

THE SOUTH PACIFIC ISLANDS FISHERIES NEWSLETTER

Nos. 3 & 4

Noumea, New Caledonia

March 1972

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EDITORIAL

The last months of 1971 saw many changes in the direction of SPIFDA activities and these are presented in pages 4 to 12 which reproduce the nucleus of the report of the second meeting of the Consultative Committee and a review of the current activities arising out of the recommendations of that Committee.

Mr Alan Tubb, who had the demanding task of setting up SPIFDA and advising on the initial studies undertaken by the consultants, left Noumea in August to take up another FAO post in Indonesia. Through this medium we send him our best wishes in his new post and we hope that he will keep in touch with his friends and contacts who appreciated his friendliness and devotion in the demands made on him as first Project Manager.

In August 1971 Professor F. Doumenge came to Noumea as Acting Project Manager; on 1 November his appointment was confirmed for the period of two years. Professor Doumenge holds the chair in Tropical Geography at the University of Montpellier, France, from which work he has been granted leave of absence to become a member of FAO and to undertake the duties of Project Manager, SPIFDA. Professor Doumenge is already well known in the South Pacific as he has had close ties with the region for over twelve years. In 1966 he published a work having as subject "Man in the South Pacific", being a study of acquired knowledge of the physical, human and economic problems of the South Pacific islands. His particular interest lies in the problems of fishing and marine culture in tropical waters. Professor Doumenge represented the territories of French Polynesia and the Condominium of the New Hebrides at the first meeting of the Consultative Committee in 1970.

SPIFDA reluctantly said goodbye to Val Hinds in December 1971. Val Hinds was serving with the South Pacific Commission as Fisheries Officer when SPIFDA came into being and he then combined his work for the SPC with the role of Co-Manager, SPIFDA. His stalwart and jovial figure was familiar to everyone connected with fishery in Micronesia, Malanesia and Polynesia. Combining a sound technical background with long experience of navigation and fishing techniques, Val Hinds' work was appreciated in those territories benefitting from his visits and advice. When Val Hinds left the post of SPC Fisheries Officer SPIFDA

simultaneously lost his services as Co-Manager which left the Agency bereft of staff. The post of Fisheries Officer to the SPC remains vacant but it is hoped a new appointment will be made in April or May after consultation between SPC and FAO.

Val Hinds' many friends will be pleased to hear of his new appointment as Deputy Director of the Fisheries Division in the Marine Department of the New Zealand Government, based in Wellington. We wish he and his family a happy and successful future and hope that he will find occasion to visit us.

On 26 February Mr Raoul Derijard arrived in Noumea to join SPIFDA for a period of seven months. A highly qualified marine biologist, experienced in running marine culture laboratories and experimental farms, he will be responsible for setting up and management of the experimental station at the Baie de Saint-Vincent in New Caledonia, which is described on page 13 of the Newsletter. The next issue will give a full description of this project and, too, of the mariculture station being established at Koror, of which you will find a description on pages 14 and 15.

The latter project is fortunate in acquiring the services of Mr Clyde Sayce who it is hoped will be available at the beginning of May to act as consultant for a year, taking leave of absence from his post with the Department of Fisheries in Washington, U.S.A. One of the highest qualified oyster biologists, he has frequently visited Japan to inspect consignments of spat destined for the Pacific coast of America and he has also assisted in the organisation and development of many private oyster farming ventures.

SPIFDA also anticipates welcoming in early June Mr R.H. Baird, of FAO, who worked for some years at Conway Laboratory in Wales and who until March of this year was working on a FAO/UNDP project in British Honduras. Mr Baird is a biologist specialised in the culture of oysters and mussels and his expertise will be of inestimable value in advising on the work to be undertaken at the Baie Saint-Vincent and also on the extension of the work of this station which it is hoped to establish in Fiji.

It is hoped that final confirmation of dates and venue for the next meeting of the Consultative Committee can be given in the next issue of the Newsletter, already in course of preparation. It will be held during either the last week of July or the first week of August, following on the SPC's Fifth Technical Meeting on Fisheries. At last year's meeting of the Consultative Committee hope was expressed that these meetings might be held in Papeete, Tahiti, but if this is not possible, they will be held in Noumea.

* * *

Extract of the report of the

SECOND MEETING OF THE CONSULTATIVE COMMITTEE

Noumea, New Caledonia

18 - 22 October 1971

Introduction

At the request of the Secretary-General, South Pacific Commission, and in accordance with the Plan of Operations which requires that intervals between meetings should not exceed twelve months, the Second Meeting of the SPIFDA Consultative Committee was convened at SPC headquarters, Noumea, on Monday, 18 October 1971.

Members representing the Territories were: Dr S. Swerdloff (American Samoa), Dr. B. White (Cook Islands), Mr J.S. Manikiam (Fiji), MM. Stein, Ellacott and Siu (French Polynesia), Mr S. Rawlins (Gilbert and Ellice Islands), MM. Sauvée, Guerlain and Boyer (New Caledonia), Mr B. Sorin (New Hebrides), Mr G.K. Graham (Papua/New Guinea), Mr W.W. Mauck (Tonga), Mr P. Wilson (TTPI) and Mr W. Travis (Western Samoa).

Also attending as Consultative Committee members were: Mr H. Winsor (FAO), Mr M. Priestley (UNDP), Mr A. Harris (SPC) and Professor F. Doumenge and Mr V.T. Hinds (respectively SPIFDA Project Manager and Co-Manager).

SPIFDA consultants attending were: Dr D.K. Villaluz (Philippines) and Mr J. Fyson (Fiji).

The Government of France was represented by Mr J. Emond.

Mr P. Logan (US Peace Corps, Fiji) and Dr C. Nash (Oceanic Institute, Hawaii) were present as observers.

The meeting was brought to order by Mr P. Wilson, Chairman of the First Meeting of the Consultative Committee, who briefly commented on the progress of SPIFDA during the past year and then introduced the Acting Secretary-General of the South Pacific Commission, Mr John E. deYoung, who made the opening address.

Mr W. Travis was unanimously elected Chairman (proposed by Dr B. White and seconded by Dr S. Swerdloff. Dr Swerdloff was elected Vice President (proposed by Mr. Wilson and seconded by Mr. S. Rawlins). A Drafting Committee was appointed consisting of -

	Mr V.T. Hinds	SPIFDA Co-Manager, Noumea
assisted by	Dr B. White	Cook Islands
	Mr P. Wilson	TTPI
and	Mr P. Siu	French Polynesia

Following adoption of the proposed Agenda, the Project Manager's report was reviewed and the critical financial state of the Agency emphasized. It was pointed out that there was a need for concentration of a small number of experts in a few places for longer periods of time as it was obvious, in the light of the first year's operations, that SPIFDA would not be able to operate in all territories and in all disciplines at the same time.

