



INDO-PACIFIC FISHERIES COUNCIL

PROCEEDINGS

3RD MEETING 1ST-16TH FEBRUARY 1951

MADRAS—INDIA

SECTION I

MADRAS, 1951

OFFICE-BEARERS
of the
INDO-PACIFIC FISHERIES COUNCIL, 1951/52

Chairman : - D. V. Villadolid
Vice-Chairman : - R. Serene
Retiring Chairman : - J. D. F. Hardenberg
*Secretary** : - G. L. Kesteven

TECHNICAL COMMITTEE I (Hydrology & Biology)

| | | | |
|--------------------|--------------------------------|----------------------|-----------------------|
| <i>Australia</i> : | D. Rochford, <i>Chairman</i> . | <i>Netherlands</i> : | C. J. Bottemane. |
| <i>Burma</i> : | | <i>Pakistan</i> : | Nazir Ahmad. |
| <i>Cambodia</i> : | | <i>Philippines</i> : | D. K. Villaluz. |
| <i>Ceylon</i> : | | <i>Thailand</i> : | Boon Indrambarya. |
| <i>China</i> : | | <i>U.K.</i> : | Soong. Min-Kong. |
| <i>France</i> : | R. Serene. | <i>U.S.A.</i> : | O. E. Sette. |
| <i>India</i> : | T. J. Job, <i>Rapporteur</i> . | | Townsend Cromwell. |
| <i>Indonesia</i> : | W. H. Schuster. | | (<i>alternate.</i>) |
| <i>Korea</i> : | | <i>Vietnam</i> : | R. Serene. |

TECHNICAL COMMITTEE II (Technology & Economics)

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|--------------------|----------------------|----------------------|------------------------------------|
| <i>Australia</i> : | A. Dunbavin-Butcher. | <i>Korea</i> : | |
| <i>Burma</i> : | | <i>Netherlands</i> : | C. J. Bottemane. |
| <i>Cambodia</i> : | Dom-Saveun. | <i>Pakistan</i> : | M. R. Qureshi, <i>Rapporteur</i> . |
| <i>Ceylon</i> : | | <i>Philippines</i> : | Claro Martin. |
| <i>China</i> : | | <i>Thailand</i> : | Boon Indrambarya. |
| <i>France</i> : | J. Lemasson. | <i>U.K.</i> : | T. W. Burdon, <i>Chairman</i> . |
| <i>India</i> : | B. N. Chopra. | <i>U.S.A.</i> : | H. J. Deason. |
| <i>Indonesia</i> : | Amin Katamsi. | <i>Vietnam</i> : | Tran Van Tri. |

* The office of the Secretary of the Council is occupied by the F.A.O. Regional Fisheries Officer for Asia and the Far East.

SECTION I

REPORT OF PROCEEDINGS

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The full PROCEEDINGS of this meeting consists of three sections of which the first, *Report of Proceedings*, is issued here. Section II comprises the *Technical Papers* presented at the Meeting by Delegations; Section III comprises the *Symposium Papers* read in the evening Symposium Sessions.

SUMMARY ACCOUNT OF THE MEETING

1. The meeting opened on Thursday, 1st February, 1951, at 3 p.m. with an address of welcome by Hon'ble Roche-Victoria, Minister for Food and Fisheries, Madras Government. The meeting was then formally opened by Hon'ble K. M. Munshi, Union Minister for Food and Agriculture.

2. The meeting was attended by 32 representatives of 13 member governments of the Council and two representatives from SCAP. An observer was present also from UNESCO and certain Delegates acted as Observers on behalf of S.P.C., and P.S.C. Various officers of the Central and State Governments of India were available to assist at certain discussions.

3. The meeting consisted of 18 Council sessions and various Committee sessions. There were numerous Sub-Committee sessions and, in addition, three evening symposium sessions. The Council also saw Technical films on two evenings and the Delegates attended a variety of excursions and receptions.

4. The Council elected Dr. D. V. Villodolid as its Chairman and Mr. R. Serene as its Vice-Chairman for 1951-52. Technical Committees were appointed in accordance with the rules and Chairmen, Rapporteurs and *ad hoc* Sub-Committees were appointed.

5. The Council received and approved a report from the Executive Committee, and also the Secretary's Report of work performed on behalf of the Council by the Secretariat during 1950-51, and in connection with these reports adopted an amendment of its rules to provide that these should in future be presented in a single report from the Executive Committee.

6. The Council adopted the Secretary's Report on the financial affairs of the Council and also received from F.A.O. a statement of the budget available for 1951. It recommended the expansion of this budget for future years.

7. The Council considered a proposal for amendment of its Agreement in connection with the frequency of its regular meetings and decided not to make this amendment, but it decided to amend its rules to bring these more into conformity with the intention of the Agreement and to provide that during each meeting the question of fixing a time for the subsequent regular meeting should be considered.

8. The Council received a request from the Government of Laos that it be allowed to be represented by an Observer, and acceded to this request.

9. The Council considered the question of the relationship of its activities with those of other international organizations concerned with fisheries work and adopted resolutions providing for the continuance of already developed liaison and the development of new connexions in the future.

10. The Council recommended to Member Governments the appointment of administrative and bibliographic correspondents through whom the Secretary might maintain communication in respect of Council affairs.

11. The Council accepted the invitation of the Philippine Government to hold the fourth meeting in the Philippines and decided to set the date of that meeting for October-November 1952.

12. The Council received reports from Technical Committees appointed at the second meeting (Cronulla, 1950) of the work performed on behalf of the Council in the interval since that meeting. These, together with technical papers (of which there were 66) and certain working papers, were referred to the Technical Committees under a series of Assignment Notes which specified problems to be considered by the Committees.

13. The Council through its Committees developed a report on the status of the fishing industries in the Indo-Pacific region and adopted this for transmission to the Organization.

14. The Council considered the question of its bibliographic work and adopted a plan for the development of this work submitted to it by the Technical Committees and by a Special Committee.

15. The Council resolved to develop its project for the preparation of a series of handbooks on the fisheries of the Indo-Pacific region and formulated a plan for the development of this project.

16. The Council recommended action to be taken to secure the fullest dissemination of information concerning fishery programmes in the region.

17. The Council approved the Executive Committee's action in respect of publications dur-

ing 1950-51 and its proposed schedule of publications for 1951-52.

18. The Council received a report on the arrangements made for the distribution and exchange of its publications and, subject to the submission of proposals for amendment of the distribution list being made by delegations, approved of this plan and distribution list.

19. The Council resolved to include within its consideration the use of documentary films and recommended action to secure the extension of their use.

20. The Council gave consideration to the problems of technical assistance for the economic development of the fishing industries of the Indo-Pacific Region, and, considering the provision of technical training to be of paramount importance, adopted a plan for the development of a series of schemes of technical instruction in which it was hoped that Member Governments would collaborate and for which it was hoped that technical assistance might be available.

21. The Council chose subjects for the symposia to be held during its fourth meeting.

22. The Council adopted proposals of the Executive Committee specifying certain procedures to be employed during Council meetings in respect of the nomination of Technical Committees, the reception of Technical Committee reports, and the conduct of Technical Committee activities.

23. The Council formulated plans for work in connection with the various technical fields which are the responsibility of the Technical Committees. It adopted a series of resolutions on these subjects recommending certain action to Member Governments, requesting its Sub-Committees and Com-

mittees to take certain action, and directing the Secretariat to provide such assistance, as might be required. These resolutions related to Hydrology, Planktology, General Biology, Gear Technology, Food Technology and Socio-Economics. Within the field of General Biology, the Council proposed specific action in respect of Methodology, the problems of the Hilsa fisheries, the problems of fish culture, the control of the spread of noxious weeds affecting fish culture, and the study of tuna, pelagic neritic groups and sea-weeds.

24. In connection with the composition of its Executive Committee, the Council provisionally adopted an amendment which provided that the Executive Committee should consist of the Chairman, the Vice-Chairman and the retiring Chairman, with the Secretary as a Member *ex-officio*, without a vote.

25. The Council adopted a resolution drawing attention to the problems created by the lack of proper harbour facilities for fishing craft and recommending action in connection with this problem.

26. The Council adopted a resolution recommending action to be taken to assist Member Governments in the procurement of equipment for research and exploratory projects.

27. The Council adopted a set of rules concerning the submission of technical papers to its meetings and providing a machinery whereby a selective process might be applied to papers submitted.

28. The Council gave preliminary consideration to the question of regionalization of its activities and directed that this subject should be placed on the agenda of the fourth meeting.

AGENDA AND PROGRAMME OF THE MEETING

The Council commenced its work with the following agenda :—

A. Procedural Items :

1. Adoption of the Agenda.
2. Report on Credentials.
3. Statement of Delegations.
4. Election of Chairman and Vice-Chairman.
5. Executive Committee Reports.
 - 5.1 Executive Committee Report.
 - 5.2 Secretary's Report of Work Performed on Behalf of the Council by the Secretariat.
6. Secretary's Report on the Financial Affairs of the Council.
7. Budget.
8. Proposals for Amendments to the Agreement.
9. Membership, Liaison.
 - 9.1 Membership.
 - 9.2 Liaison.
10. Nomination of Technical Committees—1951/52.
11. Council Correspondents.
12. Council 4th Meeting.

B. General Technical Items :

13. Reports of Committees.
14. Annual Report to FAO.
15. Bibliographic work.
16. Publications.
 - 16.1 Preparation.
 - 16.2 Editorial work.
 - 16.3 Distribution and Exchange.
17. Films.
18. Expanded Programme of Technical Assistance for Economic Development (Point IV).
19. Subject of the Symposium of the 4th Meeting.

C. Technical Items for Technical Committees:

20. Technical Committee I.
 - 20.1 Hydrology.
 - 20.2 Planktology.
 - 20.3 Biology.

21. Technical Committee II.
 - 21.1 Gear Technology.
 - 21.2 Food Technology.
 - 21.3 Socio-Economics.

22. Other items :

This agenda was dealt with in 18 half-day sessions of the full Council, of which many were devoted to matters concerning the Technical Committees, and to receiving technical papers.

The Technical Committees met separately in various sessions throughout the progress of the meeting. Many Sub-Committee meetings also took place outside the hours of the scheduled sessions.

The Council held symposium sessions on three evenings.

The following excursions were attended by the Delegates :—

| | | |
|------------------------|----|-------------------|
| Fishing-village | .. | February 2nd |
| Fish Farm | .. | February 3rd |
| Fish Market, Madras | .. | February 4th |
| Calicut and Mettur Dam | .. | February 9th-12th |

The following receptions were tendered to Delegates :—

By the Hon'ble Sri. K. M. Munshi, Minister for Food and Agriculture, Government of India.

By His Excellency the Governor and Her Highness the Maharani Saheba of Bhavnagar, 5th February.

By the Indian Delegation, 13th February.

By the Marine Food Corporation, 14th February.

By the Pakistan Delegation, 15th February.

By the Madras Fisheries Department, 16th February.

PROCEEDINGS

The meeting opened on Thursday, 1st February, 1951, at 3 p.m. with an address of welcome by Hon'ble Roche-Victoria, Minister for Food & Fisheries, Madras Government. The meeting was then formally opened by Hon'ble K. M. Munshi, Union Minister for Food and Agriculture.

1. **ADOPTION OF THE AGENDA:** The Agenda as circulated was adopted.

2. **REPORT ON CREDENTIALS:** The Secretary's Report on Credentials (Appendix 1) was adopted, and it was noted that certain of the credentials were not exactly in conformity with the provisions of representation contained in the Council's Agreement. It was agreed that the Secretary should draw the attention of Member Governments to this fact.

3. **STATEMENTS BY DELEGATIONS:** Statements were made by the Delegates of Australia, Cambodia, India, Indonesia, Netherlands, Pakistan, Philippines, Thailand and Vietnam.

4. **ELECTION OF CHAIRMAN AND VICE-CHAIRMAN:** Dr. D. V. Villadolid was elected Chairman and Mr. R. Serene was elected Vice-Chairman.

5. EXECUTIVE COMMITTEE REPORTS:

5.1. *Executive Committee Report:* The Council received and approved a Report from its Executive Committee (Appendix 2) and approved a proposal from the Executive Committee that in future the report of the Executive Committee should include the report of the Secretary and accordingly the Council resolved that

The Council, having received the Report of the Executive Committee for 1950-51 of its work during the year, and also the Report of the Secretary of the work performed by the Secretariat on behalf of the Council during the year,

And, having considered the proposal of the Executive Committee that in the future the Council should receive only a Report from the Executive Committee which would incorporate the Secretary's Report,

Approves this suggestion,

And Resolves that the Council's Rules of Procedure shall be amended as follows:

Section IV, Para 1(c) which reads: "A Report by the Secretary of the work performed

on behalf of the Council by the Secretariat" shall be deleted and in lieu thereof the following shall be substituted:

"(c) A Report of the Executive Committee of its activities during the year including a Report of the work performed on behalf of the Council by the Secretariat."

5.2. *Secretary's Report of work performed on behalf of the Council by the Secretariat:* The Council received and adopted the Secretary's Report and agreed to adopt it as a whole in particular accepting Part II as integral with the Report (Appendix 3).

6. **SECRETARY'S REPORT ON THE FINANCIAL AFFAIRS OF THE COUNCIL:** The Secretary's Report (Appendix 4) was adopted.

7. **BUDGET:** The Council received from FAO a statement of funds available for the Council's work during 1951 (Appendix 5). It was recorded that it was Council's belief that the budget for 1952 should be increased, for printing and other purposes, by about \$500 to \$1,000 US.

8. **PROPOSALS FOR AMENDMENTS TO THE AGREEMENT:** The Council considered and rejected a motion that the Council's agreement should be amended to provide that the Council should meet biennially instead of annually. However the Council felt that the question of time of its regular meeting should be considered at each meeting and accordingly resolved that

The Council's Rules of Procedure shall be amended as follows:

(a) Strike out Paragraph 1, Section II, of the Rules and substitute therefor as follows:

"(i) In pursuance of, and in accordance with, Article II(5) of the agreement, the Council shall at each meeting consider whether a meeting should be held in the next following year or in the second year following, and shall decide the time and place for the next meeting in accordance with the requirements of the Council's programmes and the terms of the invitation of the country in which the meeting is to be held. The Chairman, accordingly, shall issue the announcement of the meeting, PROVIDED THAT, if the Council at a regular meeting is unable

to fix a time and place for the next meeting, it shall take a decision as to the calendar year in which the next meeting is to be held, and the Chairman is then authorized to fix the time and place of the meeting after consultation with Member Governments and having secured the approval of a majority of the Member Governments."

(b) In Section IV, "Agenda", Paragraph 1, insert after (h) the following new item :

(i) Consideration of the time and place of the next meeting.

(c) In Section IV, "Agenda", Paragraph 2, second line, alter the phrase which now reads "(a) to (h) of para 1" so that it reads "(a) to (i) of para 1".

(d) Section VII, Para 1, 1st sentence should be amended so that it reads as follows :

"The Council shall, during each regular meeting, elect the Chairman and Vice-Chairman of the Council who shall serve until the end of the next regular meeting."

9. MEMBERSHIP, LIAISON :

9.1. *Membership* : The Council received a request from the Government of Laos that it be represented by an Observer and acceded to this request. Mr. R. Serene represented the Government of Laos as Observer.

9.2. *Liaison* : The Council received the report of a Special Committee which considered the question of relationship with International Organizations and resolved that

(1) *It will be useful to have a courtesy liaison (including the exchange of all publications and effective exchange of correspondence) with as many international organisations as possible when those organisations are interested in the subjects which are the concern of the I.P.F.C. In certain instances a much closer relationship is desirable. For instance such organisations are :

F.A.O. SISTER ORGANISATIONS

1. Mediterranean Fisheries Council (when formed).

ORGANISATIONS WORKING IN THE INDO-PACIFIC REGION

1. Pan-Indian Ocean Science Congress (to meet in Australia between 1954 and 1956).

2. Pacific Science Congress.

* The Council's Resolution will henceforth be referred to by a numerical system of which the first number will represent the year in which the *Proceedings* is published, the second the agenda item under which the resolution is taken, and the third, if necessary, the number of the resolution under the agenda item. Thus, the first resolution under item 9.2 will be identified as 51/9.2 (1).

Considering the future development of Fishery Organizations the Council resolved that

(2) When a number of councils is set up a plan or scheme of co-ordinating the development and research programmes of mutual interest will be highly desirable, if not absolutely essential. The F.A.O. might be apprised of the opinion at this stage.

10. NOMINATION OF TECHNICAL COMMITTEES—1951-52 : The Technical Committees for 1951-52 were nominated as shown on page 2.

11. COUNCIL CORRESPONDENTS : The Council considered a proposal from the Executive Committee concerning the provision of administrative and bibliographic correspondents and recorded its view that it is desirable that the Council should be provided with administrative correspondents and bibliographic correspondents and recommended to Member Governments that these should be provided and should be charged with the responsibilities as described in the Executive Committee's report (Appendix 6).

12. COUNCIL 4TH MEETING : The Council accepted the invitation of the Government of Philippines to hold its 4th Meeting in Manila, the Philippines, and decided to set the time of that meeting as October-November 1952.

13. REPORTS OF COMMITTEES : The Council received from its Technical Committees the reports of the work performed in the interval since the second meeting (Appendices 7 & 8). It referred these reports, together with Technical and Working Papers to the Committees for 1951-52 under a series of Assignment Notes. (See below under Items 20 and 21.)

14. ANNUAL REPORT TO THE ORGANIZATION : The Council received from the Secretariat a draft of a statement on the status of the fishing industries of the Indo-Pacific Region and referred this to the Technical Committees and to an Editorial Committee for revision to become the Council's Report on the subject to the Organization. The report is given as Appendix 9 to these Proceedings.

15. BIBLIOGRAPHIC WORK : The Council gave consideration to its programme of Bibliographic work and resolved that

Attaching considerable importance to the development of its programme of bibliographic work, recommends to Member Governments that this work should receive close attention,

And resolves to adopt the following plan of action in respect of this work :

1. The Council's bibliographies will, as far as possible, be restricted to published material of direct interest to fisheries subjects but,

2. Where, as in the case of planktology, this rule cannot be applied, special attention shall be paid to publications which give the background to such studies for the area as a whole ;

3. The Council will indicate from time to time the subjects in which work may be started in all sectors with the least possible delay ;

4. As a means toward the facilitation of the development of these bibliographies, draft general bibliographies for each country or group of countries, such as the draft for the western sector, shall be prepared ;

5. Specially selected bibliographies relating to each subject of the handbook shall be prepared for inclusion as appendix to the appropriate sections of the handbook ;

6. The bibliographies (other than those included in the handbook, or in standard publications) shall be printed in the format of the FAO Fisheries Abstracts and of the U.S. Fish and Wild-life Service's Abstracts, so that they may be cut out and used for immediate conversion into library cards ;

And the Council recommends to Member Governments that they authorize their specialists to collaborate in this work, and especially recommends to Member Governments that Bibliographic Correspondents be appointed in accordance with the suggestion contained in the working paper IPFC/C51/12*, and be authorized to act as liaison in the manner proposed in that paper ;

And the Council resolves to approve the following specific projects :

(a) In the field of interest of Technical Committee I :

1. The revised bibliography of plankton in the Western Sector be completed by India as soon as possible and circulated in whatever manner may appear best and most feasible to the Editorial Committee ;

2. A bibliography of *Chanos Chanos* culture be prepared by Indonesia, and circulated similarly ;

3. A bibliography of tuna fisheries be prepared by the United States ;

4. A bibliography of hydrology be prepared by Australia.

(b) In the field of interest of Technical Committee II :

Bibliographies in the following subjects be prepared at the earliest opportunity, by the working groups designated in the resolutions submitted by Technical Committee :

1. Fishing Gear, its construction, operation and methods of preservation ;

2. Fisheries products and methods of processing fish ;

3. Marketing of fisheries products, fresh and processed ;

And the Council recommends to the Member Governments concerned in the foregoing projects that they enable their technical workers to continue with the work.

16. PUBLICATIONS

16.1. *Preparation* : The Council discussed at length its project for the preparation of a series of handbooks on fishery subjects and adopted the resolution that

(1) Having resolved to undertake the preparation and publication of a series of handbooks dealing with various subjects concerning the fisheries of the Indo-Pacific region,

Resolves to adopt the following plan for the prosecution of this work :

1. The Secretary is hereby requested to undertake the responsibilities of General Editor of the handbooks ;

2. Member Governments are requested to nominate, each, one person to act on the General Editorial Committee of the handbooks ;

3. The Editorial Committee is requested to prepare as quickly as possible, on the basis of the recommendations and suggestions of the Technical Committees and the resolutions of the Council, the preparation of a prospectus of the handbooks indicating in as full detail as possible, the contents of each ;

4. The Editorial Committee is requested to circularise this prospectus among competent workers and endeavour to establish a panel of authors by whom the various handbooks shall be written ;

5. The Editorial Committee is requested to form, from among its members, a series of sub-committees to be responsible for the individual handbooks ;

6. The handbooks shall be published in loose-leaf form and may be issued in any order whatever, according to the availability of manuscript.

The Council also gave consideration to the desirability of effecting the widest possible

* See Appendix 6.

dissemination of current information concerning fishery programmes and resolved that

(2) Having considered the question of dissemination of current news on activities in Government Fishery Departments and Institutions and the part which this can play in stimulating the interest of Fishery workers ;

Records its views that such a method is highly useful and to be incorporated in the Council programme,

And therefore recommends that steps be taken to develop arrangements for channelling such information to the Secretariat, use being made for this purpose of the proposed arrangements for administrative correspondents;

And further recommends that the means of disseminating the information, either by use of the F.A.O. Fishery *Bulletin* or by use of other channel, should be investigated.

16.2. *Editorial Work*: The Council received and approved the report of the Editorial Committee on its work in connection with arranging the publication of the Council's proceedings and other matter. (See Appendix 10.)

