



MONTHLY SERVICE BULLETIN

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Vol. II, No. 5

May 1, 1953

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STAFF NOTES

The Minister for Fisheries (Mr. Kelly) and the Superintendent (Mr. Fraser) visited Mandurah towards the end of April and discussed with local fishermen several matters dealing with the fisheries of Peel Inlet.

Inspector F. A. L. Connell has resumed duty after annual leave, which he spent in Singapore.

Inspector J. E. Munro is at present on annual leave. Inspector A. K. Melsom is acting as Metropolitan Inspector.

Assistant Inspector G. Coombes has returned to duty after leave, and Cadet Inspector B. A. Carmichael is back on the job following 3 months' national service training with the Army.

Mr. B. R. Saville is acting as Clerk-in-Charge during Mr. Brownfield's absence relieving in the State Hotels Department. Mr. H. B. S. Shugg, of the Native Affairs Department, is relieving in Mr. Saville's position.

Mr. J. E. Bramley, Supervising Inspector, spent some time during April in the Bunbury and Mandurah districts.

Assistant Inspector J. L. Gallop has gone to Geraldton to assist Inspector Bowler during the Abrolhos crayfish season. Inspector R. M. Crawford is at Mandurah in his stead.

Mr. L. G. Smith, Technical Officer, was in the Albany district during April tagging ruffs. He was assisted at Bremer Bay and Cheyne Beach by Inspector G. C. Jeffery. Towards the end of the month Mr. Smith left for Esperance and Hopetoun in company with Mr. W. B. Malcolm, of C.S.I.R.O. Division of Fisheries, for further ruff tagging work.

Inspector J. S. Simpson is at Pemberton making ready for the distribution of trout which is scheduled for early May. Inspector H. J. Murray and Mr. Simpson will transport the fish.

#### GERALDTON DISTRICT NOTES

It is pleasing to see new bodies springing up at various places. The latest of these came into being on March 9, when the Northampton District Angling Club held its inaugural meeting. Inspector S. W. Bowler was present. There are about 30 foundation members; the President is Mr. D. Izard and the Secretary Mr. R. E. Kagi. We wish the new club every success.

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Geraldton Ice Works Ltd., which was formed some years ago to take over the old Geraldton Ice Works, and later went in for de-tailing and freezing crayfish and filleting, packaging and freezing fish, has now closed down.

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As a consequence of torrential rains towards the end of March, all rivers in the Geraldton area, from the Murchison south to the Irwin, have been in flood. The Greenough River, which only occasionally breaks through to the sea, opened on March 26.

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Inspector Bowler has supplied the following figures in relation to the Abrolhos crayfishery during the current season -

<u>Group</u>	<u>No. of men</u>	<u>No. of boats</u>
North Island	9	4
Wallabi	34	26
Easter	40	25
Pelsart	24	15
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Totals:	107	70
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The l.f.b's "Eureka", "Linda" and "Pacific" are transporting crayfish from the Islands to the Geraldton Fishermen's Co-op. Ltd., and the "Queen" and "Suda Bay" to the other two processing firms, Golden Glean Fish Processing Pty. Ltd. and Tropical Traders and Patersons Ltd.

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Although the first fortnight of the current Abrolhos season was somewhat poor, April has seen some very good catches. In the Rat Island area of Easter group the take of crayfish has been excellent, and the indications point to greater production this year than ever before. At the Wallabi group the take is comparable with 1952, and only on the shallows in the Pelsart group, and at North Island, is there any suggestion of reduced catches. On April 11 more than 50,000 lb. of crayfish was landed at Geraldton. This equals the record established on one day in 1951, when a similar quantity was brought ashore. Unfortunately mortality among the fish en route to, and while awaiting processing at, Geraldton has been unduly high. Inspector Bowler, in a report on the matter, ascribes it to one or more of several factors (1) abnormally hot weather; (2) slow transport; (3) bad organisation at one processing works; (4) dirty bags; and (5) careless handling by fishermen at islands. From one consignment which arrived at Geraldton early in April more than a ton of dead crayfish were removed. This represented about one-eighth of the total landings for that day.

M.V. "LANCELIN" - SOUTH-WESTERN CRUISE

Last month we published a resume of a report prepared by Mr. K. Godfrey, of C.S.I.R.O. Division of Fisheries, relating to "Lancelin's" operations to March 16. A report has now been received from the skipper

(Capt. H. C. W. Piesse) concerning the work done during the final fortnight.

A further test was made with the small trawl and 60-lb. boards in Bunbury harbour in 2-3 fathoms. The net worked satisfactorily. The catch comprised a few flounder, boxfish, whiting, cuttlefish and rays, as well as great quantities of blue manna crabs. No prawns were taken.

On March 18 the experimental drift nets were overhauled and laid on the net rack aft ready for shooting. The nets consisted of 3 lengths of 160 to 200 yards each, with  $2\frac{1}{8}$ " to  $2\frac{1}{2}$ " mesh of 9 and 12 ply, lightly leaded and corked. Each was 2 fathoms in depth. The nets were shot joined together and attached to heavy bridles running their full length from dan buoy to ship. Spectacular results were not expected, for although a few ruff had been sighted along the beaches most of the summer, no migrations had been observed. It was really a little early, the northerly movement of fish normally taking place about mid-April.

The nets were shot in the evening approximately 8 miles to the westward of the southern end of Bouvard Reef in about  $16\frac{1}{2}$  fathoms. The wind was S.S.W., S3, during the night, and a drift of approximately 9 miles in a northerly direction was made in 11 hours. The wind was steady and the net streamed clear all night. At daylight the nets were hauled in with a catch of 24 large ruffs. Most were near the lead line and partly eaten by sea-lice and squid.

During the night a whaler shark was landed with two ruffs in gut - these were probably taken from the net. Other fish could quite easily have become lightly meshed and have dropped out of the small mesh. No further drifting trials were made because of the virtual absence of ruff from the area.

