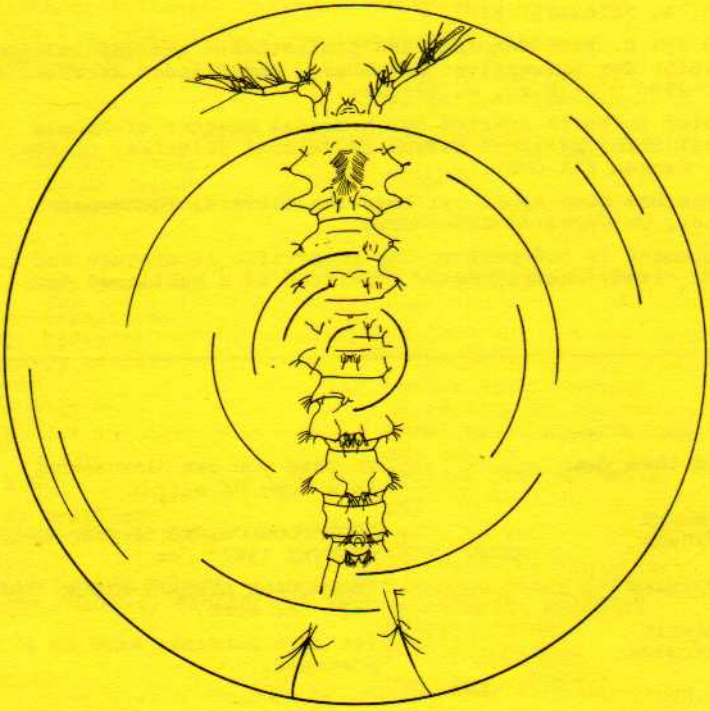
ISSN 0722-5741

MONOCULUS

Copepod Newsletter



Nr. 14

April 1987

bis

Bibliotheks- und Informationssystem der Universität Oldenburg
North American Edition distributed by National Museums of Canada

MONOCULUS

Copepod Newsletter

Number 14 April 1987

Edited by: H. Kurt Schminke, Fachbereich 7 (Biologie), Universität Oldenburg, Postfach 2503, D-2900 Oldenburg, W. Germany.

Gerd Schriever, Zoologisches Museum der Universität Kiel, Hegewischstr. 3, D-2300 Kiel, W. Germany

Cover by: A. Salewski, Kiel

Produced by: H. Kurt Schminke and Bibliotheks- und Informationssystem (BIS) der Universität Oldenburg, Ammerländer Heerstr. 67/99, D-2900 Oldenburg, W. Germany.

Distributed in North America by: National Museums of Canada (Chang-tai Shih, National Museum of Natural Sciences, Ottawa, Ontario, Canada K1A OM8).

This issue has been typed by: Angelika Sievers, Fachbereich 7 (Biologie), Universität Oldenburg.

Birthdays this year

85: Th. Monod
O. Tanaka

80: T. Hoshina

75: J. Eiselt
E. Marques

70: M.S. Kun
W. Vervoort

In case you are interested in a copy of either

"COPEPODOLOGISTS OF THE WORLD-SURVEY 1987" or

"MONOCULUS LIBRARY-STOCK 1986/87" or both,

let Kurt Schminke know on a postcard.

Deadline for the next issue of *MONOCULUS*: 15 September 1987

Editorial

We shall never do it again. What a job to keep track of who is entitled to receive the newsletter and who has to be spared because the questionnaire added to *MONOCULUS* No. 12 had not been returned even after circulation of a reminder. It was a lot of extra work we imposed on ourselves in our zeal to make our census of copepodologists as complete as possible. We thought this was justified in view of the idea of preparing a second directory of copepodologists, the first now being six years old and completely out of date. The idea was not our own, but we have never declined to follow up suggestions that could be beneficial for most of us. We hoped all would join us in this attitude. Finally 61 % (viz. 378) of the recipients of *MONOCULUS* did. Many thanks for this cooperation.

The new directory will be available in London and by mail directly from Kurt Schminke. It will contain addresses of all recipients of *MONOCULUS* and tables with the information from the questionnaires such as to allow quick orientation on who is engaged in what kind of research. The price will probably be about US $ 5.00. If you are interested in a copy, please let Kurt know on a postcard so that the number of copies to be printed can be estimated. To give you a first idea of the kind of information to be expected, in this issue of the newsletter we reproduce what has been put down in the questionnaire under the heading "Brief titles of your current projects in copepod research".

Our third meeting, this time in London, is coming up. Geoff said about 130 people have announced their participation so far. For those who can't come he has prepared a little portrait of the British Museum (Natural History), the host of this conference. Other contributions in this issue are from T. Ito, H. Juhl, Z. Kabata, and J.C. von Vaupel Klein.

J. Chojnacki helped with drawings. All these contributions are gratefully acknowledged. For New Year we were pleased to receive again a couple of unusual greeting cards. Two of them are reproduced in this issue.

Well, see you in London and in case you have time before or after the conference we would be glad if you popped in to see us in Oldenburg or Kiel.

B. Dussart & D. Defaye, Les Eyzies, France

THE WORLD ASSOCIATION OF COPEPODOLOGISTS

WAC WAC ..... WAC WAC

1. Membership

It had been our hope that the number of founder members of the WAC would double during the period since the last issue of the newsletter. This goal has not quite been reached. The number has risen from 125 to 207. From now on no new founder members will be created except in cases where we have been notified of the delay of the dues because of exchange problems and where applications for waiving of the dues have not yet been decided on by the Executive Council. So far the list of founder members contains the following names:

FOUNDER MEMBERS OF THE WORLD ASSOCIATION OF COPEPODOLOGISTS

AUSTRALIA: Arnott, Bayly, McKinnon, Mufinon, Rippingale, Tafe, West ----- **AUSTRIA:** Schaber ----- **BANGLADESH:** Das ----- **BARBADOS:** Gooding ----- **BELGIUM:** Bergmans, Daro, Fiers, Heip, Revis, Tackx ----- **BENIN:** Citarella ----- **BRAZIL:** Björnberg M.H., Björnberg T.K.S., Campaner, Carvalho, Hadel, Malta, Robertson, Rocha, Santos Silva, Thatcher, Varella ----- **BULGARIA:** Naidenow ---- **CANADA:** Benz, Chapman, Chow-Fraser, Corkett, Crawford, Davies, Deets, Fernando, Fontaine, Fulton, Gardner, Grainger, Harding, Hogans, Kabata, LeBrasseur, Mayzaud, McLaren, Rainville, Roff, Sevigny, Shih ---- **CHILE:** Castro Romero ----- **FINLAND:** Purasjoki, Sarvalla, Vuorinen ----- **CHINA:** Chen, Li Song ----- **FRANCE:** Boucher, Hipeau, LeBorgne, Miquel, Razouls, Rouch ----- **GERMANY, FED. REP.:** Barthel, Beckmann, Böttger, Dahms, Diel, Grau, Hahn, Hulsemann, Kohlhage, Kukert, Kunz, Kurbjeweit, Lenz, Mielke, Noodt, Rieper, Schminke, Schnack, Schriever, Schulz, Stich, Tiemann ----- **GREAT BRITAIN:** Barnett, Boxshall, Conway, Fryer, Gee, Geddes, Gotto, Harding, Harries, Lindley, Thompson ----- **HUNGARY:** Holynska ----- **INDIA:** Battacharya, Chandran, Madhupratap, Meenakshikunjamma, Ranga Reddy, Roy, Shirgur, Stephen ----- **INDONESIA:** Keim ----- **IRELAND:** Holmes ----- **ISRAEL:** Almeida Por, Kahan, Por ----- **ITALY:** Fava, Stella ----- **JAPAN:** Ito, Izawa, Kikuchi, Kimoto, Koga, Nagasawa, Morioka, Motoda, Nishida, Onbé, Ooishi, Takegami, Tanaka, Taniguchi, Ueda, Urawa, Uye ----- **KUWAIT:** James ----- **NETHERLANDS:** Baars, Klein Breteler, Stock, von Vaupel Klein, Vervoort, Vijverberg, ----- **NEW ZEALAND:** Bradford, Burns, Hicks, Jones, Lewis, Wells

----- **NORWAY:** Fosshagen ----- **PAKISTAN:** Ali-Khan ----- **PAPUA NEW GUINEA:** Tseng ----- **PHILIPPINES:** Mamaril ----- **POLAND:** Chojnacki, Drzycimski, Piasecki ----- **PORTUGAL:** Vilela ----- **RUMANIA:** Plesa ----- **SOUTH AFRICA:** Grindley, Heeg, Rayner ----- **SOUTH KOREA:** Kim ----- **SPAIN:** Soler-Torres ----- **SWEDEN:** Elmgren, Öresland ----- **THAILAND:** Suvapepun, Yoosukh ----- **USA:** Barr, Bell, Benz, Blades-Eckelbarger, Bowman, Cohen, Cordell, Dagg, Damkaer, Dawson, Decker, Dojiri, Ferrari, Fleeger, Fleminger, Frost, Gannon, Haury, Heron, Ho, Humes, Jonasdottir, Lonsdale, Marcogliese, Marcus, McAlice, Michel, Miller, Moisan, Morris, Orsi, Paffenhöfer, Park, Peterson, Reid, Simenstad, Stearns, Tester, Toal, Trinast, Turner, Vanderploeg, Walker, Walter, Wiebe, Wishner, Wyngaard.

According to article 1 of the by-laws all applicants for membership must from now on be nominated by two (founder) members of the Association. After approval of a nomination by the Executive Council the status of a candidate member will be attained. A list of all candidate members will be presented to the general meeting in London for approval whereupon candidates become active members. This may sound a little complicated but all you have to do is to ask two colleagues from the list above to support your application. The rest is a gentle walk on the stepping-stones to membership. Go ahead, you will enjoy the stroll.

2. Dues

Founder members should start to consider payment of the dues for 1987. If you like you can also pay for one year in advance to reduce costs (the dollar is so cheap for the moment!). US $ 7.00 (DM 14.00) are due in case you pay for 1987 only, but US $ 14.00 (DM 28.00) are due on the following account if you want to pay in advance also for 1988:

No. 7233 190, Commerzbank Kiel, W. Germany
Mark "WAC, c/o Dr. G. Schriever".

Colleagues from Europe may send their personal euro-cheques to Gerd Schriever. Americans and Canadians may do the same with their personal cheques.

For those who want to pay by postal money order, use the following account: No. 3465 08 - 303, Postgiroamt Hannover, W. Germany. Please mark "WAC, c/o Dr. H.K. Schminke".

We do not mind if you send more than the actual dues and donate the surplus to the Association. This has been done by F. Koga, K. Kimoto, Y. Morioka, and T. Onbé. Many thanks for this sign of encouragement!

3. General meeting

In case you have suggestions for topics to be put on the agenda of the general meeting in London, please let Kurt Schminke (general secretary) know.

4. Nomination

Dr. Christopher John Corkett (Chris to his WAC friends) has a curriculum vitae that impresses one by its vigour and versatility. Born in England, he flitted across the ocean between his native land and Canada with ease that would excite envy of more sessile mortals.

Educated in the University of London, Chris obtained his Ph.D there in 1966 and went, as a post-doctoral fellow, to Dalhousie University in Halifax, Nova Scotia. Two years later (1968) he was back in England as a research fellow in the University of Bristol. His next jump was to the laboratory on Citadel Hill, Plymouth (Marine Biological Association of the UK), that hallowed sanctum of all marine biologists, where he became a research fellow. By 1974, however, we see him again in Canada, as a Research Associate in Dalhousie. There he has remained until now, except for one year (in 1980-1981) spent in the Acadia University.

