March, 1963

STAFF NOTES

The Director, Mr A.J. Fraser, will accompany the Minister for Fisheries, Mr Ross Hutchinson, to Albany on March 8. They will visit the proposed townsite of Casuarina, and with Mr H.O. Webster will inspect the habitat of the Noisy Scrub-bird. Mr Webster, it will be remembered, re-discovered this rare creature on Christmas Eve, 1961. The following day the Minister and Mr Fraser will attend a meeting of the Lower Great Southern Regional Council. Some of the matters to be discussed at the meeting will include the future of "A" Class reserve 25113, near Lake Magenta, and fisheries development at centres along the south coast.

On March 11, the Minister and the Director will fly to Port Lincoln in South Australia to attend a meeting of the Southern Pelagic Project Committee. After the opening of the meeting the Minister, at the invitation of the Premier of South Australia, Sir Thomas Playford, will inspect units of the tuna fishing fleet and tuna processing facilities at that centre. Mr Hutchinson will return to Perth by air on March 14, but Mr Fraser, who will attend most of the sessions of the committee, will not return until March 17.

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The impending marriage has been announced of Mr G.C. Ferguson, of Head Office, and Miss Jessie Booth. The ceremony will take place on April 20 at St. Aidan's Church, Mosman Park. Miss Booth spent her earlier years on Peron Station, Shark Bay, but latterly has resided at North Innaloo. Mr Ferguson will commence annual leave on April 22.

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Other officers to commence annual leave this month will include the Chief Clerk, Mr B.R. Saville, on March 4, Assistant Inspector G.J. Hanley, of Mandurah, on March 11, and Mr P.G. Yewers, of Head Office, and Inspector A.T. Pearce on March 18. Inspector E.I. Forster will skipper the p.v. "Dampier" in Mr Pearce's absence.

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Our congratulations are extended to Mr R.J.

McKay on his promotion to Technical Officer, Grade 1, as from December 14, 1962. Mr N.E. McLaughlan, Fauna Warden, has been recommended for promotion to the item vacated by Mr McKay - 3874/62, Technical Officer Grade 2. The recommendation is subject to appeal, but he will be transferred from March 15 to act in the item until the matter has been finalised. If his promotion is subsequently confirmed, the item he occupies at present, i.e., No. 3867/62, Fauna Warden, will be advertised as soon as possible.

PERSONAL PAR

Mr C.H. Tyndale-Biscoe, of the Australian National University, Canberra, accompanied by the Director of the Western Australian Museum, Dr W.D.L. Ride, called on the Director on February 4. Mr Biscoe was a member of the party which surveyed Bernier and Dorre Islands in 1959 and was one of the authors of the report of the survey which was published as Fauna Bulletin No. 2. He intends to revisit Bernier Island in May this year.

POLICE HEADQUARTERS TO MOVE

From March 11 the office of the Commissioner of Police and the administrative headquarters of the Police Department will be located at the corner of Wellington and Plain Streets, East Perth. The telephone number from that date will be 23-3821. It is understood that renovations to the building, which was previously the Perth Girls' High School, should be completed in the near future. Subsequently, the Firearms and Liquor Branches will transfer to East Perth, but the Criminal Investigation Branch will transfer to the vacated quarters in James Street.

TRADE WITH U.S.A.

The Monthly Summary of Australian Conditions (February 13, 1963), of the National Bank of Australasia Ltd., under the foregoing heading, published figures relating to exports from the Commonwealth to the United States of America. They show that the value of crayfish tails rose sharply from £3.4 million in 1960/61 to £6.0 million in 1961/62, an increase of 76%.

The following is a copy of the table as printed-

EXPORTS TO U.S.A.

	1960/61	1961/62	Change
Beef, frozen ...	£25.5m.	£45.8m.	+ 80%
Other meats ...	5.8	5.5	- 5
Wool, greasy ...	4.2	9.7	+ 131
Other wool ...	6.6	7.2	+ 9
Lead (including lead-based alloys and silver-lead ores) ...	4.7	8.3	+ 77
Crayfish tails ...	3.4	6.0	+ 76
Sugar	1.2	3.4	+ 183
Other exports ...	21.1	23.1	+ 9
	72.5	109.0	+ 50%

CRAYFISH RESEARCH AT THE ABROLHOS

A circular letter prepared by the Senior Research Officer, Mr B.K. Bowen, and distributed to fishermen at Geraldton, invites the co-operation of Abrolhos fishermen in crayfish research work being undertaken in that area. Believing that real co-operation can only be won by keeping the fishermen informed of what is being done, who will do it, and what it is hoped to achieve, Mr Bowen has set these things down precisely. He has advised that the personnel to assist him in the immediate future include the master and crew of the research vessel "Lancelin" and Technical Officers R.J. McKay and J.S. Simpson.