Fifteen craypots were set at the south end of Bouvard Reef in 3 to 10 fathoms. The pots were pulled five times for a total catch of 37 crayfish (Panulirus longipes). They were mainly small and consisted of 21 males and 16 females. Their total weight was 29 lb., or an average of 12.6 oz.

Trolling was carried out north and west of Bunbury, and also on the run to Fremantle on April 1 and

2. Several schools of tuna were seen as well as some large pilchard shoals. The tuna appeared to be of a small, even run, but they did not strike freely. Seven southern bluefin were taken, and a narrow-barred spanish mackerel, length 39", weight 27 lb., was landed. The surface temperature of the water where the fish were trolled was from 18.9°C to 19.9°C, i.e., from 66° to 68° Farenheit.

#### CRAYFISH AT MANDURAH

Handline fishermen operating about 10 miles west of Mandurah have during recent weeks been making fair catches of crayfish. Three men are operating from 3 to 5 pots each, and the catch of each man averages about 60 lb. daily. This, it is believed, is the first real attempt at commercialising the crayfish resources off Mandurah, and plans are now being laid to extend operations next year.

Most of the present catch is being sold locally.

#### FISH DYING IN PALLINUP ESTUARY

Reports reaching the Department from Fauna Warden J. Traynor and others indicate that following a long spell of exceptionally dry conditions the waters of Beaufort Inlet (or, as it is more commonly known, Pallinup Estuary) have become so low and de-oxygenated that vast quantities of fish, bream, mullet, ruff and whiting, have died there.

Beaufort Inlet, which is about 70 miles N.E. by E. from Albany, and Wellstead Inlet, which is about 30 miles E. of Beaufort Inlet, are recreation reserves vested in the Gnowangerup Road Board. By an amendment to the Fisheries Act passed in 1938, and never repealed, any road board in whom any waters are vested may make by-laws regulating fishing therein, and on the coming into operation of the by-laws any proclamations, regulations, etc., relating to the waters already in existence are null and void. Furthermore no proclamation or regulation issued by the Governor while the by-laws remain in force shall have any effect.

The Gnowangerup Road Board subsequently made by-laws and assumed control of the fisheries of the inlets concerned, and although by agreement between the Board and the Department the by-laws were at one time revoked and control handed back to the Department, fresh by-laws were later promulgated, and control of the fisheries once more reposed in the Board. That is the situation today.

When the Department first heard of the mortality, Inspector G. C. Jeffery, of Albany, in whose district the waters lie, made contact with the Road Board and suggested that all restrictions on fishing be lifted for a time so that the fish would not be wasted. The approach was successful and the waters were opened for a month, and fishermen Swarbrick and Heberle made one or two good hauls.

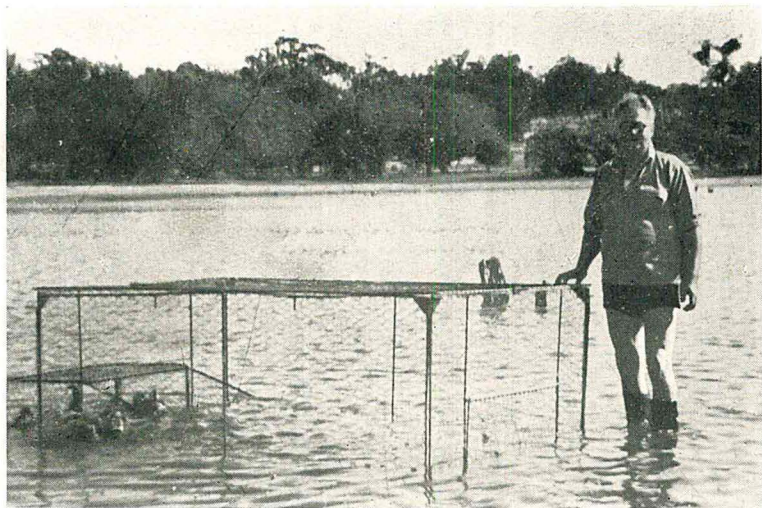
Mr. Heberle has now produced for the inspection of the Minister and head office personnel a number of photographs taken at Beaufort Inlet, as well as a sample of fish he caught there. The photographs, one or two of which will be reproduced in the next issue, bear out his statement that "hundreds of tons" of good fish had perished. The fish themselves were in shockingly poor condition, and were covered in sores.

The view of the Professional Fishermen's League, which to a large extent is shared by departmental officers, is that the control of these two fisheries should revert permanently to the Department. It is believed that as all our marine and estuarine fisheries are interdependent, any damage which may accrue to any one of them through faulty management, due either to a lack of appreciation of overall fishery problems or else to a purely parochial outlook, must be felt, to a greater or lesser degree, by all other fisheries.

#### DUCK BANDING

Warden J. Traynor has almost reached the thousand mark with his duck-banding operations. As soon as this figure is reached he will pack up his traps until next spring. His work during April has been confined to Queen's Gardens, Perth, and Lake Karrinyup, Balcatta.

# TRAPPING WILD DUCK FOR BANDING



Warden J. Traynor with ducks in trap (Lake Karinyup)



“Dry” trap, duck entering box (Yanchep)



Shallow-water trap (Lake Karinyup)



Improved deep-water stake trap (Lake Wardering)

In the last issue of the "Bulletin" a table of recoveries was given. The following recoveries were reported to the Department in April:-

No.	Date ringed	Place where ringed	Date recovered	Place where recovered	Distance travelled
					Miles
			<u>BLACK DUCK</u>		
1035	5.6.52	Queens Gardens Perth	ca.8.1.53	8 m. S. of Boyup Brook	135
1154	11.11.52	Narrikup	14.4.53	Chittering Lake	225
1277	27.1.53	Yanchep	12.4.53	Yanchep (found dead)	-
			<u>GREY TEAL</u>		
1317	10.2.53	Lake Wardering Woodanilling	29.3.53	11m.N.of Kojonup	25
1342	12.2.53	do.	15.3.53	do.	25
1358	do.	do.	3.4.53	10m.N. of Kojonup	25

COCKROACHES

As is almost inevitable with small boats associating with other boats, one or two of our patrol vessels are slightly infested with cockroaches. The advice of the Government Entomologist was sought as to what control measures might be adopted, and he has replied as follows -

"Cockroaches may be effectively controlled by dusting or spraying with DDT. Where it is desirable to bring a heavy infestation under control quickly, kerosene sprays of 4% or 5% DDT should prove most satisfactory. If fire risk precludes the use of the kerosene mixture, then water mixtures could be substituted. If cockroach activity persists after two sprayings at an interval of about a fortnight, 10% Gammexane dust could be liberally applied behind cupboards and other fixtures likely to harbour the insects."

