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AUSTRALIAN
MARINE SCIENCE



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No. 33

January 1971

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EDITORIAL

First may I extend sincere wishes for a successful New Year to all our members. With the advent of pollution legislation or environmental departments in most States and the Federal Office of the Environment starting up in 1971, employment prospects should improve. In fact the whole environmental bandwagon seems to be well and truly on the move, both in the political and the educational field. It would seem to behove A.M.S.A. members to assist this progress in all possible ways, both by using the Association as a voice and by taking part in local organisations.

The first Council meeting under our new President was held at the Australian Museum on November 5th. Present were the President, Secretary, Editor, Dr McIntyre (Publications Committee Chairman), Pat Dixon (Publications Editor), and Councillor Commodore A.H. Cooper. It was decided to hold the next Annual Conference in conjunction with A.N.Z.A.A.S., with our meetings taking place on May 21-22-23, 1971. A joint symposium with other societies or sections will also be held during A.N.Z.A.A.S. week, probably on some aspect of environmental studies. It was reported that the Electrode Handbook (No. 2) was nearing completion and should appear in the new year. A business manager to handle distribution and sale of handbooks may be appointed if current negotiations with one of the University Press agencies prove unsuccessful. Registration of the Bulletin for transmission through the post (greatly reducing our postage bill) was refused by the P.M.G. on various technicalities. However, it is hoped that minor changes in printing and two new clauses in the Constitution may overcome these objections.

Only one member responded to the suggestion made in the last Bulletin that titles of published works by members be listed. This practice is followed by the Australian Society for Limnology and our New Zealand counterparts. However, it seemed rather unfair to expose the one complying member all on his own, so his list will be held over until joined by others. Thank you anyway Ron.

A reminder to members. We can now print illustrations. How about some photographs of groups or activities or new ships and buildings?

B.S.N.

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STATEMENT OF RECEIPTS & EXPENSES

A.M.S.A. SYMPOSIUM — PARKVILLE 1970

RECEIPTS	\$	EXPENSES	\$
REGISTRATION FEES Conference (52x\$5, 1x\$4) Symposium (103x\$5, 7x\$3)	264.00 536.00	Hiring of "Science Centre" Facilities	207.75
MOTEL DEPOSITS	10.00	MOTEL DEPOSITS PAID	10.00
JANET CLARKE HALL Accommodation Deposits \$100.00 Bal. Payments \$260.00	360.00	JANET CLARKE HALL Accommodation A.M.S.A. Dinner Meals	390.00 237.00 249.00
A.M.S.A. Dinner 56x\$3.50 Meals & cut lunches 239x\$1	196.00 239.00	Wine 93.75 Ale 6.80	100.55
DINNER WINE SOLD * (see note below)	79.90	Bond Paper for Printing	130.54
Sale of Symposium Publications	35.00	Charter of bus for Field Excursion	54.00
		Morning & Afternoon Teas	16.74
		Paper cups & books of tickets	1.05
		BANK ACCOUNT CHARGES	
		Bank of N.S.W.	1.80
		Excess receipts over expenses	321.47
* WINE and ALE Purchases 100.55 Less Sales 79.90 Cost of Sherry Party 20.65	1719.90		1719.90

QUEEN'S FELLOWSHIPS IN MARINE SCIENCE

To commemorate the Royal Visit to Australia in 1970 the Australian Government established the Queen's Fellowships Scheme. Under this scheme up to five fellowships may be awarded each year for full-time research by young scientists of exceptional promise and proved capacity for original work. These awards are tenable at the Australian Institute of Marine Science, Townsville, an Australian university or approved research institution normally for two years. Tenure of a Fellowship is expected to commence within nine months of the announcement of the award.

QUALIFICATIONS: Queen's Fellows should have a Ph.D., or equivalent qualifications, or equivalent research or professional experience, in a discipline applicable in marine science.

Awards will, in general, be restricted to applicants who are not more than 30 years of age on the date when applications close.

* STIPEND \$7,000 (Australian) per annum — increased to \$7,500 per annum at age 28 years.

* ALLOWANCES are payable in respect of a Fellow's wife (\$500 p.a.), each dependent child (\$200), superannuation payments (up to 10 per cent of stipend), appropriate insurance coverage and necessary travel expenses. Host

institutions are paid an allowance towards the cost of setting up the fellow and his research work.

APPLICATIONS: Persons interested in applying for the above fellowships should obtain application forms and a statement of the conditions of award from the Secretary, Queen's Fellowships Committee, Department of Education and Science, P.O. Box 826, Canberra City, A.C.T. 2601, Australia; The Official Secretary, Australia House, Strand, London, W.C.2, England; or The Consul General, Australian Consulate General, 636 Fifth Avenue, New York 20, N.Y. 10020, U.S.A. Applications for the awards, which will be announced in JUNE 1971, close at the Canberra address on 28 FEBRUARY 1971.



