FISHERIES DEPARTMENT, WESTERN AUSTRALIA

MONTHLY SERVICE BULLETIN

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STAFF NOTES

The Superintendent, Mr. A. J. Fraser, left in the company of the Hon. Minister, Mr. L. F. Kelly, M.L.A., for the eastern States. Mr. Fraser does not expect to be back until February 17.

The Supervising Inspector, Mr J. E. Bramley, entered the Repatriation General Hospital, Hollywood, on January 12 and was discharged on the 23rd after treatment. After another month at work he will have to report for further medical attention.

The Acting Senior Clerk (Mr. H. B. Shugg), Captain H. C. W. Piesse, Inspectors J. E. Munro and R. M. Crawford and Assistant Inspector N. E. McLaughlan all recommenced duties in January after annual leave.

Mr. Ian Bartholomew of Head Office is serving again in the Navy for a month's refresher course under the National Service scheme.

Our hearty congratulations and best wishes are extended to Inspector Fred Connell who was married on Saturday, January 30, in the Trinity Church to Miss Elaine Shapcott. Fred and his bride are on three weeks' honeymoon in the eastern States. They left by road for Brisbane via Adelaide, Melbourne and Sydney and will be returning through Alice Springs.

Assistant Inspector N. E. McLaughlan and Cadet Inspector M. J. Simpson are at present on p.v. "Kooruldhoo" at Lancelin Island.

Assistant Inspector V. J. Sinclair and Cadet Inspector B. Carmichael are now stationed at Lancelin Island.

Mr. George Coombes rejoined the staff as a temporary Assistant Inspector and is at Geraldton assisting Inspector S. W. Bowler.

The Relieving Inspector (Mr. A. K. Melsom) has proceeded to Broome to act as Pearling Inspector during Mr. M. Goodlad's period of biennial leave.

DUCK BANDING

On January 6 Fauna Warden J. Traynor proceeded to Karrinyup Lake and commenced trapping at that locality. He estimated that there were about 1,000 birds on the Lake, comprising mainly black duck and coot with small numbers of grey teal and musk duck and a few white-eyed duck, blue-winged shovellers and others.

The results were not entirely satisfactory, due partly to the number of coot which ate the bait and appeared to keep ducks from entering the traps readily, and also to the receding water level which necessitated the traps being moved at least every day. Up to January 25, 207 black duck, one grey teal and 2 coot were banded. Traps were then lifted and brought to Queen's Gardens for another trial there. However, our large trap (7' x 6' x 3'6") disappeared completely during the night of the 27th. The C.I.B. were called in immediately but at the time of going to press the trap has not been recovered. Mr. Traynor has left for the Three Springs area following confirmed reports of good banding prospects there.

The presence of swamps in different centres, where, at this time of the year, such waters are usually dried up, is keeping the ducks scattered and making it difficult to band ducks in the hoped-for numbers. It is anticipated that, as the season

progresses and the small swamps dry up and the availability of natural feed decreases, the ducks will come into the larger lakes and be trapped more readily.

Since the previous figures were published, the following recoveries of bands have been reported -

No.	Date Ringed	Place where Ringed	Date Recovered	Place where Recovered	Distance Travelled
		Black Duck			
2107	8.1.54	Karrinyup Lake	20.1.54	Bindoon (Brockman R)	40 miles
2208	19.1.54	do.	20.1.54	do.	do
2211	do.	do.	20.1.54	do.	do.
2135	24.1.54	do.	24.1.54	Moondine	30 miles
2128	9.1.54	do.	24.1.54	Bailup Farm on the Avon	32 miles
2264	22.1.54	do.	24.1.54	do.	do.

HONORARY WARDENS' QUARTERLY REPORTS

The first series of reports by recently-appointed honorary Wardens are coming to hand and to date over 40 have been received. Some very interesting information is being provided which it is intended to tabulate for departmental information and/or the guidance of the Fauna Protection Advisory Committee. The following information is a very brief summary of the reports received to date -

Possums: Increases have been reported in the Beverley, Cuballing and Katanning districts but it would appear that only a few of these creatures are concerned in each report.

Black Duck: These are said to be plentiful in the Murchison area and better seasons have been reported from Busselton, Katanning, Murray and Albany districts. Within each district, however, reports do differ and generally there appears to be a scattering of these birds. At Lake Gundaring on the opening day of the duck shooting season, black ducks comprised only about 1% of the total ducks taken.

Grey Teal: These were reported as plentiful during the breeding season in outlying areas such as Yilgarn and Dalwallinu, but as the water there dries up they are of course moving to their usual habitat. They are reported to be plentiful at present in the Murchison, Three Springs and Busselton districts and commencing to arrive in the Murray district in increasing numbers. Many reports speak of a decline in numbers generally for which the advent and increase of the fox receives the main blame.

Quail: These are said to be abundant at Esperance and Narrogin. They were present during the harvest time in Dalwallinu and Yilgarn districts and have been reported in fair numbers from quite a few areas.

Brush Wallabies: There has been some increase reported from forest reserves, etc., and there is an indication that protection is arresting their decline.

A number of reports from the Katanning area mention tammar and a colony of quokka was reported from the Drakesbrook district. In one reserve in the Mount Marshall area some dunnarts, spiny ant-eaters, numbats, possoms, native cats and gnows are said to be present.

THE RELUCTANT SEAL

by G. C. Jeffery

The gay holiday spirit of the Esperance Anglers was changed to one of deep concern shortly after the New Year.