The Project Manager emphasized the need for completing certain projects successfully to secure a sound foundation for the future of the Agency. In order that this might be achieved he recommended the establishment of certain projects including

1. the demonstration of new and improved fishing techniques in mangrove areas and the harvesting of under-developed resources;
2. the establishment of one or more pilot farms for the cultivation of Macrobrachium;
3. the establishment of pilot experimental mari-culture farms in Koror and New Caledonia.

Considerable emphasis was placed on the selection of suitable projects to be presented in order of priority to ensure the sympathetic consideration of the funding agencies.

Consultants and experts

The Consultative Committee expressed its appreciation of the service provided to SPIFDA by the various consultants and experts who had visited the area under the auspices of SPIFDA. The Consultative Committee also appreciated the presence at the meeting of Dr D.K. Villaluz, consultant on aquaculture, and Mr J. Fyson, boatbuilding consultant. The Committee also noted that efforts had been made to have other consultants attend the meeting.

The Consultative Committee also expressed its appreciation for the reports and recommendations received from consultants, which were of great value in considering the future work programme of SPIFDA. The Committee noted, however, that reports were not yet available from some of the consultants and recommended that action be taken to speed up the circulation of such reports to ensure that they could be given full consideration well before the next meeting of the Consultative Committee.

Aquaculture projects

The Consultative Committee discussed the various proposals. Various amendments were made and the final recommendations were as follows:

The Consultative Committee,

BELIEVING that one of the main requirements of fisheries development being the introduction of skilled techniques in the application of aquaculture and

RECOGNISING the lack of such scientific and technical skills in the SPIFDA region,

RECOMMENDS after due consideration and establishment of priorities that SPIFDA implement - with the help of the funding agencies -

A coastal aquaculture demonstration centre at St. Vincent Bay, New Caledonia	US \$ 100,000
A marine culture demonstration centre at Koror in the Palau Islands, TTPI	US \$ 100,000
A demonstration centre in French Polynesia for controlled high-density reproduction and rearing of giant fresh-water prawns (<u>Macrobrachium</u>)	US \$ 90,000
Coastal fisheries in mangrove channels and sandy muddy beds	US \$ 14,750
TOTAL	US \$ 304,750

N.B. The Project Manager and experts attached to these projects to be available to travel to other territories to advise on, and assist in, implementation of related projects on request by the various territories.

Bêche-de-mer project

The proposal for the bêche-de-mer project was read by Mr Wilson (TTPI) and, after a short discussion and minor revision, was accepted by the Consultative Committee.

The Consultative Committee,

BELIEVING that the bêche-de-mer project offers the prospect of immediate practical application to the economy of territories and, in particular, to the more remote areas,

RECOGNISING the value of the advice of the consultant and

NOTING that the species of commercial importance have been identified, underwater pictures taken of the animals in their natural habitat the promising markets identified,

RECOMMENDS that SPIFDA -

1. Immediately engage the services of an experienced processing and marketing technician, as an essential follow-up to the survey to bring this project to an early and successful conclusion, to conduct a training tour of interested territories, in particular Cook Islands, French Polynesia, Gilbert and Ellice Islands, New Hebrides, Papua/New Guinea, Tonga and Trust Territory of the Pacific Islands.

The Consultative Committee,

NOTING the need for the preparation of an illustrated handbook on the identification, processing and marketing of bêche-de-mer,
RECOMMENDS further that SPIFDA -

2. Publish such a handbook, illustrated with photographs and descriptions of
 - a) the commercially important species as they appear underwater to the fisherman;
 - b) all steps of processing the various species;
 - c) the markets and approximate selling price of the various species of commercial importance.
3. To thus complete this project adopt a budget of US \$ 35,000.

Marine turtle project

The Consultative Committee discussed the proposed project and, having taken into account the advice of the two turtle experts and made one major amendment, the submitted proposal was accepted.

The Consultative Committee,

BELIEVING that turtles constitute an important but endangered resource in the South Pacific region and
RECOGNISING that little background material is available for wise management of this resource,
RECOMMENDS that SPIFDA -

1. Arrange, by contract, for a turtle investigator to compile and produce a "Basic Field Guide for Marine Turtle Management" which should include sections on
 - a) identification
 - b) life history
 - c) field study techniques
 - d) population management
 - e) rearing
2. Initiate a comprehensive turtle-tagging programme in selected territories.
3. Arrange that pertinent turtle information, both from territorial and outside sources, be compiled, summarised and circulated to the territories, utilising the existing framework of the SPC Intelligence Service.
4. To achieve this adopt a budget of US \$ 2,700.

Fishing boat project

Discussion followed presentation of the sub-committee's proposals; after considerable amendment from the floor the following was agreed.

The Consultative Committee,

RECOGNISING that the provision of suitable designs and vessels is essential to the successful development of the fisheries of the region and that suitable craft do not exist in many of the territories

CONSIDERS THAT until such time as suitable vessels are designed and built the development of territorial fisheries will be delayed

COMMENDS the work of John Fyson to date but recognises the need for additional assistance in order to meet the varied needs of the territories within the shortest possible time and therefore

RECOMMENDS that SPIFDA -

1. Develop designs, based on territorial fisheries' requirements, of several classes of fishing vessel including
 - a) a 28 - 36 foot semi-displacement day-boat
 - b) a 35-- 40 foot general purpose ferro-cement displacement fishing vessel for small scale inshore fisheries operation
 - c) a ferro-cement live bait skipjack tuna fishing vessel
2. Furnish such technical expertise as is required to supervise the construction of prototype vessels.
3. Provide an advisory service on other boat problems that may arise in the territories.

The Consultative Committee,

TAKING INTO ACCOUNT the wide geographic separation of the territories and the amount of travelling involved, in order to accomplish this programme

FURTHER RECOMMENDS that SPIFDA -

4. Increase assistance to include two experts for a further period of 24 man/months and, additionally, two associate experts to assist in the design work involved.
5. To achieve this adopt a budget of US \$ 149,000.

Bait-fish project

The Consultative Committee discussed the proposals presented and major revisions were made. They were then accepted as amended.