LOCAL EVENTS

Consolidated Nucleonics Pty. held a seminar in Sydney on December 21st at which Mr Dale E. Well showed film and spoke. Mr Well is President of the Oceanic Institute of Hawaii which maintains the Sea Life Park and also markets underwater equipment as the Makai Range Corporation. Mr Well described the research work of the Institute and the development of underwater communications, earth-moving, vehicular and construction equipment. The films have been left in Australia and may be seen by arrangement with Mr John Holloway or Mr Alan Phillips of Consolidated Nucleonics.

The St. George Underwater Centre of 456 King Georges Road, Beverly Hills Sydney, are running a "Fotog Competition". Aspiring underwater shutterbugs may be interested to submit their works and compete for the \$50 and \$20 awards or the gold, silver and bronze medals. Closing date February 15th. Judging March 7th and announcement of awards, March 15th.

The Institute of Marine Sciences (University of N.S.W.) plans to hold a Symposium on Marine Science on August 16-17th, 1971. The four sections will be devoted to Marine biology and chemistry, Marine geophysics and geology, Physical oceanography and coastal engineering and Ship Facilities. Intending participants should contact Professor C.E. Wallington at Kensington.

Our sister society, The Australian Society for Limnology, will be holding its Annual Conference in Hobart from Friday 5th, to Monday 8th February, 1971. The annual dinner is on Saturday following an afternoon symposium on pollution. Interested parties should contact J.C. Wharton at Fisheries and Wildlife, 605 Flinders Street Extension, Melbourne, 3000. The Society is now represented on the Australian National Committee of the International Association for Water Pollution Research.

Australian National Committee for Oceanic Research

Overseas Visitors and New Appointments List nc 53/70

This list will be sent regularly to those on the distribution list. Recipients are requested to supply advance notice of impending visits of marine scientists whose calibre would be such as to make them potential seminar contributors. Information should be sent to the Executive Secretary, Australian Academy of Science, Gordon Street, Canberra City, A.C.T. 2601. It need not necessarily be complete, as it is believed that incomplete reports are better than none at all. The information will be listed in the following form:

Name of visitor, home institution and country, scientific field, dates of visit, host institution, principal local contact, other comments including itinerary of visit if known.

Information is also requested on new staff appointments to positions in marine science within Australia.

LIST No. 3 — August 1970

Dr. M.H.A. Keenleyside, Associate Professor of Zoology, the University of Western Ontario. Ethology of reef fishes. August 1970-July 1971. University of Queensland. Professor J.M. Thomson.

Dr. H.H. Harvey, Associate Professor of Zoology, the University of Toronto. Environmental Physiology of fishes. August 1970-July 1971. University of Queensland. Professor J.M. Thomson.

Dr. W.K. Patton, Associate Professor of Zoology, Ohio Wesleyan University. Symbiotic crustacea. July 1970-June, 1971. University of Queensland. Professor J.M. Thomson.

Professor W.H. Hildemann, Department of Medical Microbiology and Immunology, School of Medicine, The Center for the Health Sciences, University of California, March-September, 1971, James Cook University of North Queensland. Professor C. Burdon-Jones.

Dr. P.C. Young, previously working in Britain on fisheries helminthology has been appointed to CSIRO Division of Fisheries and Oceanography, Cronulla, to work on the biology of prawn stocks off the east coast of Australia.

A list of overseas marine scientists who will be attending the Twelfth Pacific Science Congress in Canberra from 18 August - 3 September, 1971, has previously been circulated.

1970 FISHING INDUSTRY CONFERENCE CONCLUDED

The following comments refer only to the conduct and organisation of the Conference which was organised by the W.A. Fisheries Conferences Standing Committee — a committee representing the University of Western Australia, the Australian Fishing Industry Council (W.A. Branch) and the Department of Fisheries and Fauna.

Talks given by the various speakers, together with illustrations and the discussions which followed, will be the subject of a special issue of F.I.N.S. to be published in November. *Editor.*

"*Gear Technology in Relation to Fish Finding*" was the theme of the 1970 Conference which was held in the No. 1 Arts Lecture Theatre at the University of Western Australia from August 28 - 30. Some 90 delegates, representing a wide section of the fishing industry, attended.

A greater number attended the 1968 Conference but many of the delegates on that occasion were scientists and technical officers who had attended the preceding 3-day Annual Meeting of the Australian Marine Sciences Association which had organised the Conference. The 1970 Conference was attended by a greater number of delegates from the fishing industry.

