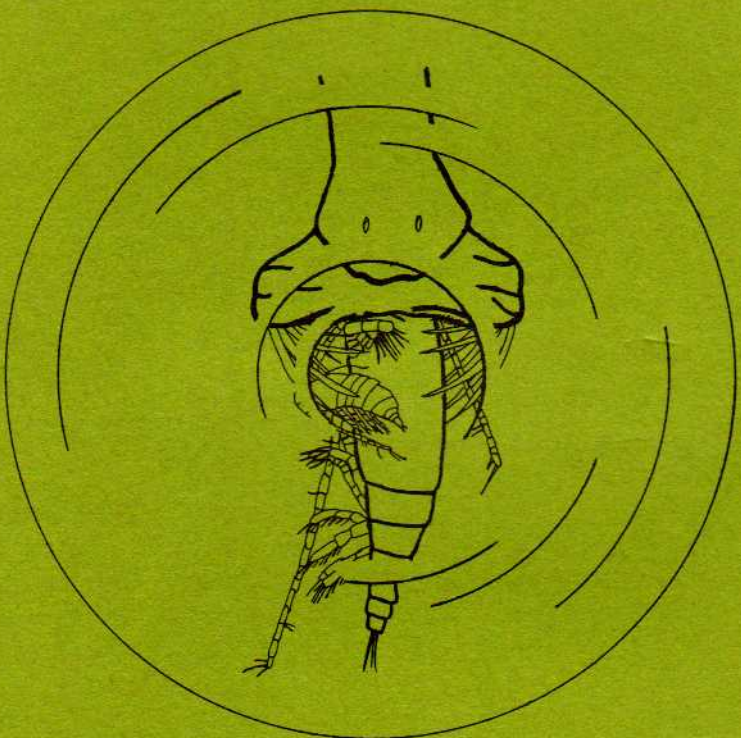
ISSN 0722-5741

# MONOCULUS

## Copepod Newsletter



Nr. 16

May 1988

bis

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

# MONOCULUS

Copepod Newsletter

Number 16 May 1988

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

Gerd Schriever, Zoologisches Institut, Universität Kiel, Biologiezentrum, Olshausenstr. 40, D-2300 Kiel, W. Germany.

Cover by: A. Salewski, Kiel. Portraits by: Juliusz Chojnacki, Institute of Fisheries, Oceanography and Protection of Sea, Kazimierza Królewicza 4, PL-71-550 Szczecin, Poland.

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.



---

*The first record of a bopyrid isopod is apparently that of Deslandes (1724), who noted a parasite infesting a shrimp in France ... This same species was finally named Monoculus crangorum by Fabricius (1798). Latreille (1802) subsequently made it the type species of Bopyrus ...*

from: Markham - 1985: Mem.Hourglass Cruises 7(3): 7

Birthdays this year

80: C. Mihai Bacescu
Sigeru Motoda

70: Thomas E. Bowman
Albert de Decker
Ingvar Kristensen

Deadline for the next issue of *MONOCULUS*: 15 September 1988

# Editorial

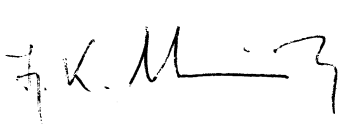
We had to neglect our '*MONOCULUS* factory' for a while. Gerd has left the Museum and has a new address now, Kurt had other priorities for a couple of months. As a consequence, this issue of the newsletter is a little late and the directory 'Copepodologists of the World' spent the winter in diapause, but there are signs that it will soon emerge from this condition.

Articles in *MONOCULUS* start to interest other publishers. Recently, Kabata's note on the disappearing type specimens of Ergasilus funduli and Thatcher's 'Hope for HYP' have been reproduced in the Biology Curators' Group Newsletter in England and Ferrari's obituary of A. Fleminger in this issue will also appear in the Journal of Crustacean Biology.

It has been decided in the meantime where our next International Conference on Copepoda will be held. A fantastic spot has been selected. It is a pity we have to wait until 1990 to go there. Don't just wait, use the time for saving a bit of money to make the stay even more enjoyable.

This newsletter is dominated by the rest of the list of current research projects compiled from the questionnaire in 1986. Some projects may not be 'current' any more but we feel the list may still be useful in showing the different research interests. For the remaining space we have received contributions from H.-U. Dahms, F. Ferrari, G.R.F. Hicks, T. Ito, H. Juhl, M. Mullin, and S.-I. Uye. J. Chojnacki has drawn the portrait of A. Fleminger. M. Pottek, a student in Oldenburg, has contributed a cartoon which was inspired by his sorting of samples from the Antarctic. B. Dussart and K. Purasjoki sent the greetings for New Year reproduced in this issue.

Many thanks to all of them for their help in producing another (interesting) issue of our newsletter.



