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STAFF NOTES

The Minister for Fisheries and Fauna (Mr. Ross Hutchinson) will officially open the new departmental research station located on the Tuttanning Fauna Reserve some 14 miles east of Pingelly on November 6.

The Director, Mr. A.J. Fraser, Fauna Officer H.B. Shugg and Wildlife Research Officer T.L. Riggert will also be in attendance, as well as some members of the Fauna Protection Advisory Committee and representatives of other Departments and the Shire of Pingelly.

In the evening the Minister, accompanied by Mr. Fraser, will attend the annual dinner of the Rock Lobster-Crayfish Industry Development Association of Australia at the Palace Hotel. Also present will be the Administrative Officer, Mr. B.R. Saville, and the Supervising Inspector, Mr. J.E. Bramley.

* * *

We extend our congratulations to Miss B.G. Powell, of Head Office, and Inspector D.P. Gordon (Albany) on their recent engagement and also to Mr. P.G. Yewers, of Head Office, and Miss L. Huntley, of Nollamara, who likewise announced their engagement last month.

* * *

Officers who commenced annual leave last month include Inspector E.I. Forster (p.v. Vlaming) on October 5, Inspector P.V. Clarke (p.v. Misty Isle) on October 12 and Fleet Maintenance Officer A.J. Bateman on October 16.

* * *

Technical Officer J.S. Simpson returned to duty on October 24 after his recent long illness. Although on deck again it will be a week or two before Mr. Simpson is completely restored to health.

The r.v. "Peron" returned to Fremantle on October 30 from Shark Bay after completing trawling survey work on the Quobba-Cape Inscription areas

PERSONAL PARS

A visitor to Perth last month was Dr. H.G. Klos, Scientific Director of the Berlin Zoo. During his stay Dr. Klos, who was accompanied by his wife, was shown over the Pingelly Fauna Reserve, some wetlands in the metropolitan area and Rottnest Island. He was also the guest of the State Zoological Gardens Board for a few days.

XMAS HOLIDAYS

The Public Service Commissioner has determined that the public service holidays for the coming festive season will be December 25 and 28 and January 1 and 4.

CARE OF SICK, INJURED AND DERELICT FAUNA

Staff members are advised that, in future, all inquiries from the public for the collection of injured or derelict fauna should be directed to Miss C.A. Nicholls, either at her home at 15 Circe Circle, Dalkeith 'phone 86.5653, or C/- The Division of Wildlife Research, C.S.I.R.O., 'phone 86.2451.

The Government has agreed to pay Miss Nicholls £250 a year to assist in her work of collecting and caring for injured birds and animals. This Department is therefore absolved from any responsibilities it had in this regard and accordingly no official mileage or use of Departmental vehicles will be sanctioned except by specific approval which will only be given when the circumstances warrant it.

MATTERS ARISING FROM 1964 DEPARTMENTAL CONFERENCE

At the annual departmental conference held in July, opportunity was given to the field officers present to discuss, under the guidance of Mr. Herbert Ende, of the Department of Management, Perth Technical College, problems confronting them in the control of their respective districts and in the exercise of powers conferred by the various Acts administered by the Department.

Those present were divided into groups. Mr. Ende posed certain questions and each group was asked to find answers. They were told to treat each subject completely objectively and to say what they thought without fear of favour.

Although some situations were, perhaps, rather exaggerated, a number of useful suggestions and some good constructive criticism resulted. The points raised are summarised below. Following each are set out the views of the administration, as expressed at a meeting of branch heads convened by the Director last month to deal with these matters.

1. Departmental Administration: Improvement could be made by more frequent visits by departmental executives and more sympathetic approaches to the field staff; plans for staff training should be formulated and implemented; reprimands should be administered in private.

In regard to general departmental administration, it was agreed that more frequent visits to outstations by the Director and Administrative Officer respectively would be of advantage, not only to the field staff, but also to those officers themselves. It is appreciated that an expanding industry, a growing field staff, an intensification of scientific research following the setting up of the Western Fisheries Research Committee, a great increase in fauna conservation activity and in involvement in numerous matters arising from regular Commonwealth-States fisheries and fauna conferences, have imposed a very heavy work load on the top executives. Although additions have been made to the clerical branch over the past years, they have not kept pace with the Department's greatly increased functions, nor have they maintained relativity with staff increases in other branches. Only recently has approval been signified to the appointment of a clerk-in-charge to assume control of the Clerical Branch and to relieve the Administrative Officer of some of his duties. The latter, when this senior appointment is made, will in turn take over more responsible duties now devolving on the Director, and both will, it is hoped, be able to spend more time in the field. It is virtually impossible, we freely acknowledge, to administer efficiently a Department with an outreach like ours by sitting behind a desk in Head Office all the time.

So far as training is concerned, it will be appreciated by those of the staff whose good fortune it has been to attend the Commonwealth-States field officers' training school at Cronulla, Sydney, that we should be doing something like this for ourselves. There is now under consideration a proposal that the States all "club together" to appoint an education officer who would move from State to State and organise in-service training.

If this comes about, we in Western Australia will take advantage of the opportunity to hold regular courses. If not, we shall certainly do something about it independently. There are available to us the services of quite a number of people as instructors, and our own graduates from the Cronulla school would be asked to pass on some of the information they have gleaned there. There would, of course, be written and practical examinations, and the results of these could well be taken into consideration when judging suitability for future promotion.

The Director believes that reprimands, on the occasions when they must be administered, should, unless in the interests of discipline it is necessary to do otherwise, be given privately. Circumstances could and might arise when it is desirable to reprimand publicly, in which case public reprimand will be administered. All senior officers have been made aware of the Director's wishes in this matter.

2. Annual Conferences: Too little time is provided, resulting in the rushing of business; there should be less control by senior officers and greater participation by staff; the agenda should be circulated some time in advance and sponsors of items on the agenda required to furnish background notes at the same time so that copies might be sent to all participants some days before the conference starts.

The Branch Heads are of the opinion that each conference should endure for one week, and the Director agrees. The staff will be circularised at least one month before the opening date of the conference and invited to submit items for the agenda. If advice is not received earlier than a fortnight before the start of the conference of the desire to have an item included, and if the item is not supported by a background paper, it will not be included in the agenda. Copies of background papers will be sent to all participants for study at least a week before the conference opens.

3. Problems Hindering Department: The administration is out of touch with the local situation; annual financial appropriations are inadequate; communication is poor.

So far as departmental appropriations are concerned, it must be borne in mind that finance is not unlimited. The Treasury can spend only as much money as it has. There are many claims on the public purse, and although all Departments of the State could with advantage use more money than can be made available this year, one must accept that there is only one source of revenue - the taxpayer.

The taxpayer is the man with the vote, and if he thinks he is taxed more heavily than is necessary, he will see to it that another Government, which has undertaken to spend less, is returned at the next election. The allocation of funds for departmental purposes in the financial year 1964/65 is £146,730 (salaries, £97,430; incidentals £49,300). Ten years ago, in the year 1954/55, the appropriation was £46,944 (salaries, £29,294; incidentals £17,650). We seem to have made some progress!