A small seal took up residence in the Esperance Bay and quite a few kindly souls took it upon themselves to feed it unwanted fish. This agreed with the seal immensely, but, being of a

ravenous nature, he soon discovered that his diet could be increased with fresher and more succulent varieties by taking them from the anglers' lines.

The poor seal was then not appreciated and a deep plot was hatched by several of the keen anglers. After enticing the seal on to the foreshore they literally bagged **it** and in the wheat bag it remained until transported to the Eleven-Mile Beach by car. Feeling that a good job had been done the keen anglers returned to their jetty angling after releasing the seal.

There were some very red faces around the dinner table that night as it appears that the seal, disliking the environs of the Eleven-Mile Beach, put his best fins forward and was duly waiting with a kind smile on his face to welcome the keen anglers on their arrival at the jetty. The seal was still there at the time of my departure.

CRAYFISH EXPORT

1953 saw an increase in the weight of crayfish exported. The figures hereunder compare 1953 with the 1952 figures.

Year	Cray Tails		Whole Crays		Total Weight all exports lb.
	New York lb.	Other lb.	New York lb.	Other lb.	
1952	2,736,703	9,340	-	24,036	2,770,079
1953	2,851,678	3,875	-	55,780	2,911,333
	Incr. 4.2%	Decr. 58.5%		Incr. 132%	Incr. 5.1%

PEARLING

Further to the table of production shown in the October Bulletin, hereunder is published a summary of the production figures for the whole of 1953.

The figures at Broome are very interesting bearing in mind the induction of 35 Japanese divers into the industry. Actually 38 Japanese divers were employed but three of these were Australian born. It will be seen that the number of vessels at Broome increased from 20 to 25, or by 25%, while the total labour expanded from 175 to 261, an increase of 49.1%. The increase percentage of pearlshell bears a close relation to the percentage increase of the labour as the 1953 total of shell landed was an increase of 49.3% over the 1952 figures. The value of the shell increased by 62.3%.

1952

	No. of Vessels	Total Labour (No. of men)	Quantity of Pearlshell T. C. Q lb	Value of Pearlshell £
Broome	19	175	292. 8.3.15	170,382
Onslow	1	9	10. 3.-. -	6,500
Totals	20	184	302.11.3.15	176,882

1953

	No. of Vessels	Total Labour (No. of men)	Quantity of Pearlshell T. C. Q lb	Value of Pearlshell £
Broome	25(25%)	261(49.1%)	435.14.3.10(49.3%)	276,310(62.3%)
Onslow	1	8	12.10.-. -	Unsold
Totals	26	269	448. 4.3.10	-

"PACIFIC PRIDE'S" MISADVENTURE

Considerable space has recently been devoted in the press to the misfortune suffered by the "Pacific Pride" at Green Island on January 17 and subsequently. It is understood that a very stiff easterly caused the boat to lift her anchor and to be driven on the reef before the crew had sufficient time to prevent it.

After withstanding some considerable buffeting she was, through the strenuous efforts of the salvage crew, refloated and eventually towed to Fremantle but every day further misfortune threatened and at times became alarmingly imminent.

Damage is reported to be in the vicinity of £2,000, mainly to the engine and electrical equipment, due to its immersion in sea water.

The "Pacific Pride" was built at Newcastle and is 56 ft. long with a beam of 16 ft. and a 4'6" draft. She is said to be the last left in Australia of the Fly River scows built for the Air Force for work in the islands. She is owned by Messrs. W. Balgarnie and J. O. Weekes.

FREMANTLE, LANCELIN IS. AND CERVANTES IS. CRAYFISHERY

The 1953-54 crayfishing season for the Fremantle, Lancelin Is. and Cervantes Is. areas opened on December 1, 1953. The lucrative crayfishing industry has this season attracted approximately 94 fishing craft of all types ranging from 20 ft. motor boats to an 85 ft. boat equipped with a processing and refrigeration plant. The boats are dispersed evenly along the coastline from Mandurah to Hill River. On January 1, 1954, the area between Hill River and Knobby Head was opened to crayfishing. This allowed a number of the larger vessels to exploit the new grounds in order to ascertain the density of the crayfish population.

In block 29, that is the area south of Fremantle, 16 boats worked by 53 men caught 165,707 lb. of crayfish in the month of December. These figures give an average of 3,128 lb. of crayfish per man as

compared with a catch of 72,671 lb. at an average of 4,542 lb. per man for the same month of 1952.

In block 36, last December, there were 32 boats operated by 120 men and 609,139 lb. of crayfish were caught, averaging 5,076 lb. of crayfish per man. In December, 1952 a total of 737,266 lb. were caught at an average of 5,715 lb. of crayfish caught per man.

Twenty-five boats are using the Lancelin Island anchorage, and supplying the two mainland processing plants owned by Lancelin Products Ltd. and Tropical Traders and Patersons Ltd. There is also one freezer boat operating from Lancelin Island. Last year approximately 30 boats operated from this Island. The catch for this area has been moderate only.

The Green Isle anchorage is occupied by 4 freezer boats and that of Cervantes Island by 2 freezer boats.

Since January 1 l.f.b. "Shelley Boy" has been processing the catch of eight boats operating from Jurien Bay; l.f.b. "South Seas" and l.f.b. "Nord Star" have been catching and processing their own catch and l.f.b. "Villaret" has been processing her own catch and also the catch of two other boats.

The following extract of a report received from the Inspector stationed in the Jurien Bay area is interesting -

"During this month, the fourteen boats have made comparatively good catches. The crayfish have been a good size, with the exception of the first few days, when the boats were working in shallower water (eighteen to twenty-five fathoms). The majority of crayfish taken were mature and had apparently populated this area for some time past. The fishermen have noticed that if their pots are replaced on the same ground for two successive days, their catch is practically negligible. This, together with the fact that very few young crayfish have been taken, seems to indicate that the area does not attract a large seasonal migratory population, as appears to be the case further south.