The Consultative Committee,

BELIEVING that the regional natural bait-fish resource is of prime importance to the successful development of skipjack tuna pole-and-line fisheries planned for many of the territories and

RECOGNISING the frailty of the total bait-fish resource and its susceptibility to over-exploitation (and the consequent danger to the local ecology) and the need to develop alternate supply sources (including artificial baits),

RECOMMENDS that

1. The recommendations of the First Meeting of the Consultative Committee, under the heading of Bait-fish, should be carried out.
2. The services of an expert, knowledgeable in the practical cultivation of sources of live-bait (including tilapia, gambusia, etc.) be procured.
3. SPIFDA contribute towards the establishment of a pilot Alternative Bait-fish Evaluation Project centred on American Samoa, such contribution to consist of the partial services of the bait-fish expert. This project to include
 - a) captive rearing of several species of potential bait-fish
 - b) evaluation of their effectiveness as live bait
 - c) economic feasibility of such rearing
 - d) study of mortality rate
 - e) development of artificial lures to be used in conjunction with successful alternative live-bait species.
4. To achieve this adopt a budget of US \$ 48,100.

Provision of training fellowships

The Consultative Committee discussed the possibility of providing training fellowships, at centres where projects are undertaken, for the purpose of better disseminating the knowledge, technical skills and experience acquired through such operations. The possibility of granting training fellowships outside the sphere of SPIFDA projects should not, however, be precluded. The most important qualifications for such fellowships were felt to be practical skill and experience as fishermen.

The Consultative Committee,

RECOMMENDS therefore that the sum of US \$ 60,000 be set aside for this purpose, this sum being considered adequate to meet training requirements for all the projects proposed above.

Summary of budget requests

Project:	Aquaculture	US \$
	St. Vincent Bay project	100,000
	Koror project	100,000
	French Polynesia project	90,000
	Mangrove channel fisheries	14,750
		<u>304,750</u>

Project: Bêche-de-mer	35,000
Marine turtles	2,700
Fishing boat development	149,500
Bait-fish	48,100
Fellowships	60,000

In drafting the foregoing programme for future activities of SPIFDA, it was accepted that some of the programmes concerned would not be finalised before the scheduled completion date for the SPIFDA Project, July 1973, and therefore assumes continuation of the SPIFDA Project beyond that date.

Determination of priorities

The Consultative Committee considered that each of the projects in the above list should be regarded as having equal priority. If funds were to prove insufficient to meet all requirements in full, the Committee suggested that suitable budgetary adjustment be made wherever possible.

The Consultative Committee noted that funds presently available to SPIFDA would enable the following projects to be continued or put in hand immediately:

	US \$
Fishing boat project (continuation of Mr John Fyson's services for a further 12 months)	149,500
Bêche-de-mer project	35,000
Mangrove fisheries project	14,750
Turtle project	2,700

With regard to the remaining priority projects, additional funds would appear to be necessary before formal implementation, but the Committee recommends that preparatory organisational work be undertaken to ensure that the projects can be implemented as soon as the necessary approval for funding has been received.

* * *

PROJECTS RETAINED AND FINANCED BY SPIFDA

Inasmuch as the projects proposed and those recommended for retention by the Second Meeting of the Consultative Committee together amounted to more than US \$ 600,000, it was necessary to explore means of achieving their realisation and financing through the good offices of FAO, UNDP and the various Administrations and organisations likely to afford assistance in the setting up and development of specific operations.

It was therefore arranged that Professor F. Doumenge, the Project Manager, visit Koror (TTPI) from 15 to 22 November, followed by Honolulu on 22 and 23 November 1971 and Apia from 24 to 26 November before going on to FAO headquarters in Rome from 13 to 18 December and from 10 to 14 January 1972.

These various consultations resulted in decisions taken at FAO headquarters, Rome, at meetings held on 16 December 1971 and 11 January 1972. Faced with the impossibility of obtaining funds to supplement the existing budget and so enable all the projects planned to get under way, a decision was inevitable that activities must be kept within the framework of existing funds. The following projects therefore had to be abandoned:

1. Demonstration centre for controlled high density reproduction and rearing of giant fresh-water prawns (Macrobrachium) in French Polynesia (funds required US \$ 90,000)
2. Coastal fisheries in mangrove channels and sandy, muddy beds (funds required US \$ 14,750)
3. Bait-fish project (funds required US \$ 48,100)

The marine turtle project was retained with provision of US \$ 2,700. As SPIFDA is obliged to confine itself to plans which are realisable within the period of the Plan of Operations, expiring July 1973, the other projects were cut back to more modest proportions.

SPIFDA contributions were therefore pegged as follows:

1. Aquaculture demonstration centre, St. Vincent Bay, New Caledonia.

Salary of expert in shellfish (oyster and mussel) culture for 12 months and possible purchase of material and equipment to a total of US \$ 15,000. The centre, financed by counterpart contribution from the Administration of New Caledonia, will conduct experiments in transplantation of molluscs.

As a beginning, it was decided to undertake controlled introduction of giant green mussels (Mytilus smaragdinus) from Manila Bay (Philippines).

Operations at St. Vincent Bay centre will provide a groundwork of experience to be followed up in Fiji where the expert in shellfish culture will frequently be called upon to work. The financial provision made is primarily to cover launching an extension of these operations in Fiji.

2. Mariculture demonstration centre at Koror (Palau Islands, TTPI).

Salary of oyster expert for 12 months and fish culture expert for 6 months.

3. Beche-de-mer project.

Provision reduced to US \$ 5,000 for printing and distributing 1,000 copies of a handbook based on the report of Mr. Sachithanathan, SPIFDA consultant.

4. Ferro-cement fishing boat project.

Provision made to cover the services of Mr. John Fyson until end December 1972. It is anticipated that in 1973 his post will be transferred to another UNDP budget (Regional Fishing Boat Development Adviser).

5. Training Fellowships.

Provision reduced to US \$ 10,000 intended to provide subsidies for persons from other territories wishing to spend a period of practical training at the centres at Koror, St. Vincent Bay and, later, Fiji.

* * *

THE BAIE DE SAINT-VINCENT MARINE CULTURE EXPERIMENTAL STATION
NEW CALEDONIA

The Baie de Saint-Vincent marine culture experimental station is located on a particularly well suited natural site, one hour by road from Noumea and half an hour or so from Tontouta international airport.

The work of the experimental station will consist in developing cultures of marine and brackish water species which have a commercial value: oysters, mussels, penaeidae prawns and fish - mullet (Mugilidae), milkfish (Chanidae), rabbitfish-picots (Siganidae).

Funds are provided by the territory of New Caledonia: 10,900,000 francs CFP or US \$ 115,000 for the 1972 calendar year. This amount is for the construction of the infrastructures and local operating costs. SPIFDA will provide a marine culture expert for twelve months.

The working installations consist of a salt-water pond with an area of 13,000 square metres and a capacity of 20,000 cubic metres, enclosed by a 120-metre dyke with a 15 square metre concrete fish trap fitted with sluices (moine-pêcherie).

