



The Newsletter of the International Association of Meibenthologists

PSAMMONALIA

Compiled at the
National Institute of Water and Atmospheric Research (NIWA)
Wellington, New Zealand

Help us build the new IAM website!

<https://www.meiofauna.org>



**DONT FORGET TO RENEW YOUR IAM MEMBERSHIP!
APPLICATION FORM CAN BE FOUND ON THE LAST PAGE.**

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- ◆ 1968-69 W. Duane Hope
- ◆ 1970-71 John Gray
- ◆ 1972-73 Wilfried Westheide
- ◆ 1974-75 Bruce Coull
- ◆ 1976-77 Jeanne Renaud-Mornant
- ◆ 1978-79 William Hummon
- ◆ 1980-81 Robert Higgins
- ◆ 1982-83 Carlo Heip
- ◆ 1984-86 Olav Giere
- ◆ 1987-89 John Fleeger
- ◆ 1990-92 Richard Warwick
- ◆ 1993-95 Paul Montagna
- ◆ 1996-98 Magda Vincx
- ◆ 1999-2001 Yoshihisa Shirayama
- ◆ 2002-2004 John Lamshead
- ◆ 2005-2007 Keith Walters
- ◆ 2008-2010 Paulo Santos
- ◆ 2011-2013 Nikolaos Lampadariou
- ◆ 2014-2016 Wonchoel Lee
- ◆ 2017-2019 Vadim Mokievsky
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CONTENTS

P. 3 Paul Somerfield obituary

P. 4 IAM's new website

P. 5 Back to the roots of IAM

P. 19 Book review—New horizons in Meiobenthos research

P. 22 Application form or membership renewal

EDITORIAL

Kia ora dear colleagues!

I hope you have all had a good northern hemisphere summer and did not suffer too much from the heatwaves (terrestrial or marine). For those of us in the southern hemisphere, we look forward to warmer days and a return to the field.

Sadly in this issue of Psammonalia we are once again including an obituary to one of the meiofauna greats — our esteemed colleague and friend Paul Somerfield who left us recently. I am very grateful to Michaela Schratzberger for sending a very thoughtful piece about Paul's life. (p. 3)

Since the last edition of Psammonalia, Matthew Lee has been busy setting up the new IAM website, which can still be found at the same address: <https://www.meiofauna.org>. To make this a great and useful website we need everybody to pitch in ideas and content, so please think about what you may be able to contribute and get in touch with Matt (see p. 4 for details).

Over the last few weeks I had the pleasure of editing a substantial piece by Olav Giere, who looks back at the origins of IAM and the first International Meiofauna Conference in 1969 in Tunis. Olav brings to life the founding members of meiobenthology with a rich description of their research and accomplishments as well as personal anecdotes and observations. My overall impression from this retrospective look into the origins of our discipline is that scientific careers take a myriad different directions reflecting the many idiosyncrasies, circumstances and personalities of the people undertaking meiofaunal research. In other words, the lives of meiobenthologists are as diverse as the animals they study.

This issue also includes a review by Helena Adão of the recently published book 'New Horizons in Meiobenthos Research' edited by Olav Giere and Michaela Schratzberger. This book, which originated from discussions at SeventIMCO in Portugal in 2019, inspired Jeroen Ingels to write the following limerick, dedicated to Olav and Michaela:

At the lunch table in Evora it was just a thought

Discussed briefly, enthusiasm had us caught

Then four years of drafts and graft

Word smithing executed as craft

And what a gift to meiobenthologists it's brought

Finally, I'd just like to mention that some discussions are happening within the IAM council about IAM becoming a not-for-profit organisation. This change would for example allow IAM to receive and manage endowments, but would come with at a cost of additional administrative and financial burden. If any of you have the knowledge to weigh the pros and cons of such a transition we'd love to hear from you!

I hope you enjoy this issue of Psammonalia and as always we welcome your thoughts, feedback and contributions.

Daniel Leduc

Obituary – Paul Somerfield



Professor Dr Paul Somerfield (1963-2023)

It is with great sadness that I have to let you know that our friend and fellow meiobenthologist Prof. Dr. Paul Somerfield passed away peacefully on 31 July 2023, after a short, serious illness.

Paul's career in meiobenthology started with his PhD on marine mites at Trinity College, University of Dublin. He then spent time in Australia and South-East Asia before he joined the Plymouth Marine Laboratory in the UK in 1991. Here, he expanded his expertise in the taxonomy of various marine meiofauna phyla, to also include the response of their species, populations and communities to natural and man-made disturbances. Over the next three decades, Paul became a highly-respected marine scientist, colleague and collaborator across disciplines, organisations and geographies. Paul pioneered the integration and analysis of marine biodiversity data from disparate sources to understand large-scale and long-term processes, and their implications for the ways in which we predict the consequences of environmental change. He served on many international and national panels, committees and working groups, where he was highly-regarded for his passion for science, his inquisitive mind, his encyclopedic knowledge of the ocean, and his unique sense of humor.

For many years, Paul worked alongside Bob Clarke and Richard Warwick on developing the PRIMER-e software (Plymouth Routines in Multivariate Ecological Research). Teaching others in the use of PRIMER would take Paul around the world, from the poles to the tropics. Combining his creativity as an ecologist and his hands-on approach to statistics, Paul worked tirelessly to demys-

tify multivariate statistics and to bring often complex statistical and ecological concepts to masses of scientists and non-scientists, thereby making multifaceted environmental information robust, intellectually accessible, and thus usable.

Paul's scientific legacy includes the authoring and co-authoring of more than 150 peer-reviewed scientific articles and a number of books and chapters, all of which have been cited in excess of 36,000 times. Paul was also incredibly pleased about having been awarded an Honorary Professorship at the University of Plymouth in July 2023, in recognition of his sustained and influential contribution to marine science.

Paul epitomised all the character traits scientists across disciplines aspire to, including curiosity, honesty, enthusiasm, commitment and imagination. He had the curiosity to ask difficult questions, the honesty so that he could admit when he was wrong about something and try something else, enthusiasm so that he didn't mind being wrong and could cope with repeating work, commitment to collaborate and address scientific questions in all their complexity and to unselfishly offer support to others, and imagination to move from a list of observations and data to true understanding.

In online posts published by the Plymouth Marine Laboratory (<https://www.pml.ac.uk/news/In-Memoriam-Professor-Paul-Somerfield-PML-Ecologist>), scientists from around the world fondly describe Paul as a passionate, knowledgeable and innovative scientist, a sought-after collaborator and – above all – a valued fellow scientist and friend. Paul's genuine interest in, and commitment to, helping others emerges as a common theme. Paul will be remembered for his ability to think outside the box, for making the impossible surmountable, for never being afraid to speak his mind, for the collaborative spirit with which he approached research, for never taking himself or anyone else too seriously, for his humanity, his sensitivity, and his ability to make everybody feel welcome. Paul was the perfect team mate who always had your back, no matter what.

Paul was a wonderful friend and an incredibly talented and creative scientist. As a friend, I valued his honesty and his unconditional support, and as a colleague I valued his insights and his impeccable professional judgement. His sharp mind spotted poor science from a long way off. Working with, and learning from, him over the years has massively influenced the science I do and the way I do it. The "Paul Way" of doing everything in life was truly unique: always thorough, always authentic and always full of integrity. Paul has given us so much and his legacy will live on in all who lived and worked with him.

Paul is survived by his wife Tina and his daughter Annabel, to whom we extend our deepest sympathies.

*Michaela Schratzberger
August 2023*

New IAM website update

The IAM website has been moved to a new server, but the web address remains the same (<https://www.meiofauna.org>). During the course of the year we will be refreshing the website and adding more content. Setting up the framework of the website is the easy part, adding content which drives visitors is the hard part (currently averaging about 20 visitors a week). To be successful this requires a team effort with contributions from a diversity of members. Currently the site has only a few pages (Home page, Officers, Psammonalia, and Conference (in development)).

