



# Intergovernmental oceanographic commission

# 22

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## FOREWORD

Since we find that too much confusion has resulted from the publication of the IIOE Information Paper showing the date of issue only, and no reference number in the top righthand corner, this new issue, No.22, reverts to the previous form. We would therefore ask you to insert in the last three issues (since No.18) of May, August and September 1968, Nos. 19, 20 and 21 respectively. It should however be noted that the IIOE Information Paper now only appears when relevant information for publication is available, and no longer on a regular basis.

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REPORT OF THE SIXTH MEETING OF THE CONSULTATIVE COMMITTEE  
FOR THE INDIAN OCEAN BIOLOGICAL CENTRE, HELD AT ERNAKULAM  
FROM FEBRUARY 22nd TO MARCH 3rd, 1968.

The sixth meeting of the Consultative Committee for the Indian Ocean Biological Centre was held from 22nd February to 3rd March 1968. The first day, 22-2-1968, was devoted to an informal meeting to decide on the order in which items of agenda could be taken up for discussion. On 27th and 28th February, group discussions were held at Munnar (a hill station) and on 29th discussions were held with the staff of the Indian Ocean Biological Centre. Formal sessions were held on 23rd, 24th, 25th and 26th February and on 1st and 2nd March 1968. The session in the forenoon of Saturday, 24th February, was a joint session of the Consultative Committee and the Indian Advisory Board for the Indian Ocean Biological Centre, and a number of prominent scientists from institutes at Ernakulam, were also present by invitation. The formal sessions were presided over by Professor J. Krey, Chairman of the Consultative Committee.

1. WELCOME BY THE CHAIRMAN

The Chairman welcomed the members and invitees to the meeting. He referred to the papers already circulated to the invitees and noted with satisfaction the record of steady progress of the Indian Ocean Biological Centre in the appended reports. He drew particular attention to the new phase of activities in research and advanced sorting into which the Indian Ocean Biological Centre was entering. He called upon the Director of the Indian Ocean Biological Centre to give a brief resume of his report for 1967-68.

2. REVIEW OF THE PREVIOUS YEAR'S WORK BY THE DIRECTOR AND THE CURATOR OF IOBC

(a) Report of the Director of the IOBC

Dr. N.K. Panikkar, Director of the Centre, briefly summarised his report (Appendix I) and made special mention of the following sections:

- (i) The sorting of zooplankton proceeded steadily and the volume of research activities and advanced sorting, increased.
- (ii) Accommodation arrangements continued as in the preceding year and acquisition of a building site of 1.1 acres was now due to be completed.

- (iii) Laboratory facilities were augmented as also furniture and fittings. The library continued to expand by purchase by the National Institute of Oceanography by placing of subscriptions to more journals and by receipt of gifts from the German Forschungsgemeinschaft, the Plankton Laboratory at Edinburgh and from scientists and institutions of various countries. Staff position continued without substantial change and the scientific staff received guidance and supervision from Dr. R.R. Prasad (Chief Scientist-in-Charge) and the Curator. Between the departure of the last Curator (Dr. Edward Brinton) and the arrival of the present Curator (Mr. D.J. Tranter) uninterrupted progress of sorting and other regular activities was maintained by Mr. L.R. Kasturirangan (Associate Curator).
- (iv) The total number of plankton samples deposited at IOBC is now reckoned as 2181 and of this number, the total number for which sorting had been completed up to the end of December 1967 was 1760. Of the remaining 421 samples, a considerable number were non-standard.
- (v) The papers and maps presented by the Scientific Staff of IOBC at the "Symposium on Indian Ocean" at New Delhi (March 1967) and their forthcoming publication as also the first fascicle of Volume I of the General Properties Atlas by Dr. R.R. Prasad (in the Press) indicate the progress in research on the IIOE Collections achieved by the Indian Ocean Biological Centre. The visits of Professor Rass to advise on working up the collections of fish eggs and larvae and of Dr. D.I. Williamson to examine the Decapod larvae collections and advise on these allocations to Specialists are noteworthy developments. The addition of Research Fellows for work on the I.I.O.E. collections is another point worth drawing attention to.

(b) Report of the Curator of IOBC (Appendix III)

The Curator (Mr. David Tranter) in his report emphasized that the work at IOBC is entering a new phase. Specialists are ready to examine the Collections and regular consignments are being made as basic sorting draws to a close. Sub-sorting programmes are gathering momentum and specialists are visiting the Centre with greater frequency. Part of the Collection, consisting of soft bodied organisms and samples from particular cruises, is not in good condition. Steps are being taken to control this deterioration problem.

The Centre is receiving generous support from both National Institute of Oceanography (India) and Unesco in the supply of equipment. In both cases the delay is considerable and might be reduced. Urgent steps must be taken to control humidity because of fungal growth on the optical equipment. The major item of equipment needed at present is a fast, safe, shallow-draft, work-boat. Wide requests have been made for essential literature.

The work of the Centre is handicapped because of the lack of service facilities, notably draughting, workshop and data processing. A Statistician would be a valuable addition to the staff. Reference collections have yet to be established. Data reports are not yet ready for publication.

Field work has commenced in the environs of Cochin and seminars and discussions are being held regularly.

(c) Matters arising out of IOC Fifth Session

The Chairman next called upon Dr. Østvedt to relate briefly some of the proceedings of the IOC's Fifth Session and Dr. Østvedt gave a resume of the IOC discussions. It was recommended by the IOC that a comprehensive report should be prepared on "The original plan for Indian Ocean Biological Centre and the extent to which these plans have been fulfilled up to February 1968".

The following recommendation was adopted:

The Consultative Committee recommends that the Unesco Curator be requested to get ready before February 1969 a draft report on the aims and functions of IOBC and how far these have been fulfilled till now.

It was agreed after discussion that this work may be in three fascicles as follows:

1. History, organization, aims, procedures, etc. adopted by the IOBC.
2. Stability pertaining to IOBC material.
3. An account of the sorted and sub-sorted material available for study by specialists.

This report will be finalized by the Consultative Committee at its next meeting. Drafts of the first part may be circulated when ready.

3. ROUTINE SORTING AND SUB-SORTING OF THE INTERNATIONAL COLLECTIONS

(a) As requested by the Chairman, progress to date was outlined by Mr. D.J. Tranter. The increase in research activity and advanced sorting work was stressed and the consequent diminution in the rate of basic sorting work.

(b) In assessing future requirements, Mr. Tranter laid stress on need for additional research microscopes and for a fast, safe, shallow-draft work-boat to augment collection facilities.

The Consultative Committee resolved to repeat the recommendation of 1967, that the Curator, guided by the Unesco-CSIR Contract, should request microscopes, camera-lucidae and other necessary equipment from Unesco to meet present and future needs and that priority of requirements should be indicated. The committee further recommended that a small, fast, safe, shallow draught workboat be purchased for the use of the IOBC in routine collecting programmes and research programmes arising out of the International Collections, and for the use of visiting planktologists.

It was emphasized that a boat of good speed and shallow draft consistent with safety would be a valuable asset to the research group.

Attention was focussed on the de Havilland Hercules workboat made in Australia for a variety of purposes and adapted by CSIRO for hydrological work on the continental shelf. This workboat is made of aluminium with polyurethane foam floatation and is fitted with twin 40 hp. outboard motors, winch, davit, radio, echosounder, life-jackets and so on.

Dr. Panikkar assured the meeting that the workboat would be maintained by National Institute of Oceanography and that full costs would also be met. He pointed out that if such a boat is ordered by Unesco, spare parts for a period of five years should also be assured and part of it ordered along with the boat. He also recalled that CSIR expects that Unesco funds be used for providing only such equipments or facilities as are not readily available in India. This specialized type of field boat can be considered as an item for import.

Dr. Østvedt explained that Unesco budget provision for IOBC will be examined again to see if enough funds exist to meet the cost of a work-boat for IOBC.

(c) Equipment and other factors affecting the rate of sorting were discussed along with (b). The harm done to oculars and objectives of compound microscopes by fungal growth was also discussed at length and the remedial measures to be put into effect were reviewed and debated. Dr. N.K. Panikkar recounted the steps taken to get expert advice and help from the Central Scientific Instruments Organization at Chandigarh and Mr. Tranter drew attention of members to plans prepared by Mr. Jacob George for a storing cabinet for optical equipment. Use of desiccants was discussed. Prof. Krey agreed to take with him a few oculars and objectives to manufacturers in West Germany, have these articles inspected and improved, and troubles like fungal attacks eliminated.

