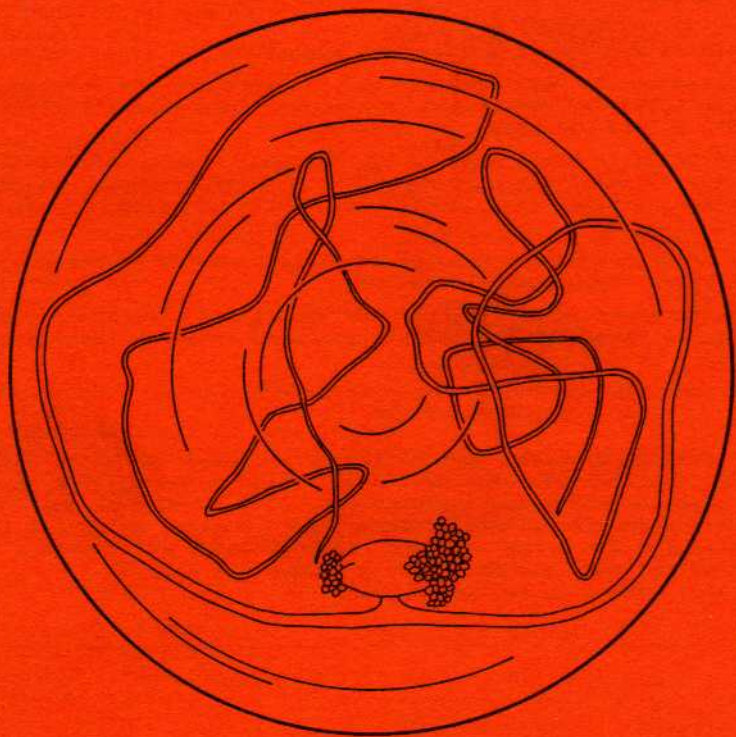


# MONOCULUS

copepod Newsletter



Nr. 21

November 1990



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# MONOCULUS

## Copepod Newsletter

Number 21

November 1990

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With reference to the application by Professor H. Munro Fox (1951, Bull.Zool.Nomencl. 2: 37-39) I am of the opinion that the generic name Monoculus Linnaeus, 1758, should be suppressed under the plenary powers before someone selects a type species for the genus so named, and, by doing so, upsets a long-established and universally understood name. In vain, Joshua L. Baily, in vain!

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### Died:

Otohiko Tanaka (1902 - 2 August 1990)  
(see *MONOCULUS* 15: 10-13 for vita)

Takahisa Nemoto (1930 - 22 August 1990)

Deadline for the next issue of *MONOCULUS*: 1st April 1991

## Editorial

The first issue of *MONOCULUS* appeared in October 1980. It had 15 pages and was sent to 393 people. Since then twenty further issues have appeared and in the past ten years the newsletter has become a regular and normal element in every copepodologist's professional life, in fact, so normal that when asked to write down for this birthday issue what feelings are provoked when the newsletter arrives, almost nobody reacted. This unrepining acceptance we interpret as a sign of good health and as a tacit agreement with the present concept of the newsletter offering a mixture of information and entertainment.

One change, however, is unavoidable since it has been decided on the last meeting at Karuizawa. You have received 21 issues free of charge now but unless you become a member of WAC this will be your last issue! When the decision was announced at the conference a long queue formed immediately in front of the treasurer's desk. We saw it with great satisfaction. Why should so many colleagues rush for membership if not for fear of losing the newsletter? If you feel the same don't miss page 2 of this issue for further information.

The *MONOCULUS*-community thus is merging with the fellowship of the "World Association of Copepodologists". What were hopes at the beginning has finally become reality. Remember what F.D. Por wrote in the first issue: *"Much primordial work has to be done -- first of all a listing of all the copepodologists eventually reaching a three-digit figure, this should not be easy. ... We shall then have to go down to organizational items. Should we, for instance, establish a permanent organization, or restrict ourselves to a sequence of scattered meetings? Should we content ourselves with a modest and thin newsletter or dare to think of a computer-produced bibliography and directory?"*

We have achieved all this, only the number of copepodologists has not reached a three-digit figure yet, thank goodness. We have regular meetings, we have not too modest a newsletter. We

have an up-to-date directory. We have a computer-produced bibliography well underway. We have a permanent organization. Not bad, hey? Someone has to sit down now, we are afraid, and write the programme for the next ten years. Volunteers?

Karuizawa has been a marvellous conference. We all met under one roof and decided to stay under one roof from now on, the WAC. It is therefore important that everyone knows the rules of the society and his own status. We have devoted a few pages of this issue to bring together all the relevant information. If you want to continue to receive the newsletter, please remember: No member of WAC? - no newsletter anymore. Added to this issue you will find a form to apply for membership of the Association. Don't forget!

This is the first issue that has not enough space for all the contributions offered. We regard this as the finest birthday present. We had planned to make an index for the twenty previous issues to remind you of all the information already published. This has, however, to be postponed until the next issue as also have a few articles received already. For help with this issue we have to thank R. Böttger-Schnack, C. Cheng, C. Corkett, M. Grygier, S. Nishida, J. Orsi, J. Sieg, C. von Vaupele-Klein who used the typewriter, while M. Pottek and B. Schumacher used the pencil for their contributions. One drawing has been pinched from the invitation of the University of Amsterdam for a meeting on occasion of J.H. Stock's retirement. May those who know the anonymous artist convey him/her our thanks and greetings.

Enjoy the birthday issue of our newsletter as we enjoyed putting it together. Ten years the same editors, we admire you.

J. K. M. - 3

J. Schumacher

The l e t t e r b o x

Birthday letters

Birthday letters

C. CHENG (Xiamen, Fujian, P.R. of China):

*Thank you for the regular sending of MONOCULUS for the past two years. First of all, I would like to offer my hearty congratulation on the 10th anniversary of MONOCULUS in October 1990 which is a unique journal in the field of copepodology, giving a lot of interesting information of all sorts to copepodologists throughout the world. I am particularly interested in the personal news including birthday and death, obituary, change of addresses and occupation, particularly the research activities and achievements, etc. I would also like to read the abstracts of important papers presented at the forthcoming conference of copepodology held in Japan in September this year, which I am unable to attend owing to my advanced age (80 next year) and failing health. I am looking forward to reading all sorts of news about the conference in the next issue of MONOCULUS.*

Ruth BÖTTGER-SCHNACK (Kiel, Germany):

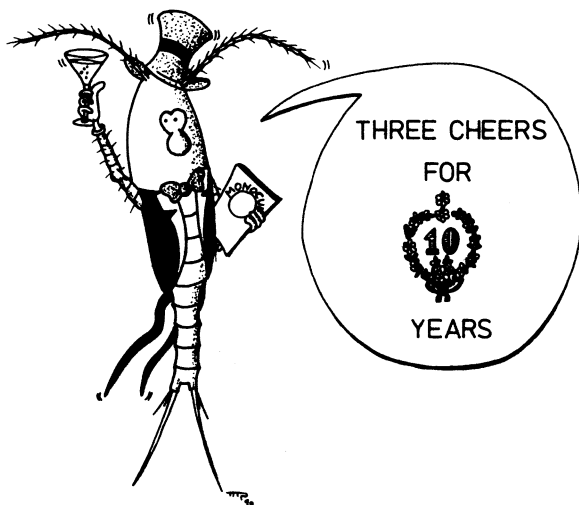
*When I read the editorial of the last MONOCULUS issue (No. 20), which claimed the 10th birthday of this newsletter, I immediately wanted to respond saying what a wonderful and informative newsletter it is and how much I like it. But I was occupied with many other duties and so I postponed writing the letter to the next day and then to the next week and so forth...*

*When I met you at the Fourth International Copepod Conference at Karuizawa, you told me that most MONOCULUS readers must have reacted like me, because you had received only one letter*

referring to this topic until then. WHAT A SHAME !! So here comes my belated letter saying HAPPY BIRTHDAY ! and telling you how much I acknowledge the work you have done during the last ten years to keep this newsletter alive. MONOCULUS is such a lively and informative journal. I enjoy the easy reading style, and I like the informative announcements and interviews as well as the discussions on methodological problems (e.g. on taxonomic descriptions).