16.3. *Distribution and Exchange*: The Council received a report on the arrangements made for the distribution and exchange of its publications and, subject to the submission of proposals for amendment of the distribution list being made by delegations, approved of this plan and distribution list.

17. *FILMS*: Documentary films relating to fishery subjects were exhibited in the course of the meeting and the usefulness of such films in the Council programme was discussed. The Council therefore resolved that

Having considered the usefulness of Documentary Films as an instrument in educational programmes, and their particular usefulness for the Council's programmes, both as a record and as an educational method,

Resolves to include the use of such films in its programmes, and as a beginning in this direction,

Recommends that Member Governments provide the Secretariat with a list of all Documentary Films on Fishery subjects available or under preparation, through both official and non-official channels, and recommends to the organization that it enable the Secretariat to continue its work in making a film record of the industries of this region;

And further recommends that steps be taken to make these films available to Member Governments for exhibition to fishery workers.

18. *EXPANDED PROGRAMME OF TECHNICAL ASSISTANCE FOR ECONOMIC DEVELOPMENT (POINT IV)*: The Council discussed at considerable length the question of technical assistance for economic development of the fishing industry of this region and paid particular attention to the question of technical instruction. It adopted the following resolution :

The Council, having studied in all aspects the situation of the fisheries of the Indo-Pacific region and the possibilities of their development, believes that the major factor operating to hinder the development of the fisheries of this region is the present lack of sufficient suitably-trained personnel,

And, since it therefore considers that one of the first courses of action to be undertaken to bring about the development of these fisheries must be to provide for the training of personnel, and in view, moreover, of its survey of immediate requirements,

It recommends to its Member Governments that steps be taken immediately to initiate training projects in certain instances and in others to expand and develop existing training projects, to provide for the following types of training: for Fishermen, training in the use of motorised vessels and mechanised auxiliary equipment and the necessary navigational practices to permit fullest use of such motorised vessels; for Governmental officers various courses in fresh and brackish-water cultural practices, fisheries gear technology, fisheries food technology, the administration and development of marine fisheries and of fresh and brackish water fisheries, and in statistics, to enable those officers effectively to administer and develop fisheries;

And it further recommends that it be recognized that the foregoing list of types of training is only of that which is immediately required for development purposes and makes minimal reference to the requirements for training research workers;

And the Council, having considered the means whereby such training might be provided and having received information that certain Governments either have already established or propose to establish instructional facilities which, it is understood, they would be prepared to make available under certain conditions to other Member Governments,

Recommends that advantage be taken of this situation by the establishment of arrangements under Article III(e) of the Council's agreement for a co-operative developmental project to provide the required training and in accordance with Section XI(4) of the Council's rules hereby directs the Secretary to gather

such information as may be required to enable him effectively to assist the Council in working out the details of such arrangements, as required under Article VI(4) of the agreement,

And in particular, having regard for the possibility that aid in various forms might be forthcoming for the countries of this region under the United Nations expanded programme for technical assistance for economic development, and under other bilateral and multi-lateral programmes of such assistance,

The Council hereby requests the Chairman (or the Executive Secretary, upon direction of the Chairman) (1) to assist, on request, the proposed host Governments in carrying out, with the Director-General of the Food and Agriculture Organization or other agencies or Governments through which such technical assistance might be provided, negotiations concerning the details of curriculum, programme, financial arrangements, provision of technical personnel, and recruitment of trainees for each training project referred to herein; and (2) to keep the Members of the Council informed of the progress of these negotiations, and to arrange for Members of the Council to participate, if they desire.

19. SUBJECT OF THE SYMPOSIUM OF THE 4TH MEETING: The Council discussed at length the usefulness of its Symposium Sessions and the subject or subjects which should be chosen for these Sessions for the 4th Meeting. It resolved that

The subject of the symposium for the 4th Meeting should be Some Aspects of Socio-Economics and that the Executive Committee should be authorised to decide upon the precise subject and to arrange the schedule of speakers.

It further resolved that a second symposium be arranged for the 4th Meeting on the subject of the Role of Research in Developing the Fisheries of the Indo-Pacific area.

TECHNICAL COMMITTEES

The Council received from delegations a long series of Technical Papers as shown in the list in Part 4, pp. 52-54. These papers were referred to the Technical Committees which considered them in relation to the problems stated to the Committees by the Council. The Committees reported to the Council on these problems, and recommended on the reception of the Technical papers which were either read or tabled. The Committees then submitted a series of resolutions as to the action to be taken.

The Council considered proposals from the Executive Committee concerning the procedures

to be followed during Council Meeting in respect of the Technical Committees. These proposals, set out in Appendix 11, relate to the nomination of the Committees, the reception of reports from the Committees and the conduct of Technical Committee activities. The proposals were adopted.

20. TECHNICAL COMMITTEE I.

20.1. *Hydrology*: The Committee having reported to the Council on the problem of reviewing the Hydrological programmes in progress in the region and having recommended measures for the co-ordination and improvement of these programmes, the Council resolved that

(1) Having considered the report of technical Committee I in respect of its implementation of the proposal, made at the 2nd Meeting, in connection with taking of surface salinity observations, and the compilation of the data thus obtained in an atlas,

And believing that the successful development of this programme would be of assistance to the Fishery programmes of Member Governments,

Recommends to Member Governments that programmes of collecting surface salinity and temperature observations either be initiated or, if in progress, be developed, and that the results be transmitted regularly to the Secretariat,

And requests the Hydrological Sub-Committee of Committee I to propose measures for the compilation and tabulation of the data and their display in atlas form,

And directs the Secretariat to assist the Sub-Committee in this work and to take such steps, for the dissemination of the analysed results, as might be possible.

Further, on the advice of Technical Committee I, it was resolved that

(2) the Council directs the Secretariat to distribute widely copies of IPFC/C51/11.*

In addition it was resolved that the Council

(3) Recognizing the importance of estuarine and neritic waters in the fisheries of the Indo-Pacific region,

Recommends to Member Governments that they should initiate or develop hydro-biological investigation of these waters;

And further, recommends to the attention of Member Governments the simple methodology described in Mr. Tham Ah Kow's paper "Statement on Marine Investigations in Malaya", which might easily be adopted even in countries with limited specialized staff and facilities.

* IPFC/C51/11—Working Paper reporting the availability of Japanese hydrographic data

20.2. *Planktology*: The Committee having reported on the Planktological programmes of the region, the Council resolved that

Recognizing the importance to research programmes on fish populations, and through those, to the general programme of fishery development, of an understanding of planktonic communities,

Believes that steps should be taken to encourage and develop those programmes,

And therefore recommends to Member Governments, that they furnish, through the Secretariat, full information on planktological investigations within their country, whether in marine, brackish or fresh waters,

And requests the Planktology Sub-Committee to compile the information thus furnished and on the basis of the study thus made to formulate further proposals for the consideration of Council at its next meeting.

20.3. *Biology*: The Committee having reported generally on the Biological programmes in progress in the region the Council resolved that

(1) Having regard for its functions to co-ordinate programmes of research and development in the region, and reviewing the information at present before its Committees,

The Council points out that this function can be discharged only if the Council is furnished with full up-to-date information on fishery projects and the fishery industries and resources of each country,

And therefore, recommends to the Member Governments that they recognize this principle, and take such steps as may be possible to ensure the effective and complete transmission of information to the Council.

The Committee was requested to give particular attention to the following problem: *To study the methodological problems involved in the conduct of population studies, having particular attention to the sampling programme to be followed, and the statistical techniques to be employed in analysis of the data—especially in analysis of frequency curves. This matter is to be discussed with the statistical working group. To particularize further, it is suggested that immediate studies be made of the variability of catches taken from various populations, by certain methods and under specified conditions, and that coefficients of variability be calculated in respect of certain factors as a means to selecting the most significant for prolonged study, and on its submissions, the Council resolved that*

(2) The Council, having considered the urgent need for methodological quantitative studies of fishery phenomena, and having regard for the lack among fisheries biologists

in general of special training in such methodology,

Recommends that the statistical working group prepare a series of instructional pamphlets on the statistical methodology of the different sections of fishery research,

And further recommends that, as a basis to planning the extension of such work intensive pilot studies should be undertaken, under the guidance of the Statistical Working Group, by research units in India, Pakistan, Thailand, Vietnam and the Philippines.

Among the fish stocks of the region, the Council held that those of the *Hilsa* were of special importance and on the submissions of the Committee, resolved that

(3) Having considered the extent and importance of the fisheries for *Hilsa* in Burma, India and Pakistan, and being aware of the severe fluctuations which take place in the catches of the species, and of the intensity of the fishing operations which have been brought to bear upon it, believes that urgent action should be taken to secure the fullest possible information on the species and on the fishery which bears upon it,

And recommends to Member Governments that the urgency of this be recognised at once,

And the Council recommends that the *Hilsa* Sub-Committee, consisting of Dr. Hora, Dr. Nazir Ahmad and a Burmese representative, continue the development of Council's interest in the subject,

And the Council recommends that this working group should undertake as an urgent assignment the preparation of a bibliography on the subject and the compilation of all available information;

In addition the Council recommends that the three Member Governments concerned should undertake immediately certain studies on the racial composition of the *Hilsa* stocks in accordance with a plan which should be submitted by this group, and that the results of this study may be made available to the group which should meet, if possible, towards the end of this year in order to consider the material then available and to formulate a programme for further work.

The Council paid close attention to the problems of fish culture and requested Committee I *to survey and appraise the fish-cultural practices of the Region; to survey the programmes of research concerning fish under cultivation and to propose measures for the co-ordination and improvement of such programmes and on the submission of the Committee resolved that*

(4) Recognizing the importance of fish cultural practices in fresh and brackish waters

throughout this region and the fact that in all countries steps are being taken to improve and extend these practices,

Recommends to Member Governments, that they initiate and/or intensify investigational programmes, which should include the following items :

1. Survey of cultivable waters;
2. Determination of the quality and quantity of fish food organisms in the different types of waters with reference to their physico-chemical conditions and the variations thereof;
3. Study of the feeding, breeding and growth of cultivable species;
4. Study of fish associations and the determination of the optimum densities of compatible combinations of different age groups for stocking operations;
5. Consideration of fish seed resources, their transport and distribution.

In addition it was resolved that

(5) The Council, being aware of the economic importance to inland waters of the spread of various noxious weeds, and being aware also of the successful use of 2, 4-D and other hormonal herbicides,

Believes that it would be of assistance to fishery workers in the region if they could have a practical manual on the use of such herbicides, prepared on the basis of experience in the region,

And therefore recommends to Member Governments that reports on experience in the use of these chemicals be made available through the Secretariat,

And requests the Fish-culture Sub-Committee of Committee I to undertake the analysis of such information, and to review all published reports on the subject and to prepare a handbook on the basis of the material thus assembled.

Finally it was resolved

(6) The Council, recognizing the importance and urgency in the Indo-Pacific region of the problem of pollution of natural waters, more especially having regard for the increase of industrialization in various countries of this region,

Recommends that Member Governments should furnish full information on the cases of pollution in the area, on the nature and effect on the fish stocks of the reported pollution and on any action taken to implement a remedy of such effect,

And requests the sub-committee on fish-culture to take suitable steps to codify the information thus supplied.

The Committee was requested to formulate plans for co-ordinated study of the taxonomy of tuna in the region, the appraisal of the stocks of this group, and the development of fisheries bearing upon them, and on its submissions, the Council resolved that

(7) In continuation of its programme in relation to Tuna,

Recommends to Member Governments that attempts be made to collect morphometric data of this group, especially of populations occurring around India and Ceylon, and that these should be made available through the Secretariat,

And requests the Tuna Sub-Committee of Technical Committee I to undertake the compilation of such data.

In respect of taxonomic problems, the Committee was requested to survey the taxonomic work relating to fisheries in progress in the region and to propose measures for the utilization of the results of such research in the prosecution of fisheries programmes, especially by way of securing standardization of nomenclature ; and on its submission, the Council resolved that

(8) Recognizing the importance to the biological programmes in the region, of proper taxonomic practices,

And wishing to ensure the effective continuance of the work of the Taxonomic Sub-Committee of Technical Committee I,

Recommends to Member Governments that they make available to the Sub-Committee any identification keys of local common fish species (with their vernacular names) as may be available,

And requests the Taxonomy Sub-Committee to use such keys in preparation of general field keys for the use of the Council;

And further requests and authorizes Dr. Panikkar to continue his discussions with the International Commission for Zoological Nomenclature regarding the standardization of nomenclature of fishes of this region.

The Committee was also asked to survey the programmes of Research bearing on pelagic neritic fish stocks, and on the Committee's submission the Council resolved that

(9) Recognizing the economic importance of the pelagic neritic group of fishes, wishes to encourage the development of programmes in connection with this group, and as a first step in this direction,

Recommends to Member Governments that they furnish information on their programmes in connection with

- (1) *Rastrelliger kanagurta* and related species
- (2) *Sardinella* spp.

(3) Other Clupeids and Anchovies,

And requests the Pelagic Neritic Fisheries Sub-Committee to compile, study and report on the information furnished.

The Committee also made recommendations in connection with the development of sea-weed research and industry and on its submissions the Council resolved that

(10) Being aware of the actual and potential importance of seaweeds in the fishing industries of the region,

Requests the Algology Sub-Committee of Technical Committee I to continue its activities and,

Recommends the authorities in Japan, Australia and U.S. to furnish information on critical factors in the manufacture of Alginic Acid and/or Agar for dissemination to members of the Council,

And recommends that taxonomic studies on the economic genera *Gracillaria* and *Hypnea* be furthered, it being expected that initiative in respect of work on the former genus will rest with Australian workers who already have evinced keen interest in the group.

Finally the Council accepted the Committee's view that it was impossible at this stage to propose priority among the Committee's projects.

21. TECHNICAL COMMITTEE II.

21.1. Gear Technology : Technical Committee II was requested to *survey the fishing gears in use in the region and to propose a codification of the description of such gears in relation to an analysis of their construction, operation, etc.* and on its submissions, the Council resolved that

(1) Having reviewed the work which has been done so far in surveying the fishing gears in use in the Indo-Pacific region as published in numerous papers both within and without the region, the Council

Believes that a catalogue of the gears in use should be prepared along with a simplified key,

And recommends, subject to the approval of the Member Governments concerned, that Mr. Burdon, Mr. Van Tri and Mr. Umali be asked to undertake the preparation of this catalogue,

And the Council further recommends that Member Governments should make available directly to Mr. Burdon by 1st August 1951 or as soon as possible copies of all published material relating to this subject.

The Council also resolved that

(2) Believing that the classification of fishing boats being a necessary preliminar to any

work in the development of fishing craft in the region,

Recommends that action be initiated on the preparation of a classification of fishing boats along the lines of the tentative outline submitted by Dr. Gibson-Hill in his paper "Proposed system for recording the kinds of fishing boats used in South and East Asia", and recommends that Dr. Gibson-Hill be requested to undertake this work;

And the Council further recommends that Member Governments should make available directly to Dr. Gibson-Hill by 1st August 1951 or as soon as possible copies of all published material relating to this subject.

The Committee was also requested to *survey the methods employed for the preservation of fishing gear in the region and to examine the possibilities of improving those methods;* and on its submissions the Council resolved that

(3) Having given consideration to the methods employed in the preservation of fishing gear and to the importance, in the economy of fishing operations, of preventing excessive and too rapid deterioration of gear;

And believing that considerable advantage is to be drawn from a careful study of the methods at present in use,

Recommends that the survey of such methods should be developed with the greatest possible speed, and that all Member Governments make available full information on this subject;

And the Council further recommends to the attention of the Member Governments the desirability of carrying out planned research work in connection with the methods of preservation of fishing gear and that where such investigations may be in progress, they should be continued as far as possible.

The Council also requested the Committee to *survey the programmes which have been initiated and/or are in progress for the introduction of non-indigenous fishing gear,* and on its submissions the Council resolved that

(4) Being aware of certain projects undertaken for the introduction of non-indigenous gear to the region and being aware of the importance of the outcome of the projects, especially as a positive guidance to member countries,

Recommends that Member Governments who have carried out such projects should furnish the Secretariat at the earliest opportunity with full information on the project and further recommends that Member Governments now initiating such projects furnish the

Secretariat with early information on all stages of each project.

and also resolved that

(5) The Council, having considered the recommendation of technical Committee II in respect of Mr. Chidambaram's paper on the experimental introduction of powered fishing vessels within India and Ceylon,

Requests the Author, subject to the approval of the Member Government concerned, to widen the scope of and expand this outline to be a Technical paper for the 4th Meeting of the Council.

21.2. *Food Technology*: The Committee was requested to survey the methods employed in the region for the processing of fish and to examine the possibilities of effecting improvements in such methods, and having considered the Committee's submissions the Council resolved that

(1) Recognising the importance of reliable information on existing methods of processing of fish, and considering it desirable that full information should be gathered on these methods and that such information should be organised within a logical classification,

Recommends that Monsieur Lafont of the Fisheries Research Institute, Phnom Penh, be invited to undertake the preparation of a classification scheme for consideration of the Council at its next meeting;

And the Council further recommends that Member Governments should make available directly to Mon. Lafont by 1st August 1951 or as soon as possible copies of all published material relating to this subject;

The Council also resolved that

(2) Believing that a handbook describing processing equipment, methods and procedures employed in and suitable for this region, should be prepared,

Recommends that each country designate from among its fishery personnel a Food Technologist to collaborate in the drafting of suggestions for such a handbook.

The Committee was also requested to consider a survey of the trade in processed fish in the region, and to examine the possibility of recommending means of securing improvement in that trade, and on the Committee's submissions the Council resolved that

(3) Having considered the condition and the problems of the trade in fishery products in the Indo-Pacific region, considers that it would be helpful to the Council's programme if an account of this trade could be prepared,

And therefore recommends, subject to the approval of the Member Governments concerned, that a working group be established comprising Mr. Lafont, Mr. Ranganathan and a representative from U.K.;

And further recommends that this group be permitted to utilise the services of such other persons as collaborators and consultants as necessary.

21.3. *Socio-Economics*: The Committee was requested to survey the programmes in progress in the region in connection with the socio-economic condition of the fishing industry and to consider whether recommendations may be made for the co-ordination and improvement of these programmes, and on its submissions the Council resolved that

(1) The Council, having considered generally the socio-economic problems of the fishing industry of the Indo-Pacific region, and recognizing the complexity of these problems and their relationship with problems of other types,

Recommends that workers with experience in this field should, subject to the approval of the Member Governments concerned, prepare technical papers on the various aspects of the problem so that Technical Committee II will be in a position to formulate specific proposals for the consideration of the Council at its fourth meeting;

And also recommends that immediate attention be given to the problem of indebtedness in the industry;

And further recommends that, to facilitate this object, the Executive Committee should invite papers where it is convinced that this course is desirable.

The Committee was also requested to examine the statistical programmes in the region and the possibility of making recommendations for the improvement of the use of the sampling methods when complete statistical survey is impossible, and on the Committee's submissions the Council resolved that

(2) Having considered the information available on the fishing industries of this region and recognizing the inadequacies and imperfections of this information,

Recommends to Member Governments that they accept, as an eventual and essential objective the establishment of an adequate statistical service for fishing industries in order that they may be placed in possession of current information on the condition of the industry and its factors of production as a guide to successful administration, development and conservation.

The Council also resolves that the Council being desirous of encouraging the development

of statistical services for the fishing industries of this region, approves the plan for the establishment of a statistics school,

And approves the early preparation of a statistical handbook for fishery workers,

And requests, subject to the approval of the Member Governments concerned, the statistical working group consisting of Mr. Royer, Mr. Burdon, Mr. Sukhatme and Dr. Kesteven, to continue their activities in this field and to undertake the various tasks described here.

The Council also resolved that

(3) Recognizing the fact that statistics and statistical methods have application in all fishery research, development and administrative projects, recommends that this subject form a separate item of the agenda in subsequent meetings of the Council.

22. OTHER ITEMS.

22.1. Composition of the Executive Committee: Having given consideration to the problem of working of the Executive Committee and the desirability of securing the availability of further assistance in its tasks the Council decided to enlarge its Executive Committee and resolved that

(1) The Council's Rules be amended as follows :

Strike out the 1st sentence of Para 1, Section X of the Rules and substitute the following :

"The Executive Committee shall consist of the Chairman, the Vice-Chairman and the immediately retired Chairman. The Secretary shall be an ex-officio member without vote."

It is understood that the foregoing amendment shall not enter into force until, pursuant to Article VII, Paragraph 2 of the agreement, it shall have been approved by the Director-General of F.A.O.

In addition, the Council thought fit to resolve that

(2) The delegates at the third meeting of the Council accept the principle that at elections of the Chairman and Vice-Chairman no precedent shall be said to have been established and that all such elections shall be free.

22.2. Harbour Facilities: The Council discussed the disabilities under which the fishing industry is placed by the lack of adequate harbour facilities and accordingly resolved that

Having considered the problems relating to approaches to fishing ports,

And, having reviewed the disabilities under

which fishing craft are placed by the inadequacy of such facilities, which have the effect of reducing the efficiency and the magnitude of fishing operations, and thus of reducing the amount of fish production,

And considering this in relation to the urgent need to promote progress of the underdeveloped fishing industries of the Indo-Pacific region and to increase food production,

Recommends to Member Governments that suitable action be taken, wherever necessary, to improve and expand the existing approaches to fishing ports in order to remove the disabilities described above and to ensure the navigability of approaches to fishing ports, the removal of submerged obstructions and the marking by lights of channels leading to and from fishing ports.

22.3. Scientific Equipment: The Council considered the problem of availability of scientific equipment for research and exploration and resolved that

Recognizing the problems which exist in connection with equipping the research and exploratory projects in the region, and the need to give some assistance in disposing of these problems,

Recommends to Member Governments that any difficulties in this connection be communicated through the Secretariat,

And directs the Secretariat to assist Member Governments, as far as possible, in ascertaining availability of such equipment.