Chris' entire working life (now over 20 years) was devoted to planktonic copepods. He studied various aspects of their biology, as well as systematics. A good example of his interests is a 230-page long monograph on Pseudocalanus, written with Dr. McLaren.

One would think that with his research and teaching his slate should be full. One would be wrong. He managed to squeeze in also work in Jamaica, Barbados and Kuwait, and visited and lectured in Bristol (England), Kuwait, McGill (Canada), Sao Paulo (Brasil) and Miami. Phew! And he has 25 papers to his credit.

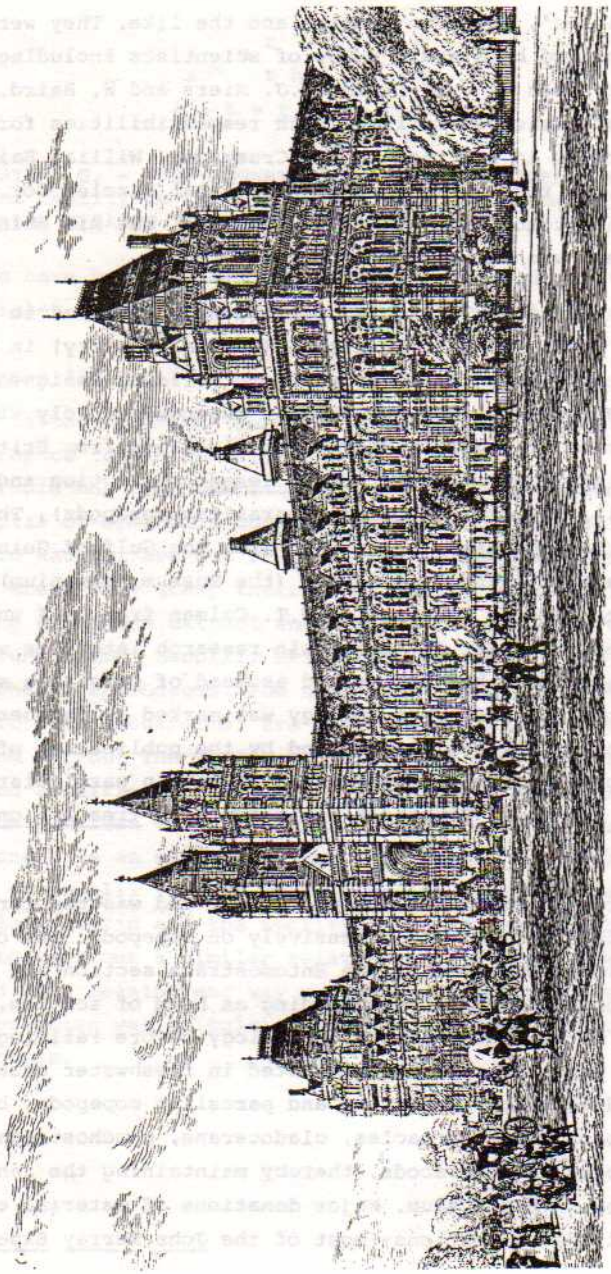
In nominating him for the General Secretary-Treasurer of WAC, we are not backing a dark horse. We saw him actively working in the organizing committee of our II conference in Ottawa. We know he would make an excellent secretary. We like working a willing horse. And his CV tells us that he took quite recently a course on "Human Relations in Business". Now that WAC is becoming a respectable organisation, a touch of business sense will not come amiss. Also the microcomputer which Chris recently bought for his house could be invaluable for keeping track of addresses of WAC members and their dues.

We hope that our nomination of Chris will be generally supported.

Z. Kabata, H.K. Schminke

A BRIEF HISTORY OF THE BRITISH MUSEUM (NATURAL HISTORY) - HOST OF THE THIRD INTERNATIONAL CONFERENCE ON COPEPODA.

The British Museum was founded in 1753, some years before Gunnerus (the Bishop of Trondheim) described Monoculus and even longer before our dedicated editors launched the newsletter of the same name. During the first 128 years the natural history collections were stored together with the



'antiquities', Egyptian mummies and the like. They were studied and displayed by a small group of scientists including such familiar names as W.E. Leach, E.J. Miers and W. Baird. These scientists were generalists, with responsibilities for several other groups in addition to the Crustacea. William Baird, for example, is remembered in copepodological circles for his 'British Entomostraca' published in 1842, but his main work at the Museum was on the Mollusca and Vermes.

In 1881 the natural history collections were moved to their present home, the British Museum (Natural History) in South Kensington. Here, in the magnificent building designed by Alfred Waterhouse, the collections expanded rapidly with the acquisition of several important collections from British copepodologists; G.S. Brady (the Challenger collection and other material), P.W. Bassett Smith (parasitic copepods), Thomas Scott (the Buccanneer collection from the Gulf of Guinea and other material) and A.M. Norman (the Museum Normanium). The Crustacea were in the care of W.T. Calman from 1904 until his retirement in 1936. Calman's main research interests were with the Malacostraca but his period as head of Crustacea section and, later, as Keeper of Zoology was marked by further expansion of the collections and by the publication of his major works on the Crustacea as a whole (in particular his classic volume on Crustacea in Lankester's Treatise on Zoology, 1909).

J.P. Harding joined the Museum in 1937 and was the first member of staff to work extensively on copepods. The copepod collections were part of the Entomostraca section and were the responsibility of John Harding as head of section, although he went on to become Keeper of Zoology before retiring in 1971. Harding was particularly interested in freshwater crustaceans and studied both free-living and parasitic copepods, but he also published on barnacles, cladocerans, conchostracans, anostracans and ostracods, thereby maintaining the generalist tradition in the Museum. Major donations of material continued to swell the collections; most of the John Murray Expedition

copepods were donated by R.B. Seymour Sewell, and throughout his career Robert Gurney placed his crustaceans in our care.

In 1963 the Natural History Museum finally became independent of the British Museum, by Act of Parliament. It is still funded directly by the Government, as a Research Council of the Department of Education and Science. Its primary function is to maintain, display and undertake research on the natural history collections. At present the Museum has approximately 700 members of staff, just under 400 of whom belong to the scientific departments. The Crustacea section numbers just seven staff, including the present head of section, A.A. Fincham, and one of the deputy Keepers of Zoology, Roger Lincoln. We seek to maintain and add to the collections whenever possible, and to the sectional library of reprints. We hold these collections in trust for present and future generations of scientists and we are pleased to make them available to scientific visitors. For those who are unable to travel here the Museum has a generous lending policy for all but the most fragile specimens.

We look forwards to welcoming all participants at the Third International Conference on Copepoda in August 1987.

Geoff Boxshall

ANNOUNCEMENTS

PUBLICATION OF PROCEEDINGS

An agreement has now been reached with Dr. W. JUNK Publishers, in The Netherlands, on the publication of the Proceedings of the forthcoming Third International Conference on Copepoda. The Proceedings will be published in the journal Hydrobiologia and as a separate hardbound volume in their

I have been promoting them for years now as a reviewer of manuscripts and at all other occasions, whether asked or not. I will be glad to take part in your discussion.

All those interested in taking an active part in the discussion in London should consider bringing along slides with what they consider good examples. Bad examples may also be useful but are likely to contribute less to our discussion which aims at reaching agreement on the definition of standards for good descriptions. I guess agreement on what is bad will not be too difficult to achieve, but we are more ambitious than that.

Kurt Schminke

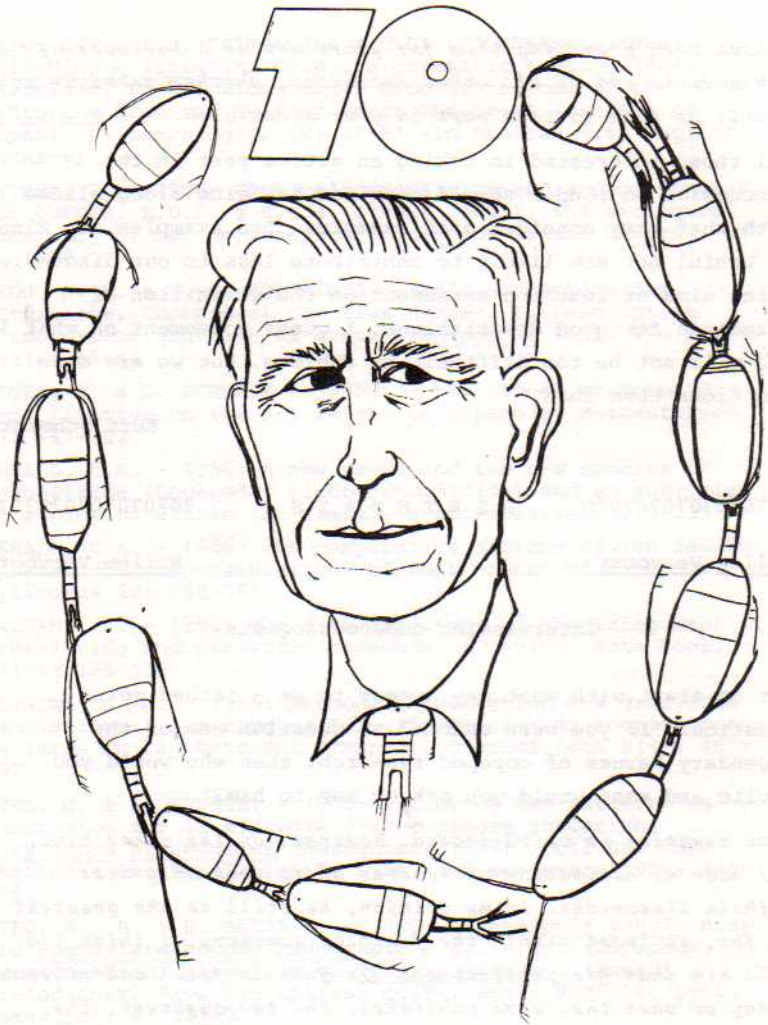
7070707070707070 B I R T H D A Y S 7070707070707070

Willem Vervoort Willem Vervoort

Interviewing copepodologists

Let us start with what may appear to be a rather weird question. "If you were enabled to question one of the legendary heroes of copepod research, then who would you invite and what would you ask or say to him?"

That question is weird indeed. However, on the other hand, I'd have no hesitation whatsoever as to name only one: Wilhelm Giesbrecht. In my opinion, he still is the greatest by far, at least within the field of taxonomy. I think I'd tell him that his publications are just as fresh and relevant today as when they were published. The thoroughness, the detail, the completeness, all that is still amazing and nothing has yet detracted from their value as an example for present-day copepodologists. And imagine those painstakingly scrutinous observations with the relatively primitive optics of that time ... no dark-field, no phase-contrast, no interference-contrast, no S.E.M. ... Yet, I would ask Giesbrecht urgently to separate the figures and descriptions by species and not to intermingle them the way he has actually done.



That would certainly have facilitated working with his papers a great deal (as, incidentally, G.O. Sars already remarked in his Account on the Crustacea of Norway). And I would also ask Giesbrecht where the types of the Naples material can be found. I'm convinced it would be very important to have these available. But primarily I would congratulate Giesbrecht with his achievement: to produce anything so scrupulous, that it could reign for almost a century over copepod taxonomy.

On the occasion of his 70th birthday, *MONOCULUS* has paid a visit to Dr. Willem Vervoort at Leyden, The Netherlands, and has interviewed him in a conversation over coffee and cake. "How did you become involved in copepod taxonomy yourself?"