"At present, all boats are working eighteen to twenty-five miles off-shore, west and south-west of Jurien Bay. There are large areas of sandy bottom in this area, and even more further north, and, with the exception of boats with echo-sounders, the fishermen have found it hard to locate areas of good bottom.

"The fishing boats 'Proton' and 'Sonoma' spent a little over a week in the beginning of the season working from Green Head; and although both these boats are equipped with echo-sounders, and their skippers are competent men, they were unable to find crayfish in sufficiently large quantities, and consequently they returned south and worked from Cervantes.

"During the month of December, the area around Cervantes, where the boats were then working, was producing large quantities of crayfish, but this month, 'Sonoma' and 'Proton' have reported their catches have fallen alarmingly. For example, on the day I visited Cervantes, 'Sonoma' had pulled one hundred pots for two bags, and 'Proton' one hundred pots for five bags."

WATER RATS

Notification has been received from the Director of Fisheries and Game, Melbourne, that some consignments of water rat skins are reaching Melbourne from this State. Since the proclamation of the Fauna Protection Act in July, 1952, water rats have been totally protected and any dealings in their skins other than by the authority of this office is illegal.

Skin merchants and furriers have been advised and requested to supply details of the skins on hand. No action is contemplated to seize present stocks of skins but all firms have been advised that before any export will be permitted authority must first be obtained from this Department. Inspectors are directed to notify this office of any instances coming to their notice either of the taking of water rats or the possession of their skins.

EXPORT ESTABLISHMENTS

The Department of Commerce and Agriculture has advised as under -

1. The following is the complete list of vessels currently registered under the Export (Fish) Regulations as Export Establishments.

"Proton"	"Eureka II"
"Sonoma"	"Kingfisher"
"Eckero"	"Nord Star"
"Bluefin"	"Pacific Pride"
"Villaret"	"Shelley Boy"
"South Seas"	"Batavia Road"
"Carmela"	

Current certificates of registration remain in force until 30th June, 1954. Advice will be forwarded of any amendments to the list.

2. The following shore establishments are currently registered as Export Establishments.

Geraldton area -

Geraldton Fishermen's Co-op. Ltd.,
Ocean Street,
Geraldton.

Golden Gleam Fish Processing Co. Ltd.,
Augustus Street,
Geraldton.

Tropical Traders & Patersons Ltd.,
Marine Terrace,
Geraldton.

Tropical Traders & Patersons Ltd.,
Evans Street,
Geraldton.

Lancelin area -

Tropical Traders & Patersons Ltd.,
Lancelin Island.

Lancelin Products Ltd.,
Lancelin Island.

Fremantle area -

Tropical Traders & Patersons Ltd.,
(leased portion of W.A. Meat Export Works),
Robbs Jetty.

Genex Pty. Ltd.,
(leased portion of W.A. Meat Export Works),
Robbs Jetty.

Brown & Dureau,
(leased portion of W.A. Meat Export Works),
Robbs Jetty.

Anchorage Butchers Pty. Ltd.,
Coogee.

The following establishments are registered as "Appointed Places" under the Exports (Fish) Regulations for storage and examination of frozen fish.

W.A. Meat Export Works,
Robbs Jetty.

Fremantle Cold Stores,
Beach Street,
Fremantle.

The following canneries are registered as Export Establishments for fish canning under the Exports (Fish) Regulations.

Ocean Canning Co.,
Sydenham Street,
South Belmont.

Ocean Canning Co.,
Busselton.

Hunt's Canning Co. Pty. Ltd.,
Albany.

Current certificates of registration remain in force until 30th June, 1954. Advice will be forwarded of any amendments to the lists.

THE RESOURCES OF THE SEA

(iv) The Crayfish Industry

by Keith Sheard

(This is the fourth and last of a series recently broadcast by the A.B.C.)

"Barren, desolate, and dangerous. Mariners beware."

With that grim warning the Portuguese and Dutch explorers and traders of the sixteenth and seventeenth centuries dismissed the Western Australian coastline.

Of course their ships strayed; and the list of those that were lost on the voyage around the Cape of Good Hope, then eastwards with the good winds - and north eastward to Java - only made that warning more real. The caverns of the sunken ships, and the barrels of their guns were homes for crayfish; while the fleets, far away, sailed to the riches of the Indies.

The "Gilt Dragon" and the "Zeewyck" and more were lost. Pelsart and many other captains with their stories of few anchorages, no harbours and no water, all helped in the land being left to the natives, and the kangaroos.

Pelsart in his boat journey north to Batavia had time to describe the wallabies of the Abrolhos; but the riches under his keel had to wait for centuries until modern science and machinery, and the demands of a market on the other side of the world, turned them into gold.

Today, the treacherous reefs and ledges bring us wealth, and not only wealth, but also an opportunity of adventure and independence in the getting of it.

The source of this industry, the crayfish, or spiny lobster, really has a fine scientific name - PANULIRUS. It is borrowed from an ancient Mediterranean

legend of Palinurus, the doomed pilot. This fellow had offended the Gods, and was condemned to spend eternity sailing within sight of his homeland but never to set his foot on shore - if he did he perished.

Of course he was lured to land, and there he died.

So our poor crayfish - Panulirus - is lured to the baited craypots; and on land, he dies - in millions.