We have some suggestions for additional pages, (below) but we are also open to suggestions from the community. If you would like to help, please get in touch (matt@matthewlee.org). We need photos, text, links, ideas, you name it! Together we can make the International Association of Meiobenthologists website, **the go-to** site on the web for information on the meiobenthos. When we google meiobenthos or an associated term the IAM website should be the first site on the results page.

1. Membership pages

This is in development and will hopefully include the option of paying membership dues online using your debit or credit card. Membership directory with basic contact information and bios.

2. Research pages

Invited general reviews of different research topics, e.g. Deep-sea meiobenthology, Loriciferans, (ideas gratefully received).

Methods, not just the method as found in a paper, but with commentaries, photos and practical advice.

Reports from research expeditions, been on a cruise or somewhere well off the beaten track, tell us about it!

3. Educational Resources

We need to educate the community more widely about the meiobenthos, their role in the ecosystems and why they matter. We also need to recruit the next generation of meiobenthologists.

The material should cover all levels: academic, from young children to university students, but also the general public.

Material could include: posters, pamphlets, field/lab guides, presentations that teachers can include in their classes, class plans for practical activities, webpages.

The material should be available in a diversity of languages, not just English.

The material should be available under a Creative Commons Licence.

Everyone can help with this, not just by providing finished materials, but also photos, or help with translating materials into your native language.

4. Notice board

Looking for collaborations?

Need specimens from particular habitats or parts of the world.

Looking for that old paper that's not available online.

Do you have opportunities for students in your lab?

Introducing new students.

5. Species of the Month

Showcase to the world that fascinating species that you can find in the beach next to your lab.

Promote a species that you've just described.

You've got a really good photo and you just want to show off..!

Matthew R. Lee



Back to the roots of IAM:

The origin of the International Meiofauna Conferences, the International Association of Meiobenthologists, and the Psammonalia newsletter

By Olav Giere



First International Meiofauna Conference, Tunisia 1969

Front Row (from left): Irwin Newell, John Gray, Robert Higgins, William Hummon, Wilfried Westheide, Leland Pollock, Bengt-Owe Jansson

Middle Row: Pierre Lasserre, Bertil Swedmark, Jeanne Renaud-Mornant, Claude Jouin, Claus Clausen, Wolfram Noodt, Ernst Kirsteuer (partly obscured), Marian-Traian Gomoioi

Back Row (heads visible): Neil Hulings, Robert Hessler, Alasdair McIntyre, Duane Hope, Franz Riemann, John Wells, Robert Williams, Wolfgang Sterrer

Back to the roots of IAM – continued

Introduction

An old-fashioned black-and-white photograph showing a group of friendly looking people in an unattractive ‘tomb’ of stone walls – why should we care, why even write about it, about its history and about the persons who are unknown to most of you?

Well, these were the participants of the 1st International Meiofauna Conference, and among them the founders of our Meiofauna Association, who decided to regularly meet and discuss their research at their ‘Conferences’. So, they were and are the ‘scientific grandfathers’ of the present-day researchers, determined to work in this new and expanding field of science.

Scientifically they originated from a few ‘forefathers’ who found interest in studying tiny, somewhat bizarre looking animals from various marine and freshwater sands, also from sites not expected to harbour any animals, like clean sand beaches, mountain caves and smelly mud beds. Here they quite often encountered animals never seen before and not assigned to a known animal group. No wonder that these early pioneers were keen in describing these morphological and taxonomic novelties from strange habitats giving them fancy names, often with beautiful ‘antique’ derivations (at that time knowledge of Greek and Latin belonged to ‘higher education’), to name a few of the linguistic classics:

Mystacocarida, the ‘moustache shrimps’ with *Derocheilocaris*, the ‘shrimp with a large upper lip’ (Pennak, Zinn)

Florarctus stellatus, the stary flower-bear, and *Monobryzoon ambulans*, the lone animal walking in moss

Archiannelida, the ancient annelids living in the...

Mesopsammal, the voids between sand grains (Remane)

Microcerberus in the ‘stygbios’, the small multi-headed hound guarding the underworld river Styx (Delamare-Deboutteville)

Around these pioneers of meiobenthology, schools of students developed who were fascinated by the new zoological field and its rich, often strange looking ‘interstitial fauna’ (a term coined in 1935, and only few of us are aware of this, by the British copepod specialist A.G. Nichols). These followers continued morphological and taxonomical work, but their research wanted to understand the ecological conditions of the new ‘meiofauna’ (named so in 1942 by ‘Molly’ Mare from the Plymouth Marine Laboratory).

What is the role of grain size and shape? How steep are the temperature gradients in the sediment? Which salinity fluctuations appear in tidal beaches? What is the impact of oxygen content in the interstitial sediments? What are the reasons for different distribution patterns in similarly looking habitats? And, already then, one of the most urgent topics to study: the impact of pollution on meiofauna. These physical and chemical recordings gradually became supplemented by first attempts to understand also the biotic environment: colonization patterns, food supply, effects of predation. These were predominant questions the ‘grand parents’ of meiofauna research were discussing. When entering a new field of benthic research, also today you will try to answer similar questions for understanding new faunas in novel areas.

So, these were also topics of interest for the 28 meiofauna enthusiasts who participated in the 1st International Meiofauna Conference in Tunis, 23 of whom are depicted in the above ‘photograph of the founders’.

But what made the long tradition of Meiofauna Conferences to start in Africa? Here, the founder and 1st chairperson of the International Meiofauna Association, the recently deceased Robert Higgins, makes his appearance. Starting at the Smithsonian Institution in Woods Hole, Mass., Bob served at that time as ‘Attaché Scientifique’ at the US embassy in Tunis and as director of the Mediterranean Sorting Centre in Salammbô (the ancient Carthage), Tunisia. This position he took over from Neil Hulings (see photo) who returned to the Smithsonian in the US only to start his new meiofauna work at Mediterranean beaches in Beirut, Lebanon and Jordan.

Back to the roots of IAM – continued

It was the Mediterranean Sorting Centre and the Tunisian government who generously supported the organisation of the 1st Meiofauna Conference at the Hilton Hotel in Tunis. Neil's studies in Tunisia and Jordan probably made him the first scientist to investigate meiofauna from African beaches. No wonder, that these two 'pioneers' were the main organizers of the 1st Conference presenting the research data of a small group of mostly young colleagues united in the only three years young Meiofauna Association.

Literature cited:

Mare, M.F. (1942): A study of a marine benthic community with special reference to the micro-organisms. *J. Mar. Biol. Ass. UK* 25: 517-554

Nichols, A.G. (1935): Copepods from the interstitial fauna of a sandy beach. *J. Mar. Biol. Ass. UK* 20: 379-405

A subjective presentation and introduction to the participants of the 1st meiofauna conference shown on photo

Front row, from left:

Irwin Newell (1916-1979)

*Institution**: University of California, Entomology Dept., Riverside, USA

Main field of work: Systematics and distribution of marine halacarids, also studies on (tropical) pest mites and insects.

Characteristic features of work: connecting taxonomic and zoogeographical studies on halacarids with comprehensive and qualified entomological sciences. Newell had an antipathy against dichotomous identification keys and constructed interesting 'tabular keys' for his mites.

Some personal impressions: One of the few scientists who worked and published in numerous studies on both marine meiofauna as well as on (tropical) pest insects and mites. Based on his profound zoogeographical knowledge, Irwin early on propagated the continental drift theory by Alfred Wegener. His pupils said: He was conservative and thorough in reaching conclusions before making recommendations

from his studies. His judgement was respected not only in science but in policy-making duties and administrative matters.