A leaflet setting out the life history and habits of the pest is available. It sets out fully the most effective method of applying insecticides. If any officer desires a copy, we would be happy to secure one for him. Skippers of vessels where there is cockroach infestation should requisition the insecticides in the normal way.

RUFF TAGGING - APRIL, 1953

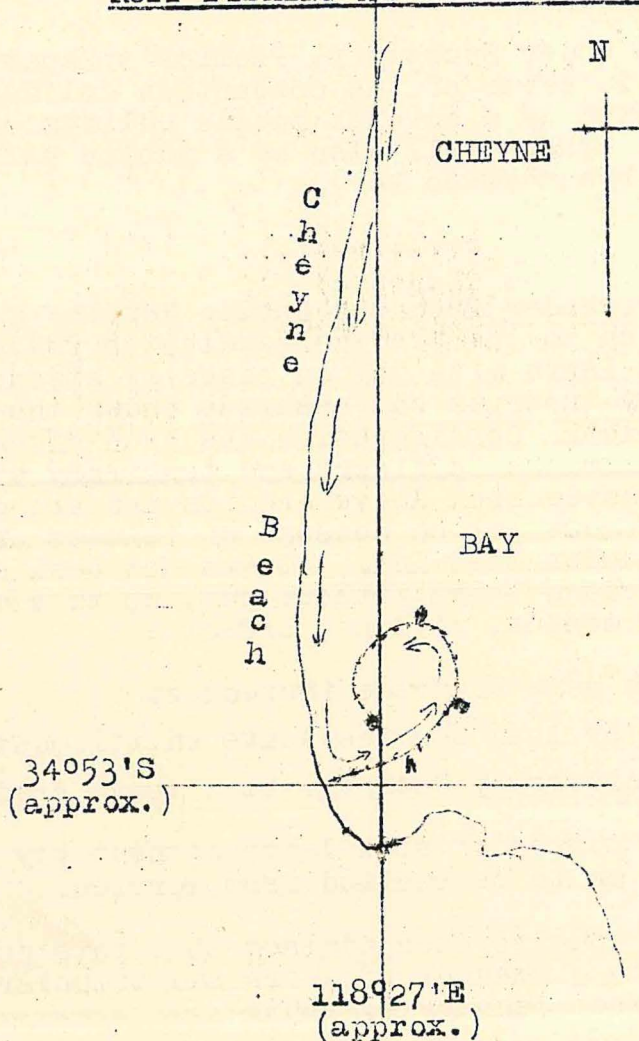
Mr. L. G. Smith, Technical Officer, reports that in company with Inspector G. C. Jeffery, he visited Cheyne Beach on April 10, arrangements having been made with fishermen Birss and Westerberg for catching ruff for tagging. On arrival at the Beach they found many tons of ruff penned awaiting transport to the Albany cannery, and another shot was in progress with another 20 tons in the bunt of the net. By means of coal baskets 1,000 fish were trailed out of the net and transferred to the tagging pens. A start was made at 10 a.m. and by 2.15 p.m. 1,000 fish had been internally tagged, measured and recorded. Mr. Smith states that the ruff on this occasion were of a larger run than ever previously tagged.

On April 14 Messrs. Smith and Jeffery visited Bremer Bay, where fisherman Cullinane and team were operating. Although Cullinane was packing up to leave Bremer, he agreed to make a shot, and at 4 a.m. the following day 600 ruff were landed. Of these 435 were tagged internally in about  $1\frac{1}{2}$  hours.

Mr. Smith remarks that as far as the south coast is concerned, this is perhaps the "best season ever for herring".

Inspector G. C. Jeffery has furnished information in relation to the method of netting in vogue at Cheyne Beach for the capture of ruff. As it differs materially from methods adopted elsewhere, a copy of Mr. Jeffery's notes and diagram are given overpage.

RUFF FISHING AT CHEYNE BEACH



The ruff travel in the direction indicated by the arrows. About sunset a large seine with deep bunt (400 yards of  $1\frac{3}{4}$ " x 18-ply net - bunt 30' deep) is run out from the beach in the manner shown in the above rough sketch, anchored by boats as shown. The net is left set all night, and at daylight the free end is brought ashore and the fish are bunted up in water about waist deep. The fish are then brailed out of the bunt. It appears that once the fish hit the net they travel along the cork-line into the circle, where they mill all night. (net not to scale).

ADMINISTRATIVE CIRCULARS

The Under Secretary, Premier's Department, advises that in terms of the Coronation Holiday Act, 1952, there will be a special public holiday on June 2, 1953. There will also be a public holiday on June 1, 1953 (Foundation Day).

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A circular from the Public Service Commissioner draws attention to the procedure which is followed when granting sick leave with pay in cases of absences from duty caused by injuries compensative under the Workers' Compensation Act. Consideration has been given to the question of permanent officers and temporary employees who have exhausted sick leave credits and are granted sick leave without pay on account of illness or injury compensative under that Act. It has now been decided that in such cases leave without pay, up to a maximum period of six months, will not affect -

- (i) the due date of grade increases;
- (ii) annual or long service leave entitlements;
- (iii) the anniversary date for sick leave credits.

Any period of sick leave without pay in excess of six months is to be excised from service.

The Commissioner advises that this new ruling applies to both permanent officers and temporary employees, and operates from January 1, 1953.