The Consultative Committee recommends that an air-conditioned dehumidified chamber be set up in the main laboratory for storage of microscopes.

Dr. N.K. Panikkar mentioned the practical difficulty of carrying out this recommendation now when a shift to a different building is a near possibility.

The need to improve library and reference literature was discussed, as a factor affecting the rate of sorting and research. A list of desired literature, prepared by Shri M. Sakhivel and other assistants, transmitted by the Curator to Unesco and duplicated by them for distribution to National Co-ordinators with the request to send photo-copies to IOBC, was circulated to members. Dr. N.K. Panikkar drew the attention of the members to numerous items on the list which ought to be deleted before the lists could be mailed to National Co-ordinators, since these publications were Indian and could be obtained locally without difficulty.

(d) Status of sub-sorting

Arising out of the report on sub-sorting programmes for Copepods by Dr. Fleminger, on fish eggs and larvae by Dr. Ahlstrom and Prof. Rass, the committee discussed the question of the relative spheres of work of the sorting staff of the IOBC and the specialists to whom the material is to be sub-sorted and sent out. This was particularly relevant in view of the fact that the IOBC work was entering its next phase and that the sub-sorting operations themselves require a high degree of skill and scientific expertise which have developed in the sorters who are by themselves qualified scientists with a basic master's degree in Zoology. Further work on the collections at the IOBC beyond the primary sorting by the IOBC staff would naturally have to be recognized as scientific work of their own, apart from any detailed studies which the sub-sorted samples may receive in the hands of specialists.

The Committee, therefore, decided that the persons sub-sorting the material, either individually or as teams, separating them into smaller taxa at family level or generic level where such differentiation is possible, should be invited to prepare and publish distributional and allied accounts of the taxa handled by them. Their relative share of authorship would depend on the extent of time devoted to this work by them either individually or collectively.

The Committee also recommended that there was scope for fruitful collaboration between specialists who receive material for critical taxonomic study and persons who did the advanced sorting where such collaborative studies are possible. In such cases the distributional

and taxonomic studies could be fruitfully combined. In the event of the IOBC staff themselves being able to handle the material and develop scientific studies on the basis of area-wise or seasonal distribution they should be encouraged to do so, as such opportunities would be a great encouragement to them and a positive incentive for critical scientific effort.

The Committee recognized that all groups of plankton cannot be treated in the same way and that in arriving at decisions, the peculiar features of the groups of organisms, their relative abundance, their taxonomic complexity, the points of view and approach to the subject by the specialist in their field and competence of the concerned IOBC scientists are all involved. In this connection the views held by Dr. Ahlstrom in his report on fish eggs and larvae was also taken into consideration. He had emphasized that before the larval fish materials are parcelled out to specialists, the collection should be analyzed as a whole, in order to obtain information on the kinds, abundance and distribution of the major groups of fishes. "The importance of systematically collected larval fish information for evaluating fishery resources has not been sufficiently appreciated". In the opinion of the Committee this may be given special attention because of the scientific importance of the group and the Director of the IOBC was requested to examine the possibility of additional staff support in the special branch of study.

#### 4. SPECIAL ANALYSIS OF THE INTERNATIONAL COLLECTIONS BY TAXONOMISTS

On the request of the Chairman, the Curator outlined the progress in the past year in the distribution of material to specialists and items pending for despatch to specialists.

The Committee endorsed steps taken by the Curator to screen samples for adequate preservation before they are despatched to specialists.

Mr. Tranter also mentioned that Volume I of the Handbook on International collections, including Station Data and Displacement Volumes, could be published as soon as discrepancies were reconciled. He outlined plans for Volume II of the Handbook containing environmental data.

The Committee discussed the 'visits of experts during 1967 and 1968' and the reports of these experts. Dr. Østvedt explained that the report of Dr. Ahlstrom would be published soon by Unesco in the IIOE Newsletter, as recommended by the Committee in 1967. A report by Dr. A. Fleminger on the assessment of Copepods was presented to the Committee which also recommended publishing it in the Newsletter together with Dr. Ahlstrom's report.

Furthermore, the Committee recommended that the reports by Prof. Rass and Dr. Williamson be published as soon as they are submitted.

#### 5. STEPS TO BE TAKEN FOR PREVENTING DETERIORATION OF THE IOBC COLLECTIONS

The Chairman outlined the problem to the Committee members and to the invited scientists (forenoon of Saturday 24 February 1968) and extensive discussions took place. At the end, Prof. Krey requested Mr. Tranter to prepare a summary of the discussions. The summary is as follows:

Following Dr. Fleminger's report after last year's Consultative Committee Meeting, the question of deterioration of some of the samples was raised and some correspondence took place among the number of scientists concerned or acquainted with the problem. At the same time some experiments were started with the various preservatives at the IOBC and the other Centres within the newly formed SCOR-Unesco working group 23 on Preservation of Plankton Samples.

Dr. Fleminger described the type of deterioration he observed in some of the Copepod samples he examined and he assessed the value of the collections for systematic study.

Dr. Williamson largely concurred in this report regarding the Decapod crustacean larvae with the views expressed by Dr. Fleminger and both were optimistic that the material was still quite useful for systematic studies.

Dr. Rao who worked on the Chaetognaths pointed out that the state of the samples he worked on was variable; some species were in good condition whereas others were in an advanced state of deterioration. Dr. Rao also pointed out that he could not find any significant differences between the collection examined by him at the IOBC and at the Smithsonian Institution. A different view was expressed by Prof. Kurian with regard to Cumacea examined by him also from both Institutions.

Dr. Panikkar reported on his experience with the Anthozoan larvae which he examined together with Mr. Balachandran and pointed out that while the material was suitable for taxonomic studies up to genera, specific determinations were more difficult as they depend on histological preparations of the inner structures. This defect was also observed in anthozoan larvae of many former expeditions and reports on them were mostly up to generic level only. Dr. Kimor reported on the state of Cladocera samples and the residue samples of microplankton which he examined at the IOBC in 1964 and found them satisfactory for taxonomic purposes.



A number of participants in the discussion pointed out that most samples, many of them several decades old and preserved by conventional means are still in a most satisfactory state of preservation in many laboratories in India, even at Ernakulam itself.

Mr. Tranter then summed up the types of deterioration, organic deterioration, decalcification and depigmentation, and introduced the documents presented by Miss Saraswathy on bivalve larvae and by Mr. Gopalakrishnan on foraminifera. The large bivalves were in a far better state of preservation than the smaller ones while the foraminifera were in a fairly sound condition.

Some comments were made comparing the condition of the archives with the state of the sorted material. Dr. Williamson reported that he saw no significant difference (in Decapod larvae) between the condition of the sorted material and the condition of the archives.

The following conclusions as drawn up by Mr. David Tranter, outlines "The status of preservation of the IOBC samples" in the light of the Committee discussions:-

Part of the International Collections at IOBC shows signs of organic deterioration. This deterioration is by no means universal to the whole collection, nor general to all the taxa present. The crustacean taxa which constitute the bulk of the material are, in general, adequately preserved for identification purposes. These conclusions are based on examination of the material by Unesco Curators, Members of the Consultative Committee and visiting specialists.

The conditions unique to the present situation would seem to be :

1. The use of hexamine as a buffer.
2. The long chain of events in the history of the plankton samples from their collection by the ships of many countries to their processing at IOBC.
3. The long duration of sorting at the IOBC into approximately seventy taxonomic groups.
4. The high temperatures prevailing at the processing laboratory.

Because there is no reasonable hypothesis which can be advanced as to how hexamine can cause deterioration in organic material, and because experiments have failed to duplicate such an effect, the influence of hexamine as a causative factor can be discounted. The interaction of the other three characteristic conditions suggests the following working hypothesis: that the collections were exposed, at some time in their history, to bacterial attack occasioned by inadequate preservation.

There is strong circumstantial evidence that the deterioration observed in the material sorted at IOBC took place in this way. These samples were in some cases sorted in tapwater and experiments seem to indicate that samples fixed in formaldehyde and subsequently left in tapwater show signs of decomposition. This could, however, be debated. Archives left in preservative showed no sign of deterioration.