Cased in his armour, he spends his adult life on the rocky sea-bottom living on other animals, and the plants that grow there. He has few enemies, the octopus, the snapper and jewfish and the big rock-cods. He is particularly fitted for his life, as a reef-hunting scavenger, and against those enemies he holds his own very well.

But against mankind his only defence is his numbers; yet, although these are great, it is necessary to protect him by carefully regulating the fishery, so his numbers are always sufficient for breeding and so that he can grow to a proper size, and condition, for processing. This asks for a very close study of his habits, and of his life-history. It requires that a very close watch be kept on the catch statistics so that danger signals can be recognised, and it demands that, one way or another, the industry must be as carefully managed and protected as, say, the Timber Industry, or flocks of sheep, or herds of cattle. Perhaps even more so, because there are many perils facing the crayfish stocks, against which we can take no precautions.

Just what do we know?

We know that the range of sea-bottom that suits the crayfish best, lies from a little south of Garden Island to a little north of the Abrolhos - from the shore reefs to a depth of about 30 fathoms. We know that conditions are more or less suitable, north to Maud's Landing, and south to the Leeuwin; and even to deeper waters - say to 40 or 45 fathoms.

As for its life-history, it begins life as an egg, one of 200,000 or so attached to the swimming

paddles under the abdomen of its mother, and spends two or three months like that, while she is in the shelter of crevices and cracks, in the shallower reefs, where there is plenty of oxygen in the water.

Then it leaves the egg, not as a crayfish, but rather like a small pea that has sprouted thin roots in a bunch at one end.

For a while it hides in darkened crevices, and does not feed. Then it moults its skin and changes to a flat, leaf-like form - still nothing like a crayfish - just a flat, beautifully transparent leaf with feathery legs and feelers, and two dark eyes, on stalks. It can swim and float, and feed on the minute specks of life in the water.

It drifts out to sea and spends the next three to five months of its life as part of the plankton - the life suspended and floating in the ocean - growing larger and larger, but still not recognizable as a crayfish.

During this time the risks of being eaten are tremendous, and the chances of survival, very small indeed; but some survive.

I have caught them with special nets a hundred miles out to sea, and a hundred fathoms down - and they have been netted much further out, and much deeper down.

Sooner or later, out of the thousands of millions that are hatched, a few million change to a shape that for the first time is quite like a small crayfish, an inch or two long, and this floats back to the reefs and ledges of the shallow waters.

The same currents and wind-drifts that set Pelsart's ship on to the western reef of the Abrolhos, and has since destroyed a score of others on the ledges of the mainland, bring these small voyagers safely home.

Once there they change their shell again, and sink to the bottom in the true crayfish armour.

In two or three years they are adult and mature, and, in the right season, are fit for catching and freezing, then for transporting, to earn a share of dollars from America.

"In the season - the winter at the Abrolhos, the summer further south - the fishermen set their pots, some from small boats fifteen to thirty feet long, some from small ships, forty to eighty. The catch is treated in various ways. At the Abrolhos the crays are kept in wooden, floating cages, until the carrier boats arrive from Geraldton, 40 miles away, then they are bagged and taken to the processing factories. At Lancelin and off Fremantle they are brought in by daily runs, sometimes in bags, more often in wells built into the boats."

The shore-based processing plants at Geraldton, Lancelin and Fremantle - or rather Robbs Jetty - freeze quite a large amount; but others are processed aboard freezer boats, small ships that find a perilous anchorage in small bays and behind small islands in very isolated places north of Lancelin Island.

Life on these ships is not easy, but it has something in it of achievement and adventure, and even, if the luck runs, good reward.

The day is never ended. For most it is up anchor by dawn to pull the craypots, twenty or thirty miles away, then, the pots rebaited and the catch in bags, it's back to the anchorage to set up the processing troughs and tables.

The tails are pulled off the crayfish. They are thoroughly cleaned and drained, graded for size and colour, packed in cellophane, and then in boxes. Next they are stacked into the freezing room, and the crew wash down the deck and tables, and carry out the hundred and one ship's duties. Then it is time for a little sleep before the day starts again.

If the freezers break down the catch of many days is lost. If a strong blow comes, the pots are scattered far and wide, while many disappear for ever unless the ropes and floats have been well looked after. In any case there are long periods when no

fishing is possible during bad weather, the boats and men are idle at the distant anchorages, and the costs mount up.

All the while there is danger of fire (one processing boat near Jurien Bay was destroyed last season) and of storm, with no help near. A lost fishing boat makes a brief headline - but it is a livelihood or perhaps a life gone.

No! It is not an easy life. Neither is that on the smaller boats, but the men of the crayfishing fleet, men of many nationalities, see nothing out of the ordinary in it. They are superb, coast-wise seamen and they carry in their minds a detailed picture of the rocky bottom which they have never seen.

The present industry is quite young. Before the war a few crayfish were caught in local waters and sold for two or three shillings a dozen. In the thirties a small cannery was started, but it was not until the war years that the fishery began to grow. This was mainly to supply a cannery at Geraldton, but the catch was small by present standards.

Even in 1945 it was only about three-quarters of a million pounds, and it needed the tremendous stimulus of the American markets, and refrigeration, to really grow. By 1948 it was just under 3 million pounds and today it is eight and a half million a year.

This increase gives in cold figures what is really one of the romances of modern commerce - or so it seems to me. After all, crayfish flesh is one of the most perishable of food-stuffs, and its flavour very soon departs. It darkens rapidly and altogether it is rather like the little girl of the nursery rhyme.

"When it is good it is very very good;
And when it is bad it is horrid."

Yet this delicate freshness can be transported across the world, and retained for months.

