Number 4 August, 1981

ROTIFER NEWS

A Newsletter for Rotiferologists throughout the World

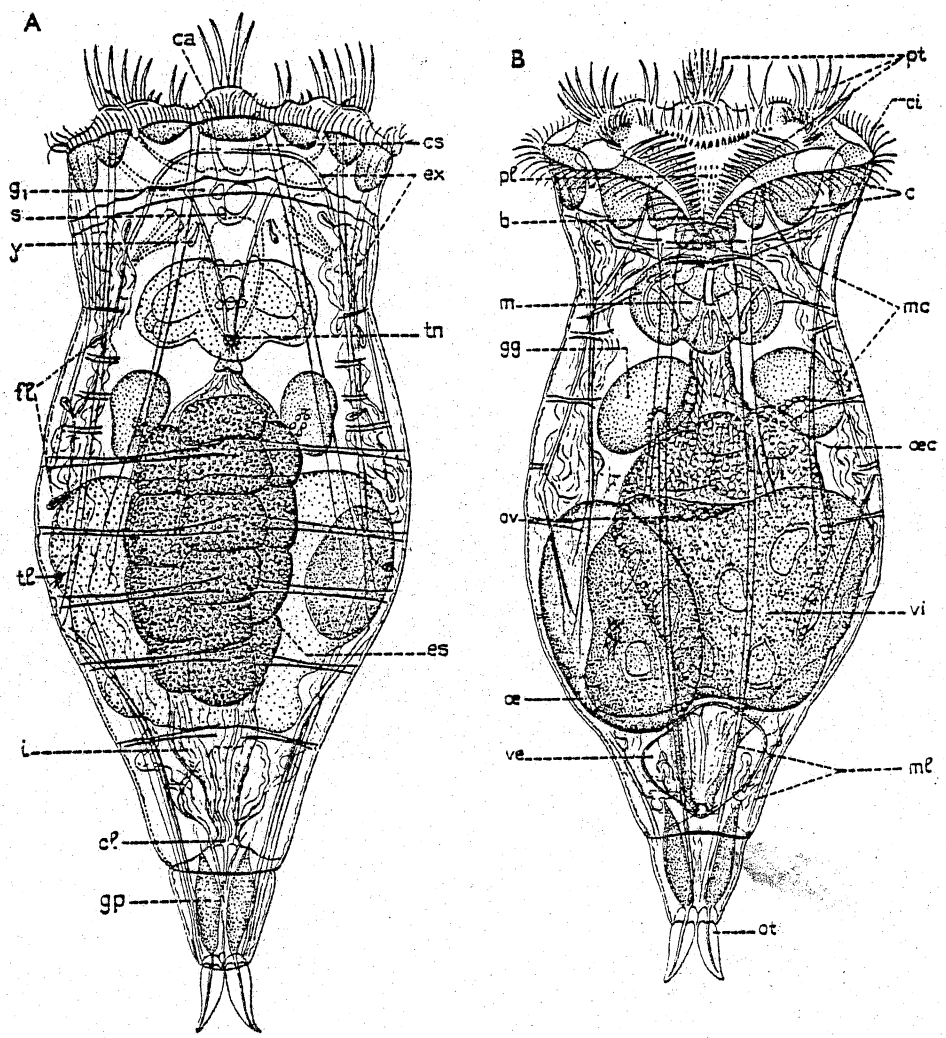

FIG. 1015. — *Epiphanes (Hydatina) senta*, ♀, × 240 (1). *A*, vue dorsale; *B*, vue ventrale. Les noyaux ne sont pas représentés sauf dans le vitellogène, et les muscles ne le sont pas tous. *b*, bouche; *c*, plasmodes de la couronne; *ca*, ceinture circumapicale; *ci*, cingulum; *cl*, cloaque; *cs*, conduit du sac rétrocérébral; *es*, estomac; *ex*, néphridie; *fl*, ses flammes; *g*, ganglion cérébral; *gg*, glandes gastriques; *gp*, gl. du pied; *i*, intestin; *m*, mastax; *mc*, muscles circulaires; *ml*, m. longitudinaux; *œ*, œuf; *œc*, œsophage cilié; *ov*, ovaire; *pl*, plaque buccale; *pt*, pseudotrochus; *s*, sac rétrocérébral; *tl*, tentacule lombaire; *tn*, t. nucal; *ve*, vessie; *vi*, vitellogène; *y*, œil.

(from Paul de Beauchamp. 1965. Classe des Rotifères: Traité de Zoologie)

Editors:

James R. Litton, Jr.
Biology Department
Saint Mary's College
Notre Dame, IN 46556
U.S.A.

Robert L. Wallace
Biology Department
Ripon College
Ripon, WI 54971
U.S.A.

CHANGE OF EDITORSHIP

I have asked James Litton and Robert Wallace to become the editors of ROTIFER NEWS, and they have kindly agreed to take on this responsibility. Please give them your support so that we can make this an effective vehicle for communication among rotifer workers worldwide.

Sincerely,

John J. Gilbert

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NOTICE

ROTIFER NEWS is not a part of the scientific literature and should not be cited as such. ROTIFER NEWS prints abstracts, news and notes about work in progress or items being submitted for publication in regular scientific journals.

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FREQUENCY OF ISSUE OF ROTIFER NEWS

We intend to issue ROTIFER NEWS annually each August. If a large body of exciting material accumulates rapidly enough we will issue a January/February issue each year. Please send reprints and/or references, news, notes, requests to either:

James R. Litton, Jr.
Biology Department
Saint Mary's College
Notre Dame, IN 46556 U.S.A.

or

Robert L. Wallace
Biology Department
Ripon College
Ripon, WI 54971 U.S.A.

PLEASE BE SURE TO RETURN THE ENCLOSED QUESTIONNAIRE/SURVEY. Thank you.

NEWS, NOTES AND REQUESTS

1. Back Issues of Rotifer News still available!

If you need or want a back issue (1-3) of Rotifer News copies are still available. Please request from Jim Litton.

2. Recent books and monographs of interest to Rotiferologists

A. ROTATORIA. Die Rädertiere Mitteleuropas.

Walter Koste. 1978. I. Textband. II. Tafelband.
Schweizertbart'sche Verlagsbuchhandlung, Stuttgart.

This identification guide is a completely revised version of the famous work by M. Voigt (1956/57), "Rotatoria - die Rädertiere Mitteleuropas" (Rotatoria - the Rotifers of Central Europe")

Walter Koste was able to concentrate on the most extensive group, the Monogononta with the orders Ploimida and Gnesiotrocha, since an excellent work by J. Donner already exists on the Bdelloidea, which contains an excellent treatment of both the terrestrial and aquatic forms of this species.

All Monogononta Rotifers found to date in Central Europe have been described by the author in the greatest detail, but a description is also given of all the important cosmopolitical species known to the author. As sub-tropical and tropical forms are also occasionally found outside their natural biotops, in Central Europe, e.g. in heated pools and in waters warmed in summertime, the author has also endeavoured to indicate how these interlopers can be identified.

In order to facilitate identification, a numeric code and a dichotomous identification code have been provided, as well as many corresponding drawings which have been collected in the text and also in a comprehensive volume of illustrations.

At the end of each genus, lists are given of critical taxonomical data, specific names, which have apparently arisen through the description of conserved artefacts or individual variants.

Everyone concerned with the huge group of Rotifers will want to consult the new "KOSTE/VOIGT".

B. ROTATORIA. Proceedings of the 2nd International Rotifer Symposium
H. J. Dumont and J. Green (editors).

(DEVELOPMENTS IN HYDROBIOLOGY VOLUME 1). 1980.

Dr. W. Junk bv, The Hague.

available from:
Kluwer Academic Publishers Group,
P.O. Box 322,
3300 AH Dordrecht,
The Netherlands.

A list of participants and papers from the 2nd International Rotifer Symposium follows the News, Notes and Requests section.

C. A Key to the Freshwater Planktonic and Semi-Planktonic Rotifera of the British Isles. Rosalind Pontin. 1978. Freshwater Biological Association. Publication No. 38.

available from: The Librarian
The Freshwater Biological Association
The Ferry House
Far Sawrey
Ambleside, Cumbria, LAZZOLP
ENGLAND

D. An Illustrated Key to the Planktonic Rotifers of the Laurentian Great Lakes. D. W. and D.R. Grothe. 1977. U.S. Environmental Protection Agency. Publication number PB-291289/AS.

available from: National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161, U.S.A.

E. Index of Names and Locations of Algae and Some Groups of Microorganisms Found in the Netherlands Waters
M. G. N. Dresscher (editor). 1976. Amsterdam and New York: North-Holland.

This volume gives about 50 pages and names and locations of Rotifers found in the Netherlands.

F. The Evolution and Ecology of Zooplankton Communities. W. Charles Kerfoot (editor). 1980. Hanover, N.H.: University Press of New England.

available from: University Press of New England
P.O. Box 979
Hanover, N.H. 03755 U.S.A.

3. A limited number of Börje Carlin's thesis (Die Planktonrotatorien des Motalaström. Zur Taxonomie und Ökologie der Planktonrotatorien. 1943) Requests are still available from Limnological Institute, Lund (Gunnar Andersson or Bruno Berzins) or Limnological Institute, Uppsala (Birger Pejler).