Salt water is pumped into the pond by a 650 cubic metre/hour pump as soon as the tide level reaches the 0.45 mark below mean sea level. Auxiliary ponds are provided on the pond's periphery for use as shellfish holding and rearing ponds (claires).

Power is provided by a 25 kw generator which will also supply the laboratory installations.

The accommodation and installations have been designed to allow for expansion at a later date.

It is also planned that work should begin in 1972 on a hatchery aimed at supplying oyster spat, mullet and rabbitfish fry and post-larvae of penaeidae prawns.

* * *

STATUS OF THE PALAU MARICULTURE DEMONSTRATION CENTRE

The Palau mariculture demonstration centre has been established to develop the culture of commercially important marine and fresh-water species which can be farmed in various islands and marine environments through the Trust Territory and the Pacific.

Funding for the Palau mariculture demonstration centre has been procured from Sea Grant, South Pacific Islands Fisheries Development Agency, (SPIFDA), and Manpower Development Training Act (MDTA).

Sea Grant has pledged US\$7,500 until 1 July 1972 at which time an additional \$ 70,000 for a two-year programme can be requested. The \$ 7,500 covers stipends for 10 Micronesian trainees for a one-year period.

SPIFDA has pledged support in the form of two consultants. A fish culture consultant, probably from the Philippines, will be in Palau for approximately six months. An oyster consultant, from the west coast of the United States, will be in Palau for one year. There is a possibility of some further assistance from SPIFDA but nothing is confirmed at this time.

SPIFDA assistance has also made possible the development of this mariculture demonstration centre inasmuch as they have funded transportation of a variety of marine consultants in mariculture who have travelled through the Pacific region in order to select an area which would have the greatest chances of success for the development of the mariculture demonstration centre. All of the consultants were of the opinion that Palau was the logical choice for this centre.

The Palau Community Action Agency is negotiating with the Office of Economic Opportunity to fund mariculture and agriculture programmes at village level. The exact amount of money being discussed is not definite, but it is possible that it will exceed by a considerable amount the total marine resources budget now allocated. PCAA is co-ordinating this activity closely with the Marine Resources Division. The 10 Micronesian trainees in the Palau mariculture demonstration Centre are being selected through the PCAA village programmes and it is hoped they will eventually find employment as skilled mariculturists within OEO programmes at village level.

The Marine Resources Division has also established a dockside laboratory for the present mariculture programme. A field station has also been built to serve as a training site for the Micronesian mariculturists. A fishery biologist, Dr. James McVey, is devoting his full time to the development of the mariculture programme. The initial emphasis will be on raising edible oysters, already a developing industry, rabbitfish, macrobrachium (fresh-water shrimp), tridacna clams, milkfish and turtles.

It is felt that the development of the successful mariculture demonstration centre in Palau will make possible further commercial fish farming ventures in other districts. By bringing together a series of topnotch consultants in the mariculture field it is expected that the problems now standing in the way of establishing commercial marine farming ventures can be resolved and the commercial farming of the inshore waters of the Trust Territory can be initiated. If this is the case, such farms could go a long way towards reducing fishing pressure on stocks now being commercially exploited as well as to provide fish at reasonable prices for the inhabitants of the islands while also creating export sales.

* * *

INTERNATIONAL SYMPOSIUM

ON

THE OCEANOGRAPHY OF THE SOUTH PACIFIC

Wellington, New Zealand

9-15 February 1972

An International Symposium of Oceanography on the problems of the South Pacific was held in Wellington (New Zealand) from 9 to 15 February 1972. This meeting, organised by the New Zealand Royal Society and the National Commission for UNESCO, gathered together 141 participants (131 representing national organisations and 10 being observers from international organisations).

SPIFIDA delegated the Project Manager (Professor F. Doumenge) as observer and the South Pacific Commission their Programme Director (Economic), (Mr A. Harris).

Together with 72 New Zealand participants, 20 Australian and 14 American, were also present 1 English, 1 Chilean, 2 French, 1 Indonesian, 1 Japanese, 1 Peruvian and 1 Russian. South Pacific island territories were noticeably sparsely represented with the exception of New Caledonia (7 participants, delegates of the ORSTOM Centre in Noumea), one participant representing each of the following territories: Fiji (University of the South Pacific), New Hebrides (Geology Division), Papua/New Guinea (Division of Mines and Geology). We therefore consider it might be of interest to pass on to readers the main subject matter presented relative to oceanographic research as applied to development of fishing and marine culture.

The Symposium was divided into three sections:

1. Physical oceanography, with particular accent on the general circulation of water in the Pacific, on equatorial currents and on the hydrological structure of the south west Pacific.
2. Marine geology and geophysics, with particular reference to plate tectonics and evolution of continental margins in the Australian-Antarctic region and New Zealand, and geophysical research of basins and ocean margins.

3. Marine biology, concerning which we feel it would be useful to give the entire programme:

Programme - Marine Biology

Wednesday, 9 February : Coral reefs and South Pacific fauna

Chairman: Professor W. Stephenson

"Coral fauna of the Cook Islands"

Dr D.R. Stoddart, Cambridge University, U.K.

"The 'barren stretch' of coral shores"

Professor J.E. Morton, University of Auckland, N.Z.

Thursday, 10 February : Plankton studies

Chairman: Dr D.E. Hurley

"On the ecology of the family Phronimidae (Crustacea amphipoda) in the Western Pacific"

Mr. Repelin, Centre ORSTOM, New Caledonia

"Hydrological and biological observations in Dusky Sound, a New Zealand fiord"

Dr J.B. Jillett and Dr S.F. Mitchell
Otago University, New Zealand

"Micronekton in the equatorial and tropical South Pacific ocean"

Messrs M. Legand, P. Bourret and A. Michel
Centre ORSTOM, New Caledonia

"Nutrients in hydrological studies"

Messrs C. Oudot and F. Rougerie
Centre ORSTOM, New Caledonia

: Productivity and nutrients

Chairman: Professor G.A. Knox

"A multidisciplinary programme to investigate the sources and consequences of upwelled enrichment of nutrients off the N.S.W. coast"

Messrs N.C. Bulleid and D.J. Carpenter,
CSIRO, Cronulla, Australia

"Phytoplankton and nutrients in the Hauraki Gulf approaches, New Zealand"

Dr F.J. Taylor, University of Auckland, New Zealand

1. "Carbon/chlorophyll relationships in the Peru coastal current"
2. "Nutrients in the Peru coastal current"
3. "Distribution of chlorophyll 'a' in the Peru coastal current"
4. "Productivity and phytoplankton on the Peruvian coast"

Mr O.G. Guillen and others, Instituto del Mar, Lima, Peru

Friday, 11 February : Zoogeography and faunal distributions
Chairman: Professor J.E. Morton