The Conference commenced with a dinner at University House on Friday evening, August 28, at which Professor C.J. Birkett Clews, Deputy Vice Chancellor of the University of W.A. was host. Mr. G.C. MacKinnon, Minister for Fisheries and Fauna was to have officially opened the Conference but, due to a sudden illness, was unable to attend. He requested Mr. B.K. Bowen, Director, Department of Fisheries and Fauna, to open the Conference on his behalf and to convey to all present his best wishes for a most pleasant and successful conference.

Mr. Bowen introduced the various speakers and paid special tribute to Simonsen Radio of Norway for their co-operation and courtesy in permitting and facilitating the attendance of Mr. H. Erlandsen, the principal speaker. While on a recent overseas visit Mr. Robins, the Department's Senior Research Officer, Development, had selected the principal speaker and appreciation was expressed for his choice of a speaker of such wide experience in the use of echo-sounding and sonar equipment and interpretation of echo traces coupled with the outstanding ability of being able to impart that knowledge.

Other speakers were Mr. S. Hynd, Principal Research Officer, Division of Fisheries and Oceanography, C.S.I.R.O., Cronulla; Mr. R. Boylen, Assistant Under Treasurer, Treasury Department; Mr. N. Swarbrick, Professional Fisherman, Albany; and Mr. J. Robins, Senior Research Officer (Development), Department of Fisheries and Fauna.

The two-day agenda covered the following topics:

- * Ultrasound in water
- * Transducer, The Ultrasound Beam
- * Location of Fishing Grounds
- * Some Economic Aspects of Future Fisheries Development in W.A.
- * Echo Sounder and Sounder Equipment
- * Interpretation of Echograms
- * Unexploited Fishery Potentials of W.A.
- * Discussion periods at the close of each session.
- * Displays of electronic equipment by:
 - Amalgamated Wireless (Australasia) Ltd.
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The Conference was judged to be successful because of the interest shown by all delegates, the discussions which took place during both the formal sessions and the tea/lunch breaks, and the many requests that similar and more conferences be held in the near future.

THE UNIVERSITY OF WESTERN AUSTRALIA MARINE SCIENCE CAMP, AUGUST 1970

During the August vacation a camp was held at Rockingham on Cockburn Sound in which students in Botany, Geography, Microbiology and Zoology participated. Following the actual camp, material collected and the data amassed were processed back in the laboratories. The camp was largely organised by a student committee and considerable assistance was received from Sheen Laboratories.

Industry already discharges a variety of wastes into the Sound and it is the intention of the Commonwealth Government to build a causeway (with two gaps in it) between Point Peron and Garden Island. The aim of the camp was therefore to make an assessment of the present position, to find out what effect, if any, existing discharges have on the fauna and flora, and to provide a baseline from which to monitor changes that may take place as the result of continued discharge and construction of the causeway.

A quantitative study was therefore made of a few organisms which it was thought would serve as indicator species of actual or future pollution. The organisms selected were: *Mytilus edulis planulatus* (with morphometrics and *B. coli* counts), simple ascidians, *Posidonia* and its many epiphytic algae. Distribution and abundance of these were studied by sampling at various points around the Sound, from places close to discharge points and places well away from any known source of pollution. Plankton hauls were made for zooplankton both in the Sound and outside for comparison. The geographers studied sediment transport along the beach using dyed sand.

Although this was necessarily a relatively small scale effort, a lot of valuable data was collected and this was reported and discussed at a final seminar. The objectives of the camp were achieved; we have both evidence of the effects produced by existing discharges and the baseline with which to compare future observations. When the present obsession with examinations and preparation for them is over, the results will be put into publishable form.

- E.P. Hodgkin.

NOTES FROM S.A. BRANCH

1. South Australia's first artificial reef was placed on Sunday 6th September last in St. Vincent Gulf. On the previous day about a hundred volunteer workers helped to bind old rubber tyres in bundles of ten, cut them to ensure

sinking and loaded them into a barge from which they were dumped about 2 miles off a metropolitan beach at a pre-determined site in 30 ft. of water. The project was organized by Mr. A.M. Olsen, supported by the Fisheries Department with assistance from skin divers and boating enthusiasts. It is planned to drop a further 7,000 tyres on the site during the next few weeks.

2. The South Australian Branch of A.M.S.A. met on 14th September. The meeting sent its good wishes to Reg Sprigg who is seriously ill in hospital with hepatitis and amoebic dysentery.

Prof. C. Manwell (Zoology Department of the University of Adelaide) discussed some aspects of pollution. Some of its effects may be unpredicted and far-reaching. A recent example is the reported impotence among farm workers due to absorption of pesticides (some members felt this was not such a bad thing from an over-population point of view providing they did not pass it on to the birds!)

As an aftermath of the Conference on pollution in Melbourne it was resolved that the Committee should prepare a summary of the Melbourne Conference and wait on the Premier to point out some of its more urgent findings.