There will be two main lines of research in the programme, which will take some years to complete. The immediate objects are -

(a) the usefulness of escape gaps in crayfish pots; and

(b) the study of relative growth rates of crayfish in the Easter and Pelsart Groups.

In overseas lobster and crayfish fisheries, escape gaps are commonly used and it has long been held in some quarters here that they would be of assistance in minimising the number of undersize crayfish taken. Whether or not this is so will be demonstrated by Mr Bowen and his

team.

The study of the growth rates will be undertaken to endeavour to determine the reasons for the difference in the size structure of crayfish at the two groups. A phase of this study will be the accumulation of accurate data on the number of pots set at various depths on both fishing grounds.

The field work, which commenced on February 26, will continue through to the first two weeks of April and May, although the first phase will be concluded on March 17. Fishermen, as well as our own staff, are invited to contact any members of the research team if they have any questions to ask or if they would like to discuss any of the programmes' many aspects.

THE U.S. MARKET FOR CRAYFISH

The table opposite has been drawn up from information gleaned from the Market News Service of the Bureau of Commercial Fisheries in New York, U.S.A. In its newssheet of January 23, the Service reports that the market for spiny lobster tails, as they call them, was dull and stocks were liberal. It will be noted that while Australian tails command the best prices, no quote was given for the 4 - 6oz. midget size. The reason for this is not known, but it can be seen that a number of other countries are supplying small fish in this range. In view of the state of the American market, it is encouraging to note that the Fremantle Fishermen's Co-operative Society Ltd. is currently exploring the demand for crayfish tails in Italy.

REVIEW

A Guide to the Study of Fresh-Water Biology

J.G. Needham and P.R. Needham. (5th Edition)

The present volume is a revised and enlarged edition of the handbook produced by J.G. Needham and P.R. Needham in 1938. This revision has been carried out by the junior author alone as J.G. Needham has since died.

The book is divided into two parts - the first deals entirely with the identification of aquatic organisms, while the second gives some general considerations of the aquatic environment and its measurement.

SPINY LOBSTER TAILS

U.S. Market Prices, New York Area - January, 1963

Country of Origin	Tail Prices per lb. (in U.S. Dollars)* of Grades						
	2-4 oz	4-6 oz	6-8 oz	8-10 oz	10-12 oz	12-16 oz	16-20 oz
	$	$	$	$	$	$	$
Australia	-	-	1.48 to 1.53	1.53 to 1.58	1.69 to 1.73	1.69 to 1.73	1.45 or lower
Bahamas	-	Some to 1.24	1.30	1.35	1.45	-	-
Brazil	1.15	1.21 to 1.26	1.25 to 1.30	1.35 to 1.40	1.45 to 1.50	-	-
Ecuador	-	1.23 to 1.25	1.35 to 1.40	1.42 to 1.45	1.50 to 1.55	1.50 to 1.55	-
British Honduras, Costa Rica and Nicaragua	-	1.20 to 1.24	1.25 to 1.28	1.36 to 1.38	1.43 to 1.45	-	-
India	1.13 to 1.15	Some to 1.20	Some to 1.20	Some to 1.28	Some to 1.36 to 1.38	-	-
New Zealand	-	-	1.45 to 1.50+	1.52 to 1.55	1.70	1.70	1.40 to 1.45
	Largest pack over 20 oz. @ up to $1.35 per lb.						
West Indies Federation	Some to 1.30	-	Some to 1.40	Some to 1.45	Some to 1.50	Some to 1.50	Some to 1.45

- No price quoted or not marketed.

* U.S. dollar approximate equivalent of 8/10 Australian

Source: Bureau of Commercial Fisheries, Market News Service, New York.

The taxonomic section is devoted entirely to the North American flora and fauna and thus should be used with caution by the Australian student. However, as many families and genera are cosmopolitan this manual should provide a good starting point for the identification of certain Australian aquatic groups. These include the desmids, diatoms, protozoa, rotifers, the crustacean sub-class copepoda and the crustacean order cladacera. In Australia, the keys for identification of aquatic insect larvae and adults should be used with particular caution and the fish keys are entirely inapplicable.