Influential scientific publications:

Acari, in: *Fresh-Water Biology* (W.T.Edmonson, ed.) 2nd ed., Wiley, 1959

Antarctic Halacaroidea, in: *Antarctic Research Series* vol. 40, 284 pp. Amer. Geophys. Union, 1984

Construction and Use of Tabular Keys. *Pacific Insects* 12: 25-37

John Gray (1941-2007)

*Institutions**: Univ. of Leeds, Wellcome Marine Laboratory, Robin Hoods Bay, Yorkshire, UK; Appointed professor at University of Oslo

Main field of work: Marine sediment ecology with a focus on the abiotic factors; early studies on the impact of marine pollution; one of the first meiobenthologists to underline the role of sediment bacteria. His particular scientific potential was the derivation of (theoretical) conclusions from his data and observations. Especially in projects of high environmental impact on the western Baltic Sea John underlined the relevance of precaution and environmental care even when scientific data were not (yet) perfect.

Characteristic features of work: John's contributions to marine environmental studies were always solidly based on profound statistics – not trivial in those times.

Some personal impressions: John was a perfect organizer and brilliant speaker. The organizer of the 2nd International Meiofauna Conference 1973 in York (England) was a critical and eloquent scientific pragmatist; he kept reminding his audience to always question views and conclusions. But this conciseness was always connected with a great, sometimes ironic, humour – and he loved good wine!

Influential scientific publications:

Gray, J.S.: *Ecology of marine sediments*. Cambridge Univ. Pr., 185 pp, 1981.

Hulings, N.C. & Gray, J. (1971): *A Manual for the Study of Meiofauna*. *Smiths. Contr. Zool.* 78, 84 pp.

Back to the roots of IAM – continued

Robert (“Bob”) Higgins (1932-2022)

*Institution**: Smithsonian Institution, Washington, D.C., USA

Main field of work: Morphology, systematics of kinorhynchs, priapulids, tardigrades, loriciferans (the larval stage of this ‘new’ phylum is called ‘Higgins larva’); Bob began his career studying moss tardigrades at the University of Colorado as a pupil of R. Pennak.

Characteristic features of work: Detailed and exact descriptions, worked often together with R. Kristensen from Copenhagen (see picture).

Some personal impressions: Bob was always a very precise, serious, and engaged colleague. As excellent organizer he managed to found in 1966 our International Association of Meiobenthologists (IAM). Mark my words: Without Bob no IAM! Moreover: In 1969 he was instrumental to get going, together with N. Hulings, the 1st International Meiofauna Conference in Tunis in 1969 (see group picture above) – still to this day the only meiofauna meeting in Africa. Bob sampled often in countries pristine from meiofauna research. He developed the frequently used ‘mermaid bra’, a small 63-micron mesh net (see picture, with R. Kristensen at the famous statue of ‘the little mermaid’ in Copenhagen—photo courtesy of R. Kristensen, on right).



*At time of photo (1969)

Influential scientific publications:

Higgins, R. & Thiel, H.: Introduction to the study of meiofauna. Smiths. Instn. Press, Washington, 1988

Nybakken, J.W. & Higgins, R.P. (2007): Intertidal Meiobenthos. In: The Light and Smith Manual. Intertidal Invertebrates from Central California to Oregon. Intertidal Invertebrates from Central California to Oregon. 4th ed., Univ. Cal. Press, pp. 18-23.

Higgins, R.P. (2007): Kinorhyncha, Loricifera, and Priapulida. In: The Light and Smith Manual. Intertidal Invertebrates from Central California to Oregon. Intertidal Invertebrates from Central California to Oregon. 4th ed., Univ. Cal. Press, 269-273.

William (“Bill”) Hummon (1932-2017)

*Institution**: Ohio State University of Athens

Main field of work: Morphology, distribution of marine gastrotrichs; abiotic factors in beach sediments (worked on the fetch energy index)

Characteristic features of work: For a long time the only specialist on Gastrotricha in the US, one of the few meiobenthologists who are name patrons of a taxonomic family (Hummondasyidae).

Some personal impressions: Bill was critical against any military service; with his quiet humour he was always helpful and present when needed.

Influential scientific publications:

Hummon W.D. (2001-2010). Global distribution of marine Gastrotricha (online ‘Checklist Gastrotricha’)

Hummon, W.D. (2007): Gastrotricha. In: The Light and Smith Manual. Intertidal Invertebrates from Central California to Oregon. 4th. ed., Univ Intertidal Invertebrates from Central California to Oregon. Univ. Cal. Press, 267-268

Back to the roots of IAM – continued

Wilfried Westheide (1937-)

*Institution**: University of Göttingen (Germany)

Main field of work: Anatomy, biology, systematics and evolution of meiobenthic polychaetes.

Characteristic features of work: Always basing on evolutionary aspects, his numerous papers on meiobenthic polychaetes focused on distribution and speciation, particularly on the ‘meiofauna paradox’. The ‘direction of evolution’ – is it speciation, differentiation or also reduction?

Some personal impressions: A quiet, critical commentator with a fine, restrained humour and an impressive knowledge, not only on meiofauna. From his school of students originated a large number of well-known researchers and authors specialized on the morphology, systematic position and evolution of meiofauna.

Influential scientific publications:

Westheide, W. & Rieger, R., eds. (2004): *Spezielle Zoologie*. Spektrum, Heidelberg, 1st ed. This prominent German two-volume textbook has seen several editions and even been translated into Russian.

Westheide, W. (1987): Polychaetes: Interstitial families. *Synops. Brit. Fauna* 44, 169 pp.

Westheide, W. (1997): The direction of evolution within the Polychaeta. *J. Nat. Hist.* 31: 1-15

Westheide, W. (1987): Progenesis as a principle in meiofauna evolution. *J. Nat. Hist.* 21: 843-854

Westheide, W. (1984): The concept of reproduction in polychaetes with small body size: adaptations in interstitial species. In: Fischer A, Pfannenstiel HD (eds.) *Polychaete reproduction*. *Fortschr. Zool.* 29: 265-287

Leland Pollock (1943-)

Institution: Drew University, Madison, New Jersey, USA

Main field of work: Systematics and distribution of marine tardigrades

Characteristic features of work: Pollock was specialized on marine tardigrades, mostly from American coasts. However, his ‘Practical Guide’ (see below)

shows the amazing width of his general zoological knowledge.

Some personal impressions: Pollock’s unconventional way of looking at the marine environment and its inhabitants is best shown by his novel ‘tabular keys’ of species in ‘Practical Guide’. Instead of the usual ‘dichotomous keys’, he illustrates and explains this unique identification method of marine animals in a ‘Key to Certain Bolts and Screws’ – absolutely unique! A quotation best characterizes Pollock as the enthusiastic university teacher (it might stand for many others as well): “*Teaching while being ... immersed in the medium is the setting which field biologists relish. There, a sense of physical adventure couples with intellectual discovery in a way, which can't help but infect willing students. I have had the luxury of teaching in such settings throughout my career*”.

Influential scientific publications:

Pollock, L. (1975). Tardigrada. In: *Reproduction of marine invertebrates*. Vol. II, Ch. 2, 43-54. Giese & Pearse (ed.), Elsevier

Pollock, L. (1998). *A Practical Guide to the Marine Animals of northeastern North America*. Rutgers Univ. Press, New Brunswick, New Jersey, 1997

Pollock, L.W., Carranza, A.: Tardigrada. In: *The Light and Smith Manual. Intertidal Invertebrates from Central California to Oregon*. 4th. ed., Univ. Cal. Press, pp. 293-297.

Bengt-Owe Jansson (1931 – 2007)

*Institution**: Askö Laboratoriet, University of Stockholm, Sweden; 1972 professor at the University of Stockholm, Sweden

Main field of work: Environmental factors and ecology of meiofauna in Baltic shores.

Characteristic features of work: Starting studies on various factors determining the distribution pattern and dynamics of (Baltic) meiofauna, Bengt-Owe was one of the first to focus on the functioning and threats to the Baltic as an interconnected system. Jansson has been closely affiliated with the Arizona State University.

