

REPORT ON SCOR WORKING GROUP 23
ZOOPLANKTON LABORATORY METHODS

Meeting in Bath, 13-20 July 1972

The second and final meeting of Working Group 23 was held at Bath University, Bath, England from July 13-20, 1972, in conjunction with a Symposium on the Fixation and Preservation of Marine Zooplankton. The following members of WG 23 participated:

Chairman V. Kr. Hansen (Denmark), J.R. Beers (USA), H.J. Flugel (FRG), B. Kimor (Israel), H.F. Steedman (UK), T. Tokioka (Japan).

Dr. M.E. Vinogradov (USSR) sent his apologies for being unable to attend.

Activities 1968 - 1972

A report issued following the first meeting of WG 23 in Washington, D.C. (March 25-30, 1968) was published in the SCOR Proceedings, volume 4. The Interim Recommendations on Methods of Fixation Preservation and Biomass Determination given in the report have been further studied by the Working Group through experiments and discussions. Revisions to the interim recommendations will be published in the manual on Laboratory Methods in the Study of Marine Zooplankton under the relevant sections (ref. below). The Proposals for Future Activities made by WG 23 at the meeting in 1968 have all been implemented.

Report on the Meeting in Bath

The Symposium program included the following lectures:

Dr. H.F. Steedman: Fixation and preservation in liquids. I. Aldehydes. II. Alcohols, glycols and other reagents. III. General physical and chemical properties of preserving reagents - osmotic properties, pH, etc.

Dr. F.J.R. Taylor: Fixation, preservation and documentation of non-photosynthetic unicellular marine plankton.

Dr. Ruth Turner: Fixation, preservation and storage of marine boring mussels.

Dr. M. Omori: Variations in dry weight, organic matter, and concentrations of carbon, nitrogen, and hydrogen in freshly prepared and in fixed zooplankton.

Dr. J.R. Beers: Methods for estimation of plankton biomass.

Dr. K.W. Petersen: Preservation of medusae, siphonophora, ctenophora and special techniques used for identification of preserved specimens.

In addition, demonstrations were given on the following topics:

Data processing of marine zooplankton collected by the Hardy continuous plankton recorder (Dr. Hunt).

Identification of marine zooplankton by electronic measuring devices - "Quantimet" (Mr. Fawell).

Laboratory utensils for handling and sorting marine specimens - containers, labels, catalogs, etc. (Dr. Fehlmann).

Deep freeze drying of marine organisms in the field and in museums (Mr. Harris).

Identification, labelling, processing and data recording methods (Dr. Faber).

The Working Group conducted meetings during the morning of July 13, between sessions of the Symposium, and on July 19. The final drafting of this report was on July 20.

The principal topics of the WG 23 discussions during its meetings at Bath University were concerned with:

1. The preparation and publication of a manual on zooplankton laboratory methods.
2. Continuation of the current experiments on the fixation and preservation of zooplankton, and
3. The initiation of new activities relevant to the above.

Recommendations

1. Manual on Zooplankton Laboratory Methods

UNESCO has agreed to publish a manual on zooplankton methods compiled by WG 23. In this connection, it is recommended that:

- (i) the title of the manual should be Laboratory Methods in the Study of Marine Zooplankton.
- (ii) the manual should be in loose-leaf style with a durable hard cover
- (iii) each numbered section should be paginated separately to allow for substitutions of new or replacement parts
- (iv) each numbered section should be followed by its pertinent reference
- (v) an Editorial Board be responsible for the preparation of the manual. It should consist of Drs. Beers, Hansen, Steedman and Mr. Griffiths, a planktologist who is currently engaged in collecting, and represents the viewpoint of the user of the book
- (vi) UNESCO make available to the Editorial Board the technical advice of a professional layout man from their staff
- (vii) Dr. Steedman be the Chief Editor to be responsible for communicating with UNESCO
- (viii) for Section 8 dealing with the various taxonomic groups there should be a Special Editor, Dr. K.W. Petersen, to ensure uniformity of presentation and to prevent duplication of information
- (ix) UNESCO seek funds to enable Dr. Petersen to consult with authors when the Editorial Board deems it necessary
- (x) following publication of the manual, a permanent editor should be appointed by UNESCO to be responsible for the updating of and additions to the book
- (xi) specific details regarding processing and handling of zooplankton samples under different climatic and hydrographic conditions be provided in the manual
- (xii) a list, with current prices, of suppliers of chemicals, glassware and other equipment from as many countries as possible be included, and
- (xiii) condensed reports of about 10 pages each on the experiments carried out at the IOBC, Cochin, India and in Japan, together with the edited symposium lectures of Drs. D. Jones, M. Omori, and M. Vinogradov be published with the manual. If this proves to be impossible for financial reasons they should be published together in an appropriate periodical with reference to the manual and with an introduction to the Bath University Symposium.