Because the International Collections were sorted not in tapwater but in preservative, and because sorted material and archives show equal deterioration, such an explanation cannot fully explain the deterioration observed with this material. Either the collections were exposed to bacterial decomposition before they reached the IOBC, or else they were so exposed in some instances during the fractionation process when both aliquot and archive were involved.

The latter possibility can be checked by comparing the condition of processed with unprocessed samples. The former possibility can be checked by comparing samples received at IOBC with archives or duplicates retained by the National Laboratories which collected the samples e.g. in Japan and the U.S.A. The comparisons available between IOBC and Smithsonian material gives conflicting results.

The present problem has focussed attention on the more general problem of plankton preservation and the need for critical experimental work in this field.

#### 6. PROGRESS IN PREPARATION OF IIOE ATLAS AND THE PROBLEMS THEREOF.

The Chairman introduced the subject. Dr. Panikkar gave details of the IOC Meetings where the proposal for a series of Atlases under the General Editorship of the Director of IOBC was accepted with the first Atlas on General Properties under the Joint Editorship of Dr. Brinton and himself. Work on this was progressing. He also informed the Committee of the circumstances necessitating early publication of the first fascicle

of the series (Zooplankton Biomass for the Arabian Sea and the Bay of Bengal) prepared by Dr. R.R. Prasad and said that this section of the Atlas was now in progress. Two specimen maps in the proof-stage were shown. There was much general discussion on the possible choice of different map-projections by different authors and whether this would be a source of disadvantage. Inter alia, Dr. Østvedt agreed to send a full set of IIOE Information papers (Numbers 1 to 18) to every member of the Committee to provide a full background information on the subject to assist at future meetings. Prof. Krey gave details of his draft maps on Chemical Biology of the Indian Ocean. The Committee welcomed the early publication of the first fascicle of Volume I of the Atlas, prepared by Dr. R.R. Prasad, depicting the distribution of zooplankton biomass over the Arabian Sea and the Bay of Bengal.

## 7. SELECTION OF TAXONOMIC SPECIALISTS

The Chairman introduced the subject and Mr. Tranter reviewed groups for which specialists have been selected, groups for which lists have been prepared by Prof. Rass, Dr. Fleminger and Dr. Williamson, and groups for which specialists have to be found thereafter.

The Consultative Committee recommended that the lists of specialists prepared by Prof. Rass (with suitable condensations), Dr. Fleminger and Dr. Williamson be printed as appendices to the Report of the Sixth Meeting 1968, and that the specialists recommended in these lists be approved pending receipt of acceptance of responsibility by the scientists and the specialist's institution.

After discussions on the mode of selection of specialists in future and for revisions which may become necessary in the lists for fish larvae, Copopoda and Decapod larvae, the following resolution was adopted :-

The Consultative Committee nominated the Director of IOBC, the Curator and Professor S. Krishnaswamy to form a sub-committee entrusted with the responsibility of suggesting names of specialists for groups in future or to fill gaps in lists caused by the declining of responsibility. The names suggested will be circulated by mail to all Committee members and if no objections are raised within a month, the names suggested would be deemed to have been approved.

## 8. OTHER ITEMS WITH THE PERMISSION OF THE CHAIRMAN

### (a) Research and Training

The Research and Training programmes of the IOBC were discussed in great detail by the Committee following a proposal

by the Curator that steps should be taken to develop the research activities of the IOBC through a regular programme of collection of plankton during cruises in which the scientific staff of IOBC would participate, thus giving them opportunities to get acquainted with field work, and at the same time augmenting the collections. The Curator also desired emphasis on studies pertaining to seasonal variation in the plankton of the Kerala Coast and the adjoining areas.

In a lengthy discussion which ensued, invitees from other Institutions at Cochin, members of the Committee and the Advisory Board participated. While everyone was agreed on the scientific importance of such studies, differing views were expressed on the scope and propriety of such studies being undertaken by the IOBC, considering that plankton programmes pertaining to the west coast of India were being pursued by the Central Marine Fisheries Research Institute, the University Department of Oceanography and the Biological Oceanography Division of the National Institute of Oceanography itself. The growth of these programmes and the thinking of the Indian organizations on their relative responsibilities was outlined by Dr. Panikkar. It was explained that the IOBC's responsibility should be primarily the handling, sorting and subsequent study of the International Collections in which field much remains yet to be done. In the course of time the scientific activities of the IOBC and the Biological Oceanography Division of NIO would merge into a compact programme in Biological Oceanography of the Indian Ocean. In the field of research, the IOBC may still be able to develop certain fields such as, for example, plankton methodology as applied to tropical plankton.

A full scale development of the IOBC into an International Centre of tropical plankton research would be desirable but there was no indication whether large scale support from international sources, essential for this objective, would be available. While this question need not be considered as closed, the Committee recommended as follows:-

1. The primary responsibility of the IOBC should be the examination and study of the International Collections through the co-operation of world specialists, the local staff and the Curator.
2. Steps should be taken to augment the IOBC Collections in the following manner:-
  - (a) Attention of National Coordinators to be invited to the large gaps in the distribution of IOSN samples in several areas of the Indian Ocean and

that they be requested to secure coverage for plankton collections in these areas when future cruises are planned.

- (b) Request for samples from the Indian Ocean during future expeditions to be renewed through SCOR and IOC.
  - (c) Steps to be taken by Unesco to secure ship-board fellowships in ships working in the Indian Ocean to IOBC staff as a definite move towards giving them field-training and experience.
  - (d) Opportunities to be given to the IOBC staff to make plankton collections in order to enable them to compare fresh material with the IOBC samples, particularly with reference to certain groups of organisms which are currently under study by certain members of the IOBC staff.
  - (e) Collaborative Programmes with other local Institutions like the Oceanography Department of the University, Central Marine Fisheries Institute and other divisions of the National Institute of Oceanography, to be developed.
3. The Curator and the IOBC staff recognize that research in plankton methodology (more especially improvement in techniques for the study of tropical plankton) is a field of activity in which they could profitably engage without any possible overlap with programmes of other Institutes like the Oceanography Department of the University, Central Marine Fisheries Institute and other divisions of National Institute of Oceanography and a demonstration workshop for plankton methodology should be developed. Such research in methodology should be organized in 1969, with Unesco support.

(b) Contract sorting

The subject of contract sorting was discussed and it was agreed that such sorting programmes would be technically feasible. The subject should be further examined as a contract by FAO or other interested agency on the one hand and the CSIR (National Institute of Oceanography) on the other.

(c) Congress on Biology of Indian Ocean

The Committee was informed of the proposal for a "Congress on Biology of the Indian Ocean" and the Committee welcomed the proposal. At present the suggestions were that this might be

held either at Kiel or in Tokyo. It was strongly emphasized, from the point of view of the IOBC, that such a Congress could most appropriately be held in a suitable place in India or similar place where the largest number of scientists who would benefit from such a Symposium are stationed. On behalf of the National Institute of Oceanography, the Director assured that if it was held anywhere in India, travel support to attend the Congress would be available.

(d) Date of next session

In addition to the dates for the next session, the lectures for the session of 1969 were also discussed. Professor Kimor proposed that "Population studies on plankton communities" be taken as a general heading under which each member could choose his own topic and title for the lecture, and this was accepted. The title and text of the lecture may be transmitted to Dr. Qasim in Ernakulam approximately four weeks in advance of the lecture dates so that mimeographed copies could be supplied to the audience before the commencement of the lecture. Members were requested by Dr. Panikkar to send brief summaries (approximately two pages of typed matter with one or two figures) of their 1968 lectures so that they could be published in the National Institute of Oceanography House Journal.

Dr. Panikkar introduced the questions relating to the future of the IOBC, after it had discharged its obligations in storing, sorting and distributing the sorted fractions to specialists. He requested members to give special thought to this leading to a fruitful discussion at the next Consultative Committee meeting.

9. ELECTION OF NEXT CHAIRMAN

The Committee unanimously decided to request Prof. Krey to continue as Chairman till the next session of the Consultative Committee during the course of which the next Chairman could be elected. The representative of Unesco was requested to take up this with the Office of Oceanography of Unesco.

10. CONCLUSION : LIST OF RECOMMENDATIONS

- (1) The Consultative Committee recommends that the Unesco Curator be requested to get ready before February 1969 a report on the original plan of the aims and functions of IOBC and how far these have been fulfilled till now.