I think this newsletter has done a big deal in bringing the worldwide distributed members of the family of copepodologists closer together, and I hope it will continue doing this in the future.

THREE CHEERS and all my very best wishes.



A.C. COHEN (Los Angeles, U.S.A.):

I am grateful to receive MONOCULUS and would like to continue to do so. I have enjoyed the discussion on a model description and favour as much detail as can be afforded efficiently.

*After finishing my copies I donate them to the reprint library in the Crustacea dept. here (Natural History Museum of Los Angeles County).*

#### A family under one roof

It was with great expectations that I travelled to Japan. When I was about 16 years old it was my dream to go there. In those days I read what books and pamphlets I could get on Japan. I had a pen-friend with whom I exchanged letters regularly for a few years. Some of the decorations in my home remind me of this period. They were little gifts received for New Year.

Why on earth is our conference to be held in a small place up in the mountains? I had been asking myself before landing in Japan. When I left the plane at Narita Airport it became clear at once. In Tokyo it was terribly hot and the air-conditioned train that took us to Karuizawa let us feel already what it would be like up there. We had a pleasant trip of about two hours while most of the others had booked a bus transfer which took eight hours due to traffic jams and other obstacles. At the railway station S. Nishida awaited us with a group of students and gave a first example of the perfect organization of the conference. *"Immediately after the conference in London"*, Shin-ichi Uye, the local secretary, told me later, *"we had a national meeting deciding on who would be responsible for the preparations. S. Kadota became the chairperson. I was appointed local secretary, S. Nishida was allotted the domain of domestic affairs (meaning money, I guess - H.K.S.). J. Hiromi, the late T. Ito, K. Nagasawa, and M. Omori joined the organizing committee later. It was Kadota's idea to choose Karuizawa Seminar House for the conference. He is actually Dean of the School of Agriculture and Veterinary Medicine of Nihon University to which the Seminar House belongs."*

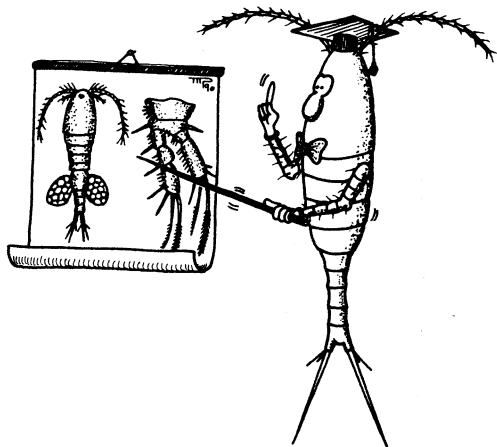


This house is basically built in the Japanese style and to live in it meant for us foreigners to adapt to a few unusual habits. "Please take off your shoes", we were asked on our arrival. We had to exchange them against a pair of slippers waiting for us in a locker in a special room adjacent to the entrance. These slippers were a bit small but one became used to them after a while. They had to be taken off when entering the tatami room. Tatami is a kind of straw mat on the floor on which we were asked to settle for the night. On it we had to spread our futon, explained to us as a kind of mattress with quilts. The futon and a pillow had to be covered with sheets and to be stored in the oshi-ire, a wardrobe, during the day. Before slipping into this terrestrial bed we were expected to wear a yukata, a dressing-gown held together by an obi or cotton belt. The yukata is without buttons or zip-fastener. We were admonished to keep the obi tied neatly so that the yukata does not flap open at the front. Also we should wear it with the left side over the right, right over left being used for dressing corpses. In Japan yukatas are provided but no towels leaving some of us wondering whether they should use their pyjamas as such. But we had not to worry, the organizers had foreseen the dilemma.

The Karuizawa Seminar House turned out to be the ideal meeting place with everything required under one roof. Grouped around a central lounge are the entrance hall, an auditorium, the dining hall, conference rooms in the first floor, and the floors leading to the sleeping rooms. In this lounge S.-i. Uye and S. Kadota were able to welcome 52 guests from abroad and 49 domestic participants. One of the reasons to go to Japan with the conference was the fact that there are so many copepodologists but always only a few when we meet elsewhere. *"Why we are so many? Copepods are important as food for fish. In Japan", S.-i. Uye said, "we depend on marine food. You will have noticed that most of us are marine planktonic copepodologists. Only a few work on parasitic or freshwater copepods."*



The bathrooms were also completely Japanese style, of course. In some there were two separate tubs, one moderately hot, the other super hot. You wash and rinse yourself before entering these bathtubs. No soap allowed in them. They are for warming and relaxing only. I didn't need them during the conference which I found inspiring and relaxing enough. I learned a lot on planktonic copepods, liked the discussions revolving round the new phylogeny of Copepoda presented at the conference, enjoyed the



excursion to Mt. Asama despite rainy intervals, and was curious every time I entered the dining hall. The meals were unusual, some bizarre, but all tasted well. The conference dinner, also Japanese style of course, was superb. What an atmosphere that evening! It was easy to make contacts with our Japanese colleagues of whom the older ones can't travel far anymore and of whom many of the younger ones have never had an opportunity to do so yet. *"Many of the Japanese colleagues have no experience in presenting a paper on an international meeting"*, I was told by S.-i. Uye, *"and in particular in doing this in English. But this meeting is so family-like that many Japanese beginners feel encouraged to approach copepodologists from foreign countries without hesitation."*

Yes, we became a big family because we lived all under one roof, did not disperse in the evenings, had ample opportunity to make contacts and to sit together to chat and discuss. We were so well looked after and everything was done when pro-

blems arose. We wanted to demonstrate our Copepoda data-base but could not get through to our computer in Cologne (Germany). So S. Nishida tried everything and did not give up until finally the connection was established. *"We could help 29 people in various ways"*, S.-i. Uye explained, *"for some we paid the travel expenses, the living expenses during their stay for others, and some had their registration fee waived."* This is an impressive achievement.

The conference did end with the general meeting of the WAC and the Maxilliped Lecture by J.H. Stock on "Some reflections on the antiquity of the copepod lineages". The president for the next three years is Arthur Humes (Woods Hole), vicepresident is Geoff Boxshall (London). General Secretary and treasurer have not changed. The next meeting in 1993 will be in Baltimore (U.S.A.) Brian Bradley is the local secretary. It was decided to restrict the newsletter to members of WAC only, beginning with the spring issue 1991 (No. 22). It is mailed to well over 650 people at present, only 321 are members of the WAC.

Looking back it was a wonderful meeting. Even S.-i. Uye admitted: *"I had time to listen to lectures because the supporting staff of students was so marvellous."* When I had left behind tatami, futon, yukata and slippers and sat in the train to Tokyo, I felt that my expectations had been exceeded. I almost even witnessed my first typhoon. Its destructive force was shown in TV but it did not reach Karuizawa. I regretted not to have more time for further travelling in Japan. All the warnings that Japan is terribly expensive I found wrong and it is a pity that many have stayed away because of this prejudice.