Diagrams and keys throughout this section are clear and concise - the author making liberal use of the best modern marks available in each group. Of particular interest to the student, amateur naturalist and other persons concerned with the identification of fishes is the author's section, "Definitions and counts of fish structures". Here all counts and measurements necessary for fish identification are described concisely and fully - in fact, we know of no single publication where these are described with such clarity.

The second main section contributes little new information, but has brought together, in a concise form, the basic requirements for a study of the aquatic environment. The section on "Distribution and abundance of stream-dwelling organisms", although not comprehensive, provides the student and fisheries worker with a useful statement of the problems of stream productivity. It gives an insight into the quantity and quality of research necessary for good stream management.

The revision of this manual, originally produced by two of America's top fresh-water biologists, should fill a definite niche in aquatic studies in North America. We can only hope that Australian authors will provide us with a similar manual in the near future.

(R.J. Slack-Smith)

SWANS AT AIRPORT

The black swans domiciled on specially-prepared pools have been one of the many attractive features of the new Perth airport which have excited attention and comment. As some concern, however, was expressed for the welfare of the birds, particularly in the small pool in the main quadrangle, an official

inspection of the pools was made on February 4. Those taking part were Dr D.L. Serventy, representing the Fauna Protection Advisory Committee, Mr C.F.H. Jenkins, representing the Zoological Gardens Board, who donated the swans to the airport, and this Department's Fauna Protection Officer, Mr H.B. Shugg. They were met by the Airport Manager, Mr H.A. Lee, whose staff supplied details of the diet and handling of the birds and maintenance of the pools.

The swans were found to be in good condition; their waterproofing and plumage being excellent. Their diet, which was said to consist of bran, pollard, wheat, considerable quantities of watercress with some lettuce and silverbeet, was considered to be most adequate. The temperature of the water in the pools was taken and found to be up to 80° in the quadrangle pool and up to 84° in the large outside pool. The temperature was lower in the smaller pool as the water in it was changed more frequently. These temperatures were thought to compare favourably with natural waters. They were about the same as those found in farm dams by the Senior Research Officer during the trout research programme. The only recommendations made by the party was that the water in the small pool be changed twice a week during the height of summer and that cast feathers be removed during moulting periods. The airport manager agreed that this work would be carried out.

SPERM WHALE SURVEY

Aerial surveys of the continental shelf from Albany to Carnarvon will commence this month. Dr R.G. Chittleborough, Senior Research Officer, Division of Fisheries and Oceanography, C.S.I.R.O., will be in charge of the programme, which is expected to continue for two years at an estimated cost of nearly £50,000. The surveys, which are being financed jointly by the whaling companies and the Fisheries Development Trust Account, will allow the collection of data on the concentration of whales, their seasonal variations and migrations around the coast. It is hoped that this additional information on the sperm whale stocks will be of considerable benefit to the two Western Australian companies, the Cheynes Beach Whaling Company and the Nor'-West Whaling Company Ltd. In the early stages, the surveys will entail six days' flying a month but an evaluation will be made after a few months' work.

FAUNA IN CAPTIVITY

The publication of a photograph on the front page of "The Daily News" in its issue of February 28 highlights the popular misconceptions held on the laws relating to the keeping of fauna in captivity.

Regulation 12A states precisely that a person who holds any fauna in captivity must be licensed. The only exception to this requirement is in respect of a person who has nine or less birds of unprotected species. If a person holds any other fauna whatsoever he will need a license. The lad mentioned in the press item was photographed with a salt-water crocodile which, although an unprotected species, is one which we do not allow to be kept in captivity. The reason for this is obvious. If one survives in captivity it will grow up only to become a very real problem.

Quite a few children, many of whom may be "budding" naturalists, are tempted to keep various reptiles in captivity and seem to be unaware that this too is forbidden except under license. Generally, these unfortunate creatures are held in unsatisfactory conditions and given a totally inadequate diet. Due to the ability of reptiles to go for long periods without food, their young owners think their "pets" are doing well, but they almost always starve to death. In any case, almost all species of reptiles are protected - the only unprotected ones being the front-fanged poisonous snakes and the salt-water crocodile.