22.4. Technical Papers submitted to Council:

The Council having reviewed the technical papers presented at the 3rd Annual Meeting, and having considered the relationship of these papers to the Agenda of the Meeting and to the functions of the Council,

Believes that it is necessary to lay down some general rules for the presentation of technical material at Council Meetings in future,

And therefore resolves to adopt the rules presented in Appendix I of this resolution,

And recommends to Member Governments that an endeavour should be made to apply these rules in submitting papers to Council at its meetings, and further recommends to Member Governments the adoption of a notice of papers, etc., to be given to the Secretariat some time in advance of the meeting, a plan for which is given in Appendix II PROVIDED HOWEVER that it shall be open to the Chairman to accept any paper considered suitable for the Meeting of the Council.

APPENDIX I

Rules concerning Technical Papers to be submitted to the Council

1. Generally, the purpose of submitting papers to the Council is to apprise the Council of matters relating to fishery problems and programmes in the area in order that the information contained therein might be taken into cognisance by the Council in discharging its general functions, and papers should be prepared from this point of view.

2. Specifically the purpose of any paper should be one or more of the following :

- (a) In relation to the Council's functions under Article III(a), to inform Council of results obtained in the study of problems of development and proper utilization of living aquatic resources in order that it might formulate the oceanographical, biological and other technical aspects of these problems and advise and report on these problems in accordance with its functions ;
- (b) In relation to the Council's function under Article III(b), to apprise the Council of projects initiated, in progress, or completed, in respect of which it might wish to propose development or co-ordination ;
- (c) In relation to the Council's function under Article III (c), to inform Council of methods and equipment being used in order that it might propose measures to bring about standardisation.

3. A distinction should be made between those papers which are prepared for publication as the normal output of any institution, or department, and those which are prepared for the Council, whether or not at its request, for any of the purposes shown in Paragraph 2.

4. Whilst no fast rule should be formulated and applied at present it should be recognized as a principle that the Council should not normally accept for publication in its Proceedings papers of the first type referred to in Paragraph 3.

5. The complete text of each technical paper for submission at a Council Meeting shall be placed in the hands of the Secretary at least 30 days before the commencement of the Meeting and either copies of the complete text or a full informative summary shall be available for full distribution during the Meeting, otherwise the paper shall not be received.

APPENDIX II

The notice should give (1) the name of the Member Government, (2) the Agenda item in which the material is being submitted and the subject, (3) a list of the papers to be presented, (4) a list of papers and other material submitted for information, together with (5) a statement of films, photographs and other demonstration material and finally (6) a statement of the propositions to be submitted on the subject by the delegation.

22.5. *Regionalisation*: The Council discussed the desirability of regionalising its activities and resolved that

The Council having heard discussions on the matter of regionalising its activities, and recognising the fact that many of the Council's problems are restricted to distinct sections of the region, and that advantage might be derived from closer study of such problems by regional groups of representatives from adjacent member countries,

Directs that the subject of regionalisation shall be placed on the agenda for the next Council Meeting,

And that working papers on the organisation and function of area and subject-committees within the Conseil International pour l'exploration de la Mer, be prepared by the Secretariat together with other relevant documents for full discussion of this subject at the next Council Meeting,

And suggests to the Executive Committee that in the course of its travel through the Indo-Pacific area it should arrange informal regional meetings of local groups whenever possible.

Appendix I

SECRETARY'S REPORT ON CREDENTIALS

The Secretary wishes to report that he has received formal credentials, letters of appointment and other means of identification, which satisfy him that the persons named in the Meeting document IPFC/C51/INC 7 entitled "List of Delegates and Observers", as Delegates and Experts are properly appointed by their respective Governments to attend the Council Meeting in the capacity indicated. In addition he has similar documents in respect of the persons named as Observers of the International Organizations to whom invitations had been issued in accordance with Section XII of the Council's Rules of Procedure.

However he wishes to point out that certain of the documents can hardly be regarded as credentials in the true sense of the word and further that certain of the documents do not conform with the provisions of the Council's Agreement in respect of designation of the capacity of the representation composing a delegation. He wishes to suggest that difficulties and misunderstanding could be avoided if Member Governments would undertake to ensure the availability of formal credentials containing certain minimum particulars such as full name, and the designation of the individual as delegate, alternate delegate, expert or adviser.

Appendix 2

EXECUTIVE COMMITTEE'S REPORT

The Executive Committee wishes to report having met on four occasions since the Council's 2nd meeting. These Committee Meetings are listed in the Secretary's report (IPFC/C51/12). The Committee is particularly impressed by the advantages of the arrangements under which its meetings are held at different places during the year. During the year of report these meetings took place at Manila and Phom-Penh. The Committee not only had the opportunity of learning something of local condition of those places, but had discussions with local workers which, it believes, may have been as stimulating to these workers as they were to the Committee.

The Committee presents and recommends for adoption and approval, the printed proceedings of the 2nd meeting. Copy of Section I of the Proceedings has, in accordance with Article III(i) of the Agreement, been transmitted to the Director General of the Food and Agriculture Organisation. The Director General's acknowledgement of receipt of the report is given as Appendix to this paper. Action taken in respect of distribution of these proceedings is described in working paper IPFC/C51/5.

The Committee reports having taken such action as was possible to implement the decisions of the Council at its 2nd Meeting. The action taken is reported in the Secretary's Report of work performed on behalf of the Council by the Secretariat (IPFC/C51/17) and in other working papers distributed at this meeting. The relationship of these working papers to the agenda is shown in the annotations to the finally adopted agenda.

The Committee has given particular attention to the following subjects: fish trade (IPFC/C51/19), technical instruction (IPFC/C51/14), liaison between international fishery organisations (IPFC/C51/6), and Council correspondents (IPFC/C51/12). It invites the Council's closest consideration of the recommendations contained in these papers. It also recommends to the Council, for closest consideration and careful revision, the Secretariat's draft statement on the status of the fishing industries of this region (IPFC/C51/23).

APPENDIX

Dear Dr. Hardenberg,

I wish to thank you for your letter of 3rd January, 1951, to which you attached Reports of the First and Second Meetings of the Indo-Pacific Fisheries Council, as is required by the Agreement.

It gives me pleasure to note the very good beginning which the Council has made in what I believe to be a fundamental contribution to the well-being of the people in the Indo-Pacific region. Your reports illustrate how, by co-operative consideration, nations can approach complex problems and work towards their solution to mutual benefit.

The course of the Council's work will no doubt be beset by difficulties, but I am sure they will be overcome by its patience and persistence, and that the progress will fulfil the promise of the start which has so well been made.

Yours sincerely,
(Sd.) N. E. DODD
NORRIS E. DODD
Director General.

Appendix 3

SECRETARY'S REPORT OF WORK PERFORMED ON BEHALF OF THE COUNCIL BY THE SECRETARIAT

In addition to the staff noted in the report for 1949, the Secretariat has had the services of an additional typist (Prathak Smithinunt) since November 1949. The Secretariat has continued to draw on the staff of the Regional Representative of the Director-General of F.A.O. for considerable clerical and other assistance in the execution of the rather heavy programme of work for the Council during 1950.

PART I

1. PUBLICATION OF THE PROCEEDINGS OF THE COUNCIL'S 2ND MEETING.

Notifications to authors of papers submitted to the Council of the Editorial Committee's decision to include their paper in the printed proceedings were distributed within a few days of the end of the

Council Meeting. The Manuscript of Section I of the Proceedings was delivered to the printer about mid May and the bulk of the MS of the other two sections was delivered by October. Despite various difficulties arising out of postal and other delays Section I was completed during December and it was expected that the remaining sections would be completed during January. Advantage was taken of visits to Singapore—May, July and November, to deal at first hand with the arrangements for this.

2. EXECUTIVE COMMITTEE MEETINGS.

The Executive Committee held the following meetings during 1950:—

- (a) At the CSIRO Marine Biological Laboratory, Cronulla, Australia, May 1—2.

(b) At the office of the Director of Fisheries, Manila, Philippines, August 24—26.

(c) At the Institute of Fisheries, Phnom-Penh, Cambodia, December 10—14.

The Secretariat carried out the usual servicing work for these meetings.

3. ACTION DIRECTED BY THE COUNCIL AT ITS 2ND MEETING.

(a) Membership of Technical Committees: The Government of Burma, Ceylon and India were advised of the Council's invitation that they should name members for their countries on the Technical Committees. The Government of India named Drs. Panikkar and Prashad and subsequently, on the retirement of Dr. Prashad, the Secretariat has been informed that Dr. Chopra would serve on Technical Committee II.

(b) Questionnaire on preservation of fishing gear: This questionnaire was circulated to Member Governments. The replies are reported in the Report of Technical Committee II.

(c) Paper on Organization of the Fishing Industry of the Indo-Pacific Region: Delegates were circulated with a request for comment and further information; their replies are summarised in the Report of Technical Committee II.

(d) Importance of Statistical Records: The resolution on this subject was circulated to Member Governments.

(e) Questionnaire on non-indigenous gear: This questionnaire was circulated to Member Governments as directed; the replies are summarised in the Report of Technical Committee II.

(f) Technical Assistance: This question has been considered by the Executive Committee, as directed, and is reported on in working paper IPFC/C51/14.

(g) Transplantation of fish: The recommendations on this subject were communicated to Member Governments in a circular letter; their replies are summarised in the Report of Technical Committee II.

(h) Scientific Equipment: The results of the Secretariat's activities in implementation of the suggestion under this head are given in working paper IPFC/C51/20.

(i) Hydrological Data: The recommendation on this subject was communicated to Member Governments in a circular letter.

(j) Statistics Working Group: Activities of the proposed working group have been developed as reported in working paper IPFC/C51/21.

(k) Bibliographic work: Implementation of these recommendations is discussed elsewhere in this report.

4. SPECIAL ASSIGNMENTS.

Assignments of 1949 which have been further developed include:—

(a) Preliminary Register of Projects, Institutions, Vessels and Personnel—see IPFC C51/9.

(b) The IPFC List of Scientific and other Periodicals published in the Indo-Pacific Area, presented initially at the 2nd IPFC Meeting, Cronulla, as IPFC/C50/15. The Secretariat under recommendation of the Council continued work on the preliminary list by circularizing Member Governments requesting assistance in the revision; the response to this request was poor, and therefore acting on a directive from the Executive Committee, the Secretariat proceeded with printing the list, with as much revision as could be done with the limited facilities available. Galley proofs of this printing were sent to certain Governments, by whom it might have been expected that revision could have been made in time; some help was obtained in this way. The Secretariat however must note with regret the obvious imperfections and deficiencies in the present publication and it is hoped that additions and amendments to be made in future issues will be brought to the notice of the Secretariat.

(c) Bibliography—see IPFC/C51/10.

(d) Exchange of biological material: Member Governments have been circularized on this subject at the request of various workers, and as a result there has been some exchange of biological material among the fishery workers in the following countries: Indonesia, Thailand and India. In addition a special request received from Malaya for specimens of *Stolephorus* was brought to the attention of these countries where this group occurs.

5. PREPARATIONS FOR THE COUNCIL'S 3RD MEETING.

Following receipt of the invitation of the Government of India, in August, the concurrence of Member Governments was obtained in the choice of time and venue for the meeting. At the same time action was initiated for the development of preparations in India. Invitations were issued in October and were accompanied by a draft agenda with some notes and other papers. In November/December the R.F.O. visited India in the course of visits to East and West Pakistan, and in company with a representative of the Government of India visited Madras for a conference with officers of the Government of Madras. Arrangements were initiated in August for the symposium at the Council Meeting. Further distribution of meeting papers was made in December and January.

PART II

The following activities of the Secretariat staff as part of the F.A.O. programme in the region

is briefly reported for the information of the Council.

TOURS AND CONFERENCE

In July/August 1950 the Regional Fisheries Officer made an extended tour to Singapore; Djakarta; Colombo; Mandapam and Calicut; Karachi, New Delhi and Calcutta; for consultative work and in connection with the Technical Assistance programme. In August the R.F.O. attended the 2nd 1950/51 Executive Committee Meeting of the IPFC at Manila. In November a further visit was made to Singapore to continue discussions on the Singapore fishery survey and for talks on statistics and other matters with the Fisheries Officer. A further tour was made in November extending into December by the R.F.O., accompanied part of the way by the Assistant Regional Fisheries Officer. Both officers at the request of the Pakistan Government spent some time in East Pakistan engaged in the survey of the Fisheries. The R.F.O. continued alone to New Delhi for consultations with the Indian Government and then proceeded to Lahore to lecture to the Asian Training Centre on Agricultural and Allied Projects. At the time of the 3rd 1950/51 Executive Committee Meeting at Phnom-Penh, Cambodia, in December there was discussion of local programmes with the staff of the Fisheries Research Institute, Phnom-Penh.

CONSULTATIVE WORK

Consultative work with the Fisheries Department of Thailand has been developed and the Asst. Regional Fisheries Officer has spent much time with the Director-General and his staff advising them in various programmes and projects as laid down in the recommendations of the F.A.O. Fisheries Mission for Thailand. The survey of fishing gear has been continued and an additional thirteen fishing methods have been recorded. There has been close collaboration between the workers of the Bangkok Experimental Station and the A.R.F.O.

The Singapore Fisheries survey has been very considerably developed and the R.F.O. has continued to advise on methods to be employed in this programme.

Some time was spent with the Acting Director of Fisheries, Hong Kong, in reviewing the programmes in statistics, socio-economics, the salt-fish trade, junk mechanization and marketing. In East Pakistan there exists a number of major problems in connection with the Fisheries of that country and their development; in response to a request made to FAO for assistance in surveying and appraising the existing data with a view to preparing recommendations for action to improve the situation, a brief

survey was made in November December and a report will be made in the near future.

The R.F.O. continued to advise on the fisheries programme of Ceylon.

TECHNICAL ASSISTANCE

During the year both the R.F.O. and A.R.F.O. participated in discussions of plans for Technical Assistance to countries of the region. Those included Indonesia, Ceylon, Pakistan, India and Thailand.

ASIAN TRAINING CENTRE ON AGRICULTURAL AND ALLIED PROJECTS SPONSORED JOINTLY BY PAKISTAN, F.A.O. AND THE INTERNATIONAL BANK

A series of lectures relating to Fisheries was prepared by the R.F.O. under the general title, 'Planning the Development of Asian Fishing Industries' and was delivered in three sections dealing with

(a) Present status of Asian Fishing Industry and Principal Prospective lines of Development.

(b) Specific Projects of Development and Methods of Implementation.

(c) Formulation and Management of Projects.

The printed Report of the Centre will contain the above lectures.

HERRING MEETING

A Paper entitled "Possibilities for Exporting Herring Products to Asia and the Far East" with supporting tables and photographs was prepared for presentation by F.A.O. at the Meeting on Herring Technology which was convened at Bergen, Norway 24—29 September 1950. In addition a documentary film entitled "Fish for Asian People" was prepared to illustrate the Paper still further.

FILM WORK

In addition to the film "Fish for Asian People" opportunity has been taken during tours to take further movie films for documentation of the fisheries of the region. In all more than three thousand feet of film have been exposed, covering items in Indonesia, West Pakistan, East Pakistan, India, Cambodia, Hong Kong and the Philippines. The Cambodia material has been added to the film taken by the Cambodia Government for the film "Some Views of Fisheries of Cambodia" which is the provisional draft of a film on this subject. Special attention was paid in the Philippines to the Bangos fishery and it is hoped to develop a substantial documentation of this fishery in the Philippines and Indonesia.

Appendix 4

SECRETARY'S REPORT ON THE FINANCIAL AFFAIRS OF THE COUNCIL

1. The following statement sets out the expenditure of the Indo-Pacific Fisheries Council Secretariat for the financial year 1950. The figures are subject to confirmation by the Budget and

Finance Section of the Administrative Division of F.A.O., by whom the expenditures have been authorized in appropriate form. The corresponding Budget Allotments for the period are also shown.

| | 1950 | |
|--|-----------------|--------------------|
| Expenditure U.S. \$. | | Budget U.S. \$. |
| A. EXECUTIVE COMMITTEE TRAVEL | | |
| (1) IPFC 2nd (1950/51) Executive Committee Meeting, Manila, August 1950, and representation at South Pacific Commission Conference, Sydney, August 1950. Fares and travel expenses of Chairman | 1,021.60 | |
| (2) IPFC 3rd (1950/51) Executive Committee Meeting, Phnom-Penh, December 1950. Fares and travel expenses of Chairman and Vice-Chairman | 926.70 | |
| | <u>1,948.30</u> | 1,600.00 |
| B. PRINTING | | |
| (1) Stationery and temporary typing service in preparing MS for printing | 111.85 | |
| (2) Printing costs of List of Periodicals | | |
| (3) Printing costs of the IPFC 2nd Proceedings | <u>111.85</u> | 3,000.00 |
| C. MEETING | | |
| (1) Meeting expenditure in connection with the 2nd IPFC Meeting, Cronulla, April 1950* | 351.03 | |
| (2) Film charges | 245.65 | 596.68 |
| | | 1,500.00 |
| D. MISCELLANEOUS EXPENSES | | |
| Overtime | 36.63 | |
| Office equipment | 84.81 | |
| Shipping and freight | 61.85 | |
| Stationery | 135.93 | |
| Telegrams and postage | 696.52 | |
| | <u>1,015.74</u> | 900.00 |
| TOTALS | <u>3,672.57</u> | 7,000.00 |
| Plus Commitments (Approx) | 1,545.00 | |
| GRAND TOTALS | <u>5,217.57</u> | <u>7,000.00</u> |

* Covering airfreighting of documents from Bangkok to Australia, shipping of documents from Australia to Bangkok, translation services, publicity and press services, and incidental Secretariat expenses.

2.. Attention is drawn to:—

- (1) This figure represents a revision in October 1950 of the original allocation made of US \$2,000.00 which, upon request of the IPFC Secretariat on direction of the Executive Committee, was reduced by US \$400.00 in order to meet heavier miscellaneous expenditure than allowed for, the US \$400.00 being transferred from the "Executive Committee Travel" item to the "Miscellaneous Expenses" item. However, as can be seen, a retransfer will be necessary.
- (2) This is an approximate figure since final settlement by the Budget and Finance Section of the Administrative Division of FAO has not been effected.
- (3) This figure represents the original allocation of US \$2,000.00 plus an additional US \$1,000.00 transferred in December to allow for the printing of Mr. W. H. Schuster's book on "Fish Culture in Salt Water Ponds in Java & Madura". It has since been found impossible to print the book at this juncture and a request has therefore been made for the transfer of this amount to the 1951 Budget.
- (4) No payment has yet been made in respect of the printing costs of the "List of Periodicals" but it is estimated the cost will be about US \$145.00.
- (5) No payment has yet been made in respect of the printing costs of the 2nd IPFC Proceedings, but it is estimated that the total cost will be approximately US \$1,400.00 of which about US \$70.00 is the cost of distribution of the Proceedings. In addition there will be some postage charges.

(6) This figure represents the original allocation of US \$500.00 plus an additional US \$400.00 which was transferred in October from the "Executive Committee Travel" item at the request of the IPFC Secretariat on the direction of the Executive Committee.

(7) This sum is the amount paid to "Presentation Inc." for editing and producing copies of the film of the IPFC 2nd Meeting. Portion of this amount (US \$120.00) is recoverable from individuals for whom copies were made. On the other hand some additional changes have yet to be entered against this item in respect of this project.

3. It will be seen that of the total allocation for the year, US \$7,000.00, approximately US \$5,217.57 will have been used, representing an under-spending of the original allocation of US \$6,000.00 by US \$782.43. Among the items, the "Travel" item was apparently overspent but this appearance is solely due to the premature transfer from this item which was made on the basis of faulty estimation of the costs of the two separate sets of travel made. The "Miscellaneous Expenses" item is shown as being overspent even after increasing the allocation by US \$400.00. However, part of the total for this item consists of amounts which could properly be charged against other items.

If the Executive Committee will be able to perform its work during 1951 without the prolonged travel which was involved under item A (1) above and if the Secretariat programme for the year should be similar to 1950 including a similar printing schedule (special provision being made for such projects as printing Schuster's book), it would seem that the Council would operate again on a budget such as the above.

Appendix 5 STATEMENT OF THE 1951 BUDGET PROVIDED BY F.A.O. FOR THE I.P.F.C

The 1951 Budget of the FAO Fisheries Division, as approved by the 6th Session of the Conference, makes the following provisions for the servicing of the Indo-Pacific Fisheries Council, as set forth in Article VI (2) of the Agreement and Paragraph 2, Section XI, of the Council's Rules of Procedure:

| | |
|--|----------------|
| (1) Travel of Chairman and Vice-Chairman of the Council when performing Council duties away from their headquarters between annual meetings .. | \$2,000 |
| (2) Printing .. | 2,000 |
| (3) Meetings .. | 750 |
| (4) Miscellaneous Expenses, such as postage, cables, stationery, and outside Secretariat assistance .. | 500 |
| Total .. | <u>\$5,250</u> |

Other expenses of the Secretariat, such as salaries, allowances, etc., will continue to be provided for separately by the Organization. Dr. D. B. Finn, the Director of Fisheries Division of F.A.O., draws attention to the fact that the FAO Budget for 1951 is reduced to \$4,500,000 and of this amount \$350,000 is to be used in connection with the expenses resulting from the move to Rome. With the exception of Item 3, Meetings, the suggested budget is the same as that adopted for 1950. He further points out that should the need arise, arrangement for a transfer from one budget item to another would be made as was done during the current year.

- Appendix 6

PROPOSAL FOR THE APPOINTMENT OF COUNCIL CORRESPONDENTS

1. At its 2nd Meeting the Council adopted a resolution concerning the appointment of its Technical Committees and the acceptance, by the Members of the Committees, of responsibilities as technical correspondents of their countries to the Council. (See the Proceedings of the Council's 2nd Meeting, pp. 6-7).