The secret is speed, care, and cleanliness in the processing, then very sharp freezing temperatures and steady holding temperatures in the cold-storage rooms, together with a very strict inspection at all the stages.

The result is that the Western Australian crayfish is keenly sought by the American buyers, and by the American diners.

It is worth all the trouble? Well - last year's catch brought us over two million dollars, about £900,000 pounds in Australian money.

That money supported fishermen and their families, men and women in the processing factories, transport drivers, and refrigeration workers. It is passed from hand to hand in the community adding its quota to the incomes of boat-builders, engineers, ship providors, exporters, and small traders. In one way and another it affects the livelihood of many who live in Geraldton and Fremantle, and its influence is felt in the whole State structure.

Further than that, whether it be regarded as an offering laid at the foot of the almighty dollar or not, it is certainly true that it plays its part in easing Australia's overseas burden.

And all of this, from waters where the Portuguese and Dutchmen's warning "Abrolhos"! - Look out! Mariners beware! is still as true as it was three or four centuries ago.

THE CLEARING HOUSE

Someone Got Off Course

A Norwegian coastal pilot complained to the police at Tromsoe last week that a man aboard the 692-ton Grimsby trawler "Northern Sea", which he was piloting, knocked out three of his teeth.

The man, who was at the wheel, is alleged to have hit the pilot after the latter had reprimanded him for not keeping the correct course.

After the incident, the pilot ordered the ship around and took the trawler back to Tromsoe.

The trawlerman was not arrested and the trawler was allowed to proceed to the fishing banks after her agents in Tromsoe had guaranteed full compensation to the pilot.

("The Fishing News", London, December 5, 1953.)

Plastic Boats

Norway has built a plastic boat, which has been demonstrated near Oslo. It costs about £30, and maintenance costs are claimed to be very small. The boat is a rowing boat, half the weight of one made of wood, and it is hoped to begin mass production soon. Other plastic boats planned include 18-feet sailing boats, a 22-feet motorboat and a 30-feet life-boat. When it is ready the life-boat is to be sent to Britain for tests. Production is being financed by two Norwegian shipping companies.

("The Fishing News", London, December 5, 1953.)

More Care in Handling Fish

A small minority who show some disregard for hygiene in handling fish at Lowestoft were criticised by Dr. A. C. Gee, Medical Officer of Health for the Borough, in his annual report received by the Lowestoft Town Council.

Dr. Gee stated Lowestoft was establishing a considerable reputation as a port where prime fish in good condition was landed and, so far as the handling of fish at sea was concerned, this reputation was earned.

Referring to the high price of fish, the report stated that it was of little interest to the public to be given a long list of reasons for high prices if the food they saw on the fishmongers' slabs had a "very jaded appearance."

The report also pointed out that the hooks used for lifting metal kits were not intended for lifting fish and went on to ask how often packers' shovels were scrubbed.

There are differences of opinion in the trade regarding the merits of ice packing and refrigeration. This is what Dr. Gee says in his report: "There is little value in spending time and money in sorting and cleaning fish then packing it into a container which is either soiled or has seen 'better days'. No amount of icing over will cure a dirty container, in fact just the opposite effect is obtained, for as the ice melts into water bacterial growth which may have been inhibited by the temperature of the ice becomes active with the rise in temperature as the ice is converted into water, and the bacterial contamination is spread to the water and by the water itself. Thus, until all fish can be transported in refrigerated transporters which are capable of being easily cleaned, these conditions must arise if the containers themselves are not cleaned."

"It is re-emphasised that these practices are the exception rather than the rule," the report added, "and it may be argued that only one or two fish may be damaged, but it is suggested that with present day prices one cannot afford to damage any fish and that such damage may not become truly apparent until the time when the fish is exhibited for sale."

("The Fishing News", London, December 12, 1953.)

India Sets Up Big Tropical Fish Research Station -

In South India, 20 miles from Dhanuskodi, lies the little village of Mandapam where, on the premises of a naval hospital built during World War II, is situated the biggest centre in the world for research on the fisheries of the tropical seas.

In India fisheries research is still in its infancy, for it was only in 1949 that the Central Marine Fisheries Research Station started work at Mandapam. The progress so far achieved holds out promise of a steady and even rapid growth.

Broadly speaking, the problems under investigation can be classified into the marine resources, biology, marine factors, fish farming and work on marine by-products.

There are outposts at a number of places. A sub-station at Calicut is working on the causes of fluctuations in the major fisheries, especially oil sardines.

Another research unit at Karwar in the Bombay State deals with Indian mackerel, which is probably the most valuable Indian sea fish. Still another batch of workers is studying the potentialities of prawn farming, a very lucrative industry at Narakkal near Cochin. The clams, oysters and squids - have not been forgotten. They are under close observation at Madras.

Surveys of fish catches along the nearly 3,000-mile coastline of India, excluding Kathiawar, show that the total landings of marine fish during last year were nearly 502,000 tons, as against 551,000 tons in 1950 and 504,000 tons in 1951.

A pilot project is to be shortly started for the development of waste lands in India into fish farms. Sea water will be let in over a lowlying area of about 50 acres. Here the breeding and growth of certain fish will be investigated under controlled but natural conditions.

If this project is successful, it will help to utilise thousands of acres of low-lying lands for

fish production, which now lies waste, all along the east coast of India. A species of fish known to scientists as Chanos Chanos, forms the basis of an extensive fish industry in such fish farms in Indonesia and Philippines.

During the last few years the Indian shark liver oil industry has grown steadily in importance.

Last year India exported about 3,825 tons of prawns from Cochin to the Far East and earned approximately Rs. 8,500,000 in foreign exchange. The prawns research unit of the Research Station is now working on schemes which aim at improving the catches of prawn farming on a commercial scale.