Back to the roots of IAM – continued

Some personal impressions: A leading figure in Swedish ecological research and early advocate of nature conservation in the sensitive Baltic Sea, Bengt-Owe founded and lead the famous Askö Marine Laboratory. Once you arrived there, you felt how he understood to combine effective research work with a relaxed atmosphere – a rare and remarkable feature that many guest meiobenthologists did enjoy. One of those persons talented enough to rise from studies on tiny animals to high public recognition (e.g. member of the Swedish Academy of Science)

Influential scientific publications:

Jansson, B.-O. (1972): Ecosystem approach to the Baltic Problems. Bull. Ecol. Res. Committee No. 16, 72 pp. Swed. Nat. Sci. Res. Council. Stockholm

Jansson, B.-O., Wulff, F. (1977): Ecosystem analysis of a shallow sound in the northern Baltic: A joint study. Contr. Askö Lab., 18 pp. Univ. Stockholm Publ.

Jansson, B.-O. ed. (1986): Coastal-offshore ecosystem interactions. Proceedings of a symposium at San Francisco State University, 367 pp. Springer

Middle row, from left:

Pierre Lasserre (1940-)

Institution:* Marine Biology Station, Univ. of Bordeaux, Arcachon, France

Main field of work: Taxonomy and ecology of marine meiobenthic oligochaetes with a focus on sediment oxygen fluxes and micro-respirometry. Pierre was the 1st student of Jeanne Renaud-Mornant (see below)

Characteristic features of work: His early ecophysiological studies in experimental microcosms gained attention. Leaving pure research quite early, Pierre ascended later to high levels in French science politics and in Unesco conferences. In recognition of his various science-political contributions and memberships he received numerous international honours and degrees. In 2009 Pierre became Honorary Professor at the famous Sorbonne University, Paris

Some personal impressions: Pierre Lassere was presumably the first specialist on meiobenthic marine oligochaetes, although he did not follow this path

too long before his talent to coordinate and convince opened him up a much wider scene. He is a wonderful example showing how small, meiobenthic worms can pave the way to a remarkable public career as an advocate for European science/political platforms - or was it Pierre's famous laughing face?

Influential scientific publications (Out of Lasserre's plenty of publications I can cite here just one strictly biological and one environmental/political paper):

Lasserre, P: Marine microcosms: Small-scale controlled ecosystems. Pp. 20-60. In: Enclosed Experimental Marine Ecosystems: A Review and Recommendations. Springer, New York, Inc.1990

Chesney, M., Lasserre, P. & Troja, B. (2016): Mitigating Global Warming: a Real Option Approach. Ann. Operat. Res. Springer 255: 465-506.

Bertil Swedmark (1918-1975)

Institution:* Kristineberg Zoological Station, Fiskebäckskil, Sweden

Main field of work: Anatomy, biology and systematics of selected, often rare sand meiofauna (such as gastrotrichs, medusae, bryozoans, "archannelids") under evolutionary aspects

Characteristic features of work: Structural adaptations to interstitial life. Very early Swedmark pointed out the possible role of meiofauna as indicators and test organisms for pollution studies, especially in Swedish fjords.

Some personal impressions: Swedmark was strongly influenced by his long time at the French marine station in Roscoff (his early publications were in French, he received his doctor title from the University of Paris). Returning to Sweden, he became director of the famous Kristineberg Marine Station. I see Bertil Swedmark in a position close to the ancestors who 'discovered' and described novel interstitial fauna, but he was also one of the early ecologists who realized the enormous ecological role of 'meiobenthos'. As such he certainly belonged to the founders of today's 'meiobenthology' as a research field of its own. To me Bertil appeared as the friendly, very interested, linguistically cultured and attentive 'grandfather type'.

Back to the roots of IAM – continued

As such he certainly belonged to the founders of today's 'meiobenthology' as a research field of its own. To me Bertil appeared as the friendly, very interested, linguistically cultured and attentive 'grandfather type'.

Influential scientific publication:

Swedmark, B. (1964): The interstitial fauna of marine sand. *Biol. Rev.* 39, 1-42.

Jeanne Renaud-Mornant (Renaud-Debyser) (1925 – 2012)

*Institution**: Museum National d'Histoire Naturelle, Paris, France

Main field of work: Morphology, systematic of various interstitial taxa, e.g. tardigrades, polychaetes, mystacocarids. In 1986 Jeanne found the 'ghost larva', later identified as a loriciferan.

Characteristic features of work: Beside her many years at the famous Museum of Natural History in Paris (where she curated a special exhibition on meiofauna in the famous 'Grande Galerie de l'Évolution), Jeanne worked for several years in Brasil, where she founded an active school of meiobenthologists. The 13th EMBS (2007) has been dedicated to her.

Some personal impressions: Everybody who has met Jeanne will remember her humour, 'vivacité' and enthusiasm. Artistically multi-talented, Jeanne created the famous picture of the tardigrade *Florarctus asper* that made its way into many textbooks. During retirement years she travelled with her husband along European and North American canals on their boat named « Tardigrade ».

Influential scientific publications:

(as) 'Renaud-Debyser', J. (1963): Recherches écologiques sur la faune interstitielle des sables. *Basin d'Arcachon, ile de Bimini, Bahamas. Vie Milieu (Suppl.)* 15: 1-157.

Claude Jouin (Jouin-Toulmond)

*Institution**: Faculté de Sciences, University of Paris, Quai Saint Bernard, Paris

Main field of work: 'Archiannelids', especially Nerillidae; taxonomy, morphology and reproductive biology.

Characteristic features of work: Classical taxonomic and structural research with a focus on the reproductive-biological pattern of meiobenthic polychaetes

Some personal impressions: Claude started her career with studies on various interstitial annelids, mainly on the group formerly called 'Archiannelida'. She found a fascinating new species without a (functional) gut (*Astomus*) – a parallel to gutless oligochaetes and nematodes. Together with her husband A. Toulmond she later changed her scientific focus to respiration physiology of polychaetes, which live in oxygen-depleted environments.

Influential scientific publications:

Jouin, Claude (1970). Recherches sur les Protodrilidae (Archiannelides): I. Étude morphologique et systématique du genre *Protodrilus*. *Cah. Bio. Mar.* 11: 367-434.

Jouin, C. (1966): Hermaphroditisme chez *Nerillidopsis hyalinae* n.g., n.sp. et chez *Nerillidium* Remane, Archiannelides. *Comptes Rendus Acad. Sci. Paris, D* 263: 412-415.

Jouin, C. (1979): Description of a free-living Polychaete without gut: *Astomus taenioides* n.gen., n.sp. (Protodrilidae, Archiannelida). *Can. J. Zool.* 57: 2448-2456.

Claus Clausen

*Institution**: Zoological Laboratory, University of Bergen, Bergen, Norway

Main field of work: Taxonomy and morphology of gastrotrichs and (in early years) interstitial cnidarians

Characteristic features of work: Although his presentation at the First Meiofauna Conference was about

Although his presentation at the First Meiofauna Conference was about 'Interstitial Cnidaria', Clausen's classical taxonomic work focussed on marine gastrotrichs with publications from 1965 to

Back to the roots of IAM – continued

2004. *Crasiella clauseni* has been described as eponym for him by Lee & Chang (2012).

Some personal impressions: Claus has been described as a rather quiet, serious and supportive man with a competent knowledge on (marine) gastrotrichs.

Influential scientific publications:

Clausen, C. (2004): Gastrotricha from the Faroe Bank. *Sarsia* 89: 423-458.

Clausen, C. (2000): Gastrotricha Macrotrichida from the Tromsø region, northern Norway. *Sarsia*, vol. 85, no. 5/6. 357-479.

Rao, G.C. & Clausen, C. (1970). *Planodasys marginalis* gen. et sp. nov. and Planodasyidae fam. nov. (Gastrotricha Macrotrichida). *Sarsia*, 42: 73-82.