It is suggested that communication between Head Office and the field staff is poor. By means of the Monthly Service Bulletin all members of the staff are kept posted with important decisions, staff movements and interesting developments in the fisheries, and the Commonwealth Fisheries Newsletter goes regularly to each officer. A copy of each new proclamation and regulation is sent to all officers, and a copy of the "Public Service Vacancies" page of the Government Gazette is posted to each outstation weekly. Shortcomings in communication are inherent in almost every organisation, and this can be quite troublesome. Head office personnel have been labouring under difficulties for some time, with the result that some things that ought to have been done have been left undone. Specific instances of breakdowns in communication, or fields in which they have occurred, should be brought to our attention. At the same time, having regard to special efforts to keep the staff informed, it is thought that the suggestion that communication is poor is greatly exaggerated.

4. General: The Departmental lacks a public relations programme; there should be training for the field staff in public relations; inspectors are underpaid in relation to other public officers of similar status; inspectors are not always backed up in their decisions.

The value of good public relations is not underestimated departmentally. We have no public relations officer, nor are we able to give high priority to the creation of such a post while funds cannot be found for what we consider to be more necessary appointments. Each one of us, from the lowest to the highest, has a public relations responsibility. We are all public servants and we are paid to give service to the public. In many ways each can carry out a really worthwhile programme. Probably the best means of establishing good public relations is by creating an image which will cause all men to look up to the Department. We must not, in either our public or private behaviour, do anything which will cause the community to look down on us or on the Department.

So far as training is concerned, inspectors will recall that from time to time, too, we have reproduced suitable material in the monthly bulletin. Furthermore, at the 1963 departmental conference, Mr. Ende gave an acceptable and inspiring as well as informative talk on this important subject. Such talks will be given at future conferences.

Are the members of our field staff really underpaid? Taking our allowances into consideration, the following are the weekly rates (inclusive of allowances) paid to shore-based inspectors (sea-going personnel receive greater allowances) -

	<u>Minimum</u>	<u>Maximum</u>
Supervising Inspector	£37.10.0	£38.15.0
Senior Inspector	£32.17.6	£34. 3.0
Inspector Grade 1	£30. 7.6	£31. 9.0
Inspector Grade 2	£28. 0.0	£29. 2.6
Assistant Inspector	£9.10.0	£25. 2.6
Cadet Inspector	£9.10.0	£23. 7.6

The Public Service Commissioner fixes these rates. Any officer who is dissatisfied may appeal to the Public Service Appeal Board, either as an individual or as one of a group of officers doing similar work. The field officers have their own Sub-Association, and have direct access to it and the Civil Service Association if they need advice and assistance. It would not be proper for the administration to offer further comment.

Regarding the allegation that members of the field staff are not backed up in the decisions they make, it can only be inferred that some of the inspectors are disgruntled when their recommendations are not accepted. The Director and the branch heads would like to make it clear that even if such recommendations are not approved, or approved with modifications, it is not necessarily due to shortcomings in the arguments adduced, although this is at times so. Frequently it happens that the recommendations are not in accord with departmental policy nor based on principles laid down as a guide in certain matters. The Director does not always agree with branch heads, the Minister does not always agree with the Director, and Cabinet does not always agree with the Minister. Not one of us regards a refusal to accept our views as "skin off our nose". We put up our case as we see it, and that is as far as we can go.

The Director has frequently said that inspectors have discretion in administering their respective districts. It is obviously not possible to define in precise terms how discretion may be exercised. Provided, however, that what is done is what any prudent and reasonable person may in the circumstances be expected to do, the action of the officer concerned will be upheld departmentally. If, on the other hand, discretion is exercised negligently or carelessly, or without thought of the consequences, the officer's action will not be supported by the administration. Instead, his decision might be reversed, and in extreme cases reprimand or even more severe punishment will be administered. The exercise of discretionary powers is a serious responsibility which must be approached with care and forethought.

Next month we shall deal with other matters emerging from the conference discussions.

TASMANIAN FISHERMEN'S SEMINAR

A seminar on Fisheries Management organised by the Professional Fishermen's Association of Tasmania was held at the University of Tasmania, Sandy Bay, on October 1 and 2. This was the first of its kind to be held in Australia.

Considerable assistance was rendered by the Fisheries Division of the local Department of Agriculture, the Division of Fisheries and Oceanography, C.S.I.R.O., and the Education Committee of the Commonwealth-States Fisheries Conference in planning the programme and organising the seminar.

The Director of Agriculture, Tasmania (Mr. F.W. Hicks, I.S.O.), who is also chairman of the Sea Fisheries Advisory Board, acted as chairman.

The following is a list of the papers presented -

1. "The Biological and Social Importance of Fishery Resources", by Professor T.O. Browning, Waite Professor of Entomology, Waite Agricultural Institute, University of Adelaide.
2. "The Effect of Fishing on Fishery Resources", by Dr. G.L. Kesteven, Assistant Chief, Division of Fisheries and Oceanography, C.S.I.R.O.
3. "The Technology and Economics of Fishing", by Mr. A.G. Bollen, Assistant Director, Fisheries Branch, Department of Primary Industry, Canberra.

4. "Management of Fishing Operations", by Mr. A. Dunbavin Butcher, Director of Fisheries and Wildlife, Victoria.
5. "Restrictions on Fish Catch", by Dr. A.G. Nicholls, Division of Fisheries and Oceanography, C.S.I.R.O., Melbourne (Presented by Dr. Kesteven).
6. "Regulations Relating to Characteristics of Fishing Gear and their Use", by Mr. D.D. Lynch, Commissioner of Inland Fisheries, Hobart.
7. "Control and Limitation of Licenses", by Mr. D. French, Fisherman, Stanley, Tasmania.
8. "Conflicting Objectives", by Mr. A.J. Fraser, Director and Chief Inspector, Department of Fisheries and Fauna, Western Australia.

The seminar was well attended by fishermen from all parts of Tasmania. Each talk was of about $\frac{3}{4}$ hour duration and a similar period was allowed for discussion. The discussions were at all times spirited and for the most part completely objective, and the departmental officers who contributed papers and took part in discussion were delighted with the response from the fishermen. It is to be hoped that the seminar will set the pattern for fishermen in other States and be the forerunner of many more.

On the first evening, a reception and cocktail party was tendered to all participants and their wives by Mr. L.M. Shoo-bridge, President of the Tasmanian Professional Fishermen's Association, at the Highfield Hotel, Hobart.

LEGAL LENGTH OF CRAYFISH

The Minister for Fisheries and Fauna last month released the following statement to the Press -

Fisheries Minister Ross Hutchinson announced yesterday that after close consideration of the request of the Confederation of Licensed Fishermen - which represents fishermen at Fremantle - for a reduction of the minimum legal carapace length of "white" crayfish from 3 in. to $2\frac{7}{8}$ in., he had decided that the request must be refused.