Originally, I was involved in hydroid systematics but, by the time I had examined all relevant collections in The Netherlands (i.e., Leyden and Amsterdam), we were in the middle of World War II and there obviously was no opportunity to collect new material. Then Prof. Boschma proposed to investigate the Copepoda of the Snellius Expedition as a Ph.D. thesis. Thus, I studied the deep-water samples of this collection and I still regret that I have never found the time to examine more of the Snellius material. Most of it is still standing untouched here, in the RMNH, and it is of fine quality. Most samples have been taken from river mouths and shallow bays, and I am convinced that they contain many interesting taxonomic facts, waiting to be discovered.

Willem Vervoort was born on the 12th June 1917 at Schiedam, The Netherlands. In 1936 he registered at Leyden University (founded 1575) where he passed his doctoral examination (cf. B.Sc.) in Biology in 1941. His Ph.D. on "The Copepoda of the Snellius Expedition, I" he got in 1946 with Prof. Dr. H. Boschma. In that time he had been (Oct. 1938 - Sept. 1939) assistant in Systematic Botany and (Jul. 1941 - Jul. 1946) assistant c.q. scientific assistant at the Rijksmuseum van Natuurlijke Historie (RMNH), Leyden. For the next two years (Jul. 1946 - Jul. 1948) he was a biologist with the Netherlands Whaling Cy., and then (Aug. 1948 - Sept. 1950) returned to the RMNH as a scientific officer. From Sept. 1950 until Jul. 1961 he was (chief) scientific officer c.q. lecturer in Zoology (i.e. histology) at the Zoological Lab. of Leyden University before returning again to the RMNH as chief scientific officer (Jul. 1961 - Sept. 1970). During all this time he was not only involved in laboratory work. On the contrary, fieldwork explicitly was one of his passions. He made trips to the Antarctic on a Dutch whaler, the "Willem Barentsz" (1946-48), and he took part in large expeditions to

New Guinea (1959) and Surinam (1966 and 1969), next to making numerous other travels abroad. "Tough expeditions never failed to appeal to you. Could you mention a few highlights from your fieldwork experience?"

Well, "tough" may be a little exaggerated. The student's excursions, the trips on the "Willem Barentsz" and the field work in Surinam were more like picknicks. But the expedition to New Guinea was tough, indeed. It was in 1959 and I was 42 years old, when I arrived in the tropics for the first time. The damp heat and the absence of anything reminding of a decent path through the jungle were surely like hell, during the first week there. Walking, or should I say stumbling, was only possible in river beds. We slept with our clothes on and we dried our shoes over a charcoal fire, so we had to put them on stinking the next morning. That was tough, but we got used to it very quickly. Yet, the damp atmosphere had removed the labels from all our tins of canned food so we found out about the contents only when it was too late already, viz., when they were opened. So it happened once that we ate rice with liver-pie three times a day for a fortnight in succession ... only the smell of it! Yes, that was really tough.

In Sept. 1970 Willem Vervoort became Deputy Director of the RMNH and, in October 1972, Director of the Museum until July 1982. At the same time (Oct. 1973 - Jul. 1982) he was a Professor of Systematic Zoology at Leyden University. "From the very start you have shown an interest in compiling a complete record of copepod bibliography: how come?"

I'm afraid I cannot give any special reason for that. It's just that knowledge of literature is an important aspect of research in general and of systematics in particular, also, of course, in view of zoological nomenclature. The larger my card-file grew, the more challenging it became to have it complete. Besides, every time I discovered (almost) to have drawn a faulty conclusion due to a blank spot in my knowledge of literature, this gave me a stimulus to continue digging in libraries for new references.

"Having seen such a dazzling number of copepod papers and considering the actual state of research, could you give us your opinion on the development of copepodology (or: copepod taxonomy) in the coming decades?"

Unfortunately, I do not think my crystal bulb is any better than yours, so my view of the future is as clear or as blurred as anyone's. But, as I see it, the importance of copepodology is still growing. Really detailed data on developmental history will be needed in view of the increasing interest in life cycle histories and food chains. The same goes for work on nutritional behaviour (cf., e.g., Rudi Strickler). Then, macroevolutionary and phylogenetical items are attracting more and more attention lately (e.g., Geoff Boxshall), as are studies on speciation and the consequent division of so-called "variable" species into a number of clear-cut, distinct forms. In this respect, I admire Abraham Fleminger's work in particular. Of course, the inventory work must keep up in parallel in order to provide, inter alia, the urgently needed large-scale view of historical biogeography of plankton with reliable data. Taisoo Park is doing very fine work in this field, I think, very detailed, too. In general I could say: more of the same but more and more detailed work, exploring also the hitherto untackled problems. Near-bottom and meiobenthic faunas would constitute another example of future explorations to be foreseen.

"Parts I and II of your "Bibliography of Copepoda up to and including 1980" have now been published. This must be very satisfactory but, apart from the concluding volume III, do you still have other plans in this area?"

Yes, I'm glad that this work is nearing completion by now. Though I have been working primarily on hydroids lately, I've also managed to go through the better part of the final check-up of volume III. This will include the supplement A-Z of the years 1980-85. I estimate the bibliography comprises some 20,000-30,000 entries now but I have not seen all of these personally: some 20 % I have been unable to trace. My card-files have been built up through the years, from the

7070707070707070 B I R T H D A Y S 7070707070707070

Maria S. Kun Maria S. Kun

Dr. Maria S. Kun was born on January 31, 1917, in Petrograd (nowadays Leningrad). Having graduated from the University of Kazanj in 1939 she began her scientific activity at the Biological Station of the Pacific Research Institute of

Fisheries & Oceanography (TINRO), on the Sakhalin Island, and since 1949 up to the present she has worked in the head office of TINRO in Vladivostok. Comparatively short a period of time, from 1953 up to 1963, she worked in Astrakhanj where she dealt with the study of plankton of the Volga-Caspian basin and its variability under the influence of varying hydrological regimes, and with copepod taxonomy of the Caspian Sea as well. This fundamental work was a component part of the "Atlas of the Caspian Sea Invertebrates", of which she had been one of the editors.

Dr. M. Kun has devoted much time of her scientific activity to the investigation of plankton of the Soviet Far Eastern seas and the northwestern Pacific. The field of her scientific interests is notable for its variety including the taxonomy and zoogeography of a number of copepod species as well as their biology, and the geographical variability of the genus Calanus. She has completed the description of a little known species, Pareuchaeta abyssalis, in the Sea of Japan, and has led the investigations on the biology and life cycle of Pseudocalanus elongatus, Calanus glacialis, Oithona similis in the Sea of Japan. She has published on the feeding of plankton-eating fish of the Sea of Japan and the Okhotsk Sea, and produced a monograph on the "Zooplankton of the Soviet Far Eastern seas".

Dr. M. Kun possesses large organizational abilities and from 1965 up to 1975 was an assistant of a National Coordinator in the International programme of the investigation of the Kuroshio current (CSK). During a long period of time she was head of the laboratory of hydrobiology of TINRO; 14 scientists defended their theses under her leadership. In recent years, on the basis of long-term experiments, she has made rather successful attempts to forecast specific periods of the beginning of biological seasons in the zone of the subarctic front on the northwestern Pacific. As usual Dr. Kun is full of strength and energy, and her colleagues expect further discoveries and major research works in a new field - forecasting

of hydrobiological situations in regions important for fishery investigations

V.I. Chuchukalo

The l e t t e r box

E.G. SILAS (Santhom, Madras, India) announces:

You will be glad to hear that I have recently taken charge as Head of the Central Institute of Brackishwater Aquaculture, one of the new fisheries institutes of the Indian Council of Agricultural Research, established for giving a focus on coastal aquaculture. The Institute is taking up major programmes for culture of live feed organisms which will also include Copepods. As you are well aware, the Copepod parasites in the culture system will also be receiving special attention.

NEWS NEWs NEws News news .... news newS neWS nEWS NEWS

OUTSTANDING PAPER AWARD FOR BRIAN MARCOTTE

Each year the Awards Committee of The Crustacean Society selects a paper published in the Journal of Crustacean Biology for the Outstanding Paper Award. For 1984 the paper entitled "Behaviourally defined ecological resources and speciation in *Tisbe* (Copepoda: Harpacticoida)" by Brian Michael Marcotte, published in volume 4, number 3, pages 404–416, was chosen for the award.

OFFER AND REQUEST CORNER

F. FIERS, Institut Royal des Sciences Naturelle de Belgique, Rue Vautier 29, B-1040 Bruxelles, Belgium, asked long ago to publish the following question. Unfortunately, his letter had been misplaced. We hope it is not too late to give him the information he asked for:

I am looking for two collections: the WILLEY collection and the K. ROE collection. I saw some specimens from the K. ROE collection, loaned from the National Museum of Ireland (Dr. J.M.C. HOLMES) but the majority of her material must be deposited elsewhere. Does someone know more about it?

W.E. HOGANS, Huntsman Marine Laboratory, Brandy Cove, St. Andrews, N.B., Canada EOG 2XO, is in need of specimens:

I am looking for any specimens of Pennella collected from flying fish (Exocoetus) and porcupine fish (Diodon). Not being too picky, I would gladly take specimens from any fish host, whatever the condition. I would also like to ask if anyone might know where the type specimens of species described by Steenstrup and Lutken are deposited. In attempting to revise the genus Pennella I have found that most early workers found it unnecessary to designate or deposit type specimens. This, combined with the usual three-line description and less-than wonderful figures, is really frustrating. (example: Gnanamuthu described 6 species of Pennella; types none). Any information or specimens would be much appreciated.

C. PLESA, Str. Gh. Dima nr. 28, ap. 27, 3400-Gluj-Napoca 6, Roumania, has published a "Microglossaire de Stygologie" (in: Theoretical and Applied Karstology 2 (1985): 25-45). Whoever is interested in a copy may write to him by adding 3 coupons réponse international to the letter in order to help with the costs for mailing.

D.J. TAFE, 41 The Crescent, Dee Why 2099, Australia, has both an offer and a request:

I have only just returned from a two-year contract as a lecturer at the University of Dar es Salaam in Tanzania. I brought back a number of zooplankton samples which I collected in the Rufiji River Delta of Tanzania and in the Zanzibar Channel. Copepods were found to outnumber all other zooplankters and the common genera included Acartia, Calanopia, Eucalanus, Paracalanus, Temora, Tortanus, Corycaeus, Oithona and Oncaea. If anyone requires specimens from that little known area I will endeavour to supply them.

In the near future I would like to begin a Ph.D. thesis on ecological and taxonomic aspects of marine planktonic copepods, preferably Calanoida. If any MONOCULUS readers have suggestions regarding sponsorship and a possible institute for enrolment I would be interested to hear from them. In 1980 I was awarded an M.Sc. degree for a study on mouthpart morphology and feeding in eleven dominant species of estuarine copepods.

****

exchange service exchange
M O N O C U L U S *M O N O C U L U S* *M O N O C U L U S*
service exchange service

****

VI. Japan

The JSPS (Japan Society for the Promotion of Science) sponsors the following three types of programmes for the invitation of foreign researchers by Japanese Scientists.

1. Short term program: 1-4 months
2. Long term program (senior): 6-10 months
3. Long term program (junior): 6-12 months (post-doctoral).

Although the JSPS fellowship is most popular, some other grants will be also available; for example, major universities have their own programs to invite foreign scientists (as grants provided by supporters' associations, etc.). The Ministry of Education sponsors inter-university co-operative researches. In any case, those copepodologists who wish to be invited would try to contact, first of all, any colleague in Japan.

Tatsunori Itô

Santa Tomé; XII-86

¡Feliz año Nuevo!