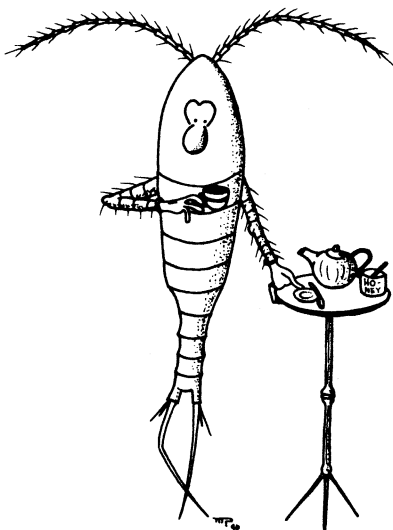
There are some new decorations at my home now reminding me of this conference.

H.K.S.

FIFTH INTERNATIONAL CONFERENCE ON COPEPODA

I have discussed the possibility of having the 5th Copepoda Conference in Baltimore in 1993 and it seems OK. I do not have a local Committee since I have not asked everyone. Frank Ferrari, myself, Shin Ichi Uye and you and Gerd can be listed. I will be adding a couple more.

The meeting will be held at the University of Maryland Baltimore County, Southwest of Baltimore, Maryland, 15 min. from Baltimore Harbor, 8 min. from the airport and about 1 hour from Washington, D.C. by car and subway. The dates will be June 5 to June 10, 1993. There will be lots to see and do for registrants and accompanying persons.



I am hoping to have more posters at the next meeting and no concurrent sessions. Also, I suggest that each session consist of a keynote speaker and contributed papers - the keynote speakers would choose the papers. Some papers could be assigned to poster sessions - arranged by topic.

I intend to use *MONOCULUS* for publicity and also send some letters to people who were not at Karuizawa. At least we can say that the new State of Germany is safe from hordes of Copepodologists until 1996!

B. Bradley  
The University of Maryland, U.S.A.

Jan Hendrik Stock

Jan Hendrik Stock

Interviewing copepodologists



Jan Stock is renowned for his cunning and well-aimed remarks. *"He could as well have read from a telephone book"*, was his comment on a lecture trying to summarize the state of knowledge of a particular group of Crustacea from a particular geographical area. Hardly a conference where he is spared the remark *"These folks should treat biology with statistics, not as statistics"*. He doesn't like sweet foods we learn from a not too serious article published recently on the occasion of his retirement as professor of the University of Amsterdam. When offered jam he will decline saying "I have already had jam - earlier this year."

We didn't even have a drink when we sat down for this interview after it was all over. Conference time is busy time not only for the local organizers but for the president of WAC as well. Jan Stock has done a lot for copepodology. He has or-

ganized our first conference in Amsterdam, the proceedings of this conference appeared under his editorship in *Crustaceana*, he served as first elected president of WAC, and he has made hundreds of copepods happy by giving them a name and numerous copepodologists by providing information on their biology, distribution and phylogenetic relationships. While we sat in that bare and uninviting chambre séparé faintly hearing the chatter of the others having drinks in the lounge he told me the story of his triple engagement.

Chapter one went like this: "I was a student assistant at the Zoological Museum when in 1949/50 there was a Mytilicola explosion in the Netherlands. It became of interest to know whether a similar event in 1870, commonly known as 'the shell disease', had been caused by the same agent. I asked whether bivalve specimens collected in 1870 were available in the Museum. They were, but as I had no idea what Mytilicola looked like, before opening the shells I went into the field to have a look. I then returned into the Museum, looked in the guts of the old bivalve specimens and found no Mytilicola. The 'shell disease' must have had a different cause and it was later found what that was. While in the field I had opened several different bivalves like Macoma, Mytilus, Cardium and others discovering in them species of Modiolicola and Paranthessius, some of which turned out to be new to science. Later while working in Roscoff for my masters on chemoreception of sea spiders I continued opening molluscs looking for copepods. In Roscoff I met Bocquet who then was working on copepods from echinoderms. Together with him I have published a long series of papers on copepods. When this started I was still a student and the articles were in French."

Chapter two dealt with Pantopoda: "My very first publication was a key to the sea spiders of the Netherlands. They had been looking for someone to do the job and my supervisor at the Museum had encouraged me saying 'Take the sea spiders, there are only ten species'. Matters turned out not to be that

*simple when I later made a compilation."* Sea spiders accompanied him through his master's and Ph.D. thesis which dealt with sea spiders from the Antarctic collected on various expeditions in the thirties.

Chapter three described the consequences of a project of the inland water shipping authorities which offered some money for a survey of the North Sea Canal. *"There had been complaints by farmers that salty water was penetrating more and more inland spoiling their soils. Studying the distribution of amphipods with differing salinity tolerances could provide indications whether this is so. My first station yielded a Corophium species to which Schellenberg's illustrations did not fit. It turned out to be a new species, the only new one in the survey. I called it multisetosum. It is characteristic of low salinity and had previously always been confounded with Corophium volutator".*

Copepods, pantopods and amphipods: Jan Stock has worked on all three groups all his lifetime. In his understatement: *"At least I kept my card files up to date."* As his list of publications shows there is hardly a year since 1952 where he has not published on all three of them simultaneously. Apart from a few papers written on isopods and thermasbaenaceans he has produced to date 123 publications on copepods, mainly parasitic ones, 102 on amphipods, and 78 on pantopods. Such expertise in several different groups at a time is the exception today.

*"After the war we were so many, but we were told 'when you are interested you have a chance', and most of us had indeed. People today should remember that! What is good, comes young",* is another one of his sayings. It is the dedication to the subject that counts. *"If you want to earn money become a dentist."* He didn't. His scientific career started when he was a student assistant at the Museum. Later he became research assistant and then curator of Crustacea at the Museum. In the

early sixties he was a guest lecturer at the University of Puerto Rico. He knew the West Indies already from collecting trips after his Ph.D. In 1968 he became Professor of Systematic and Geographic Zoology at the University of Amsterdam.

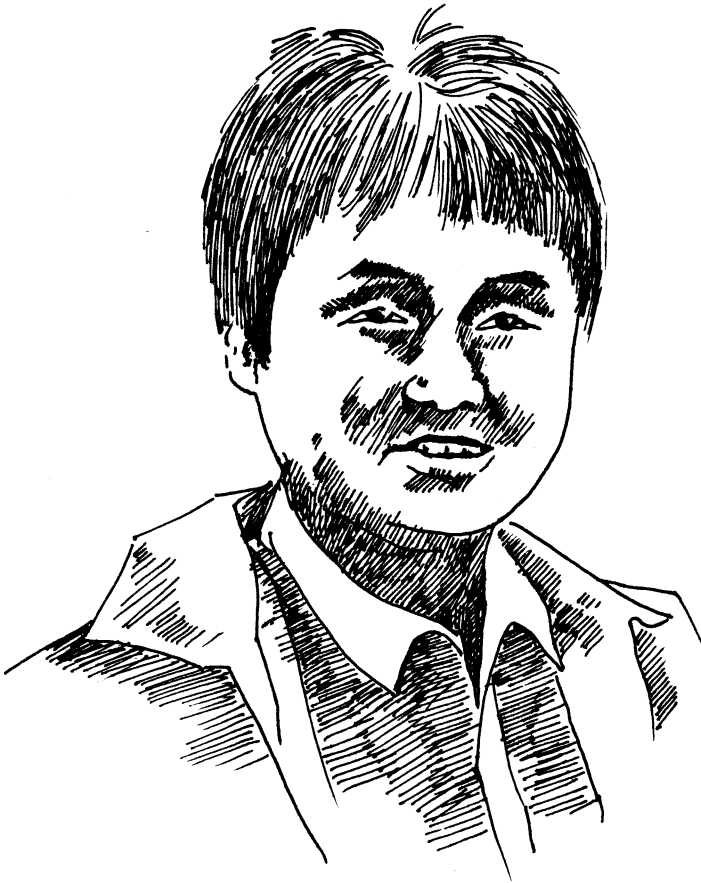
In the early seventies a major shift took place in his scientific interests. All of a sudden papers appear on the groundwater fauna of the West Indies which culminate in a long series of publications by himself and other authors under the heading of "Amsterdam Expeditions to the West Indian Islands". *"It all started in 1973 when I was working on parasitic copepods of coral reefs in Curaçao. The rumor was spreading in the population at that time that the groundwater grew saltier and saltier because Shell Oil refineries pumped up too much water for cooling. Therefore the company looked for someone to compare the actual groundwater fauna with results of an investigation carried out in the early thirties by Wagenaar-Hummelinck. I became interested and during my survey discovered so many remarkable species that I started to ask for grants. By the way, my work showed no difference between the 1930s and the 1970s."*