"Decapod crustacea from South Pacific reefs and islands"
Dr J.C. Yaldwyn, Dominion Museum, New Zealand

"Systematics and zoogeographic aspects of south-eastern Polynesian echinoderms"

Dr D.M. Devaney, Bernice P. Bishop Museum, Honolulu and
Mrs L.M. Marsh, Western Australian Museum, Australia

"Influence of the equatorial divergence upon zoogeography and vertical distribution of some bathypelagic copepods in the Pacific Ocean"

Mr J.A. Gueredrat, Centre ORSTOM, New Caledonia

"Faunal distributions and relationships in the New Zealand archibenthal (bathyl) region"

Mr E.W. Dawson, Oceanographic Institute, New Zealand

"The distribution of mussels in Eastern Australia and New Zealand"

Dr R.J. McIntyre, University of N.S.W., Australia

: Fish studies

Chairman: Mr G.D. Waugh

"Sharks of New Caledonia"

Messrs P. Fourmanoir and P. Rancurel, Centre ORSTOM, New Caledonia

"An attempt to determine the time of death of catches during longline fishing"

Mr J.S. Pages, Centre ORSTOM, New Caledonia

"The population dynamics of the New Zealand Tarakiji, Cheilodactylus macropterus (Bloch and Schneider), and changes due to fishing: an exploration"

Mr C.M. Vooren, Fisheries Research Division, New Zealand

Tuesday, 15 February : Benthic ecology
Chairman: Dr J.C. Yaldwyn

"Computer analyses of complex shallow water benthic communities"

Professor W. Stephenson, University of Queensland, Aust.

"Coastal benthic octopods (Mollusca-Cephalopoda) of New Caledonia"

Mr P. Rancurel, Centre ORSTOM, New Caledonia

"Amphipods consumed by longline pelagic fishes from the western south Pacific"

Mr R. Repelin, Centre ORSTOM, New Caledonia

: Fish studies

Chairman: Mr G.D. Waugh

"Ecology and regulation of calcium metabolism in coral grazer parrot fish"

Professor M. Pontaine, Museum National d'Histoire Naturelle, France

"Feeding habits of deep swimming tunas"

Messrs M. Legand and R. Grandperrier, Centre ORSTOM, New Caledonia

"Review of current work on midwater fishes in the South Pacific"

Dr J.R. Paxton, The Australian Museum, Australia

At the closing of the Symposium the participants adopted various resolutions, the most important of which concerns SPIFIDA projects and is of interest to all South Pacific island territories; the following resolutions are from a working group concerned with shore and shallow-water fauna of the tropical Pacific : Dr D.R. Stoddart, Professor J.M. Morton, Mr E.W. Dawson, Dr D.M. Devaney, Mr P.J. Beveridge and Dr J.B. Jillett.

1. To reaffirm the recommendations put forward by Professor G.A. Knox at the 1968 SCOR South Pacific meeting as long-term aims and to note that work on these is continuing on a national and institutional level.

[The recommendations were:

- 1) Detailed investigation of the subtropical convergence
- 2) Study of biological characteristics of the eastern boundary currents
- 3) Study of relationships of planktonic communities and water masses
- 4) Systematic benthic investigations along the lines of the New Zealand work
- 5) Tuna biological studies.]

2. Noting that the study of shallow-water communities had not been considered in 1968 and, noting the growing interest of biologists especially in coral reef studies, to recommend that the study of coral reefs and associated communities in the South Pacific be added to the list of proposals drawn up in 1968.
3. In order to implement this recommendation, to obtain results over a five-year period, to further recommend
 - a) that a position paper on South Pacific reef studies be drawn up by an ad hoc committee for circulation to interested workers and national groups;
 - b) that consideration be given to a small international meeting of South Pacific reef workers in 1975 at which specialists would be asked to contribute comprehensive reviews of the present state of knowledge in their fields of study, of reef communities and biogeography;
 - c) that efforts be made to encourage international exchange of information on South Pacific reef studies;
 - d) that consideration be given to practical problems of financing reef expeditions and of increasing numbers of taxonomists working reef biota.

The following are recommended as a suitable ad hoc committee:

Dawson	(New Zealand)	Chairman
Morton	(")	
Beveridge	(University of the South Pacific)	
Stoddart	(United Kingdom)	
Devaney	(U.S.A.)	
Doumenge	(New Caledonia)	
Chevalier		
or Salvat	(France)	
Randall	(U.S.A.)	

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SECOND INTERNATIONAL OCEAN DEVELOPMENT CONFERENCE AND EXHIBITION

Tokyo, 4-9 October 1972

The second International Ocean Development Exhibition will be held in Tokyo at the International Trade Centre from 4 to 9 October 1972. Being held concurrently is the second International Ocean Development Conference. This Conference will take place on 5, 6 and 7 October 1972 at the Kidean-ren Kaikan (Economic Management Association Building) in Tokyo.

The main theme of the Conference will be recent progress in ocean development and will be centred around four main aspects:

1. Marine environment

5 October afternoon: Coastal oceanography and water pollution.

6 October morning : Marine phenomenon and air-sea interaction.
Comprehensive and basic survey and management of oceanographic and meteorological information.

2. Research and survey of ocean

5 October afternoon: Marine development and electronics.
Measuring the instrumentation.

6 October morning : Submersible research vehicles.

3. Marine structures and civil engineering

6 October afternoon: Materials and process engineering (corrosion, marine life protection).

7 October morning : Operation machine system (for drilling and dredging).
Underwater manipulators and marine robot technology.

7 October afternoon: Marine engineering.
Environmental conditions of undersea working; man and undersea habitat.

4. Marine resources

6 October afternoon: Aquaculture, deep sea fishing and new fishing methods.

7 October morning : Development of mineral resources and survey of sea bed.

7 October afternoon: Desalinisation of sea water and extraction of soluble elements; utilization of marine energy (tidal, wave and thermal energy).
Marine parks.

Those interested in the exhibition or the conference may write to:-
The Secretariat, International Ocean Development Conference and Exhibition,
25 Shiba-Park, Minato-ku, Tokyo 105, Japan.

WORK OF LABORATORIES IN THE AREA

It is perhaps of interest to readers to know of the main activities of the laboratories working on problems of marine biology and oceanography, especially as applicable to the islands of the South Pacific. It is hoped that up to date information will be regularly presented to SPIFA for circulation through the medium of this Newsletter.

INSTITUTE OF MARINE BIOLOGY, UNIVERSITY OF HAWAII

Coconut Island, P.O. Box 1067, Kaneohe, Hawaii 96744.