The views of many sectors of the fishing industry had been sought by the Confederation and relayed to the Minister. Those who supported a reduction in length were:-

1. Confederation of Licensed Fishermen;
2. Rock Lobster/Crayfish Industry Development Association of Australia;
3. National Fisheries (1957) Pty. Ltd;
4. Safety Bay-Rockingham licensed fishermen;
5. Messrs. Annear and Wheeler Bros.; and
6. Geraldton Fishermen's Co-Operative Ltd. (with reservations)

Those who opposed the reduction in length were

- (a) Dongara Fishermen's Association; and
- (b) Geraldton Professional Fishermen's Association.

Although it was possible that a majority of fishermen supported the request for a reduction in length, the Minister said that he was not prepared to seek a bubble popularity at the expense of prejudicing the future of the industry.

Mr. Hutchinson said that he had been advised by fisheries research experts that the contention held by many fishermen that "white" and "red" crayfish were of different species could not be sustained. Direct underwater observations by means of SCUBA equipment had proved quite conclusively that the "whites" are merely pre-mature "reds". Therefore, there being only one species of crayfish, regulations must apply equally to both phases of the fish.

It was agreed, said Mr. Hutchinson, that if the minimum legal length were to be decreased by $\frac{1}{8}$ in., as proposed, the immediate effect would undoubtedly be an increased catch of quite a substantial amount - perhaps up to $1\frac{1}{4}$ million lb. of white crayfish in the first year. However, by reason of such a large increase in the take of younger fish, there would in all probability be a long-term effect resulting in a smaller annual catch than is made at present.

In the interests of conserving the fishery, therefore, it seemed it would be most unwise to make the change requested.

MULTICOLOURED PRAWNS FOR SHARK BAY

The hypothesis that prawns migrate from the Shark Bay nurseries to commercial grounds was made a number of years ago and not critically tested.

Further evidence of this migration has been found in the log book data obtained from the fishing boats in 1964. However, this now has to be demonstrated practically and the rates and routes of migration determined. This information is essential for making accurate population estimates leading to rational management of the Shark Bay prawn resource.

Mutilation tagging (dart, Petersen and wire tags) has been found to cause considerable mortality and curtailment of activity.



A staining technique successfully developed in the U.S.A. is to be used in Shark Bay. This involves injecting a non-toxic dye into the blood causing an overall colour change and an accumulation of colour in the head. These dyes are not lost with moulting. The colours planned are red, green and blue.

The prawn research vessel "Penaeus" is to be tested on the Swan River king and school prawns as a preliminary to a full-scale field programme. The light aluminium launch "Penaeus" is to be used for this work. (The "Penaeus" was obtained in February 1964 for the prawn research programme.) The R.V. "Peron" will be used for the Shark Bay field programme. This programme is projected for February 1965 and it is hoped that about 10,000 king and tiger prawns will be stained in Hopeless Reach. These stains are soon

Recoveries will largely depend upon the fishermen although some recoveries will be attempted from the "Peron". A reward of 2/- will be offered for each stained prawn returned to departmental officers by fishermen.

COMMONWEALTH-STATES FISHERIES CONFERENCE

The conference held in Melbourne in December, 1963, was, it may be remembered, adjourned to meet again in Melbourne at a mutually convenient time. The meeting was resumed on September 22 and carried through until nearly midnight on the following day. The Director (Mr. Fraser) and the Administrative Officer (Mr. Saville) represented Western Australia. The Chairman was the Director of Fisheries and Wildlife, Victoria (Mr. A. Dunbavin Butcher).

There was an exceptionally long agenda. The following are some of the more important topics set down for discussion -

1. Overseas investment in the Australian fishing industry.
2. Entry of foreign fishing vessels into Australian ports
3. Name and terms of reference of the Southern Pelagic Project Sub-Committee
4. Australian participation in the Indo-Pacific Fisheries Council.
5. Uniform fisheries statistics.
6. Scallop research in Victoria and Tasmania.
7. Western Fisheries Research Committee - crayfish research and escape-gaps in craypots.
8. Tuna research and general market measuring.
9. Gear technology - establishment of gear research unit.
10. Fishing-boat design - visit to Australia of Mr. Jan-Olaf Traung.
11. Fishing port development Tasmania.
12. Gulf of Carpentaria prawn resource survey.
13. Training courses for field officers - proposed appointment of education officer.
14. Fisheries seminars.
15. Monofilament nets.
16. Importation into Australia of live aquarium and food and sport fishes.
17. Use of pesticides and their effect on fish.
18. Need for uniformity in maritime regulations relating to fishing vessels.

19. Seismic surveys in offshore oil exploration programme.

All States were represented. Representatives were also present from C.S.I.R.O. as well as from the Commonwealth Departments of Primary Industry and Territories.

FAUNA OFFICER'S EASTERN STATES VISIT

During his recent trip to the Eastern States where, as the representative of the Government of Western Australia, he participated in the successful establishment of the Australian Conservation Foundation, the Fauna Officer, Mr. H.B. Shugg, took advantage of hospitality extended to him to visit a number of centres in Canberra, Victoria and South Australia.

In Canberra, the Chief of the Division of Wildlife Research, C.S.I.R.O., Dr. H.J. Frith, escorted Mr. Shugg over the Division's research centre and headquarters at "Gungahlin". He was particularly interested to see among the centre's wild duck collection the young Freckled Ducks forwarded there under special license after having been taken in Benger Swamp near Harvey, last breeding season. Dr. Frith is currently studying the species to gain further information on their scientific classification (taxonomy) and scientific evolution (phylogeny). Mr. Shugg was also shown over the centre's extensive laboratories and holding yards and pens where research is being conducted on rabbits, kangaroos, wombats, magpies and other species of fauna.

During a two-day stay with the Victorian Department of Fisheries and Wildlife, Mr. Shugg was taken by the Superintendent of Game Management (Mr. M.C. Downes) to that Department's sanctuary and research centre, "Serendip", at Lara, near Geelong. Besides its use as one of the main duck banding sites in the State, this centre is being developed as a major wetland research station. Work in progress there includes studies in the integration of fauna conservation with farm management and waterfowl breeding and behavioural studies. Following successful breeding of chestnut teal at Werribee, Mr. Downes is using this species in his efforts to breed non-migratory stocks of ducks at "Serendip" for release in suitable areas. Mr. Shugg reports that since his last visit a fine machinery shed had been erected at the station and a comfortable, three-bedroomed home had just been completed for occupation by the recently appointed manager. Other buildings were in course of erection and a start was soon to have been made on the proposed research laboratories.

The following day Mr. Shugg was taken to Snob's Creek and shown over the trout hatcheries. He was particularly impressed by the efficiency and cleanliness of this extensive establishment and its attached research laboratories and equipment - not to mention the magnificent scenery at the nearby Eildon Weir.