"Insular groundwater biotas - a biogeographic synthesis" was the valedictory lecture entitled that he gave during a ceremony on the occasion of his retirement. He has decided to leave the metropolitan area of Amsterdam and settle in a house on the countryside. *"I want to carry on groundwater work. We want to make a census of the present day status of the distribution and presence of groundwater animals in tropical and subtropical islands of the Atlantic. This we want to link up with the geology of the area. If sea levels rise as many predict the groundwater of the islands will be disturbed or changed. In forty years' time it will be important to know whether there have been changes in its fauna. First I shall finish on these grants. Copepods? Yes, I have own material from Madagascar, the Red Sea, and the West Indies waiting to be worked up."*



You want another one of his famous remarks to finish this interview? When he saw me arrive at Karuizawa with the result of my recent reproductive success and heard me muttering something to the effect that this has been a rather late event, he commented with a merry twinkle: *"Early ripe, early rotten."*

H.K.S.



TATSUNORI ITO  
1945-1990

On April 8, 1990, Dr. Tatsunori Itô of the Seto Marine Biological Laboratory, Kyoto University, 45 years of age, apparently took his own life by jumping from a sea cliff in Shirahama, near his laboratory. His body having been found and identified on May 9, Dr. Itô's funeral was held in Sapporo, Hokkaido, on May 13. He is survived by his wife and a son and daughter.

Tatsunori Itô was born in Sapporo on January 26, 1945, and he graduated from Sapporo-Kita High School in 1963. He completed his undergraduate studies in the Faculty of Science of Hokkaido University in Sapporo in 1967 and continued there as a research student for an additional year. In 1968, he was appointed Instructor in the Zoological Institute of Hokkaido University and began his doctoral studies on harpacticoid copepods under the direction of Prof. Mayumi Yamada. His D.Sc. was awarded on September 30, 1975, for a thesis on the family Harpacticidae in Japan. Dr. Itô spent a year overseas in 1976-77 as a Visiting Research Fellow at the Naples Marine Biological Station, and upon his return to Hokkaido University he was promoted to Lecturer in the Zoological Institute, a rank he kept until 1981. Then he took a new job as Associate Professor at the Seto Marine Biological Laboratory of Kyoto University, and held this position until his death. He made another extended foreign trip in 1987, including three months as a Visiting Investigator at the San Diego Natural History Museum, where I first met him in person. In 1988 he took part in a Sino-Japanese limnological expedition in China.

Three main themes can be recognized in Dr. Itô's scientific work: Harpacticoida, Facetotecta, and crustacean phylogeny. Between 1968 and 1981 he published an eight-part series of taxonomic papers on the marine harpacticoid copepods of Hokkaido and by 1985 he had also written over 20 other mostly taxonomic papers and several abstracts on principally Japanese

harpacticoids. A few of these papers concerning fresh-water or non-Japanese forms were coauthored. In this period he also published a few papers on microcerberid isopods and in the late 1970's he was a member of the Board of Correspondents of the meiofauna newsletter "Psammonalia". Dr. Itô's artistic standards and abilities were high, and his style of illustration has been cited as exemplary by several contributors to the ongoing "model description" discussions in *MONOCULUS*. Many of his papers emphasized developmental features particularly of copepodids, such as the ontogeny of the antennules and thoracopods, and setal homology by formation. Dr. Itô was a pioneer in this line of research whose more recent advocates include Ferrari, Dahms, and Fiers. He was also interested in harpacticoid biogeography.

Around 1984 Dr. Itô's taxonomic activities changed as he took up a study of the Facetotecta or Hansens' γ-larvae. Occasionally with coauthors, he published from one to four papers or abstracts annually on these enigmatic planktonic larvae with no known adults. It was in connection with this work that I first began to correspond with him, and from 1985 on I was asked to check the English in most of his manuscripts. The work on the Facetotecta has been very interesting to carcinologists at large. Dr. Itô has shown that these larvae are not necessarily rare curiosities, but can be diverse, abundant and easy to maintain in the laboratory. Unfortunately, the work was left incomplete, since he had not yet published many results of his rearing work and, furthermore, Dr. Itô was very disappointed not to have discovered any adult facetotectans.

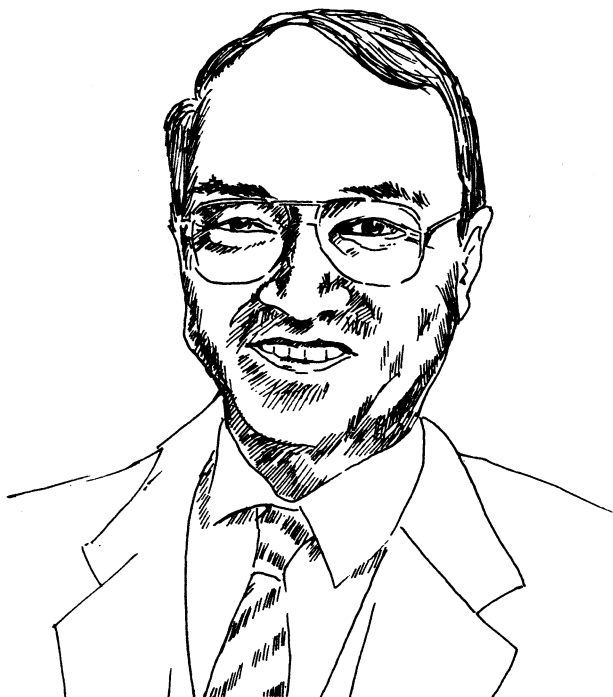
The third major portion of his work consisted of controversial phylogenetic speculations about crustacean morphology, particularly involving copepods. This began in 1982 with a paper on the origin of copepod legs, which was followed by similar papers involving the Tantulocarida, Leptostraca, Cephalocarida, and Remipedia. These papers often included new information based on scanning electron microscopy. The remipede work was done in conjunction with Dr. Frederick R. Schram, and Dr.

Itô's efforts to determine the affinities of the Facetotecta led him to make some studies of ascothoracidans, in which I also took part. His most recent unpublished discovery, communicated to me a few weeks before his death, was the first Japanese tantulocaridan, parasitic on a misophrioid copepod from Okinawa. His phylogenetic work earned Dr. Itô an invitation to the 1990 International Workshop on Crustacean Origins and Evolution in Sweden, which he unfortunately did not live to attend, and where his absence was palpable. Dr. Itô attributed the controversy surrounding some of his papers to a lack of understanding of "similarity-oriented" Japanese scientific logic by "difference-oriented" Western scientists. Once in Kyoto he tried to illustrate to me the difference between these philosophies with reference to an assortment of hand-thrown (i.e., non-identical and not geometrically perfect) ceramic dishes in a shop window.

At the Seto Marine Biological Laboratory, Dr. Itô had teaching and administrative duties, and for several years he has had a graduate student, Hirokuni Noda, studying marine tardigrades. Dr. Itô had recently made a start at improving the museum facilities at the Laboratory and had a scanning electron microscope installed. He was editor-in-chief of the Publications of the Seto Marine Biological Laboratory and has been involved in publishing a Japanese translation of the International Code of Zoological Nomenclature. He attended the First International Copepod Conference in Amsterdam and was to have chaired a mini-symposium in and edited the Proceedings of the 1990 Conference in Japan; after his death the mini-symposium became an homage to him and his work. He had been the Asian Regional Governor of the Crustacean Society through 1989 and was a member of several Japanese and international scientific societies.