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The Public Service Commissioner has also circularised permanent heads concerning the rent to be paid for official quarters occupied by civil servants. It will be remembered that the Public Service Act provides that if an officer occupies official quarters, a fair and reasonable sum as rent may be deducted from the officer's salary and that the rent shall not exceed 10% of his salary.

A recent investigation of fixing and adjusting rents charged for occupancy of quarters has disclosed lack of uniformity, and it has been decided that from July 1, 1953 (inclusive) -

- (i) deductions in respect of rental for official quarters shall be annual determinations subject to adjustment only on July 1 in each ensuing year; and
- (ii) the rental to be charged in each case shall be 10% of the officer's salary at July 1 each year, or the economic rental - whichever is the lower - with a ceiling in either case of £120 per annum.

Officers who are not occupying official quarters on July 1 in any year but subsequently take up residence therein shall be charged a rent of 10% of salary on date of occupation, or the economic rent - whichever is the lower - with a ceiling of £120 per annum.

#### WESTERN AUSTRALIAN FISHERIES

Some months ago it was stated that we would carry each month a story dealing with one of our more important fisheries. Three have now appeared - Australian salmon, trout and pearlshell - and it was intended that the current issue would run the story of the mullet. Owing to Mr. Brownfield's transfer to another Department, and the additional burdens cast on the remaining members of the staff, this has not been possible. It will however appear in the June Bulletin.

#### PRIORITY AMONG NETTERS

It will be remembered that a year or two ago in the Supreme Court action Chipperfield and Andre v. Smith, the Chief Justice in his judgment held that regulation 13, which determined the rights of priority as between net-fishermen operating on the same ground, did not mean exactly what the Department intended when the regulation was made. Since then the re-drafting of the regulation has been considered, and the matter placed before the Fishermen's Advisory Committee. As a result new regulation 13 was gazetted on April 10, and a copy is attached hereto for the information of all the staff.

## THE CLEARING HOUSE

### Electric Fishing

The use of an electrical shocking method for catching tuna in Scandinavian waters has been so successful that it may revolutionize this fishery.

Tuna in these waters may reach a weight of 800 pounds and it is estimated that 9 of every 10 fish hooked are lost while being landed. With the new shocking device, all of the fish hooked can be brought aboard.

The equipment used is reported to be very simple and within the cost range of all fishermen engaged in the tuna fishery. The electrical unit consists of one motor converter receiving its current from a small accumulator.

This electrical fishing method was developed by German scientists, who are also developing an electrical fishing method, which is said to attract fish within an electric field to a positive pole, where they would be captured. Preliminary tests are said to have been successful and the experimenters are testing the commercial application of this device for trawl fishing. In this method of fishing, the electric poles would be arranged so that fish on both sides of the net would be attracted into the trawl mouth, greatly increasing the fishing area of the net.

("Pacific Fisherman", California, U.S.A., March 1953)

### Lights for Herring

Norwegian herring fishermen have been utilizing lights to attract fish to shallower depths. During night fishing, the herring are at times detected on their recording echo sounders below the depth range of their nets. In this event, the fishermen focus a high-powered light down into the water above the location of the fish. The fish are attracted by the lights and observed on the echo sounder as they migrate towards the surface. When the herring have been brought up within a fishable depth, the net is set and a haul made. British workers experimenting with lights were able to attract pilchards by this method,

FISHERIES ACT, 1905-1951.

Fisheries Department,  
Perth, 27th March, 1953.

F.D. 208/51, Ex. Co. No. 535.

HIS Excellency the Governor in Executive Council acting pursuant to the provisions of the Fisheries Act, 1905-1951, has been pleased to amend in the manner mentioned in the Schedule hereunder the regulations made under the Act and published in the *Government Gazette* on the 6th day of May, 1938, and amended from time to time thereafter by notices published in the *Government Gazette*.

A. J. FRASER,  
Chief Inspector of Fisheries.

Schedule.

The abovementioned regulations are amended by substituting for regulation 13 the following:—

Priority Among Netters.

13. The rights of priority for hauling nets, as between fishermen netting in the same ground, are hereby determined as follows:—

- (1) Where netting operations include the use of a beach—
  - (a) the first turn shall belong to the licensed fisherman who first arrives on the ground with a *bona fide* crew of licensed fishermen, with a licensed fishing boat marked in accordance with regulation 2, with a lawful net ready for shooting and hauling;
  - (b) the next turn shall belong to the licensed fisherman who next arrives as above, and so on;
  - (c) a turn shall come to an end when a licensed fisherman has shot and hauled his net and it shall in no case last more than 24 hours as against any other licensed fisherman who is on the ground waiting for a haul;
  - (d) during his turn a licensed fisherman shall have exclusive right to the ground where he remains with his crew on portion of the ground in readiness to "shoot" with one end of his hauling line ashore;
  - (e) no licensed fisherman shall have a second turn until all the other licensed fishermen on the ground have had their first turn;
  - (f) no unlicensed fisherman or licensed fisherman in an unlicensed boat shall have any claim to a ground as against a licensed fisherman and crew in a licensed boat, marked in accordance with regulation 2.

For the purpose of this paragraph "ground" means any portion of a beach not longer than one-half mile and includes the adjacent water to a distance of one-half mile measured rectangularly from the beach.

- (2) Where netting operations do not include the use of a beach—
  - (a) the first turn shall belong to the licensed fisherman who first arrives on the ground with a *bona fide* crew of licensed fishermen in a licensed fishing boat marked in accordance with regulation 2, with a lawful net ready for shooting and hauling;
  - (b) the next turn shall belong to the licensed fisherman who next arrives as above, and so on;
  - (c) a turn shall come to an end when a licensed fisherman has shot and hauled and the turn shall in no case last more than 12 hours;

- (d) during his turn a licensed fisherman shall have exclusive right to the ground where he remains with his crew on portion of the ground in readiness to "shoot";
- (e) no licensed fisherman shall have a second turn until all the other licensed fishermen on the ground have had their first turn;
- (f) no unlicensed fisherman or licensed fisherman in an unlicensed boat shall have any claim to a ground as against a licensed fisherman and crew in a licensed boat, marked in accordance with regulation 2.