Juan Carlos Paggi

J.C. Paggi, Santo Tome, Argentina

Business ssenisuB

1. *MONOCULUS*-Library/Bibliography

The *MONOCULUS* reprint library is growing. As you may see from the list of current literature below there is a steady influx of brand-new publications. Many thanks to all who have put the *MONOCULUS*-Library on their list for regular mailing.

We would be glad if the stream of older literature would be just as broad. We thank M. Fontaine, R. Harris, W. Piasecki, and Ch. Walter who have diverted some older reprints to our collection. But we need more if our project of a computerized bibliography is to be successful. As this project is now funded officially we have no other choice but success. For keywording we need the whole articles, not just the titles.

Therefore Wolfgang Janetzky who has joined our team in the meantime will send you shortly an excerpt from our bibliography with those of your titles that are present in the *MONOCULUS*-Library. In most cases this will be only a small fraction of your total output on Copepoda. Please be so kind and send us reprints of the articles still missing in the *MONOCULUS*-Library, and in case your stocks are depleted, please consider of providing us with a xerox-copy. If you see a chance of helping us in procuring reprints on copepods from other sources (duplicates in your own reprint collection, old stocks in department libraries, remnants of reprint collections of deceased colleagues etc.), please don't hesitate to do so.

In London a complete list of the stocks of the *MONOCULUS*-Library will be available and whoever is interested in a copy, please let Kurt know on a postcard in advance so that we have an estimate of how many copies to print. The booklet will be free of charge for those who provide us with older reprints in exchange.

If you need literature from the *MONOCULUS*-Library we can now offer a moderate service. Wolfgang Janetzky has agreed to copy articles for you. Tell Kurt Schminke what your literature requirements are. Wolfgang will then let you know the price and start with copying as soon as the money has arrived on his account. But please don't expect him to copy whole libraries.

2. *MONOCULUS*-Museum

No news.

3. Mailing

Two letters have been returned to us:
Maria de Lurdes Shirley, Instituto Hidrografico, Farol da Guia, P-2750 Cascais, Portugal;
Mitsuaki Uchima, Institute of Fisheries Resources, Tokyo University of Fisheries, 4-5-7 Konan, Minato, Tokyo 108, Japan.
Who knows the new addresses?

4. Current research activities

K.O. COYLE from Fairbanks, Alaska, USA:
While most of the research by our institute is limited to North Pacific and Arctic environments, we work in a variety of habitats: planktonic, benthic, intertidal, subtidal. We are currently working on benthic amphipod production in the northern Bering Sea (some specimens are infested with a copepod parasite), fishes in Beaufort Sea lagoons (they feed on calanoids) and fisheries recruitment problems in southeast Alaska (larval fish are feeding primarily on copepod nauplii). Thus, although the major thrust of these studies is not directly related to copepods, information on copepod taxonomy, ecology, energetics and biogeography can be very useful in the identification of prey items and parasites in our samples and in the interpretation of our data. It is possible that projects funded in the future may deal specifically with copepod research.

S. & P. NIVAL, Villefranche-sur-Mer, France:
We are now involved in the study of fertility of Copepods from the Ligurian Sea under various trophic conditions, mainly Temora stylifera and Centropages typicus raised at the laboratory during temporary rearings (S. Nival), and in the integration of the experimental results into a model of the pelagic Mediterranean ecosystem taking into account the fluctuations of the various parameters: nutrients, phytoplankton, recruitment and competition of zooplanktonic species, ... throughout the foodweb (P. Nival).

M. O'REILLY, Edinburgh, Scotland, U.K.:
I have recently completed 2 years as a Research Assistant to Dr. Colin Moore at Heriot-Watt University, Edinburgh, studying the taxonomy of the Harpacticoid genus Haloschizopera. We propose to publish a lengthy paper describing several new species of this genus.
At present, however, I am employed by the Forth River Purification Board to monitor marine macrobenthos on Sewage Sludge Dumping Grounds and my interest in copepods is now concentrating on species associated with or parasitic on polychaetes, crustaceans or molluscs.

5. Questionnaire 1986

One of the information asked on the questionnaire was about "Brief titles of your current projects in copepod research". The answers were not meant for the new directory, so we reproduce them here. Some answers are only a list of general terms, so we omit them here.

Alcaraz, M., Barcelona, Spain:

1. Turbulence and energy transfer from phytoplankton to copepods.
2. Relationships between deep phyto- and zooplankton layers.
3. Plankton production in frontal zones.
4. Feeding and metabolism in copepods.

Ali-Khan, S., Karachi, Pakistan:

1. New record and variants of deep-sea copepods from the Arabian Sea.
2. Analysis of calanoids from the Atka Bay (Antarctica).

Alvarez, M.P.J., Sao Paulo, Brazil:

1. The genus Longipedia of the Sao Paulo coast.
2. Species of the family Tetragonicipitidae.

Andersen, O.G.N., Copenhagen, Denmark:

1. Annual cycle of Copepoda in Isefjord, Denmark.
2. Arctic marine zooplankton, a synopsis.
3. Vertical distribution of microzooplankton in Fram Strait.

Andronov, V.N., Kaliningrad, USSR:

1. Revision of the family Tharybidae (Calanoida).
2. The systematization of the bottom-living Calanoida.

Arcos, F., Guayaquil, Ecuador:

1. Copepods as biological indicators.
2. Zooplankton of Galápagos.

Arnott, G.H., Queenscliff, Australia:

1. The reproductive biology of Gladioferens pectinatus (Calanoida).
2. Population growth of Gladioferens pectinatus (Calanoida).
3. Ecology of zooplankton of the Gippsland Lakes, Victoria.

Avdeev, G., Vladivostok, USSR:

1. Morphological adaptation of bomolochids to various ecological groups of fishes.
2. Host specificity of the copepod family Bomolochidae.
3. Taxonomic studies of copepods belonging to the Lichomolgidae found in Aplacophora.

Baars, M.A., Den Burg, The Netherlands:

1. NECTAR '77, '78, '82, tropical Atlantic Ocean, biomass and vertical distribution.
2. REFLEX '83, northern North Sea, grazing and faecal pellets.
3. Snellius II Expedition, Banda Sea, biomass and grazing in two monsoon periods.
4. Frisian Front Project '86, southern North Sea, grazing experiments.

Baretta, J.W., Den Burg, The Netherlands:

1. Zooplankton modelling.
2. Respiration of the zooplankton community.
3. Carbon content of the zooplankton community.

Barnett, P.R.O., Oban, Scotland:

1. Biology of harpacticoid copepods in shallow subtidal sands.
2. Deep-sea harpacticoid copepods.

Barr, D.J., College Station, Texas, USA:

1. Taxonomy, phylogeny, and zoogeography of Pseudocyclops (Calanoida: Pseudocyclopidae).
2. Calanoid copepods of Mesquite Bay, Texas.
3. Marine cave calanoids of the Caribbean.

Barthel, K.-G., Kiel, Fed. Rep. Germany:

1. Feeding ecology of Calanus spp. in the Greenland Sea.

Baskaran, K., Porto-Novo, India:

1. Studies on the ecology of copepods at Coleroon Estuary, south-east coast of India.
2. Development studies in copepods.

Batchelder, H.P., Narragansett, USA:

1. Life cycles of Metridia pacifica.
2. Modelling population dynamics of Metridia pacifica.
3. Bioluminescence of marine copepods (Pleuromamma and Metridia).

Bathmann, U.V., Kiel, Fed. Rep. Germany:

1. Calanus in the Norwegian Sea.
2. Copepod fecal pellets: content and production.
3. Copepod feeding and defecation.

Bayly, I.A.E., Clayton, Australia:

1. Ecology of calanoids in Antarctic lakes.
2. Revision of South American species of Boeckella (Calanoida-Freshwater).

Beckmann, W., Hamburg, Fed. Rep. Germany:

1. Red Sea ecology: distribution of calanoids, trophic community structure.
2. Near-bottom distribution of calanoids in the deep Northeast Atlantic.

Benda, R.S., Valdez, USA:

1. Periodicity of zooplankton in sanitary waste ponds.
2. Salmon parasites.

Benz, G.W., Vancouver, Canada:

1. Revision and phylogenetic analysis of the family Pandaridae.
2. Spatial distribution of Dinemoura latifolia on its preferred host.
3. Phylogenetic analysis of the family Cecropidae.
4. Gill pathologies caused by copepods parasitic upon elasmobranchs.

Bergmans, M., Brussels, Belgium:

1. Life history adaptation in Tisbe.
2. Sex ratio and local mate competition in the T. gracilis group.

Bhattacharya, S.S., Bombay, India:

1. Taxonomy and population dynamics of the major calanoid copepods of Bombay coastal waters.
2. Effects of hydrocarbons and crude oil on the adults and developmental stages of Oithona.
3. Feeding appendages and methods of feeding in some calanoid copepods.
4. Parasitic copepods from marine fishes.

Binet, D., Nantes, France:

1. Ecology of marine copepods of tropical seas (mainly coastal) Atlantic: Western Africa, Pacific: New Caledonia.
2. Short and long term variations related to hydrological and climatological features.

Bisol, P.M., Padova, Italy:

1. Genetic variability in relation to the environment.
2. Biochemical relationships and speciation in Tisbe and Tigriopus.

Björnberg, T.K.S., Sao Sebastiao, Brazil:

1. Identification of naupliar stages of coastal copepods.
2. Muscle system of Canuellidae nauplius.

Blades-Eckelbarger, P.I., Fort Pierce, USA:

1. Ultrastructure of gametogenesis in selected marine Calanoids.
2. Ultrastructure of internal anatomy in selected marine Calanoids.
3. Ultrastructure of the "pigment knob" in Pleuromamma spp.
4. Survey (with SEM) of spermatophore attachments and the mechanism of sperm transfer in selected marine Calanoids.

Bodin, Ph., Brest, France:

1. Ecology: temporal-space fluctuations of harpacticoid copepod communities.
2. Biology: trophic relationships of harpacticoid copepods in the food-chain.
3. Systematics of harpacticoid copepods as an essential tool in ecology.

Bodiou, J.Y., Banyuls-sur-Mer, France:

1. Harpacticoids from infralittoral fine sands in Banyuls/Mer.
2. New species of Leptastacus.
3. Zoogeography and ecology of the intertidal Harpacticoids from Kerguelen and Crozet.

Böttger-Schnack, R., Kiel, Fed. Rep. Germany:

1. Red Sea ecology: community structure and vertical distribution of cyclopoid copepods.
2. Population structure and vertical distribution of Macrosetella gracilis (Copepoda, Harpacticoida) in relation to blue-green algae.

Boileau, M.G., Windsor, Canada:

1. Population genetics of North American Arctic Calanoids.
2. Routes of postglacial dispersal of Calanoids.
3. Biochemical systematics of the Acanthocyclops.

Boucher, J., Brest, France:

1. Interactions between behaviour and hydrodynamics.
2. Microscale vertical distribution of copepods.

Bowman, Th.E., Washington, USA:

1. Nitocra n.sp. associated with the boring isopod Sphaeroma peruvianum.

Boxshall, G.A., London, England:

1. Book: 'An Introduction to Copepod Structure and Function'.
2. Study of skeletomusculature of Siphonostomatoida.
3. Taxonomic revision of Siphonostomatoida families associated with Invertebrates.
4. Description of fossil parasitic Copepod (with Roger F. Cressey).

Bradford, J.M., Wellington, New Zealand:

1. Developmental stages of Calanus australis, Calanoides macrocarinatus, and Neocalanus tonsus.
2. Development times of common New Zealand copepod eggs in relation to temperature.