Another common offence is the keeping of kangaroos in captivity. Whether these animals are the unprotected red or euro, or the partially-protected grey kangaroo, or the protected brush wallaby, none may be kept by any person unless he has been given special approval. The keeping of any kangaroos in the metropolitan area is generally frowned upon as they tend to be held in quite inadequate areas and under unsatisfactory conditions. Furthermore, experience has shown that there are frequent escapes, thus providing traffic hazards and generally creating a nuisance. It has been laid down that animals shall not be kept even in country areas unless each is allowed at least $\frac{1}{4}$ acre of land for itself, is provided with sufficient food, shelter and water, and is kept under aesthetically satisfactory conditions.

SALMON RESEARCH

Late last month, Dr J.M. Thomson, Principal

Research Officer, Division of Fisheries and Oceanography, C.S.I.R.O., and project leader of the Western Fisheries Research Committee, visited Albany to organise the current year's large-scale fish-tagging programme which commenced in earnest last year. In a press interview at Albany, Dr Thomson said that research conducted by his section had indicated that salmon schools spawned somewhere off the coast between Albany and Cape Naturaliste. It had been shown that salmon spawn was carried eastwards by the Southern Ocean drift towards Bass Strait. In that region immature fish predominated in the stocks of salmon. It had been established by tagging that mature salmon moved from that area to westwards of Albany - presumably to spawn.

In conjunction with the fish-tagging programme, measuring and sampling of salmon brought to the Albany cannery will be carried out. This will lead to a better understanding of the population dynamics of the species and of the effects of fishing on the stock.

Mr Favelle, a technical assistant of the Division of Fisheries and Oceanography, is located at Albany for the duration of the current season.

BOAT LOSSES

Mr C.D. Welsh, of Geraldton, lost his 20-ft. boat on the reefs near the Geraldton Lighthouse on February 25. He had been pulling craypots only about a quarter of a mile offshore when his boat was struck by large seas and wrecked. He spent an hour and a half in the water before being rescued by a passing vessel.

A less serious mishap occurred earlier in the month at Mandurah when Mr Ken Cotter's 22-ft. crayfishing boat was driven on to the bar at the entrance to Peel Inlet. Mr Cotter, although assisted by volunteers, experienced great difficulty in manhandling the vessel across the bar. Helped by the Shire Council's grader, however, the feat was finally accomplished.

Concern mounted in Geraldton last month when the crayboat "Rhonda" failed to arrive in port. Due at Geraldton at 4 p.m. on February 14, the "Rhonda" was still missing at first light next morning and a light aircraft was despatched from the Geraldton airfield to search for her. The search was soon successful, the "Rhonda" being sighted at 7.25 a.m., when the pilot radioed that all appeared to be well with the vessel.

FAUNA NOTES

In a letter to Dr D.L. Serventy on January 10, the discoverer of the Noisy Scrub-bird, Mr H.O. Webster, reported that a nest of the species had been found. He wrote, "I have some interesting news for you - Eric and Lindsay Sedgwick came down on Monday and in the course of a visit to the back country at Two People Bay we decided to make our way up one of the gullies. I was trailing through the thick scrub with Lindsay following and Eric bringing up the rear. Suddenly I heard an exclamation behind me and turned to see Lindsay with a globular nest in his hands. In pushing aside the scrub and rushes, I had stepped over it but fortunately he spotted it. Of course it was a nest of Atrichornis, and a recent one - made up of dry reeds which were fairly loosely formed into a ball shape - entrance at the side, sizes - 6" x 5½" and 6½" high, and it was placed on a kind of platform made of the same material in small round rushes about 8" from the ground. The nest was actually only 80 yards from the sea".

The nest of this species was first found by Mr A.T. Hassell "in thick scrub near Albany", in October, 1897. He found the nest on the ground "alongside the root of a eucalyptus tree which was about 7" out of the ground. It was dome-shaped, constructed of grass and footlets with a few leaves and lined with a quite downy substance". Its measurements were given as 5¼" broad by 8½" high. Mr Webster has called the gully where it was found Sedgwick Gully in honour of its finder and has named another one Mees Valley in honour of Dr G.F. Mees, Curator of Vertebrates at the Western Australian Museum.

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Apropos of our previous notes on the occurrence of black swans at sea, Assistant Inspector D.H. Smith, of Albany, in reporting counts of waterfowl made around the lower foreshore at Albany, reminds us that black swans are common in those waters at various times. For example, on February 7, he estimated that there were between 400 and 500 swans there in addition to about 250 black duck and 30 grey teal.