Noted Marine Biologist Abraham Fleminger Dies

Dr. Abraham Fleminger, a long-time research biologist with UCSD's Scripps Institution of Oceanography, died yesterday, Wednesday, Jan. 13, 1988, in San Diego, California. The cause of death was peritonitis, following a kidney transplant.

Fleminger, 62, was the curator for more than 20 years of the largest and most complete collection of marine zooplankton in the world, housed at Scripps Institution. He had been affiliated with the Scripps Institution's Marine Life Research Group since 1960, specializing in studies of the ecology and distribution of marine copepods.

An outstanding quality of his scientific work was his incisive ability to see the connection between the morphology of copepods, their biogeography, and their evolution, as exemplified in his investigations of the Pontellidae. His publications include descriptions of many new species and analyses of ecological events relating to their evolution. He was known for his use of scanning electron microscopy to reveal new integumentary organs helpful in clarifying phylogeny, and discovery that sex change can take place in certain copepods when the environment changes prompted a rethinking of the population biology in this field.

Fleminger, born in New York City, on Feb. 4, 1925, was a graduate of Brooklyn College and received his master's degree and doctoral degree in biology from Harvard University. He served as a fish research biologist with the U.S. Fish and Wildlife Service from 1955 to 1960.

During his 28 years at Scripps Institution, Fleminger was the chief scientist on several biological expeditions, particularly those conducted for the California Cooperative Oceanic Fisheries Investigations (Cal-COFI), a long-term study of marine life in the California Current. He travelled extensively in the Caribbean, the Eastern Pacific Ocean, and among the archipelagos of the Indo-Pacific region, defining local species of copepods and their distributions. A species of a Japanese copepod is named for him.

Fleminger was an advisor on marine studies to several nations, through UNESCO and other international agencies and universities. He wrote numerous publications and journal articles on biological oceanography and was the editor of the CalCOFI Atlas Series. He was a fellow of the American Association for the Advancement of Science and a member of the American Society of Limnology and Oceanography and Sigma Xi.

Fleminger is survived by his wife, Joy, and his son, David Fleminger of San Diego. A memorial service will be held at Scripps Institution of Oceanography.

Scripps Institution of Oceanography

## Abraham Fleminger - Copepod Geographer

Abraham Fleminger died January 13, 1988, of peritonitis. Kidney failure and a failed kidney transplant had complicated his health problems. He was 62.

Abe is very difficult to categorize. He was a bright man, very well-read, who took an eclectic approach to research problems. He enjoyed marine biology, on occasion spoke of himself as a natural historian; copepodologist was fine, but zoogeographer/systematist is the best descriptor, I believe. Abe was interested in a wide range of fundamental problems about copepods and, more generally, marine organisms. He was knowledgeable about distributional ecology, biogeography, feeding and reproductive behavior, and structural and functional morphology. And Abe did more than just discuss these topics separately. He impressed both his readers and listeners with a unique ability to explain how concepts in one topic could be integrated with another to solve a problem in yet a third.

Abe graduated from Brooklyn College, and received a masters and doctorate (under Dr. Elizabeth Deichmann) from Harvard University. While at Harvard, Abe was influenced by the writings of Ernst Mayr. The biological species concept and allopatric model of speciation were fundamental to Abe's approach to copepod zoogeography. After completing his dissertation on calanoid copepods of the Gulf of Mexico, Abe served briefly with the U.S. Fish & Wildlife Service in Galveston. In 1960 he moved to Scripps Institution of Oceanography where Martin Johnson and his students were working on the pelagic zoogeography of the Pacific Ocean.

In his research Abe studied morphological variability among groups of copepods and attempted to correlate that variability with spatial separation of the groups. Whenever possible he tried to associate such correlations with natural history events, particularly as these events may have interrupted gene flow and shaped future populations. In his descriptions of copepods Abe was careful to establish the degrees of poly-

morphism within the species, and then used this information to provide the foundation for all further analyses.

Abe contributed to an understanding of the development and variation in primary sexual characters, but he usually focused his attention on the skeletal morphology of calanoids, because many secondary sexual characters are expressed in the copepod skeleton. Abe believed characters which separated populations were not neutral, but had adaptive significance. Reenforcement of secondary sexual characters resulted from contact between previously isolated populations; its cause was behavioral selection against hybridization, and thus gamete wastage, between populations. Pontellid copepods, like many heterarthandrian calanoids, exhibit elaborate diversity in male grasping antenna, leg 5, spermatophore coupler, and the urosome of both sexes. Abe found these variations were sufficient to allow differentiation of populations and yet structured enough to allow subsequent integration into species groups. Several amphascandrian families offered a more challenging analytical problem for Abe because clausocalanids, eucalanids, and calanids do not exhibit as striking a divergence of secondary sexual characters. With the latter two families, Abe emphasized diversity and patterns of integumental organs as aids in separating and grouping populations. A list of Abe's copepods new to science is appended. He also established two new calanoid genera, Parundinella, and the spinocalanid Isaacsicalanus with which he remembered a close friend, John Isaacs.