Brand, G.W., Queenscliff, Australia:

1. Effects of low heavy metal concentrations on population growth and larval viability.
2. Variation in brood sex ratio; control and significance.
3. Morphological asymmetry; influence of stress.

Brandl, Z., Budějovice, Czechoslovakia:

1. Predatory feeding of cyclopoid Copepods.
2. Development of cyclopoid Copepods.
3. Taxonomy of Acanthocyclops.

Bresciani, J., Copenhagen, Denmark:

1. Continuous studies of the integument in free-living and parasitic copepods.
2. Internal morphology of free-living and parasitic copepods.

Brown, C.S., Vancouver, Canada:

1. Copepod production, diversity, population dynamics and community structure in a tidal estuary at the head of the Bay of Fundy.

Brownell, Ch.L., Rogge Bay, South Africa:

1. Mass culture of Paracalanus scotti Früchtl, Acartia africana (Steuer), as food for rearing fish larvae.

Burns, C.W., Dunedin, New Zealand:

1. Feeding behaviour, starvation tolerance, resting egg production, and life history characteristics in Boeckella spp.

Burton, R.S., Philadelphia, USA:

1. Population genetic differentiation in Tigriopus californicus.
2. Hybrid breakdown in interpopulation crosses in T. californicus.
3. Response to osmotic stress in Tigriopus species.
4. Biochemical genetics of Tigriopus species.

Campaner, A.F., Sao Paulo, Brazil:

1. Taxonomy of Arietellus (Calanoida: Arietellidae).
2. Anatomy and taxonomy of Gaussia (Calanoida: Metridinidae).
3. Planktobenthic copepod fauna off Brazil.

Carvalho, M.A.J. de, Sao Paulo, Brazil:

1. Effects of river impoundment on the copepod community.

Castel, J., Arcachon, France:

1. Biology of the populations of Eurytemora hirundoides in the Gironde estuary.
2. Characterization of lagoon ecosystems by means of their copepod fauna.
3. Relationships between copepods and organic particulate matter in oyster beds.
4. Possibilities of trophic competition between planktonic copepods and oyster larvae.

Castro Romero, R.E., Antofagasta, Chile:

1. Life history of Metapeniculus antofagastensis Castro & Baeza, 1985.
2. Neobrachiella Kabata, 1979, parasitic on Sciaena host fishes from Antofagasta.
3. Lernaeopodids parasitic on Elasmobranchs from Antofagasta, Chile.
4. Copepods parasitic on deep-sea fishes from Antofagasta coast.

Chandra Mohan, P., Visakhapatnam, India:

1. Systematics and ecology of marine and estuarine copepods.
2. Fauna of copepods associated with other marine invertebrates.
3. Role of copepods in the secondary production.

Chandran, A., Trivandrum, India:

1. Biology of copepods parasitic on freshwater fishes of Kerala.
2. Copepod parasites of elasmobranch fishes of the S.W. coast of India.
3. Functional morphology of the digestive system in certain poecilostome and siphonostome copepods parasitic on marine fishes.

Chapman, P.M., North Vancouver, Canada:

1. Sediment bioassay testing with Tigriopus californicus.

Chojnacki, J., Szczecin, Poland:

1. Mesozooplankton biomass assessment.
2. Zoocenoses of the Southern Baltic pelagic waters.
3. Ecological study - Antarctic Copepoda.

Chow-Fraser, P., Montreal, Canada:

1. Resource partitioning in co-occurring Diaptomus species.
2. Functional response and selectivity patterns in Diaptomus.
3. Utility of gut content analyses in copepod research.
4. Feeding behaviour of Diaptomus in relation to functional response.

Citarella, G., Cotonou, Benin, Africa:

1. Production apparente du copépode Temora longicornis.
2. Distribution des copépodes dans le détroit de Northumberland.

Connell, A.D., Congella, South Africa:

1. Copepoda from neuston netting at sea, mostly pontellids.

Conover, R.J., Dartmouth, Canada:

1. Relationship between pelagic zooplankton and ice algal production.
2. The use of chlorophyll to study zooplankton nutritional physiology.
3. Arctic life cycles and adaptive strategies for copepods.
4. Prey-predator interactions among planktonic organisms.

Conway, D.V.P., Plymouth, England:

1. Vertical distribution of oceanic calanoid copepods.
2. Seasonal vertical distribution of Calanus nauplii.

Corkett, Chr.J., Halifax, Canada:

1. Life cycles of Calanus, Pseudocalanus and Oithona.
2. Laboratory rearing of Calanus and Pseudocalanus.
3. Embryonic development of marine Calanoids.
4. Estimates of secondary production.

Coull, B.C., Columbia, USA:

1. Fish predation effects of harpacticoid population dynamics.
2. Long-term variability of meiobenthic copepods.
3. Harpacticoid systematics.

Coyle, K.O., Fairbanks, Alaska, USA:

1. Systematics and biology of parasitic copepods infesting the brood pouch of Ampeliscidae amphipods from the northern Bering Sea.

Crawford, P., Wolfville, Canada:

1. Seasonal variations in body size and fecundity in Eurytemora herdmani in a turbid estuary.
2. Viability of Eurytemora herdmani eggs following ingestion by fish.

Cressey, R., Washington, USA:

1. Key to Caligus.
2. Revision of the Bomolochidae.
3. Parasitic copepods of the Gulf of Mexico and Caribbean Sea.

Dahms, H.-U., Oldenburg, Fed. Rep. Germany:

1. Phylogenetic significance of larval characters for Harpacticoida.
2. Systematics and ecology of benthic/ice-inhabiting harpacticoids.
3. Ecophysiology and life history of Antarctic harpacticoids.
4. Autecology (salinity, temperature, pH-tolerance) of Paramphiascella fulvofasciata.

Dagg, M.J., Chauvin, Louisiana, USA:

1. Laboratory and field measurements of egg production by Acartia tonsa and of feeding by Neocalanus plumchrus, Calanus pacificus, and Metridia pacifica.

Damkaer, D.M., Seattle, USA:

1. Nicothoid copepod parasitic on mysids.
2. History of the study of Copepoda.

Das, N.G., Chittagong, Bangladesh:

1. Taxonomy and distribution of copepods in the Bay of Bengal.
2. Copepods of the Nap River estuary.

Dawson, J.K., Los Angeles, USA:

1. Study of small scale dynamics of zooplankton by high frequency acoustics.

Decker, C.J., Stony Brook, USA:

1. Feeding selectivity and mechanisms of selection in marine harpacticoid copepods.
2. Taxonomy of marine harpacticoids from a salt marsh in the Northeastern USA.

Deets, G., Vancouver, Canada:

1. Phylogenetic analysis of Kroyeriidae.
2. Phylogenetic analysis of Eudactylinidae.
3. Parasitic copepod - chondrichthyan coevolution - cladistics.
4. Parasitic copepods in the Sea of Cortez (Northeast Pacific).

Dessier, A., Brest, France:

1. Response to El Nino signals of the epiplanktonic copepod population in the eastern tropical Pacific.

Dexter, B.L., Purchase, USA:

1. Developmental grazing capabilities.
2. Phytoplankton-zooplankton interactions.
3. Seasonal distribution and abundance patterns.
4. Indicator species of water pollution.

Diel, S., Kiel, Fed. Rep. Germany:

1. Developmental biology of main copepod species in Fram Strait.

Dinet, A.H.R., Nieul-sur-Mer, France:

1. Microdistribution of copepods (meiofauna) in salt marshes.
2. Harpacticoids from the deep-sea and hydrothermal ecosystems.

..terature-literature-literature-literature-literature-litera..

BOOKS

CORNER, E.D.S. & S.C.M. O'HARA (eds.) - 1986: The biological chemistry of marine copepods. Clarendon Press, Oxford, 349 pp.

VERVOORT, W. - 1986: Bibliography of Copepoda, up to and including 1980, Part I (A-G). Crustaceana, Suppl. 10: 1-369

VERVOORT, W. - 1986: Bibliography of Copepoda, up to and including 1980, Part II (H-R). Crustaceana, Suppl. 11: 371-845

1984

ESSAFI, K., P. CABRAL & A. RAIBAUT - 1984: Copépodes parasites de poissons des Iles Kerkennah (Tunisie méridionale). Archs. Inst.Pasteur Tunis 61(4): 475-523

HERMAN, P.M.J., C. HEIP & B. GUILLEMIJN - 1984: Production of Tachidius discipes (Copepoda: Harpacticoida). Mar.Ecol. Prog.Ser. 17: 271-278

KABATA, Z. - 1984: Caligus sicarius n.sp. (Copepoda: Siphonostomatoida), a parasite of Crenimugil crenilabris (Forskal, 1775) (Pisces: Teleostei) in the Gulf of Aqaba. Wiadom. Parazytol. 30(2): 133-139

MARCOTTE, B.M. - 1984: Behaviourally defined ecological resources and speciation in Tisbe (Copepoda: Harpacticoida). J.Crust.Biol. 4(3): 404-416

MOESCHLER, P. & R. ROUCH - 1984: Un nouveau genre de Canthocamptidae (Copepoda, Harpacticoidea) des eaux souterraines de Suisse. Revue suisse Zool. 91(4): 959-972

THIELEMANS, L.K.H. & C. HEIP - 1984: The response of a harpacticoid copepod community to sediment disturbance in a semi-enclosed lagoon. Hydrobiologia 118: 127-133

TITO DE MORAIS, L. & J.Y. BODIOU - 1984: Predation on meiofauna by juvenile fish in a Western Mediterranean flatfish nursery ground. Mar.Biol. 82: 209-215

VAN DAMME, D., C. HEIP & K.A. WILLEMS - 1984: Influence of pollution on the harpacticoid copepods of two North Sea estuaries. Hydrobiologia 112: 143-160

WHITMAN, R.L. - 1984: Parastenocaris texana, new species (Copepoda: Harpacticoida: Parastenocarididae) from an east Texas sandy stream with notes on its ecology. J.Crust.Biol. 4(4): 695-700

WIERZBICKA, J. & M. GAJDA - 1984: Parasitic fauna of the barracouta, Thyrsites atun (Euphrasen, 1791) from off New Zealand. Acta Ichthyol.Piscat. 14(1-2): 149-154

WIERZBICKA, J. & D. LANGOWSKA - 1984: Parasitic fauna of Spiny Dogfish Squalus acanthias L. off New Zealand. Acta Ichthyol. Piscat. 14(1-2): 157-166

Excerpt from the literature

From: KABATA, Z. - 1986: Type specimens of Ergasilus funduli Krøyer, 1863 (Crustacea: Copepoda) re-examined. Steenstrupia 12(9): 154-156

This paper would not be complete without an account of the fate of the examined specimens. The best-preserved of them (Fig. 1) was selected as the lectotype, there being no types designated in Krøyer's material. Afraid that further manipulation might be damaging to the fragile specimen, I labelled the slide on which it had been mounted in Berlese's fluid and returned it to Dr. Wolff in Copenhagen. To my surprise, Dr. Wolff, having looked at the slide, was unable to find anything under the coverslip. The specimen had inexplicably vanished. I asked Dr. Wolff to send the slide to me again, so that I could verify this strange fact. I need not have troubled. The much-travelled slide was indeed innocent of any specimens.