For the purpose of this paragraph "ground" means that area of water to be fished within the limits of one-quarter mile by one-quarter mile.

- (3) Where netting operations are by means of set nets—
  - (a) the first turn shall belong to the licensed fisherman who first arrives on the ground with a *bona fide* crew of licensed fishermen in a licensed fishing boat marked in accordance with regulation 2, with a lawful net ready for setting;
  - (b) the next turn shall belong to the licensed fisherman who next arrives as above, and so on;
  - (c) a turn shall come to an end when a licensed fisherman has hauled his net and the turn shall in no case last more than 24 hours;
  - (d) no licensed fisherman shall have a second turn until all the other licensed fishermen on the ground have had their first turn;
  - (e) no unlicensed fisherman or licensed fisherman in an unlicensed boat shall have any claim to set a net as against a licensed fisherman and crew in a licensed boat, marked in accordance with regulation 2.

For the purpose of this paragraph "set" means to place a net in the water with the cork line at or beneath the surface. "Ground" means that area of water to be fished within the limits of an area 100 yards by the length of a lawful net.

- (4) It shall be unlawful to wilfully disturb or frighten fish on or in the vicinity of a haul, or in any manner to obstruct a licensed fisherman during his turn.
- (5) When a licensed fisherman is lawfully in possession of a haul, no person shall impede him by the process known as "blocking" whereby another person sets or places his net as to prevent or attempt to prevent fish getting to the haul.
- (6) Any licensed fisherman who suffers any loss from a breach of this regulation may be authorised by the Minister to take legal proceedings at his own expense.

but found that herring in these waters would seek deeper water when a light was focused on the school. Canadian workers have reported that lights will cause Pacific herring to scatter. The ability to attract members of the herring family to lights undoubtedly varies with the size and the species of fish.

("Pacific Fisherman", California, U.S.A., March 1953)

### Overfishing Conference

#### Results of the London Meetings.

Governmental delegates from 11 of the 12 signatory countries to the Overfishing Convention of 1946 (which comes into force on April 5) attended meetings at the Ministry of Agriculture and Fisheries offices in London last Wednesday and Thursday, to arrange for the bringing into force of the Convention's provisions and the setting-up of the Permanent Commission which will have the duty of considering what further fish conservation measures may be required. The Convention covers the fishing grounds around the British Isles and in the North Sea, and in the waters of Greenland, Iceland, the Faroe Islands, Northern Norway and Bear Island.

Representatives attended from Belgium, Denmark, France, Iceland, the Irish Republic, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom. Poland, also a signatory, was invited, but was not represented at the meetings.

The meeting considered the application of Articles 5, 8 and 9 of the Convention, prescribing minimum sizes of mesh of nets which may be used in waters covered by the Convention and minimum sizes for different species of fish which may be landed and sold. There was general agreement that time was required for existing stocks of nets to be used up, and that the provisions of Articles 5, 8 and 9 should be introduced in all the signatory countries not later than April 5, 1954. A protocol to give effect to this decision was accordingly drawn up and agreed, and will be signed in London shortly.

It was also agreed that the first meeting of the Permanent Commission to be set up under the Article 12 should be held in London on May 5 next. This meeting will settle the committee's procedure

and initiate the study of further conservation problems with a view to their consideration at subsequent meetings of the Commission.

The Federal Republic of Germany is not a signatory to the Convention, but has been invited to accede to it and has indicated its intention to do so when necessary legislation has been passed.

("The Fishing News", London, March 7, 1953.)

Ireland May Use Planes to Spot Illegal Trawling

Irish Air Force planes on training duty may be used to patrol coastal waters and notify the presence of poaching trawlers, Mr. Oscar Traynor, Minister for Defence, announced in the Dail last week. He said that he was not aware that the Wexford coastal waters were being invaded by foreign trawlers. The area was frequently patrolled by corvettes, and illegal fishing there had not recently been reported.

Mr. J. Leary (Labour) said that the Wexford coast was being invaded by British and foreign trawlers, and the local fishermen had no protection.

Mr. Brendan Corish (Labour) said that vessels from five nations had been poaching there in the past few weeks. A Belgian trawler skipper had recently boasted that he would shoot his nets over the coast if he wished and would not be caught.

("The Fishing News", London, March 7, 1953)

Harnessing Wealth from the Sea

Importance of By-Products from Fish

by A. C. Hardy, B.Sc., F.R.G.S., M.I.N.A.

Few recent pronouncements about the fishing industry have been more inspirational than Mr. Michael Graham's radio talk in the series "Research for Plenty". He preached, in effect, that "world fishing is world feeding", and made a plea for the correct use of the resources of the seas and in particular for the correct use of herring. Mr. Graham was not specifically concerned with fish factories, though obviously he must have had them well in mind.

Nor perhaps did he, being so close to the industry, realise the parallel existing between world fishing and another great world industry - that of oil.

It is true to say that the oil industry attracts public attention because of its romance; because of the spectacular sums of money which large oil groups spend upon refineries and fleets of tankers. The products of distillation of crude oil affect directly and indirectly the lives of every one of us. How many people pause to reflect that these remarks can be applied also to the fishing industry?

#### Nothing Need be Wasted

The main difference is that fishing is at present neither organised on a worldwide scale nor does it possess the vast wealth which favours the twin businesses of oil production and distillation. A parallel between the two industries is the fact that the raw material is processed for valuable by-products and that some of these by-products bear a chemical similarity as between industry and industry. Apart from that, fishing, as a world industry, is in about the same position as regards development as was the oil industry at the beginning of the First World War.

Enormous vistas open, and just as the success of the oil industry was founded upon the gradual appreciation of the worth of certain by-products which had formerly gone to waste, so now we are beginning to realise that practically 100 per cent. of the body of every fish caught can be used for some useful purpose. Today, it is possible, for example, to make cream, nougat and other sweets by the "distillation" - if such a term may be non-technically applied - of fish bodies in bulk.