Mark J. Grygier, Silver Spring, USA

(List of publications of Dr. Tatsunori Itô to be published in the next issue.)



TAKAHISA NEMOTO  
1930-1990

Dr. Takahisa Nemoto, a biological oceanographer, died of lung cancer on 22 August 1990 at the age of 59.

Dr. Nemoto was born on 28 October 1930 in Tokyo. After graduating from the Department of Fisheries, the Faculty of Agriculture of the University of Tokyo in 1953, he joined the staff of the Whales Research Institute. During his career of 13 years at the Institute, his main research interest was on the ecology of euphausiids and copepods as major food items of baleen whales. As a result of this research, he was awarded a degree of doctor of agriculture from the University of Tokyo in 1958. His doctorate thesis entitled "Foods of baleen whales

with reference to whale movements" is widely considered a major contribution to the field. In addition to this line of research, he was also interested in the diatom flora on the skin of whales from the very beginning of his career, with an attempt to resolve migratory history of whales. This led him to realize a necessity of precise identification of these diatoms, and his efforts in cooperation with his colleagues and other specialists resulted in several taxonomic papers on pennate diatoms. This research is being succeeded by his co-workers.

In 1967 he was appointed associate professor of the Plankton Division, the Ocean Research Institute of the University of Tokyo and engaged in research and education on biological oceanography. He was promoted to a full professor in 1982 and has served as director of the institute from 1986 to 1990. During his tenure at the University, he extended his research on euphausiids to the feeding ecology and the functional morphology of feeding appendages and foregut, covering all the euphausiid genera. In recent years, he focused his research on the distribution and life history of the key species of meso- and bathypelagic macrozooplankton and micronekton, a subject regarded as important but had not been properly investigated. He published papers on this subject for squids, fishes, euphausiids, shrimps, amphipods and copepods on the basis of samples collected from various parts of the world oceans including the northern North Pacific, the East China Sea, the Antarctic and Japanese coastal waters. He also directed and encouraged the researches of his graduate students on various aspects of biological oceanography. These include life histories of pelagic shrimps and mesopelagic fishes, feeding ecology of pelagic copepods, functional morphology of euphausiid feeding, population genetics of chaetognaths, life histories of pelagic amphipods and parasitic copepods, and ecology of oceanic nanoplankton and red-tide phytoplankton. It is also well known that a series of his research work on euphausiids led to the planning and implementation of an inter-

national research programme in the Antarctic called BIOMASS. In 1978, he was awarded Gold Medal of la Société franco-japonaise d'Océanographie for his research on ecology of euphausiids. He has been president of the Oceanographical Society of Japan since 1989 and was vice-president of the Plankton Society of Japan from 1987 to 1989.

During his productive research career, he published over 100 scientific papers on wide-ranging topics and problems, which include an array of suggestive and stimulating studies on copepods and related subjects. His papers on the gut chlorophyll pigments of euphausiids (1968) and copepods (1968, 1972) are particularly important. In these papers, he made the first attempt to use gut pigments as an indicator of feeding activity of zooplankton. This method is later refined by his successors and now widely used as a powerful tool in estimating in situ feeding activities of copepods. He also suggested the importance of particles containing degraded phytoplankton as food of meso- and bathypelagic animals, which has been confirmed by recent workers.

Dr. Nemoto engaged in research works and education in the field of biological oceanography with enthusiasm and distinguished achievement, and also contributed greatly to various national and international activities of oceanography. The passing away of Dr. Nemoto is very much regretted by all who know him. He is survived by his wife, Kazuko, his daughter, Hisako, and his son, Takeshi.

Shuhei Nishida, Tokyo, Japan



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#### THE WORLD ASSOCIATION OF COPEPODOLOGISTS

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##### 1. Officers

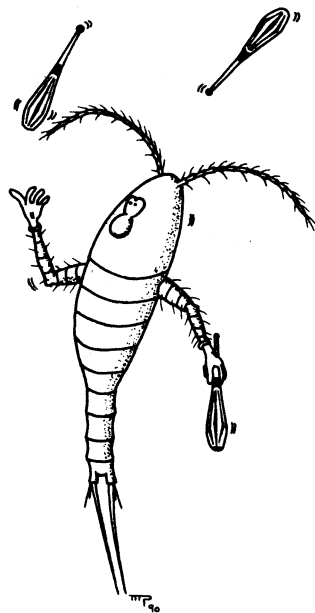
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Germany

## 2. Founder members

At the beginning of August 1987 all members that were on the MONOCULUS mailing list turned into founder members (article 1 of the By-laws). This was a "once only" event and it is not possible for others to now join the WAC as founder members.

## 3. Active and candidate members

Any person interested in any aspect of the study of Copepoda is eligible for membership of the WAC. Applicants for membership must be nominated by two active or founder members of the Association, those who have completed this application process are known as candidate members. A list of candidate members will be presented by the Executive Council to the membership during the business meeting of the WAC and candidate members who are ratified by the quorum of the business meeting become active members. If you are interested in becoming a member of the WAC write to the General Secretary (Chris Corkett) for application form and other information. Note the application form asks for signatures from two members. If this will cause you difficulty please inform the Gen. Sec. who may be able to obtain them for you.

#### 4. Dues

Dues are payable by founder, active and candidate members. You may ask the Executive Council to have your dues waived or reduced (Article 10 of the By-laws) by letting the President know what these reasons are.

Dues are at 9 US \$ (or 13.00 DM) per annum and may be paid in person at WAC conferences. Europeans may send their personal euro-cheques in German Marks. Americans and Canadians should send their personal cheques, while all the others should use international money orders or bank drafts in US \$ and make them payable to the following account:

No. 7233190, Commerzbank Kiel, mark "WAC, c/o Dr. G. Schriever".

Dr. Gerd Schriever  
c/o Zoologisches Institut  
Biologie-Zentrum  
Universitat Kiel  
Olshausenstr. 40  
D-2300 Kiel 1  
GERMANY

Those who want to pay by postal money order may use the following account:

No. 346508-303, Postgiroamt Hannover, mark "c/o Dr. H.K. Schminke".

Members who are more than two years in arrears will automatically have their membership terminated and will no longer receive *MONOCULUS*.

Dues may also be paid in US\$ cash.