4. Pter Burwitz and Wolfgang Tobias report the availability of the valuable collections of the late Josef Hauer:

Der wissenschaftliche Nachlass von Dr. h.c. Josef Hauer (5.8.1888 - 11.9.1970) aus Karlsruhe konnte im Jahr 1971 von der Senckenbergischen Naturforschenden Gesellschaft in Frankfurt a.M. erworben werden und befindet sich seitdem im Natur-Museum und Forschungsinstitut Senckenberg, Sektion Limnische Ökologie und Entomologie IV, in Verwaltung.

Zum Nachlass gehören neben einer Kollektion von insgesamt 3,729 mikroskopischen Präparaten, die unter den Sammlungsnummern SMF Rot. GP 1001 - 4730 inventarisiert sind, die gesamte Fachbibliothek, wertvolle handschriftliche Notizen, Zeichnungen, Präparate-Skizzen, Literatur- und Artenkataloge sowie die umfangreiche wissenschaftliche Korrespondenz. Gerade die schriftlichen Aufzeichnungen und Vorstudien für Veröffentlichungen stellen für jemanden, der sich mit taxonomischen, systematischen und zoogeographischen Fragen bei Rädertieren befasst, eine wahre Fundgrube an Information dar. Insofern und speziell unter dem Aspekt eines

bestürzenden Mangels an Taxonomen allgemein und Rädertier-Spezialisten im besondernen, unter dem die heutige Zoologie leidet, erscheint es notwendig, auf diese kostbare Sammlung kurz aufmerksam zu machen.

Insgesamt befinden sich in der Präparate-Sammlung 566 Spezies und 95 Subspezies, die auf folgende Gattungen verteilt sind:

Anuraeopsis
Ascomorpha
Aspecta
Asplanchna
Birgea
Bdelloidea
Brachionus
Callidina
Cephalodella
Collotheca
Colurella
Conochilus
Conochiloides
Chromogaster
Cupelopagis
Cystonia
Dapidia
Dicranophorus
Diplax
Dipleuchlanis
Dissotrocha
Diurella
Dorria
Enteroplea
Elosa
Encentrum
Eosphora
Epiphanes
Eudactylota
Euchlanis
Filinia
Floscularia
Gastropus
Habrotrocha
Hexarthra
Itura
Keratella
Lacinularia
Lecane (Monostyla)
Lepadella
Lindia
Lophocharis
Macrochaetus
Metadiaschiza
Microcodon
Monommata
Myersina
Mytilina
Notholca
Notommata
Paracolurella
Paraploesoma
Pedalia
Philodina
Platyias
Pleuretra
Ploesoma
Polyarthra
Pompholyx
Proales
Proalinopsis
Pseudonotholca
Pseudoecistes
Ptygura
Resticula
Rotaria
Scaridium
Schizocerca
Sinantherina
Sphyrias
Squatinella
Streptognatha
Synchaeta
Synkentronia
Taphrocampa
Testudinella
Tetramastix
Tetrasiphon
Trichocerca
Trichotria

Von den in fast 50 Publikationen HAUER's (vgl. dazu DONNER 1971) für die Wissenschaft neu beschriebenen Rotatorien-Taxa aus Mitteleuropa, Asien und Südamerika ist nachstehendes Typenmaterial vorhanden:

Ascomorpha klementi
Asplanchna girodi
Asplanchna pinti
Brachionus angularis var. aculeata f. lateralis
Brachionus forficula var. aculeata f. lateralis
Brachionus gessneri
Brachionus gillardi
Brachionus incertus
Brachionus neali
Brachionus quadridentatus
Brachionus voigti
Brachionus zahniseri var. neotropicus
Brachionus zahniseri var. reductus
Cephalodella donneri
Cephalodella inquilina
Cephalodella mucronata
Cephalodella physalis
Cephalodella plicata
Cephalodella strepta
Keratella cholearis macracantha
Keratella lenzi
Keratella thomassoni
Keratella thomassoni f. endonis
Lecane bifastigata
Lecane donneri
Lecane elsa
Lecane murray
Lecane nodosa
Lecane pertica
Lecane protecta
Lecane remanei
Lecane rhenana
Lecane rodescui
Lecane ruttneri
Lecane sympoda
Lecane undulata
Lepadella astacicola
Lepadella brachicola

Cephalodella tantilla
Chromogaster klementi
Dicranophorus claviger
Dicranophorus thysanus
Dissotrocha hertzogi
Diurella insignis
Diurella insulana
Diurella maior
Diurella musculus
Diurella myersi
Diurella taurocephala
Diurella tenuidens
Diurella vernalis
Euchlanis lucksiana
Eucactylota wulferti
Hexarthra intermedia var. brasiliensis
Keratella cholearis irregularis connectens
Lepadella parasitica
Monostyla conspicua
Monostyla crypta
Monostyla elachis
Monostyla latens
Monostyla mitella
Monostyla solfatara
Monostyla syngenes
Monostyla thienemanni
Monostyla wulferti
Mytilina acanthophora
Synkentronia bursaria
Synkentronia complicata
Synkentronia porrecta
Testudinella amphora
Testudinella brycei
Testudinella insinuata

Darüber hinaus sind sowohl von älteren als auch jüngeren Veröffentlichungen von Josef Hauer noch Separate verfügbar (Zahl in Lammern), die an Interessenten abgegeben werden können. An die kostenlose Abgabe ist die Bitte geknüpft, möglichst im Tausch eigene Rotatorien-Arbeiten, auch ökologischen und physiologischen Inhalts, zur Komplettierung der Bibliothek zu übersenden.

1935: Rotatorien aus dem Schluchseemoor und seiner Umgebung. - Verh. Naturwiss.Ver. Karlsruhe, 31: 47-130. (1)
1937: Zur Kenntnis der Rotatorienfauna des Eichener Sees. - Beitr. naturkundl. Forsch.SW-Deutschl., 2: 165-173. (2)
1937/38: Die Rotatorien von Sumatra, Java und Bali nach den Ergebnissen der Deutschen Limnologischen Sunda-Expedition. - Arch. Hydrobiol., Suppl. 15 (Trop.Binnengewässer, 7): 296-384 und 507-602. (4)
1939: Zur Kenntnis der Rüsselrädertiere (Bdelloidea) des Schwarzwaldes. - Beitr. naturkundl.Forsch.SW-Deutschl., 4: 163-175. (2)
1940: Beitrag zur Kenntnis der Rotatorien warmer Quellen Deutschlands. - Zool.Anz., 130: 156-158. (1)
1952: Rädertiere aus dem Naturschutzgebiet "Wutachtal". - Beitr. naturkundl.Forsch. SW-Ddeutschl., 11: 45-53. (6)
1952: Pelagische Rotatorien aus dem Windgfällweiher, Schluchsee und Titisee im südlichen Schwarzwald. - Arch.Hydrobiol., Suppl. 20: 212-237. (1)
1953: Zur Rotatorienfauna von Nordostbrasilien. - Arch.Hydrobiol., 48: 154-172. (2)
1956: Ein neuer Brachionus (Rotatoria) aus Venezuela. - Beitr. naturkundl.Forsch. SW-Deutschl., 15: 63-64. (4)
1957: Rotatorien aus dem Plankton des Van-Sees. - Arch.Hydrobiol., 53: 23-29. (6)
1958: Rädertiere aus dem Sumpfe "Grosse Seewiese" bei Kist (Würzburg). - Nachr. Naturwiss.Mus.Stadt Aschaffenburg, Nr.60: 1-52. (3)
1958: Beiträge zur Kenntnis südamerikanischer Rotatorien. - Beitr. naturkundl. Forsch.SW-Deutschl., 17: 174-178. (16)
1959: Raumparasitische Rotatorien aus der Kiemenhöhle des Steinkrebses (Potamobius torrentium SCHR.). - Beitr.naturkundl.Forsch.SW-Deutschl., 18: 92-105. (9)
1959: Dissotrocha schlienzi HAUER. - Arch.Hydrobiol., Suppl.25 (1): 65-66. (13)
1961: Zur Kenntnis südamerikanischer Rotatorien. - Beitr. naturkundl.Forsch. SW-Deutschl., 20: 67-69. (64)
1962: VOLKER KLEMENT, Rotatorienforscher und Apotheker. - Jh. Ver.Naturk. Wurttemberg, 117: 6-64. (7)
1963: Zur Kenntnis der Rädertiere (Rotatoria) von Ägypten. - Arch.Hydrobiol., 59: 112-115. (13)
1964: Lecane remanei n.sp., ein neues Rädertier aus dem Amazonasgebiet. - Zool. Anz., 172: 26-30. (64)

1965: Zur Rotatorienfauna des Amazonasgebietes. - Internat.Rev.ges.Hydrobiol., 50: 341-389. (46)
1965: Über einige im Stromgebiet des Amazonas neuentdeckte Radertiere. - Beitr. naturkundl.Forsch. SW-Deutschl., 24: 41-46. (57)
1966: Brachionus gillardi n.sp. - Beitr.naturkundl.Forsch.SW-Deutschl., 25: 73-74. (64)

For further information on use and availability of these resources contact:

Dipl.-Biol. Peter Burwitz und
Dr. Wolfgang Tobias
Forschungsinstitut Senckenberg
Senckenberganlage 25
D - 6000 Frankfurt a.M. 1 GERMANY

5. R.N. SINGLA, is engaged in a study of certain aspects of reproduction and sexual transition in Rotifers and would appreciate receiving reprints of papers and suggestions on this field.