- (2) The Consultative Committee resolved to repeat the recommendation of 1967 that the Curator, guided by the Unesco-CSIR Contract, should request microscopes, camera-lucidae and other necessary equipment from Unesco to meet present and future needs and that priority of requirements should be indicated. The Committee further recommended that a small, fast, safe, shallow draught workboat be purchased for the use of the IOBC in routine collecting programmes and research programmes arising out of the International Collections, and for the use of visiting planktologists. Attention was focussed on the de Havilland Hercules workboat made in Australia for a variety of purposes and adapted by CSIRO for hydrological work on the continental shelf. This workboat is made of aluminium with Polyurethane foam flotation and is fitted with twin 40 hp. outboard motors, winch, davit, radio, echosounder, life-jackets and so on.
- (3) The Consultative Committee recommended that an air-conditioned dehumidified chamber be set up in the main laboratory for storage of microscopes.
- (4) The Consultative Committee recommended that the reports submitted (or to be submitted) by Dr. Ahlstrom, Dr. Fleminger, Professor Rass and Dr. Williamson after assessing the collections at IOBC, be published by Unesco.
- (5) The Consultative Committee recommended that the lists of specialists prepared by Professor Rass (with suitable condensations), Dr. Fleminger and Dr. Williamson be printed out as appendices to the Report of the Sixth Meeting 1968 and that the specialists recommended in these lists be approved pending receipt of acceptance of responsibility by the scientist and his institution.
- (6) The Consultative Committee nominated the Director of IOBC, the Curator and Prof. S. Krishnaswamy to form a sub-committee entrusted with the responsibility of suggesting names of specialists for groups in future or to fill gaps in lists of specialists. The names suggested will be circulated by mail to all Committee members and if no objections are raised within a month the names suggested will be considered to have been approved.

7) The Consultative Committee recommended as follows:

- (i) The primary responsibility of the IOBC should be the examination and study of the International Collections through the cooperation of world specialists, the local staff and the Curator.
- (ii) Steps should be taken to augment the IOBC Collections in the following manner:-
  - (a) Attention of National Coordinators to be invited to the large gaps in the distribution of IOSN samples in several areas of the Indian Ocean and that they be requested to secure coverage for plankton collections in these areas when future cruises are planned.
  - (b) Request for samples from the Indian Ocean during future expeditions to be renewed through SCOR and IOC.
  - (c) Steps to be taken by Unesco to secure ship-board fellowships in ships working in the Indian Ocean to IOBC staff as a definite move towards giving them field-training and experience.
  - (d) Opportunities to be given to the IOBC staff to make plankton collections in order to enable them to compare fresh material with the IOBC samples, particularly with reference to certain groups of organisms which are currently under study by certain members of the IOBC staff.
  - (e) Collaborative Programmes with other local Institutions like the Oceanography Department of the University, the Central Marine Fisheries Institute and other divisions of the National Institute of Oceanography, to be developed.
- (iii) The Consultative Committee recognized that research in plankton methodology (more especially improvement in techniques for the study of tropical plankton) is a field of activity in which the IOBC could profitably engage without any possible overlap with programmes of other institutes. To develop this activity they recommended that a demonstration workshop for plankton methodology should be organised at IOBC in 1969, with Unesco support.



# 11. LECTURES BY THE CONSULTATIVE COMMITTEE MEMBERS

For the benefit of the IORC staff, as well as the biologists in general, some of the members of the Consultative Committee delivered a few lectures during the period of their stay in Ernakulam for the Consultative Committee meetings. The names of the members and the topics on which they spoke are given below:-

- |                       |  |
|-----------------------|--|
| Prof. B. Kimor        | - Plankton affinities between the Red Sea and the Eastern Mediterranean.                               |
| Prof. J. Krey         | - Heterogeneity and variability in Biological Oceanography.<br>- Chemical Biology of the Indian Ocean. |
| Prof. V.N. Greze      | - Trophic composition in the plankton community.   |
| Prof. Masateru Anraku | - A hydrodynamic study of the high speed plankton sampler.   |

Summaries of these lectures are being published in Vol.I Nos.1 & 2 of "MAHASAGAR", the house journal of the National Institute of Oceanography.

## APPENDIX I

### REPORT OF THE DIRECTOR OF THE INDIAN OCEAN BIOLOGICAL CENTRE FOR 1967-68

#### 1. GENERAL

The Indian Ocean Biological Centre has entered into its sixth year of life, after completing over five years of expanding scientific activities since its commencement in November 1962. The main function of the Centre is handling standard samples of zooplankton collected by research ships of the countries which participated in the International Indian Ocean Expedition. The primary task of basic sorting and processing of the samples is now approaching completion. Concurrently, there is an increasing volume of specialized work comprising further subsorting and also research on taxonomic, distributional and ecological aspects of the plankton constituents. The Indian Ocean Biological Centre is a regular division of the National Institute of Oceanography (of India) since the beginning of 1966. The Centre has proved its usefulness so well that, in consequence, a new five-year agreement (1966-1970) governing the International Collections deposited at this Centre and research activities based upon them, has been entered into by the Council of Scientific and Industrial Research (of India) on the one hand and Unesco on the other.

#### 2. ACCOMMODATION AND SERVICES

The Centre continued to function in two buildings. The IOBC Laboratory Wing continued to be housed in the southern wing of the Oceanographic Laboratory of the Kerala University. A second wing is housed in a rented building of approximately 1500 sq. feet of floor space, situated close to the bigger wing. The main stores, the administrative section and the laboratory for the subsorting of Crustacea Decapoda larvae are located in this building. These temporary arrangements will, it is hoped, be replaced soon when a building site of 1.1 acres at Ernakulam is acquired and steps taken to erect a permanent building for the Centre. The laboratories have been fitted with well-designed work benches and chairs, ensuring maximum efficiency and comfort to the sorters and research workers. Additions of furniture during 1966-67 and 1967-68 have maintained this standard. Ceiling fans, lighting fixtures, water taps and sinks for the washing of glassware, are all being added too. Additional airconditioning units are being procured. Sliding doors have been fitted to the racks on which the plankton collections are stored.

### 3. SCIENTIFIC EQUIPMENT

During the past year a few items of specialized equipment arrived out of earlier contracts with Unesco but no fresh orders have been placed with Unesco for any major items of scientific equipment. Routine needs of chemicals, glassware and formalin have been provided in adequate volume from Indian sources. A work bench has been fitted up for histological work, with microtome, paraffin-bath, stains and all other accessories.

### 4. LIBRARY

The library of the Centre continued to grow and the number of journals arriving through subscription has now increased. Steps have been taken to assess the gaps in the sections of reference literature on plankton groups and to fill the gaps by purchase or by appeals to national coordinators to secure these works for the Centre by photocopying and other methods. Even though the central library of the NIO units at Ernakulam is located at the Biological Oceanography Division (the old IBP Unit), all the relevant literature including books and periodicals used by IOBC staff, and of which they are in frequent need, are housed in the IOBC Laboratory Wing. This step ensures ready access to references whenever the need arises.

### 5. STAFF

#### a) Scientific

1. Chief Scientist-in-Charge (Part-time)	1
2. Senior Scientists (Officers)	4
3. Senior Scientific Assistants	3
4. Junior Scientific Assistants	9
5. Senior Laboratory Assistants	8

#### b) Administrative

1. Junior Accountant	1
2. Junior Stenographer	1
3. Junior Stenographer (for the Curator)	1
4. Store Clerk	1
5. Librarian	1

#### c) Ancillary Technical

Laboratory Attendants	7
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#### d) Subordinate staff

1. Gestetner Operator	1
2. Peon/Messenger	1
3. Security Guard	1
4. Watchman (daily wages)	1

Dr. R. Raghu Prasad continued as Chief Scientist-in-Charge and provided all necessary guidance and supervision.

Dr. Edward Brinton completed his term of duty as Curator and left for the U.S.A. on 9th May 1967. Unesco appointed Dr. David J. Tranter of the CSIRO Australia as Curator to succeed Dr. Brinton and he took charge on 2nd November 1967. During the entire period 1967-1968 the uninterrupted progress of sorting and other regular activities was maintained by Shri L.R. Kasturirangan acting as Associate Curator.