2. Although only one Government has communicated its approval of this plan, it is assumed that under this arrangement the Council is provided with two technical correspondents from each country, with the exception of those for whom the same person is named for each committee.

3. The Secretariat has indicated that in its experience it finds that a need exists for additional correspondents through whom the Council's work might be developed. Correspondents are required for the bibliographic work of the Council and for the Council's Register and News 'Bulletin'. The Executive Committee therefore proposes to Council that it should be recommended to Member Govern-

ments that in addition to the Technical Correspondents provided in the Technical Committees, two other correspondents should be appointed by each country, with responsibilities as follows:

Administrative Correspondent :—to serve as liaison with the Secretariat in respect of administrative matters, including the transmission to the Secretariat of information required for the annual revision of the Council's Register, and of information concerning current activities, for inclusion in the Council's News 'Bulletin'.

Bibliographic Correspondents :—to serve as liaison with the Secretariat in respect of all the Council's bibliographic work in so far as it affects the correspondent's country. In particular the bibliographic correspondent would be responsible for the annual revision of the list of periodicals, and for the collection of the material for the Council's current bibliography.

Appendix 7

EXECUTIVE COMMITTEE'S REPORT ON PUBLICATIONS

During 1950/51 the Council's publications consisted of the Proceedings of the 2nd Meeting and the List of Periodicals. During 1951/52 the Executive Committee proposes to publish these, and, in addition, certain other items. It is thought that the Proceedings of the current meeting will not exceed in length the Proceedings of the 2nd Meeting and may in fact be shorter; the Periodicals List also will not be longer. In addition to the aspect of length of the contemplated publications the Executive Committee is pleased to learn that it can effect considerable economies in the printing programme, as compared with previous years, by placing the work here in India. Accordingly it is possible to plan a more ambitious printing programme than had been expected. In addition to the Proceedings and the Periodicals List the Executive Committee therefore proposes to publish as much of the Register as may be completed, and, the translation of the book by W. H. Schuster "Fishculture in saltwater ponds on Java". The present situation in respect of the Register is described in IPFC/C51/9. Schuster's book has appeared in a Dutch edition with English

summaries and has been well received; its availability in English edition will be a considerable contribution to promoting this section of the industry. Present estimates of printing costs suggest that the above-listed four items will take three quarters of the Council's printing budget, leaving roughly five hundred dollars U.S. for other work. If this should be so the Executive Committee would propose to employ the remaining funds in publishing such sections of the Handbook as might become available for printing during the year.

The Committee also wishes to draw attention to the fact that the Secretariat has given assistance in connection with the publication of an English edition of the handbook for identification of fishes, by Schuster and others. It will be remembered that a Thai edition of this work was published with the assistance of the Secretariat last year. Finally, the Secretariat has given some assistance also in the efforts at arranging an English edition of the handbook on the fisheries of Indonesia by Delsman and Hardenberg.

PROCEDURES AT COUNCIL MEETINGS

Nomination of Technical Committees : The Executive Committee proposes that the Technical Committees should be appointed at each meeting and should hold office until the presentation of their report at the next meeting. This will mean the Committees will function at each meeting in handling the material brought by the Secretariat and by Delegations, and after the meeting will hold responsibility for continuance of the work. This procedure will also have the effect that it will permit the Committees to be composed, at each meeting, of persons present at the meeting and should dispose of the disabilities of the inevitable failure of certain members to appear at the subsequent meeting.

Technical Committee Reports : As a logical development of the foregoing, the Executive Committee proposes that the Technical Committees should present only the reports of their work since the previous meeting (documents IPFC/C51/22 and IPFC/C51/26 & 21 at this meeting). The Committee proposes that these reports should be discussed and referred with other material to the new Committees for action during the meeting.

Committee Activities : A. Each Committee should be given a series of statements of work setting out, in respect of each subject,

- (1) Problem or problems to be considered, with such additional direction as may be considered necessary.
- (2) List of papers, working and technical, which must be considered, with an indication of whether any papers have been referred to other Committees and in such cases

whether they are to be considered separately by each Committee or in collaboration.

- (3) Statement of any propositions.

B. Committees should then consider the foregoing with the papers, and should report to the Technical Committee (in the case of Sub-Committees) or the Council (in the case of the Technical Committees and of the Special Committees) along the following lines :

- (1) A statement, prepared by the rapporteur, of the Committee's views on the subject, including
- (2) A brief review of the papers submitted and proposals for the reception of papers either (a) in full, (b) in summary, (c) simply by notice ;
- (3) A statement of action proposed to the Council including, where necessary, draft resolutions for consideration by Council.

The reports will be assimilated into the Council report and these will be published separately as appendices, from the Committee reports, only such material as may be necessary to clarify material contained in the report itself.

C. The foregoing reports shall be presented to Council full session at a time indicated, and shall be used as a basis for conduct of Council business in respect of the subject. It is expected that the Council will in this way be able to complete its consideration of each subject in turn.

REPORTS OF TECHNICAL COMMITTEE I

A. REPORT OF THE COMMITTEE FOR 1950/51

This report of the activities of Technical Committee I, which are set out under the several Sub-Committee headings, covers the period from the 1950 plenary council meeting to 31st December, 1950. Where Sub-Committee reports contain substantial factual information they are rendered in full in appendices.

(1) *Tuna Fisheries* : In implementation of the opinion expressed by this Sub-Committee in the last report of Technical Committee I, that the most important problem confronting the Sub-Committee is to determine the races of sub-specific divisions of Pacific tuna species, standard morphometric measurements have been taken of tuna species over a wide region. 2,783 sets of these, obtained from 12 species of tuna, are enumerated in the report of the Chairman of the Sub-Committee, which is rendered in full in Appendix I of this report.

(2) *Neritic Pelagic Fisheries* : No report from this Sub-Committee is at present forthcoming.

(3) *Fish-Culture* : Throughout the year the Sub-Committee on Fish Culture continued its efforts to gather basic information about the inland fisheries of the Indo-Pacific area. Visits by the Chairman, Mr. W. H. Schuster, to Papua, New Guinea and Ceylon helped greatly and additional information was also forthcoming from other member States. This has enabled further tables to be compiled, adding to the material published last year.

It is becoming clear that basic research work and adequate documentation of all efforts being made in fish cultural practices are being neglected and are not only inadequate but are being thrust to one side in endeavours to achieve quick results. It is apparent that sound practices in fish culture and the extension and further development of known techniques must be based on much more fundamental knowledge than is at present available.

The full report of the Chairman of the Sub-Committee and the annexed tables are given in Appendix 2.

(4) *Planktology* : The Chairman of the Sub-Committee, Dr. H. Thompson, reports that no matters requiring action between meetings of the Council have been referred to the Sub-Committee. During the year some correspondence has occurred between the Secretary of the Council for the Ex-

cutive Committee and the Chairman of the Sub-Committee regarding the compilation of the proposed handbook of field and laboratory practices in planktology.

(5) *Hydrology* : The Chairman of the Sub-Committee reports :—

(a) *General Activities* : Surface salinity observations in the Java and Banda Seas have been collected by the Laboratory for the investigation of the Sea at Djakarta and the Chairman is in receipt of mean surface salinity charts for April and June, 1949. No reports of similar surface collection by other member nations have been received. The Fisheries Department, Singapore, has been in touch with the Chairman regarding analytical methods and reagents for a hydrological programme in Malayan waters in 1951.

A list of oceanographical equipment and their manufacturing supply houses was prepared by the Chairman for the Siamese delegate to the I.P.F.C., in anticipation of hydrological and planktological research by this member country.

(b) *Implementation of Resolutions of Hydrology Sub-Committee* : Since the last I.P.F.C. Meeting the manufacture of bathythermographs has been commenced in England and the attention of the Secretariat is drawn to part (b) of Resolution 5 introduced by Technical Committee I on behalf of the Hydrology Sub-Committee. The manufacturers of this instrument are S. G. Brown & Sons, England, and the price for the standard 450 ft. pattern is £A94/10/-. A combined bathythermograph and sea sampler is also available at £A197/10/-. Direct approach to this company in the United Kingdom is recommended.

(c) *Hydrological Programmes* : As far as can be gathered from the rather scanty correspondence and discussion, no significant changes in programmes have occurred since the last IPFC Meeting.

During the year the National Oceanographical Institute's vessel, the Royal Research Ship

Discovery II, arrived in Australian waters at the commencement of a further Commission's work in the Southern Ocean. Advantage was taken of her movements to obtain hydrological data from two lines of stations off the New South Wales coast, extending further seawards than Australian fisheries research vessels have yet achieved. During the coming year further similar work on behalf of Australian research interests will be done in the intervals between cruises to Antarctic waters.

(6) *Taxonomy* : It is with pleasure that I report that since the last Council Meeting, Dr. N. K. Panikkar has accepted the chairmanship of the Sub-Committee on Taxonomy.

The Chairman has submitted a copy of "A Key for the Field identification of the Clupeoid fishes of India," prepared by Mr. R. V. Nair of the Indian Central Marine Fisheries Research Station, for circulation to members of the Council. The key omits the genera *Thrissocles* and *Anchoviella*.

(7) *Seaweeds* : The Chairman of the Sub-Committee reports that the work of his Sub-Committee

has been handicapped by the loss of liaison with the Rapporteur, Dr. Chyung Moon Ki.

The Chairman has listed a series of 11 studies of seaweeds in progress during the past year in various Member States.

He has also submitted a Bibliography containing 24 items. These are given in full in Appendix 3.

Technical Papers :

The following technical papers have been submitted for communication to the Council :—

- (1) Fish Culture : "Modern techniques for transportation of fish" by K. Vaas.
- (2) Hydrology : "A comparison of the hydrological conditions of the east and west Australian coasts in October, 1950," by D. J. Rochford.

GEORGE W. RAYNER.

Appendix 1

REPORT OF THE CHAIRMAN OF SUB-COMMITTEE ON TUNA TO DECEMBER 31, 1950

At the first meeting of the Indo-Pacific Fisheries Council, Technical Committee I was requested "to explore the opportunities for collaboration by members of the Council in the study of the tuna fishery resources and make recommendations thereon to the Council at its next regular session."

Pursuant to this request it was reported to the Council (IPFC/C50/35) at its second meeting : "That the most urgent and fundamental problem with the tunas and one of distinctly international bearing was to determine whether the population of each important tuna species is continuous and homogeneous throughout its range or whether each is composed of a number of independent or semi-independent units and if so, the limits of each."

Through further conferences during the second meeting of the Council it was agreed desirable to standardize measurements and to publish individual morphometric measurements. The standards for measurements were agreed to be those defined by H. C. Godsil ("A Preliminary Population Study of the Yellowfin Tuna and the Albacore"—Calif.

Div. of Fish and Game *Fishery Bull.* No. 70, 1948) and by John C. Marr and Milner B. Schaefer ("Definitions of Body Dimensions used in Describing Tunas"—U.S. Fish and Wildlife Service *Fishery Bull.* No. 47, 1949) with investigators, of course, collecting data on such additional characters they judge to be appropriate to their particular studies.

Indicative of the progress made in this field, sets of morphometric measurements have been taken on 2,783 specimens of 12 tuna species from 10 different parts of the Indo-Pacific region. The distribution of these data among the species and localities is given in the attached table. Those listed under Australia were taken by the C.S.I.R. Fisheries Laboratory of Australia, the remainder were by agencies of the U.S. Fish and Wildlife Service as follows : Philippine Islands, by the Philippine Fishery Programme; Marianas and Marshall Islands, by South Pacific Investigations; and the others by Pacific Oceanic Fishery Investigations. The listings in the table are complete up to November 23, 1950, for measurements by the C.S.I.R. and to December 31, 1950, for those taken by the U.S. Fish and Wildlife Service.

O. E. SETTE,
Chairman,
Sub-Committee on Tuna.

Number of specimens for which sets of morphometric measurements have been made on tunas from various localities of the Indo-Pacific area by scientists of Australia up to Nov. 23, 1950, and the United States up to Dec. 31, 1950.

| SPECIES | Australia 1949-1950 | Philippine I 1949 | Japan 1949-1950 | Marianas I 1949 | Caroline I 1948-1950 | Marshall I 1947 | Society I 1949 | Phoenix I 1950 | Line I 1950 | Hawaiian I 1948-49-50 | TOTAL |
|------------------------------------|------------------------|----------------------|--------------------|--------------------|-------------------------|--------------------|-------------------|-------------------|----------------|--------------------------|-------|
| <i>Thunnus thynnus maccoyii</i> .. | 10 ¹ | | | | | | | | | | 10 |
| <i>Thunnus germo</i> .. | 2 | | 14 | | 64 | | | | | 100 | 180 |
| <i>Thunnus orientalis</i> .. | | | 6 | | 4 | | | | | | 10 |
| <i>Neothunnus macropterus</i> .. | 14 | 122 | 50 | | 352 | 44 | 48 ² | 74 | 102 | 251 | 1,057 |
| <i>Parathunnus sibi</i> .. | | | 7 | | 94 | | | | 15 | 272 | 388 |
| <i>Kishinoella tonggol</i> .. | 63 ³ | 57 | | | | | | | | | 120 |
| <i>Euthynnus alletteratus</i> .. | 36 | | | | | | | | | | 36 |
| <i>Euthynnus yaito</i> .. | | 181 | 13 | 1 | 4 | 30 | | 1 | | 64 | 294 |
| <i>Katsuwonus pelamis</i> .. | 17 | 48 | 37 | 35 | 12 | 46 | 122 | 13 | 17 | 225 | 572 |
| <i>Gymnosarda nuda</i> .. | 10 | | 2 | | | 64 | | | 1 | | 77 |
| <i>Auxis thazard</i> .. | | | 14 | | | | | | | 14 | 28 |
| <i>Auxis tapeinosoma</i> .. | | | 11 | | | | | | | | 11 |
| TOTAL .. | 152 | 408 | 154 | 36 | 530 | 184 | 170 | 88 | 135 | 926 | 2,783 |

¹ In addition, 14 were measured in Hawaii after having been shipped from Australia in frozen condition.

² Measured in Hawaii after having been frozen.

³ An additional 106 specimens were measured only for pectoral fin length and greatest depth.

Appendix 2

REPORT OF THE CHAIRMAN OF SUB-COMMITTEE ON FISH CULTURE TO DECEMBER 31, 1950

The Sub-Committee on fish culture continued with its efforts to gather basic information about the inland fisheries in the Indo-Pacific area. Prominence was given to fish culture in fresh and brackish water ponds but, since the Committee was convinced that actions such as protection of fish, the transplantation of fry and the introduction of new species cannot logically be separated from capture operations, it concluded in the survey the problems connected with the management of water systems, other than ponds.

The data, received by the Committee in answer to the questionnaire, supplemented by the body of facts at its disposal in relevant publications, make it possible to define the present status of the developmental work as follows:

In almost all countries of the area interest is focussed on the cultivation of fish in fresh and brackish water ponds. Desire to achieve quick results creates a tendency to include fish culture in developmental programmes even before the suitability of the recommended techniques has been investigated by comparative experiments. A survey of recent publications shows that basic research work is often thrust into the background by investigations on special subjects. Basic documentation of the limnological efforts is a weak spot in almost all Fisheries Departments in the area, since even a general recording of the ecological peculiarities of important species of fish or a methodical examination of the indigenous cultural methods has not yet been started. In the extension of inland fisheries gamb-

ling for a lucky hit often seems to be preferred to trusting systematic investigation. The problems are almost alike all over the area but lack of basic documentation makes a coordination of the developmental programmes a difficult task.

In the case of fish culture the propositions are relatively simple. It is necessary to investigate (a) which of the species cultivated are able to give the highest yields per cultural unit and (b) which cultural techniques have to be applied to achieve the highest outputs in money.

It is impossible to approach the core of these problems without a sound knowledge of the production capacity of all indigenous species of fish suitable for culture in ponds. Only a reliable body of data makes it possible to judge the desirability of the introduction of foreign species and the necessity for transplantation of native fish.

A still greater vacuum in basic investigations can be stated as existing in regard to fish culture in natural or artificial water systems, other than ponds. Piscatorial exploitation of lakes, swamps, rivers and estuarine waters is often neglected since, for lack of a scientific basis, nobody dares to take the risk to start operations. Without investigating the natural fish production first and without records of the available quantities of fish food, no programme for a proper management can be formulated.

The "open" waters in almost all countries offer possibilities for a manifold increase in the amount of space suitable for the culture of fish, greater than ponds ever can provide. Developmental work for open waters has to start with (a) a survey of the ichthyofauna, (b) an investigation of the feeding and propagation habits of the frequently occurring species and (c) a stocktaking of the quantities of fish

food. These data are the basis for all further limnological work, but modest as the enquirer may be, he draws a blank at present on most of his questions.

The situation as described above is a consequence of the short experience in fresh water work most of the Fisheries Department have. Limnology is a relatively new science and tropical fish culture is a section which still has to win its spurs. With no standards established and no directions drawn fisheries workers try to find their way on slippery ground and the Sub-Committee's endeavours to compile basic data and to stimulate basic investigations are a modest step in the desired direction.

The Sub-Committee draws full attention to two recent publications as welcome attempts to formulate problems, viz :

Dr. G. L. Kesteven : Value of inland fisheries vast scope for development.

Dr. S. L. Hora : Fisheries resources of West Bengal and their utilization.

It deplores the non-appearance of publications with a general scope on subjects of limnological and fish cultural nature.

In completion of the body of data published in the Committee's 1949 report, information on fish cultural operations was received from Japan and Tasmania. In addition, the Chairman has had an opportunity to collect information during visits to the Territory of Papua and New Guinea and to Ceylon. The tables annexed to this report are an addition to or a revision of the material published last year.

(Sd.) W. H. SCHUSTER,
Chairman,

Sub-Committee on Fish Culture.

After closing this report a comprehensive contribution was received from India, which will be dealt with in next year's report.

TABLE I
AREA OF INLAND WATERS

| | Ponds | | Lakes ha. | Mangrove marshes ha. | Lagoons and estuarine waters ha. | Reservoirs ha. | Ricefields | |
|-------------------------|-----------------------|--------------------------|--------------|----------------------------|--|-------------------|------------------|------------------------|
| | Fresh water ha. | Brackish water ha. | | | | | With fish ha. | Without fish ha. |
| 1. Ceylon .. | | | | | 117,000 | 80,000 | 350,000 | 16,000 |
| 2. East Bengal .. | 60,000 | 15,000 | | 290,000 | 164,000 | | 8,000,000 | |
| 3. Hawaii .. | | 850 | | | | | | |
| 4. Indo-China .. | 25,000 | | 300,000 | | 1,000,000 | 25,000 | 3,200,000 | 15,000 |
| 5. Indonesia .. | 9,000 | 110,000 | 335,000 | 6,000,000 | 8,500,000 | 27,000 | 4,500,000 | 67,000 |
| 6. Japan .. | 617* | | 21,000 | | | | 495,000 | 18,200 |
| 7. Malaya .. | 150 | | | 300,000 | | 500 | | 300,000 |
| 8. New Guineas Papua .. | | | 80,000 | 500,000 | 100,000 | | | |
| 9. Tasmania .. | | | 65,000 | | 1,000 | | | |

* Trout ponds only.