(to be continued further below)

1985

BOUCHER, J. - 1985: Caractéristiques physiques et biologiques. In: LAUBIER, L. & C. MONNIOT (eds.), Peuplements profonds du golfe de Gascogne, p. 25-42, éd. IFREMER Brest

DURFORT, M. - 1985: Possible relació de la presència d'esferocristalls intestinals amb la vitellogènesi dels crustacis copèpodes. Biologia del Desenvolupament 3: 195-209

DURFORT, M. - 1985: Aplicacio conjunta de mètodes morfològics citoquîmics i d'anàlisi de raigs X en l'estudi de concrecions minerals intracitoplasmàtiques. Butll.Soc.Cat.Cièn. 6(1): 25-38

DURFORT, M., M.G. BOZZO & M. POQUET - 1985: Fine structure of the deferent duct and the seminal vesicle of Diaptomus conexus (Crustacea: Copepoda). Butll.Inst.Cat.Hist.Nat. 52 (Sec.Zool., 6): 103-117

EL GHARBI, S., V. ROUSSET & A. RAIBAUT - 1985: Biologie du copépode Lernaeenicus sprattae (Sowerby, 1806) et ses actions pathogènes sur les populations de sardines des côtes du Languedoc-Roussillon. Rev.Trav.Inst.Pêches marit. 47 (3/4): 191-201 (year of publication stated 1983, but appeared 1985)

HERMAN, P.M.J. & C. HEIP - 1985: Secondary production of the harpacticoid copepod Paronychocamptus nanus in a brackish-water habitat. Limnol.Oceanogr. 30(5): 1060-1066

HUMES, A.G. - 1985: Myicola metisiensis (Copepoda: Poecilostomatoida), a parasite of the bivalve Mya arenaria in eastern Canada, redefinition of the Myicolidae, and diagnosis of the Anthessiidae n.fam. Can.J.Zool. 64: 1021-1033

HUMES, A.G. - 1985: Cnidarians and copepods: a success story. Trans.Am.Microsc.Soc. 104(4): 313-320

HUMES, A.G. - 1985: Poecilostomatoid copepods parasitic in the scleractinian coral genus Goniastrea in the Moluccas. Publ.Seto Mar.Biol.Lab. 30(4/6): 277-286

HUMES, G.A. & S.Y. LEE - 1985: The poecilostome copepod Anthessius mytilicolus Reddiah, 1966, associated with the mussel Perna viridis (L.) at Hong Kong. Asian Mar.Biol. 2: 85-91

PESCE, G.L. & D.P. GALASSI - 1985: Due nuovi Diacyclops del complesso "languidoides" (Copepoda: Cyclopidae) di acque sotterranee di Sardegna e considerazioni sul significato evolutivo dell'antenna nei copepodi stigobionti. Boll.Mus. civ.Stor.Nat.Verona 12: 411-418 (appeared 1986)

POQUET, M. - 1985: Dades preliminars sobre la localitzacio de cellules endocrines - l'intesti de Copèpodes parasits. Treb.Soc.Cat.Biol. 38: 45-50

ROCHA, C.E.F. - 1985: Freshwater copepods of the genus Oithona Baird, 1843 from the Amazonian region (Brazil). Rev.Hydrobiol.trop. 18(3): 213-220

STOCK, J.H. - 1985: Redescription et statut générique de Pseudanthessius nemertophilus Gallien, 1936, copépode poecilostomatoïde associé à Lineus longissimus des côtes de la Manche. Cah.Biol.Mar. 26: 321-329

VALERO, J.G. - 1985: La vitellogènesi a Acanthocyclops robustus G.O. Sars (Copepoda, Cyclopoida): Fase primària. Biologia del Desenvolupament 3: 241-249

WYNGAARD, G.A., R. RUSSEK, J.D. ALLAN - 1985: Life history variation in north temperate and subtropical populations of Mesocyclops edax (Crustacea: Copepoda). Verh.Internat. Verein.Limnol. 22: 3149-3153

Excerpt from the literature

From: KABATA, Z. - 1986: same work as above, p. 156

Both Dr. Wolff and I wanted to have a lectotype selected. Having picked out of the remaining material the only specimen that, in my opinion, sufficiently displayed the diagnostic features of the species, I put it on a slide in Berlese's fluid and labelled it immediately. Several days later I inspected the slide thoroughly. To my utter disbelief, the specimen was not there. A small clump of debris that might have represented copepod remains was all that could be found.

It seems fairly obvious that Berlese's fluid must have acted as a solvent and caused a complete, or almost complete, disintegration of the copepods. This could have happened only because of the old age of the specimens, combined with whatever treatment they had received in the past ...

This strange incident is reported upon as a warning to copepodologists who have to examine century-old specimens. I am also glad to report that Dr. Wolff's helpful friendship for me appears to have survived this debacle.

1986

ANDRONOV, V.N. - 1986: Pseudocalanidae Sars, 1901 (Crustacea, Copepoda): proposed precedence over Clausocalanidae Giesbrecht, 1892. Bull.zool.Nom. 43(3): 297-299

AVDEEV, G.V. - 1986: Three new and one well-known species of parasitic copepods in the genus Nothobomolochus (Bomolochidae, Poecilostomatoida). Zool.Zh. 65(1): 55-65 (In Russian with English summary)

AVDEEV, G.V. & V.N. KASATCHENKO - 1986: Parasitic copepods from fishes of the genus Lophiomus Gill in the Pacific. Crustaceana 50(1): 53-67

AVDEEV, G.V. - 1986: New harpacticoid copepods associated with Pacific cephalopods. Crustaceana 51(1): 49-65

AVDEEV, G.V., E.M. TZIMBALJUK & O.G. LUKOMSKAYA - 1986: Philoblenna littorina sp.n., a parasitic copepod (Philoblennidae, Poecilostomatoida) from gastropods of the genus Littorina from the Gulf of Peter the Great (the Sea of Japan). Parasitologiya 20: 78-81 (In Russian with English summary)

BAMSTEDT, U. - 1986: Chemical composition and energy content. In: CORNER, E.D.S. & S.C.M. O'HARA (eds.), The biological chemistry of marine copepods. Clarendon Press, Oxford, p. 1-58

BODIOU, J.-Y. & J.-C. COLOMINES - 1986: Harpacticoides (Crustacés, Copépodes) des Iles Crozet. I. Description d'une espèce nouvelle du genre Arenopontia Kunz. Vie Milieu 36(1): 55-64

BÖTTGER, R. & D. SCHNACK - 1986: On the effect of formaldehyde fixation on the dry weight of copepods. Meeresforsch. 31: 141-152

BOXSHALL, G.A. - 1986: A new genus and two new species of Pennellidae (Copepoda: Siphonostomatoida) and an analysis of evolution within the family. Syst.Parasitol. 215-225

BOXSHALL, G.A. - 1986: The comparative anatomy of the feeding apparatus of representatives of four orders of copepods. Syllogeus 58: 158-169

BRESCIANI, J. - 1986: The fine structure of the integument of free-living and parasitic copepods. A review. Acta Zool. 67(3): 125-145

BRYLINSKI, J.-M. - 1986: Méthode de détection des gradients faunistiques: les courbes FCT. Répartition du zooplancton au large du Cap Gris-Nez (France). Oceanol.Acta 9(4): 457-467

CASTEL, J. & A. FEURTET - 1986: Influence des matières en suspension sur la biologie d'un copépode estuarien: Eurytemora hirundoides (Nordquist, 1888). Coll.Nat.CNRS "Biologie des Populations", Lyon, 4-6 septembre 1986: 391-396

CASTRO, R., R. & H. BAEZA K. - 1986: Lernaeopoda tenuis n.sp. and Pseudolernaeopoda caudocapta n.g., n.sp. (Copepoda, Lernaeopodiae) parasitic on Triakis maculata (Kner & Steindacher) from the Chilean coast, South Pacific. Syst. Parasitol. 8: 227-233

CHEDI, K. & J. BOUCHER - 1986: Extraction automatique de paramètres descriptifs par l'analyse d'images. Application à la biologie marine (zooplancton). Innov.Techn.Biol.Med. 7(4): 386-399

CORNER, E.D.S., S.C.M. O'HARA, A.C. NEAL & G. EGLINTON - 1986: Copepod faecal pellets and the vertical flux of biolipids. In: CORNER, E.D.S. & S.C.M. O'HARA (eds.), The biological chemistry of marine copepods. Clarendon Press, Oxford, p. 260-321

DAHMS, H.-U. - 1986: Zur Biologie von Paramphiascella fulvofasciata (Copepoda, Harpacticoida). Helgoländer Meeresunters. 267-277

DALY, K.L. & D.M. DAMKAER - 1986: Population dynamics and distribution of Neomysis mercedis and Alienacanthomysis macropsis (Crustacea: Mysidacea) in relation to the parasitic copepod Hansenulus trebax in Columbia River estuary. J.Crust.Biol. 6(4): 840-857

DEARBORN, J.H., F.D. FERRARI & K.C. EDWARDS - 1986: Can pelagic aggregations cause benthic satiation? Feeding biology of the Antarctic brittle star Astrotoma agassizii (Echinodermata: Ophiuroidea). Biology of Antarctic seas XVII, Antarct.Res.Ser. 44: 1-28

DO, T.T. & T. KAJIHARA - 1986: Studies on parasitic copepod fauna and biology of Pseudomyicola spinosus, associated with blue mussel Mytilus edulis galloprovincialis in Japan. Bull.Ocean Res.Inst., Univ.Tokyo 23: 1-63

DO, T.T. & T. KAJIHARA - 1986: Sex determination and atypical male development in a poecilostomatoid copepod, Pseudomyicola spinosus (Raffaele and Monticelli, 1885). Syllogeus 58: 283-287

DURFORT, M. & M.G. BOZZO - 1986: La linea germinal masculina de Diaptomus conexus (Crustacea, Copepoda). Estudi ultraestructural preliminar. Biologia del Desenvolupament 4: 91-106

FAVA, G., I. LAZZARETTO & E. MARTINI - 1986: Effeti morfologici della riduzione di salinità in due popolazioni lagunari del Copepode Tisbe clodiensis. Atti Ist. Veneto Sci. 144: 63-70

FIERS, F. - 1986: Laophontina posidoniae n.sp. from the Gulf of Calvi (Copepoda, Harpacticoida, Laophontidae). Vie Milieu 36(1): 65-73

FIERS, F. - 1986: A new record and redescription of Paralaophontodes echinata (Willey) (Copepoda, Harpacticoida, Ancorabolidae). Annls.Soc.r.zool.Belg. 116(2): 137-144

FIERS, F. - 1986: Harpacticoid copepods from the West Indian Islands: Laophontidae (Copepoda, Harpacticoida). Bijdr. Dierk. 56(1): 132-164

FIERS, F. - 1986: Feregastes wellensi n.gen., n.sp., a new genus of the family Tegastidae (Copepoda, Harpacticoida) from the Andaman Islands. Crustaceana 51(3): 277-285

FRYER, G. - 1986: Structure, function and behaviour, and the elucidation of evolution in copepods and other crustaceans. Syllogeus 58: 150-157

GEE, J.M. & J.W. FLEEGER - 1986: Two new species of harpacticoid copepod from the South Orkney Islands, Antarctica, and a redescription of Idyellopsis typica Lang (Tisbidae). Zool.J.Linn.Soc. 88: 143-165

HADA, A., S. UYE & T. ONBE - 1986: The seasonal life cycle of Sinocalanus tenellus (Copepoda: Calanoida) in a brackish-water pond. Bull.Plankton Soc.Japan 33(1): 29-41

HARDING, G.C. - 1986: Organochlorine dynamics between zooplankton and their environment, a reassessment. Mar.Ecol. Prog.Ser. 33: 167-191

HARRIS, R.P. - 1986: Diel patterns of ammonium excretion and grazing rhythms in Calanus helgolandicus in surface stratified waters. Mar.Ecol.Prog.Ser. 31: 75-85