## 6. SCIENTIFIC ACTIVITIES AT THE CENTRE

### A) Sorting of Plankton

This has proceeded steadily during 1967-68 and the present position is indicated below:

Sorted samples as on 31.3.1967 .....	1571
Sorted samples during 1967 (April to December)....	189
Samples unsorted on 1.1.1968 .....	421
Total number of IIOE Samples at IOBC ....	2181

### B) Research on Plankton

Dr. R. Raghu Prasad completed his study of zooplankton biomass in the Arabian Sea and the Bay of Bengal. The paper is being published. The charts relating to biomass are also being separately published as a first fascicle of the "General Properties" atlas under the co-editorship of Dr.N.K. Panikkar and Dr. Brinton. Dr. Brinton, assisted by Shri K. Gopalakrishnan (J.S.A.) continued his studies on Euphausiacea of IIOE Collections till May 1967. After this date the studies are being continued at the Scripps Institution of Oceanography, since Dr. Brinton has returned to his parent laboratory, and the Euphausiid material also has been transferred to the care of this laboratory. Shri M. Krishna Menon, Scientist, continued his studies on Decapod crustacean larvae and the programme of subsorting of the collection from each station into about two dozen groups until he completed his term of appointment in October 1967. Shri L.R. Kasturirangan, Scientist and Associate Curator, is continuing his interest in the Copepod material of the IIOE Collections, in the plans for subsorting of this vast group and in specialized studies of Eucalanus and Rhincalanus. Dr. R.V. Unnithan, Scientist, continued his work on the "Micro associates of Marine fishes" and has also begun studies on the Platyhelminthes from the IIOE Collections.

The more senior from among the sorting assistants are increasingly engaged in specialized work. Each has a group in which he has special interest and carries out not only further subsorting but also taxonomic work and research studies.

Shri P. Gopala Menon	- Crustacea Decapoda Larvae
Shri M. Sakthivel	- Mollusca Thecosomata
Shri K.J. Peter	- Fish eggs and larvae
Shri P.N. Aravindakshan	- Mollusca Heteropoda
Shri Jacob George	- Ostracoda
Shri George Peter	- Pelagic Polychaeta
Shri V.T. Paulinose	- Crustacea Decapoda Larvae
Smt. Vijayalakshmi R. Nair	- Chaetognatha
Shri T. Balachandran	- Pelagic Anthozoa
Smt. C.B.Lalithambika Devi	- Flat-fish Larvae

#### 7. FACILITIES FOR VISITING SCIENTISTS

Visiting scientists and research workers were given full facilities at the Centre as in previous years. The most notable among these visiting scientists from abroad has been Professor Rass from the Institute of Oceanology of Moscow who spent nearly eight weeks at the IOBC examining and evaluating the collections of fish eggs and larvae. Prof. Williamson from the Marine Biological Station (University of Liverpool) at Port Erin, Isle of Man, England, is expected to arrive in March and do the same for the main body of the Crustacea Decapoda larvae. Besides these two who spent time at the IOBC examining the International Collections, there were numerous other distinguished marine biologists from India and abroad who visited IOBC and held discussions with the scientific staff.

#### 8. LECTURES AND SEMINARS

Participation by the IOBC staff and scientists in the Symposium on "Indian Ocean" organized in Delhi in March 1967 by the National Institute of Sciences of India and the Indian National Committee on Oceanic Research, was the highlight of the year. Staff members also attended many lectures by visiting scientists amongst whom two may be mentioned:

- 10 November 1967 - Prof. H.A. Bern, University of California (at Berkeley) spoke on "Endocrines in Fishes".
- 1 December 1967 - Prof. R.P. Clark, University of Newcastle-upon-Tyne, England, spoke on "Reproductive Biology of Polychaetes".

## 9. BUDGET

A summarised budget statement for 1967-68 is given below:

	<u>Amount in Rupees</u>
Pay and allowances	1,59,800
Scientific and Office equipment and contingencies	<u>1,18,000</u>
Total	2,77,800 =====

### Budget estimate for 1968-69

Pay and allowances	1,82,000
Equipment and contingencies	<u>1,30,000</u>
Total	3,12,000 =====

## 10. ORGANIZATION

The organizational set-up continued, in the main, as in earlier years.

## 11. PUBLICATIONS

1. Dr. R.P. Prasad "Zooplankton Biomass charts for the Arabian Sea and Bay of Bengal", Fascicle 1 of the General Properties. Atlas of the IIOE with Co-editors: Dr. N.K. Panikkar and Dr. E. Brinton, C.S.I.R., January 1968.
- \* 2. Shri M. Sakthivel "A preliminary report on the distribution and relative abundance of Euthecosomata with a note on the seasonal variation of Limacina species in the Indian Ocean".

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\* being published in the Symposium Number of the Proceedings of the National Institute of Sciences of India.

- \* 3. Shri P.N. Aravindakshan "Preliminary report on the geographical distribution of the species of Carinariidae and Pterotracheidae (Heteropoda, Mollusca) from the International Indian Ocean Expedition".
- \* 4. Shri Jacob George "Preliminary report on the distribution and abundance of plankton Ostracoda in the Indian Ocean".
- \* 5. Shri George Peter "A preliminary report on the general distribution and seasonal variation in abundance of the planktonic polychaetes in the Indian Ocean".
- \* 6. Smt. Vijayalakshmi R.Nair - "A preliminary report on the biomass of Chaetognaths in the Indian Ocean comparing the southwest and north-east monsoon periods".
- \* 7. Shri Balachandra Menon  
and  
Dr. N.K. Panikkar "Preliminary studies of the distribution of planktonic Anthozoa (Coelenterata) in the Indian Ocean".
- \* 8. Shri K. Gopalakrishnan  
and  
Dr. E. Brinton "Preliminary observations on the distribution of Euphausiacea from the International Indian Ocean Expedition".
- \* 9. Shri K.J. Peter "Larvae of Rastrelliger (Mackerel) from the Indian Ocean".
- \* 10. Shri K.J. Peter "Preliminary report on the density of fish eggs and larvae of the Indian Ocean".
11. Shri K.J. Peter "A note on the record of Rastrelliger (Mackerel) larvae from the Indian Ocean".  
Curr. Sci., 36, 10, 273-74
12. Shri M. Sakthivel "A note on the abundant occurrence of Desmopterus gardineri Tesch in the Indian Ocean". To appear in J. Bombay Nat.Hist.Socy., April 1968.
- \* 13. Shri M. Krishna Menon "Preliminary notes on the decapod larvae of the Arabian Sea".

## 12. SCIENTIFIC STAFF

- A. 1. Chief Scientist-in-Charge (Part-time)  
Dr. R. Raghu Prasad
2. Assistant Director and Head of the Centre  
Dr. S.Z. Qasim
3. Senior Scientific Officer  
Shri M. Krishna Menon (till Oct. 1967)
4. Senior Scientific Officer/(Associate Curator)  
Shri L.R. Kasturirangan
5. Junior Scientific Officer  
Dr. R.V. Unnithan
6. Pool Officer  
Dr. C. Sankaran Kutty (from December 1967)

### B. SORTERS

- (i) Senior Scientific Assistants
1. Shri P. Gopala Menon
  2. Shri M. Sakthivel
  3. Shri K.J. Peter
- (ii) Junior Scientific Assistants
1. Shri P.N. Aravindakshan
  2. Shri Jacob George
  3. Shri George Peter
  4. Shri V.T. Paulinose
  5. Smt. Vijayalakshmi R. Nair
  6. Shri T. Balachandran
  7. Smt. C.B. Lalithambika Devi
  8. Shri T.C. Gopalakrishnan
  9. Dr. M. Saraswathy
- (iii) Senior Laboratory Assistants
1. Smt. P.P. Meenakshi Kunjamma
  2. Shri S.V.M. Abdul Rahim
  3. Shri P.S. Mohamed Gani
  4. Shri T.O. Chandrabhanu
  5. Smt. K. Sarala Devi
  6. Smt. Rosamma Stephen
  7. Shri O. Raveendran
  8. Shri P. Venugopal



C. RESEARCH FELLOWS

(i) Senior Research Fellow  
Dr. N. Ravindranatha Menon

(ii) Junior Research Fellow  
Shri S.C. Goswami

13. VISITORS TO IOBC - 1967-1968

1. Dr. C.V. Kulkarni, Director of Fisheries, Govt. of Maharashtra, Bombay, India.
2. Dr. Hari Narain, Director, National Geophysical Research Institute, Hyderabad, India.
3. Prof. P.N. Ganapati, Head of the Department of Zoology, Andhra University, Valtair, and Member of Indian Advisory Board for IOBC.
4. Dr. J.D. Costlow, United States Office of Naval Research. U.K. Office, London.
5. Dr. Aubrey W. Pryce, United States Office of Naval Research.
6. Dr. Wynford Davies, Washington D.C., U.S.A.
7. Dr. W. Aron, Smithsonian Institution, Washington D.C., U.S.A.
8. Prof. H.A. Bern, University of California, California, U.S.A.
9. Mr. Chi-yun Pau, F.A.O. Expert, Cochin, India.
10. Prof. R.B. Clark, Director, Dove Marine Laboratories, Cullercoats, University of Newcastle-upon-Tyne, U.K.
11. Dr. Madeleine Oliverean, Institut Océanographique, Paris.
12. Dr. Anna N. Bidder, Department of Zoology, University of Cambridge, Cambridge, England.
13. Dr. M.C. Merler, Biological Station, St. Johns, Newfoundland.
14. Dr. J.P. Burch, Museum and Department of Zoology, University of Michigan, Ann Arbor, Michigan, U.S.A.