6. Lucia Regina Ferraz is working at the Marine Biological Station in Brazil. She has been studying Brachionus plicatilis in an attempt to determine the best food for its mass culture. Good results have been obtained so far using the algae Dunaliella tertiolecta and Tetraselmis striata. L. Ferraz requests other researchers who are working with rotifers as food for larval fish to write so that they might exchange information.

7. Thomas Norgrady (with J. Kalff) has been studying the population dynamics of Lake Memphremagog rotifers. In that study the rotifer population was followed quantitatively along the whole length of the narrow and long (24 miles) oligotrophic - mesotrophic lake situated on the Quebec - Vermont border. Originating at southern end of the lake, as the effluent of the town of Newport, Vermont, a continuous phosphorus gradient stretches along the lake, diminishing towards north. Primary production expressed in chlorophyll and rotifer biomass also decreases from south to north, as expected. The notable exception to this is the vernal rotifer production peak (end of May - early June) when an unusually high Polyarthra vulgaris, Keratella earlinae, Kellicottia longispina and Conochilus unicornis population develops in the northernmost (normally least productive) basin, which is not in normal proportion with the relatively low primary production. The phenomenon occurred every year during the investigation (1974 - 76) and could probably best be explained by nannoplankton size distribution most favourable at that time, i.e. a larger proportion of the phytoplankton being edible.

T. Norgrady has also begun a comparative investigation on a small group of small lakes near Montreal. An interesting aspect of this study has been the difference in the rotifera fauna and population dynamics in two interconnected adjacent lakes. In this study some interesting observations on the behavior of Cupelopagis vorax were made.

Additionally, T. Nogrady has begun investigations on rotifer neurophysiology and neuropharmacology. Preliminary results indicate the absence of adrenergic systems in several species.

8. Bashir A. Subla has been studying the rotifer fauna in northern India. He has submitted the following research note.

The state of Jammu & Kashmir (lat. 32-73°N; long. 72-80°E) is situated in the northern part of the Indian sub-continent. The vale of Kashmir, a well watered plain, lies for the most part at an elevation of about 1580 m between Pirpanjal Mountain and the main range of Himalaya. The abundance of aquatic habitats (i.e. streams, rivers, ponds, and lakes) present unique opportunity to a field biologist.

Very little is known about the Rotatoria of this region, the earliest work on the group being that of the members of Yale North India expedition (Edmondson & Hutchinson 1934). Since then stray reports have appeared (Das et al. 1969, Subla 1970), on the Zooplankton of Kashmir but the rotatoria of Kashmir never engaged the special attention till recently. The present study on the group include the systematics, distribution and the variation in morphological features of the species, besides, their seasonal and annual behaviour. The studies have also been undertaken to incorporate the seasonal and annual rates of phytoplankton production, phyto-zooplankton dynamics and their contribution towards the metabolism of an aquatic habitat and also to assess the energy turnover and trophic status of such habitats.

Sixty eight (68) species of Rotatorian fauna have so far been reported from different parts of the valley of Kashmir (Subla et al., in press) many of which show interesting features and distributional pattern and some of which are rare species.

9. Krzysztof Plasota, Maria Plasota, and Władysław J.H. Kunicki-Goldfinger have begun research on the regulation of development of Rotifera, using Habrotrocha rosa Donner 1949 (Bdelloidea). The preliminary stages of the study are concerned with methods for obtaining monoxenic and axenic cultures of the rotifer and increasing knowledge on its biology, karyology, and embryology. Abstracts of preliminary results are given in following notes.

Methods for obtaining an axenic culture of H. rosa Donner 1949.
H. rosa was isolated from activated sludge from a sewage purification plant. The culture was freed from contaminating eucaryotic organisms by picking up single specimens with a needle and transferring them to sterile basal nutrient medium. The majority of contaminating bacteria was eliminated by penicillin treatment (penicillin even at very high concentrations is non-toxic for Rotifera). The remaining bacteria in the culture (mixture of Pseudomonas sp.) were eliminated by a multi-step procedure: lysis of Pseudomonas cell wall with a special buffer (Gilleland, Stinnet, and Eagon 1974) and repeated short treatment with nebcine, chlortetracycline, and carbenicillin at concentrations at which a small fraction of animals survived. Axenic cultures of H. rosa were supplemented with penicillin-sensitive Micrococcus sp. as a particulate food. The resulting monoxenic culture may be shifted to axenic conditions by penicillin treatment

Biology, karyology and development of H. rosa Donner 1949.
The average life span of H. rosa is 20 days. Three distinct life-periods may be distinguished: period before maturation (2-3 days), period of fertility (6-9 days), and period of senescense when no eggs are formed but the animal is fully active (10-14 days). A small fraction of individuals die during the fertile period, apparently due to some disturbance in the egg-laying process (eggs in such cases accumulate in the body). The number of eggs produced during the fertile period averages about 30; the number of eggs laid on one day varies but does not exceed 6. The development of the embryo, from the moment of egg-laying until the hatching of the animal, lasts 30.5-33 hours. If hatching is delayed by a few hours, the young animal dies in the egg-shell. The early stage of development, from egg-laying till formation of four blastomeres, is relatively short: 1 h - 1 h 15 min. The cleavage is unequal (spiral), thus being of the same type as in monogonont Rotifera. The number of somatic cell nuclei per H. rosa, as measured

in Feulgen stained preparations (Jones and Gilbert 1977), averages 428. Besides, there are 7 to 13 large nuclei of syncytial vitellarium and 16 to 27 oocytes. The number of chromosomes per diploid (?) nucleus is 14. There is, however, no homology inside the chromosome set (Hsu 1956 a,b). The chromosomes are exceedingly small: one to a few μ in length. The chromosomes were examined in sections or squashed preparations stained with iron-hematoxyline or orcein. All observations were made on animals from laboratory culture.

Literature Cited

Gilleland, H.E., Jr., Stinnet, J.D., and Eagon, R. 1977. Ultrastructural and chemical alteration of the cell envelope of Pseudomonas aeruginosa, associated with resistance to ethylenediaminetetraacetate resulting from growth in Mg^{2+} deficient medium. J. Bact. 117:302-311.

Hsu, W.S. 1956 a. Oogenesis in the Bdelloidea rotifer Philodina roseola Ehrenberg. La Cellule 57:283-296.

____. 1956 b. Oogenesis in Habrotrocha tridens (Milne). Biol. Bull. 111: 364-374.

Jones, P.A. and Gilbert, J.J. 1977. Polymorphism and polyploidy in the Rotifer Asplanchna sieboldi: Relative nuclear DNA contents in tissues of saccate and campanulate females. J. Exp. Zool. 201:163-168.

10. March Allyn Waldauer sends an abstract of her thesis: The psammon community of Southwick Beach, New York. 257 pages, 61 figures, 30 tables, 1977: State University of New York College of Environmental Science and Forestry, Syracuse, N.Y., U.S.A.

Comparison was made of two psammon communities, on either side of a barrier beach at Southwick Beach State Park, N.Y. Overall species diversity in August was: H' = 1.289 on the sheltered beach; H' = 1.023 on the exposed beach, which faced Lake Ontario. In addition, more organisms and representatives of more families were found on the sheltered than the exposed beach. The exposed beach community was dominated by rotifers such as Dichranophorus, whereas the sheltered beach, which faced a quiet marshy pond, was dominated by the nematodes Cryptonchus, Achromadora, Monhystera, and Tobrilus. Also found were gastrotrichs (Chaetonotidae), Turbellaria, harpacticoid copepods, Tardigrada (Macrobiotus), Oligochaeta, ostracods, and dipteran larvae. Distributions of major groups and common species were studied on both beaches along horizon (distance above the water table), with depth to 9 cm, and with season. Community similarity (QS) matrices and food webs were made for both beaches. Limiting factors to the exposed beach community were wave action and lack of detrital food. In contrast, oxygen and competition were limiting factors on the more sheltered beach. Selective and non-selective deposit feeders comprised only 19% of the exposed beach meiofauna, but were 73% of the sheltered beach fauna population. Epigrowth feeders (which fed on attached algae and bacteria) were also more important on the sheltered than exposed beach. In contrast, 64% of the exposed beach community but only 5% of the sheltered beach community consisted of predator-omnivores. Common species of those genera characteristic of the sheltered beach, such as the rotifers Cephalodella and Monostyla, showed more specialized habitats as implied by differences in their distributions than did species of exposed beach genera. The narrow distributions and the dominance by selective feeders are indicative of narrower niche size on the more densely populated and more diverse sheltered beach.

She further requests help in species identification of several Dichranophorus and one Encentrum(?) from the Lake Ontario beach.

11. Nancy Butler is working on a master's thesis on various aspects of the ecology of Cupelopagis vorax. She requests that others working with C. vorax write for an exchange of information.

12. S. M. Das reports a study he completed on the Rotifers of the Kumaon Lakes, Uttarpradesh, India. This represents the first report of the rotifer fauna in these lakes. 13 families, 29 genera and 36 species of rotifers are recorded from Nainital lake and Bhimtal lake. Some of these rotifers, as in Kashmir, are confined only to these high altitude lakes and have palaearctic affinities. The 9 species viz Trichotria tetractis, Eosphora najas, Gastropus haptopus, Gostylifer, Filinia terminales, Conochilus hippocrepis, Proales fallaciosa, Philodina roseola, Trochosphaera solstitialis, and Philodinavus paradoxus are representatives of Palaearctic elements found normally in Europe and America. Some of these species have also been reported from Kashmir by Edmondson and Hutchinson (1934) and by Das (1969, 1970, 1971, 1976). These 9 species may be considered as high-altitude temperate species, as they are rare or unrepresented in the rotifer fauna of the plains of India.