HARRIS, R.P., J.-F. SAMAIN, J. MOAL, V. MARTIN-JEZEQUEL & S.A. POULET - 1986: Effects of algal diet on digestive enzyme activity in Calanus helgolandicus. Mar.Biol. 90: 353-361

HERBST, H.-V. - 1986: Beschreibung des Thermocyclops hastatus antillensis n.ssp., mit einem Bestimmungsschlüssel für die Gattung Thermocyclops Kiefer, 1927. Bijdr.Dierk. 56(1): 165-180

HERBST, H.-V. - 1986: Copepoda: Cyclopoida aus dem Meeres- und Brackwasser-Interstitial. In: BOTOSANEANU, L. (ed.), Stygofauna Mundi, p. 313-320, E.J. Brill/Dr. W. Backhuys, Leiden

HERON, G.A. & D.M. DAMKAER - 1986: Two species of Urocopia, planktonic poecilostomatoid copepods of the family Urocopiidae Humes and Stock, 1972. Proc.Biol.Soc.Washington 99(1): 140-148

HERON, G.A. & D.M. DAMKAER - 1986: A new nicothoid copepod parasitic on mysids from northwestern North America. J. Crust.Biol. 6(4): 652-665

HUMES, A.G. - 1986: Copepodids and adults of Leptinogaster major (Williams, 1907), a poecilostomatoid copepod living in Mya arenaria L. and other marine bivalve molluscs. Fish. Bull. 85(2): 227-245

HUMES, A.G. - 1986: Observations on xarifiid copepods parasitic in Scleractinia. Syllogeus 58: 326-332

IMAMURA, T. & Y. KIKUCHI - 1986: Studies on water mites and harpacticoid copepods as the indicative animals for environmental factors in inland water habitats. Research Projects in Review 8 (1985): 317-331

IZAWA, K. - 1986: On the development of parasitic Copepoda. IV. Ten species of poecilostome cyclopoids, belonging to Taeniacanthidae, Tegobomolochidae, Lichomolgidae, Philoblennidae, Myicolidae, and Chondracanthidae. Publ.Seto Mar. Biol.Lab. 31(3/6): 81-162

KABATA, Z. - 1986: Redescriptions of and comments on four little-known Lernaeopodidae (Crustacea: Copepoda). Can.J. Zool. 64: 1852-1859

KABATA, Z. - 1986: Type specimens of Ergasilus funduli Krøyer, 1863 (Crustacea: Copepoda) re-examined. Steenstrupia 12(9): 153-156

Excerpt from the literature

From: FRYER, G. - 1987: Quantitative and qualitative: numbers and reality in the study of living organisms. Freshwater Biology 17: 178-179

Formulae have been devised for feeding rates and for the sizes of particles ingested. For example, using plastic beads as 'food':

$$y = 22x + 4.87$$

where y is the diameter (μm) of the largest bead ingested and x is carapace length (mm)...
This formula has been uncritically applied to the feeding of the nauplii of cyclopoid copepods (Burgis et al., 1973). But cyclopoid nauplii are not filter feeders (as some branchiopod nauplii are): they grasp their food. Furthermore, while filtering anomopods extract and manipulate particles with their trunk limbs, nauplii, which have no trunk limbs, do so with cephalic appendages. The mandibles, the only appendages common to both mechanisms, are as different as the teeth of a horse and a lion. The feeding apparatus of cyclopoid nauplii is indeed as different from that of a Daphnia as is that of a wolf from a baleen whale. Further, nauplii have no carapace - whose length is an element of the formula! To apply this formula to nauplii is like using a relationship between antler length in a cervid and the ability to grind grass with its molars to work out a similar relationship in lions. Nevertheless, in this meaningless way a figure for the size of particles eaten was calculated and used in wider ecological speculations.

KING, E.M., N.A. RAYNER, M.F. GRIFFITHS & J. HEEG - 1986: Factors affecting the elimination of Tropodiaptomus spectabilis and its replacement by Metadiaptomus transvaalensis in an oligotrophic lake. Syllogeus 58: 341-349

LE BORGNE, R. - 1986: The release of soluble end products of metabolism. In: CORNER, E.D.S. & S.C.M. O'HARA (eds.), The biological chemistry of marine copepods. Clarendon Press, Oxford, p. 109-164

LESCHER-MOUTOUE, F. - 1986: Copepoda Cyclopoida Cyclopidae des eaux douces souterraines continentales. In: BOTOSANEANU, L. (ed.), Stygofauna Mundi, p. 299-312, E.J. Brill/Dr.W. Backhuys, Leiden

MADHUPRATAP, M. & P. HARIDAS - 1986: Epipelagic calanoid copepods of the northern Indian Ocean. Oceanol.Acta 9(2): 105-117

MARKHASEVA, E.L. - 1986: A new species of Pseudochirella (Copepoda, Calanoida) from the south-eastern Pacific. Zool. Zh. 45(3): 462-465 (In Russian with English summary)

MARKHASEVA, E.L. - 1986: Revision of the genus Batheuchaeta (Calanoida, Aetideidae). Zool.Zh. 45(6): 837-850

MAYZAUD, P. - 1986: Digestive enzymes and their relation to nutrition. In: CORNER, E.D.S. & S.C.M. O'HARA (eds.), The biological chemistry of marine copepods. Clarendon Press, Oxford, p. 165-225

MAYZAUD, P. - 1986: Enzymatic measurements of metabolic processes concerned with respiration and ammonia excretion. In: CORNER, E.D.S. & S.C.M. O'HARA (eds.), The biological chemistry of marine copepods. Clarendon Press, Oxford, p. 226-259

PETKOVSKI, T.K. - 1986: Zur Taxonomie des Genus Neocyclops Gurney 1927 (Crustacea, Copepoda Cyclopoida). Acta Mus. maced.sci.nat. 18(2): 27-46

PETKOVSKI, T.K. - 1986: Zur Taxonomie des Genus Mesocyclops G.O. Sars 1914 (Crustacea, Copepoda Cyclopoida) in der Neotropis. Acta Mus.maced.sci.nat. 18(3): 47-79

PIASECKI, W. - 1986: Description of the male of Tracheliastes maculatus Kollar, 1835 (Siphonostomatoida, Lernaeopodidae). Syllogeus 58: 584-588

PIASECKI, W. - 1986: Extrusion of the filamentum frontale in copepodids of Tracheliastes maculatus Kollar, 1835 (Siphonostomatoida: Lernaeopodidae). Syllogeus 58: 589-593

POULET, S.A., R.P. HARRIS, V. MARTIN-JEZEQUEL, J. MOAL & J.-F. SAMAIN - 1986: Free amino acids in copepod faecal pellets. Oceanol.Acta 9(2): 191-197

RAIBAUT, A., P. BERREBI & V. ROUSSET - 1986: Utilisation de la génétique enzymatique pour comparer les copépodes parasites du genre Lernaeenicus (Pennellidae) selon la zone d'implantation dans l'hôte, Sardina pilchardus (Walbaum, 1792). C.r.Acad.Sci.Paris (III) 303(2): 31-36

RAYNER, N.A. & E.M. KING - 1986: First record of a freshwater calanoid Tropodiaptomus spectabilis (Kiefer, 1929) (Crustacea, Copepoda) as host of an ellobiopsid parasite. J.Plankton Res. 8(5): 837-840

RAZOULS, S., S. NIVAL & P. NIVAL - 1986: La reproduction de Temora stylifera: ses implications anatomiques en relation avec le facteur 'nutrition'. J.Plankton Res. 8(5): 875-889

RIBES, E. - 1986: Estudio de las masas electrodensas (nucleolus-like-bodies) en los oocitos de Hemidiaptomus roubaui (Copepoda, Calanoida). Biologia del Desenvolupament 4: 107-121

RIBES, E. - 1986: Estructura y evolución del nucléolo durante la oogénesis de Hemidiaptomus roubaui (Copepoda, Calanoida). Biologia del Desenvolupament 4: 271-282

RIBES, E. - 1986: Estudio morfológico del condrioma en la oogênesis de Hemidiaptomus roubaui (Copepoda, Calanoida). Biologia del Desenvolupament 4: 283-298

ROCHA, C.E.F. da - 1986: Copepods of the genus Oithona Baird, 1843 from mangrove areas of Central and South America. Hydrobiologia 135: 95-107

ROUCH, R. - 1986: Quelques nouvelles Parapseudoleptomesochra Lang, 1965 (Harpacticoidea, Ameiridae) des eaux souterraines du sud de l'Espagne. Stygologia 2(3): 217-253

ROUCH, R. - 1986: Sur l'écologie des eaux souterraines dans le karst. Stygologia 2(4): 352-398

SARGENT, J.R. & R.J. HENDERSON - 1986: Lipids. In: CORNER, E.D.S. & S.C.M. O'HARA (eds.), The biological chemistry of marine copepods. Clarendon Press, Oxford, p. 59-108

SCHRIEVER, G. - 1986: Distribution and ecology of Cletodidae (Crustacea, Copepoda) at the Iceland-Faroe Ridge from 290 m to 2500 m water depth. Syllogeus 58: 448-458

SCHRIEVER, G. 1986: The status of the genus Thieliella Schriever, 1982 (Copepoda, Ancorabolidae) including the description of the male of Cletodes endopodita (Schriever, 1984). Crustaceana 51(1): 102-104

SCHRIEVER, G. - 1986: New Harpacticoida (Crustacea, Copepoda) from the North Atlantic Ocean. VIII. The description of Eurycletodes (Oligocletodes) quadrispinosa sp.n. and the male of E. (O.) monardi Smirnov (Cletodidae). Zool.Scr. 15: 233-236

SCHULZ, K. - 1986: Temoropia setosa sp.n. (Copepoda: Calanoida: Temoridae) aus dem Kanarenstromgebiet (Nordost-Atlantik) mit Anmerkungen zur Gattung Temoropia T.Scott. Mitt.hamb.zool. Mus.Inst. 83: 139-146

SHARIFF, M., Z. KABATA & C. SOMMERVILLE - 1986: Host susceptibility to Lernaea cyprinacea L. and its treatment in a large aquarium system. J.Fish Diseases 9: 393-401

STOCK, J.H. & R.U. GOODING - 1986: A new siphostomatoid copepod associated with the west Indian sea urchin, Diadema antillarum. Bull.Mar.Sci. 39(1): 102-109

SZABO, I. & G.A. GARDNER - 1986: First description of Metridia okhotensis Brodsky, 1950 (Crustacea: Copepoda) male, with female, fifth copepodites, and notes on distribution in British Columbia inlets. Can.J.Zool. 64: 1555-1562

UEDA, H. - 1986: Redescription of the planktonic calanoid copepod Acartia hudsonica from Atlantic and Pacific waters: a new record from Japanese waters. J.Oceanogr.Soc.Japan 42(2): 124-133

UEDA, H. - 1986: Taxonomic reexamination and geographic distribution of copepods known as Acartia clausi in Japanese coastal and inlet waters. J.Oceanogr.Soc.Japan 42(2): 134-138 (In Japanese with English abstract)

UEDA, H. - 1986: Redescriptions of the closely related calanoid copepods Acartia japonica and A. australis with remarks on their zoogeography. Bull.Plankton Soc.Japan 33(1): 11-20

UEDA, H. - 1986: Reproductive isolation between the sympatric, closely related species Acartia omorii and A. hudsonica (Copepoda: Calanoida). Bull.Plankton Soc.Japan 33(1): 59-60

UYE, S. - 1986: Impact of copepod grazing on the red-tide flagellate Chattonella antiqua. Mar.Biol. 92: 35-43

Excerpt from the literature

From: FRYER, G. - 1987: same work as above, p. 179

But to return to nauplii. These animals are badly served by freshwater ecologists. Counters try to identify adult members of the plankton. They usually can't identify nauplii so they call them just that, treat them as a single entity, and cheerfully show temporal changes in abundance, even though several species, or even members of two orders, may be present. Workers with pigeons, pheasants and sparrowhawks would never lump their chicks in this way.

