1989. Natural and disturbance-induced demographic variation in an infaunal polychaete <u>Nephtys incisa</u>. Mar. Ecol. 57: 89-102.
- Zubkov, M.V. 1989. Ciliates of lower layers of oxygen zone and of zone of coexistence of oxygen and hydrogen sulfide in the Black Sea. Zool. Zh. 68: 15-18.