<u>Name</u>	<u>Department</u>	<u>Field of research</u>
John E. Bardach	Director of Institute	Ecological physiology, especially chemical and temperature senses of fishes. Aquaculture.
Albert H. Banner	Zoology	Invertebrate zoology, snapping shrimp, marine toxins, pollution between algae and coral reef.
Joseph M. Branham	Zoology	Experimental embryology, sea urchins and starfish.
Julie H. Brock	Zoology	Ecology and taxonomy of invertebrate phyla and sea worms, coral reefs and amoeba.
John Caperon	Oceanography	Ecology
S. Allen Cattell	Oceanography	Phytoplankton ecology.
Keith E. Chave	Oceanography	Mineral seawater interaction.
Thomas A. Clarke	Oceanography	Ecology and biological oceanography.
Maxwell S. Doty	Botany	Marine algae, primary productivity and ecology.
Richard W. Grigg	Institute	Coral ecology.
Kaare R. Gundersen	Microbiology	Marine microbial ecology.
Samuel R. Haley	Zoology	Animal development, ghost crabs, gametes, embryology.
Philip Helfrich	Institute	Coral reef community ecology, pollution, culture of marine organisms in the tropics.
Louis M. Herman	Psychology	Sound senses of porpoises.
E. Alison Kay	Gen.Science	Marine molluscs of the Indo-West-Pacific: systematics, morphology, ecology and biogeography
George S. Losey	Zoology	Behaviour of marine animals, fishes, functional morphology and ecology.
John A. Maciolek	Zoology	Limnology, fishery biology, stream ecosystems, estuaries, shoreline ponds, diadromous and mixohaline fauna.
John M. Miller	Institute	Ecology, larval fishes

Garth Murphy	Oceanography	Ecology. Population dynamics. Management of inshore resources.
Arthur N. Popper	Zoology	Fish communication, squirrelfish and mammalian anatomy.
John E. Randall	Bishop Museum	Tropical marine ichthyology and biology.
S. Arthur Reed	Zoology	Coral, turtles, amoeba.
Ernst S. Reese	Zoology	Animal behaviour, marine crustacea, reef fishes, hermit crabs.
Donald E. Stevens	Zoology	Tuna, trout, turtles.
Jeannette W. Struhsaker	Institute	Marine ecology and ecological genetics, invertebrate zoology, evolution, aquaculture of marine organisms, especially molluscs.
Albert L. Tester	Zoology	Behaviour of sharks, teleosts (bony fish).
Sidney J. Townsley	Zoology	Radioecology (radioactive nuclides in marine organisms).
Richard E. Young	Oceanography	Pelagic invertebrates, cephalopods.
Ziad H. Shehadeh	Oceanic	
	Institute	Spawning and breeding of mullets.
Robert Cardover		Penaeidae.

UNIVERSITY OF THE SOUTH PACIFIC, SUVA, FIJI

John Ackermann	Population ecology of marine invertebrates, especially molluscs.
Graham Baines	Productivity of turtle grasses; physical environment of lagoons and saltwater lakes.
Peter Beveridge	Coral reef ecology, with particular interests in Holothurians, Ophiuroids and Madreporian corals.
Bruce Carlson	U.S.P. Reference collection of algae and coelenterates.
Mike Gawel	U.S.P. Reference collection of fishes.
Martyn Gorman	Breeding ecology of sardines and sardinellas; sea birds.
Bob Lawrence	Hydrography of lagoons.
David Nedwell	Mineralisation and primary productivity in the marine ecosystem; pollution and its effects upon these processes. Marine microbiology.
Thelma Richmond	Nutrient cycling and organic production in mangroves.

OCEANOGRAPHY STUDY AND RESEARCH SECTION, ORSTOM

Noumea, New Caledonia

At the ORSTOM centre of Noumea oceanographic research is carried out by a team of 20 workers split as a rule into a biological oceanography group (8 workers) and a physical oceanography group (12 workers).

I. The work of the physical oceanography section includes studies at the lower trophic levels in collaboration with biological section workers. The research programmes and work is divided as follows:

H. Rotschi	Programme direction. Co-ordination between workers, synthesis of results.
F. Jarrige	Systematic information observation of data processing and preparation of programmes for more specific analysis. Data processing evaluation of analysis methods. Preparation of a circulation numerical model relating to weather conditions showing currents observed at the equator in the western Pacific and numerical application of equatorial circulation analytical models by use of data processing.
C. Colin	Preparation of a circulation analytical model linked to weather conditions showing observed currents at the equator in the western Pacific. Work undertaken jointly with F. Jarrige for data processing.
P. Rual	Hydrology Interpretation and use of current direct measurements. Circulation hydrological interpretation (temperature, salinity, oxygen, nutrient salts). Adaptation, maintenance, repairs and checking of electronic equipment.
G. Henin	Hydrology Geotrophic interpretation between surface circulation and weather conditions, study of regional weather. Maintenance and checking of hydrology equipment.
J.R. Donguy	Hydrology Interpretation of T-S diagrams, surface observations by merchant vessels, counter-current hydrology. Maintenance and checking of hydrology equipment.
P. Hisard	Hydrology Link between circulation and distribution of nutrient salts, hydrological nature and hydrological interaction in the formation of equatorial currents system, longitudinal variations of the latter.

G. Oudot	Chemistry	Various forms of mineral nitrogen, molecular nitrogen, ammonia, nitrate, dissolved organic nitrate and nitrogen, particulate organic nitrogen, phosphate, dissolved organic phosphorous, particulate organic phosphorous, dissolved organic carbon. Adaptation, conduct and checking of chemical analysis.
F. Rougerie	Chemistry	Oxygen, silicate pH, alkalinity, carbonic acid gas system. Adaptation, conduct and checking of chemical analysis.
J. Pages	Enzymology	Nitrate-reductase, phosphatase, electron transport system (ETS), global proteins, ATP.
B. Wauthy		Quantitative aspects of primary production.
R. Desrosieres		Phytoplankton numeration, floristic aspects, spacial-temporal distribution, trophic links with zooplankton.

II. The biological oceanography section deals both with fundamental problems and technological matters linked with applications to pelagic fishing.

M. Legand	Director of research and synthesis; deals more particularly with research on tuna biology and micronectonic fish.
P. Bourret	The application of data processing to marine biological research. Methodology IKMT (mid-water trawl). Study of tuna and tuna-like larvae.
P. Fourmanoir	Epipelagic and coral fish with special emphasis on systematics.
J. Gueredrat	Ecology, distribution and trophic upstream and downstream relations of Copepoda. Planktonic and larval net methodology.
R. Grandperrin	Tuna ecology and biology. Floating longline and IKMP methodology.
R. Repelin	Study of pelagic amphipodes with particular reference to amphipodes in thonidae stomach content. Larval net and conic net methodology.
C. Roger	Study of euphausiids, with particular reference to tuna stomach contents.
R. Rancurel	Cephalopoda biology and systematics. Study of terebratulid molluscs.

