

Indian Ocean Biological Centre

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 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 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 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. 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 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 IOBE.

(a) Report of the Director of the IOBC

Dr. N.K. Panikkar, Director of the Centre, briefly summarised his report 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 Press) indicate the progress in research on the IIOE collection achieved by Indian Ocean Biological Centre. The visits of Professor Rass to advise on working upon the collections of fish eggs and larvae and of Dr. D.I. Williamson to examine the Decapod larvae collections and advise on these allocation to Specialists are noteworthy developments. The addition of Research Fellows for work on the IIOE collections is another point worth drawing attention to.

(b) Report of the Curator of IOBC

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. Ostvedt to relate briefly some of the proceedings of the IOC's Fifth Session and Dr. Ostvedt 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 1st part when ready may be circulated.

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 purpose 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.

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 the 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 the 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. Ostvedt explained that the 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 airconditioned 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 earlier Shri M. Sakthivel and other assistants, transmitted by the Curator to UNESCO and duplicated by them for distribution to National Co-ordinators with request to send photo copies to IOBC, was circulated to members. Dr. N. K. Panikkar drew the attention of the members to numerous items in 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 analysed 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. Ostvedt 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 Fleming on the assessment of Copepoda was presented to the Committee which also recommended publishing it in the Newsletter together with Dr. Ahlstrom's Report.

Further, 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 24-2-1968) 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. Fleming'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 w.g. 23, on Preservation of Plankton Samples.

Dr. Fleming described the type of deterioration he observed in some of the Copepod samples he examined and 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. Fleming 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 collection 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 USA. 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 IOE 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 proofstage 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. Ostvedt agreed to send a full set of IIOE Information paper (Number 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 Professor 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 his 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. Copepoda, and

Decapod Larvae, the following resolution was adopted.

The Consultative Committee nominates 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 Permissions of 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 the seasonal variation in the plankton of the Kerala Coast and the adjoining areas.

In a lengthy discussions 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 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 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 be taken to augment the IOBC collections in the following manner :
 - (a) Attention of National Coordinators be invited to the large gaps in the distribution of IOSN samples in several areas of the Indian Ocean and 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, be renewed through SCOR and IOC.
 - (c) Steps be taken by UNESCO to secure ship-board fellowships in ships working in Indian Ocean to IOBC Staff as a definite move towards giving them field-training and experience.

(d) Opportunities 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, 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 be most appropriately held in a suitable place in India or similar place where the largest number of scientists who would be benefited 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 in advance of commencement of the lecture. Members were requested by Dr. Panikkar to send brief summaries (approximately 2 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 obligation 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, Cameralucidae 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, lifejackets and soon.
- (3) The Consultative Committee recommends that an air-conditioned dehumidified chamber be set up in the main laboratory for storage of microscopes.
- (4) The Consultative Committee recommends that the reports submitted (or to be submitted) by Dr. Ahlstrom, Professor Rass and Dr. Williamson after assessing the collections at IOBC, be published by UNESCO.
- (5) The Consultative Committee recommends 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 nominates 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 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 would be deemed to have been approved.
- (7) The Consultative Committee recommends as follows :
 - (i) 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.
 - (ii) Steps be taken to augment the IOBC collections in the following manner :
 - (a) Attention of National coordinators be invited to the large gaps in the distribution of IOSN samples in several areas of the Indian Ocean and 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, be renewed through SCOR and IOC.
 - (c) Steps be taken by UNESCO to secure ship-board fellowships in ships working in Indian Ocean to IOBC staff as a definite move towards giving them field-training and experience.
 - (d) Opportunities 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, be developed.
 - (iii) The Consultative Committee recognizes 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.