#### 5. List of members

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 --- **BELGIUM:** Bergmans, Daro, Demeulenaere\*, Fiers, Huys, Maas, Revis, Tackx --- **BRAZIL:** Almeida-Por, Alvarez, Björnberg M.H., Björnberg T.K.S., Carvalho, Hadel, Malta, Robertson, Rocha, Santos Silva, Schutze, Thatcher, Varella --- **BULGARIA:** Naidenow --- **CANADA:** Chapman, Chisholm, Chow-Fraser, Conover, Corkett, Crawford, Davis, Deets, Escribano, Fernando, Fontaine, Fulton, Galbraith\*, Gannon, Gardner, Grainger, Gustavson, Harding, Hogans, Kabata, Le Brasseur, Locke, Marcogliese, Mayzaud, McLaren, McQueen\*, Rainville, Roff, Sevigny, Shih --- **CHILE:** Castro-Romero, Maren --- **DENMARK:** Bresciani, Kiorboe --- **ECUADOR:** Arcos --- **FINLAND:** Purasjoki, Sarvala, Vuorinen --- **FRANCE:** Bodin, Boucher, Defaye, Dussart, Hipeau-Jacquotte, Lescher-Moutoue, Monniot, Poulet, Razouls, Rouch, Seguin --- **GERMANY, FED. REP.:** Ahnert, Barthel, Beckmann, Brenning, Böttger-Schnack, Dahms, Diel, Glatzel, Grau, Hulsemann, Janetzky, Keim, Kohlhage, Kunz, Kurbjewit, Lenz, Mielke, Noodt, Rieper-Kirchner, Schiel-Schnack, Schminke, Schriever, Schulz, Schwenger, Sieg, Steib\*, Stich, Tiemann, Uhlig, Wellershaus --- **GREAT BRITAIN:** Barnett, Boxshall, Bron, Conway, Fryer, Gamble, Geddes, Gee, Gotto, Green E., Green J., Gresty, Hamond, Harding, Harris, Hay, Lindley, O'Reilly, Thompson, Ward --- **HUNGARY:** Forro, Holynski --- **INDIA:** Arunachalam, Bhattacharya, Chandran, Godhantaraman, Madhupratap, Meenakshikunjamma, Nair, Radhakrishnan, Rama Devi, Ranga Reddy, Roy, Shirgur, Stephen --- **INDONESIA:** Arinardi --- **IRELAND:** Holmes  
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 --- **RWANDA:** Citarella --- **SOUTH AFRICA:** Grindley, Hart, Heeg, Oldewage, Rayner --- **SPAIN:** Fernandez de Puellas, Soler-Torres  
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## 6. Mailing list

Gerd Schriever keeps the official mailing list of members and names of those who have paid their dues. If you change your address or have a query about your dues you should contact Gerd.

## 7. Bylaws

(To be published again in the next issue.)

## 8. *MONOCULUS*

All founder, active and candidate members receive the newsletter *MONOCULUS*. The newsletter will be sent free to some individuals in some countries that have difficulty in obtaining foreign currency.

## 9. *MONOCULUS*-Library

The library has been built up in conjunction with the project of a computerized bibliography of copepod literature (see Crustacea Database below). It contains about 10,000 documents (books and reprints, either original or copied) at present. To keep the library up-to-date everyone is asked to send reprints of his publications to Kurt Schminke. In case of literature problems everyone can write to the library and ask for having articles copied. This service is not free of charge. For further information write to:

*MONOCULUS*-Library  
c/o Dr. H.K. Schminke  
Fachbereich 7 (Biologie)  
Universität Oldenburg  
Postfach 2503  
D-2900 Oldenburg  
Germany

#### 10. Survey of Copepodologists of the World

Copies of "Survey of Copepodologists of the World" were sent free to 1990 members. Copies will be sent to new members while supplies last. Non-members may obtain copies \$10.00 US by writing to Kurt Schminke (see section 1 for address).

#### 11. Crustacea Database

Anyone who is interested in using the database may contact the following institution for more information

DI1MD1  
Postfach 420580  
D-5000 KÖLN 41  
Germany

The database currently contains about 28,000 documents mainly dealing with Copepoda and Tanaidacea (see also p. 36).

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#### O F F E R   A N D   R E Q U E S T   C O R N E R

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*Literature, past and current, on any aspect of ergasilids and ergasilosis of fish would be a great help in the successful and meaningful completion of my research project 'Ecology of copepod parasites of fishes with emphasis on the family Ergasilidae (Copepoda, Poecilostomatoida)'.*

*Kindly send materials to:*

S. RADHAKRISHNAN, Ph.D., Dept. Aquatic Biology & Fisheries,  
University of Kerala, Beach P.O., Trivandrum 695 007,  
Kerala State, India



As discussed during the conference, I would like you to announce in the next *MONOCULUS* that an annual list of new taxa of Copepoda has been compiled since 1984 (certainly I would appreciate a reprint of any new taxa if the author(s) would like to send me one) and there are limited copies of back issues of *MONOCULUS* (Nos. 4 to present). I shall send you a copy of the annual new taxa list for *MONOCULUS*-Library and shall send one to any WAC member if requested. WAC members may request back issues of *MONOCULUS* on a first come first serve basis.

Dr. C.-t. Shih, Zoology Division, Canadian Museum of Nature,  
P.O.Box 3443, Station "D", Ottawa, Canada K1P 6P4

The l e t t e r   b o x

W.A. BOEGER (Rio de Janeiro, Brasil) has changed institution and copepods:

I left my position at INPA and accepted a job in Rio as a university professor and director of a "to-be" Marine Biology Laboratory.

Yes, I am back to these nice creatures again (the copepods). Being a freshwater "copepodologist" for so long, these marine species appear like beings from another planet. I already have a beautiful collection of them on which I shall start working soon. You should be getting, in the near future, reprints of two new papers with descriptions of a couple of "strange" amazonian forms from the gills and gill rakers.

M.L. del RIO MISPIRETA (Lima, Peru) informs us:

I am a biologist, employed in: Oficina Nacional de Evaluacion de Recursos Naturales. This is an institution which is in-

volved in the evaluation of natural resources and environmental problems in Peru.

My area of interest regarding research is related to copepods from Peru (Cyclopoida and Calanoida: Boeckellidae). Now, I am initiating studies on the genus Eucyclops from high Andean lakes. There are registered 49 species described by foreign scientists.

Please, my correct name is: Maria Luisa del Rio Mispireta Onern - Los petirrojos 355. Maria Rio de Valde is a mistake. O.K.?

M. O'REILLY (Glasgow, Scotland) has also changed institution and copepods:

I am now employed in marine pollution monitoring and my copepod interests have been diverted to parasitic and commensal species of marine benthic invertebrates. I am particularly interested in the associates of polychaetes - Herpyllobiids, Nereicolids, Clausids etc. and have also collected a number of Nicothoid brood parasites of Amphipods and Cumaceans. I have a number of new species and new genera being prepared for description. I would be interested to hear from any other copepodologists with similar interests or material.

#### AQUATIC INVADERS

The estuary of the Sacramento and San Joaquin rivers in central California has recorded the arrivals of its fourth and fifth copepod invaders. They are the calanoid copepods Pseudodiaptomus forbesi and P. marinus.

Five exotic copepods is a large number for an aquatic ecosystem to absorb and we have no reason to believe that these will be the last invaders or that only copepods will come in. A clam and an amphipod have also appeared in recent years.

Mr. Jeff Cordell of the University of Washington (Seattle) has just informed me that Pseudodiaptomus poplesia, a native of Mainland China, has recently been found in the Columbia River and is more abundant than the native Eurytemora affinis. The Columbia's plankton was last sampled 10 years ago, about the time that timber exports to China (and ballast water imports from China) began.

The problem is caused by the dumping of ballast water from ocean-crossing freighters and tankers. These ships carry from 330,000 to 1.8 million liters of water to maintain trim and stability. The water is pumped aboard in the estuarine or coastal ports of one continent and discharged in the waters of another continent. It is a world-wide problem and Carlton (1985) lists a variety of invertebrates and vertebrates (fish) that have been provided with free passage to new lands by means of ballast water.

I am writing this note to alert copepodologists to the threat posed to native faunas by exotic invaders. Copepodologists, if they have local sampling programmes, should be looking for unexpected organisms under their microscopes. Few regular planktonic or benthic monitoring programmes exist anywhere in the world, but to determine to what extent native faunas are being adulterated by exotics, copepodologists should find time to sample port areas and search for species that do not belong. Whether or not such species are found, scientists should consider pressuring their legislative bodies and the International Maritime Commission of the UN to restrict the dumping of ballast water in coastal and inland waters, as the Great Lakes Fishery Commission and the California Department of Fish and Game have already done.

The requested regulations will require all ships to exchange ballast water in mid-ocean (beyond any continental shelf) before docking in any American or Canadian port. The Canadian Coast Guard has drafted voluntary guidelines and 83 % of the

ships entering Great Lakes ports have adopted these guidelines.