TABLE 2
LIST OF SALMONIDAE CULTIVATED IN THE INDO-PACIFIC AREA

| Species | Kind of water used for culture | Manner of seed- procuring | Feeding habits | Remarks | |
|-----------------------------------|--------------------------------------|------------------------------|-------------------|--------------|----------------------------|
| | | | | Productivity | Value for con- sumption |
| Salmo fario .. | streams, lakes | artif. fertil. | predator | 200 kg p.ha | excellent |
| Salmo irideus Shasta .. | ponds, lakes | artif. fertil. | predator | | excellent |
| Salvelinus fontinalis Mitch. .. | ponds, lakes | artif. fertil. | predator | | excellent |
| Salvelinus pluvius .. | streams | spawns in streams | predator | | excellent |
| Salvelinus pundscha .. | streams | spawns in streams | predator | | excellent |
| Salvelinus malma .. | streams | spawns in streams | predator | | excellent |
| Oncorhynchus keta Walb. .. | streams, lakes | artif. fertil. | predator | | excellent |
| Oncorhynchus masou Br. .. | streams, lakes | artif. fertil. | predator | | excellent |
| Oncorhynchus gorbuscha Walb. .. | streams, lakes | artif. fertil. | predator | | excellent |
| Oncorhynchus Kawamura Tord. .. | lakes | artif. fertil. | predator | | excellent |
| Oncorhynchus macrostomus Gthr. .. | lakes | artif. fertil. | predator | | excellent |
| Oncorhynchus nerka Walb. .. | streams | artif. fertil. | predator | | excellent |

TABLE 3
LISTS OF APODES CULTIVATED IN THE INDO-PACIFIC AREA

| Species | Kind of water used for culture | Manner of seed-procuring | Feeding habits | Remarks | |
|---------------------------------|--------------------------------|--------------------------------|----------------|--------------|------------------------|
| | | | | Productivity | Value for consumption. |
| Anguilla japonica T. and S. . . | Ponds, lakes, streams | Fingerlings coll. in estuaries | Predator | | Good |

TABLE 4
LIST OF SPECIES CULTIVATED IN HAWAII

| Species | Water used for culture | Manner of seed procuring | Average weight of fish in grammes | Average consumption weight in grammes | Normal rearing period | Losses during rearing |
|----------------------------|------------------------------|---|-----------------------------------|---------------------------------------|-----------------------|-----------------------|
| Chanos chanos (Forsk.) . . | brackish or saltwater ponds | fry enter ponds during filling; fingerlings seined in coastal waters. | | | | |
| Mugil cephalus L. . . | brackish or salt-water ponds | fry enter ponds during filling; fingerlings seined in coastal waters. | | | | |

Average production of fish-ponds per ha/annum.

| | |
|----------------|--------------|
| Mugil cephalus | 9 kg |
| Chanos chanos | 7 kg |
| Other fishes | 5 kg |
| Clams | 7 kg |
| Crabs | 3 kg |
| Shrimps | — |
| | <u>31 kg</u> |

TABLE 5
LIST OF SPECIES CULTIVATED IN CEYLON

| Species | Kind of water used for culture | Manner of seed procuring | Average weight of fish in grammes | Average consumption weight in grammes | Normal rearing period | Losses during rearing |
|-------------------------------------|--------------------------------|--|-----------------------------------|---------------------------------------|-----------------------|-----------------------|
| 1. Cyprinus carpio L. . . | rivers | spawns in rivers. | | | | |
| 2. Osphronemus goramy Lac. | rivers | spawns in rivers. | | | | |
| 3. Ctenopharyngodon idellus (C. V.) | freshwater ponds, tanks | fingerlings imported. | | | | |
| 4. Chanos chanos (Forsk.) | lagoons | fingerlings collected in coastal waters. | | | | |

TABLE 6
LIST OF SPECIES CULTIVATED IN PAKISTAN (EAST BENGAL)

| Species | Kind of water used for culture | Manner of seed procuring | Average weight of fish at one yr. in grammes | Average consumption weight in grammes | Normal rearing period in mths. | Losses during rearing |
|--------------------------------------|-----------------------------------|--|--|---------------------------------------|--------------------------------|-----------------------|
| <i>Catla catla</i> (H.B.) | .. freshwater ponds | eggs and fry collected in rivers | 1,500 | 1,000 | 4 | 20% |
| <i>Labeo rohita</i> (H.B.) | .. freshwater ponds | eggs and fry collected in rivers | 1,250 | 1,000 | 4 | 30% |
| <i>Cirrhina mrigala</i> (H.B.) | .. freshwater ponds | eggs and fry collected in rivers | 750 | 600 | 4 | 40% |
| <i>Labeo calbasu</i> (H.B.) | .. freshwater ponds | eggs and fry collected in rivers | 750 | 600 | 4 | 40% |
| <i>Labeo gonius</i> Blkr. | .. freshwater ponds | eggs and fry collected in tanks and wet fields | 500 | 500 | 4 | 40% |
| <i>Clarias batrachus</i> (L.) | .. freshwater ponds | naturally breeds in tanks and ditches | 250 | 200 | .. | .. |
| <i>Heteropneustes fossilis</i> (Bl.) | .. freshwater ponds | naturally breeds in tanks and ditches | 250 | 150 | .. | .. |
| <i>Anabas testudineus</i> (Bl.) | .. freshwater ponds | naturally breeds in tanks and ditches | 250 | 120 | .. | .. |
| <i>Lates calcarifer</i> (Bl.) | .. fresh and brackish water ponds | fry collected in rivers and estuaries | 3,000 | 1,000 | .. | .. |

TABLE 7
LIST OF SPECIES CULTIVATED IN MALAYA

| Species | Water used for culture | Manner of seed procuring | Average weight of fish at 1 yr. in grammes. | Average consumption weight in grammes | Normal rearing period in mths. | Losses during rearing |
|---|------------------------|------------------------------------|---|---------------------------------------|--------------------------------|-----------------------|
| <i>Ctenopharyngodon idellus</i> (C.V.) | freshwater ponds | fry imported (China) | 3,000 | 2,400 | 9 | 50% |
| <i>Aristichthys nobilis</i> (Rich.) | .. freshwater ponds | fry imported | 3,000 | 2,400 | 9 | 30% |
| <i>Hypophthalmichthys molitrix</i> (C.V.) | .. freshwater ponds | fry imported | 2,400 | 1,800 | 9 | 30% |
| <i>Labeo molitorella</i> (C.V.) | freshwater ponds | fry imported | 300 | 225 | 9 | 50% |
| <i>Cyprinus carpio</i> L. | .. freshwater ponds | spawns in spawning ponds. | 600 | 450 | 9 | 50% |
| <i>Osphronemus goramy</i> Lac. | .. freshwater ponds | spawns in the ponds | 375 | 600 | 18 | 50% |
| <i>Osteochilus hasselti</i> (C.V.) | .. freshwater ponds | spawns in ponds and rivers. | 300 | 200 | 9 | |
| <i>Puntius schwanefeldii</i> (Blkr.) | .. freshwater ponds | fingerlings collected from rivers. | 300 | 200 | 9 | |
| <i>Helostoma temminckii</i> (C.V.) | freshwater ponds | spawns in the ponds | 200 | 100 | 9 | |
| <i>Tilapia mossambica</i> Peters | .. freshwater ponds | spawns in the ponds | 200 | 100 | 9 | |
| <i>Trichogaster pectoralis</i> (Regan) | ricefields | spawns on the fields. | 110 | 70 | 5 | |
| <i>Trichogaster trichopterus</i> (Pall.) | ricefields | spawns on the fields. | 18 | 12 | 5 | |
| <i>Clarias batrachus</i> (L.) | .. ricefields | spawns on the fields. | 200 | 150 | 6 | |
| <i>Ophiocephalus striatus</i> Bl. | .. ricefields | spawns on the fields. | 400 | 250 | 6 | |
| <i>Oxyloetris marmoratus</i> Bl. | .. freshwater ponds | spawns in the ponds | 900 | | | |

Appendix 3

CURRENT STUDIES AND BIBLIOGRAPHY.

Studies in Progress :

1. Economic marine algae of Indonesia, Dr. J. S. Zaneveld, Laboratory for Marine Investigations, Pasar Ikan, Djakarta, Indonesia.
2. Marine algae of the Coral Reefs of the Bay of Batavia, Dr. Zaneveld.
3. Bibliography—Dr. Zaneveld.
4. Comparisons in the algal ecology of marine cut platforms in Australia and Great Britain—Professor Lily Newton, University College of Wales, Aberystwyth, and Mr. A. B. Cribb, C.S.I.R.O. Division of Fisheries, New South Wales, Australia.
5. Ecological studies on *Gracilaria confervoides*, in Australia—Professor Lily Newton, Mr. A. B. Cribb and Mr. E. J. Ferguson Wood.
6. Biology, ecology and survey of area of *Macrocystis pyrifera*—Mr. A. B. Cribb and Mr. L. H. Crosby, C.S.I.R.O. Division of Fisheries, Cronulla.
7. Ecology and taxonomy of South Australian seaweeds—Mr. Brian Womersley, University of Adelaide, South Australia.
8. Taxonomy and ecology of West Australian seaweeds—Mr. Gordon Smith, Botany Department, University of Western Australia, and Mr. Robert Royce, Herbarium, Perth, Western Australia.
9. Taxonomic and Physiological studies of New South Wales algae—Miss Vlasta Benes, Botany Department, University of Sydney.
10. Seasonal variation in the chemistry of *Macrocystis pyrifera* and *Durvillea*—Messrs. E. J. F. Wood and G. Grace, C.S.I.R.O., Cronulla.
11. Studies of *Digenia simplex*—Dr. D. V. Villadolid, Bureau of Fisheries, Manila.

Publications :—

1. The Charophyta of Malaysia and adjacent countries. *Blumea* 4 (1940-1-223, F. 1-21, maps 1-2 (English).
2. Is er plaats voor een agar-agar-industrie in Indonesia? *Econ. Weekbl. Indon.* 1948, 52 (1948) 1107-1108 (Dutch).
3. Is de zee een waterweestijn (Apakah lautan itu gurun air? *Visserijnieuws* (Berita Perikanan) 1 (1949) 13 (Dutch & Indonesian).

4. De economische betekenis van zeewieren en de mogelijkheid tot hun exploitatie in de Maleise Archipel.—*Chren. Naturae* 105 (1949) 1-8. (Dutch, with summary in English: the economic importance of seaweeds and their possible exploitation in the Malayan Archipelago).

5. Vangnetten in de natuur. (Djaring 'alam).—*Visserijnieuws* (Berita Perikanan) 1 (1949) 13-14 (Dutch & Indonesian).

6. The economic marine algae of Malaysia and their applications. I, Cyanophyta and Chlorophyta. I.P.F.C., *Proc.*, 1: 107-114.

7. Agar-agar.—*Visserijnieuws*, (Berita Perikanan) 2 (1950-42-43). (Dutch and Indonesian).

8. Naar de eilanden van de Radja-Ampatgroep.—*Vakbl. v. Biol.*, 30 (1950) 62969, map 1. (Dutch).

9. Drie eeuwen algologisch werk in Indonesia.—*Chren. Naturae* 106 (1950) 329-339, 3 figs. (Dutch)—in the press.

10. A review of three centuries of phycological work in Indonesia, 1850-1950.—(including an extensive Bibliography). *Organ. Sci. Research Publ.* 21 (1950). English—in the press.

11. Wood, E. J. F. (1941).—Agar-agar, a new potential industry in Australia, *Journ. Coun. Sci. Ind. Res.* 14 (221).

12. Wood, E. J. F. and Peddie, M. (1941). Harvesting of *Gracilaria confervoides*—*ibid.* (315-316).

13. Wood, E. J. F. (1942). Agar manufacture, *ibid.* 15 (1-5).

14. May, V. (1945). Studies on Aust. Algae I. *P.L.S., N.S.W.* 69 (220-228).

15. May, V. (1946). Studies on Aust. Mar. Algae II. *P.L.S., N.S.W.*, 70 (121-124).

16. May, V. (1945). Report on systematic work on red algae in Australia. *Journ., Coun. Sci. Ind. Res.* 18 (62-68).

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19. May, V. (1947). Algal genus *Gracilaria* in Australia. *Bull. C.S.I.R.* 235.

20. May, V. (1947). Studies on Aust. Mar. Algae III. *P.L.S., N.S.W.* 71 (5 & 6) 273-277.

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22. May, V. (1949). Studies on Mar. Algae V. *P.L.S., N.S.W.* 73 (196-262).

23. Womersley, H. B. S. (1947). The marine algae of Kangaroo Island. I. A general account of the algal ecology. *Trans., Roy. Soc. S. Aust.* 71 (2) 228-252.

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(Sd.) E. J. FERGUSON WOOD.

Chairman,

Sub-Committee on Seaweeds.

REPORT ON ALGAL RESEARCH IN JAPAN

FORWARDED BY S. C. A. P.

PART I

SUMMARY OF ALGAL RESEARCH*

SECTION 1: *Taxonomy.*

The classification of seaweeds is being done by Dr. Y. Yamada (Hokkaido University) and his colleagues. It includes the taxonomy and identification of Japanese species belonging to *Ectocarpus*, *Chordariales*, *Sargassum*, *Bangia*, *Porphyra*, *Gelidium*, *Grateloupia*, *Corallinaceae*, *Ceramium*, *Polysiphonia*, and also the freshwater algae belonging to the *Cyanophyceae*, *Conjugales*, *Charales*, etc.

SECTIONS 2 & 3: *Taxonomy and Ecology.*

In ecological studies, the chief subjects treated are: the research on seaweed associations in the tidal zone, studies on the oceanographical factors regulating the distribution of marine algae, and the ecology of *Zostera* areas.

In addition, the algal ecology of areas such as Oshoro Bay, Hokkaido, Mutsu Bay, Aomori Prefecture, Toyama Bay, Toyama Prefecture, Inland Sea of Seto and South Izu Islands are being studied.

SECTION 4: *Economic Aspects of Ecology and Propagation.*

In the study of aquatic plants, research on life history and ecological characters of useful weeds such as *Enteromorpha*, *Ulva*, *Monostroma*, *Chordariales*, *Porphyra*, *Gelidium*, *Gracilaria* is planned to get data for their propagation. Main interest

has been paid to the study of *Porphyra tenera* ("Asakusa nori"), *Gelidium amansii* ("Tengusa," Agar-agar).

SECTION 5: *Cytology.*

In the cytological field studies on the chromosome numbers, embryology, etc. of *Sargassum* are being made and their phylogenetic relationship is being considered.

SECTION 6: *Technology.*

The important points in the recent studies in this field are: (1) the study of alginic acid, especially the method of bleaching and refining without the loss of viscosity; (2) the application of high frequency heating and filtration methods.

Both studies have shown commercial possibilities.

Concerning agar-agar, mechanization of agar-agar production has been studied with emphasis on: (1) The optimum temperature and time during the process of refrigeration and drying and their effects on the quality; (2) method of boiling by high frequency heating, particularly minimum loss by pressure in the boiling kettle for agar-agar extraction and the effects on the quality.

The results from these studies are being translated into industry.

* Prepared by Fisheries Agency, Ministry of Agriculture and Forestry, Japanese Government, December, 1950.

PART II

LIST OF WORKERS AND SUBJECTS

| No. | Name of Researcher. | Research Institute. | Location. | Subject of Research. |
|-----------------------------|---------------------|--|--------------------------|---|
| <i>Section 1: Taxonomy.</i> | | | | |
| 1. | Yukio Yamada | Botanical Faculty, Science Dept., Hokkaido University. | Sapporo City, Hokkaido | Species of <i>Sargassum</i> in Japan and Formosa |
| 2. | Munenao Kuroki | Botanical Faculty, Science Dept., Hokkaido University. | Sapporo City, Hokkaido | <i>Ectocarpus</i> and its systematic allies in Hokkaido |
| 3. | Norio Segi | Fisheries Department, Mie University. | Tsu City, Mie Prefecture | <i>Polysiphonia</i> and <i>Gelidium</i> in Japan |
| 4. | Tsuyoshi Tanaka | Fisheries Department, Kagoshima University. | Kagoshima Prefecture | <i>Bangiales</i> in Japan; <i>Galaxaura</i> in Japan. |

| No. | Name of Researcher. | Research Institute. | Location. | Subject of Research. |
|---|-----------------------|--|---------------------------------------|---|
| 5. | Yoshikazu Okada | Fisheries Department, Kagoshima University. | Kagoshima Prefecture. | Taxonomy on the fresh water algae. |
| 6. | Kozo Iwamoto | Tokyo Fisheries University. | Kurihama, Kanagawa Prefecture. | Marine algae in Japan. |
| 7. | Sokichi Segawa | Fisheries Faculty, Agriculture Dept., Kyushu University. | Fukuoka City, Fukuoka Prefecture. | <i>Corallinaceae</i> in Japan. |
| 8. | Yoshio Sakai | Fisheries Faculty, Agriculture Dept., Hokkaido University. | Sapporo City, Hokkaido. | <i>Cladophora</i> and its systematic allies in Hokkaido. |
| 9. | Isamu Umezaki | Fisheries Faculty, Agriculture Dept., Kyoto University. | Maizuru City, Kyoto Prefecture. | Marine <i>Cyanophyceae</i> in Japan. |
| 10. | Hideo Kazaki | Tokyo Municipal University. | Meguro-ward, Tokyo | <i>Characeae</i> in Japan. |
| 11. | Yuichi Yoneda | Fisheries Faculty, Agriculture Dept., Kyoto University. | Maizuru City, Kyoto Prefecture | Taxonomy of fresh water algae. |
| 12. | Toshio Ei | Onahama Fisheries College. | Fukushima Prefecture | Seaweeds in waters off Onohama, Fukushima Pref. |
| 13. | Jun Tokita. | Fisheries Faculty, Agriculture Dept., Hokkaido University. | Sapporo City, Hokkaido. | Marine algae in Japan, especially those in cold waters. |
| <i>Section 2 : Taxonomy & Ecology.</i> | | | | |
| 14. | Yoshiteru Nakamura. | Seaweed Laboratory, Science Dept., Hokkaido University. | Muroran City, Hokkaido. | Studies on spore of Japanese species of <i>Ceramium</i> . |
| 15. | Hiroyuki Hirose. | Kobe University. | Kobe City, Hyogo Prefecture. | Taxonomy of fresh water algae, studies of female organ of <i>Dudrusnaye</i> . |
| 16. | Kanichi Inagaki. | Shimizugaoka College. | Muroran City, Hokkaido. | <i>Chordariales</i> from Japan, Grand cell of <i>Rhodophyceae</i> . |
| 17. | Hikoe Ohmi. | Fisheries Faculty, Agriculture Dept., Hokkaido University. | Sapporo City, Hokkaido. | Generation and development of spore of <i>Gracilaria</i> . |
| 18. | Katsutaro Oshima. | Toyama Gakugei (Liberal Art) University. | Toyama City, Toyama Pref. | No data available. |
| 19. | Yoshizo Ujiie. | Kagawa Gakugei (Liberal Art) University. | Takamatsu City, Kagawa Prefecture. | No data available. |
| 20. | Michiyasu Mori. | Yatsushiro College. | Yatsushiro City, Yamamoto Prefecture. | No data available. |
| <i>Section 3 : Ecology.</i> | | | | |
| 21. | Seiji Migita. | Fisheries Department, Nagasaki University. | Nagasaki City, Nagasaki Prefecture. | No data available. |
| 22. | Eiji Ogata. | Science & Engineering Dept., Biological Faculty, Osaka University. | Osaka City, Osaka Pref. | No data available. |
| 23. | Tetsuo Searashi. | Pedagogical Dept., Kanazawa University. | Kanazawa City, Kanazawa Prefecture. | No data available. |
| <i>Section 4 : Ecology and Propagation.</i> | | | | |
| 24. | Moritoshi Arazaki. | Fisheries Faculty, Agriculture Dept., Tokyo University. | Tokyo. | Ecology and Propagation of <i>Ulva</i> and <i>Enteromorpha</i> . |
| 25. | Toraichiro Kinoshita. | Fisheries Laboratory of Hokkaido Region. | Yoichi, Hokkaido. | Life history of <i>Porphyra</i> of Hokkaido. |

| No. | Name of Researcher. | Research Institute. | Location. | Subject of Research. |
|--------------------------------|-----------------------|---|---|---|
| 26. | Sangoro Shibuya. | Fisheries Laboratory of Hokkaido Region. | Yoichi, Hokkaido. | Life history of <i>Porphyra</i> of Hokkaido. |
| 27. | Hiroyuki Kumagaya. | Kushiro Branch, Hokkaido Fisheries Experimental Station. | Kushiro, Hokkaido. | Life history of <i>Porphyra</i> of Hokkaido. |
| 28. | Toraya Fujiyama. | Shin-maiko Experimental Stn., Fisheries Faculty, Agriculture Dept., Tokyo University. | Asahi-mura, Aichi Pref. | Female organ and Propagation of <i>Prasiola</i> . |
| 29. | Kazue Fujiyama. | Shin-maiko Experimental Stn., Fisheries Faculty, Agriculture Dept., Tokyo University. | Asahi mura, Aichi Pref. | No date available |
| 30. | Yoshio Hasegawa. | Hokkaido Fisheries Experimental Station. | Sapporo, Hokkaido. | Ecological study of "Hijiki" (<i>Turbinaria fusiformis</i>). |
| 31. | Hiroshi Kunieda. | Aoyama Gakuin University. | Minato-ward, Tokyo. | Ecology and propagation of <i>Porphyra</i> . |
| 32. | Minoru Katada. | Second Fisheries College. | Shimonoseki, Yamaguchi Prefecture. | Ecology and propagation of <i>Gelidium</i> and "Hijiki" (<i>Turbinaria fusiformis</i>). |
| 33. | Saburo Ueda. | Tokyo Fisheries University. | Kurihama, Kanagawa Prefecture. | Propagation of <i>Gelidium</i> , and life history of <i>Porphyra</i> . |
| 34. | Sudo Shunzo. | Fisheries Laboratory of Tokai Region. | Chuo-ward, Tokyo. | Studies of algal spore. |
| 35. | Koji Nozawa. | Fisheries Faculty, Agriculture Dept., Tokyo University. | Tokyo. | No data available. |
| 36. | Kaneko Masanosuke. | Individual. | C/- Fisheries Section, Kumamoto Pref. Office. | Ecology and propagation of <i>Porphyra</i> . |
| 37. | Takashi Kato. | Aichi Fisheries Experimental Stn. | Miya-machi, Aichi Pref. | Propagation of <i>Porphyra</i> by Heterooxine. |
| 38. | Takeo Kurakake. | Aichi Fisheries Experimental Stn. | Miya-machi, Aichi Pref. | Propagation of <i>Porphyra</i> by vegetable hormone. |
| 39. | Shigeru Sano. | Nagasaki Fisheries Exp. Station. | Nagasaki City, Nagasaki Prefecture. | Propagation of <i>Porphyra</i> . |
| <i>Section 5 : Cytology.</i> | | | | |
| 40. | Shumpei Ino. | Okayama University. | Okayama City, Okayama Prefecture. | Cytology of algae. |
| <i>Section 6 : Technology.</i> | | | | |
| 41. | Takeo Takahashi. | Second Engineering Dept., Tokyo University. | Chiba City, Chiba Pref. | Alginic acid production. |
| 42. | Tetsunosuke Yanagawa. | Doshisha University. | Kyoto City, Kyoto Pref. | Agar-agar manufacture. |
| 43. | Yoshio Kojima. | Tokyo Industrial University. | Meguro-ward, Tokyo. | Agar-agar manufacture. |

Prepared by Fisheries Agency, Ministry of Agriculture and Forestry, Japanese Government, December, 1950.

Appendix 4

REPORT OF THE SUB-COMMITTEE ON TAXONOMY

During the year under report attempts were made to continue the work on standardization of names of commercially important fishes of the Indo-Pacific area but not much progress has been made. The correspondence initiated during the previous year with the International Commission on Zoological Nomenclature was pursued but the working sheets and detailed information requested from the Secretary to the International Commission have not so far been received.

A field key for identification of Clupeoid fishes of India has been prepared by Sri R. V. Nair of the Central Marine Fisheries Research Station. This field key is now being scrutinized by specialists and it is proposed to circulate the key after it has been revised eventually to enlarge its scope and make it applicable to the whole area.

Preliminary work relating to the preparation of guides for identification in respect of planktonic copepods and planktonic diatoms have been initiated at the Central Marine Fisheries Station (India) and specialists in a few other groups have been contacted.