13. J. P. Sharma, S. K. Chowdhary, and J. B. Srivastava report the following ecological observations on the rotifer fauna of the Jammu region, Jammu and Kashmir, India.

Ecological observations on 33 species of rotifers of Jammu region were made from biweekly collections. The periodic collection in regular successions were made from eight natural ponds located in different ecological conditions of the region. The ponds were thoroughly studied for faunistic and ecological investigations on rotifers specially with regard to the influence of temperature, pH, and consistancy of oxygen.

During the course of the investigation, it was observed that the rotifer population could be divided into eurythermal and stenothermal groups. The eurythermal group (those species surviving in a range of 15° to 35°C) includes: Keratella valga, K. tropica, Brachionus rubens, B. plicatilis. The stenothermal group is composed of rotifers surviving in one of two different sets of temperatures, a meso-stenothermal range (15-20°C) and a warm-stenothermal range (20-25°C). Species which may be classified as meso-stenotherms indlude: Rotaria sp., Philodina sp., Keratella cochlearis, Hexarthra sp., Filinia opoliensis, Pompholyx sulcata, Monostyla bulla, B. calyciflorus, B, falcatus. Species which may be classified as warm-stenotherms include: B. quadridentata, B. forficula, B. angularis, K. hiemalis, Filinia longiseta, Epiphanes brancionus, Epiphanes calculata, Euchalanis dialatata, Menfredium Sp., Lepadella ovalis, Proalides verrucosus, Eosphora najas, Cephalodella gibba, Resticula melandocus, Polyarthra sp, Trichocerca longiseta, Asplanchna priodonta, Lecane luna, Conochilus unicornis, Conochiloides dossuarius, Ascomorphella volvocicola.

Species which were found within the pH range of 7.5 to 10.3 included: Brachionus rubens, B. plicatilis, B. angularis, B. forficula, B. quadridentata, B. falcatus, B, calyciflorus, Keratella valga, K. tropica, K. hiemalis, K. cochlearis, Epiphanes brachionus, E. calvulata, Euchalanis dialatata, Menfredium sp, Lepedella ovalis, Proalides verrucosus, Eosphora najas, Cephalodella gibba, Resticula melandocus, Polyarthra sp, Ascomophella volvocicola, Trichocerea longiseta, Asplanchna priodonta, Lecana luna, Monostyla bulla, Pompholyx sulcata, Filinia longiseta, F. opoliensis, Conochilus unicornis, Conochiloides dossuarius, Hexarthra sp, Rotaria sp, Philodina sp.

There are certain species like Brachionus calyciflorus and Keratella valga which were found in highly alkaline water, pH > 12.0.

Species found in waters with an oxygen concentration between 6 and 12 $mg \cdot l^{-}$ include: Lepadella ovalis, Proalides verrucosus, Eosphora najas, Cephalodella gibba, Resticula melandocus, Ascomorpha volvocicila, Trichocerca longiseta, Flina opoliensis, Polyarthra sp, Brachionus falcatus, B. quadridentata, B. forficula, B. plicatilis, B. rubens, Keratella tropica, K. valga, K. hiemalis, K. cochlearis.

14. J. V. Reed is working on improving methods for long term maintenance of rotifer cultures, which do not require a lot of attention. The best results have been achieved with test tube soil-water cultures. Two species, Cephalodella tantilla Myers and C. sagitta Wulf, have been maintained for nearly six o months with virtually no attention (probably much longer by now; Eds.) Some species have not cultured satisfactorily by this method.

(NB: The editors are currently collecting the details of the preparation of rotifera media - see item #15).

J. V. Reed has also recently started a project to look more closely at the nature of dietary specificity in rotifers. His research will involve a detailed comparison of three acid water species which are taxonomically related, but which vary widely in their distribution and occurrence: Cephalodella tantilla, C. nana Myers, and C sabulosa Myers.

15. For an upcoming synopsis to be published in the next issue of Rotifer News the editors request that researchers culturing rotifers on artificial media send detailed descriptions of each medium which they have or are currently using. Please include the following:

1. The medium name,
2. The details of its preparation (use empirical formulas),
3. The origin of the medium,
4. The species which have been successfully cultured on the medium, and the length of time they have been in culture, and
5. Any other pertinent information which you believe is important.

16. The Third International Rotifer Symposium is being planned for late August, 1982. It will be held at the Institute of Limnology, University of Uppsala, Sweden.

Second International Rotifer Symposium

Gent, Belgium

17 - 21 September 1979

Attending this symposium were 50 scientists from 17 countries (Australia, Austria, Belgium, Canada, England, France, Germany, Israel, Italy, The Netherlands, Norway, Poland, Scotland, Sweden, Switzerland, USA, USSR). The scientific program consisted of invited reviews, contributed papers, and workshops (see below). The proceedings will be edited by H. J. Dumont and J. Green and published by Dr. W. Junk, The Netherlands, both as a book and as a special volume of the journal, Hydrobiologia.

The symposium was superbly organized by H. J. Dumont and his associates and was sponsored by the State University of Gent, the National Science Fund of Belgium, the Ministry of National Education and Culture of Belgium, and the Donk Lake Local Authorities and Tourism Organization. In addition to the scientific program, there was a Mozart concert, a viewing of slides taken by M. Sudzuki at the first international symposium at Lunz, Austria, a tour of Gent and Bruges, and a sumptious banquet which included two courses of eel from Donk Lake and a non-stop band from 9 PM to 3 AM.

Scientific Program

17 September

1) C. E. King (USA) -- Aging (review).

2) E. Lubens and R. Fischler (Israel) -- Induction of sexual reproduction in *Brachionus plicatilis* reared in sea water.

3) P. Clément and R. Pourriot (France) -- Evolution of the photoperiod influence on a ten year old clone of *Notommata copeus*.

4) C. Ricci (Italy) -- Maternal reproductive rate effect on offspring experimental observations.

5) T. W. Snell (USA) -- Density dependence of sexual reproduction in natural populations of *Asplanchna girodi*.

6) R. W. Epp (USA) -- Metabolic responses to temperature change in temperate rotifers.

7) Workshop on culture techniques: R. Pourriot, moderator.

8) M. Schlüter (Germany) -- Mass culture experiments with *Brachionus rubens*.

18 September

1) P. Clément (France) -- Phylogeny (review).

2) E. Wurdak (USA) -- Ultrastructure and histochemistry of the rudimentary gut of male *Asplanchna sieboldi*.

Scientific Program - Continued

3-5) J. Amsellem, A. Cornillac, P. Clément (France) and C. Ricci (Italy) -- Ultrastructural approach to feeding behavior in Philodina roseola and Brachionus calyciflorus: a) the buccal velum, b) the esophagus, and c) the cilia and muscles.

6) J. Amsellem and P. Clément (France) -- Special techniques of scanning and transmission electron microscopy for rotifers.

7) M. Coussement and H. J. Dumont (Belgium) -- Some peculiar elements in the rotifer fauna of the Atlantic Sahara.

8) Discussion of techniques: electronic particle counting (P. L. Starkweather) and gel electrophoresis (C. E. King).

19 September

1) R. L. Wallace (USA) -- Ecology of sessile rotifers (review).

2) A. Herzig (Austria) -- Some features of the ecology of Rhinoglena fertoensis in Neusiedler Lake.

3) N. Lair (France) -- Distribution of rotifers in the Loire river in regions of nuclear power plants.

4) L. May (Scotland) -- Field observations on rotifers in Loch Leven, Scotland.

5) Workshop on population parameters: W. Hofmann, moderator.

6) A. Grundström (Sweden) -- Rotifer population dynamics in relation to phytoplankton.

7-8) A. Kunicki-Goldfinger and M. Plasota (Poland) -- Axenic culture and embryogenesis of Habrotrocha rosa.

9) K. Preissler (Germany) -- Optical orientation of pelagic rotifers.

20 September

1) P. L. Starkweather (USA) -- Feeding (review).

2) J. J. Gilbert (USA) -- Observations on the susceptibility of some protists and rotifers to predation by Asplanchna girodi.

3) K. G. Bogdan, J. J. Gilbert, and P. L. Starkweather (USA) -- In situ studies on the feeding rates of some planktonic, suspension-feeding rotifers, using three types of tracer particles.

4) A. Ruttner-Kolisko (Austria) -- The abundance and distribution of Filinia terminalis in various types of lakes, as related to temperature, oxygen, and food.

Scientific Program - Continued

5) N. Leimeroth (Germany) -- Respiration of different stages of *Brachionus calyciflorus*.

6) R. Pourriot (France) -- Observations on the hatching of resting eggs.

7) P. L. Starkweather and K. G. Bogdan (USA) -- Detrital feeding in natural zooplankton communities: discrimination between live and dead algal foods.

21 September

1) B. Pejler (Sweden) -- Variation in the genus *Keratella* (review).

2) J. Green (England) -- Variation in *Keratella tropica*.

3) P. Leentvaar and J. Sinkeldam (The Netherlands) -- Observations on *Keratella tropica* in the "Hollands diep", The Netherlands.

4) W. Hofmann (Germany) -- On variation in *Keratella cochlearis* populations in Holstein lakes.

5) Workshop on taxonomy and biogeography: H. J. Dumont, moderator.

6) W. Koste (Germany) -- Remarks on the characteristics of the rotifer fauna of Notogea.