Wolfram Noodt (1927 – 1991)

*Institution**: University of Kiel, Germany

Main field of work: Marine Harpacticoida

Characteristic features of work: Morphology and taxonomy of common Harpacticoida, unusual interstitial and subterranean crustaceans, e.g. Syncarida. Noodt's publications on the shore fauna had a strong ecological background

Some personal impressions: Soon after the start of his scientific career in Kiel, Germany, Noodt worked for some years in South America as university teacher and doing biogeographical studies on various crustaceans. After his return he became professor at the University of Kiel. His teaching skills, his critical but encouraging comments and helpful support of students in his weekly 'question time' were famous.

Noodt was for many years editor of the widely distributed copepod newsletter 'Monoculus'. In the 80s he was co-founder of a small publishing company associated with the University of Kiel, where he published contributions on the problematic field of nature conservation and politics in the Baltic area. In a recent letter his wife described him as 'not fond of academic boards, he rather tried to support and advise students and younger colleagues'.

Influential scientific publications:

Noodt, W. (1957): Zur Ökologie der Harpacticoida (Crust. Cop.) des Eulitorals der deutschen Meeres-küste und der angrenzenden Brackgewässer. *Z. Morph. Ökol. Tiere* 46, 149-242

Noodt, W. (1965): Crustacea subterranea aus Argentinien. *Beitr. Neotrop. Fauna* 4, 84-129

Noodt, W. (1969): Die Grundwasserfauna Südamerikas. In: *Biogeography and Ecology in South America* 2: 659-684. Junk, Den Haag

Noodt, W. (1970): Zur Eidonomie der Stygocaridacea, einer Gruppe interstitieller Syncarida (Malacostraca). *Crustaceana* 19, 227-244

Noodt, W. (1972) Brasilianische Grundwasser-Crustacea. *Crustaceana*, 1. Studien an den Gattungen Parastenocaris Kressler und Forficatocaris Jakobi aus der Serra do Mar von Sao Paulo (Copepoda, Harpacticoida), *Crustaceana*. 23, 76-99

Ernst Kirsteuer (1933 – 2012)

*Institution**: Dep. Living Invertebrates, American Museum of Natural History, New York, USA

Main field of work: Systematics and morphology of various marine interstitial meiofauna groups, e.g. polychaetes, priapulids (*Tubiluchus*), nemertean.

Characteristic features of work: see above

Some personal impressions: A member of the 'Vienna Group' of meiobenthologists (e.g. Wolfgang Sterrer, Jörg Ott), Ernst Kirsteuer joined the staff of the American Museum in 1965, where he worked for many years and became head of the Invertebrate Zoology Department. After his early retirement he moved to the countryside to live a 'life as self-sufficient as possible'.

Influential scientific publications:

Zur Kenntnis der Archannelida des Roten Meeres. *Zool. Anz.* 177: 288-296.

Back to the roots of IAM – continued

Marian-Traian Gomoiou (1936 – 2021)

*Institution**: Institute of Biology, Dep. Marine Biology, Constantza, Romania

Main field of work: Beginning with studies on sandy shores of the Black Sea, especially on psammobiotic and other molluscs, Gomoiou widened his focus to study the dominant ecological aspects of this enclosed sea. He is considered a key founder of marine ecology in Romania.

Characteristic features of work: Gomoiou soon went the rather typical pathway – from specialized studies he generalized his aspects to focus on eutrophication, pollution, and oxygen depletion. Also the biologically famous delta of the Danube was his main focus area. As head of a large institute and member of the Romanian Academy of Science he initiated a large monitoring program focusing on the hydrological and biological status of the Black Sea.

Some personal impressions: Gomoiou is another colleague among meiobenthologists to start off with tiny animals and later act as a powerful member (see photo, compare with the Tunis-photo!) of international scientific academies and in committees with highest science-political rank, the nesco or the Club of Rome.



*At time of photo (1969)

Influential scientific publications:

Gomoiou, M.-T., 1976 - Ecological studies on psammobiotic molluscs from the Romanian littoral of the Black Sea. *Ecologie marină*, Ed. Acad. București, 5: 173-349 (in Romanian).

Wijsman, J. W. M; Herman, P. M. J., Gomoiou, M.-T. (1999): Spatial trends in sediment structure and benthic activity in relation to the Danube plume on the Black Sea continental shelf – *Mar. Ecol. Prog. Ser.* 181: 25-39.

Langmead O., McQuatters-Gollop A., Mee L.D, Friedrich J., Gilbert, A.J., Gomoiou, M.-T., Jackson E.L, Knudsen S., Minicheva G., Todorova V. (2009) Recovery or decline of the northwestern Black Sea: A societal choice revealed by socio-ecological modeling. *Ecol. Modell.* 220: 2927 – 2939.

Back row, from left:

Neil Hulings (1930 – 2011)

*Institution**: Smithsonian Institution, Washington, D.C. USA (see Introduction above), supervisor of meiofauna at the Oceanographic Sorting Center, Smiths. Instn. Washington, D.C.; in 1974: University of Jordan in Amman

Main field of work: Littoral sand meiofauna, especially ostracods.

Characteristic features of work: I assume, Hulings was the first meiobenthologist to sample meiofauna on beaches of Northern Africa (Tunisia), the Red Sea (Gulf of Aquaba) and the Eastern Mediterranean (Jordan).

Some personal comments: Hulings was Associate Professor (marine ecology and geology) at the Texas Christian University in Fort Worth until 1966. He studied marine benthic fauna in the Northwestern Gulf of Mexico and soon focused on ostracods. His time at the Smithsonian Institution gave him the chance to go to Tunisia and study African beaches.

Some scientific publications:

Hulings, N.C. (1967): Marine Ostracoda from the Western North Atlantic Ocean: Labrador Sea, Gulf of St. Lawrence and off Nova Scotia. *Crustaceana*, Vol. 13,3: 310-328.

Back to the roots of IAM – continued

Hulings, N.C. (1969): Taxonomy and ecology of near-shore Ostracoda from the Pacific Coast of North and Central America. In: The Taxonomy, Morphology and Ecology of Recent Ostracoda. pp. 412-422 (Neale, J.W., ed.), Oliver & Boyd, Edinburgh, G.B.

Hulings, N.C. (1971): A comparative study of the sand beach meiofauna of Lebanon, Tunisia and Morocco. *Thalassia Jugoslav. 7*: 117-122.

Hulings, N.C. (1971): Proceedings of the First International Conference on Meiofauna. (Ed.) Smiths. Contr. Zool. 76, Washington, 205 pp

Hulings, N.C. & Gray, J. (1971): A Manual for the Study of Meiofauna'. Smiths. Contr. Zool. 78, 84 pp.

Robert “Bob” Hessler (1932-2020)

Institution: Scripps Institution of Oceanography, U.C. San Diego, La Jolla, Ca., USA

Main field of work: Studied deep-sea crustaceans, but always saw the ‘biggerpicture’, the deep-sea communities. Developed innovative tools for deep-sea research and documented abundant marine life beyond about 5000 m depth (in 1975 he succeeded in photographing life at 9,600 m depth).

Characteristic features of work: Bob started with meiofauna studies (Cephalocarida, Mystacocarida), but he had the unique talent to always see ‘the entire picture’. So, his appearance at a group photo above is depicting just a small ‘meiobenthos phase’ of his rich life. He was a great academic teacher, and his audience was often so fascinated by his incomparable talent of talking and explaining that overrunning of time was not a problem!

Some personal impressions: Bob was a real ‘all-rounder’: he studied forestry, became Master in zoology and PhD in paleontology, Assoc. Scientist in marine biology (colleague of Howard Sanders in Woods Hole Oceanographic Institution). In 1969 (the date of group picture!) he was Associate Professor at Scripps Institution and later Full Professor in biological oceanography– what a career! Hessler at Scripps and Sanders at WHOI dominated research on ecology and biodiversity of deep-sea during the 1970s.