Opposition from shipping companies has been encountered but since the threat is an economic as well as ecological one, political bodies should be receptive to the need for restrictions. The Great Lakes Fishery Commission estimates that it will cost \$ 4 billion US over the next ten years to control the zebra mussel which is clogging water intake pipes. Additional damage to fisheries is expected from the European ruffe.

In the Sacramento-San Joaquin Estuary, the fresh-water Diaptomus spp. and the estuarine Eurytemora affinis have been reduced to low levels of abundance. The dominant copepods are now Sinocalanus doerrii in fresh water and Pseudodiaptomus forbesi in brackish to fresh water. Both species are native to China.

Further information can be obtained from the California Dept. of Fish and Game, 4001 N. Wilson Way, Stockton, CA 95205 and the Great Lakes Fishery Commission, (Marg Dochoda), 1451 Green Road, Ann Arbor, Michigan 48105-2898.

Reference:

Carlton, J.T. - 1985. Transoceanic and interoceanic dispersal of coastal marine organisms: the biology of ballast water. Oceanogr. Mar. Biol. Ann. Rev. 23:313-371.

James J. Orsi  
Bay-Delta Study, Stockton, CA, U.S.A.



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MODEL DESCRIPTION

*Calanoida*

MODEL DESCRIPTION

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General remarks

In the latest issues of *MONOCULUS* (nos. 17, 18, 19, and 20), there have been several 'Model Descriptions' of copepod groups as well as various comments upon these or on the phenomenon 'model description' itself. Prior to venturing to present a model, or standardized, description of a calanoid, I should like to place a few remarks here, as well.

Frank Ferrari (*MONOCULUS* 20: 24-28) is right in claiming that descriptions serve purposes of differentiating species just as well as of analyzing phylogeny. For the first purpose they should be discriminative only, for the second they must be exhaustive. But then indeed: exhaustive in the original sense of Hennig, who advocated to consider the 'holomorphology' of a species, i.e., the morphology of all semaphoronts, in phylogenetic systematics. The failure to present such descriptions is a purely practical point: no copepodologist has the time, or the energy, let alone the material required, to prepare an exhaustive description of all naupliar and copepodid stages for every new species he or she is going to describe. Not when we merely consider external (= skeletal) anatomy, certainly not if we think of internal anatomy as well. Thus, the vast majority of descriptions will continue to be concerned with adult skeletal morphology alone, often of a single sex, and if one is lucky, of a hopefully matching couple of male and female.

When I described the female of *Euchirella messinensis* (Claus, 1863) in so much detail (cf. Zool. Verh., Leiden, 198), it was not because I had a vision that every future description of a calanoid copepod would have to be as exhaustive. It was be-

cause I was in need of a complete picture of calanoid external morphology as a standard for comparison: and I had found nothing of the kind in previous literature. Before being able of reducing the amount of information in descriptions, copepodologists ought to have an idea of what is there to be found in total. Only then it is possible to decide what information can be omitted without doing any harm.

Then, how should one conceive a Model Description? Certainly not by adopting a rigid formula in which every description of a newly discovered species ought to be fitted (or better: be forced into). I'd rather suggest a kind of 'minimum' description, as a list of features which should always be mentioned or discussed and/or figured (even their absence should be stated explicitly). Before objecting that this would seem insufficient, let me explain three accompanying conditions which I have in mind and which would have to form an integrated whole with this basic idea. The first condition is, that there should be made a distinction between descriptions of the type-species of a genus and those of other members of the group. In my opinion, a type-species has to be described in much more detail than its congeners, the descriptions of which can always refer back to the more elaborate treatise of the type-species.

Next, authors should be critical as to which details are in need of publishing and which are not: the personal standard of perfection of any individual scientist should invariably overrule some formal standard of a model description. He or she has the actual specimens under the microscope and may easily observe all their features. It is the great responsibility of that particular scientist to decide which of those features ought to be communicated to his or her fellow students and which can be left out. So, it all comes down to his or her experience, common sense, and industriousness. And that should never be judged too uncommittal: the readers of the paper will have, at least initially, nothing else but the description,

and upon the characters given therein they will have to decide whether or not material they have in hand might be included in the same species, or will belong to another, new species, etc., etc. This condition will prevent authors from being too superficial (a minimum list is the standard) and yet provides sufficient room for necessary additions to the minimally required information.

Finally, authors of species of calanoids should never present a description of a calanoid without having properly dissected at least one specimen (or, if a single specimen is available only, having dissected either the right or the left series of appendages) and having made proper microscope slides of these (with, of course, hope for HYP, see *MONOCULUS* No. 15: 20-23). Descriptions which fail to present figures of the oral appendages or which launch pro deo remarks like "mouthparts of the usual .....id type" do not at all qualify (I should know, because I slipped the same way in my 1970 paper, *Zool. Verh., Leiden*, 110).

So, if constrained within these conditions, just giving a minimum list of features as a framework for a 'model description' has got to suffice, at least in theory.

Now back to the issue of phylogeny. I believe model descriptions of the type proposed herein will come out to yield sufficient detail and information for at least initial phylogenetic analysis: many relevant characters can be determined and states can be coded at least binary. Yet, this constitutes merely a side-effect of a thorough description, and not its primary purpose. A 'general purpose' description should in the very first place be discriminative and next it should be detailed enough for the user to judge whether or not it will be relevant to include the species in question in the phylogenetic analysis he or she is planning to perform. Which means: is it worth the trouble of asking specimens on loan in order to study them personally. This should not be interpreted

as a justification for reduced accuracy in descriptions, but it should be taken as a warning for users not to try using descriptions beyond the goals they were designed for. For instance (cf. Ferrari's remark about one's artistic capacities): I would not be shocked to learn from a specimen in hand that a row of 19 spinules in a figure in reality counts 21. What is important is, that the row of spinules was figured at all. The model description must be able to tell you: "This species also has the row of spinules you are looking for! So, ask for a loan of some specimens and make a detailed description of number, shape, and actual arrangement yourself." In my opinion, that is precisely the way in which the value of model descriptions for phylogenetic purposes ought to be conceived.

To conclude my general remarks I'd like to state I agree with R. Hamond (*MONOCULUS* 20: 28-29) that captions of figures should invariably mention the specimen the figure was taken from. That is purely a matter of necessary scientific scrutiny. Drawing anything which was not actually observed is likewise a big mistake, as Hamond rightfully points out. However, in my opinion the use of dashed lines is useful in giving the author's interpretation of the missing parts while there should be no basis for confusion. As regards Dr. Hamond's remarks about phase- and interference contrast: yes, authors should indeed always state their observation techniques, for which a single sentence will do in general. On the other hand, I have never observed anything by interference contrast which could not be observed by ordinary bright-field microscopy as well: true, it is a bit more difficult to see, but once you know it's there, it never escapes attention anymore. The new techniques are far more convenient, but the classical technique combined with patience and scrutiny is perfectly well able to yield the same detail of observation by an experienced observer: Giesbrecht (1892) and With (1915) are there to testify so.

J. Carel von Vaupel Klein  
Rijksmuseum van Natuurlijke Historie  
Leiden, The Netherlands



Business ssenisuB

1. MONOCULUS-Library/Bibliography

The bibliography project ends this year. We have made great progress during those four years of financial support, although a bit remains to be done. If the data-base now available online (see below) is used by copepodologists we might eventually get some more money to complete it. Obviously, nobody will be inclined to invest further money into a data-base that has no customers. So use it and in case you find information lacking (which is unavoidable) write to DIMDI in Cologne (address below) and urge them to spend some more money for the completion of the data-base.