15. Dr. Ralph W. Dexter, Department of Biological Science,  
Kent State University. Kent, Ohio, U.S.A.
  16. Dr. Alan K. Kohn, Department of Zoology, University  
of Washington, Seattle, Washington, U.S.A.
  17. Dr. Ferdinand Starmuhlur, Zoologisches Institut der  
Universitat Wien, Austria.
  18. Dr. D.N. Atapattu, Department of Zoology, University  
of Ceylon, Colombo.
  19. Dr. A.H. Sattanathan, Department of Zoology, University  
of Ceylon, Colombo.
  20. Prof. T.S. Rass, Institute of Oceanology, Academy of  
Sciences, Moscow, USSR.
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## APPENDIX II

### REPORT OF THE CURATOR TO THE SIXTH MEETING OF THE CONSULTATIVE COMMITTEE FOR THE IOBC

#### SUMMARY:

The work at IOBC is entering a new phase. Specialists are ready to examine the Collections and regular consignments are being made as basic sorting draws to a close. Sub-sorting programmes are gathering momentum and specialists are visiting the Centre with greater frequency. Part of the Collection, consisting of soft bodied organisms and samples from particular cruises, is not in good condition. Steps are being taken to control this deterioration problem.

The Centre is receiving generous support from both NIO (India) and Unesco in the supply of equipment. In both cases the delay is considerable and might be reduced. Urgent steps must be taken to control humidity because of fungal growth on the optical equipment. The major item of equipment needed at present is a fast, safe, shallow-draft, work-boat. Wide requests have been made for essential literature.

The work of the Centre is handicapped because of the lack of service facilities, notably draughting, workshop and data processing. A statistician would be a valuable addition to the staff. Reference collections have yet to be established. Data reports are not yet ready for publication.

Field work has commenced in the environs of Cochin and a seasonal study is planned between the Kerala coast and the Laccadives. Seminars and discussions are being held regularly.

To fulfil its complete role, the IOBC needs to develop as a Centre for research on tropical plankton.

#### 1. DETERIORATION CONTROL

To deal with the deterioration problem several steps have been taken:-

- 1.1 The collections have been grouped together in one room under the care of one person (Balachandran) who will be assisted by a "Collection Tender", soon to be appointed, as recommended by the Consultative Committee.

- 1.2 Samples which are deteriorating because of rusting of containers and other forms of container desintegration, are being stored in more suitable containers. Within the next year all samples will be transferred to transparent styrene jars with leakproof lids.
- 1.3 All jars are being stored in light-proof, dust-free wooden cabinets with sliding doors.
- 1.4 The collection room is being fitted with air-conditioners which will operate continuously, day and night.
- 1.5 Consignments are being examined for excessive deterioration, before despatch to specialists, and badly deteriorated samples are removed from the consignment. This branch of the work is being dealt with by Raveendran.
- 1.6 The rate of consignment is being speeded up and specialists are being encouraged to visit the IOBC as early as possible.
- 1.7 An experimental programme has commenced on the efficiency of various fixatives and preservatives under various conditions.
- 1.8 Close supervision is being kept on the way preservatives are being made up for routine use.
- 1.9 A water filter has been ordered to provide bacteria-free tap water for the Laboratory.
- 1.10 The use of the "Lea Plankton Splitter" has been largely replaced by the "Folsom Splitter" which is less abrasive (a modified Folsom splitter which will divide the catch into 5 parts is being made and a modified Lea splitter which is less abrasive is under trial).
- 1.11 The routine of measuring the displacement volume of the sorted fractions has been discontinued.
- 1.12 It is planned, with the consent of the Consultative Committee, to carry out all future sorting in phenoxetol solution to relieve the discomfort created by formaldehyde fumes.
- 1.13 Formaldehyde (4%) buffered with Hexamine (1%) will continue to be used as the standard preservative unless the Consultative Committee should recommend otherwise.
- 1.14 A statistical survey of the collection is planned to try to isolate the main causes of deterioration.

## 2. CONFIRMATION OF SPECIALISTS SELECTED

### 2.1 Selected by the 1967 Consultative Committee

The following specialists have agreed to accept the responsibility for the following material:-

Rass	Fish eggs and larvae
Williamson	Decapod larvae other than Penaeidae.
Fleminger	Copepoda
Be'	Foraminifera
Taki & Okutani	Cephalopod larvae
Ralph	Cubomedusae (and possibly Scyphozoa)
Wickstead	Branchiostoma
Alikunhi	Stomatopod larvae
McGowan	Pteropods

Professor Rass and Dr. Williamson have already visited the Centre to initiate collaborative research programmes. Dr. Be' is expected for a similar visit in August.

The following specialists are awaiting the decision of their Institute to accept joint responsibility for the work:-

Gruner	Amphipoda
Daniel	Siphonophores
Krishna Menon	Penaeidae

The following specialists have either declined or expressed strong reservations:-

Tebble	Polychaeta
Cook	Cyphonautes
Buchman	Appendicularia

No answer has been obtained from the following:-

Tirmizhi	Sergestidae
McGowan	Heteropods

2.2 The following specialists selected prior to the 1967 Consultative Committee Meeting have been at work for some time on the material:-

Krishna Pillai	Mysidacea
Brinton	Euphausiacea
Unnithan	Platyhelminthes
Kurian	Cumacea
T.S.S. Rao	Chaetognatha
Panikkar and	
Balachandran	Anthozoan larvae

2.3 The following trainee specialists on the staff at IOBC need to be found a senior specialist with whom to collaborate, or else vested with the full responsibility for the material they are studying:-

Aravindakshan	Heteropods
Jacob George	Ostracods
George Peter	Polychaetes
Ravindranatha Menon	Cyphonautes

### 3. NEW ALLOCATIONS

It is possible at the 1968 Consultative Committee Meeting to finalize the allocation of material except for some small groups which should perhaps remain at IOBC.

#### 3.1 Larger Collections

Hydrozoa	Cladocera
Trochophore Larvae	Pyrosomes
Nudibranchs	Bivalve Larvae
Gastropod Larvae	Radiolaria
Isopods	Sipunculids

#### 3.2 Smaller Collections

Actinodrocha  
Echinoderm post-larvae  
Pilidium  
Halobates  
Brachiopoda

### 4. EQUIPMENT

#### 4.1 Received:

<u>Item</u>	<u>Date of Receipt</u>
Sample Tubes	20.6.1967
Indian Ink Pens	15.12.67

#### 4.2 Ordered:

##### 4.2.1 Through N.T.O.

<u>Item</u>	<u>Date of Ordering</u>
Filing system	4.11.1967
Air Conditioners (2)	9.11.1967
Card Index Drawer	12.11.1967

Fluorescent lighting for collection room	12.11.1967
Histological equipment	12.11.1967
Zero power Eyepiece and objective	14.11.1967
Sinks and Draining racks	18.11.1967
Tool Kit	30.11.1967
Chemicals for measuring formaldehyde content	16. 1.1968
Standard plankton jars (5000)	21. 1.1968
Reprint boxes	30. 1.1968

#### 4.2.2. Through Unesco

<u>Item</u>	<u>Date of ordering</u>
Spectrophotometer Parts	Before Oct. 1967
Jewellers Forceps	" "
Verifax copying paper	" "
Stereo Research Microscopes (3)	19.10.1967
Dark-field condensers for same (3)	"
Rotating Plankton Trays for same (3)	"
35 mm Camera	"
Nylon Gauze for making nets	"
Monel Metal Gauze " "	"
Plastic Electrical Tape	"
Air Conditioners (2)	"
Plenoxetol	23.10.1967
Flow meters	17.11.1967
Spares for pH meter	16.12.1967
Drawing apparatus	16.12.1967
Eyepiece and Stage Micrometers	16.12.1967
Water Filter	30. 1.1968
Books (Tregouboff & Rose, Wickstead, Caribbean copepods)	30. 1.1968
Turtax Equipment	15.11.1967
Plankton Net	11. 1.1968
pH Paper	27. 1.1968
Metre Blocks (2)	30. 1.1968

#### 4.3 Needed

When the current orders are eventually fulfilled the backlog of outstanding needs will be met. However, new needs will develop with the development of active research programmes and these should be anticipated.