NOVEMBER MEETING

3. Dr. Ruth Turner spoke about marine borers. Dr. Turner is recognized as a world authority on teredine borers and works at the Museum of Comparative Zoology, Harvard University. She was invited by C.S.I.R.O. to visit Australia and is examining the biology of marine borers in Australia.

4. Dr. Barry Fowler talked about the effects of nitrogen narcosis on divers, in connection with underwater habitats.

Barry, a South Australian, has just completed a Ph.D. at the Defence Research Establishment, Toronto, investigating effects of narcosis on memory. He has now been appointed to the Institute of Environmental Medicine, Philadelphia, where he will continue his studies in connection with the "Sealab" underwater living experiments.

S.A. Shepherd, State Convener.

DEPARTMENT OF AGRICULTURE
G.P.O. Box 192B
HOBART TASMANIA 7001

1st October, 1970

To the Editor,

I have recently returned from an overseas trip of five months in which I visited Japan, Scandinavia, United Kingdom, Canada and America, principally looking at shellfish culture. I also attended the FAO meeting on Purse Seining and Fishing Finding in Iceland and the ICES symposium on Stock Assessment and Recruitment in Denmark during July.

The laboratory is now functioning as it should after some initial troubles with the water intake system. It is anticipated that we will be appointing a new research officer this year and I propose that he will be taking charge of our scallop and oyster programmes. We have completed two pollution surveys during the year; one a fully comprehensive survey of an area off Burnie in connection with North-West Acid's sulphuric acid plant and the second a smaller programme, off Devonport in connection with APPM's plant at Wesley Vale. In collaboration with Professor Radok at the Horace Lamb Institute we have been releasing surface drift cards in the area and a monthly system to monitor currents, temperatures and salinity has been instituted with the co-operation of North West Acid.

The Division has recently made a very good 16mm movie film of rock lobster moulting which may be of interest to other AMSA members.

I am afraid that that is about all the news and I hope that when I get settled from my trip I will be able to organise some regular meetings for Tasmanian members of AMSA.

Best wishes,

A.J. Harrison, Marine Biologist.

OVERSEAS EVENTS

Second International Congress on the History of Oceanography; Challenger Expedition Centenary Edinburgh, 12-20 September, 1972

THIRD CIRCULAR

The Second International Congress on the History of Oceanography (the First Congress took place in Monaco in 1966) will be held in Edinburgh from 12 to 20 September inclusive, 1972, immediately following the Edinburgh International Festival of Music and Drama in that year.

Centenary celebrations in honour of the sailing of H.M.S. 'Challenger' on her historic oceanographical expedition, 1872-1876, will initiate the Congress which will be under the Honorary Presidency of His Royal Highness, Prince Philip, Duke of Edinburgh, who will be supported by a distinguished Committee of Patronage.

The Opening Assembly, on Tuesday, 12 September, 1971, in the Usher Hall, Lothian Road, Edinburgh, together with official opening speeches, will comprise four invited lectures on the Challenger Expedition, the history of its conception, its organisation, and its influence on subsequent progress in oceanography. Addresses will be given by Sir Maurice Yonge, Professor D. Merriman of the Bingham Oceanographic Laboratory, Dr. H.L. Burstyn of the Carnegie-Mellon University, Pittsburgh, and by Dr. A.E. Ritchie, Edinburgh. Places at the Opening Assembly which are not required for congress participants and guests will be made available to an invited audience including members of the general public.

Meetings on the six working days to follow, 13-15 and 18-20 September inclusive, will be held in the Appleton Tower of the University of Edinburgh, and will be devoted to summary addresses, by the authors, of their pre-printed papers, and to general discussions on these contributions. Between 60 and 100 papers may thus be presented. It is recommended that contributors should concern themselves particularly with the growth and progress of marine science, fitting modern advances into the perspective of developments from the earliest times. A wide range of topics is thus expected to be covered. Contributions, however, need not be confined to a single topic; papers which deal with general topics, overlapping two or more of the following Sections, will be welcome.

Programme Sections and their Conveners

1. The Sea Floor Dr S.E. Calvert
2. Ocean Circulation Dr J.C. Swallow
3. Deep-Sea Exploration & Research . Dr G.E.R. Deacon
4. Life in the Deep Oceans Dr J.A. Allen
5. Life in the Upper Layers Dr J.H. Fraser
6. Meteorology Prof. H. Charnock
7. Navigation & Cartography .. Rear-Adm. G.S. Ritchie
8. Physics & Chemistry Dr J.H. Steele
9. Fisheries Research Dr C.E. Lucas
10. Health & Survival at Sea : Sur. Rear-Adm. S. Miles

Offers of contributions should be submitted *as soon as possible* addressed to the Conveners of the Sections, as above,

at The Royal Society of Edinburgh, 22 George Street, Edinburgh, EH2 2PQ. Abstracts of the proposed contributions, not exceeding 500 words and in English, should be rendered to the above address not later than 31 March, 1971. An original copy of each accepted paper, in double-spaced typescript, with illustrations and ample margins, will be required not later than 31 October, 1971.