2. The CRUSTACEA-Database now available online

**Generalities:** During the "Second International Conference on Copepoda" in Ottawa 1984 we presented the CRUSTACEA-Database and announced the project "Bibliography of the Copepod Literature 1756-1970". In London 1987 and from time to time in *MONOCULUS* we reported on its progress, and finally on the "Fourth International Conference on Copepoda" we could present a rather complete database. This was made possible by the kind help of many copepodologists and by the generous financial support of the German Government (Bundesministerium für Jugend, Familie, Frauen und Gesundheit). As the project definitely ends in December 1990 the remaining time is used for final additions and corrections.

The CRUSTACEA-Database was originally developed at the Universität Osnabrück/Standort Vechta and later transferred to DIMDI (Deutsches Institut für Medizinische Dokumentation und Information) at Cologne. DIMDI is one of the centers in Germany offering access to various kinds of databases through international network services. Therefore, the CRUSTACEA-

Database typically should be available through library services. Or, if someone is able to link his PC via the telephone line to the international network it should even be possible to use the database directly at ones desk.

**Content:** 28,000 documents are currently stored in the CRUSTACEA-Database at DIMDI, but in the final state it will contain about 36,000 units. Of these, about 28,000 - 29,000 will deal directly with copepod literature. The remaining documents are so-called "superposed" documents, viz. journals and books. This, we think, is necessary to make the database more convenient because it allows e.g. to extract all titles of one journal dealing with Copepoda. Typically, journal documents also include information referring to the correct title of the journal (which is stored in full length as well as abbreviated) or changes in the journal's name. In the case of chapters the title of the book itself is also stored, thus making available the complete data often necessary for ordering a copy. Also the possibility exists to check whether other chapters in the same book deal with Copepoda.

In our project we were requested to build up the database only for literature published between 1756-1970. During the past four years naturally we came across a lot of additional literature. Occasionally those citations were also stored in the database so that the bibliography is nearly complete till 1980. It is fragmentary from then on.

**Keywords:** Keywording is a time-consuming process and has been the most expensive part of the project. It is much easier to punch in a hundred documents than selecting the keywords. Therefore complete keyword lists are available for only 35 % of the documents at present. We hope that in the future the opportunity will arise to also add the remaining documents, but this will depend on whether the database is accepted internationally or not.

Keywords are mainly arranged in three groups: Taxonomic names, general and geographic headings. Taxonomic names and general headings are combined in one field in the CRUSTACEA-Database at DIMDI. Typically general keywords (e.g. anatomy) are combined with the higher taxon to which they refer. Asking for COPEPODA-ANATOMY will give you only those documents which really refer to the anatomy of copepods; the same is true for COPEPODA-NORTHATLANTIC. Unfortunately the CRUSTACEA-Database at DIMDI does not have a thesaurus yet. Therefore all papers dealing with e.g. CALANIDAE still have to be processed by typing in the names of all subordinate genera.

For papers which have gone through the keywording process all taxa names on the species and subspecies level have been stored and in case other crustaceans are also mentioned these are indicated on the ordinal level.

**Availability:** The CRUSTACEA-Database is available via the international network at DIMDI (Address: DIMDI, Postfach 420580, D-5000 Köln 41, Germany). That institution also supplies the information necessary (preview, handbook, search examples etc.) for using the database. We will only occasionally be able to carry out search requests and provide you with the information needed.

**Future plans:** After having stored the copepod literature known to us for the period 1756-1970 (1980), we now shall only maintain the database. At more or less regular intervals corrections and occasionally keywords will be added.

All literature currently donated to the *MONOCULUS*-Library will be stored in the CRUSTACEA-Database eventually.

J. Sieg (Vechta, Germany)

### 3. Mailing

Looking at the address label you will find some additional information. This is to remind you of your status in relation to WAC and when to pay the next dues:

86-95 = WAC member, dues paid including printed year  
W = membership dues waived  
NM = new member, no dues paid  
NM91 = new member, dues paid including 91  
CM = candidate member, no dues paid  
CM91 = candidate member, dues paid including 91

Mail to the following people has been returned: L.A. Bouwman (Haren, NL), H. Grigg (Plymouth, U.K.), C.D. Jamieson (Petone, N.Z.), R. Pallares (Buenos Aires, Argentina), E. Poggensee (Schleswig, Germany), M. Uchima (Tokyo, Japan), S. Vijayalakshmi (Madurai, India), L. Walker (Bradenton, FL, U.S.A.). Who knows the new addresses?

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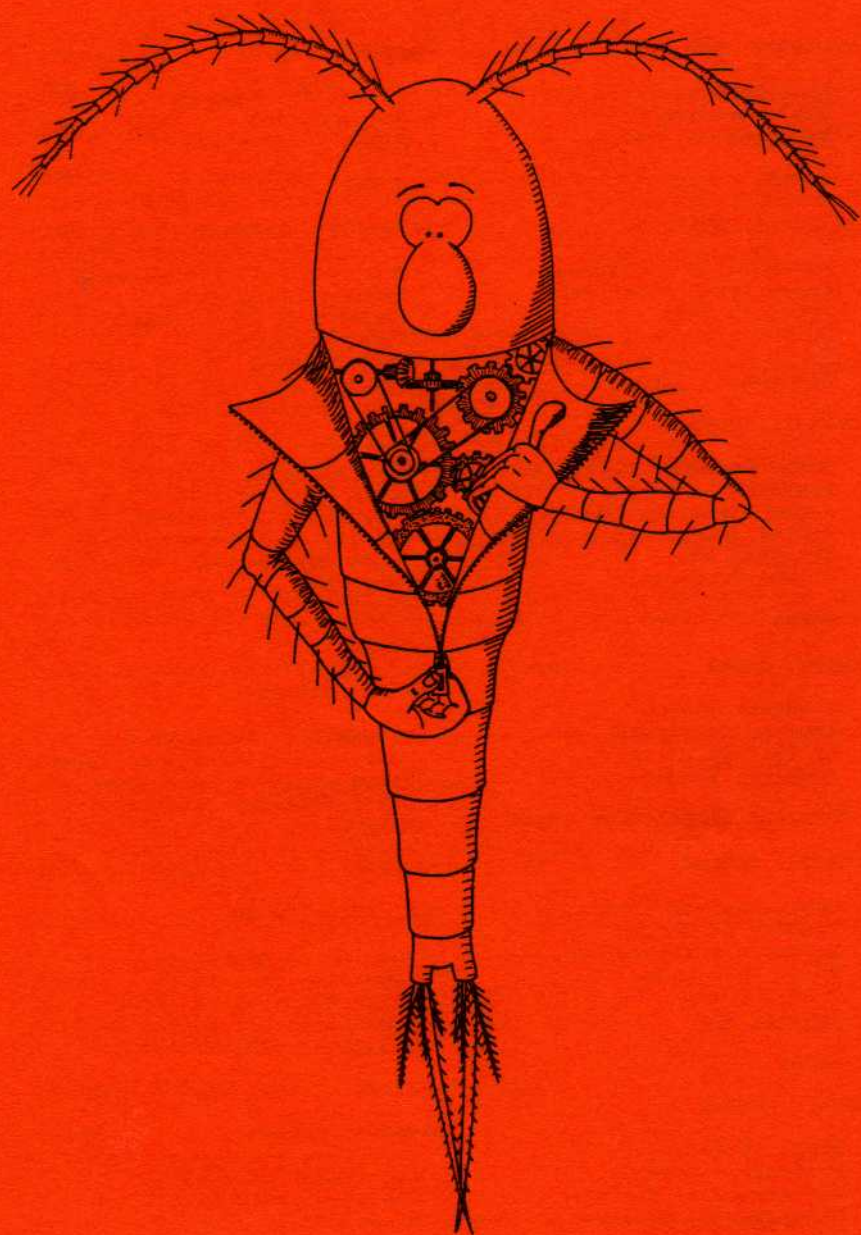
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Field of interest: \_\_\_\_\_

1. \_\_\_\_\_

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