#### 4.3.1. Laboratory Equipment

The needs which are developing here are two-fold : the need for more research microscopes (both Stereo and Compound) and the need for simple aquarium facilities for rearing plankton organisms. Because the microscopes already present at IOBC are deteriorating fast due to fungal growth on the lenses, it would probably be unwise to order more until suitable dehumidified space is provided in the main laboratory.

#### 4.3.2. Field Equipment

Here the outstanding need is for a fast safe shallow-draft workboat, which will reach a wide range of plankton habitats within half a day's cruising from the Laboratory. No existing boat available at Cochin at the moment is suitable for this purpose. This facility is required both to satisfy the research programmes developing at the Laboratory from the International Collections, and to attract visiting planktologists both from India and abroad.

### 5. LIBRARY

- 5.1 A system of regular routing of journals from the Central Library has been established. The plankton literature contained in these journals is card indexed by the staff under the general supervision of Aravindakshan.
- 5.2 Key references to the taxonomic literature have been gathered together by the staff under the general supervision of Sakthivel, and requests have been placed with the authors concerned. The response has been encouraging. A bibliography of the remaining literature required has been prepared and circulated to IIOE National Coordinators.
- 5.3 Each acquisition is identified upon receipt with a characteristic IOBC stamp.

### 6. SERVICES

#### 6.1 Care of Optical Equipment

Most of the microscopes are badly fouled with fungal growth and need to be cleaned before the lenses are irreparably damaged. Arrangements are being made by the Director to receive a visit from an optics specialist from the Central Scientific Instruments Organization.



When the damage has been corrected the problem still remain of creating a convenient dehumidified microscope storage space in the main Laboratory where most of the microscopes are used, so that further damage will be prevented. The general care of optical equipment is now in the hands of Jacob George.

## 6.2 Draughting Facilities

As emphasized by previous meetings of the Consultative Committee, the services of draughtsmen are required to prepare figures and charts for publication. This work could profitably be combined with photographic work, the demand for which will gradually increase.

## 6.3 Workshop Facilities

In general the workshop requirements of the IOBC are being met by outside firms and technicians. Although this system is reasonably successful, there will always be a need for on-the-spot workshop facilities, however modest in scope. Without this it would be very difficult to encourage that necessary critical interest in methodology which is characteristic of good science.

## 6.4 Data Processing and Statistics

As basic data accumulates from the routine sorting programmes and as specialists begin to receive the material sorted, an urgent need has developed for a Data Processing and Statistical Section within the IOBC. Although there are no electronic data processing facilities here the data do need to be recorded in a way that will be acceptable to established Data Centres with which IOBC could develop a profitable liaison. A satisfactory solution has been found to the problem of reconciling early transmission of data to Data Centres with the obvious need to protect the interests of the specialists who provide the data. A newly appointed research fellow (Chandrasekharan) is being introduced to this work. A full time fellow in statistics is also required. He should, preferably, be affiliated with the National Institute of Statistics from where he could draw moral and practical support.

# 7. PUBLICATIONS

## 7.1 Handbook Volume 1. (Station Data and Displacement Volume)

This is not yet ready for publication. The station list previously prepared shows some discrepancy with the Data Reports published by National Laboratories. Clarification of the discrepancies is being sought. The volume will be published some time in 1968.

## Volume 2. (Environmental Data)

Negotiations are being made with World Data Centre A to receive data for IOSN Stations. It is proposed to include the following data in Volume 2 of the Handbook:

Temperature	0m and 200m
Salinity	0m and 200m
Depth of mixed Layer <del>10m</del>	Where $\Delta t < 0.02$ °C./metre
Nitrate	0m, 10m, and 200m
Phosphate	0m, 10m, and 200m

The preparation of material for the Handbook is being dealt with by Venugopal.

### 7.2 IOBC Pamphlet

Nothing has yet been done to "advertise the facilities and opportunities available at IOBC for visiting research workers". With some guidance from the Consultative Committee on this matter, the Pamphlet could be produced during 1968.

### 7.3 Research Papers

With the exception of some interim reports, few research papers have yet been published on the International Collections or on associated research work carried out at IOBC. With the increased emphasis on placing material in the hands of specialists and on involving the laboratory staff in research programmes arising out of the IIOE, this situation should gradually change.

## 8. TRAINING IN TROPICAL PLANKTOLOGY

So far the Laboratory did not fulfil one of the major rôles envisaged in the original concept - that is, as an International Training Centre in tropical planktology. In this respect the IOBC has functioned purely as a National Laboratory.

## 9. REFERENCE COLLECTIONS

In this respect also, the IOBC has not yet taken up the challenge. There are two types of reference collections which should be gathered together.

### 9.1 Species Level

These will accumulate at the IOBC as collections are analysed by specialists. Because the material by this time may not be in the best condition, the building up of reference collections from new collections off the Kerala coast should be encouraged.

## 9.2 Group Level

A limitation to newly developing plankton programmes in under-developed countries is the need for reference collections at the Group Level particularly with respect to fisheries research programmes (e.g. Penaeid larvae, Tuna larvae, Planktonic food organisms and so on). Such material properly identified to Family or Genus and preserved in excellent condition could be one of the greatest contributions of the Laboratory to the development of plankton research in tropical regions.

## 10. SEMINARS AND DISCUSSIONS

Discussions are held regularly each week or fortnight, in which the whole staff participate. The topics of the first series were:-

1. "A programme for the regular collection of plankton from the environs of Cochin" (Ravindranatha Menon)
2. "The case for altering routine techniques at IOBC" (Tranter)
3. "Distribution of species of the genus Desmopterus" (Sakthivel)
4. "On some general aspects of the study of fish eggs and larvae" (K.J. Peter)
5. "Basic principles of the recent systematics of fish eggs and larvae" (Rass)

The convener of the Discussion series is Ravindranatha Menon (Rapporteur: Mrs. Vijayalakshmi R. Nair).

6. "Appendages of Halocypridae (Ostracoda)" (Jacob George)
7. "Hydrological changes in the waters near Cochin" (Sankaranarayanan)

## 11. FIELD WORK

### 11.1 Cochin Environs

Fornightly plankton collections are being made at two stations, one well outside and one well inside Cochin Harbour. The collections are yielding material for experiments on preservation, and information on species succession. The programme is in the hands of research fellow Ravindranatha Menon.

### 11.2 Laccadives Survey

A programme is developing to make a seasonal study of some elements of the plankton between the Kerala Coast and the Laccadives Islands. A number of arrangements have yet to be made before this programme can begin.