Visiting Oceanographic Research Ships

It is hoped that representative oceanographic research vessels may find it convenient to visit Edinburgh (the Port of Leith) during the period of the Congress. Advance intimation of the attendance of research ships, with any facilities that may be offered, will be appreciated.

Exhibitions

It is intended to mount exhibitions of relics of the Challenger Expedition — apparatus, photographs, log-books, note-books, original drawings and paintings — as well as of modern oceanographic instruments and equipment. The practical demonstration of modern gear on board visiting research vessels will be welcomed.

Social Functions and Excursions

An official Congress Reception for all participants and their associates will be held, probably on the evening of Tuesday, 12 September, 1972, in the Assembly Rooms, George Street, Edinburgh. Thereafter there will be receptions by Her Majesty's Government, the Corporation of the City of Edinburgh, the University of Edinburgh, and the Royal Society of Edinburgh on succeeding evenings except Thursday, 14 September, which will be free. Saturday and Sunday, 16 and 17 September, will be reserved for excursions, details of which, including costs, will be announced later.

Accommodation

Accommodation has been reserved at the Pollock Halls of Residence, University of Edinburgh. In addition, the Edinburgh Corporation Accommodation Bureau will be pleased to assist those participants who wish to stay in hotels or private guest houses.

Registration Fee

Active participants in the Congress, entitled to attend all sessions, exhibitions, and social functions, will pay a registration fee not exceeding fifteen pounds (£15). Each participant may be accompanied by one or more near relatives (husband, wife, son, daughter, brother, sister), with similar entitlements, at a fee of three pounds (£3) each. Bona fide students will be required to pay a registration fee of two pounds (£2).

Intimation of Attendance

All who expect or hope to attend the Congress are asked to indicate their interest.

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McGill University
MONTREAL

MARINE SCIENCES CENTRE

3rd November 1970

MEMORANDUM
TO ALL PROJECT LEADERS, SECTION PM/IBP

1. At the General Assembly of IBP in Rome, September-October 1970, the meeting of Theme Co-ordinators of Section PM recommended very strongly that a working Conference of Section PM should be organized in order to bring together as many Project Leaders as possible, to consolidate the work of the Section, to take stock of the progress made, and in general, to exchange information and to discuss future organization of the work around the three main themes which IBP/PM has developed; namely, Production, Pollution, and Exploitation. Assuming that funds can be obtained for travel and subsistence, the Working Conference is planned for October 1971 in Rome, in the FAO building. Dr. Mario Ruivo has offered the hospitality and facilities of FAO for the conference. It will be timed to follow the annual meeting of ICES so that travel expenses may be shared. The conference will probably require five full days of work. It is planned not as a formal presentation of results by the reading of papers, but as an assessment of achievement and a co-ordinated planning for work in the immediate future.

Three Workshops have been proposed:

—Production Mechanisms in the Sea.

—Sea Mammals.

—Man's Interference in Marine Production.

While formal papers are not planned, one of the important bases of the conference will be progress reports from Project Leaders. For this purpose, I am asking Project Leaders to prepare such progress reports, to be sent to me by May 1st, 1971, so that there will be time to organize them into groups and have them copied for the conference, and sent to Workshop Chairmen and Panels.

2. Could I also have from Project Leaders, as soon as possible, information on whether projects are still going, whether they have lapsed, or whether they have been completed? This will give me material to make an inventory of PM projects to up-date IBP News No. 18, March 1969.

3. Also, please send me references to any publications which have come out of your project. This list should include articles in scientific journals, articles contributed to IBP publications, and manuscript reports circulated.

4. I am at present engaged in attempting to raise about \$20,000 in order to defray expenses of the Working Conference. Naturally, the first source of travel funds, I hope, will be found within the member countries of IBP, in particular from the National Committees. The preparation of progress reports for presentation and use at the conference will no doubt make it easier for such funds to be obtained. Failing such funds, the money which I am now trying to raise will be used for participants' expenses, but it will by no means be possible to pay the expenses of all.

I look forward to hearing from you in the near future.

Best wishes.

M.J. Dunbar, Convenor, PM

Tropical Fish Culture Research Institute,
Batu Berendam, Malacca,
West Malaysia.