This cold, calculating method of dealing with the harvest of the sea is perhaps far removed from the romance associated with fishing, as we understand it and see it in the British Isles. That kind of fishing and the ships which carry it out are likely to remain with us for some time. However, here it is proposed to discuss the new aspect of fishing - the fish-processing industry and the types of ship, now in an evolutionary stage, which can carry out this duty.

### Floating Factories

They are floating, self-propelled factories, with most of the human amenities enjoyed by workers in such places ashore. Some of these vessels are self-sufficient in that they catch their own fish, while others, operating on the pattern of whale factories, work in association with small catchers. It is these special ships, gradually taking the place of factories situated ashore, which are responsible for the reduction of fish to its natural by-products and which will, to an increasing extent, be used in the future.

One of the most interesting present types of floating fish factory is that which has on board a complete plant for the making of cattle meal and herring oil. For both oil and meal production the herring, whose body is particularly high in oil content, is an ideal fish. In 1949 Britain's herring industry provided just over 2,000 tons of oil - enough to make approximately 20,000,000 individual weekly margarine rations in the United Kingdom and sufficient protein for 45,000 tons of animal feedingstuffs. This clearly indicates only one of the advantages of the harvest of the sea.

White fish generally are lower in oil content than are herring, but here again all wastage and offal that accumulates after the body has been filleted can be converted into fishmeal for cattle and poultry. The oil in white fish is concentrated in their livers and this makes possible a separate treatment for oil extraction. It is carried out on a large scale with livers of cod and halibut, for the oil content is extremely high in vitamins A and D. Thus fish factories provide either crude oils or the liver material for pharmaceutical or food industries to refine into concentrated vitamin products. From another part of the cod, its bladder, is made isinglass, used in jelly manufacture and beer clarification.

At first sight, fish scales do not seem to offer more than aesthetic value, but several products can be made from them. Much of the substance in scales is cystine, one of the aminoacids which make up the structural proteins and in the treatment for nutritional disorders pure aminoacids are often used. According to a chemical expert, Mr. D. P. Hopkins, F.R.I.C., the chemical property of scales is due to the presence of a substance called guanine. Pearl essence,

the basis of the artificial pearl industry, is largely a concentrated extract of guanine from scales. By slow combustion of fish scales, an excellent grade of animal charcoal is obtained, which is widely used in a number of industries for clarifying, decolorizing and purifying. Foam-making substances for fire extinguishers are also made from fish scales.

The salmon provides nutrition for young poultry in a substance called arginine. Many by-products are used in food manufacture, even if made from parts of fish which are ordinarily regarded as inedible. Even attractive soft leathers, which compare favourably with those from reptile skins, can be made from the skins of suitable fish species.

The general feeling among imaginative people today is that the fishing industry is not just a profitable field for investment or an interesting contributor to the prosperity of the country. It is a provider of the essentials to a healthy, happy life, free from the diseases attributable to malnutrition. Provision of antidotes to malnutrition in the underdeveloped and undernourished parts of the world is a task with which the United Nations is charged through the Fisheries Division of its Food and Agricultural Organisation, with headquarters situated in Rome.

Naturally, through its naval architect it is closely informed of all developments in the design and construction of floating fish factories. So, in addition to the growing number of such vessels operating in those parts of the oceans which are normally associated with conventional trawl, line and seine fishing, floating factories are planned to operate in the tropical seas, taking fish which hitherto have been considered as inedible or which cannot be used as food except very locally because of the lack of proper refrigeration and distribution facilities.

#### Production Only Half Potential Consumption

What a harvest these floating factories have reaped, even with their - so far - limited use! The Fisheries Division of the F.A.O. has called attention to the fact that biologists estimate the annual world fish production from all sources at about 25,000,000 tons. Nutritionists tell us that the population of the world could easily consume 50,000,000 tons per year. Biologists

say that the fisheries resources of the world are of sufficient magnitude to yield production of this amount, but to attain this goal it would be necessary to invest stupendous sums in ships, facilities, equipment, labour and research, so it is likely to be many years, if ever, before a production of this size is realised.

Meanwhile, the fishing industry, which has never lacked imagination, is going forward and doing its best to produce more food with the means at its disposal, bearing in mind that many of the latent fishery resources of the world lie in waters off the coasts of undeveloped countries or in their inland waters. If more fish is to be caught - and remember the target is 50,000,000 tons per year - how is this to be accomplished? Obviously more ships will be needed and, as a leading builder of fishing vessels of all kinds, Britain will benefit. That, too, would be fairly easy if the fish could be landed iced in the conventional way.

We have seen that fishing in the future will use nearly every part of every kind of fish. To attain this end means the construction of fish factories. With certain exceptions to be mentioned, the existing factories have been built ashore, in Norway, on the Pacific Coast of the United States, and in South Africa, for example. The shore factory is static and can deal with local kinds of fish only if normal economics are to be followed. The floating factory can operate anywhere in the world and can be designed to deal with a wide variety of fish in quantities governed only by the size of the ship.

Hence floating factories are essentially complicated structures. Not only must they propel themselves, but they must carry the large and complicated machinery required for dealing with the catch - dismembering the fish, boiling the livers to extract oil, filleting, deep-freezing and packaging the flesh, and reducing bone and skins. The edible portions have to be marketed ashore under ideal conditions.

#### Two Crews usually Carried

Most floating factories carry two crews, one being engaged entirely in operational duties concerning the ship, while the other comprises the fishermen

proper and a group of workmen and technicians for dealing with the by-products. Again using the oil industry as an analogy, it is as though an ordinary oil tanker had mounted on her deck a complete refining plant and that when she arrived in port she discharged crude oil, petrol, kerosene, benzine, etc., in the quantities required, the refining processes having been carried out at sea.