In South Australia, Mr. Shugg was taken on a 400-mile, two-day trip up the Murray River. He was shown over a number of wetland sanctuaries as well as the wall-site of the proposed 5,000,000 acre-foot dam at Chowilla, near the Victorian border. When completed, this will be the largest body of water impounded in Australia - it will hold 12 times as much as Sydney Harbour and half as much again as Lake Eucumbone in the Snowy Mountains. It will be more than 5 times as large as our largest, the Wellington Dam, which holds about 40,000,000 gallons. When filled, Chowilla Dam will flood an enormous area and should provide tremendously valuable habitat for waterfowl, some of the many species of which Mr. Shugg had the pleasure of observing elsewhere on the meanders and billabongs of the Murray.

Staying overnight at Barmera, on the Murray, Mr. Shugg accompanied the Senior Fisheries Officer of S.A., Mr. Ray Vann (who, with the Senior Wildlife Officer, Mr. Doug Seaton, conveyed Mr. Shugg on the trip), to a meeting of the Barmera Professional Fishermen's Association, at which he gave a short address on fisheries administration in this State with emphasis on the parts played here by the fishermen themselves.

The extensive hospitality, both personal and official, extended to Mr. Shugg in Canberra by both the Fisheries Branch of the Department of Primary Industry and by the Division of Wildlife Research, C.S.I.R.O., and by the respective departments and officers in Victoria and South Australia, is most sincerely appreciated by both Mr. Shugg and this Department.

RESEARCH ON WEDGE-TAILED EAGLES

Advice has been ^{received} reviewed that Dr. H.J. Frith, Chief of the Division of Wildlife Research, C.S.I.R.O., Canberra, has appointed Mr. Michael Ridpath to initiate work on the ecology of the wedge-tailed eagle in Western Australia. Mr. Ridpath, who will be arriving in this State towards the middle of 1965, will also do some work in the ecology of rails. From his research more might be learnt about the black-tailed native hen whose incursions into various parts of Western Australia are well known, but the reasons are obscure and the source of the birds uncertain.

VARIATION IN BASIC RATES

A circular from the Public Service Commissioner advise that as a result of the recent declaration of the Western Australian Industrial Commission increasing the basic wage, variations in the basic rates and salary rates of Government employees will apply on and from September 22, 1964.

Typical salary increases for both General and Clerical Division officers are set out in the table hereunder:-

Category	Age or Year of Service	Gross Annual Salary Rate		
		<u>OLD RATE</u>	<u>NEW RATE</u>	<u>INCREA</u>
Cadet and Assistant Inspector G-VII-1	15 years	421	430	9
	16 years	491	502	11
	17 "	601	614	13
	18 "	711	727	16
	19 "	845	862	17
	20 "	943	960	17
	21 " or first year service	1011	1028	17
	22 " or second year service	1051	1068	17
	23 " or third year service	1091	1108	17
	24 " or fourth year service	1141	1158	17
G-VII-2	Minimum	1141	1158	17
	Intermediate	1176	1193	17
	Maximum	1211	1228	17
Inspectors Class G-II-1	Minimum	1351	1368	17
	Maximum	1408	1425	17

Category	Age or Year of Service	Gross Annual Salary Rates		
		<u>OLD RATE</u>	<u>NEW RATE</u>	<u>INCREASE</u>
Inspectors				
Class G-II-2	Minimum	1465	1482	17
	Maximum	1522	1539	17
Senior Inspectors Etc.				
Class G-II-3	Minimum	1584	1601	17
	Maximum	1646	1663	17
Class G-II-4	Minimum	1708	1725	17
	Maximum	1770	1787	17
Class G-II-5	Minimum	1833	1850	17
	Maximum	1896	1913	17

INDO-PACIFIC FISHERIES COUNCIL

A Session of the Indo-Pacific Fisheries Council, a subsidiary body of the Food and Agriculture Organisation of the United Nations, is held at approximately two-yearly intervals. The sessions rotate from member-country to member-country.

The purpose of the Council is to gather around the same table fisheries workers in various fields - administration, science and technology - from all parts of the Indo-Pacific region, and to discuss problems affecting member-nations. Many papers are contributed. These are considered by one of the Technical Committees and, where considered worthy, published in the Session's Proceedings. Usually a symposium is held during the Session, and papers selected from those contributed are presented and discussed. The I.P.F.C. accordingly provides a most valuable forum for the discussion of common problems.

Last month the 11th Session was held in Kuala Lumpur, Malaysia. The Australian representatives were Dr. G.L. Kesteven, of C.S.I.R.O., and Mr. N.V. Harris, Superintendent of Fisheries, N.S.W.

The first session (it was then called "meeting") was held in Singapore in 1949. Subsequent sessions were in Sydney Australia (1950), Madras, India (1951), Quezon City, Philippines (1952), Bangkok, Thailand (1954), Tokyo, Japan (1955), Bandung, Indonesia (1957), Colombo, Ceylon (1958), Karachi, Pakistan (1961), and Seoul, Korea (1962).

BARROW ISLAND WILDLIFE

Barrow Island which has been reserved since 1910, when it was set aside under the Permanent Reserves Act of 1899, as Class "A" for the protection of flora and fauna, is home for a number of forms of Australian wildlife that are absolutely unique, and the preservation of the island's fauna and flora is of utmost importance.

Before commencing its drilling operations there West Australian Petroleum Pty. Ltd. (WAPET) agreed to take all possible precautions to protect and leave undisturbed the island's fauna. It also impressed on all employees and contractors the necessity to preserve this reserve as nearly as possible in its natural state. The effectiveness with which this company has put that policy into practice is commendable, and a letter expressing the Department's sincere thanks has been sent.

As the favourable situation existing at Barrow Island could well serve as a standard for others to emulate, some publicity was sought from the Petroleum Information Bureau, Melbourne. the following reply was received from Mr. D.M. Patcher the Bureau's director -

"We have already been impressed by the attitude taken by WAPET to preserve our priceless heritage on Barrow Island, which I had the good fortune to visit two months ago. When passing through Perth, I was given a description of the unique animals to be found on the island by Dr. David Ride, Director of the Western Australian Museum, and I incorporated this information in a short item in the September issue of the "Petroleum Gazette", copy of which is sent to you under separate cover, and later in one of our regular press releases, copy of which is enclosed. You will be pleased to know that the press release has been used by quite a number of papers throughout Australia, including at least one in your State."

The article appearing in the "Petroleum Gazette" reads as follows:-

Unique Wildlife

Barrow Island, which is situated off the north-west coast of Western Australia, 60 miles north of Onslow, is a place of great interest to naturalists as well as to oilmen. The island was completely unoccupied by man until the oil searcher's arrival.

Approximately 18 miles long by 8 miles wide, Barrow Island is a reserve for the protection of flora and fauna. Its interest to naturalists lies in the fact that it possesses a number of unique species of marsupials and other Australian wildlife, most of which have not yet been classified.

Animals of particular interest include a wallaby, which grows to a length of about 4ft. and is closely related to the euro or roan wallaroo, a hopping marsupial found on adjacent islands in the area. There is also a spectacled hare-wallaby which has orange rings around its eyes.

Exclusive to the island is a rat-kangaroo, about the size of a domestic cat. This is a new species at present being classified by scientists of the American Museum of Natural History and the Western Australian Museum.