7) C. G. Hussey (England) -- A historical survey of the collection and study of rotifers in Britain.

Additions to the list of Rotifer Investigators with their research interests.

Kathe B. Anderson, Zooplankton Ecology.
Nadine Angeli, Zooplankton of oxydation ponds.
Ulfaf Antonsson, Population dynamics and evolution: Feeding of rotifers and crustacea related to phytoplankton and fish in oligo trophic in Iceland.
Walter J. Barnett, Biological relationship of rotifers and the carnivorous plant genus, Utricularia.
S. M. Baynes and A. P. Scott, The effect of algal diet and temperature on the biochemical composition of Brachionus plicatilis.
S. C. Bhardwaj, Morphology of rotifers and its functional significance.
Roberta K. Cap, Zooplankton analyst at Great Lakes Laboratory.
Lai Hoi Chaw, Limnology and Fisheries.
Richard D. Coleman, Role of organic detritus in nutrition of rotifers.
Daniel D. Cathey, Survey of the fauna associated with some lakes of the Antartica.
Karl L. Curry, Taxonomy and ecology of Zooplankton.
Deepesh N. De, Collecting and identifying rotifers with special reference to seasonal variation in population density and growth. Karyological and genetic studies with the objective of determining sex mechanism.
Marcel Donze, Population dynamics of planktonic rotifers as affected by temperature. (Thermal pollution).
Robert Epp, Energetic cost of movement and the efficiency of the ciliary apparatus with regards to movement. The male of Brachionus plicatilis and the relationship of its reduced size to its higher activity. Metabolic responses to temperature change in temperate and tropical rotifers of the same species.
Ireneo Ferrari, Taxonomy and ecology of planktonic rotifers in several Italian lakes.
Lucia Regina Ferraz, Rotifers in the Marine Station at the Institute de Pesquisas de Marinah at Rio de Janeiro.
Walter Greenwood
Michael Grey
Reidar Grundström, Population dynamics in a oligotrophic lake in Central Sweden.
Juta Haberman, Ecology of planktonic rotifers in freshwater.
Kenneth R. Halscott, Mass culture of marine brackish water rotifers for larval fish and shrimp rearing experiments; taxonomy, nutritional aspects, and biochemical composition.
Charles Hussey, Collections of British rotifers.
Sif Johansson, Population dynamics of rotifers mainly (Synchaeta baltica, S. monopus and S. fennica) and other zooplankton in the Baltic.
Owen Kennedy, Rotifers as trophic indicators. Predator-prey relationships. Rotifers in an estuarine ecology.
Gy Kováks, Seasonal dynamics of rotifer population in fish ponds.
W. J. H. Kunicki-Goldfinger, Molecular genetics.
A. Thomas Legget, Jr., Ecology of marine rotifers; mass culture of rotifers.
David Lenat
Robert Magnien, Rotifer feeding behavior and selectivity. Effects of predation upon rotifer community structure.
Marjanca Maric, Studies of rotifers in the river Drava near Maribor.
Linda May, Population dynamics of rotifers in Loch Leven, Kinross, Scotland.
Helmut Müller, Fossil rotifer eggs.
Jens Petter Nilssen, Life history strategies, predator-prey interactions, population dynamics.
Thomas Nogrady, Population dynamics of rotifers. Neuropharmacology and neurophysiology of rotifers.

Barbara J. Oden, Temporal variations among rotifer species.
Juan Paggi and Susana Paggi, Taxonomy and ecology of freshwater zooplankton of Parana River, Argentine.
Marie Dominique Parenty, Zooplankton of oxydation ponds.
M. A. Paul, Zooplankton of freshwater ponds near Kerala, India.
Erben Radovan
Edith Reck, Ecological studies on rotifers in eutrophic ponds.
J. Roy Robertson, Demography of bdelloids which are subjected to freezing or drying.
David P. Roche, Rotifer reproductive biology, especially diapause.
Klaus-Dieter Schlunder, Ecology and physiology of rotifers in some waters near Munster.
B. K. Sharma, Systematics of and ecology of Indian freshwater rotifers.
Shyamkishore Singh, Reproduction in a monogonont rotifer.
Anna Szaniawska, Rotifer cultures with different physical and nutritional conditions.
Elys Szymanski-Bucarey
Paul N. Turner, Investigation of taxonomic variables relating to classification.
Günter Tzschaschel, Systematics and ecology of marine interstitial rotifers, zonation and seasonal distribution of monogonont rotifers, population dynamics of several species dependent on temperature, dampness of the sand, grain size, etc. on the German North Sea Island of Sylt.
Carole V. Verdone, Aging studies using Asplanchna brightwelli: Effects of temperature, starvation, and vitamin E.
Marcy Allyn Waldauer, Psammon of the Lake Ontario shore.
Norbert Walz, Population dynamics in Lake Constance; Feeding and energetics.
Criag Williamson, Selective predation by copepods on rotifers.
Stephen A. Wille, Cyclomorophosis in Kerateila quadrata; feeding, selectivity, culturing.
Joy L. Woods, Biology and ecology of Antarctic rotifers.
Manuel Yúfera, Research concerning isolation and culture of rotifers for aquacultural purposes.
Nancy M. Butler, Ecology of Cupelopagis vorax.
Marcel Donze, Population dynamics of rotifers as affected by temperature (thermal pollution).
David Klarer, Plankton energetics.
Carol Meise, Seasonal changes in the genotypes of Asplanchna sieboldi; predation effects on A. sieboldi polymorphic response.
Manfred Schlüter, Chemostat cultures of Brachionus calyciflorus.
B. K. Sharma, North Indian rotifers; Brachionid and Laconid rotifers; rotifers in waters of varying trophic status.
Bashiva A. Subla, Plankton of high altitude and valley flatland lakes and ponds of Kashmir.
Stephen A. Willé, Cyclomorphosis -- especially in Keratella quadrata; feeding selectivity; rotifer culture.

Updated list of Rotifer Investigators and their mailing addresses

Hakon Adalsteinsson
Orkustofnun
Langavey 116
Reykjavik
ICELAND

Roland Aloia
Department of Biology
University of California
Riverside, California 92502 U.S.A.

F. Amat
Institute de Investigaciones
Pesqueras, Labatoratonio de Castellón
Castellon
SPAIN

Heikki Amrén
Ravinvägen 14
77500 Krylbo
SWEDEN

J. Amsellem
Laboratoire Histologie
Université Lyon I
43 Boulevard du 11 Nov.
696211 Villeurbanne
FRANCE

R. Stewart Anderson
Anne-Marie Anderson-DeHenau
Water Quality Control Branch
Alberta Environment
6th Floor - Oxbridge Place
9820-106 Street
Edmonton, Alberta
CANADA
T5K 2J6

Kathe B. Anderson
Aquatic Environmental Sciences
Union Carbide Corporation
Saw Mill River Road 100C
Tarrytown, New York 10591 U.S.A.

Gunnar Andersson
Institute of Limnology
University of Lund
Fack
S - 2220 03 Lund 3
SWEDEN

Nadine Angeli
Université des Sciences et Techniques
Biologie Animale
59655 Villeneuve d'Ascq cedex
FRANCE

Ulfaf Antonsson
Institute of Limnology
Box 557
S-751 22 Uppsala
SWEDEN

Martin T. Auer
809 Crawford Avenue
Syracuse, New York 13224 U.S.A.

Guido Badino
Instituto di Zoologia Generale
Della Università di Torino
Via Academia Albertina, 17
10123 Torino
ITALY

Walter J. Barnett
195 E. Faith Terr.
Maitland, Florida 32751 U.S.A.

Lois Bateman
Memorial University of Newfoundland
Department of Biology
St. John's, Newfoundland
CANADA

S. M. Baynes
MAFF Fisheries Laboratory
Lowestoft, Suffolk, NR33 OHT
UNITED KINGDOM

Wilhelm Becker
Zoologisches Institut der Universität
Papendamn 3
2 Hamburg 13
GERMANY

Leonard M. Bennetch
827 W. Market Street
Bethlehem, Pennsylvania 18018 U.S.A.

S. C. Bhardwaj
Department of Zoology
Kurukshetra University
Kurukshetra - 132119
INDIA

C. William Birky, Jr.
Department of Genetics
The Ohio State University
Columbus, Ohio 43210 U.S.A.

Brit Godske Björklund
Skanselien 33
5000 Bergen
NORWAY

A. G. Bogoslovsky
Sevastopolsky Prospect 63/20
kv 124
Moscow, M- 209
U.S.S.R.

Martin Boraas
The Pennsylvania State University
College of Science
Department of Biology
208 Life Sciences 1
University Park
Pennsylvania 16802 U.S.A.

James Bricker
Biological Station
Douglas Lake
Pellston, Michigan 49769 U.S.A.

Leslie G. Brinson
Biology Department
East Carolina University
Greenville, North Carolina 27834
U.S.A.

Hans Buchner
Zoologisches Institut der Universität
D 8 München 2
Luisenstrasse 14
GERMANY

Margot Buckley
445 Conway Street
Winnipeg, Manitoba R3T 2N7
CANADA

Arthur L. Buikema, Jr.
Center for Environmental Studies
Virginia Polytechnic Institute and
State University
Blacksburg, Virginia 24061 U.S.A.

Dewey L. Bunting
Department of Zoology
University of Tennessee
Knoxville, Tennessee 37916 U.S.A.