VALERO, J.G. - 1986: Anàlisi del espectre proteic a la maduració d'oòcits en crustacis copèpodes. Biologia del Desenvolupament 4: 153-160

VAUPEL KLEIN, J.C. von - 1986: On articulations in the furcal setae of calanoid copepods and their role in swimming movements. Syllogeus 58: 494-501

WELLS, J.B.J. - 1986: Biogeography of benthic harpacticoid copepods of the marine littoral and continental shelf. Syllogeus 58: 126-135

WELLS, J.B.J. - 1986: Copepoda: Marine-interstitial Harpacticoida. In: BOTOSANEANU, L. (ed.), Stygofauna Mundi, p. 356-381, E.J. Brill/Dr. W. Backhuys, Leiden

WEST, G.A. - 1986: Parashiinoa mackayi gen.nov., sp.nov. (Poecilostomatoida: Shiinoidae), a new parasitic copepod from two Australian species of Pomadasys (Haemulidae). J.Nat.Hist. 20: 1339-1345

WYNGAARD, G.A. - 1986: Genetic differentiation of life history traits in populations of Mesocyclops edax (Crustacea: Copepoda). Biol.Bull. 170: 279-295

WYNGAARD, G.A. - 1986: Heritable life history variation in widely separated populations of Mesocyclops edax (Crustacea: Copepoda). Biol.Bull. 170: 296-304

1987

HIRCHE, H.-J. & R.N. BOHRER - 1987: Reproduction of the Arctic copepod Calanus glacialis in Fram Strait. Mar.Biol. 94: 11-17

Theses

ARCOS, F. - 1985: Studies on some eastern equatorial Pacific herbivorous calanoid copepods: abundance, patterns of distribution and relationships with water masses. MSc. thesis, University of California, San Diego, 83 pp.

STEIB, K. - 1985: Epidemiologie und Vektorökologie der Dracunculose in Obervolta (Burkina Faso), Westafrika. PhD. thesis, Fakultät Biologie, Universität Hohenheim, W. Germany

... from a student's test paper ...

"during the night zooplankton migrate from the depths to and area known as the euphoric zone, where light penetrates during the day."

(courtesy Rob Rippingale, Bentley, Western Australia)

DIRECTORY OF COPEPODOLOGISTS

BASKARAN, K.

Centre of Advanced Study
in Marine Biology
Annamalai University
Porto Novo 608 502
Tamil Nadu

INDIA

(Ecology of copepods of Coleroon Estuary, India. Development.)

BOEGER, WALTER A.

Dept. Biological Sciences
Idaho State University
Pocatello, ID 83209

USA

(Gill parasites of fish.)

DARO, M.H.

Lab Ecology
Free University Brussels
2 Pleinlaan
B-1050 Brussels

BELGIUM

(Structure of marine ecosystems. Vertical migration zooplankton. Diurnal feeding rhythms (particularly Copepods). Phyto-Zoo-Bacterioplankton relationship.)

HOFFMEYER, MONICA SUSANA (Dr.)

Avenida Alem 53
8000-Bahía Blanca
(Buenos Aires)

ARGENTINA

(Feeding of calanoids, morphology of mouthparts as well as chemo- and mechanoreceptors, measurements of enzymatic activity in calanoids.)

IANORA, ADRIANNA

Stazione Zoologica
Villa Communale
I-80121 Napoli

ITALY

(Vertical zonation, biomass and species composition of Mediterranean copepods.)

ILIFFE, THOMAS M. (Dr.)

Bermuda Biological Station
17 Biological Station Lane
Ferry Reach GE 01

BERMUDA

(Biogeography of marine cave copepods.)

JOHNSON, THOMAS D.

Marine Sciences Research
Center
SUNY
Stony Brook, NY 11794

USA

(Egg production, developmental stage, and mortality of Parvocalanus crassirostris.)

KIM, IL HOI

Department of Biology
Kangreung National University
Kangreung
Kangwon-do

210 KOREA (SOUTH)

(Symbiotic copepods of Korea.)

KURBJEWEIT, FRANK

Institut für Meereskunde
Kiel
Düsternbrooker Weg 20
2300 Kiel 1

FED. REP. GERMANY

(Grazing experiments of Arctic copepods on Phaeocystis pouchetii.)

MALTA, J.C. DE OLIVEIRA

Instituto Nacional de
Pesquisas da Amazonia
(INPA)
Estrada do Aleixo 1756
Caixa Postal 478
Manaus - Amazonas -
CEP 69000

BRAZIL

(Studies in parasitic copepods of fishes.)

NAIR, B. UNNIKRISHNAN

Department of Aquatic
Biology and Fisheries
University of Kerala
Beach P.O.
Trivandrum - 695 007

INDIA

(Copepods associated with invertebrates, copepod parasites of fishes.)

NATARAJAN, P. (Prof.)

Dept. of Aquatic Biology
and Fisheries
University of Kerala
Trivandrum - 7

INDIA

(Parasitic copepods of fishes: population biology, ecology, taxonomy.)

NIVAL, SUZANNE

Station Zoologique
B.P. 28
F-06230 Villefranche-sur-Mer

FRANCE

(Fertility rate and reproduction of Temora stylifera and Centropages typicus.)

RAMA DEVI, CHINTALA

Dept. of Zoology
Nagarjuna University
Nagarjunanagar 522510
Andhra Pradesh

INDIA

(Postembryonic development of diaptomid copepods.)

RAZOULS, SUZANNE

Laboratoire Arago
F-66650 Banyuls-sur-Mer

FRANCE

(Ecophysiology: Metabolism, reproduction, growth, length of development.)

VARELLA, A.M. BEZERRA

Estrada do Aleixo 1756
Caixa Postal 478
69.000 Manaus - Amazonas
Ramal-162

BRAZIL

(Systematics and larval development of parasitic copepods.)

Change of address

BARR, DOUGLAS J.

Texas A&M University
Department of Biology
College Station,
Texas 77843-3258

USA

BATCHELDER, HAROLD P. (Dr.)

Graduate School
of Oceanography
University of Rhode Island
South Ferry Rd.
Narragansett, RI 02882

USA

BATHMANN, ULRICH V. (Dr.)

Sonderforschungsbereich 313
Olshausenstraße 40
D-2300 Kiel 1

FED. REP. GERMANY

BINET, DENIS

Antenne ORSTROM-IFREMER
B.P. 1049
F-44037 Nantes, Cedex 01

FRANCE

BÖTTGER-SCHNACK, RUTH (Dr.)

Institut für Meereskunde
an der Universität Kiel
Seefischmarkt
Wischhofstraße 1-3
D-2300 Kiel 14

FED. REP. GERMANY

BRANDL, ZEDENEK (Dr.)

Institute of Landscape
Ecology
Czechoslovak Academy of
Sciences
Section of Hydrobiology
Na Sádkách 7
CS-37005 Ceské Budéjovice

CZECHOSLOVAKIA

BROWN, GAYLE SHELLEY

Dept. of Zoology
University of British Columbia
6270 University Boulevard
Vancouver, BC.

CANADA V6T 2A9

CHOW-FRASER, PATRICIA (Dr.)

Concordia University
Dept. of Biology
1455 de Maisonneuve Blvd.West
Montreal, Quebec

CANADA H3G 1M8

COHEN, ROSALIND E.

U.S. Department of Interior
Minerals Management Service
(MS 644)
Branch of Environmental Studies
18th + C Streets, N.W.
Washington, D.C. 20240

USA

GAJEVSKAJA, ALBINA V. (Dr.)

Institute of Biology
of Southern Seas
2 Avenue Nakhimov
335000 Sevastopol

USSR

GIFFORD, DIAN J. (Dr.)

Louisiana Universities
Marine Consortium
Chauvin, Louisiana 70344

USA

GUEREDRAT, JEAN-ALFRED (Dr.)

Centre ORSTOM
B.P. 81
F-97201 Fort de France Cedex

MARTINIQUE

JONGE, V.N. DE (Dr.)

Rijkswaterstaat
Tidal Waters Division
Hereweg 99a
NL-9721 AA Groningen

THE NETHERLANDS

KAZACHENKO, V.N.

The Department of Ichthyology
and Pisciculture
The Far Eastern Technical
Institute of Fishery
Lugovaya St. 52-b
Vladivostok, 690600

USSR

McALICE, BERNARD J. (Prof.)

Ira C. Darling Center
University of Maine
Walpole, Maine 04573

USA

NILSSEN, JENS PETER M.

Biology Institute
Zoology Division
University of Oslo
Blindern
N-0316 Oslo 3

NORWAY

SILAS, E.G. (Dr.)

Central Institute
of Brackishwater Aqua-
culture
12 Leith Castle Street
Santhome, Madras, 600028

INDIA

SOTO, DORIS

Lab. Limnologica
Fac. de Ciencias
Univ. de Chile
Casilla 653
Santiago

CHILE

STRICKLER, J. RUDI (Prof.)

BUMP/MBL
Woods Hole, Ma 02543

USA

TAFE, DENNIS J.

41 The Crescent
Dee Why, 2099

AUSTRALIA

VAN DE VELDE, ISABELLA (Dr.)

Koninklijk Belgisch Instituut
voor Natuurwetenschappen
Vautierstraat 29
B-1040 Brussels

BELGIUM

VUORINEN, ILPPO

Finnish Institute
of Marine Research
P.O.Box 33
SF-00931 Helsinki

FINLAND

WALKER, LINDA M.

311 Rye Road
Bradenton, Fl. 34202

USA

WATRAS, CARL J.

Center for Limnology
University of Wisconsin - Madison
Trout Lake Research Laboratory
RT, Box 76
Boulder JCT, WI 54512

USA

WEISSE, THOMAS (Dr.)

Limnologisches Institut der
Universität Konstanz
Postfach 5560
D-7750 Konstanz

FED. REP. GERMANY

WELLERSHAUS, STEFAN (Dr.)

Alfred-Wegener-Institute
for Polar and Marine Research
Columbusstrasse
D-2850 Bremerhaven

FED. REP. GERMANY

WHYBREW, DANIEL F. (Dr.)

Riemannstr. 8
D-3400 Göttingen

FED. REP. GERMANY

I hope that I am not too late to include this short notice in the forthcoming Monoculus.

THIRD INTERNATIONAL CONFERENCE ON COPEPODA

London: 10 -14 August 1987

The meeting promises to be well attended. There are at present over 130 pre-registered participants from 28 countries. Over 100 abstracts have been received and the abstract booklet is now being prepared. More than 90 % of the abstracts were correctly presented and this has made the task much easier. Thank you all for your consideration. The abstract booklet will be handed out with the Conference pack when you register on arrival.

The provisional programme of symposia, contributed paper and poster sessions, evening discussions and social events will be circulated during May to all pre-registered participants. This mailing will also include detailed travel directions for the Student Hostel and for the Conference Registration desk which will be located in the Hostel.

It is not too late to pre-register for the Conference if you have not already done so. Please contact me at the address given below for details, or look in the back issues of Monoculus. Registration fees are due by 31st May, except for overseas delegates from countries experiencing difficulties with international financial exchange. Late registration can be paid on arrival.

I am looking forwards to greeting you all at the British Museum (Natural History) in August.

Geoff Boxshall, British Museum (Natural History), Cromwell Road, London SW7 5BD.