The geographical systems Abe studied include the oceanographic provinces of the Pacific Ocean, equatorial regions of the world's oceans, and coastal zone regions of the Americas and Indo-west Pacific. He discussed effects of the final break-up of Tethyan circulation around the Panamian isthmus on the isolation of equatorial oceanic populations, as well as their coastal zone relatives, and clarified the concept of circumglobal distributions. Abe considered Pleistocene sea-level changes as a cause of isolation of American coastal-zone pontellids, and of the historical extension of upwelling in the Flores, Timor and Banda Seas which influenced speciation of the pontellids of that region.

Abe made many basic contributions to marine science, and I believe his most significant study provides evidence for an oceanographic component of Wallacean marine diversity. In a 1986 paper Abe is at his best, integrating morphological affinity, zoogeographical distributions, and the ecology of calanoid copepods. By adding recent advances in historical geology, Abe was able to make a compelling case that the well-known diversity of marine organisms centered around Wallace's Line is as much a product of Pleistocene oceanography as it is of the movement of the earth's tectonic plates.

Abe Fleminger is remembered to copepodologists with an Atlantic Paroithona flemingeri. The boreal Pacific Neocalanus flemingeri is being described. Other species certainly will be added. But Abe's ideas, particularly his magical syntheses, will be his lasting legacy.

Frank D. Ferrari
S.O.S.C./M.S.C.
Museum of Natural History
Smithsonian Institution
Washington, D.C. 20560 - U.S.A.

(A. Fleminger's list of publications will be reproduced in the next issue of the newsletter.)

P.S. This note will also appear in the "Journal of Crustacean Biology". Frank told me how this came about (letter April 7, 1988):

*Art Humes wrote to Bill Newman about Abe's death and the availability of an obituary. Bill sent the request to Mike Mullin who heads Abe's unit, M.L.R. I had sent my MONOCULUS manuscript to Mike for review and Mike sent a copy to Art. Art then called me to ask if I would mind if he reprinted it in Journal of Crustacean Biology. I said Ok.*

*H.K.S.*

"What makes a good taxonomic description?" Report on the evening discussion at the Third International Conference on Copepoda held in London on Tuesday, August 11, 1987

The evening started with an introductory contribution from John Wells and Geoff Hicks, continued with a lively discussion summarized further below and ended with the decision to start a series of model descriptions in *MONOCULUS*. Here is a slightly shortened version of the introductory paper entitled:

THE GOOD, THE BAD AND THE UGLY,
OR THE TECHNIQUES OF TAXONOMIC DESCRIPTION

Preparing good descriptions in a form that can be published at the lowest cost has never been more important than now. The reality is that, apart from what we might require as practising taxonomists, the new global economic climate may end up forcing us to accept changes. Spiralling printing costs make it increasingly difficult to get large papers accepted; a situation likely to deteriorate before it improves. On these grounds alone therefore, we should question the need for excessive descriptive verbiage. Our aim in this paper is to give our personal views on what is strictly necessary and on what standard we are trying to achieve.

The essential purpose of a description is obvious and indisputable - it must enable the taxon to be distinguished from any other taxon of the same rank. However, there are further elements to be considered:

1. No data are irrelevant
   The description must be as useful in the future as at present, that is, it must not be confined to describing only the currently important characteristics. Detail irrelevant today may well be vital tomorrow.

2. Variability is data
   The description must provide data on variability in the populations surveyed; statistically presented if possible. We appreciate that it will always be necessary to describe

some species from one or a few specimens, but we stress that this is an undesirable practice. When a large material base is available a statistically valid numbre of specimens must be studied.

3. Pictures speak more directly than words
The description must be easy to use and thus we argue that:

   (a) Illustrations are primary. They are what users first turn to and, importantly, they stand independent of the need for foreign language skills. They must be large, clear and sufficiently detailed both for the immediate purpose and to provide data for potential future use. Authors must resist editorial pressure to excessive reduction and insist on quality reproduction wherever possible; later workers may well need to make accurate measurements from illustrations.

   (b) The text is necessary only to fill out morphological detail not able to be illustrated; provide meristic data; record and discuss variability; give ecological data where available. It should confirm important elements of the figures only if this is judged to be absolutely vital to a proper understanding of the description. For example, how important, or necessary, is it to present a fine illustration of a 6-segmented antennule and to have in the text ..."Antennule 6-segmented (Fig. 1)"? The text, therefore, should be kept to a minimum. It should also be kept grammatically simple and with a limited vocabulary so as to aid translation.