The station has its own aquarium with a continuous circulation of sea water for keeping marine animals under close and constant study.

The library of books on fisheries at the Research Station is, outside Japan, the best equipped in the East. Its scientific equipment for specialised work is among the most modern and, in the words of the Chief Research Officer, its "highly trained and specialised staff is comparable to the finest in the world."

("The Fishing News", London, December 12, 1953.)

In Our Changing Economy

The Consumer is King of the American Market

In the Editorial on this page last month, wherein we discussed the present status of our changing economy, the conclusion was arrived at - this was the concensus of the best informed research and opinion, that - to quote:

"... with the coming of peace, or rather an armistice, came the conviction that the consumer was now to wear the crown of 'king emperor of the American market'."

The facts were adduced on this page last month that (1) the American family today, after taxes

and essential living costs, has five times more money to spend or to save than in 1940; (2) that the American Consumer has a standard of living for such necessities as food, higher than ever before. And that (3) he will not permit his standard of living to go down - he does not have to, he is operating at a maximum wage and even with his higher scale of living, is still saving 8% of income after taxes.

New developments since last month have come to show that the general emphasis is being led by all business, by all business counsels and expert guidance, on the theory that expansion in consumer sales will offset any decline in durable goods construction and sales.

In other words - NO DECLINE IN BUSINESS will gain headway so long as the consumer has money to spend, money in the bank, and insisting on his high scale of living. The consumer is the nation's insurance, also, to keep pay rolls and employment at high.

Again, the conclusion: The consumer will be king of the coming year's market. The consumer will save any declining economy as he did in 1949 when retail sales to consumers went up despite the contrary downward movement of manufactures, employment and incomes.

What does this mean to us in the commercial fishing Industry?

To answer it intelligently, one must consider what are today the consumer attitudes toward purchases, toward food, toward spending generally.

This study of consumer attitudes has recently been summarized in the form of an annual survey sponsored by the Federal Reserve System whose interest was particularly in consumer finances. Let it be said at the outset that those who have summarized the survey, consider the tremendous volume of annual consumer expenditures as the greatest force in our present economy.

This consumer survey divides consumer spending into that of Essential spending; for food, shelter,

sorely-needed clothing and into non-Essential spending as for luxuries, clothing one can do without, improvements to one's home, and the like.

What guides people in non-essential spending is their attitude toward purchases. That attitude has become pretty well pronounced over the past period of prosperity for 20 years back. People may be economizing - but economies will not be made on their food.

Correspondingly, we find particularly in food a change-over of food habits that is notably to the processed and pre-packaged type. Call them "convenience" products - they are easy to use. Among them: Prepared cake mixes, pie-crusts, canned baby foods, soluble coffee, and frozen foods, juices, vegetables, meats, poultry - and frozen fish and shellfish! And remember: Before 1940, the U.S.A. food bill ran to $20 billion. In 1953, it will be an estimated $63 billion!

An authoritative consumer magazine states: "The consumers of today eat better food, of course; but what is significant to the market as a whole is that they demand a lot of processing in their foods. Instead of buying a chicken and going to work on it, they are apt to demand frozen chicken livers, canned breast of chicken and dehydrated chicken soup. They want not only good food, but "convenience" built into the food as well, and they are prepared to pay for whatever services the food industry can provide."

How will we of the fishing industry meet this consumer challenge and tremendous opportunity?

Our fisheries' picture has changed with the passing of the times. Remember, not so many years ago, when any fish dealer would tell you that the only kind of fish to eat was fish cooked with the bones in them? that the only good fish was fresh fish and that frozen fish was tasteless and even harmful for your digestion? In truth, conditions some years ago did lend some measure of truth to these statements but, antagonistic as the fish merchant might be to changes - the changes had to come and they did come.

The consumer, the final and real customer of the fishing industry called the turn and regardless of old-time convictions those in the fisheries made the change so that they made profit from the customers' new attitude and preferences, from his new prosperity, his new tastes, his desire to pay more for what he wanted in fish and seafoods. And, so, when the housewife said that, regardless of whether the taste of the fish was improved by cooking them with the bones in, that she did not want bones - the fishing industry introduced fillets. That was back in 1921.

What happened to fillets is now history - a new era in sales of finny fish, "convenience" to the consumers' desire. Production of sale of fish fillets today have sky-rocketed to a point never dreamed of when the first 25,000 pounds of fish were filleted back in 1921.

Then, the housewife got a new attitude. She wanted fish that she could keep over a period of time, one that would retain the fresh-caught flavour even though it might have been caught many weeks previous. Here the fish industry was pioneer. We invented quick freeze, sharp freeze, rapid freeze, whatever you wished to call it. But the housewife's demand for it called for improvement in freezing and in storage. The fishing industry met that challenge - the result was a high quality of frozen fillet.

There are, of course, many experienced fish consumers, especially dwelling in fishery coastal towns, who will never be satisfied with anything but fresh fish and shellfish.

Comes in now, that diabolical but necessary instigator for improvements - competition enters the picture. Other food products, directly competitive to our fisheries frozen foods, enter the frozen foods field. For some time the frozen fish firms met some real headaches - these other frozen products take a real hold of the consumer and the consumers' attitude is toward them and not so much toward frozen fillets. Some of us, maybe, got a bit careless and let our quality drop a bit. The consumer was quick to react, didn't want to take chances in poor quality and so came the drive for high-quality fisheries products, frozen and fresh - and sales mounted once again.