D.J. Tranter  
Unesco Curator

LIST OF SPECIALISTSProposal for distribution of material of fish eggs and larvae  
(Code 71-79)

<u>Scientist</u>	<u>Group</u>	<u>No. of samples</u>
<u>India:</u>		
Dr. S. Jones	76 i. Scomberomoridae	20
	76 j. Thunnidae	20
	78 d. Holocentridae	20
	78 g. Dactylopteridae	20
Dr. S.V. Bapat	76 b. Carangidae	20
Dr. E.G. Silas	73 a. Synodontidae	50
	78 a. Bregmacerotidae	
Mr. K.J. Peter	72 b. Clupeidae	
	72 c. Engraulidae	190
	76 h. Scombridae	20
Mrs. C.B. Lalithambika Devi	77. Pleuronectiformes	20
<u>Japan:</u>		
<u>Dr. Tokiharu Abe</u> Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.	Elopidae, Albulidae, Megalo- pidae (Code 72a); Serranidae (76a); Pomacentridae (76a); Labridae, Scaridae (76e); Stromateidae (76f); Trichiuridae (76h); Scompaenidae (76m); Triglidae (76n); Blennioidei (76o); Sciaenidae (76p); Platycephalidae (76s); Various Acanthopterygii (76s); Syngna- thidae, Fistulariidae (78b); Sphyraenidae (78e); Polyne- midae (78f); Balistidae, Monacanthidae (78i); Diodonti- dae, Tetrodontidae (78j); Lophiidae, Antennariidae (78k).	
<u>Prof. Keitaro Uchida</u> Faculty of Agriculture, Kyushu University, Fukuoka City, Japan.		
<u>Dr. Satoshi Mito</u> Director, Inland Sea Regional Fisheries Laboratory, Ujina, Hiroshima City, Japan.		
<u>Dr. Shoji Ueyanagi</u>	79c Xiphiidae, Histiophoridae-	20
<u>New Zealand</u>		
Dr. Castle <del>74 Angui</del>	74 Anguilliformes -	20

Denmark

Dr. E. Bertelsen	78 l. Ceratioidei	- 20
Danmarks Fiskeri-og		
Havundersøgelser		
Charlottenlund Slot,		
Charlottenlund, Denmark		

U.S.A.

Dr. W.W. Anderson	Mugilidae	
Bureau of Commercial Fisheries		
Biological Laboratory		
P.O. Box 280		
Brunswick, Georgia, U.S.A.		
 Dr. A.W. Ebeling	79 c Melamphaidae	
 Dr. Robert R. Rofen		
Research Director	73 b. Paralepididae	
Aquatic Research Institute,	73 d. Scopelarchidae	
Port of Stockton,	73 e. Other Scopeliformes,	
California, U.S.A.	(Omosudidae, Everinannellidae,	
	Alepisauridae, Aulopidae,	
	Chlorophthalinidae).	

U.S.S.R.

Prof. T.S. Rass; his team	72 c. Argentinoidei	20
of Ichthyoplantologists:		
 Prof. T.A. Ostroumova	73 c. Myctophidae	760
Dr. N.S. Novikova	72 e. Stomiatoidae	20
 Dr. N.N. Gorbunova	76 g. Gempylidae	20
Dr. T.N. Belianina		
 Mrs. N.V. Kovalevskaia	75. Beloniformes	20
Miss V.A. Mukhacheva	72 f. Gonostomidae	300
Mr. Y. Shcherbachev	76 c. Coryphaenidae	20

(Prof. T.S. Rass)  
Senior Specialist: Fish Eggs & Larvae.

LIST OF SPECIALISTSCOPEPODA

<u>Name - Institution</u>	<u>Material requested</u>	<u>Recommendation</u>
1. Chiba, T. Shimonoseki University Yoshimi	<u>Megacalanus</u>	as requested
2. Fleminger, A. Scripps Institute of Oceanography.	<u>Centropages,</u> <u>Labidocara,</u> <u>Pontellina</u>	-do-
3. Frost, B. Scripps Institute of Oceanography.	<u>Clausocalanus</u>	-do-
4. Gooding, H.U. University of Singapore.	Corycadiidae, Oncacidae, Clausidiidae and related parasitic groups	-do-
5. Grice, G. Woods Hole Oceanog.Inst.	Candaciidae	-do-
6. Grindley, J.R. Port Elizabeth Museum, Port Elizabeth, S.Africa.	Pseudodiaptomidae, <u>Tortanus</u>	-do-
7. Kasturirangan, L.R. I.O.B.C.	Mucalanidae & Harpacticoida	Harpacticoida
8. Krishnaswamy, S. University Madurai	<u>Undinula vulgaris,</u> <u>Sapphirinidae</u>	as requested
9. Lang, B.T. University Saigon	Bucalanidae	-do-
10. Matthews, J.B.L. University Bergen	<u>Undinula caroli,</u> <u>U.darwinii Euaugaptilus</u>	-do-
11. Park, T.S. Woods Hole Oceanogr.Inst.	<u>Gaetanus, Euchirella,</u> <u>Metridia, Lucicutia</u> <u>Heterorhabdus</u>	<u>Metridia, Lucicutia,</u> <u>Heterorhabdus</u>
12. Pillay, P.P. C.M.F.R.S., Ernakulam.	<u>Pontellopsis, Pontella</u>	as requested
13. Saraswathy, I.O.B.S.	<u>Pleuromamma, Gaussia</u>	as requested

14. Schmeleva, A. Inst. Biology Southern Seas, Sebastopol.	Calocalanus	as requested
15. Tanaka, O. Ocean Research Inst. Tokyo.	<u>Euchirella</u> or <u>Euchaeta</u> (Part)	<u>Euchaeta</u>
16. Tranter, D. I.O.B.C.	<u>Calanoides</u> , <u>Paraeuchaeta russelli</u>	as requested
17. Ummerkutty, A.N.P. Zool. Survey of India, Calcutta.	Temoridae, Scolecithricidae, Eucalanidae.	Temoridae, Scolecithricidae.
18. Vervoort, W. Rijksnuseum v. Nat. Hist. Leinden.	Aetideidae, Phaennidae, Scolecithricidae.	Aetideidae, Phaennidae.
19. Haq, S.M. Univ. of Karachi	<u>Undinula</u> , <u>Temora</u> , <u>Eurytemora</u> , <u>Calanopia</u> , <u>Pleuromamma</u>	<u>Temora</u> , <u>Eurytemora</u> , <u>Calanopia</u> .
20. Heptner, M. Inst. Oceanology.	appen.1969. Euchaetidae, lucicentiidae Heterorhabdidae	no action
21. Minoda, T. Hokkaido University.	Lucicutia	as requested
22. Goswamy, I.O.B.C.	Oithonidae	-do-
23. Saramma (Abraham) I.O.B.C.	Acartiidae, inshore centropagidae	-do-
24. Rosamma Stephen & Sarala Devi, I.O.B.C.	<u>Haloptilus</u>	-do-



LIST OF SPECIALISTS

DECAPOD LARVAE

(partial - incomplete)

- |    |                                     |   |
|----|-------------------------------------|---|
| 1. | Dr. A.L. Rice<br>London             | Dromiidae, Homolidae, Rananidae           |
| 2. | Dr. R.R. Makarov<br>Moscow          | Crangonidae, Galatheidæ                   |
| 3. | Prof. A.J. Provenzano<br>Miami, USA | Diogenidae, Porcellanidae                 |
| 4. | Dr. D.I. Williamson<br>Port Erin    | Stenopodidae, Pandalidae,<br>Pasiphaeidae |
| 5. | Dr. K.N. Sankolli,<br>Ratnagiri     | Albuneidae<br>"Eretnocaris"               |
| 6. | Dr. C. Sankarankutty<br>Ernakulam   | Brachyura (3 families)                    |
| 7. | Shri M. Krishna Menon               | Penaeidae                                 |

#### APPENDIX IV

List of members present at the Consultative  
Committee meetings held at Ernakulam from  
22nd February to 3rd March 1968.

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- |                                   |                                       |
|-----------------------------------|---------------------------------------|
| 1. Professor (Dr.) J. Krey        | - Chairman                            |
| 2. Dr. A. Fleminger               | - Member                              |
| 3. Dr. M. Anraku                  | - Member                              |
| 4. Dr. V.N. Greze                 | - Member                              |
| 5. Professor (Dr.) S.Krishnaswamy | - Member                              |
| 6. Professor B. Kinor             | - Member                              |
| 7. Dr. N.K. Panikkar              | - Member-Secretary                    |
| 8. Dr. O.J. Østvedt               | - Unesco Representative               |
| 9. Dr. Tewfik                     | - Unesco Representative               |
| 10. Professor P.N. Ganapati       | - Indian Advisory Board               |
| 11. Dr. R. Raghu Prasad           | - Indian Advisory Board               |
| 12. Mr. D.J. Tranter              | - Unesco Curator at IOBC              |
| 13. Mr. L.R. Kasturirangan        | - Associate Curator at IOBC           |
| 14. Dr. S.Z. Qasin                | - National Institute of Oceanography. |
| 15. Dr. T.S. Satyanarayana Rao    | - National Institute of Oceanography. |