23rd October, 1970

The Tropical Fish Culture Research Institute, Batu Berendam, Malacca, Malaysia, will cease to function in its present form and under its present management on December 31, 1970. What happens after that date is still uncertain and it is not known whether any research will be continued in Malacca next year. There is a distinct possibility that moveable research facilities may be transferred elsewhere to a research institute which will be able and prepared to use them.

If research continues, either in Malacca or elsewhere, it is desirable that exchange of publications with other institutes should also continue. It is doubtful however if any of the present staff, including the Director will be remaining in Malacca. Reprints and journals sent by sea-mail take a long time to reach Malacca, and might easily go astray after the Institute is closed. To avoid this the following accommodation addresses have been proposed.

The Director, Dr. G.A. Prowse — he intends to continue his studies on the taxonomy of Malaysian desmids and other algae. In his possible new post he will also continue to be interested in all forms of fish culture, pollution and related subjects. Until his future address is known, reprints and publications should be sent to:

Dr. G.A. Prowse,
C/- R. Prowse,
45, Roe Green Close,
Hatfield, Herts, ENGLAND.

Dr. V.R.P. Sinha will continue his studies on fish pituitary hormones, possibly in Britain. Reprints and publications for him should be sent to:

Dr. V.R.P. Sinha,
C/- Dr. R.P. Sinha,
65 Hamilton Drive,
GLASGOW W.2, U.K.

Mr. Chen Foo Yan will be carrying out experiments on marine aquaculture, but will continue his interest in fish genetics. Until future notice his address will be:

Mr. Chen Foo Yan,
Primary Production Department,
Ministry of National Development,
National Development Building,
Maxwell Road, 7th Floor,
SINGAPORE 2.

Mr. Lee Chan Lui will probably be working on the culture of prawns, marine and freshwater, but will continue his studies on Zooplankton generally. Until further notice, reprints and publications for him should be sent to:

Mr. Lee Chan Lui,
C/- Mr. Lee Ten Fui,
19, Jalan Yahay,
Muar, Johore
WEST MALAYSIA.

All general publications for the Institute may be sent to:

The Secretaries,
Tropical Fish Culture Research Institute,
C/- Evvat & Co.,
P.O. Box 140, Malacca, WEST MALAYSIA

for forwarding.

All four scientists will of course notify correspondents of change of addresses.

I would as Director, like to thank all those correspondents who have assisted the Institute so much by exchange of

literatures, and in particular all those who have tried to save the Institute from the fate which is now overtaking it.
 (Dr. G.A. PROWSE) Director,
 Tropical Fish Culture Research Institute,
 Batu Berendam, Malacca, WEST MALAYSIA.

MEMBERSHIP

New South Wales	103
Queensland	48
Victoria	51
South Australia	44
Western Australia	34
Tasmania	11
Northern Territory	1
A.C.T.	13
New Zealand	5
T.P.N.G.	2

Ordinary and Associate	
Members	261
Student members	30
Corresponding members	27
Corporate members	16
	<hr/>
	334

In addition we have a mailing list, mainly university and state libraries, museums and research institutions totalling 34.

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South Africa	1
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United States of America	9

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NEW BOOKS

"Australian Crustaceans in Colour", by Anthony Healy and John Yaldwyn (A.H. & A.W. Reed). Yet another winner in the series of illustrated guides to our native flora and fauna put out by Reed. This book will inevitably have a more limited appeal than its predecessor "Australian Seashores in Colour" but maintains the high standard of illustration and text set in the latter. Some ten groups of crustacea are described and illustrated, both in colour plate and diagrams, and the text provides a running commentary, with details of distribution, anatomy, reproduction and mode of life. The text is couched in popular terms rather than scientific, and should appeal to amateur naturalists and school children. On the other hand, the illustrations are so clear that professional biologists could well find them an aid to identification in the field.

A recommended purchase for University and senior school libraries. \$3.95.

Incidentally, Reed have just put out their 1970-71 catalogue which lists not only the rest of the Colourbook Series but a wide variety of Australiana. Worth writing for a copy if you are building up a collection — (51 Whiting Street, Artarmon, 2064, or 357 Little Collins Street, Melbourne, 3000).

OVERSEAS PUBLICATIONS RECEIVED

"Marine Pollution Bulletin", 1, (6), June, 1970. Contains a thoughtful discussion by Dale Straughan entitled "Redressing the Balance on the Reef".

Intergovernmental Oceanographic Commission. "Comprehensive Outline of the Scope of the Long term and Expanded Programme of Oceanic Exploration and Research". (U.N.E.S.C.O., Place de Fontenoy, Paris, 7e., 1970). Rather heavy reading but important for deep sea oceanographers and administrators. Discusses ocean-atmosphere interaction, ocean circulation, variability, tsunamis, living resources, marine pollution, geology, geophysics and mineral resources, the Integrated Global Ocean Station System (IGOSS) and international investigations in specific regions.