The ORSTOM centre has been functioning since 1964 using a 37-metre vessel, the R.V. CORIOLIS, equipped for pelagic oceanography. The vessel has worked in an area comprising the equatorial region and the tropics as far as 20° south, and from the Coral Sea and New Guinea as far as the Marquisas and the Gambiers. The main objective is to study longline tuna, which makes up the major part of commercially-fished tuna in the Pacific, by delineating their environment, their food, their position in the pelagic food chain and their ecology. Important results have been obtained recently in respect of vertical distribution of tuna, in the synthetic description of where they belong in the food cycle and also in the study of their own feeding habits. These studies have been financed until now entirely from the general funds of ORSTOM in Paris.

MARINE LABORATORY, UNIVERSITY OF GUAM

P.O. Box EK, Agana, Guam 96910.

The marine laboratory is on a bluff below the University campus and its equipment inventory includes a running seawater system with aquaria, diving gear, basic sea-water analysis equipment and fourteen, eighteen and twenty-one foot boats. Located in the Science Building, the department has specialised rooms for laboratories and lectures. The University herbarium and zoological reference and research collections, containing several thousand local and exotic species, are also housed there.

Marine laboratory staff:

L.G. Eldredge, Director	Invertebrate zoology, biogeography.
Daniel P. Cheney	Physiology, histology.
Robert S. Jones	Marine ecology.
James A. Marsh	Invertebrate zoology, productivity.
Richard H. Randall	Corals, reef ecology.
Roy T. Tsuda	Physiology.

CENTRE NATIONAL D'EXPLOITATION DES OCEANS(1)

Tahiti, French Polynesia

CNEXO is the French Government organisation entrusted with promoting and encouraging all basic and applied research activities concerned with the development of ocean and sea resources. CNEXO gives financial support to, and collaborates with, existing research being undertaken in university laboratories, the laboratories of the Institut scientifique et technique des pêches maritimes (Scientific and Technical Marine Institute), public organisations which have a branch of oceanic research - Institut français de pétroles (French Petroleum Institute), Office de la recherche scientifique et technique outre-mer (Office of Overseas Scientific and Technical Research) - and also with private companies (Compagnie générale transatlantique, Compagnie des Salins du Midi, cooperative societies, etc.). However, when deemed appropriate, CNEXO sets up its own establishment, such as the Centre océanologique de Bretagne (Oceanological Centre of Brittany) at Brest, France.

While in regard to the oceanographic department of the ORSTOM Centre at Noumea CNEXO offers collaboration, it was decided its own laboratory should be set up in Tahiti in order to reinforce and round off on the spot the activities of the Service territorial des pêches maritimes (Territorial maritime fisheries service) and in order also to open new means of exploring the potential resources of ocean beds, reefs and lagoons.

The CNEXO centre of Tahiti is built at Vairao, some 60 kilometres from Papeete, in the south-west of the island. The site favoured the work of excavation and supply of water to the experimental and rearing tanks which cover some 2,600 square metres. Among the unusual facilities is an aquaculture hall 25 metres long and 10 metres wide.

First-stage construction of the installations, representing an outlay of more than 300 million francs CFP (a little over US \$ 3,300,000), was put in hand in August 1971 and will reach completion during August/September 1972.

Commandant de Chazau will be in charge of the centre and will be concerned especially with the section for developing mineral resources (manganese nodules).

The department of biological resources will be under the direction of Mr Alain Michel, agronomical engineer and senior research officer at ORSTOM, already well known in scientific circles for his publications - through the ORSTOM centre of Noumea - devoted to problems of plankton

(1) National Centre for the Development of Ocean Resources

productivity in the lagoons and coastal waters of French Polynesia, to special problems of the Stomatopodes group of crustaceans as well as to the threadlike larvae of lobster.

The programme of the biology section is principally orientated towards applied aquaculture of the lagoons and coastal and continental waters of tropical Pacific islands. A first phase, which has to be followed through over the five years 1973-1978 with an authorized expenditure of about 600 million francs CFP (US \$ 6.5 million), is to develop crustacean culture (penaeides and macrobrachium prawn), mollusc culture and, later, fish and turtles.

The work will be undertaken in collaboration with the Territorial marine fisheries service using new approaches aimed at opening further outlets for the French Polynesian economy.

The first to staff the biology section directed by Mr Alain Michel will take up their appointments in the coming months; they are:

J.M. Griessinger	Biologist, Doctor of Oceanography. - Circulation and regulation of the various tanks (hatchery, fattening); intensive rearing.
G. Cuzon	Biologist, CNEEXO Doctor of Oceanography. - Crustacean metabolism; nutrition (artificial feeding stuff and attractants).
J.L. Martin	Biologist, Doctor of Oceanography. - Algae culture for rearing of crustacean and mollusc larvae; artificial spat.
J. Calvas	Water sciences and technology, applied hydrobiology. - Measuring of physico-chemical parameters (lagoon and tanks); study of deposits.
A. Mailion	Aquaculture technician. - Maintenance and supervision of tanks (hatchery and fattening).

In the coming years the manning of the centre will be increased to reach, in 1978, some 40 scientists and technicians, many of whom will be indigenous to the territory of French Polynesia - those who are currently studying and receiving grounding in France to qualify as specialists in oceanography and marine biology.

It is planned that the CNEEXO laboratory will also concern itself with problems of ichthyosarcotoxism (ciguatera) and, as well, will build and ensure management of a large aquarium upon to the public.

CATCHES OF TUNA AND TUNA-LIKE FISH

AMERICAN SAMOA - Catch of the longliner tuna fleet.

Tuna longline fishing (almost entirely Japanese, South Korean and Formosan) delivering catches to the two canneries of Pago Pago (Van Camp and Star Quist) was very satisfactory during 1971. Yield of albacore was exceptionally high from May to July.