Naturalists have found a unique species of bandicoot and a small marsupial mouse, rather like the species which exists in the MacDonnell ranges in Central Australia. Some interesting species of rodents have been discovered as well, notably a large water rat about 12 in. long, with lovely fur, which is similar to a species found in the Kimberleys.

The island was discovered in 1818 by Capt. Phillip King during an Admiralty survey. It was visited in 1840 by HMS Beagle in continuation of a hydrographical survey off the coast of northern Australia. Mr. Benjamin Bynoe, the ship's surgeon, and Lieutenant Stokes, soon to be commander of Beagle, were keen naturalists and in the course of their hydrographical studies they collected specimens for the British Museum.

West Australian Petroleum Pty. Ltd. (WAPET) is keenly aware of the great value to naturalists of the unique fauna which exist on Barrow Island. It has gone to great pains to ensure that the current oil exploration operations do not interfere with the natural life of the island.

MEETING OF MINISTERS FOR FISHERIES

A meeting of Ministers charged with the administration of fisheries in their respective States, as well as the Commonwealth Minister for Territories took place in Melbourne on September 25. The Minister for Primary Industry (Hon. C.F. Adermann, M.H.R.) presided.

Attending Mr. Hutchinson, the Minister for Fisheries in this State, were the Director (Mr. Fraser) and the Administrative Officer (Mr. Saville).

Many matters were discussed. One which was of some importance to Western Australia was that of the proposed development of a tuna industry off the west coast by means of joint Japanese-Australian ventures. In the absence of concrete proposals, the Ministers felt they were unable to study the question adequately, and no decision was taken. When more definite information is available it is probable the matter will be raised again.

Other topics included the crayfish industry of Western Australia, the Tasmanian scallop fishery, fisheries statistics, the Southern pelagic project, Australian participation in the Indo-Pacific Fisheries Council, gear research, market measuring courses for field officers and others.

It was decided that the next meeting of the Commonwealth States Fisheries Conference would be followed by a further meeting of Ministers. The venue will be Queensland and the date early August, 1965.

Before the meeting opened, Mr. Aldermann gave an interesting and informative run-down of Australian fisheries in general. This is what he said -

When we look at Australian fisheries results for the past year, 1963-64, I am glad to say the year appears to have been an excellent one, with records being established in the volume and value of both fisheries production and exports.

Early reports indicate that, continuing the steady upward trend in production which has been a feature of the tuna industry since its inception in 1950-51, tuna production will again reach a new record, the preliminary figures suggesting a level of over 9,000 tons which will be almost double the corresponding figure for 1962-63.

With regard to the important crayfishery, I notice that overall production is slightly below the level of the year before, giving support to the opinion expressed on previous occasions that production from known resources in this fishery is perhaps approaching the level which can be maintained safely over the long term.

The prawn fishery responded well to strengthening demand in overseas markets and a record year was had on both the east and west coasts.

As for the significant developments which have been a feature of the scallop and abalone fisheries in Victoria and Tasmania this year, there is little need for elaboration here.

While actual production details are not yet available for remaining fisheries of commercial interest, there has been nothing to indicate that the past season has been a bad one. It is pleasing to note that in 1963-64, with few exceptions, the increased volume of production of marine products found a ready outlet in overseas markets. Preliminary trade figures suggest that the total value of exports of marine origin during 1963-64 amount to £8.3 m. representing an increase of about 12% over the previous year.

Australia is rapidly establishing herself as one of the world's leading exporters of prestige seafoods. Mainly favourable export prices, particularly for crayfish and prawns, combined with slight increases in the volume of exports of these two commodities, have lifted the value of exports of crustaceans to an estimated £6.6 m. This is about £428,000 or 8%, above the corresponding figure for 1962-63.

The picture of our major fisheries exports is quite encouraging, but we should be aware that there is a challenge in the 24% increase in the past year's imports of fish products, compared with imports in the previous year. Preliminary figures suggest that total imports of these items during 1963-64 were valued at over £11 million the bulk of this figure being accounted for by the large increase of 35% in the value of imports of frozen fish in 1963-64 over the value in the previous year. A close study of import statistics shows that, instead of arriving in consumer packs, two-thirds of these frozen fish imports were in the form of large producer packs, which were being used by fish shops and major institutional outlets such as hospitals and hotels.

It is true that to meet our total requirements we will need to continue to import fish, but unfortunately the rate of imports appears to be growing faster than the rate of domestic production. Thus our share of the domestic market is falling, particularly for certain grades of frozen fish.

While we recognize there are limits, particularly for fresh fish which can be taken from our waters, I think there is a strong case for better utilisation of the fish that is available.

In this respect, I have noted, for example, the setting up in New South Wales of a new fish marketing authority. No doubt this authority will be looking at this question.

We could also take a good look at the pattern of our fishing activities and the co-ordination of distribution of the resultant catch.

With an expanding population - already 11 million people - a growing market, and modern packaging and distribution methods, the domestic demand for fish will continue to rise. Today, more people in Australia have access to fish than ever before. The position has thus been reached when our fisheries are no longer cottage industries, and the local industry will need to be geared to meet the growth in demand. That, I suggest, is the challenge we have to meet.

With tuna very much in the picture, and the realisation that further expansion of the industry must be based on deep-sea stocks, a team of experts was sent last year to Japan, Honolulu and Samoa to investigate methods of catching mature tuna. It was found that unless there was a very definite change in the cost price structure of the Australian tuna fishery, the fishermen would be unable to operate profitably all the year round in deep-sea tuna long-lining. However, recommendations were made concerning the development of modified longline gear suitable for catching yellowfin tuna on a part-time basis, and I hope that fishermen will be actively encouraged to use the gear.

As for the southern bluefin fishery which, as you know, is the basis of our existing tuna industry, C.S.I.R.O. is actively engaged in a preliminary assessment of the distribution and population of our stocks, and I understand it will not be long before estimates are available.

Prawns are also causing wide interest in fishing circles, and it will be interesting to obtain the results as at the end of the past financial year of the survey of prawn potential which is currently being carried out in the Gulf of Carpentaria. As yet, no areas of commercial catches have been established, but a number of isolated catches of banana prawns in worthwhile quantities have been made. This leads me to hope that the survey, an example of close co-operation between the Government of Queensland and the Commonwealth, will meet with success.

In the case of scallops, the expanded production which resulted from the new operations in the Port Phillip Bay area recently made it necessary for an extensive survey to be made of existing and potential markets, and I hope that the resulting new overseas markets will stimulate further development in this potentially important fishery.

The outlook for pearling appears optimistic. With eleven pearl culture farms now established, three of them operated entirely by Australians, our pearl culture industry is showing continued expansion, the potential production within the next few years being estimated at £5m. As well as for live shell for the farms, demand is increasing for mother of pearl shell due to the present very low level of world inventories.