LOCAL PUBLICATIONS RECEIVED

"Directory of Australian Limnologists, 1970". Compiled for the A.S.L. by G.W. Brand and K.F. Walker.

Australian Society for Limnology, Bulletin No. 3. Papers (or abstracts) presented at the A.S.L. 9th Annual Conference, Colac, Vic., 1970.

A.N.Z.A.A.S. Quaternary Shorelines Committee. Latest research on the quaternary shorelines of Australia and Papua-New Guinea. Also Circular 21, a literature review to July, 1970. E.D. Gill, Hon. Sec., National Museum of Victoria, Russell Street, Melbourne, 3000.

Conservation Education Digest. A.C.F., National Science Centre, Parkville, Vic., 3052. A valuable review of all activity in conservation education, from schools to Tech. Colleges to Universities. Includes aquatic studies. Obtainable on request from the A.C.F.

Australian Skindiving Annual 1971 (60c.) A miscellany of articles on underwater topics including diving at the Deal Island (Bass Strait) wrecks, Tryon Reef, Swains Reef, and around Sydney. Tips on close-up photography and Scuba safety.

Queensland Littoral Society Newsletter, Sept. - Oct. 1970. Leading article is by D.W. Connell on Water Pollution Control in Queensland. Contains review of all artificial reef projects conducted by the society.

Ibid, Nov. - Dec. 1970. Worth reading for R.H. Bradbury's stinging summary of AMSA 70.

Beach Protection Authority, Queensland. 2nd Annual Report, 1969 - 70. (S.G. Reid, Govt. Printer, Brisbane). Interesting summary for our members concerned with beach protection.

Technical Information leaflets from Esso Chemicals. Obtainable from the Esso Chemicals sales offices in each capital city. One deals with performance experience with Corexit 7664 on oil spills worldwide, mainly in 1968. Another is a technical report by G.P. Canevari on the physical chemistry of oil dispersant use in the sea with some reference to gelling agents and absorbents. The same author has also written a review of all toxicity experiments with Corexit 7664. Lastly a report on the development and performance of Corexit 7664. Valuable reading for those interested in oil pollution.

Petroleum Search in Australia. Petroleum Titles Map as at March 31st, 1970. Published by the Petroleum Information Bureau (Australia). Important reading for conservationists who want to be well informed on how the other side is progressing.



BIOLOGY OF THE INDIAN OCEAN

The symposium will consist mainly of presentations by invited speakers of reviews of research carried out during the International Indian Ocean Expedition, of the post-expedition examination of material, and of more recent investigations relevant to the aims of the IIOE. The intent is to summarize present knowledge of the biology of the Indian Ocean. The material being prepared for the Indian Ocean Atlases will be available for comment and discussion.

There will also be introductory reviews of the relevant meteorological, physico-chemical, and geological aspects of the Indian Ocean environment. The programme will provide ample opportunity for discussion not only of individual papers but also of the interaction between environmental and biological aspects. Informal sessions will be held to evaluate the scientific planning and performance of the IIOE and to consider the development of future co-ordinated work in the Indian Ocean.

During the five-day meeting, there will also be sessions for contributed papers, for each of which 10 minutes presentation and 5 minutes discussion will be allocated. All papers and discussion will be in English, and the Symposium is open to all interested scientists. Abstracts, including diagrams and tables, will be circulated.

Scientists wishing to contribute papers should communicate with Dr. G.F. Humphrey (CSIRO, Box 21 Cronulla, Sydney 2230, Australia). For accommodation and local arrangements please write to Symposium Office, Institut für Meereskunde 23 Kiel, Niemannsweg 11, Germany. Phone: (0431) 5 97 29 60, cable address: KIELSYMPOSIUM.

PROGRAMME AS OF DECEMBER 1, 1970

31 March 1971

- 09.00—09.20 Opening Ceremony
- 09.20—09.30 Change to lecture-room
- 09.30—09.40 Introduction
- 09.40—10.10 "Meteorology of the Indian Ocean" by Prof. C.S. Ramage, Honolulu.
- 10.10—10.25 Discussion
- 10.25—10.45 "Recent Satellite Studies" by Mr. D. Johnson, London.
- 10.45—10.55 Discussion
- 10.55—11.25 Tea/Coffee

- 11.25—12.10 "Physical Oceanography of the Indian Ocean" by Prof. K. Wyrski, Honolulu.
 12.10—12.25 Discussion
 12.25—12.40 Contributed Paper
 12.40—14.00 Lunch
 14.00—14.45 "Geochemistry-sedimentology of the Indian Ocean" by Prof. A.P. Lisitzin, Moscow.
 14.45—15.00 Discussion
 15.00—15.30 "Sedimentation in the Persian Gulf" by Prof. E. Seibold, Kiel.
 15.30—15.45 Discussion
 16.15—16.45 Summary Review of Environmental Studies by Prof. G. Dietrich, Kiel.
 16.45—18.00 General Discussion