Beside his outstanding professional capacities Hessler was also a talented painter and sculpturer. He

was famous enough to become introduced to H.M. Hirohito, Emperor of Japan, in 1975. I think it is quite touching that after decades of ‘big deep-sea research’ and of responsibility for famous international research cruises, at the end of his time as scientist Bob returned to his meiofauna favourites, the Mystacocarids.

Influential scientific publications:

Hessler, R.R.: Deep-Sea Biology: A natural history of organisms at the deep-sea floor. Cambridge Univ. Press, 1999

Hessler, R.R. & Sanders, H.L. (1967). Faunal diversity in the deep-sea. *Deep Sea Res.* 14, 65-70.

Hessler, R.R., Elofsson, R. (2012): The reproductive system of *Derocheilocaris typica* (Crustacea, Mystacocarida). *Arthropod Struct. Dev.* 41: 281-291.

Alasdair McIntyre (1926 – 2010)

*Institution**: Marine Laboratory Aberdeen

Main field of work: Ecology of sandy beaches of Scotland (especially at Loch Ewe west coast of Scotland). He carried out an important, comprehensive and multi-disciplinary project which started with fish larvae but soon grew to one of the first ecosystem studies that included the abiotic factor system, meiofauna as well as fishery biology.

Characteristic features of work: Alasdair received his DSc by Glasgow University for his thesis on Marine Benthic Ecology. Beside his numerous ecological studies at Scottish coasts he grew ‘more and more international’, became professor at the University of Aberdeen, Chairman of the ICES advisory committee on marine pollution etc, etc.

Some personal impressions: Alasdair could always connect in his group - in an admirable way - a warm-hearted atmosphere with hard work and strategic scientific planning: go beyond the small details towards the general aspects; focus on details of the benthos, but always consider the general picture, the issues of marine pollution threatening our seas and the fisheries. Doubtlessly his ‘opus magnum’ remains ‘Life in the World’s Oceans’, where he brought together the scientific contributions of some 2000 (!) scientists from all around the globe. I think this is

*At time of photo (1969)

Back to the roots of IAM – continued

miraculous. No wonder that his restless scientific engagement promoted him to numerous highest positions in the UN Joint Group of Experts, the International Council for the Exploration of the Sea or the global programme “Census of Marine Life”, just to name a few. No wonder that A. McIntyre had received highest awards and official honours.

Altogether, as my friend A. Eleftheriou wrote: “Alasdair McIntyre was that rare and often undervalued individual: a real all-rounder, scientist, researcher, administrator, academic, writer, wine connoisseur, gourmet and passionate reader.”

I remember during my time with Alasdair and his group in Aberdeen our ‘after duty excursions’ to a pub near the institute where I was carefully introduced into the knowledge of whisky and even passed a whisky-examination (“we make it simple for foreigners”).

Influential publications:

McIntyre, A.D. (1968): The meiofauna and macrofauna of some tropical beaches. *J. Zool. Lond.* 156: 377-392

McIntyre, A.D.: Ecology of marine meiobenthos. *Biol. Rev.* 44 (1969): 245-290 (to my knowledge the first textbook on meiofauna ecology!)

McIntyre, .D. (ed.) (2010) *Life in the World’s Oceans: Diversity, Distribution, and Abundance*. 384 pp., Wiley-Blackwell, Hoboken, N.J., USA

William Duane Hope (1935-)

*Institution**: Natural History Museum, Smithsonian Institution, Washington, DC .

Main field of work: Systematics, comparative and functional morphology of marine nematodes

Characteristic features of work: Hope’s comprehensive scientific work covers far more than detailed taxonomy and discussions on systematics of nematodes. A meticulous observer and microscopist, he included fine-structural and phylogenetic aspects in his work.

Some personal impressions: Duane Hope is described by friends and colleagues as a ‘reserved’, yet very

helpful and friendly man. Regarding the increasing ‘taxonomy dilemma’ in meiobenthology, Duane and other renowned nematologists underline in a ‘position paper’ of 2006 (see below) the high potential of electronic publishing to reduce ‘the disproportion between numbers of species to be described and numbers of available taxonomic specialists that is greater for Nematoda than for any other metazoan phylum’. This would ‘help ameliorate the limitations of an underdeveloped taxonomy and empower the nematological disciplines currently hindered by it’. To me, these wise suggestions, published at a time when electronic publishing was still an exception, seem a positive contribution to this inherent dilemma of meiofauna taxonomy that is not restricted to nematodes only.

Hope was one of the pioneers in the discovery of ciliary structures in sense organs of nematodes. Moreover, to my knowledge, he was the first to mention free-living gutless marine nematodes (*Rhaptothyreus*).

Influential scientific publications:

Hope, W.D. & Murphy, D.G. (1969): *Rhaptothyreus typicus* n.g., n.sp., an abyssal marine nematode representing a new family of uncertain taxonomic position. *Proc. Biol. Soc. Washington* 82: 81-92.

Hope, W.D., Murphy, D.G. (1972): A taxonomic hierarchy and checklist of the genera and higher taxa of marine nematodes. *Smiths. Contr. Zool.* 187, 101 pp.

Sharma, J., Sun, L, Hope, W.D., Ferris, V.R. (2006): Phylogenetic relationships of the marine nematode family Comesomatidae. *J. Nematol.* 38: 220-232

Miljutin, D., Tchesunov, A., Hope, W. (2006): *Rhaptothyreus typicus* Hope & Murphy, 1969 (Nematoda: Rhaptothyreidae): An anatomical study of an unusual deep-sea nematode. *Nematology* 8: 1-20 DOI: 10.1163/156854106776179971

Eyuallem-Abebe et al. (2006): A position paper on the electronic publication of nematode taxonomic manuscripts. *J. Nematol.* 38: 305-311

Hope, W.D. (2007): Nematoda. In: *The Light and Smith Manual. Intertidal Invertebrates from Central California to Oregon*. Univ. Cal. Press, pp. 234-266

Back to the roots of IAM – continued

Franz Riemann (1937-)

*Institution**: Institut für Meeresforschung Bremerhaven

Main field of work: Taxonomy and (functional) anatomy of nematodes

Characteristic features of work: Beside his enormous data files and literature on nematodes, Franz is a systematist who — beyond describing — always tries to see the functional and evolutionary relevance of structures. His mucus-trap hypothesis (also ‘gardening hypothesis’) is still often cited and, in the light of novel microbial studies is gaining increasing attention.

Some personal remarks: Franz is one of the most enthusiastic specialists I met. Beyond his enormous knowledge about nematodes he just seemed to love them. During our PhD-studies I still see (or hear) him rushing into our room shouting joyfully “a new species!” However, beyond that field of systematics, his interests are always the lines connecting different aspects, e.g. evolutionary lines linked to microorganism/meiofauna and macrofauna, or ecological impacts on/by meiofauna. It is a rare feature to find a scientist like Franz who, beyond his scientific field, is an emotional naturalist – who can simply enjoy the beauties of nature around him.

Influential scientific publications:

Riemann, F. (1977). Causal aspects of nematode evolution. Relations between structure, function, habitat and evolution. - *Mikrofauna Meeresboden* 61: 217-230.

Riemann, F. (1976). Meeresnematoden (Chromadorida) mit lateralen Flossensäumen (Alae) und dorsoventraler Abplattung. – *Zool. Jb, Abt. Syst.*103: 290-308.

Riemann, R., Schrage, M. (1978). The mucus-trap hypothesis on feeding of aquatic nematodes and implications for biodegradation and sediment structure. *Oecologia (Berl.)* 34: 75-88.

Riemann, F. (1993): The mouthless deep-sea nematode *Rhabdothyreus minor* sp.n. (Rhabdothyreidae), mermithoid nematodes of uncertain systematic position. *Zool. Scr.* 22: 341-346.

Riemann, F., Helmke, E. (2002). Symbiotic relations of sediment-agglutinating nematodes and bacteria in detrital habitats: The Enzyme-Sharing concept. *P.S.Z.N.: Marine Ecology* 23: 93-113.