Prospects for whaling are not as good. The International Whaling Commission last year agreed to prohibit the capture of humpback whales south of the Equator for an indefinite period. For a short time this year we imposed a catch quota on sperm whales, but following the refusal of the International Whaling Commission to accept our proposal concerning the prohibition of pelagic whaling within a fixed radius of any shore station, the quota was abolished. C.S.I.R.O. scientists are continuing to play a leading role in the world-wide investigations into sperm whales and I hope that their findings will result in a rational exploitation of sperm whales.

Since we last met, the activities of this conference have been many and varied. The Sub-Committee on Fishing Vessel Design invited Mr. Jan-Olaf Traung, Chief of the Fishing Boat Section of the Food and Agriculture Organisation, to visit Australia during March and April of this year.

Mr. Traung visited all States and Papua-New Guinea and found that most of our vessels compared favourably with overseas boats of the same size, although there was still room for improvement.

His preliminary recommendations are concerned with research vessels, finance and insurance schemes, uniform regulations for construction of boats, safety, and the role of naval architects in the planning and design of vessels.

Since 1962, two more very successful training courses for fisheries field officers have been held at the C.S.I.R.O. Division of Fisheries and Oceanography's Marine Laboratories at Cronulla, N.S.W.

Modifications to the syllabus based on experience gained in the first two courses have contributed to improvements in the standard of the course and its value to both trainees and their departments.

Two more seminars on fisheries management have also been held. They were attended by university and private enterprise interests as well as by State and Commonwealth officers. A seminar for fishermen is being held early next month in Tasmania and is the first of its kind to be held in Australia.

Extension work is of major importance, and I feel that the activities I have just mentioned are a step in the right direction.

Concerning the activities of the Statistical Sub-Committee, you will be interested to hear that the Japanese Fisheries Agency, which controls one of the most highly developed fishing industries in the world, recently had translated for their own use the Sub-Committee's 1962 Conference report on the uniform system of collecting catch and effort statistics. On home ground, the system is now operating in three States and will be adopted by a fourth in the near future.

The uniform boat registration form proposed at the 1963 Officers' Conference has already been adopted by four States and the Northern Territory and statistics from these forms should be available by early 1965.

The work of the other Sub-Committees as well as the Statistical Sub-Committee are all examples of what can be accomplished by co-operation between the States and the Commonwealth, and I am sure you will agree that such liaison put into effect by efficient extension services and covering all facets of fisheries activities, is essential for the development and well-being of the Australian fishing industry.

TROUT FRY DELIVERIES

Technical Officer J.S. Simpson carried out the annual trout deliveries to trout acclimatisation societies from the Pemberton hatcheries between October 26 and 31.

The following deliveries were made:-

<u>Destination</u>	<u>Brown Trout Fry</u>	<u>Rainbow Trout Fry</u>
Balingup	1,500	5,000
Bridgetown	2,500	5,000
Harvey	5,000	10,000
Waroona	2,000	3,000
Dwellingup	3,000	7,000
Jarrahdale	5,000	10,000
	<u>19,000</u>	<u>40,000</u>

FISHERMEN'S ADVISORY COMMITTEE

Meetings of the Fishermen's Advisory Committee were held over most of October in Bunbury, Busselton, Manjimup, Fremantle, Geraldton and, finally, Dongara.

The response in most centres, particularly Geraldton and Dongara, was indeed gratifying and Inspector B.A. Carmichael deserves full praise for his efforts in seeking more than adequate representation from the fishermen.

Several matters were discussed during the meetings. The more important items were possibly the suggestion put forward for the banning of set nets within $\frac{1}{4}$ mile of the coast between Dunsborough and the mouth of the Capel River, the total closure of Broke Inlet to net fishing, the prohibition of taking crayfish in the Abrolhos area by means of skindiving, the return of the opening of the Abrolhos crayfish season to March 1 in lieu of March 15, the banning of fish-traps to take snapper, and aerial patrols over the Abrolhos during the months of January and February.

COMPLAINTS OF DAMAGE BY FAUNA

Staff members are advised that henceforth all inquiries and complainants must be informed that the Department is not responsible for the destruction of fauna causing damage to property or being a nuisance in some other way.

From time to time complaints are received that possums are damaging ceilings, magpies are attacking people, kookaburras are breaking windows, crows and eagles are taking chickens and so on. With the exception only of waterfowl causing damage and magpies attacking or frightening children, all inquiries are to be told that the Department accepts no responsibility for the destruction of fauna nor for the protection of property. Unless specific approval is issued from Head Office to the contrary, no mileage is to be incurred and no time is to be spent on these matters.

Possum traps will still be loaned to house holders who are troubled with possums but traps will only be loaned for a period of up to six weeks and must be picked up and returned by the persons requiring them.

In the case of magpies attacking children the established practice of destroying the offending bird may be continued provided that no objections are lodged and that there is no other alternative. If anyone in the neighbourhood objects, the matter is to be left to the people to settle. In cases of bird attacks on adults no action is to be taken but no objection will be made if the local police destroy the birds in the interest of public safety.

Cases of damage by waterfowl are to be referred to the Fauna Officer for his consideration.

FIELD OFFICERS TRAINING SCHOOL RESULTS

It is pleasing to announce that the three officers from the Department who attended the recent field officers training school at Cronulla, N.S.W. (Technical Officer N.E. McLaughlan, Inspector D.H. Smith and Pearling Superintendent R.J. Baird) were successful in the examination held at the completion of the school. We offer them our sincere congratulations and trust that the knowledge they gained will be of the utmost benefit to themselves and to the Department.

T.O. McLaughlan obtained $81\frac{1}{2}$ marks out of a possible 100 to gain distinction, and by so doing took third place in the school. Inspector Smith gained a Credit with 77 marks and Superintendent Baird passed with $59\frac{1}{2}$.

CLEARING HOUSECOD, PERCH AND CATFISH

After only four years' operation, Australia's first inland fisheries research station, near the Murrumbidgee River, New South Wales, has succeeded in artificially breeding four types of native fresh water food fish. Within months of the beginning of field experiments, biologists had bred native freshwater golden perch for the first time under controlled conditions in artificial ponds. Successes in breeding three other excellent native species were to follow. These were the silver perch, the freshwater catfish and the incomparable Murray cod. By farming native fish in Australia, they could eventually be introduced to tropical and semi-tropical areas of Asia, where warm stream and pond conditions are similar to the natural habitats of the species. Although fish farming is already well developed in many Asian countries, the species of fish being raised are generally inferior as food types to the best of the native fish of Australia. Fish bred from Australian stock would almost certainly raise the yield of Asian fish farms, as did the introduction of the African tilapia some years ago.

Since it has not previously been possible to breed native fish in captivity, fish farming in Australia has not developed to any extent. Now it may prosper, at first as a possible side-line for the man on the land but eventually as a commercial venture. Australia's inland Fisheries' Research Station was established near Narrandera - a south west pastoral town in the State of New South Wales, more than 350 miles inland from the Pacific Ocean. It was set up to combat a serious and steady decline in the numbers of fish in Australian inland waters.