2. Proposals for the Continuation of the Current Experiments on the Fixation and Preservation of Zooplankton

2.1 Observations of the experiments on the preservation of zooplankton which were initiated under WG 23 auspices must be continued at least until 1979 in order to prove the effectiveness

of the preservatives over long periods of time. Series of experiments, started in 1969, are being conducted at the Smithsonian Oceanographic Sorting Center (SOSC), Washington, D.C., USA; Bath University, England; and the Seto Marine Laboratory, the Faculty of Fisheries of Hokkaido University, and the Ocean Research Institute of Tokyo University, Japan.

It is recommended that SCOR should approach these institutions requesting them to provide support and suitable financial aid for the technical assistance that will be required to ensure the continuation of the observations.

It is further felt desirable that a co-ordinator be selected to establish exchange of information between these institutions.

2.2 Other series of experiments have been undertaken at the Indian Ocean Biological Center, Cochin, India and the Regional Marine Biological Center, Singapore.

It is recommended that UNESCO continues support of these programmes currently in progress, and examines whether the Advisory Panel for UNESCO-Sponsored International Marine Biological Centres would be the appropriate coordinating body for these two programmes.

3. Proposals for Further Desirable Activities

3.1 The technique of freeze-drying for the preservation of zooplankton and other marine organisms was demonstrated during the Symposium. Results with this method for long-term preservation seem very promising, and much interest was expressed in this as an excellent method with numerous advantages for the planktologist. To date we have only very limited experience with this technique.

It is recommended that detailed observations on the chemical and morphological effects of freeze-drying should be made relative to preservation of marine zooplankton. It would be an advantage if this were conducted at the Smithsonian Oceanographic Sorting Center, where a part of this work has already been done and where there is already the machinery available.

3.2 The need was expressed for new experimental studies to confirm and expand the work on fixatives-preservatives completed under WG 23 as well as to examine such additional parameters as the use of narcotising agents in zooplankton fixation in more depth than has been possible to date.

It is recommended that SCOR seek the initiation of such studies at the SOSC, Washington, D.C., under the direction of a competent chemist-biochemist to be appointed to their staff. It was felt desirable that a coordinator be selected to establish exchange of information between these institutions.

3.3 The experiments organised by WG 23 have dealt with the chemistry of fixatives and preservatives and the practical aspects of their use for zooplankton. Following consultation with the observer from WG 33 present at the Bath Symposium it is suggested that the methods be examined in regard to phytoplankton studies.

3.4 In open discussion during the Symposium it was noted that some important aspects with regard to the study of zooplankton in the laboratory and the handling of data were not considered by the Working Group 23. It was suggested by delegates at the Symposium that immediate consideration be given to extending the scope of the manual to include such topics as:

- (i) enumeration and subsampling methods including relevant statistical analyses
- (ii) microscopy, with special emphasis on the preparation of material for transmission and scanning electron microscopy
- (iii) chemical/biochemical analytical techniques and the estimates of values for energy flow and production modelling

- (iv) photographic methods of recording for taxonomic, behavioral, and morphological purposes and long-term environmental changes with suggestions on documentation and retrieval of both still and cine film
- (v) basic statistical techniques and parameters for use in plankton studies, and the
- (vi) suitability of freeze-drying for biological archives.

While the Working Group is sympathetic with regards to the needs for the examination of certain of the above-listed topics, others seem to have been adequately covered for the present in recent publications. In either case, the Working Group 23 feels that these subjects are outside their terms of reference. It does, however, suggest that SCOR examines the need for forming working groups to study these subjects, in particular nos. ii, iii, iv and vi. Working Group 23 does recommend that any future working groups issuing manuals on these topics consider the use of the loose-leaf style for their publications.

3.5 Working Group 23 expressed the hope that on the basis of the information obtained through the activities of this group and the need for additional experience, UNESCO would organize courses and programmes in plankton laboratory methods.

3.6 Dr. A. Fehlmann reported that he had arranged for the compilation of more than 3,000 references in the field of fixation and preservation of biological material including methods applied in industry. The Working Group took note of this information and expressed the hope that the Smithsonian Oceanographic Sorting Center would, in due time, make these references available to interested marine biologists.

ANNEX VIII

REPORT OF SCOR WORKING GROUP 32 BIOLOGICAL DATA INVENTORIES

Proposal for a Second-Level Inventory System to Facilitate Dissemination and Exchange of Biological Oceanographic Data

1. Introduction

The objectives of any system to facilitate the dissemination and exchange of marine biological data are:

- (i) To provide Institutes and individual workers with any available information which can supplement their own observations.
- (ii) To facilitate the compilation of comparative data from different regions.
- (iii) To provide individual workers with information about possible sources of material for taxonomic and other studies.
- (iv) To assist in local, national and international programme planning by making it possible to identify gaps in existing information and to provide a convenient source of information on the form and status of current work in a given area.

It is generally recognized that the traditional means of information exchange, by reference to and exchange of publications, no longer provides an adequate means of obtaining data. There is a growing need for improved handling and accessibility of biological data. The number of large international projects, FAO projects and other investigations in biological oceanography is growing. The amount of data being collected by continuous measuring and sampling devices is rapidly increasing. There is a growing need for long-term monitoring of marine communities for pollution, conservation and management studies and in relation to these there is a growing interest in eco-system modelling.