John Wells (1935 – 2018)

*Institution**: Lecturer in zoology at the University of Aberdeen, Scotland; from 1976 Professor of Zoology, later Dean at Victoria University of Wellington, New Zealand.

Main field of work: Taxonomy and ecology of harpacticoid copepods

Characteristic features of work: Wells’ study area was far beyond NZ, he worked in almost all continents, his study area ranged from Pacific coasts to many European and North America shores. His scientific activities were always accompanied by his duties as professor and (later) Dean of Science at the University of Wellington. Scientific collaborations, especially with Bruce Coull from South Carolina, supplemented the range of his work.

Some personal impressions: John Wells was an extremely skillful man, both regarding his talent in dissecting and drawing of his tiny harpacticoids, also in his capacity as an avid handyman. No wonder that the array of his activities was very broad: Interested in sports, he loved fishing as much as he was interested in classical music. After retirement John was very active in nature conservation campaigns at various coastal sites in New Zealand. By his friendly, but determined way he succeeded in amalgamating separate interests, exemplified in an event that today seems basal, but was a revolution then: technical



Back to the roots of IAM – continued

staff and senior students shared their tea hours with the academics! As Geoff Hicks wrote: “He was known as polite, patient and respectful – a real gentleman”.

Influential scientific publications:

Wells, J.B.J. (1976): Keys to aid in the identification of marine harpacticoid copepods. Univ. of Aberdeen, Dep. Zool. 215 pp (loose-leaf), with numerous amendments.

Wells, J.B.J., Hicks, G.R.F. & Coull, B.C. (1982) Common harpacticoid copepods from New Zealand harbours and estuaries. New Zealand J. Zool. 9: 151–184.

Well, J.B.J. (2007): An annotated checklist and keys to the species of Copepoda Harpacticoida (Crustacea). Zootaxa 1568, 872 pp.

Robert Williams

I regret that I have to omit Robert (standing left of the corridor wall beside Franz Riemann) in this little compilation. He is/was not a biologist and, therefore, not in my scope; no information could be found in the electronic media. At the Tunis-meeting he talked about impregnation techniques to measure particle voids and porosity in sand samples – factors of high relevance for water flux, oxygen and nutrient supply of meiobenthos.

Wolfgang Sterrer (1940-)

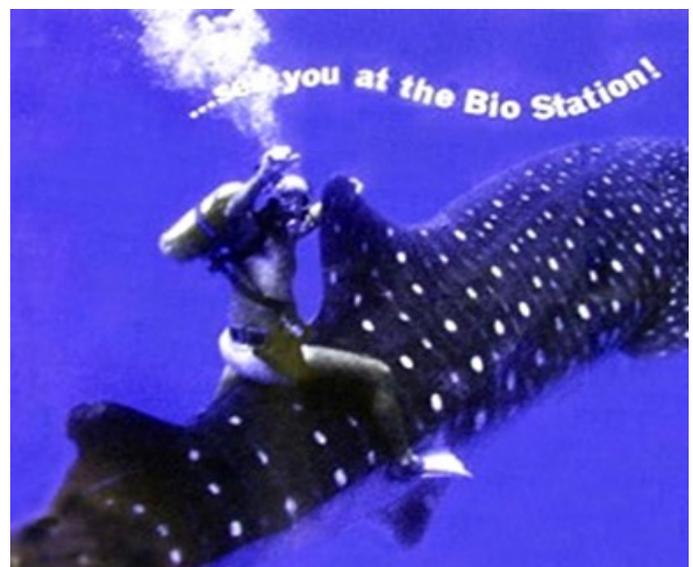
Institution: Bermuda Biological Station for Research, St, Georges, Bermuda

Main field of work: Originally, Sterrer was fascinated by Gnathostomulida, a taxon classified as a new meiobenthic phylum just in the year of the Tunis Conference, in 1969. Located at an isolated island in the middle of the Atlantic Ocean, Wolfgang naturally came to discuss problems of meiofauna distribution patterns by plate tectonics. As director of the Bermuda Biological Station he expanded his focus on general biological aspects of relevance for the Bermuda isles and their marine environment. However, Sterrer is still publishing on his favorites, the ‘jaw

worms’, often in cooperation with younger colleagues.

Characteristic features of work: Originating from the famous Austrian Riedl-School of meiobenthic animals, Sterrer started his career, in close contact with Rieger, studying turbellarians and the newly classified phylum Gnathifera. Beyond classical taxonomic descriptions his focus are general aspects like distribution and evolution of meiofauna groups.

Some personal impressions: I have never seen a director of an institute who was so easy going, friendly and sociable as Wolfgang in his wonderful Bio Station at Bermuda, and, of course, this attitude rubbed off on others, both visitors and staff. Wolfgang was the organizer of a most memorable workshop symposium “The Meiofauna Species in Time and Space” (1975) characterized by extremely vivid discussions (one famous participant –no names here– even jumped on the table to make himself better understandable!). And then the wonderful evening meetings in the station’s pub, the ‘Passing Winds’! It fits into the picture of a very ‘unusual’ scientist that Wolfgang was not only a keen diver/rider (the photo is real, no fake!). He was also popular on the Islands of Bermuda for his jazz band, where he played on Sundays in fashionable restaurants his wonderfully swinging clarinet.



Back to the roots of IAM – continued

Influential scientific publications:

Sterrerr, W. (1971) Gnathostomulida: Problems and procedures. *Smiths. Contr. Zool.* 76: 9-15

Sterrerr, W. (1972): Systematics and Evolution within the Gnathostomulida. *Syst. Zool.* 21: 151-173

Sterrerr, W. (1973): Plate tectonics as mechanism for dispersal and speciation in interstitial sand fauna. *Netherl. J. Sea Res.* 7: 200-222.

Sterrerr, W. & Ax, P. (eds.), 1977: The meiofauna species in time and space. *Microfauna Meeresboden* 61: 1-316

Sterrerr, W. (1992): Bermuda's Marine Life. Bermuda Natural History Museum, ISBN 978-0969651727

Some concluding remarks

Unique and sometimes surprising are the life data and scientific endeavours of these 'founders', the parents of our International Association of Meibenthologists. This was a small group – compared to the joyful crowds on photographs of more recent symposia. But the scientific curiosity, the professional hopes and fields of interest of these 'founders' were as fascinating and diverse as today's youngsters. In the old days, technical equipment was remarkably simple, the conveniences of computers unknown and the scope of research fields much smaller than present. This becomes particularly evident when comparing the list of references in one of the early books on meiofauna with those in present days publications – entire research fields are lacking! But the enthusiasm and warm personal interest among the pioneers of meiofauna research were as lively as among the numerous meibenthologists today. In those 'ancient' times, despite (or because of?) the absence of internet and email, personal contacts were often more important and lasting throughout years, decades and even lives.

To me this proves, and we should never forget this: There remain insights and human truths that are independent of technical potential and electronic support:

"It is the people, not the publications that make the difference"

Joe Miller, Author of 'Project Lightspeed', 2021

It is with this fundamental theorem in mind that we should see the future of our field of science, and compare it to the simple origins our scientific fathers had to base on. Preparing and writing these lines, I learned much about the various further approaches and developments toward science and scientific activities. The early meibenthologists, starting from a common basis, the 'new world' of meiofauna, had life stories as diverse as life itself with all its facets. So I can only hope that this historic outline is interesting also to all our younger followers. Where will their path of life lead them?

Epilogue

Although I have the privilege to personally know many of the colleagues on the photograph, it occasionally required quite some detective work to find out details and data. My gratitude for these informations about the old days go to several persons, but particularly to Wilfried Westheide, who sent me his (original!) photograph of the Tunis-meeting, to Bruce Coull, Wolfgang Sterrer, Franz Riemann and, last but not least, to Gertraud Teuchert-Noodt.