Top fish

Observers had noted that following land settlement and consequent river improvements, such as irrigation, weirs and flood control projects, certain species of native fish declined in numbers; some so rapidly as to disappear from streams in which they had once been plentiful. Unfortunately, the fish most affected were the best of Australia's inland edible and sporting fish. The site of the Narrandera research station was chosen in the centre of the huge Murray River system in Eastern Australia. This 1,609-mile long river and its tributaries drain a catchment area of some 414,000 square miles. The largest tributaries of the Murray - the 980-mile Murrumbidgee River and the 1702-mile Darling, are both in New South Wales and join the Murray from the north. Southern tributaries flow from the State of Victoria. Early settlers found all the rivers of this system well stocked with native fish.

The Narrandera station occupies about 50 acres, just beyond the flood plains of the adjacent Murrumbidgee River, from which it draws water for its 27 experimental ponds. It has a well equipped research laboratory and its staff is housed in comfortable all-electric cottages.

Breeding routines

Many of the experimental ponds are specially designed to provide, as far as possible, the natural conditions of flooded river backwaters, as it was suspected that the elimination of such conditions on the streams by flood control and irrigation might have upset the breeding routines of native fish. This turned out to be the main cause of the decline of fish numbers. It was nearer the truth than the adamant contention of most local anglers that the "blamed rivers have been fished out". These "flood" ponds at Narrandera, which reproduce the conditions of natural floods, are each about one quarter of an acre (100ft. x 100ft.) in area. A small section of the ponds (25ft. x 100ft.) is about 8 ft. deep and the remainder about 4 ft. An outlet tower controls water levels allowing the flooding or drying out of the shallow area while the fish remain in the pond.

Fertilisation

When full, the ponds contain about 150,000 gallons of water. Some are fertilised with a mixture of superphosphate, sulphate of ammonia, finely ground limestone and muriate of potash. This encourages the growth of weed and plankton, the only food of small fry. Success came quickly to the station. Four months after the arrival of the officer-in-charge, NSW State biologist John S. Lake, with a staff of research workers the first successful scientific attempt to breed native fish was a fact. Golden perch (*Plectroplites ambiguus*), drum-netted from the Murrumbidgee, spawned in five of the ponds. This was the first time that an Australian native fish had been stimulated to breed in captivity.

The golden perch is also known as the "callop" and "yellowbelly", and it occurs in all but the cool to cold headwaters of the Murray-Darling system. It is an excellent eating fish and, although a 9 lb. fish is considered a good catch by anglers, a specimen of 54 lb. has been captured. From the spawnings in the five different "flood" ponds, and the fact that no spawning occurred in ordinary ponds stocked with mature fish, biologists had learned for the first time that a natural flooding of shallow turbid water was required before golden perch would reproduce. It was later discovered that similar conditions were necessary when silver perch (*Bidyanus bidyanus*) were bred in the same "flood" ponds.

Like the golden perch, they required warm temperatures and a rise in water level over normally dry flats before spawning. The eggs of both species were found in free suspension in the water. The silver perch, also known as bream, is good eating and an even better sporting fish than the golden perch. It is commonly taken up to 5 lb. but fish of 17 lb. have been caught. The third fish on which breeding experiments were conducted was the freshwater catfish (*Tandanus tandanus*). Unlike the two perches, the catfish, another native of the Murray-Darling system, presented few problems. Without the stimuli of shallow flood waters and just-right temperatures it bred readily in ponds. Also unlike the perches, it did not let its eggs go free but built nests of pebbles and deposited its thick-walled roe under the gravel. The freshwater catfish is a species distinct from the catfish of Australian salt-water estuaries and is common in the warm waters of inland rivers. It is a good eating and a respected sporting fish, usually weighing between 2 lb. and 5 lb. although a length of 3ft. and a weight of 15 lb. has been reported.

Big Day

The really big day at Narrandera, however, was in October, 1963, when a small oil slick on the surface of one of the "flood" ponds early one morning was the first indication that something was doing in the watery world of the Murray cod. Underneath the oil slick in about $3\frac{1}{2}$ ft. of water the excited biologists found a section of a fibrolite pipe. This, with water-logged sticks and stones, had been placed in the pond as a shelter for the fish. Inside the pipe, neatly arranged in rows, were some 50,000 fish eggs. Until that moment not only had Murray cod not been known to breed in captivity, but no one had known for sure when or how they laid their eggs. Strangely enough, of all the many theories, none had suggested the inside of a hollow log, as represented by the fibrolite pipe, as nature's nursery for baby cod.

The Murray cod (*Maccullochella macquariensis*) is one of the world's big freshwater fish. It grows to well over 100 lb. in weight and specimens of 5ft. and more in length have been caught. It is the only freshwater fish in Australia regularly fished commercially and is always assured of top billing on any menu. The cod inhabits the whole of the Murray River system from tropical Queensland through New South Wales to temperate Victoria and South Australia. It is not only the largest of the 39 species of native Australian freshwater fish that are of interest to research workers at Narrandera.

An important by-product of the experimental breeding of Murray cod was the discovery that many of the small forage fish, on which the larger species feed, also require flood waters and shallow and warm conditions if they are to survive. For instance, the growth of Murray cod has been found to depend largely on a parallel growth of the Australian smelt and western carp gudgeon - small natives that grow only to a length of from one to two inches.

The small fish hatch on flood-covered flats at about the same time as cod and perch. Happily for the big fish, but not so happily for themselves, they grow to an edible size at about the time that the young cod and perch become too big to eat plankton. Research into the biology and habits of these small fish is being intensified, particularly now that it is realised that the effect of irrigation on river levels could eventually mean the drying up of the food source of the baby Murray cod and fish of the large edible species.

Another important by-product of the success of breeding experiments at Narrandera is the promise to anglers of a return to the days when good sport on inland rivers and lakes stocked with native fish was the rule and not the exception. Already many thousands of young cod, perch and catfish from the Narrandera station have been released in streams, rivers, lakes and farm dams. However, contrary to the firm belief of many fishing authorities and most anglers, John Lake does not consider that restocking of streams is the cure-all for poor fishing. This was only one of the many inland water management techniques. The main object of the research work at Narrandera was to find out the species of fish most suited to live and thrive in new environments of man-changed rivers.

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LARGEST SOVIET FISH FARM

Work has for some time been in progress in the Poltava district of the Ukraine on the establishment of what is claimed to be the largest fish farm, not only in the U.S.S.R., but in the world, with ponds covering an area of over 5,000 hectares (12,355 acres). The farm is situated on what is known as the Obolonskiy massif, which lies in a shallow-water zone flooded by the Kremenchug reservoir. In order to protect the fish farm against flooding a protective dam will be erected and a drainage system will be arranged on the river Krivaya Ruda to allow excess water produced by thawing snow or sudden heavy rain to flow into the reservoir, instead of the river where it passes through the area to be protected.

Pumping stations will also remove water due to sudden heavy rain or leakage, and this water may be used for topping up or freshening the fish ponds.