Fred Burchsted
Department of Zoology
University of Wisconsin
Madison, Wisconsin 53706 U.S.A.

Roberta K. Cap
Great Lakes Laboratory
1300 Elmwood Avenue
Buffalo, New York 14222 U.S.A.

John S. Carter
Environmental Laboratories
Route 3, Box 90
Huntersville, North Carolina 28078
U.S.A.

Daniel D. Cathey
Department of Biology
Virginia Polytechnic Institute and
State University
Blacksburg, Virginia 24061 U.S.A.

Lai Hoi Chaw
Universiti Sains Malaysia
School of Biological Sciences
Penang
MALAYSIA

R. Chengalath
National Museum of Natural Sciences
National Museums of Canada
Ottawa, CANADA
K1A 0M8

Pierre Clément
Laboratoire Histologie
Universite Lyon I
43 Boulevard du 11 Nov.
69621 Villeurbanne
FRANCE

Richard D. Coleman
Vanderbilt University
Department of Biology
Nashville, Tennessee 37235 U.S.A.

Thomas P. Coohill
Department of Biology
Western Kentucky University
Bowling Green, Kentucky 42101 U.S.A.

A. Cornillac
Laboratoire Histologie
Universite Lyon I
43 Boulevard du 11 Nov.
69621 Villeurbanne
FRANCE

Marc Coussement
RUG
Instituut voor Dierkunde
K.L. Ledeganckstraat 35
B-9000 Gent
BELGIUM

Karl L. Curry
1782-2 Bising Avenue
Cincinnati, Ohio 45239 U.S.A.

Guido Daems
Rijksuniversiteit Gent
Instituut v. Dierkunde
Lab. v. Morfol. en Systematiek
Ledeganckstraat 35
B - 9000 Gent
BELGIUM

H. J. G. Dartnall
British Antartic Survey
Madingley Road
Cambridge CB3 OET
ENGLAND

S. M. Das
D S B University
Naini Tal 263002
INDIA

Deepesh N. De
Indian Institute of Technology
Biosciences & Bioengineering Centre
Applied Botany Section
Kharagpur - 2
W. Bengal
INDIA 721302

J. De Maeseneer
Faculteit van de Landbouwwetenschappen
Coupure 533
B - 9000 Gent
BELGIUM

Margaretha De Ridder
Kloosterstraat 13
B-1710 Dilbeek
BELGIUM

M.V.S.S.S. Dhanapathi
Department of Zoology
D.N.R. College
Bhimavaram - 534 202
Andhra Pradesh
INDIA

Raymond D. Dillon
Department of Biology
The University of South Dakota
Vermillion
South Dakota 57069 U.S.A.

Stanley Dodson
Department of Zoology
University of Wisconsin
Madison, Wisconsin 53706 U.S.A.

Francisco Amat Domenech
Instituto de Investigaciones Pesqueras
Monturiol 2
Grao
Castellon de la Plana, SPAIN

Josef Donner
A/2801 Katzelsdorf
AUSTRIA

M. R. Droop
Dunstaffnage Marine Research Laboratory
P. O. Box 3
Oban, Argyll PA34 4AD
SCOTLAND

Henri J. Dumont
Rijksuniversiteit Gent
Instituut v. Dierkunde
Lab. v. Morfol. en Systematiek
Ledeganckstraat 35
B - 9000 Gent
BELGIUM

W. T. Edmondson
Department of Zoology NJ-15
University of Washington
Seattle, Washington 98195 U.S.A.

Jolanta Ejsmont-Karabin
Polish Academy of Science
Institute of Ecology
Department of Hydrobiology
05-150 Łomianki
Dziekanów Leśny k. Warszawy
POLAND

Judith I. Elliott
20 St. Mary's Park
Windermere
Westmorland
ENGLAND

James L. Elmore
University of South Florida
Department of Biology
Tampa, Florida 33620 U.S.A.

Robert W. Epp
Department of EPO Biology
University of Colorado
Boulder, Colorado 80309 U.S.A.

H. Fankhauser
Waldheimstrasse 43
3012 Bern
SWITZERLAND

C. Herbert Fernando
Department of Biology
University of Waterloo
Waterloo, Ontario
CANADA

Ireneo Ferrari
Instituto di Zoologia
43100 Parma
ITALY

Lucia Regina Ferraz
Ministério da Marinha
Instituto de Pesquisas da Marinha
28910 - Rio de Janeiro
BRAZIL

F. Fiers
RUG
Instituut voor Dierkunde
K.L. Ledeganckstraat 35
B - 9000 Gent
BELGIUM

Jan Fott
Department of Hydrobiology
Charles University
Vinicna 7
12800 Prague
CZECHOSLOVAKIA

Libby Frey
R3 Smith Road
Bloomington, Indiana 47401 U.S.A.

Robert L. Frock
113 Fulton Street
Hanover, Pennsylvania 17331 U.S.A.

Donald N. Gallup
Department of Zoology
University of Alberta
Edmonton, Alberta T6G 2E9
CANADA

John Gannon
University of Michigan
Biological Station
Douglas Lake
Pellston, Michigan 49769 U.S.A.

John J. Gilbert
Department of Biological Sciences
Dartmouth College
Hanover, New Hampshire 03755 U.S.A.

Andre Gillard
Faculty of Agricultural Sciences
University of Ghent
Coupure 533
B - 9000 Gent
BELGIUM

Stoica P. Godeanu
Institutul Central de Biologie
Spl. Independentei nr. 296
7000 Bucuresti, 7
RUMANIA

N. V. Gopinath
Department of Biological Sciences
Birla Institute of Technology & Science
Pilani (Rajasthan)
INDIA

Joy Grafton
Department of Ecology & Evolution
State University of New York at
Stony Brook
Stony Brook, New York 11794 U.S.A.

J. Green
Department of Zoology
Westfield College
Hampstead
London, NW3 7ST
ENGLAND

Walter Greenwood
1838 Menold Court
Allison Park, Pennsylvania 15101 U.S.A.

Michael Grey
25044 La Loma Drive
Los Altos Hills, California 94022
U.S.A.

Barbo Grönberg
Naturvårdsverkets Limnologiska
undersöking
Norbyvägen 20
Box 557
751 22 Uppsala
SWEDEN

Nevin E. Grossnickle
Center for Great Lakes Studies
University of Wisconsin-Milwaukee
Milwaukee, Wisconsin 53201 U.S.A.

Douglas W. Grothe
U.S. Environmental Protection Agency
536 South Clark Street
Chicago, Illinois 60605 U.S.A.

Reidar Grundstrom
Institute of Limnology
Box 557
S - 751 22 Uppsala
SWEDEN

Albert Guiset
Catedra de Ecol
Fac. de Biologie
University of Barcelona
Avda. Jose Antonio 585
Barcelona 7
SPAIN

Juta Haberman
Vortsjarve Limnoloogiajaam
SU-202454 Rannu, Eesti NSV
U.S.S.R.

Jordanka Serafimove-Hadžišče
Hidrobiološki zavod
97300 Ohrid
YUGOSLAVIA

Lasse Hakkari
Jyväskylän hydrobiologinen tutkimuslaitos
Riihimäentie 3
40450 Jvaskylä 45
FINLAND

Udo Halbach
Fachbereich Biologie der Universität
Siesmayerstrasse 70
6000 Frankfurt (Main) - 1
GERMANY

Donald J. Hall
Department of Zoology
Michigan State University
East Lansing, Michigan 48823 U.S.A.

Kenneth R. Halscott
Department of Natural Resources
Marine Research Laboratory
100 8 Avenue Southeast
St. Petersburg, Florida 37701 U. S. A.

U. Theodore Hammer
Department of Biology
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0W0
CANADA

Ira Hammerman
Department of Life Sciences
Bar Ilan University
RamatGan
ISRAEL

H. V. Herbst
Landesanstalt für Gewässerkunde
und Gewässerschutz
Nordrhein-Westfalen
Biologischer Dienst
415 Krefeld-Hülserberg
Am Waldwinkel 70
GERMANY

Horst Hertel
Fachbereich Biologie (10)
-Zoologie-
Technische Hochschule Darmstadt
Schnittspahnstrasse 3
D-61 Darmstadt
GERMANY

Alois Herzig
Limnologisches Institut
Bergg. 18/19
A-1090 Wien
AUSTRIA

Anna Hillbricht-Ilkowska
Department of Hydrobiology
Inst. of Ecology Pol. Ac. Sci.
Dziekanow Lensy
05 - 150 Lomianki
POLAND

Wolfgang Hofmann
Max-Planck-Institute für Limnologie
Postfach 165
2320 Plön
GERMANY

Eric D. Hollowday
45 Manor Road
Aylesbury Bucks HP20 I JB
ENGLAND

Olof Holmberg
Institute of Zoology
Box 561
751 22 Uppsala
SWEDEN

Linda L. Holmstrand
Biology Department
University of Minnesota
Duluth, Minnesota 55812 U.S.A.

J. P. Kieran Horkan
The National Institute for Physical
Planning and Construction Research
Laboratories
Pottery Road
Kill of the Grange
Dun Laoghaire
Co. Dublin
IRELAND

Nancy Hulett
P.O. Box 679
Mount Holyoke College
South Hadley, Massachusetts 01075
U.S.A.

Stuart Hurlbert
Department of Biology
San Diego State University
San Diego, California 92115
U.S.A.