Pending reply from the International Commission on Zoological Nomenclature, it is recommended that steps may be taken to collect information on the names of such commercially important fishes of each member country as should be stabilized so as to communicate the consolidated list of the area to the International Commission on Zoological Nomenclature. It is for the consideration of Technical Committee No. I whether this should be presented as a definite resolution to the Council for adoption and communication to the respective member Governments.

N. K. PANIKKAR,

Chairman, Sub-Committee on Taxonomy.

B. REPORT OF THE COMMITTEE ON ITS MEETING ASSIGNMENTS

1. REPORT ON ASSIGNMENT NOTE NO. 23.

The Committee accepts and forwards for action by the Council, the following recommendations formulated by a Sub-Committee on GENERAL BIOLOGY consisting of Dr. N. K. Panikkar (*Chairman*), Mon. R. Serene (*Vice-Chairman*), and Mr. Tham Ah Kow.

Problem : To review the biological programmes in progress in the region and to recommend measures for the co-ordination and improvement of these programmes.

Papers : IPFC/C51/TECH 7, 27, 35, 36, 37, 38, 53, 63, 65 and 67.

Proposals : Considering the economic importance of *Scylla* (serrata) in various countries of S.E.A. collaboration be established between the workers of the different countries interested in the question.

The first objective should be the revision of the taxonomy of the genus based on a study of the morphological characteristics. Mr. Serene should receive all specimens which can be sent to him by the various countries to assist him in this study.

A plan of ecological study and bionomic factors of the different species could then be established, for example at the next Meeting of the Council. Similarly the Council wishes to be informed more fully of the experience of the Philippines in the culture of *Scylla*.

2. REPORT OF ASSIGNMENT NOTE NO. 6.

The Committee accepts and forwards for action by the Council, the following recommendations developed by a Sub-Committee on HYDROLOGY consisting of Mon. R. Serene (*Chairman*), Mr. Tham Ah Kow (*Vice-Chairman*), Mr. D. Rochford, Mr. P.Ch. Veen, Mr. Herbert Graham.

Problem : To review the hydrological programmes in progress in the region and to recommend measures for the co-ordination and improvement of these programmes.

Papers and general information IPFC/C51/TECH 5/6, IPFC/C51/11 and 22 Paragraph 5.

Proposals : (a) Reiteration of the need for Member Governments to collect surface salinity and

temperature data which could eventually furnish material for the preparation by the Secretariat of temperature and salinity surface Atlas.

(b) The Council is requested to distribute copies of IPFC/C51/11 which embodies useful information on oceanography of the Indo-Pacific region.

(c) That in view of the importance of estuarine and neritic waters in the fisheries of the Indo-Pacific area Member Governments be requested to encourage or develop hydro-biological investigation of these waters. In this connection, the simple methodology mentioned in IPFC/C51/TECH(P) 70 might easily be adopted even in member countries with limited specialised staff and facilities.

3. REPORT ON ASSIGNMENT NOTE No. 7.

Sub-Committee :—PLANKTOLOGY, Dr. K. F. Vaas (*Chairman*), Mr. K. Gopinath (*Vice-Chairman*), Mr. Tham Ah Kow, Mon. R. Serene, Mon. Blache and Mr. H. R. Rabanal.

The Sub-Committee coopted the following scientific workers for expert advice :

Dr. D. V. Bal.
Mr. K. Chidambaram.
Dr. Francisca Thivy.

Present Position : The Sub-Committee endorses the remarks made by the Secretary of the Council about the disappointing Status of programmes in this field and wishes to stress the need for intensive work on Planktology which is of fundamental importance to Fisheries.

Recommendations : The Sub-Committee feels that Plankton investigations should be considered under two separate major categories, viz., (1) Fresh water Plankton. (2) Marine Plankton.

(1) FRESH WATER PLANKTON :

(a) Recommends that the Chairman of the Sub-Committee may correspond with other workers on fresh water plankton in member countries particularly India and Cambodia with a view to formulating programmes of common interest to fisheries.

(b) Mr. Schuster may be requested kindly to give information regarding names and addresses of specialists in Europe who may be consulted on all matters relating to the subject.

(2) MARINE PLANKTON :

The Sub-Committee feels that in regions where little work has been done in this field, the programme

may be taken up in four progressive stages such as :

(a) Qualitative investigations : A systematic survey of all plankton organisms. The Council may obtain lists of specialists in various groups within the area as well as outside and ascertain from them if they are prepared to deal with materials from this region. It is also suggested that preference may be given to those specialists who may give priority to the subject.

(b) Semi-quantitative investigations : A rough survey of the distribution of plankton organisms through the twelve months of the year. Each member country may be requested to draw up a regular plankton calendar with particular emphasis on those groups of probable importance to Fisheries.

(c) Quantitative investigation : Studies on daily, seasonal and annual variations in plankton communities. On the basis of results from A & C, Committee I may formulate uniform methods of quantitative investigations at a subsequent stage in consultation with specialists.

(d) Plankton in relation to hydrology and Fisheries : A study of the exact relationship between hydrological factors and plankton intensity and the inter-relationships of plankton organisms among themselves as well as with important fishes. As this involves the cooperation of other Sub-Committees as well, Committee I may take up the matter when data under the above items become available.

4. REPORT ON ASSIGNMENT NOTE No. 9.

The Committee accepts and forwards for action by the Council, the following recommendations formulated by a Sub-Committee on TUNA FISHERIES consisting of Mr. O. E. Sette (*Chairman*), Dr. D. V. Villadolid (*Vice-Chairman*), Dr. H. Thompson and Mon. Tran Van Tri.

Problem : To formulate plans for co-ordinated study of the taxonomy of the Tuna in the region, the appraisal of the stocks of this group and the development of fisheries bearing upon them.

Papers and general information : IPFC/C51/TECH 17, 51 and IPFC/C51/22.

Proposals : That morphometric data on the Tuna species occurring in the area particularly around India and Ceylon should be collected by the Council from the institutions concerned and made available to the Tuna Sub-Committee.

5. REPORT ON ASSIGNMENT NOTE No. 10.

The Committee accepts and forwards for action by the Council, the following recommendations

formulated by a Sub-Committee on FISH CULTURE consisting of Mr. W. H. Schuster (*Chairman*), Dr. T. J. Job (*Vice-Chairman*), Mon. TranVan Tri, Mon. Lafont, Dr. Nazir Ahmad, Mr. Soong Min Kong, Mr. D. K. Villaluz.

Problem : To survey and appraise the fish cultural practices of the region, to survey the programmes of research concerning fish under cultivation and to propose measures for the co-ordination and improvement of such programmes.

Papers and information available : IPFC/C51/TECH 4, 9, 14, 20, 26, 29, 43, 45, 46, 58, 69, 73, 47 and IPFC/C51/22 Paragraph 3 and Appendix 2.

Proposals : In view of the fact that in all the Indo-Pacific countries fish culture in fresh and brackish waters has begun to be taken up actively for increasing food production and moreover since such fish culture without proper technical reference to the hydro-biological conditions of these waters is likely to lead to disappointing results, it is recommended that the Indo-Pacific Fisheries Council should invite the urgent attention of Member Governments to the initiation and/or intensification of necessary investigational programmes including the following items :—

- (1) Survey of cultivable waters,
- (2) Determination of the quality and quantity of fish food organisms in the different types of waters with reference to their physico-chemical conditions and the variations thereof,
- (3) Study of the feeding, breeding and growth of cultivable species,
- (4) Study of fish associations and the determination of the optimum densities of compatible combinations of different age groups for stocking operations,
- (5) Consideration of fish seed resources, their transport, and distribution.

6. REPORT ON ASSIGNMENT NOTE No. 11.

The Committee accepts and forwards for action by the Council, the following recommendations formulated by a Sub-Committee on PELAGIC NERITIC FISHERIES consisting of Dr. N. K. Panikkar (*Chair-*

man), Dr. J. D. F. Hardenberg (*Vice-Chairman*), Mon. J. Durand.

Problem : To survey the programmes of research bearing on Pelagic Neritic fish stocks.

Papers and general information : IPFC/C51/TECH 16, 31, 32, 33, 34, 41, 42, 44, 48 and IPFC/C51/22 Paragraph (2).

Proposals : That as a first priority, information on existing research programmes related to

- (1) *Rastrelliger kanagurta* and related species
- (2) *Sardinella* spp.
- (3) Other Clupeids and anchovies

be gathered by the Council from Member Governments and made available to the Sub-Committee.

7. REPORT ON ASSIGNMENT NOTE No. 12.

The Committee accepts and forwards for action by the Council, the following recommendations formulated by a Sub-Committee on TAXONOMY consisting of Mr. I. S. R. Munro (*Chairman*), Mr. C. J. Bianco (*Vice-Chairman*), Dr. J. D. F. Hardenberg, Mon. R. Serene and Mon. Marchad.

Problem : To survey the taxonomic work in progress in the region relating to fisheries and to propose measures for the utilisation of the results of such research in the prosecution of fisheries programmes especially by way of securing standardization of nomenclature.

Papers and general information : IPFC/C51/TECH 28, 49 and IPFC/C51/22 Paragraph (6).

Proposals :

- (1) That member countries make available any identification keys of local common fish species and their vernacular names. That such information should be given to the Sub-Committee on Taxonomy for the development of general field keys for the I.P.F.C.
- (2) That Dr. Panikkar be given approval to continue discussions with the Inter. Comm. Zool. Nomenclature regarding the standardization of the names of the fish of the I.P.F.C. area.

REPORTS OF TECHNICAL COMMITTEE II

A. REPORT OF THE COMMITTEE FOR 1950/51

The Technical Committee II for 1950/51 reports the following activities undertaken by and on behalf of the Committee in accordance with the Council's directions.

(1) *Statistics* : (a) General recommendation to member Governments. This recommendation was communicated to member Governments by the Secretariat. (b) Statistics working group: This group has met on several occasions. Its report is given as appendix hereto and should be read with the DRAFT STATEMENT OF THE STATISTICAL PROGRAMME which will be circulated as IPFC/C51/21.

(2) *Survey of Gear and Methods* : The Committee notes with gratification the number of papers dealing with questions of gear technology presented at the meeting. It draws particular attention to the papers concerned with classification of gear the preparation of which, at least in one case, was undertaken on the Committee's request as being required as a basis to systematic work in this subject.

It is to be noted that no decision was taken on the recommendation of the Committee at the last 2nd Council Meeting that a suitably qualified person should be selected to examine and collate the data on gear and methods forwarded by Member Governments.

A further recommendation on this subject proposed at the 2nd Meeting to the effect that "the Technical Committee should be asked to make a detailed recommendation as to how the material submitted should be collated, systematized and reduced into a useful form and what further material should be collected to make the survey complete" unfortunately was deferred at the Meeting.

(3) *Preservation of Gear* : Member Governments were circularized with respect to methods of preservation of gear. Replies have been received from five countries and Mr. Bienvenido Datingaling and Mr. Claro Martin of the Philippines have undertaken to collate the data supplied in answer to this request. Four members of the Committee have

indicated their agreement to the acceptance of this offer.

(4) *Introduction of Non-Indigenous Gear* : Member Governments were circularized with respect to their projects for the introduction of non-indigenous gear. Replies have been received from three countries. Mr. Porfirio R. Manacop and Santos B. Rasalan have undertaken to collate the data supplied in answer to this request. Four members of the Committee have indicated their concurrence with the acceptance of this offer.

(5) *Survey of Processing Methods* : Members of the Committee were circularized with a proposal from the Chairman that consideration should be given to surveying the methods of processing employed in the region. Attention was drawn to the Committee's recommendation, at the 2nd meeting, that "the Council's approach to its survey of existing industries, in various sections, should be on the following plan :—

- (i) Adoption of a classification.
- (ii) Adoption of a standard form of description.
- (iii) Agreement on methods of compilation, and assignment of responsibility for work.
- (iv) Agreement on mode and time of publication.
- (v) Formulation of possible future lines of research.

Concurrence with this proposal has been expressed by three members of the Committee while a fourth considers that the very most accomplishment to be expected this year is some tentative agreement on (1) adoption of a classification, and (2) adoption of a standard form of description. Through preliminary formulation by members of suggestions on these items, the Committee at the next meeting could then arrive at an agreement on the minor points of variance.

(6) It will be observed that the Committee has adhered to the plan of priorities which it proposed at the 2nd Meeting.

Appendix

REPORT OF WORKING GROUP ON STATISTICS

1. *Introduction* : The Council at its 2nd Meeting adopted a recommendation of Technical Committee II drawing the attention of Member Governments to the importance of statistical work in connection with fishery programmes and proposing that a working group, composed of representatives of India, France, and the United Kingdom, should consider the statistical methods to be employed. (See the *Proceedings* of the Council's 2nd Meeting, p. 18)

In accordance with this resolution the Secretariat, under direction of the Executive Committee, communicated with the Member Governments concerned, drawing their attention to the resolution and asking whether they could participate in a meeting such as proposed and suggesting Bangkok as venue. Unfortunately the Government of India was unable to send any person to participate and after extensive correspondence it was agreed that this work should be carried out in a series of Meetings which the Secretary could arrange. These meetings were as follows :

Singapore : France, U. K., Secretary, October 1950.
New Delhi : INDIA, Secretary, November 1950.
Phnom Penh : France, Secretary, 14th December 1950.
Bangkok : France, U. K., Secretary, January 1951.
Madras : U. K., India, Secretary, February 1951.

In addition, Officers of the Government of Malaya and Singapore held an informal meeting in Singapore on 27th October 1950. Furthermore, the notes of each meeting have been widely circulated and correspondence has been exchanged.

2. *Review of Problems of Fisheries Statistics in the Region* : The Working Party has, therefore, prepared a draft statement of the Statistical programme in which the need for and the difficulties besetting the collection of fishery statistics are explained. The urgency of action is clearly illustrated by the survey of statistical series available in the region. It should be noted, however, that little or no information is available in many cases as to the methods employed and the accuracy of such figures at the present juncture is, therefore, questionable.

It is realised that the collection of fisheries statistics is rendered difficult by the diffuse nature of the industry, by the paucity of points at which fish is concentrated, by the illiteracy of the operatives and by a general lack of real organisation in the

industry. Nevertheless, it is clear that the major obstacle to progress is the lack of trained personnel. It was agreed however to recommend to the Council that it should recommend to Member Governments that they should set, as an eventual objective, the establishment of a complete statistical service for fishing industries to provide for the collection of statistical data on every aspects of the fishing industries in order that they should be placed in possession of current information on the condition of the industries, its level of production and its factors of production.

To facilitate such a programme the working party strongly recommends that a Training School on Statistics be established forthwith, a detailed proposal regarding which is included as Annexure for this report.

To facilitate further the education of fisheries workers in statistical method it is recommended that a statistical handbook for fisheries workers be prepared forthwith. The Working Party submits for consideration the names of Dr. Sukhatme, Monsieur J. Royer and Dr. G. L. Kesteven as persons suitable to undertake this work.

Both these projects will require the assistance of workers already engaged in this field and it is, therefore, recommended that a special committee should be constituted with the following terms of reference :—

(1) The study and development of the application of statistical methods to fisheries work in general and to the study of the use of sampling methods in particular.

(2) The planning of a school in statistics and, if possible, the provision of personnel for such a school.

(3) Assistance in the preparation of a statistical handbook by the collection of data and/or reports of experience.

The Committee would also maintain a close liaison with the progress of the participants in the Statistical School after their return to their countries and would be available to advise on the method which should be adopted to meet the requirements of the area concerned. In furtherance of this it is recommended that the Statistical Committee should examine the question of preparing a recommendation to Member Governments as to their minimum immediate requirements in statistics and the methods which might be employed in meeting these requirements.

For clarity, the specific recommendations which the Working Party suggests might be considered by the Council are given below.

3. *Proposals*: (1) That a special committee should be constituted with the following terms of reference:—

- i. The study and development of the application of statistical methods of fisheries work in general and to the study of the use of sampling methods in fisheries work in particular.
- ii. The planning of a school in statistics and, if possible, the provision of personnel for such a school.
- iii. Assistance in the preparation of the statistical handbook.

(2) That a training school in statistics be established forthwith.

(3) That a statistical handbook for fisheries workers be prepared.

(4) That the special committee examine the question of preparing a recommendation to Member Governments as to their minimum immediate requirements in statistics and the methods which might be employed in meeting those requirements.

Annexure

Proposal for a Training School on Statistics.

It is suggested that the training school on statistics should be located as closely as possible to the site of the FAO Regional Office with the object of minimising administrative difficulties and to take advantage of such instruction as would be available there. It is also suggested that consideration be given to the possibility of giving instructions in both French and English. In the first instance this school should give instruction at a fairly low level for people who it would be expected in time develop their technical qualifications to enable them to assume direction of national statistics programme in fisheries. It is recommended that such participants should be drawn from the Fisheries departments, and it is recommended that the school should be developed on a plan which provides that these participants on their return to their countries, should develop the national programme of fisheries statistics under the guidance of the professional statis-

ticians of their countries and of the established fisheries workers. It is further recommended that in order to ensure that this general plan of the school would be the most effective, the fullest publicity should be given in appropriate quarters to the project. In addition, it is recommended that the Committee should maintain a close liaison with the progress of the participants after their return to their countries.

It is recommended that entrants to the school should be required to be able to speak, read, and write English or French, and that they should be in possession of the certificates of Senior Cambridge Examination or of its equivalent, and that it should be stipulated that as part of these they must have the following knowledge of Mathematics:—

Arithmetic: addition, subtraction, multiplication and division, fraction, decimal, the calculation of squares of number, and the square root.

Algebra: the rule of signs, factorization, binomial and non-binomial rules, resolution into factors and simplification of factors, linear equation and graphic representation and the solution of simultaneous equations.

Geometry: the elementary books of Euclid dealing with triangle and with the elementary properties of circles.

It is recommended that the curriculum should be along the following lines:—

1. Methods of collection: drafting tables and questionnaires, planning the collection programme including the use of sampling techniques, practical problems of field collection.
2. Methods of compilation: techniques of tabulation, graphing and use of machines.
3. Methods of analysis: fundamentals of statistical practice, estimation of measures of central location and of dispersion, correlation and regression analysis, index numbers.
4. Fisheries technology and biology: an account of the structure of the industries, a general account of elementary fisheries biology and a general account of the principles of fish processing with particular attention to the calculation of equivalent weights of fisheries products.

5. The application of statistics to fisheries work.

It is recommended that the School should be of six (6) weeks duration of which the first two (2) weeks and the last two (2) should be devoted to course work and the middle two (2) devoted to field work. It is recommended that the School should be financed on the basis that the student's own costs should be met by their Governments and there should be no tuition fees as such, that if possible technical assistance should be obtained to cover any

costs of providing the teaching staff and provision of instruction, accommodation and facilities. It is also recommended that in conducting the School the greatest possible use be made of field work for the study of local industries. It is recommended that the students would be required to bring to the School with them an essay giving a brief account of the structure of the fishing industry of the country area in which they are employed. Finally, it is recommended that the School should give a certificate or diploma.

B. REPORT OF THE COMMITTEE ON ITS MEETING ASSIGNMENTS

1. REPORT ON ASSIGNMENT NOTE 14.

Problem : To consider the scope of bibliographies to be prepared on behalf of the Council.

The Committee reports that the preparation of a complete fisheries bibliography for the area is likely to take a considerable time and it accordingly recommends that priority be given to the preparation of bibliographies of the following subjects:—

(1) Fishing Gear, its construction, operation and methods of preservation.

(2) Fisheries products and methods of Processing Fish.

(3) Marketing of Fisheries Products, fresh or processed.

The Committee recognizes, however, that limitations of staff might hinder the preparation of such bibliographies in countries where there is considerable published material. It is, accordingly, recommended that a complete bibliography be established for 1950 and subsequent years and that earlier publications be included as far as possible. The Committee recommends that the bibliography should, in any case, include the key references for the subject in question and should also list basic references, published within or without the region.

It is the opinion of the Committee that the references should be separately listed on standard cards (5" x 3") in a form similar to Annexure.

The Committee further recommends that sample cards suitable for this work be supplied by the Secretariat to Member Governments in order to obtain the maximum uniformity possible.

Annexure 1

Subject :

1. Author's Name (Surname first)
2. Year of Publication.
3. Title of Paper.
4. Name of Publication, Volume No. (in Arabic), Pages (giving inclusive numbers).
5. Place of Publication (in case of Books)

If desired a condensed abstract or digest of contents could be placed on the reverse of the card.

Example :

FISHING GEAR—OTTER TRAWL

Doe, John and Richard Roe (1950)

An experimental survey of otter trawling possibilities in Timbuctoo.

Journ. Cons., 10 : 21-97.

2. REPORT ON ASSIGNMENT NOTE 15

Problem : To survey the fishing gears in use in the region and to propose a codification of the description of such gears in relation to an analysis of their construction, operation, etc.

The Committee considered the papers listed in Assignment Note 15 and took special cognizance of the papers IPFC/C51/TECH 24, IPFC/C51/TECH (P) 71, and of the classification of gear as used in India, Philippines and Japan.

The Committee recommends a catalogue of fishing gear with a simplified key be prepared by

Mr. Burdon, Mr. Van Tri and Mr. Umali for preservation in a draft form at the 4th meeting of the Council. From such a catalogue it is hoped to develop regional and/or national handbooks for fishery workers in order to make the contents of the catalogues more readily assimilable to all workers. The Committee recommends that Member Governments should submit the published material or material in press on fishing gear directly to Mr. Burdon by 1st August 1951 or sooner if possible and thereafter on the date of publication. It is visualized that as each section of the report is complete in draft form, these sections will be sent to the appropriate Government for comment or revision with the request that the corrected drafts be returned promptly to Mr. Burdon. The Committee recommends that action be initiated on the preparation of a classification of fishing boats for which Dr. Gibson-Hill has already given a tentative outline (IPFC/C51/TECH 52). It is recommended that Dr. Gibson-Hill be approached to undertake this work.