Seldom are floating fish factories alike. Some, like the "Clupea" are intended entirely for the production of herring oil and cattle meal. Others, like the American "Deep Sea", are intended for the catching of crab and other Pacific North-West Coast fish which they process for eating purposes. Yet others, like the "Refrigerator F" and her sisters, operating from Vladivostok, are intended for the processing - but not the canning - of Pacific salmon. Others, again, are intended to catch and can salmon and tuna or tunny fish.

For the last-mentioned duties many tank landing ships have been converted, and this type of ship, with her deep double bottom, side walls, ample capacity and machinery aft, is ideal for rapid and economical conversion. Smaller types of fish factories, such as the "Deep Sea", are large trawlers, and are able to fish their own catches in conventional manner. The "Clupea" and similar ships depend upon attendant catchers which may themselves be trawlers, seiners, ring-netters or other types. If, then, there is no uniformity either in size or in ship type, still less is there in the method of catching.

#### Advanced Type Now Building.

One of the newest and most advanced of all fish factory ships is the self-contained vessel now building at Aberdeen for the Leith firm of Chr. Salvesen and Company. She is unconventional; she will fish through a chute in the stern, after the manner of a whale factory ship up which the carcass of the whale is hauled for dismemberment. This interesting little ship certainly has not the appearance of an ordinary fishing vessel, but rather of a yacht or of a fruit carrier, and she has large 'tween decks in which will be situated all the machinery for the processing, deep freezing and packing of the fish which she catches. She will work off the Newfoundland Banks.

Another floating factory is the converted schooner "African Queen", lately owned by the Colonial Development Corporation and recently sold to Spanish fishermen. She has been described as a failure, but in actual fact the reason for the failure was not a technical one. She was intended for tuna and shark catching and canning, and from many points of view her interior layout can be regarded as a model, though the type of hull in which the equipment was fitted might perhaps have been better chosen.

Naturally, floating fish factories - which are ships plus fishing gear plus laboratories plus factories - are generally strange in appearance. Most have been converted from sailing vessels, cargo liners, warships and ordinary fishing vessels. Very few have been specially built. All this is indicative of the lack of general appreciation of the full potentialities of this newest ship type, though such lack of agreement on shape and detail takes second place to the realisation of the need for the type's existence.

#### Still in Evolution

From a technical standpoint floating fish-processing ships are in the same position as were the whale factories of the early 1920's, when existing tankers and cargo liners were converted. The modern whale factory ship, a fine unit of upwards of 20,000 tons deadweight, is not the product of the sudden magic touch of one naval architect on the drawing board. She has been evolved as the result of trial and error and built up on the experience of many years' operation.

So the fish factory to-day, if current practice is to be taken as a guide, is being evolved either from the ordinary trawler or developed from the tank landing ship, the "Deep Sea" being a case of the former, the "Clupea" and certain American units examples of the latter; the new Salvesen ship is a special case. In the meantime, many ordinary trawlers engaged in the Iceland and Far North fishing are being fitted with plants for processing fish offal into fishmeal and for reducing fish livers into fish oil; ships like the "Princess Elizabeth", one of the first Far North trawlers to be fitted with a complete fishmeal plant which could be used or not, according to requirements.

### Canadian Design

These ships are representative of one of the most important and far-reaching developments of the present century. They are the halfway house between the floating factory and the shore-based unit. Many interesting designs for this type of ship are now in preparation, but one which comes to mind is that which has been prepared by Milne, Gilmore and Germaine, the well-known Canadian naval architects.

It is for a ship of approximately trawler size, but a full two-decker, with a third deck in the fishhold. Of flush-deck type with machinery aft, she has a small streamlined superstructure with accommodation for deck and engineer officers. In the 'tween decks at the after end of the ship is a fish-sorting space, with the nets being drawn up through a stern chute, as is the case with the new Salvesen vessel. In the Canadian design the fish arrive under cover in the 'tween decks.

Forward of the fish-sorting space in the 'tween decks is the filleting room, and underneath the freezing and packing room, with an oil fuel bunker underneath the latter. The forward 'tween decks are taken up with crew accommodation and stores, the fishhold having a fish runway on the fore-and-aft centreline. The arrangement of placing the fish pounds under cover seems to be good, and the fish then proceed forward to the filleting machine, the washers and the conveyor. The refrigerating machine is in the lower 'tween decks above the fuel oil bunker.

The net result is a design for a ship which is suitable for trawling, processing, filleting and quick-freezing at sea, which aesthetically is not very attractive, but which seems to have been designed in a very practical manner. The one pole mast, stepped forward, has a winch and a  $1\frac{1}{2}$ -ton derrick serving two hatches trunked up through the crew's accommodation from the fishholds in the lower 'tween decks.

An interesting feature about the vessel is the very large fuel oil storage which is provided. It would be interesting to know what provision is made for trim in this design. A double bottom containing fresh water is arranged under the fishholds and there is a deep double bottom aft in the engine-room, which contains both main and auxiliary machinery. The whole

of the auxiliary services in this ship are carried out by electricity.

This ship has not yet been built, but she is one more addition to the many intriguing and important plans which are now on hand for dealing effectively with the products of the sea larder.

("The Fishing News", London, March 7, 1953.)

### Australia's Tuna Industry

#### A Growing Demand and Great Potentialities

by Peter Knox

With new orders and glowing reports on sample products flowing in from overseas, Australia appears to have struck something worth while in her infant tuna industry. In three years the delicately flavoured Australian canned tuna has sent local and overseas demands rocketing beyond the reach of the hastily geared production machine.

In 1948 the tuna industry was virtually non-existent, although as early as 1937 a cannery was built on the south coast of New South Wales to can tuna and other fish. In 1949 the fishermen of southern New South Wales netted 1,000 tons of tuna. That early catch was handled with imagination, and small frozen consignments were sent overseas to canners in many countries, including the United States of America.

Since then the industry has not looked back. In the first nine days of the 1952 season more than 250 tons were taken, and recently the 42-ft. clipper "Canberra", fishing 15 miles off Eden, on the south coast of New South Wales, took nine tons of tuna in 45 minutes. Only her size prevented her from taking more.