4. Beware the needs of the non-specialists
The fact that descriptions are often used for non-taxonomic purposes must continually be kept in mind. Users should be able to identify their material without the need to understand fully the taxonomic and nomenclatural ramifications surrounding each taxon. In well studied habitats, for instance, good clear whole animal drawings often are sufficient to identify conspicuous species.

In Summary:

A species description should be founded firmly on illustrations that are much better than "adequate", with the text providing only that which cannot be seen or measured from the figures.

A species description must be comprehensive, covering all aspects of anatomical, morphological, meristic, ecological and behavioural data that is available, without reference to the current importance of this detail.

We argue that if the illustrations are good enough nearly all of the relevant information can be interpreted from them, including absolute and relative measurements. In some cases, however, illustrations are not even provided. A classic example where the omission of full, illustrated descriptions has contributed to confusion and frustration is the use of preliminary diagnoses. This technique seeks to legitimise names of taxa well in advance of their full and formal description. We appreciate the reason for doing this but regret that in too many cases the subsequent full descriptions never appear. It is then left to the first reviser to clear up the deficiency. In the meantime the names exist in the literature, with few of us feeling confident of accurately identifying specimens on the basis of such cryptic, inconsequential, unillustrated outlines.

Regrettably this practice exists within the ranks of copepodologists, although more particularly, it must be said, at levels above the species in works which purport to be revisory of higher taxa. The erection in this manner of new genera, new families and new combinations, often through the medium of less rigorously refereed papers in conference proceedings, does nothing for the value of the work, the reputation of the author or, more importantly, for the stability of the science.

Each of us must be as rigorous as possible in our taxonomy. We must endeavour to eliminate contradiction and deception, and give full encouragement to solid practices of accurate description and full illustration before embarking upon revolutionary reassessments of taxa. We should do it ourselves and demand it

of others when we act as referees. Only then may we feel confident that copepod systematics is built on a firm base.

Resumé of Discussion

The ensuing lively, vigorous and wide-ranging discussion endorsed the vital importance of good, clean, clear, comprehensive and detailed line drawings. Photographs and SEM micrographs should be used to support rather than replace line drawings, one of their disadvantages, apart from cost, being the difficulty of obtaining quality xerox copies from them.

However, there was considerable disagreement on the extent of necessary textual description. The opinion ranged from a minimum "shopping list" approach (e.g. descriptions centred largely on abbreviated formulae), through advocates of a "telegraphic style" that highlights essentials, to those that believe that there is no substitute for a highly detailed and voluminous verbal description. There was unanimity that text and figures have to agree and that they must not provide contradictory information. It was felt that a good discussion is most desirable with a detailed comparison of the closest taxa.

There was general agreement that a consensus view on a model description for all Copepoda would not be possible; other things apart, each group tends to have a different set of well established conventions. But it might be possible for such a view to be reached by workers within each copepod order. Kurt Schminke concluded the discussion with the suggestion that an acknowledged expert in each group would present in *MONOCULUS* a model for critical comment. In this way a generally accepted overall standard may be reached, which would be a great service to all of us.

The audience also discussed such items as:

- Editorial policy, and the roles of editors and reviewers in setting and maintaining standards.
- Overcoming, or at least reducing, cost constraints in publishing taxonomic work.

- Techniques in microscopy, drawing and preservation.
- The type-concept; Holotype and Paratypes vs Syntypes.

Each of these topics is worthy of much more attention, and maybe they can be addressed in workshops at the next Conference.

John Wells
Department of Zoology
Victoria University
Private Bag
Wellington, N.Z.

Geoff Hicks
Department of Crustacea
National Museum of N.Z.
Private Bag
Wellington, N.Z.

P.S. In the next issue of *MONOCULUS* we shall start with a model harpacticoid description which then is free for critical comment.
Incidentally, Dr. H. Kunz (Saarbrücken) has recently produced an inventory of whole animal drawings of all genera of Harpacticoida he could find in the literature. This collection of xerocopied portraits of whole animals demonstrates that there are many genera of which no portraits are available. Those that exist, mostly are very poor and practically of no use even though many genera have such distinctive features that non-specialists would have no great difficulties in identifying them from whole animal drawings would these be proper enough. Good whole animal drawings are time-consuming, I know - but see above under "Beware the needs of non-specialists"!

H.K.S.

## $A^{N}N_{O}U^{N}C_{E}M^{E}N_{T}S$

### FOURTH INTERNATIONAL CONFERENCE ON COPEPODA

The Fourth International Conference on Copepoda will be held at Karuizawa Seminor House of Nihon University, Karuizawa, Nagano Prefecture, from September 16 (Monday) to 20 (Friday), 1990. Karuizawa is located 1,000 m above sea level, enjoys