Month	No. of hooks	Albacore		Big Eye		Yellowfin	
		Total catch	Per 100 hooks	Total catch	Per 100 hooks	Total catch	Per 100 hooks
January	2,539,264	63,668	2.5073	8,737	0.3441	8,303	0.3270
February	2,390,728	32,191	1.3465	11,917	0.4985	23,904	0.9999
March	2,353,495	28,695	1.2192	19,324	0.8211	33,346	1.4169
April	2,644,158	75,384	2.8510	10,139	0.3834	35,192	1.3309
May	2,967,840	132,111	4.4514	6,194	0.2087	26,163	0.8816
June	2,761,644	127,656	4.6225	5,832	0.2112	21,172	0.7666
July	2,247,983	110,796	4.9287	4,988	0.2219	18,478	0.8220
August	777,129	25,999	3.3455	1,942	0.2499	6,249	0.8041
September	2,575,700	57,242	2.2224	11,346	0.4405	34,867	1.3537
October	2,798,100	78,228	2.7957	9,980	0.3567	18,219	0.6511
November	2,922,100	99,055	3.3898	7,452	0.2550	13,463	0.4607
December	2,210,400	80,865	3.6584	3,248	0.1469	5,705	0.2581
Total:	29,188,541	911,890	3.1241	101,099	0.3464	245,061	0.8396

NEW HEBRIDES - Turnover at deep-freeze plant of Pallicolo-Santo

The deep-freeze plant of Pallicolo-Santo experienced a marked increase in activity in 1971. Since 1968 the tonnage of fish exported has doubled and the value of exports has since increased in line with rising prices on the international market.

Exports	Metric tons	Value N.H. francs ⁽¹⁾
1971	13,346	615,200,000
1970	9,218	466,597,000
1969	7,988	310,255,000
1968	6,627	234,667,033

(1) 100 francs N.H. = 1 Australian dollar
 111 CFP francs
 1.19 American dollars
 6.12 French francs

For the first time in the commercial history of the Condominium of the New Hebrides, frozen fish has reached the first ranks of exports from the Territory, exceeding the export value of local coprah production.

The Pallicolo Santo plant suffered damage at the end of October 1970 as a result of the violent earthquake. More serious damage was caused in early February 1971 by the cyclone Wendy which caused havoc in the Banks Islands before sowing seeds of destruction at Santo. Staff housing and port installations were seriously affected by these catastrophes although the refrigeration storage and boats only suffered light damage.

Export of tuna and swordfish and marlin and country of destination:

Japan		U.S.A.		Other		Total		
Metric tons	'000 A\$'000	Metric tons	A\$'000	Metric tons	A\$'000	Metric tons	A\$'000	
211	52	-	-	-	-	211	52	1971 Jan.
437	184	624	342	-	-	1,062	526	Feb.
449	163	620	340	-	-	1,069	503	March
-	-	1,118	651	-	-	1,118	651	April
489	118	-	-	-	-	489	118	May
169	77	455	268	385	385	1,475	730	June
120	29	584	336	-	-	704	365	July
1,260	462	635	367	1	1	1,895	830	Aug.
173	42	1,939	1,067	-	-	2,112	1,109	Sept.
173	42	459	263	-	-	632	305	Oct.
384	92	1,441	864	-	-	1,825	956	Nov.
300	106	453	262	-	-	754	368	Dec.
								1972
200	46	368	225	852	386	569	271	Jan.

FIJI

During 1971 the total weight of fish landed rose slightly thanks to the "secondary" species, for the two main catches, albacore and yellowfin, decreased.

Weight - metric tons

	Albacore	Yellowfin	Miscellaneous	Total
January	378	51	166	594
February	206	54	99	359
March	121	97	90	308
April	315	121	155	591
May	89	58	29	176
June	657	10	110	776
July	357	27	258	641
August	661	94	213	968
September	995	88	176	1,259
October	513	48	174	735
November	436	229	203	868
December	394	357	199	950
Total:	5,122	1,234	1,871	8,228

Turnover at the freezing plant for longline tuna at Levuka, Ovalau IslandWeight - metric tons

Type of fish	1967	1968	1969	1970
Albacore	4,334	3,543	5,742	5,319
Yellowfin	1,051	1,026	1,913	1,410
Big Eye	501	577	743	485
Black marlin	118	98	177	169
White marlin	27	18	22	22
Swordfish	120	106	141	126
Other marlin	227	201	253	317
Sailfish	83	23	40	41
Kingfish	78	64	65	55
Dolphin fish	10	6	3	3
Sk. pjack	92	17	33	110
Shark	34	17	7	5
Miscellaneous	9	8	4	-
Total:	6,689	5,685	9,143	8,063

The freezing plant for stocking tuna from Japanese, South Korean and Formosan longliners was established during 1963. In recent years turnover at this plant has shown the above results.

COMMERCIAL EXPLOITATION OF TROCHUS
FRENCH POLYNESIA

The trochus (Trochus niloticus) was introduced to Tautira, Tahiti (south-east coast of the southern peninsula) in 1957 by transplantation of 40 specimens from New Caledonia. Natural spreading the length of the reefs of Tahiti quickly followed on this introduction, the Fisheries Services meanwhile carrying out transplantations in other islands of the Society archipelago (Moorea 1963, Raiatea 1964) and Tuamotou.

Within several years the density of the new stock and the intensity of reproduction gave scope for planned exploitation under the control of the Administration.

For the first time at the end of 1971 "trochus dives" were organised at Tahiti. Only the districts of Tautira and Pueu (southern peninsula) were open to harvesting from 1 November to 15 December 1971, the shells gathered having to be larger than 8 centimetres diameter at the base. A quota of 20 tons net weight (shell plus flesh) was fixed for Pueu and the 20 divers taking part obtained this yield by 24 November. The quota of 100 tons fixed for Tautira was not attained and, by 15 December 1971, the closing day of the diving season, the 25 divers taking part had fished only 70 tons.

Sale on the local market fetched 15 francs CFP the kilo on about 10 tons, being purchased by craftsmen in pearl shell and others making curios destined for tourists. The remainder, that is about 60 tons, was purchased at an average price of 14 francs CFP the kilo by export firms having connections with Italy, Germany and England.

The value of the harvest exceeded one million francs CFP, that is, for the first year of harvesting more than ten times the funds employed since commencement for work of transplantation and transport of shells. One cannot deny that it is possible to make a substantial economic profit in the South Pacific islands by implementing a long-term, methodically applied plan to develop the resources of the reefs and lagoons.

Details of the trochus yield at Tahiti:

District	Net weight kilo	Shells fished kilo	Daily average kilo	Daily average per diver kilo	Sale value Fr CFP (1)
Pueu	19,200	15,300	1,530	180	214,000
Tautira	70,541	56,430	3,918	326	790,000

(1) 100 francs CFP = 5.5 French francs
1.07 US dollars
.90 Australian dollars

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"SHADOWS BEFORE"FAO:

Seminar on the design and construction of ferro-cement
fishing vessels, Wellington, New Zealand 9-13 October 1972

South Pacific Commission:

Planning Committee, Noumea, New Caledonia 10-14 April 1972

Twelfth South Pacific Conference, Apia,
Western Samoa 19-29 September 1972

Japanese Management Association:

Second International Ocean Development Conference
and Exhibition, Tokyo, Japan 4- 9 October 1972

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