Olav Giere

Book review



New Horizons in Meiobenthos Research, Profiles, Patterns and Potentials, O. Giere, M. Schratzberger. Springer Cham 2023, XII 407 pp. ISBN: 978-3-031-21621-3.

<https://doi.org/10.1007/978-3-031-21622-0>

This book is particularly special to me, since it was inspired by the IAM conference, SeventIMCO, which took place in Évora (Portugal) in 2019. The role of meiobentology in this "changing world" and the framing and shaping of the future of this research field were often discussed during the meeting. Michaela Schratzberger is an acquaintance for many years, and she has always been enthusiastic and deeply dedicated to understanding the role of meiofauna in benthic ecosystems. Olav Giere is a world-renowned meiobentologist - his books are always on our desks - organizer and builder of our fundamental knowledge. Together, with their profound knowledge and enthusiasm, they decided to publish

this book, joining to invited specialists in the various disciplines of meiobenthic research, with a common goal: "to stimulate and guide innovative and relevant future research and to highlight how and where meiobentology can become an integral part of general benthology".

The book includes an elucidating preface written by the editors, who stress that it does not represent another textbook or a review covering all aspects of meiobentology, but aims to address recent advances in various fields, emphasizing the role of meiofauna in benthic ecosystems. It is a rigorous book, based on well-founded knowledge, which seeks to motivate and encourage the search for new horizons and inspire the following generations.

The book includes 11 chapters, the first ones covering evolutionary processes, biochemical pathways, biofilms as meiofaunal foundations and molecular-biological processes determining bacteria-symbiotic interactions in chemosynthetic environments. Fresh-water, deep-sea, polar, cave meiofauna and meiofauna "at the limits" have their own chapters, due to the rapid growth of the knowledge in the recent years. These subjects reflect the contemporaneity of meiobentology. The central theme of the Chapters 5, 6 and 7 is the factors responsible for the patterns of meiofauna diversity and distribution, including anthropogenic disturbances. Chapter 11 is dedicated to the adaptation of meiofauna to extreme environments. A brief summary of the different chapters will be given, to highlight the importance of this book with its modern and integrative vision and understanding of the future of meiofauna research.

Chapter 1, "Evolution of Bilateria from a Meiofauna Perspective- Miniaturization in the Focus", is based on advances in microscopic techniques, new molecular and analytical tools and integrative and comparative studies. Age old questions about the evolution of animal phyla and their ramifications for our understanding of the current diversity of life are re-visited in light of recent findings.

Book review – continued

Chapter 2, “Meiofauna shaping Biogeochemical processes” examines the role of meiobenthos in marine ecosystem functioning. Recent findings on the role of the meiofauna in geochemical processes and microbial activities are presented. The impact of meiofauna bioturbation in marine sediments on processes such as carbon degradation and oxygen penetration, sulphide dynamics and nitrogen cycling are also discussed in detail. An experimental approach is essential for the understanding of the role of meiofauna in marine sediment processes, and a state of the art experimental work paramount to this subject is presented.

Chapter 3, “Meiofauna and Biofilms—The Slimy Universe” examines the relationship between biofilms and meiofauna, again a topic from the current research frontiers. The authors analyse the contribution of meiofauna to biofilm functions, the benefits of living in biofilms and the potential applications of biofilm research. Meiofauna appears as key player in biofilm food webs, stimulating biofilm functions. Biofilms provide shelter for meiofauna and there is evidence of biofilm-compatible life-styles with some nematode taxa.

Chapter 4, “Meiofauna Meets Microbes—Chemosynthetic Symbioses” summarises the current understanding of the nutritional symbioses of meiofauna with chemosynthetic bacteria. Complex symbiotic mechanisms are analysed and discussed in detail: the importance of studying chemosynthetic symbioses in meiofauna; symbiotic interfaces- the structure and function of the host; mechanisms likely to allow meiofauna to successfully associate with chemosynthetic bacteria; new insights from the physiology of chemosynthetic symbionts in meiofauna are the subjects addressed in the chapter. In addition, the authors identified gaps in the current knowledge and suggested directions for future research.

Chapters 5, “Marine Meiofauna Diversity and Biogeography—Paradigms and Challenges” discuss the importance of meiobenthic biodiversity for ecosystems functioning based of dominant meiofauna, mainly nematodes and copepods. Looking at the meaning of endemism versus cosmopolitanism, it introduces an important new insight into this discussion.

Chapter 6, “Freshwater Meiofauna—A Biota with Different Rules?” highlights the role of freshwater meiofauna in the benthic food webs and shows its role in transfer of energy and carbon through food chains. A novel modelling approach shows that secondary production of micro- and meiobenthic communities can predict microbial decomposition rates, and the key results demonstrate the importance of freshwater meiofauna in biogeochemical carbon cycle.

Chapter 7, “Hidden Players—Meiofauna Mediate Ecosystem Effects of Anthropogenic Disturbances in the Ocean” is a thorough review on how marine meiofauna respond to anthropogenic disturbance, such as bottom-trawling, pollution, introduction of invasive species and climate change. Meiofauna responses to disturbance are complex and nonlinear and this provides an opportunity for in-deep discussion and interpretation of the data to understand meiofauna resistance, resilience, scale responses and their ability to adapt.

Chapter 8, “Deep-Sea Meiofauna—A World on Its Own or Deeply Connected?” is dedicated to deep-sea meiofauna and based on many of the patterns and relationships already identified, the authors present interpretations and explanations aimed at understanding how deep-sea meiofauna patterns relate to ecological interactions. Trophic interactions, biodiversity and ecosystem function, distribution and diversity patterns, and connectivity patterns are examined and related to other deep-sea biological and abiotic components.

Book review – continued

Chapter 9, “Polar Meiofauna—Antipoles or Parallels?” aims to place Arctic and Antarctic meiobenthos in the context of their extreme habitats, based on an overview of the contrasts and similarities between them. A comparison is made between different habitats such as polar coastal areas and fjords, continental shelves and ice shelves, the deep sea and sea ice. The implications of climate change for meiofauna are considered and gaps, directions, and methods in polar meiofauna research is also explored.

Chapter 10, “Cave Meiofauna—Models for Ecology and Evolution” presents an important review of cave meiofauna from a variety of cave types: marine, anchialine and several inland cave origins. Distribution patterns and cave meiofaunal communities are discussed. The author also focuses on the potential use of these organisms to address general questions of ecology and evolution.

Chapter 11, “Meiofauna adapted to life at the margins “ examines meiofauna that is well adapted to extreme environments. These ubiquitous

organisms can sometimes survive in the most inhospitable conditions. Knowledge of the mechanisms that facilitate 'life at the limit' focuses on three meiobenthic taxa: nematodes, rotifers and tardigrades. Natural extremes have always been present, but under the current conditions of climate change, the frequency of such adaptations can provide vital information on how organisms can survive stressful challenges such as acidification, oxygen depletion and temperature increase.

This book makes the reader realise that meiofaunal research is a contemporary subject, using advanced methodologies and addressing modern scientific questions that contribute to current challenges. As the editor's state “The present book on new horizons in meiobenthos research, written by leading specialists in the field of meiobenthology, is a compilation of promising new thinking...”

Helena Adão

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INTERNATIONAL ASSOCIATION OF MEIOBENTHOLOGISTS

APPLICATION FOR MEMBERSHIP OR RENEWAL

The International Association of Meiobenthologists is a non-profit scientific society representing meiobenthologists in all aquatic disciplines. The Association is dedicated to the dissemination of information by publishing a quarterly newsletter and sponsoring a triennial International Conference. The newsletter, *Psammonalia*, is published mid-month in OCTOBER and August. Membership is open to any person who actively is interested in the study of meiofauna. Annual membership dues are EU\$10 (US\$10) and payment for up to 3 years in advance is possible. New members will receive *Psammonalia* beginning with the January issue of the year after joining. Additional contributions to the **Bertil Swedmark Fund**, used to support student attendance at the triennial conferences, is encouraged.

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