1 April 1971

- 09.00—09.40 "Light and Nutrients in the Indian Ocean" by Dr. D.A. McGill, New London.
 09.40—10.00 Discussion
 10.00—10.40 "Primary Production in the Indian Ocean I" by Prof. J. Krey, Kiel.
 10.40—11.00 Discussion
 11.00—11.30 Tea/Coffee
 11.30—12.10 "Primary Production in the Indian Ocean II" by Prof. Y. Aruga, Tokyo.
 12.10—12.30 Discussion
 12.30—12.50 "Productivity of Backwaters and Estuaries" by Dr. S.Z. Qasim, Cochin.
 12.50—13.00 Discussion
 13.00—14.15 Lunch
 14.15—14.55 "Benthos of the Indian Ocean" by Dr. F. Pasternak, N.G. Vinogradova, M.N. Sokolova and A.A. Neyman, Moscow.
 14.55—15.15 Discussion
 15.15—16.00 Contributed Papers
 16.00—16.30 Tea/Coffee
 16.30—18.00 Contributed Papers

2 April 1971 Visits to laboratories and ships

3 April 1971

- 09.00—09.40 "Plankton Ecology of the World Ocean" by Prof. C.W. Beklemishev, and Dr. H.J. Semina, Moscow.
 09.40—10.00 Discussion
 10.00—10.40 "Phytoplankton Distribution in the Indian Ocean" by Dr. I.N. Sukhanova, Moscow.
 10.40—11.00 Discussion
 11.00—11.30 Tea/Coffee
 11.30—12.10 "Phytoplankton-Zooplankton Relationships" by Dr. D.H. Cushing, Lowestoft
 12.10—12.30 Discussion
 12.30—12.50 "Arabian Sea Upwelling" by Mr. R.I. Currie, Oban
 12.50—13.00 Discussion
 13.00—14.15 Lunch
 14.15—14.55 "Zooplankton Distribution in the Indian Ocean" by Dr. T.S.S. Rao, Cochin
 14.55—15.15 Discussion
 15.15—16.00 Contributed Papers
 16.00—16.30 Tea/Coffee
 16.30—18.00 Contributed Papers

4 April 1971 Excursions

5 April 1971

- 09.00—09.30 "Agulhas Bank Plankton" by Dr. A. de Decker Capetown
 09.30—09.45 Discussion

- 09.45—10.15 "Plankton Relations in the Red Sea, Persian Gulf & Arabian Sea" by Dr. B. Kimor, Haifa
 10.15—10.30 Discussion
 10.30—11.00 Tea/Coffee
 11.00—11.30 "Biological Characteristics of 110° E" by Mr. D.J. Tranter, Sydney
 11.30—11.45 Discussion
 11.45—12.15 "Plankton Distribution in the Continental Shelf Area" by Dr. S.M. Haq, Karachi
 12.15—12.30 Discussion
 12.30—14.00 Lunch
 14.00—14.30 "Distribution of Indian Ocean Euphausiids" by Dr. E. Brinton & K. Gopalkrishnam, La Jolla
 14.30—14.45 Discussion
 14.45—15.15 "Appendicularians from the Indian Ocean" by Dr. R. Fenaux, Villefranche-sur-Mer
 15.15—15.30 Discussion
 15.30—16.00 Tea/Coffee
 16.00—18.00 Contributed Papers

6 April 1971

- 09.00—09.45 "The Fisheries of the Indian Ocean" by Mr. J.C. Marr, Rome
 09.45—10.00 Discussion
 10.00—10.45 "Zoogeography of the Fish of the Indian Ocean" by Dr. D.M. Cohen, Washington
 10.45—11.00 Discussion
 11.00—11.30 Tea/Coffee
 11.30—12.00 "Fish Eggs and Larvae of the Indian Ocean" by Prof. T.S. Rass, Moscow
 12.00—12.15 Discussion
 12.15—12.45 "Demersal Resources of some Indian Ocean Areas" by Dr. A.S. Bogdanov, Moscow
 12.45—13.00 Discussion
 13.00—14.15 Lunch
 14.15—14.45 "Fish Ecology of the Red Sea and Persian Gulf" by Prof. H. Steinitz, Jerusalem
 14.45—15.00 Discussion
 15.00—15.30 "Tuna Fisheries of the Indian Ocean" by Dr. A. Suda, Shimizu
 15.30—15.45 Discussion
 16.15—18.00 Panel Discussion
 19.00 Symposium Dinner for all participants

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