Time moves on - and with it comes progress. Competitive food firms commence making their packages more attractive, "eye appeal". Again, the fisheries didn't just stand back in a status quo - they, too, got busy and brought out more attractive packages, bringing us deep into a programme of attractive packaging. This development is now going on and in high gear.

Next to come up, was the consumers' attitude for a package that was family size - one that could fit either her large family or her small one for just one meal only, and no left overs. We met the challenge with the one pound package designed for a small family. Two packages could handle a large family.

The latest of our fisheries offerings meeting with great popularity is the breaded, cooked products. Now the housewife has only to open the package, place it in her oven - lo, and behold! she has her family's meal ready in some minutes of time - no fuss, no trouble and a perfect dinner for anyone. Next in step is to prepare a product, frozen or unfrozen, packaged or unpackaged - but make it easier to eat. Just that. And so now we have fish sticks: Bite-size pieces, all breaded, cooked, ready for heating and eating, attractively packaged, of high quality. They are meeting instant consumer acceptance, a proof that the industry is on the right track.

Naturally, costs have increased from the days of shipping round fish to markets in barrels or boxes. Today's costs include packaging material, package design, color work, research, freezing techniques; packaging machinery, improved transportation units, a whole list of modern improvements.

We add that the retail price has necessarily risen to take care of these additional costs. The consumer is willing to pay for the foods she wants. It will pay us to give her just that - the fish and shellfish she wants.

("Fishing Gazette", New York, October, 1953.)

Minneapolis-Honeywell's Underwater Seeing Unit.

A new sonar device designed to fulfill the long-time dream of fishermen and marine pilots to be able to "look around" under water and "see" ahead and to the sides of their boats, as well as directly underneath, was announced recently by its manufacturer, Minneapolis-Honeywell Regulator Company.

The device is a new type electronic echo-sounding instrument with a revolutionary engineering feature that permits it to scan under water like a sweeping searchlight.

Installed aboard one of the Moran Towing Company's newest tugs, the device, in its first public demonstration in New York harbour, charted the contours of the harbour and channels, picked up such underwater objects as pilings and buoys, and displayed its ability to "find fish". Moran and Honeywell are collaborating in a special research project in which the new device will be utilized for navigational purposes.

Appropriately called the Sea Scanar, the device operates like radar but uses bursts of high-frequency sound waves instead of radio signals to probe the underwater depths.

In principle, it is similar to the well known depth sounders. However, unlike depth sounders which "look" only in one direction - usually straight down under the boat - the new Honeywell instrument automatically sweeps back and forth at any desired depth, peering ahead and to the sides and giving a panoramic view of everything within its range.

Its scanning eye can "see" out into the water for more than a quarter of a mile (1,600 feet), but also operates at 800 and 400-foot ranges. It can scan the entire 180-degree area from port to starboard, or, if desired, can be pin-pointed to sweep a 90 or 45-degree area. The scanning can be done at any depth from the surface of the water to the bottom.

Whatever the instrument "sees" - whether it be fish, whales, underwater obstructions or the contours of the bottom or channel - is shown on a radar-type screen mounted in the pilothouse or other convenient location. In addition, the Sea Scanar has an audio feature that enables the presence of underwater objects to be identified by "pings" of returning echoes.

The device, developed by the company's marine equipment division in Seattle, can be operated almost as easily as a television set. In fact the viewing screen and control knobs are mounted on a panel that looks somewhat like the front of a small television set.

W. J. McGoldrick, Honeywell vice-president in charge of engineering, said the development would be of tremendous value to navigation on inland and coastal waters, and would "open up a whole new underwater world" for fishermen.

"Although man has been casting his nets upon the sea since Biblical days, fishing still is one of our most speculative occupations", McGoldrick said. "The big gamble always has been to find the fish. Such scientific aids as depth sounders have helped, but in a limited way.

"Now, for the first time in marine history, fishermen have an automatic scanning device that enables them to locate schools of fish, not by passing over them, but by reaching out and finding them ahead or to the side of the boat where their movements can be determined and nets set in time to catch them".

The Sea Scanar does much more than find fish, the manufacturer claims. It shows the distance of the school from the boat, how deep the school is, its approximate size, which direction it is travelling and how fast. With all of this information at his command, the fisherman no longer has to guess - he can tell precisely when, where and how to set his nets for maximum catches.

Although the Sea Scanar is fully automatic, it can be operated manually to "track" schools of fish or other objects moving under water. This is done by

simply flicking a switch and then turning a control knob to direct the sound waves toward the fish. It's much like a machine gunner firing at a moving target.

This tracking technique already has proved a boon to a Canadian whaling vessel - the "Nahmint" - which captured three whales with the Sea Scanar the first week it was installed on the vessel.

The swift-moving whales were located under water, kept under surveillance until they surfaced to "blow", and then were blasted by the harpoon gunner who knew, thanks to the Sea Scanar, just where they would surface.

When used as a navigation aid, the ability of the instrument to "look" out to each side permits pilots to navigate close to shore with safety, particularly at night or in fog. In addition to measuring depth beneath the boat, the device gives a clear picture of channels, and picks out sand bars, shoals and all other underwater hazards, in time to avoid them.

The instrument "sees" by means of high-frequency sound waves. These sound waves are fired out or down into the water in a narrow beam from a transducer mounted on the bottom of the boat. The secret of the instrument's scanning is the ability of this transducer to sweep back and forth automatically.

When the sound waves strike objects having a density different from that of water, portions are reflected back as echoes. The returning echoes are picked up by the transducer, magnified electronically and translated into signals that show up on the radar-type viewing screen as "pips" of light or are heard as "pings".