The Committee feels that it has carried out the recommendations made by the Committee on Survey of Gear and Methods at the Second Annual Meeting held at Cronulla, Australia. In line with the latter's recommendations the Committee has

(a) suggested qualified persons to examine and collate data on fishing gear ;

(b) has suggested arrangements for the preparation of a catalogue of fishing gear ;

(c) has suggested action which is expected to lead to a report on the classification of fishing boats.

The Committee reviewed the Technical papers listed in Assignment Note 15 and expresses appreciation of the information which is made available. The Committee recommends that these papers be tabled.

List of papers :

IPFC/C51/TECH 2, 7, 11, 21, 24, 51, 52, 54, 64 & (P) 71.

3. REPORT ON ASSIGNMENT NOTE 16.

Problem: To survey the methods employed for the preservation of fishing gear in the region and to examine the possibilities of improving these methods.

The Committee reports that no papers on the PRESERVATION OF GEAR were received for the consideration of the Council at its present session. No work can be undertaken to collate the data already requested until replies are received from all Member Governments,

The Committee, therefore, proposes that the Council should recommend the following action :

- (i) The Member Governments whose replies are outstanding be asked to expedite the information.
- (ii) The Member Governments already working on the problem should continue their studies.
- (iii) The desirability of conducting such work should be indicated to Member Governments not at present engaged in projects of this nature.

4. REPORT ON ASSIGNMENT NOTE 17.

Problem: To survey the programmes which have been initiated and/or in progress for the introduction of non-indigenous fishing gear.

The Committee reports that one paper IPFC/C51/TECH 72 has been received and that from discussion in the Committee it is clear that Member Governments have/or are implementing programmes involving the INTRODUCTION OF NON-INDIGENOUS GEAR AND MECHANIZATION of the existing methods.

The Committee, therefore, suggests that the Council make the following recommendations :

- (i) The Member Governments who have carried out such work but who have not replied to the question be asked to do so as early as possible.
- (ii) Those Member Governments, now implementing such programmes, should be requested to make the details and results available to the Council as early as possible.

The Committee recommends that paper IPFC/C51/TECH 72 be tabled.

5. REPORT ON ASSIGNMENT NOTE 18.

The Committee approves and forwards for the action of the Council a report prepared by a sub-committee consisting of Mr. Venkataraman (INDIA), *Chairman*, Mr. Lemasson (France), Mr. Martin (Philippines)—(absent), Mr. Katamsi (Indonesia), Dr. Deason (U.S.A.) and Mr. Dom-Saveun (Cambodia) which considered the problem :

“To survey the methods employed in the region for the processing of fish and to examine the possibility of effecting improvement in such methods.”

(1) *The Technical papers*: Nos. 10, 12, 15, 42, 59 and 67 have been reviewed. Each of these papers reports on a subject of local technological investigation designed to improve the processing and promote the better utilization of the products considered. It is believed that since the papers are available in full or in abstract to the delegations formal presentation to the Council is not necessary. The variety of problems dealt with in the various papers denotes the need for accelerated and more diversified research by all Member Governments *in the field of processing in order to promote the optima utilization of the fishing resources and to promote the economic advancement of the fishing industry.*

(2) *Classification of Processed Fishery Products*: The need for a classification of processed fishery products as suggested in IPFC/C51/26 is recognized. However, the Committee felt that it could not present at this time such a classification scheme for consideration. It has been suggested that Monsieur Lafont of the Fisheries Research Institute, Phnom Penh, might be willing to undertake the preparation of such a classification scheme for consideration of the Council at its next meeting.

(3) *Processing Handbook*: The need for basic reference material on the processing facilities, methods and procedures suitable for use in the area is urgent. There are no general manuals or procedural guides pertinent to the entire area. Suggestions as to improved methods for the local manufacture of salt are very desirable. The Indian Member mentioned a handbook "The Preservation and Curing of Fish" by Sir F. A. Nicholson, published in Madras in 1930, which although very useful, is now out of print and needs to be brought up to date. The U.S.A. Member mentioned three manuals, one on canning of fish, one on curing of fish, and one specially prepared for use in the Philippines, copies of which will be furnished as soon as possible to a designated technologist in each Member Country. It is recommended that each designated technologist furnish for the guidance of a small working group to be appointed by the Council, his suggestions as to material which should be included in a handbook on fish processing for the area. This working group, it is hoped, may be able to prepare and present a suggested outline and form of the processing handbook for the consideration of the Council at its fourth meeting.

(4) *Bibliography*: On fish processing there should have been a fairly high priority in the preparation of bibliographies or specialized subjects to be undertaken by the Council.

(5) *Future lines of Research*: The Committee

believes that intensified research on the following problems is desirable, *inter alia*:

- (a) The causes of fish spoilage and development of preventive measures.
- (b) The evaluation of standards for quality of fresh fish.
- (c) The feasibility of greater use of ice and refrigeration in the Indo-Pacific Area.
- (d) The development of standards for processing of salt fish so as to ensure maximum keeping qualities, maximum palatability and minimum use of salt consistent therewith.
- (e) Research on utilization of offal and inedible products for the development of fishery by product industries.

6. REPORT ON ASSIGNMENT NOTE 19.

Subject: Socio-economic condition of the industry.

Problem: To survey the programmes in the region in connection with the socio-economic condition of the fishing industry and to consider whether recommendations may be made for the co-ordination and improvement of these programmes.

Proposals: The Committee fully recognises the importance of the social and economic conditions of the fishing industry in sustaining or increasing production. The Committee further recognises that these conditions include such specific requirements as proper financing, suitable loan or credit programmes and improvements in the health and welfare of the communities. The Committee is aware of the basis of the limited data available that many communities in the region are already facing extreme difficulty in maintaining even the present level of production because of financial indebtedness or the inability to repay those loans which are necessary for the purchase of gear and other non-capital requirements for seasonal operations.

In such cases these communities find it impossible to consider seriously the expansion of their activities through improvement of their present fishing methods, the introduction of non-indigenous gear or the improvement of facilities for handling, processing or making their catches.

The Committee further feels that, at this stage, the whole field of socio-economics is too wide for adequate treatment and recommends that an attack be made on the problem by a full discussion, by the Council, to be followed by urgent investigation into the question of indebtedness among fishermen. It is considered that this would constitute a primary

contribution towards the imperative need for raising the economic status of fishing communities throughout the whole of Indo-Pacific region.

It is suggested that the initial discussion and the subsequent investigations might follow these lines :—

- (1) Collection of appropriate data.
- (2) The analysis of such data to demonstrate the actual position in the different areas, its effect and its causes.
- (3) Existing methods of alleviation of indebtedness.

Recommendations :

The Committee recommends that, at the next meeting of the Council, this matter, namely indebtedness, should be the subject of a Symposium and further that Member Governments with experience in this field, should prepare technical papers on the various aspects of the problem so that a special committee on the subject will be in a position to formulate specific proposals for the consideration of the Council.

Papers :

In the opinion of the Committee the following documents should be tabled for the information of the delegates :—IPFC/C51/TECH 11, 18, 23.

It is considered that paper IPFC/C51/TECH 55 should be presented by the Vietnamese delegate for discussion.

Paper IPFC/C51/TECH 66—the Indian delegation has requested that this paper be withdrawn.

7. REPORT ON ASSIGNMENT NOTE 20.

The Committee accepts and forwards for action of the Council the following report developed by a Sub-Committee consisting of Mr. Chidambaram (India), Mr. Lemasson (France), Dr. Deason (U.S.A.), with Mr. Burdon (U.K.), Dr. Kesteven (Secretary) and Mr. Iyengar (India) as consultants, which considered the assigned problem :

“To examine the statistical programmes in the region and the possibility of making recommendations for the improvement of methods employed, especially by way of use of sampling methods when complete statistical survey is impossible.”

The following general observations are offered for the consideration of the Council :

- (1) *The Statistical Programme* (IPFC/C51/21) has been prepared in response to a request at the

Second Meeting of the Council, that representatives of India, Indo-China, and the United Kingdom be requested to prepare a scheme for the guidance of Member Governments. It is believed that the programme is an excellent guide for the organisation and conduct of statistical surveys and should receive the approval of the Council.

(2) *Status of Statistics in the Region* : The statistical coverage of the Fisheries of the area is most fragmentary and of unknown veracity. The collection of statistics is rendered difficult by (a) the diffuse nature of the industry, (b) the diversity of techniques and products, (c) the paucity of collecting points at which fish is concentrated, (d) the illiteracy of a large percentage of the operatives and (e) the general lack of organisation of the industry. In some areas the taxation of the producing industry in proportion to the fish caught occasions deception in reporting catches which not only results in a reporting of lesser quantities than actually caught, but also renders the statistics invalid since there can be no measure of the degree of deception.

There have been made attempts to overcome some of these difficulties as noted in Technical Papers 25, 30 and 68. Also Mr. Iyengar (India) has made an interesting beginning in a most difficult situation. The Committee recommends that the authors of the named papers and Mr. Iyengar be given an opportunity to present an oral digest of the problems with which they are dealing and the methods they are employing as a basis for discussion.

(3) *Statistical Training* : Not only does there appear to be a lack of trained statistical workers competent to collect, analyze and interpret basic production statistics, but also there appears to be a need within the area for the better assimilation by research workers generally of biometrical concepts, measures and procedures that will facilitate and improve the reliability of their research findings.

It is recommended that the Council approve the submission to Member Governments of a recommendation that they accept, as an eventual and essential objective, the establishment of a complete statistical service for fishing industries in order that they may be placed in possession of current information on the condition of the industries and its factors of production as a guide to successful administration, development and conservation.

In order to establish such statistical service, the Committee recognises the need for statistical training courses and recommends that the Council approve (a) the planning for the school in statistics, (b) approve the proposals of the working group as to statistical curriculum embodied in IPFC/C51/

26 Annexure C and (c) the early preparation of a statistical handbook as recommended at the 2nd Meeting of the Council.

(4) *Working Group* : The importance of statistics and statistical training within the area point to the necessity for the establishment of a small working group, consisting of Dr. Royer, Mr. Burdon, Dr. Sukhatme and Dr. Kesteven which will undertake to follow through in the foregoing recommendations. This working group should be authorised to utilize the services of such specialists consultants as it deemed necessary.

8. REPORT ON ASSIGNMENT NOTE No. 21.

Problem : "To consider a survey of the trade in processed fish in the region and to examine the possibility of recommending means of securing improvement in that trade."

The Committee approves and forwards for the action of the Council a report prepared by a Sub-Committee consisting of Mr. Venkataraman (India), *Chairman*, Mr. Lemasson (France), Mr. Martin (Philippines), Mr. Katamsi (Indonesia), Dr. Deason (U.S.A.), Mr. Ranganathan (India), Mr. Boon (Thailand), and Mr. Burdon (U.K.)

The reduced volume of trade in processed fish in the region compared with the pre-war period appears to be related directly to factors outside the purview of the Council such as shortage of foreign exchange, tariffs and import control restrictions.

Whatever action is taken to facilitate trade in non-indigenous fishery products on a short-term

basis, the ultimate necessity of self-sufficiency in producing subsistence requirements of fishery products within individual countries must be the primary objective.

Working group : It is recommended that a working group may be established with Mr. Lafont of the Fisheries Research Institute, Pnom Penh, Mr. Ranganathan (India), and a representative from U.K. for drafting a report on the trade in fish and fishery products in the Indo-Pacific region.

This working group may be permitted to utilize the services of such other persons as collaborators and consultants as they feel necessary.

Technical papers : No. 56 and 57 have been reviewed and may be tabled.

9. REPORT ON ASSIGNMENT NOTE No. 22.

Problem : Determination of availability and the facilitation of procurement of scientific equipment. The Committee considers that the problem of procurement of scientific equipment could be most satisfactorily overcome by the use of a central office to which enquiries regarding requirements of such equipment could be directed. This central office would circulate lists of the requirements to Member Governments who would be able to advise manufacturers in their countries accordingly. The Committee, therefore, recommends that this procedure be adopted and that the F.A.O. Regional Office be requested to undertake the work of collecting and circulating any information so received.

STATUS OF THE FISHING INDUSTRIES OF THE INDO-PACIFIC REGION

Throughout the region there are signs of increased interest in the fishing industry and its problems. Fishery departments are being developed and strengthened, programmes of research and development are being quickened and expanded. The operatives themselves are displaying initiative in the adoption of new methods. There are grounds, therefore, for expecting a gradual improvement in all aspects of the industry.

GENERAL REVIEW OF THE INDUSTRY.

The fisheries of the region are very diverse and include some which are highly developed and of considerable proportions. Fresh-water fisheries are important throughout the region, especially on the mainland, in China, Indochina (Cambodia), India and Pakistan. Fish-cultural operations of considerable magnitude are being carried on in China, Pakistan and India and it is clear that very substantial developments could be made in this field since there are manifold situations throughout the area where facilities for culture of fresh-water fishes are underutilized. Among the brackish water capture operations may be mentioned the extraordinary production of Bagan Si-api api in Sumatra and the fishery for *Hilsa* in India and Pakistan. The cultural operations based primarily on *Chanos chanos* are important in Formosa, Indonesia and the Philippines, and in the latter country opportunities for expansion are very considerable. The brackish-water culture in India and Pakistan based on mullets and *Lates* are of special interest and yield considerable quantities of fish.

The marine Fisheries are highly developed in the eastern sector, particularly Japan, China and Korea, including both intensive coastal fisheries and operations of much wider range, and in Japan extensive tuna fisheries are included. In the central sector (Indochina, Thailand and Malaya) large quantities of the *Rastrelliger* group are taken in the home waters and the same fish are the object of an important fishery on the west coast of Peninsular India. Another group of importance is *Stolephorus* which is the "bilis" of Malaya and is known under similar names in Hong Kong, the Philippines and Indochina. The Indian Oil sardine also permits, in certain years, a considerable fishery. In addition to such coastal operations there are some hand-lining and trawling operations in deeper waters.

These fisheries engage the attention of a considerable body of fishermen in full-time occupation

and of others for varying proportions of their time. The catch of commercial (or professional) operations are supplemented by a subsistence catch which, although as yet unassessed, is undoubtedly very considerable. In some localities the subsistence catch may exceed the commercial catch. The activities of these subsistence fishermen add greatly to the problem of making a statistical survey of the fisheries of the region.

The available published production figures (Table I) denote a total catch in the order of 8 million metric tons, of which about 33% is credited to China and 40% to Japan. However these figures must be treated with some reserve since there are grounds for suspecting that some contain no estimate of subsistence catches whilst in others attempts have been made to estimate and include the subsistence catch with considerable variation in the methods of estimation employed. It is likely that the total production figure is too low as an estimate of all fishing (commercial plus subsistence) and may be too high as an estimate of commercial operations alone.

The equipment which is employed in these fisheries is extremely varied, exploiting practically every possible means of taking fish. In large part local materials such as rattan and bamboo are used, especially for the construction of the numerous types of traps, but the region's requirements of made-up threads, hooks and other materials are considerable. Recent developments in mechanization have already established a demand, albeit small as yet, for mechanized craft and equipment. At present, the efficiency of the operations, in terms of production per man engaged, is low when compared with production in other countries, which, of course, cannot be construed in itself as an index of the operational efficiency of the manpower, or of the abundance of fish.

It is probable that more than 50% of the commercial catch of the region is processed to some degree; the most important method is salting and or drying, which is practised throughout the region. In Japan substantial quantities of fish and crustacea are canned, while in the central sector there is a considerable production of fish pastes and fish sauces.

Certain of the countries of the region had before the War, substantial quantities available for export, notably Japan, Indochina, Thailand, Pakistan and India; the principal importers were China,

the Philippines, Ceylon and Indonesia. In some of the exporting countries it is certain that the exported fish did not represent genuine spare surpluses; for instance India has one of the lowest total productions in relation to population and it is known that there are substantial deficit areas in that country. The pattern of fish trade within the region was relatively complex before the war and involved large quantities of dried fish and other products (see Table 2). The trade in fishery products is generally low at present because of currency regulations and shortages and because of tariff barriers and import restrictions.

Some estimates of the national income and the value of the total fish production are presented in Table 3 as an index to the relative position of the fishing industry in the region.

SITUATION IN 1949-50.

During 1950 the total production of the Japanese fishing industry approached 3,200,000 metric tons, an increase of about 75,000 metric tons over the 1949 production. During May 1950 Japanese fishing vessels were granted permission to extend their operations in that they were permitted to organize mothership-type tuna fishing operations in a limited area south of the area authorized by SCAP for all other Japanese fishing operations.

The Philippine fisheries appear to have maintained their trend toward recovery, having a total production in the order of 250 thousand metric tons in the fiscal year 1949-50, with an increase of 18% over the production of 1948-49.

Fishing from Hong Kong was good during the year and the market handlings, although affected somewhat by the political situation, continued an upward trend. It is possible that these results may be indicative of the prevailing natural conditions of the China coast fisheries at least in the South. A similar situation of steady increase in supplies was present in Singapore, despite the falling off in supplies drawn from the Indonesian fisheries.

Although no comprehensive statistics are available, there is evidence that no major change in the natural availability of fish took place in Indochina and Thailand during the year, but both countries are affected by the conditions which have interfered with the dried fish trade.

There is no information in respect of the Burmese fisheries.

The fisheries of India, Pakistan and Ceylon showed slight improvement over the previous year. The Indian mackerel and the oil sardine fisheries of Peninsular India have been on the down-swing of

one of the natural fluctuations in abundance which characterise those stocks in their relation to the local fishing operations. The 1949/50 fishing season showed only slight improvement over the previous year.

Australian production fell by 11% during the period, despite substantial increases in certain sections of the industry, notably in the cray-fish fishery.

The trade situation remained rather low throughout most parts of the region. The political situation in the northern eastern section has interfered with international movements of fish and fishery products and this has affected the movements of fish in and out of Hong Kong from adjacent Chinese territories and other places. In addition, increased tariffs on fishery products as well as import restrictions have affected the Philippine imports of American processed fish. The exports of dried fish and other products from Indochina and Thailand continued to be at the extremely low level which they have occupied since the war, and conversely the Indonesian imports of dried fish have continued to be low.

DEVELOPMENTS DURING 1949/50.

New Fisheries: From Australia it is reported that there have been successful trials of commercial tuna operations on the East Coast. In addition, Australia reports the discovery of new ocean prawn grounds, and the development of a small purse-lampara fishery for clupeoids in Victorian waters.

Gear Technology: Japanese mother-ship operations for the tuna fishery in equatorial waters met with success during the first cruise, landing 5,349,148 pounds of tuna through the use of 25 catcher vessels. Full information regarding the second expedition is not available, but reports indicate a lesser degree of success on this somewhat smaller scale operations. Similar undertakings with handline fishing on the west coast of Southern India are reported to have met with success.

The Japanese fishing industry since the war has been effecting restoration of its fishing fleets until they exceeded the number of vessels pre-war. In order to prevent depletion of stocks, the Japanese Diet passed a law to regulate the number of fishing vessels. Under this law, by September 1950, the East China Sea fleet had been reduced from 1,000 to about 700 vessels.

Substantial mechanization of fishing vessels has taken place, the mechanization of junks in Hong Kong being perhaps the most spectacular. Since the mechanization of a pair of junks in 1948, more than 60 vessels have been converted. This number

refers to the official register, and it is known that numerous other vessels have been converted without securing the necessary maritime sanction. From Indonesia, it is reported that ECA is to assist the Majang fishery by the purchase of 60 mechanized small craft and 100 engines. Mechanized craft have been added to the fishing fleets in other countries and the Governments of Ceylon, Singapore, Pakistan and India have definite plans for encouraging and assisting this development. In India, the Government of West Bengal has added to a number of Government operated mechanized craft by the importation of two vessels from Denmark. The Governments of Bombay and West Bengal have encouraged and assisted the introduction of motor launches for the transport of fish from catching centres to the markets of Bombay and Calcutta.

The Australian Government has prepared plans of standard pearling vessels and these have been made available to the industry. It is thought that a vessel of such improved design would contribute substantially to the development of this industry.

Technical Experts and Training : The Indian Government has assisted the importation of Japanese technicians to India and in addition Danes have been employed on contracts in connection with exploratory operations in West Bengal. Also, Indian students have been sent to Europe and America.

The United States programme of training 125 Filipinos in fishery techniques was completed in October 1950. During 1950, seven outstanding leaders in Japanese Government or industry were sent to the U. S. by SCAP for orientation in administrative, legislative, scientific, and technical fields of fisheries.

A number of Taiwanese were imported to the Philippines for the purposes of developing handline fishing operations. Kaopengers returned to Australia for the pearl fishery.

Of the two fisheries schools established by the Government of India for the training of Governmental staff in management, development and extension work, the one for marine fisheries at Mandapam was closed. The other school for training in Inland fisheries at Barrackpore continued working during the period under report.

Three experts have been requested from F.A.O. to aid the Pakistan Government in final planning of a fish harbour at Karachi. A site has been chosen and a rough plan already sketched.

Processing : The Japanese fishery food technology industry was surveyed during the year and reported by the Natural Resources Section of SCAP. It

was estimated that the Japanese production of vitamin oil during 1950 would be in the order of 4.7 million pounds, of which 1.9 million pounds were exported in the period January to May, 1950. Considerable quantities of shark liver oil were produced in India, mostly for internal consumption. It was reported that plans have been made for the importation to India of a capsule making plant for the shark liver oil factory at Calicut. A fish freezing and cold storage plant with a capacity of 300 tons, is likely to be in operation shortly at Bombay (India) and a new fish market, wholesale and retail, is also nearing completion there. Steps are being formulated to construct a cold storage plant and ice factory at the Karachi, Pakistan, fish harbour, and plans are being completed for the construction of a wholesale fish terminal in Bangkok, Thailand, with the assistance of the ECA. The experimental processing plant and refrigeration facilities operated in the Philippines by the United States Fish and Wildlife service were transferred to the Philippine Bureau of Fisheries during the first part of 1950 so that the latter organization is now equipped to carry on a research programme designed to develop and disseminate improved processing techniques. The State Government of Madras with the assistance of the Government of India, has resumed the supply of salt at subsidized rates for the processing of fish in Government fish curing yards. This has resulted in larger quantities of fish being cured under Governmental supervision.