2,700 Tons

This enterprise, on which work was commenced in 1962, was intended to produce 1,800 tons of fish per annum. Since its conception, however, very considerable advances have been made in the science and practice of fish-breeding, such as the use of high-value foodstuffs in granulated form, the increase of the rate of flow water from 3 to 4.5 litres per second, the adoption of labour-saving machinery, and so on, so that the designers have found it possible to raise their estimated productivity of the fish-fattening ponds to 12.6 centners (12.5 cwt.) per hectare (1 hectare = 2.47 acres). The actual commercial output of fish may therefore be estimated at 54.35 thousand centners (approx. 2,700 tons), comprising 51.25 thousand centners (Approx. 2,500 tons) of carp, 2.38 thousand centners (approx. 119 tons) of crucian-carp and 0.72 thousand centners (36 tons) of pike.

The area most suitable for fish-breeding will constitute a special sector for that purpose, the remaining three sectors, which are situated on lower ground, being used for fattening ponds, and scattered sections of higher ground will be used for growing crops. The entire complex will be organised as a single fish-farm, to be known as the "Sulikskoye Tavarnoye Rybnoye Khozyaystvo" (Sulina Commercial Fish-Farm), with four sectors; three for farming fish for sale, and one for breeding young fish. It will have 43 fattening ponds, with an aggregate area of 4,815 hectares (11,897 acres) and 294 breeding ponds, with an aggregate area of 385 hectares (950 acres).

The ponds will generally be produced by digging holes and compacting the ground inside them. They will be drained by means of a system of open irrigation canals, which will serve also for collecting and herding the fish. In view of the close proximity of the fish farm to inhabited places, steps have been taken to protect the latter against flooding by surface water and damp seeping through the ground. The construction of the Sulina fish-farm is regarded as a typical example of the possible use which can be made of the shallow parts of reservoirs.

MORE ABOUT FISH SAUSAGES

Japan produces 150,000 tons of fish sausages and 500,000 tons of fish cakes per annum. This article gives further details of the product, which was first mentioned in the July issue.

One of the most striking features of the Japanese fisheries is the great variety of fishing gear which is used and the world wide deployment of fishing effort. Anyone visiting a Japanese fish market, such as that in Tokyo is also immediately struck by the enormous variety of fish and other marine animals which are displayed for sale for human consumption. The impression is that no marine products are wasted, and in fact some 300 species of sea food appear on the market.

The Japanese are great fish eaters - they consume between 25 and 27 kg. (1 kg. = 2.2 lb.) per head annually - and one of their most popular dishes is Tempura, which is a mixture of many types of fish and shellfish. It is therefore not surprising that so many species can be sold.

Growing Need

However, in addition to the traditional fish dishes there is, as in other countries, a growing demand for prepared foodstuffs and fish has not been neglected as the basis for these. Fish sausages and fish cakes meet this need and are supplying a growing proportion of the market. Initially the development of the fish sausage arose because of the lack of refrigerated holding capacity. Artificial chemical preservatives were therefore used in the sausages. Now, although more adequate refrigerated storage is available, sausages and fish cakes, in a variety of flavourings, cater for an established and expanding demand. At present the annual production of fish sausages is approximately 150,000 tons and of fish cakes 500,000.

Whale and tuna

Whale and tuna meat, particularly Bigeye tuna, is used as a base in the sausages, but as the cost of tuna is increasing, it has become necessary to reduce the proportion of tuna substituting white fish, principally Japanese cod and pollack. This use of white fish poses considerable problems, as the texture of white fish is unsuitable for manufacturing sausages. Sea-frozen fish is also said to be of unacceptable texture. It was therefore necessary to evolve a method of processing the white fish in a manner which would provide the proper texture for the manufacture of fish sausages.

Firm texture

After much research the method developed is to mince the fish and wash it in salt solution to remove salt-soluble proteins. Poly-phosphate, salt and sugar are added and the excess oil and water removed by pressure. Starch, either in the form of potato or corn starch, flavouring and sodium glutamate is added and the fish frozen in blocks. These blocks can be stored for six months at minus 25 deg. C. To make the sausages they are mixed with whale and tuna meat up to a maximum of 70 per cent of white fish. This sausage meat, with its preservatives and colouring, is then packed in skins. The sausages have a very firm texture and a flavouring which can be modified to suit individual requirements.

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SCALLOPS FLOOD THE MARKETS

Record supplies of scallops flooding wholesale channels in Sydney and Melbourne have caused a 30 per cent drop in prices and a first class panic in the trade. Chief cause of the upset was the discovery last year of new grounds in Port Phillip Bay (Victoria) and the year-round operation of a big fleet of scallopers. In the past, scallops were the almost exclusive preserve of Tasmanian fishermen and supplies were governed by a closed season. Wholesalers, by agreement, were able to pay fishermen a stable price and to channel the scallops out to the retail trade at a regulated flow during the rest of the year.

Trade Upset

The Port Phillip fishery upset the orderley plan because it operates without a closed season. Wholesale distributors are really concerned at the trend in the scallop trade this year. Naturally, they want to make a quid for themselves but they also realise that the future of the industry would be jeopardised by a further price collapse. For instance, this time last year, scallops were 6/- a lb wholesale in Sydney.

Door-to-door

The price had dropped to 4/3 lb by the first week in September and a week later (when this issue went to Press) to 4/- a lb. Some Melbourne processors have been hawking scallops around the Sydney trade at even lower prices. A fleet of 40 boats is operating on Melbourne's scallop beds and processors have been at the Victorian Government to close the fishery.

The Victorian Fisheries and Wildlife Department has refused to do this so it looks like the public will continue to get their scallops cheaper for some time to come. Making the situation worse, is the fact the French market is now also flooded with scallops and there's no safety valve for the surplus. Another worry too, is the claim that some of the Port Phillip scallops being exported are over matured, which means the roe may burst in transit. Once this occurs, the orange coloured roe stains the mussel and the scallop loses its eye-appeal. This would kill the export, not only for Victoria but for all Australian scallops. The way things are at present, we wouldn't like to lend any money to a scallop processor.

(Fish Trades Review Sydney September, 1964)

FISHING IN THE ANTARCTIC

Much is being said these days about the sea as a new source of food supply. One disclosure from the studies of scientists is that there are many kinds of fish that are not commonly known to man. The National Science Foundation at Washington, D.C. has recently reported a search for new types of fish beneath the thick ice caps in the Antarctic. An experiment in the use of seals as catchers of fish was tried by puncturing a hole in the ice and another hole 300 yards away. A rope connected to a fish net was tied to a seal which was pushed into the first hole. The seal being an air-breathing mammal swam toward the second hole, dragging the net with it under the ice. Rare types of fish were caught in the net along with a few of the commonly known varieties. It is expected that the Antarctic may be a rallying point for many new types of cold water fish which will be added to the world's food basket.

(Modern Government New York September-October, 1964)

RARE FISH

A rare variety of fish, black pike, has been discovered in Soviet Arctic waters and off the coast of Alaska. For 10 months of the year this species can remain frozen. Several are being sent to Moscow University for analysis.

(The Fishing News London 11 September, 1964)