Charles G. Hussey
% The British Museum (Natural History)
Cromwell Road
South Kensington
London SW7 5BD
ENGLAND

G. E. Hutchinson
Osborn Memorial Laboratories 305
Yale University
New Haven, Connecticut 06520 U.S.A.

Jan-Åke Johansson
Idunagatan 18
753 33 Uppsala
SWEDEN

Sif Johansson
Asko Laboratory
Box 58
S-150 13 Trosa
SWEDEN

Robert Keen
College of Sciences and Arts
Department of Biological Sciences
Michigan Technological University
Houghton, Michigan 49931
U.S.A.

Owen D. Kennedy
Pacific Biological Station
P.O. Box 100
Nanaimo, British Columbia V9R 5K6
CANADA

Charles E. King
Department of Zoology
Oregon State University
Corvallis, Oregon 97331 U.S.A.

Gösta Kjellberg
NIVA
Vangsvien 121
Hamar
NORWAY

David Klarer
573 McIntire Drive
Fairborn, Ohio 45324 U.S.A.

Henry K. Klimowicz
Institute of Public Utility Service
Laboratory of Hydrobiology
Kolektorska 4
Warsaw
POLAND

Brigitte Koch-Althaus
Zellescher Weg 40
8020 Dresden
GERMANY

James K. Koehler
Department of Biological Sciences
University of Wash., School of Medicine
Seattle, Washington 98105 U.S.A.

Marcia K. Kosmerchock
Limnologisch Laboratorium
Universiteit Van Amsterdam
Dierfysiologisch Instituut
Kruislaan 320
AMSTERDAM

Walter Koste
Realschul-Konrektor
Ludwig-Brill-Strasse 5
D 4570 Quakenbrück
GERMANY

Gy. Kovács
Fisheries Research Institute
P.O. Box 47
H - 5541 Szarvas
HUNGARY

Erni Kronsteiner
Biologische Station
A - 3293 Lunz am See
AUSTRIA

W. J. H. Kunicki-Goldfinger
Institute of Microbiology
University of Warsaw
Nowy Swiat 67
00-046 Warsaw
POLAND

Ekkehard Küsters
415 Krefeld - Hulserberg
Am Walderwinkel 70
GERMANY

L. A. Kutikova
Zoological Institute
Academy of Sciences
Leningrad B 164
U.S.S.R.

N. Lair
Université de Clermont-Ferrand II
Equipe d'Hydrobiologie regionale
24 Av. des Landais
B.P. 45
63170 Aubière
FRANCE

E. H. Lamoot
Institut Universitaire d'Ecologie
Tropicale
B.P. 8 109
Abidjan
IVORY COAST

Oey Biauw Lan
Department of Biology
Institute of Technology Bandung
Jalan Ganesha 10
Bandung, West Java
INDONESIA

Petter Larsson
Zoological Museum
Sarsgatan 1
Oslo 5
NORWAY

R. LéBrasseur
Pacific Biological Station
Nanaimo, British Columbia
CANADA

P. Leentvaar
Rijksinstituut voor Natuurbeheer
Leersum,
Kasteel Broekhuizen
The Netherlands

A. Thomas Leggett, Jr.
Virginia Institute of Marine Science
Gloucester Point, Virginia 23062
U.S.A.

N. Leimeroth
Fachbereich Biologie
der J.W. Goethe-Universitat Zoologie
Ak Okologie
Siesmayerstrasse 70
6000 Frankfurt am See
GERMANY

David Lenat
Department of Natural Resources
Archdale Building
Raleigh, North Carolina 27611
U.S.A.

Cyrus Levinthal
Department of Biological Sciences
754 Schermerhorn Ext.
Columbia University
New York, New York 10027 U.S.A.

Maria Lewkowicz
Laboratory of Water Biology
Sławkowska 17
Kraków
POLAND

Gene Likens
Section of Ecology & Systematics
Langmuir Laboratory
Cornell University
Ithaca, New York 14850 U.S.A.

James R. Litton, Jr.
Biology Department
Saint Mary's College
Notre Dame, Indiana 46556 U.S.A.

E. Lubzens
Israel Oceanographic & Limnological Research
Tel-Shikmona
P.O.B. 8030
Haifa
ISRAEL

Robert E. Magnien
Department of Biological Sciences
Dartmouth College
Hanover, New Hampshire 03755 U.S.A.

Joseph Makarewicz
State University College of Brockport
Brockport, New York 14420 U.S.A.

Edward Maly
Department of Biology
Concordia University
Sir George Williams Campus
Montreal, Quebec H3G 1M8
CANADA

Samuel J. Markello
4049 N. Boston Road
Eden, New York 14057 U.S.A.

Marjanca Markic
Univerza Maribor
62000 Maribor
YUGOSLAVIA

K. Martens
RUG
Instituut voor Dierkunde
K.L. Ledeganckstraat 35
B - 9000 Gent
BELGIUM

Linda May
Institute of Terrestrial Ecology
78 Craighall Road
Edinburgh EH6 4RQ
SCOTLAND

R. George Michael
Department of Zoology
North-Eastern Hill University
Nongthymmai, Shillong - 3
Meghalaya
INDIA 793003

Maria R. Miracle
Dptó. de Ecologia
Facultad de Ciencias
Universidad de Barcelona
Plaza Universidad
Barcelona 7
SPAIN

P. Chandra Mohan
Department of Zoology
Andhra University
Waltair 530003
INDIA

S. K. Moitra
Head, Zoology Department
Burdwan University
Burdwan, W. Bengal 713104
INDIA

Richard L. Moretti
Department of Biology
University of California
Riverside, California 92502 U.S.A.

George G. Mulamoottil
Faculty of Environmental Studies
University of Waterloo
Waterloo, Ontario
CANADA

Helmut Müller
Bundesanstalt für Geowissenschaften
und Rohstoffe
Stillweg 2
D3 Hannover 51
GERMANY

Iain G. Munro
Bromley College of Technology
Rookery Lane
Bromley, BR2 8HE
ENGLAND

K. Vanamals Naidu
Department of Zoology
Government Arts & Sciences College
Chittoor, Andhra
Pradesh
INDIA

K. K. N. Nair
Department of Zoology
Christ College
P.O. Irinjalakuda 680121
Kerala
INDIA

C. K. G. Nayar
Department of Zoology
Christ College
P.O. Irinjalakuda 680121
Kerala
INDIA

Jens Petter Nilssen
Zoological Institute
University of Oslo
Postboks 1050
Blindern, Oslo
NORWAY

Thomas Nogrady
Chemistry Department
Concordia University
Loyola Campus
7141 Sherbrooke Street West
Montreal, Quebec
CANADA H4B 1R6

Barbara J. Oden
West Virginia State College
Department of Biology
Institute
West Virginia 25112 U.S.A.

Hans Olofsson
Idunagåtan 18
753 33 Uppsala
SWEDEN

Juan C. Paggi
Susana B.J. de Paggi
Instituto Nacional de Limnología
J. Maciá 1933
3016 Santo Tomé
ARGENTINA

Marie Dominique Parenty
Université des Sciences et Techniques
Lille 1 - SN3 - BP36 - 59650
Villeneuve D'ASCQ
FRANCE

S. Parma
Limnologisch Instituut Nieuwersluis
Koninklijke Nederlandse Akademie van
Wetenschappen
Postbus 19 121
1000 GC Amsterdam
THE NETHERLANDS

M. A. Paul
Department of Zoology
Christ College
Irinjalakuda, P.O.
Kerala
INDIA

Birger Pejler
Institute of Limnology
Box 557
S - 751 22 Uppsala 1
SWEDEN

Robert W. Pennak
Environmental Biology
University of Colorado
Boulder, Colorado 80302 U.S.A.

J. Pensaert
RUG
Instituut voor Dierkunde
K. L. Ledeganckstraat 35
B-9000 Gent
BELGIUM

Gunnar Persson
Limnologiska Institutionen
Box 557
S - 751 22 Uppsala
SWEDEN

J. Pilarska
Polish Academy of Sciences
Institute of Ecology
05-150 Dziekanow Lesny k/Warszawy
POLAND

Brigitte Pivoda
Biologische Station Lunz
3293 Lunz am See
AUSTRIA

M. D. Pizay
Université des Sciences et Techniques
de Lille
SN3 Biologie animale
59655 Villeneuve d'Ascq cedex
FRANCE

Rosalind M. Pontin
26 Hermitage Woods Crescent
St. John's Woking
Surrey
ENGLAND

Roger Pourriot
Laboratoire de Zoologie
Ecole Normale Superieure
46 Rue d'Ulm
75230 Paris, Cedex 05
FRANCE

Modesto Pozuelo
TICA (P.E.M.A.R.E.S)
Casa del Mar 5ª Planta
Cádiz
SPAIN

Francis A. Pray
Department of Biology
Cornell College
Mount Vernon, Iowa 52314 U.S.A.

B. Preisser
Universität Rostock
Sektion Biologie
Freiligrathstrasse 7/8
25 Rostock
GERMANY

A. Kurt Preissler
Biologische Fakultät der
Universität München
am Stadtpark 20
8000 München 60
GERMANY

Rudolph Prins
Department of Biology
Western Kentucky University
Bowling Green,Kentucky 42101 U.S.A.

Luigi Provasoli
Haskins Laboratory
Yale University
165 Prospect Street
New Haven, Connecticut 06520 U.S.A.