This new Australian fishing industry has established markets in many parts of the world, but has undoubtedly achieved its most spectacular success in the United Kingdom. Recently Green's Products Ltd., Marrickville, N.S.W., received the biggest order ever from overseas for Australian canned fish -- an £80,000 tuna order from the United Kingdom. Buyers preferred Australian tuna, in this

instance, to the better-known, older-established, South American brands.

### Humble Beginnings

The beginnings of the young industry were humble. In 1936 a well-known New South Wales fisheries expert, Mr. T. Roughley, was quoted in the Sydney Sun as saying: "Close investigation of tuna fishing possibilities off the south coast of New South Wales convinces me that they should be exploited commercially without delay. There is no doubt that the possibilities of thus developing a new fishing and canning industry are very good indeed. The edibility of the fish is not in question. It tastes like chicken and is ideally suited for canning."

Fast on Mr. Roughley's advice came the small factory at Narooma in 1937, but local fishermen showed reluctance to fish for tuna in an area where so many better-known species were available for the taking, and they concentrated on salmon. However, in the spring of 1949 there came a sudden dearth of salmon in the region. The cannery increased its price for tuna, and the fishermen responded by landing 1,000 tons in a short time.

With Government help, sample consignments of frozen tuna were sent to various parts of the world. One of the largest canneries in the United States canned and processed the samples there; agents distributed consignments to such countries as Canada and Hawaii; shipments went to Europe, Great Britain, Switzerland and Italy.

Australian tuna interests launched a colourful advertising campaign on the home market, pointing out the success which the local product had achieved overseas. Within a few months, tuna was widely known and much in demand in Australia. Meanwhile the overseas demand strengthened. Enquiries and orders flowed in, especially from the United Kingdom.

Normally, the tuna season lasts from August to December, but occasionally, as in 1949, warm currents keep the season going into January and February. This season (1952-53) 14 boats fished from Narooma and 44 from Eden, just along the coast. Six of these boats have been equipped with special live-bait tanks, a method introduced by the American South Seas

Products clipper "Senibua" when she visited Australian waters in 1949, from her home base Fiji.

The "Senibua" was the first American vessel to visit Australian tuna waters. Her method was to troll, and when a strike was made the boat put out live bait to bring the school to the surface. She was unlucky in that she struck bad weather, and hence few tuna, on her trip. Nevertheless, the trip was no failure. She took 125 tons of tuna worth £A7,000, and when fishing one school off the New South Wales coast landed 29 tons in under four hours.

#### American Methods Copied

Further, the "Senibua" could undoubtedly have taken much more fish had she stuck to proven grounds, but she spent a month exploring the east coast of Tasmania for the Federal Government. Of her 140 days spent in Australian waters, only 70 were actual fishing days. However, her visit stimulated local interest immensely, and many fishermen attempted to convert their boats to the live-tank method.

An American businessman now resident in Australia, Mr. F. Fair, was so impressed with the possibilities of the Australian tuna industry that he immediately ordered from Victorian builders a small clipper on American lines. This vessel, the "Fair Venture", is powered by a 60-h.p. diesel, and has an 8-h.p. auxiliary engine to generate light and to drive pumps for circulating water through the live-bait tanks. Bait is caught with a lampara net operated from two small boats.

The lampara net has been used by Greeks and Italians for many centuries and is being increasingly used in Australia. A powerful light - 500 to 5,000 watts - is set off the stern of the boat on a boom, turned on at dusk and left to burn all night. The pillar of light attracts and seems to mesmerise the fish. They mill around in a compact mass, apparently powerless to leave. Just before dawn, a net is placed around them and they are taken without trouble.

The "Fair Venture" went into action early in 1952 and she immediately made good catches. Other boatowners were quick to copy her equipment.

Originally, in 1949, Australian tuna fishermen used barbless hooks, baited with strips of hide, feathers or aluminium; these were trailed along the top of the water through schools of fish. Now, however, they have adopted a special double-barbed hook, attached to lines 50 to 100 ft. long, and heightened by pink, blue, yellow and silver aluminium lures. Australian fishermen have not adopted the Japanese long-line (200 to 300 yards) tuna-fishing method.

The Australian methods are comparatively cheap. Many American boats are equipped to travel up to 2,000 miles to the grounds, with necessarily large storage capacity and elaborate refrigeration equipment. This is not so in Australia, where the grounds are very close at hand and skippers can return to port at night, see their catches weighed, checked and sorted and paid for before morning, if they so desire.

With the fish so close to the south coast of New South Wales, few have bothered to investigate possibilities in other Australian waters, but a check reveals that tuna exist in large quantities in several other regions. In southern Australian waters, striped tuna and southern bluefin are found in commercial quantities, although albacore is not plentiful.

In the north, northern bluefin, said to be even more prolific than southern varieties, have yet to be exploited commercially, for this fish does not take the lure well, although it can be netted. A much quieter type of tuna, it makes a delicious canned product with a flavour somewhat richer than that of the southern bluefin. However, problems of transportation and preservation have kept the North Australian tuna industry in the doldrums.

Next in flavour comes the yellow fin, which can be compared to the Californian product; the difficulty is to catch enough, its habits being different from the other types. The striped tuna is a good canning fish and satisfactory Australian canning packs have been made, comparable with Southern Californian products; these run off the Western Australian coast, apparently in small groups and with an average weight of six to eight lb. Mature tuna of about 200 lb., full of spawn have been netted occasionally, but they will not

take the lure.

Practically nothing is known of the spawning habits of tuna, particularly the bluefin. There have been many reports of spawning tuna up to 300 lb. caught near Albany, Western Australia. The Commonwealth Scientific and Industrial Research Organization hopes to make a survey to locate the grounds where these tuna may be caught by line.

With these untapped reservoirs, so close to her coasts, Australian fishing interests have much reason for optimism. The tuna is a potential dollar-earner for Australia, as well as a vital new industry for the home market and the soft-currency block.

("The Fishing News", London, March 14, 1953)