The screen has a spiderweb of lines, indicating bearing, range or distance. The position of the "pips" in relation to the lines reveal both distance and bearing. Distance is automatically computed by measuring the time interval between the sending of the sound wave and the returning echo. Inasmuch as sound travels through water at a constant speed of 4,800 feet per second, distance to any object can be computed accurately.

("Fishing Gazette", New York, October 1953.)

Albacore's Long Trip

During a recent three-week tuna-tagging cruise the N.B. "Scofield", California's fisheries research boat, used over 800 new-type tuna tags. These were hand-lettered by handicapped workers in Los Angeles. The new tags, fastened largely to Albacore during this trip, are plastic tubes whose effectiveness was proven when a California-tagged tuna crossed the Pacific and was caught by a fisherman off Japan.

It was noticed when caught on a hook and line at a point some 550 miles south-east of Tokyo. The fish was caught nearly one year after tagging.

Experiments were made during the cruise to find better ways of handling the temperamental Albacore, which goes into death throes if not tagged and thrown back into the ocean within 20 to 30 seconds after landing. Holding the hand over the Albacore's eyes, to shield them from the shock of sunlight, remains the most successful method thus far.

("Pacific Fisherman", California, December, 1953, and "Western Fisheries", Vancouver, B.C., November, 1953.)

Food Refrigeration is Big Business

Cold storage warehousing across the North Americas is a major big business operation for cold storage plants worth millions hold foods worth billions.

Here it is that modern refrigeration attempts to maintain and control storage conditions that will give the maximum storage life of a given, high quality product.

There are conditions that must be controlled if a given product is to be stored successfully. Preservation of the goods depends upon the control of the atmospheric conditions surrounding the product. These include control of temperature, humidity, and atmospheric composition.

Holding Temperatures

In a very general way, the lower the temperature the better, in the sense of preserving product quality for the maximum period of time. If the product can be frozen without irreversible deterioration, then microbial decomposition or putrefaction is the first type of deterioration eliminated below the freezing point, but chemical and physical deterioration can still continue. As the temperature is decreased still further, these physical and chemical changes are gradually retarded, somewhat differentially in different products. Indications are, that at sufficiently low temperatures all forms of deterioration are eliminated for all practical purposes.

For products that can be frozen, it is generally true that the lower the temperature the better. There is very little evidence for the scientific existence of an optimum temperature for the storage of a frozen product.

In cold storage operations, however, there is definitely a point, or, practical optimum, for storing frozen goods. Each lessening in temperature costs more and more to maintain but contributes less and less to the storage life. Obviously, paying more and more for less and less has economic limitations. In consequence it would be quite impracticable to maintain ordinary comodities at liquid air temperatures even if they did not last indefinitely. A so-called practical optimum temperature is therefore determined by such factors as the value of the product and the cost of a ton of refrigeration in a given area or warehouse, rather than by the rate of deterioration, which is always minimized as the temperature is decreased.

Scientific investigation and experience has indicated that the practical optimum for the storage of frozen goods is 0 degrees F. At this temperature most materials can be held in good condition for the required storage life. Modern insulation and refrigerating equipment are capable of providing this temperature economically even with single compressors.

There are, of course, some desirable modifications to this general rule. Fish, certain quick frozen products, and fatty materials will certainly benefit from somewhat lower temperatures if the holding period is to be an extended one. The provision of lower temperatures, even at increased cost, is frequently justified for more valuable products, such as butter. On the other hand, a good many of our ordinary packing-house meats can be held for a sufficient period at temperatures of plus 10 degrees F. However, products received in the cold-storage varies from lot to lot in its keeping quality. Successful storage of a frozen product at plus 10 degrees F. depends a good deal on the quality as received. Fluctuating temperatures in the warehouse are also more detrimental at higher mean temperatures. It is therefore good protection to store all goods at 0 degrees F. where the effects of variations in initial product quality, fluctuating temperatures, etc., are minimized.

Humidity of Storage Space

The maintenance of the proper relative humidity is extremely important in determining the shrinkage of quality of products held above the freezing point; and the surface appearance and to a lesser extent, the shrinkage of products held in frozen storage.

At temperatures above the freezing point the humidities recommended generally vary from 75 to 95% for most products of high moisture content, with the great majority requiring something in the region of 85%. For dry products the humidity is generally of the order of 70% or lower.

The more moisture in the air, the less the goods will shrink, so it would appear as if the higher the humidity the better. However, high moisture contents accelerate mold growth, so the best balance must be established between shrinkage and spoilage of the product.

("Western Fisheries", Vancouver, B.C., November 1953.)

Seeing Eye-to-Eye

Britain's official "fish-sniffers" - the Government experts who assess the freshness of a dead fish by smelling it - may soon have less sniffing to do (says the "Scottish Daily Express").

Experiments on judging the age of dead fish by the glaze in their eyes are being carried out at the Torry research station, Aberdeen, under the guidance of Dr. G. A. Reay.

A fish's eyes are compared with a series of glass eyes in the new method of age-judging - and it is claimed to be an accurate guide.

The glass eyes are filled with liquids of different cloudiness, each corresponding to the eye-glaze of fish of known age. The one which matches the eye of the fish being examined reveals how long that fish has been dead.

Reasons for the experiments: To enable scientists to compare the efficiency of different methods of storing fish, and to check on the age of fish landed by trawlermen.

Eye Note: Mrs. Beeton did not need a fish panel to tell her about fresh fish. In her "Household Management" book, published in 1861, she wrote that a good indication of a fresh fish was by "the brightness of the eyes, which should not be sunken in the head".

("Fish Industry", London, December, 1953.)