Erben Radovan
Zoologijski zavod
Rooseveltor trg 6
41000 Zagreb
YUGOSLAVIA

Stanislaw Radwan
Academy of Agriculture
Department of Zoology and Hydrobiology
Akademicka 13
20-934 Lublin
POLAND

M. Rágyanszki
Fisheries Research Institute
P.O. Box 47
H - 5541 Szarvas
HUNGARY

Adrian Rake
618 Life Sciences 1
Biophysics Department
Pennsylvania State University
University Park, Pennsylvania 16802
U.S.A.

Oscar Ravera
Biology Division
C.C.R., Euratom
21020 Ispra (Varese)
ITALY

Edith Reck
Melbweg 1
D - 53 Bonn 1
WEST GERMANY

J. V. Reed
43 Hillview Road
Canterbury, Kent
ENGLAND

Claudia Melone Ricci
Universita degli Studi
Instituto di Zoologia
via Celoria 10
I 20133 Milano
ITALY

J. Roy Robertson
University of Georgia Marine Institute
Sapelo Island, Georgia 31327 U.S.A.

Carlo Robotti
Instituto di Zoologia
Universita di Torino
Via Valgioie 123/4
10146 Torino
ITALY

David P. Roche
Environmental Laboratories
Route 3, Box 90
Huntersville, North Carolina 28078
U.S.A.

J. Rodíguez-Roda
Instituto de Investigaciones Pesqueras
Laboratorio de Cadiz
Cadiz
SPAIN

Alistair Rogers
Fisheries and Environmental Group
Scientific Service Department
Glyn Rhonwy
Llandberis
Gwynedd, LL55 4LP
GREAT BRITIAN

Diethelm Ronneberger
Akademie der Wissenschaften der DDR
Abt. Limnologie
Beuthenbergstr. Nr. 11
Schliessfach 73
69 Jena
GERMANY

J-C. Rostan
Laboratoire de Biologie Animale/Zoologie
Université Lyon I
43 Boulevard du 11 Nov.
69621 Villeurbanne
FRANCE

Agnes Ruttner-Kolisko
Biologische Station
A - 3293 Lunz am See
AUSTRIA

George W. Salt
Department of Zoology
University of California
Davis, California 95616 U.S.A.

Richard L. Sayrs, Jr.
Aquatic Biologist/Data Analyst
Limnetics, Inc.
6132 West Fond du Lac Avenue
Milwaukee, Wisconsin 53218 U.S.A.

Peter Schaber
Institut für Zoologie
Universtätsstrasse 4
A - 6020 Innsbruck
AUSTRIA

Reimar Schaden
Max-Planck-Institut für Limnologie
Postfach 165
D - 232 Plön
GERMANY

Klaus-Dieter Schlunder
Zoologisches Institut
Universität Münster
D-44 Münster
Badestrasse 9
GERMANY

Heinz Schulte
Akazienweg 23
D 83 Landshut/ Bay
GERMANY

Manfred Schlüter
Abt. fur Algenforschung und
Algentechnologie
Gesellschaft für Strahlen- und
Umweltforschung mbh München
Bunsen-Kirchhoffstr. 13
46 Dortmund
WEST GERMANY

Uda Schramm
Zoologisches Institut der Universität
Papendamn 3
2 Hamburg 13
GERMANY

A. P. Scott
MAFF Fisheries Laboratory
Lowestoft, Suffolk, NR 33 OHT
UNITED KINGDOM

J. M. Scott
Dunstaffnage Marine Research Station
P.O. Box 3
Oban, Argyll PA34 4AD
SCOTLAND

Viney Seth
Department of Biological Sciences
Birla Institute of Technology and
Science
Pilani (Rajasthan)
INDIA

B. K. Sharma
Department of Zoology
North-Eastern Hill University
Shillong - 793003
INDIA

Russell J. Shiel
The University of Adelaide
Department of Zoology
G.P.O. Box 498
Adelaide
SOUTH AUSTRALIA 5001

Shyamkishore Singh
Zoology Department
B.N.C. University
Kurukshetra - 132119
INDIA

R. N. Singla
Department of Zoology
B.N. Chakarvarty University
Kurukshetra - 132119
INDIA

J. Sinkeldam
Rijksinstituut voor Natuurbeheer
Leersum
Kasteel Broekhuizen
THE NETHERLANDS

Vladimir Sladecek
Trojanova 13
120 00 Prague 2
CZECHOSLOVAKIA

Terry W. Snell
Division of Science and Mathematics
University of Tampa
Tampa, Florida 33606 U.S.A.

P. Sorgeloos
State University Gent
Lab. Biological Research in
Environmental Pollution
Plateaustraat 22
B - 9000 Gent
BELGIUM

Peter L. Starkweather
Department of Biological Sciences
University of Nevada, Las Vegas
Las Vegas, Nevada 89154 U.S.A.

Richard Stemberger
The University of Michigan
Biological Station
Douglas Lake
Pellston, Michigan 49769 U.S.A.

Miroslav Stepanek
Institut of Hygiene and Epidemology
Praha
Srobárova 48
100 00 Prague
CZECHOSLOVAKIA

Volker Storch
Zoologisches Institüt
Hegewischstrasse 3
23 Kiel
GERMANY

Vida M. Stout
Department of Zoology
University of Canterbury
Private Bag
Christchurch
NEW ZEALAND

B. A. Subla
Department of Zoology
S. P. College
Srinagar - 190001
Kashmir
INDIA

Minoru Sudzuki
Nihon Daigaku
Higashi-Arai 557, omiya-shi
Saitama-ken
JAPAN 330

Anna Szaniawska
Instytut Oceanografii UG
Gdynia, ul Czołgistów 46
81-378 Gdynia
POLAND

Elys Szymanski-Bucarey
Institut für Ökologie
Fachgebiet Limnologie
Englerallee 19
1000 Berlin 33
GERMANY

Kuno Thomasson
Vaxtbiologiska Institutionen
Box 559
S-751 22 Uppsala 1
SWEDEN

Ludwig Tiefenbacher
Zoologische Samnlung des Bayerischen Staates
Maria-Ward-Strasse 1B
Schloss Nymphenburg
8 München 19
GERMANY

Byron Torke
Center for Great Lakes Studies
Reference Library
University of Wisconsin-Milwaukee
Milwaukee, Wisconsin 53201 U.S.A.

Paul N. Turner
3700 Sandra Dr.
Fayetteville, North Carolina 28304 U.S.A.

Günter Tzschaschel
Institut für Zoologie
Rhein.-Westf. Techn. Hoschule Aachen
Kopernikusstrasse 16
5100 Aachen
WEST GERMANY

James E. Vancil
1409 Barcelona Drive
Knoxville, Tennessee 37919 U.S.A.

Isa Van deVelde
Rijksuniversiteit Gent
Instituut voor Dierkunde
Laboratorium voor Morfologie en Systematiek
Ledeganckstraat 35
B - 9000 Gent
BELGIUM

Hem Sagar Vasisht
Panjab University
Chandigarh 160014
INDIA

T. R. Venkatesh
Department of Biological Sciences
Birla Institute of Technology and Science
Pilani 333031
INDIA

Carole V. Verdone
Concordia University
SGW Campus; H-1236
Biology Department
1455 deMaisonneuve Blvd., West
Montreal, Quebec
CANADA H3G 1M8

E. Vollrath
78 Freiburg
Hochmeisterstrasse 2
GERMANY

Marian Vranovský
Laboratory of Fishery Research and Hydrobiology
Slovak Academy of Agriculture
Drienová 5
829 68 Bratislava
CZECHOSLOVAKIA

Penny J. Wade
McMaster University
Department of Biology
1280 Main Street West
Hamilton, Ontario L8S 4K1
CANADA

Marcy Allyn Waldauer
435 E. Genesee Pkwy.
Syracuse, New York 13214 U.S.A.

Robert L. Wallace
Department of Biology
Ripon College
Ripon, Wisconsin 54971 U.S.A.

Norbert Walz
Zoologisches Institut der
Universität München
Siedlstrasse 25
8000 München 2
GERMANY

Robert W. G. White
Department of Zoology
University of Tasmania
Box 252C G.P.O.
Hobart, Tasmania
AUSTRALIA 7001

Craig E. Williamson
Department of Biology
Williams Hall 31, Lehigh University
Bethlehem, Pennsylvania 18015 U.S.A.

Joy L. Woods
Department of Zoology
University of Canterbury
Private Bag
Christchurch 4
NEW ZEALAND

Elizabeth Samodai Wurdak
Department of Biological Sciences
Dartmouth College
Hanover, New Hampshire 03755 U.S.A.

Manuel Yúfera
Instituto de Investigaciones
Pesqueras de Cádiz
Puerto pesquero s/n
Cádiz
SPAIN

Nóra Zánkai
Biological Research Institute
The Hungarian Academy of Sciences
Tihany
HUNGARY

Christian Zimmerman
Landesstelle f. Gewässerkunde
Mittelzell 425
Insel Reichenau 7752
B. R. D.
GERMANY

Roman Zurek
Polish Academy of Sciences
Laboratory of Water Biology
Sławkowska 17
Kraków
POLAND

ADDENDUN

Nancy M. Butler
Department of EPO Biology
University of Colorado
Boulder, Colorado 80309
U.S.A.

Carol Meise
Department of Zoology
University of Rhode Island
Kingston, Rhode Island 02881 U.S.A.

Mark A. White
Department of Zoology
Michigan State University
East Lansing, Michigan 48824 U.S.A.

Stephen A. Wille
Department of Zoology
University of Montana
Missoula, Montana 59812 U.S.A.

Recent Literature

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