In the canning field, Japanese fisheries expected to produce 100 to 120 thousand cases of canned crab, of which 82 thousand cases would be available for export. The Japanese pre-war crab canning industry produced about 600 thousand cases (each case of 48 No. 2 cans of 6½ oz.). In Australia it was reported in June that three canneries had ceased operations.

Marketing and Distribution : The marketing of fish in Sydney, Australia, was transferred to a board under the aegis of fishermen and other cooperatives. In Japan the price control of fish was lifted in April.

Fishery Management : As mentioned previously a reduction in the Japanese fleet operating in the East China Sea has been effected through the enactment of legislation by the Japanese Diet which permits the imposition of limitations on the number of fishing vessels in order to avoid over-exploitation and depletion of the resources. Studies in progress in the Philippines indicates that the intensity of trawling in the Manila Bay area had depleted the fishery resources and transfer of the vessels to other areas had become necessary in order that they might make profitable catches. The need thus is indicated for developing a balance between the fishing intensity and the capacity of the resource to repro-

duce and maintain its numbers. From Australia further warning was given of the overfishing of the trawling grounds of the East Coast.

Research: The programmes of research in the region received substantial impetus during the period. Reports have been received from all countries of the continuation of research activities and the development of new programmes. The scope of these programmes is indicated, in part, through the number and diversity of technical papers presented to the Council.

Particular attention should be directed to the intensity of investigations carried out in the eastern and oceanic sectors. The Research programmes of the U.S. Fish and Wildlife Service, based in Hawaii, continued a very important series of oceanographic and exploratory fishing cruises. These researches, which are at present confined to the Central Pacific (Line Islands and Phoenix Islands) will be extended in the future as far west as the Western Carolines and the Palaus. With the establishment of a civil government in the Pacific Trust Territory, the U.S. Fish and Wildlife Service will be called upon for research and administrative advice in the development and management of the fisheries.

The Australian Government report the results of its survey in northern waters of Australia. The research programme of the Philippine Bureau of Fisheries assumed the continuing phases of the research activities carried on by the U.S. Fish and

Wildlife Service from 1947 to mid-1950, and received by transfer equipment for oceanographic, bacteriological, biological, and other laboratories as well as 54-foot combination exploratory fish and research vessel, the *Jordan*.

Experimental fishing operations on a commercial basis for tuna in Fijian waters are reported to have resulted in failure.

In India, comprehensive programmes of biological research have been undertaken at the Marine and Inland Fisheries Research Stations of the Government of India and other research units of some of the State Governments. Research of fundamental academic nature is also being carried on at several Indian Universities. The charting of fishing grounds and other exploratory work was continued by the Government of India in the Arabian Sea and similar activities were initiated by the Government of West Bengal in the Bay of Bengal.

Progress was made in reorganizing the Japanese fishery research system in order to place greater emphasis on fish-population studies so as to prevent over-exploitation and insure a maximum sustained yield. Eight regional laboratories established as part of the reorganization were improved through the addition of facilities and personnel. Coordination was effected on research problems being conducted by various agencies on important fisheries such as sardines, skipjack, tuna, herring and the trawl fishery of the East China Sea.

Table 1. Fish Production in relation to population and Factors of production (approximate figures only)

| Country | Population '000s | Men '000s | Boats '000s | Production '000 Metric tons | Production tons per man engaged. | Kilograms per person in pop. |
|----------------------------|---------------------|--------------|----------------|-----------------------------------|--|------------------------------------|
| Australia | 7,700 | 17 | 5 | 36 | 2.11 | 5.2 |
| Burma | 17,000 | 44 | | | | 5 |
| Ceylon | 7,095 | 44 | 12 | 40 | 0.91 | 5.6 |
| China ¹ | 457,370 | | | | | |
| India | 342,105 | 390 | 70 | 2,700 | | 0.6 |
| Indochina | 27,000 | | | 531 | 1.36 | 1.5 |
| Indonesia | 76,360 | 258 | 25 | 266 | | 9.9 |
| Japan | 80,697 | 2,000 | | 472 | 1.83 | 6.2 |
| Korea | 28,200 | | | 3,180 | 1.09 | 39.8 |
| Pakistan | 73,321 | 200 | 17 | 250 | 1.25 | 3.4 |
| Philippines | 19,234 | | | 249 | | 13.1 |
| N. Borneo | 332 | | | | | |
| Sarawak | 550 | | | | | |
| Brunei | 41 | | | | | |
| Hong Kong | 1,800 | 58 | 4 | 52 | 0.89 | 32.6 |
| Taiwan | 6,126 ² | 170 | 20 | 57 | 0.34 | 9.3 |
| Thailand | 17,666 | 43 | 3 | 150 | 3.49 | 8.5 |
| Singapore | 964 | 5 | 2 | 2 | 0.42 | 2.1 |
| Malaya | 5,000 | 71 | 22 | 70 | 1.00 | 14.0 |

Not including Taiwan.

² 1947

The above figures are intended, except in the case of population, merely to give an indication of order of magnitude. They are grossly rounded from the original figures, some of which were drawn from official publications, others from official and semi-official reports.

Table 2. Imports and exports of fishing products for 20 Asian countries, pre-war and most recent year available.

| Country | | | | | | | Year | Total imports | Total exports. |
|--|----|----|----|----|----|----|----------------------|-----------------|----------------|
| | | | | | | | | Metric quintals | |
| Burma | .. | .. | .. | .. | .. | .. | 1938/39 ¹ | 106,276 | 18,384 |
| Ceylon | .. | .. | .. | .. | .. | .. | 1938 | 314,537 | 468 |
| | | | | | | | 1947 | 360,580 | 1,635 |
| China | .. | .. | .. | .. | .. | .. | 1938 | 580,703 | 83,131 |
| | | | | | | | 1940 | 749,625 | 77,030 |
| Formosa (Taiwan) | .. | .. | .. | .. | .. | .. | 1938 | 237,086 | 10,996 |
| Formosa (Taiwan), from Japanese territory. | .. | .. | .. | .. | .. | .. | 1938 | 268,494 | 50,838 |
| India/Pakistan | .. | .. | .. | .. | .. | .. | 1938/39 ¹ | 91,164 | 218,744 |
| | | | | | | | 1945/46 ¹ | 137,628 | 322,839 |
| Indochina | .. | .. | .. | .. | .. | .. | 1938 | 7,508 | 363,152 |
| (French) | .. | .. | .. | .. | .. | .. | 1948 | 16,700 | 49,760 |
| Indonesia ² | .. | .. | .. | .. | .. | .. | 1938 | 726,607 | 61,965 |
| | | | | | | | 1940 | 690,349 | 63,051 |
| Japan | .. | .. | .. | .. | .. | .. | 1938 | 139,948 | 2,135,227 |
| Macau | .. | .. | .. | .. | .. | .. | 1938 | 46,627 | 74,644 |
| Malaya | .. | .. | .. | .. | .. | .. | 1938 | 614,180 | 551,956 |
| | | | | | | | 1948 | 259,831 | 73,532 |
| Manchuria | .. | .. | .. | .. | .. | .. | 1937 | 767,328 | 11,024 |
| Philippines | .. | .. | .. | .. | .. | .. | 1938 | 166,991 | 6,132 |
| | | | | | | | 1946 | 213,525 | 12,917 |
| Portuguese India | .. | .. | .. | .. | .. | .. | 1939 | 173 | 9,026 |
| (Damao, Diu, Goa) | .. | .. | .. | .. | .. | .. | 1947 | 213 | 7,167 |
| Sarawak | .. | .. | .. | .. | .. | .. | 1938 | 14,953 | 4,159 |
| Portuguese Timor | .. | .. | .. | .. | .. | .. | 1938 | .. | 19 |
| Thailand (Siam) | .. | .. | .. | .. | .. | .. | 1938/39 ³ | 21,200 | 271,006 |
| | | | | | | | 1946 | 1,857 | 48,559 |

¹ 12-month period, 1 April to 31 March.² includes Java, Madura and Outer Provinces.³ for the year of 1938.⁴ for the year 1945.

Table 3. Estimates of fish production and national income (net national product) of a few countries in Asia and the Far East.

| Country | Year | Unit | Value of fish production | Net National product. | % |
|---------------------|---------|-----------------------|--------------------------|-----------------------|-------|
| Burma | 1946/47 | Million rupees | 48 | 2,385 | 2.0% |
| Ceylon | 1944 | Million rupees | 26 | 1,701 | 1.5% |
| China | 1933 | Million dollars | 176 | 19,946 | 0.9% |
| Hong Kong | | No estimate available | | | |
| India | 1946/47 | Million rupees | 150 | 55,800 | 0.3% |
| Indochina | | No estimate available | | | |
| Indonesia | 1938 | Million Guilders | Not available. | 2,766 | |
| Japan | 1948 | Million Yen | 18.85 | 1,907.2 | 1.0% |
| S. Korea | 1948 | Million Won | 3,577 | 692,428 | 0.5% |
| Malaya | | No estimate available | | | |
| Nepal | | No estimate available | | | |
| Pakistan | | No estimate available | | | |
| Philippines | 1948 | Million Pesos | 257 | 3,662 | 7.0% |
| Thailand | 1949 | Million Baht | 1,776 | 14,619 | 12.1% |

Sources :

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 Gupta's note on Estimate of National Income, Page 125.
China. *National Income of China, 1933* (in Chinese). Institute of Social Sciences, Academia Sinica, Nanking, January 1947, Vol. 1.
India. *National Income of the Indian Union Provinces, 1946/47.* Ministry of Commerce, Government of India, Page. 8.
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LIST OF PAPERS PRESENTED AT THE MEETING

WORKING PAPERS

(These were identified by the prefacing initials : IPFC/C51/).

1. Draft Agenda and Notes and List of IPFC Circular Letters.

1. Rev. 1. Agenda.
2. Statement of the 1951 Budget provided by F.A.O. for the I.P.F.C.
3. The Pacific Fishing Agreement—(For information).
4. The International Joint Commission on Oceanography.

5. List for the Distribution of the Council's Printed Proceedings.

6. Proposal concerning International Fishery Organizations.

7. Membership and Liaison with other Organizations.

8. Fishery Observers' Handbook.

9. Register of Projects, Institutions, Personnel and Vessels.

10. Sector and Specialised Bibliographies.

11. Japanese Hydrographic Data.

12. Council Correspondents.

13. Proposal for a subject for the Symposium for the Council's 4th Meeting.

14. Technical Instruction for the Fisheries Programme in the Indo-Pacific Region.

14. Add. 1. Seminars on Hydrology and on Brackish-water Fish Culture.

15. Secretary's Report on Credentials.

16. Pan Indian Science Congress.

17. Secretary's Report on the Financial affairs of the Council.

18. Secretary's Report of Work performed on Behalf of the Council by the Secretariat.

19. Fish Trade in the Indo-Pacific Region.

20. Problem of Procurement of Supplies and Equipment.

21. The Statistical Programme.

22. Report of Technical Committee I for 1950.

23. Status of the Fishing Industries of the Indo-Pacific Region.

23. Rev. 1. Status of the Fishing Industries of the Indo-Pacific Region.

24. Report of the Executive Committee.

25. Procedures at Council Meeting.

26. Report of Technical Committee II for 1950/51.

27. Publications

Papers IPFC/C51/28 to IPFC/C51/43, inclusive, contained the reports of the Technical Committees on their assignment notes, as presented here on pp. 35-37 and 41-45.

44. Report of the Committee on the Councils' Bibliographic Projects.

CONSTITUTIONAL PAPERS

IPFC/C51/Con 1. Proposal by the Government of India for Amendment of the Agreement to provide for Biennial Meetings.

TECHNICAL PAPERS

(These papers were identified by the prefacing initials : IPFC/C51/ TECH, with the further initial (P) where the paper was not precisely a technical communication but rather a general submission by a delegation.)

1S. A Training Programme in Fisheries by Marianne A. Abagon and Andres M. Mane.

2S. The Outlook of the Trawl Fishery in the Philippines by Porfirio R. Manacop.

3S. A Bibliography of Philippine Fisheries by Guillermo J. Blanco and Heraclio R. Montalban.

4S. Fish Farming in the Philippines by Domiciano K. Villaluz and Heraclio R. Montalban.

5S. The Thermal Structure of the Surface Waters off Western Philippines by Teodoro G. Megia and Alfonso R. Sebastian.

- 6S. Oceanography in the Philippines by Alfonso R. Sebastian.
- 7S. The Frame-Trawl (Kaladkad Pangbiya) Fishery of Laguna de Bay with an Analysis of the Composition of the Catch by Porfirio R. Manacop and Santiago Capco.
- 8S. The Life-History and Habits of the Goby, *Sicyopterus extraneus* Herre (Anga), Gobiidae, with an Account of the Goby-Fry Fishery of Cagayan River, Oriental Misamis Province, Mindanao, Philippines by Porfirio R. Manacop.
- 9S. The Rate of Lumut Production in Philippine Bangos Fish ponds by Herminio R. Rabanal, Ricardo S. Esguerra, Juan V. Lepez, Adolfo M. Aldana, Vivencio R. Ramos and Sergio S. Felix.
- 10S. The Studies on the Salt Concentration of Commercially Dried (Tuyo) and Smoked (Tinapa) Fish by Virgilio Uyenco, Pacita Rodriguez and Rafael Taruc.
- 11S. The Hasang Moderno, a Fish Corral used in Philippine Waters by Santos B. Rasalan.
- 12S. Utilization of some Philippine Fisheries Products by Antonio M. De Vera.
- 13S. A Study of Planktonic Algae in Philippine Bangos Fishponds by Richardo S. Esguerra.
- 14S. Lattice Methods of Oyster Culture by Deogracias V. Villadolid and Guilleromo L. Ablan.
- 15S. Proximate Chemical Composition of Various Species of Philippine Market Fishes by Jose I. Sulit, Olympia B. Navarro, Regina C. San Juan and Elisa A. Caldito.
- 16S. Spawning Habits of *Chanos chanos* (Forsskal) based on the Diameter Measurements of the Developing Ovarian Eggs by Daniel M. Bunag.
- 17S. Food of Philippine Tunas by Inocencio A. Ronquillo.
- (P) 18. An Act to amend and compile the Laws relating to Fish and Other Aquatic Resources of the Philippines Islands, and for Other Purposes.
19. Planning the Development of Asian Fishing Industries by G. L. Kesteven.
20. Notes on Pla-Kapong (*Lates Calcarifer* Bloch) Culturing in Thailand by Patna Yingthavern.
21. Indigenous Marine Fishing Gear of Thailand-Supplementary Notes by Swarnng Charernphol.
- (P) 22. Marseilles Colonial Institute Conference on Fishery Products in the Overseas French Union, 11-14 October, 1950.
23. L' Organization du Service des Peches du Cambodge by M. Dom-Saveun.
24. Consideration of the Classification of Fishing Gears and Methods by T. W. Burdon.
25. A pilot Statistical Study of a Fishing Community in Thailand by Winyu Chindaprasert.
- 27S. An Investigation of the River Godavari and the Effect of the Paper Mills Pollution at Rajahmundry by S. V. Ganapati and P. I. Chacko.
- 29S. Age and Growth of the Carp, *Labeo fimbriatus* (Block), as revealed by its Scales by P. I. Chacko and B. Krishnamurthi.
- 30S. A Survey of the Sea Fisheries of India by D. V. Bal and S. K. Banerji.
- 31S. Fish Population Studies along the Malabar Coast by B. S. Bhimachar and G. Venkatraman.
- 32S. Observations on the Biology and Embryology of Sharks of the Genus *Scoliodon* in Indian Seas by Miss Mary Samuel.
- 33S. A Contribution to the Biology of the Silver Belly, *Leiognathus splendens* (Cuv.) by H. L. Arora.
- 34S. A survey of the Flying Fish Fisheries on the East Coast of India during 1950 by D. V. Bal and S. K. Banerji.
- 35S. The Life History and Bionomics of an Indian Penaeid Prawn *Metapenaeus Dobsoni* Miers by M. Krishna Menon.
- 36S. Studies on the Growth of *Katylisia opima* (Gmelin) By K. Virabhadra Rao.
- 37S. The Biology of the Clam *Circe gibban* By Rajinder Kumar.
- 39S. Utilization of Seaweeds in India with a Note of some Properties of the Agars from Various Rhodophyceae of the Pamban Area by Francesca Thivy.
- 41S. The Influence of Surface Temperature on Fluctuations of the Mackerel Fishery *Rastrelliger kanagurta* Ruppel on the Calicut Coast by K. Chidambaram and C. G. Krishna Murthy.
- 44S. Studies on Life History, Bionomics and Fishery of the White sardine, *Kowala Coval* (Cuv) by R. Kelappan Nair.
- (P) 45. A proposal for considering the Problem of better Utilization and Management of Swampy Areas for production of fish by Nai Boon Indrambarya.
46. Preliminary Report on Air Transport of Live Fish in sealed cans under oxygen pressure by K. F. Vass.
- (P) 47. Working of the Fisheries Programmes by Member Governments of the Indo-Pacific Fisheries Council by Sri H. S. Rao.

48. Accustical Aspects of some Indonesian Fisheries by J. Westenberg.

49. Sur La Faune Ichthyologique du Laos par R. Serene.

50S. The Economic Marine Algae of Malaysia and their applications II, the Phaeophyta; III the Rhodophyta; Bibliographies and Index by J. S. Zaneveld.

51 Les Procèdes de Pêche au then des Vietnamiens de Nha Trang par MM. Nguyen Luong Khuon, R. Serene and M. Morechand.

52. A proposed system for Recording the kinds of Fishing Boats used in South and East Asia by C. A. Gibson-Hill.

53. Aperçu actuel sur la Richesse des Eaux douces du Cambodge par J. Goossens.

54. La Pêche au Filet sur le Grand Lac du Cambodge par B. Charpy.

55. A plan for the Ethnographical study of a Coastal Fishing Village of Central Vietnam by M. Morechand.

56. Sur l'interest des Cooperatives d'Achat et de vente des Produits de Pêche par M. Dom-Saveun.

57. Contrôle de la qualité des Poissons Sales—Seches par M. Lafont.

58. Pisciculture Au Cambodge par MM. Lafont & Saveun.

59. La Production de Poisson Sale-Seche du Grand Lac par Mon. R. Lafont.

60. A comparison of the Hydrological conditions of the Eastern & Western Coast of Australia by D. J. Rochford.

61. Sur l'Evolution Annuelle du Plancton de surface d'un Fleuve du Cambodge a Phnom Penh par Mon. J. Blache.

62. Données Biométriques sur *Thynnichthys thynnoides* (Blkr) Cyprinidae par J. Blache.

63. Les espèces du genre *Scylla* a Nha Trang (Vietnam) par R. Serene.

64. Etude Descriptive d'une Carrelet du Vietnam par Mon. Tran Van Tri et R. Serene.

65. Observations on the Life History, Bionomics & Fishery of the Gangetic Anchovy *Setipinna Phasa* (Hamilton) by S. Jones.

67S. Studies on Oysters & Clams. Biochemical variations by R. Venkataraman and S. T. Chari.

68S. Sample survey for estimation of total catch of Fish on the Malabar Coast by P. V. Sukhatme and K. Chidambaram.

(P)70. Statement on Marine Investigations in Malaya by Tham Ah Kow.

(P)71. An Attempt at Classification of Fishing Methods by Drs. C. J. Bottemane.

(P)72. Some Remarks on Trawl Fishing in the Tropics by Drs. C. J. Bottemane.

73. Fish Culture in Pakistan by Nazir Ahmad.

74S. Preliminary Observations on some Fishes in Karachi Waters and their probable migration by M. R. Qureshi.

(P)75. Approaches to Fishing Ports by S. B. Setna.

(P)76. Indebtedness among Fishermen by K. N. Anantaraman.

SYMPOSIUM PAPERS :

(These papers were identified by the prefacing initials : IPFC/C51/SYM).

1. A provisional survey on the Introduction and Transplantation of Fish throughout the Indo-Pacific Region by W. H. Schuster

2. Physiological Requirements of Eggs, Larvae and Fry during Transplantation by S. P. Basu.

3. Methods and problems of collecting Eggs and Fry for Transplantation with Emphasis on Milk Fish and other Fry collected from the sea and Estuarine waters in the Region by H. R. Rabanal.

4. The fitness of Ecological Niches into which Fish are introduced at various ages and the survival of the Transplanted Fish by Soong Min Kong.

6S. History of Transplantation and Introduction of Fishes in India by S. Jones & K. K. Sarojini.

7. Fish seed Industry in India by T. J. Job.

8. Response to Transplantation of Fishes in India with special reference to conditions of existence of carp fry by K. M. Alikunhi, Hiralal Chaudry & K. N. Ramachandran.

A summary was issued of almost all technical and symposium papers. Those numbers marked here with an 'S' were distributed only in summary. The missing numbers were assigned to papers which were withdrawn during the meeting.

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| <i>Member Government</i> | <i>Name</i> | <i>Designation</i> | <i>Address</i> |
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| <i>Ceylon.</i> | Hon. Sri Srivardene, (Delegate) | Parliamentary Secretary. | Ministry of Industry, Industrial Research and Fisheries, Colombo. |
| <i>France.</i> | Mon. J. Lemasson, (Delegate) | Conservateur des Eaux et Forests aux Colonies. | Direction des Eaux et Forests Service de la peche et de la Chasse en Indo-chine, Phnom Penh, Indo-Chine. |
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| | Mr. C. S. P. Varma, (Adviser) | Fisheries Officer. | Bihar. |
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