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Another interesting note recorded by Mr Smith was the sighting of 8 grey kangaroos and 6 brush wallabies during one early morning run from Manjimup to Rocky Gully on February 4.

Mr D. Gibbs, an honorary warden of Broome, in a letter dated February 21, reported the occurrence of magpie geese on the property of a fellow-warden, Mr F. Hamlett, of Roebuck Plains Station. These birds have not been recorded as breeding south of the Fitzroy River, but odd wanderers have been found at various times all over Australia outside the arid centre. Since the turn of the century their wanderings appear to have decreased, although in the 1952 irruption a few magpie geese were reported in the south-west of this State.

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In a recent press release Mr C.J. MacIntosh, of Victoria Park, reported that the breeding of peacocks and pheasants had become more fashionable in recent times. Mr MacIntosh is vice-president of the Ornamental Pheasant Society and has been breeding the birds for about ten years. He said that there was now a good market for pheasants and peacocks in Western Australia and more and more people were rearing these exotic birds in backyard aviaries.

ORNITHOLOGY BEHIND THE IRON CURTAIN

In the November, 1962, issue of The Ring, an international ornithological bulletin on bird-banding, there was published an account of the third All-Union Ornithological Conference held at Lvov from September 12 to 15, 1962. The report says that nearly 400 ornithologists from all parts of the U.S.S.R. and from Poland, Czechoslovakia, the German Democratic Republic and Bulgaria took part in the conference. There were six plenary sessions and 17 meetings in the conference at which about 250 scientific papers in all the fields of contemporary ornithology were read. The extent of bird ringing in the Soviet Union was emphasized in discussions of the problem of reorganisation of ringing in that country. It was pointed out that during the last five years, more than 1,000,000 birds had been ringed in the Soviet Union, 37,000 of them having been recovered.

In the same issue, Dr Salim Ali, of Bombay, reported two recoveries of particular interest. They were both adult males of the migratory Spanish Sparrow (Passer hispaniolensis transcaspicus) which had been ringed in Bharatpur, India (co-ordinates - 27°13' N. and 77°32' E.). The first had been banded on March 31 and recovered on June 2, while the second had been banded on April 3 and recovered on May 29, all in the same year. The recovery

site was 38 kilometres north of Frunze (co-ordinate 42°30' N. and 75° E.). Advice of the recoveries came from the Institute of Plant Protection, Alma-Ata, U.S.S.R. The birds had been killed in a campaign for the annihilation of sparrows by poisoned grain. It had been undertaken at the Djambul Plant Protection Station, where over 1.8 million birds had been destroyed. From the total mass of dead birds, 53,500 bodies were examined but only 12 ringed birds were found. All except the two mentioned above had been ringed in the same locality in previous years.

Commenting on this low recovery rate, Dr Salim Ali went on to say "that of the 3,000 Spanish Sparrows ringed in Bharatpur during 1962, only 2 should be found among 53,000 examined is an indication of the astounding magnitude of the total population of these birds. It explains and to some extent justifies the need for the drastic control measures adopted. The damage that these voracious hoards must cause to crops must be quite fantastic". He suggested that there was a need to explore the practicability of canning or preserving, in an inexpensive way, the many tons of good meat in the sparrows which might be of benefit to the protein-starved human populations in many under-developed regions of the world. He added that the incomputable masses of Black-faced Weaver or Dioch (Quelea quelea) that were destroyed in Africa every year, should be kept in mind when calculating the amount of protein which was now wasted in the world, or at the best used as manure.

It is conceivable that both these prolific species could be acclimatised in Western Australia if ever they had the opportunity. The realisation that a species could breed up to such numbers is sure justification for continuing our policy of strict control over the introduction and keeping in captivity of exotic species in this State.

OVERSIZE CRAYFISH

There was no doubt about the legality of the size of one of the crayfish taken by fisherman Paolo Romagnolo, of Fremantle, recently. Caught in a craypot in the Fremantle area, this crayfish when weighed at the Fremantle Fishermen's Co-operative Society Ltd., tipped the scales at 9 lb. Although its carapace measurement was not given, its overall length was 3 ft. 7 in. from the tip of its feeler to the end of its tail. The manager of the co-operative, Mr J.P. Pupazzoni, said

that he would have the fish treated and displayed in the society's headquarters.

PASTORALIST VERSUS SHOOTER

Those of us who are still able to recall events of 1958, might remember reading in this bulletin an account of a prolonged dispute between shooters and pastoralists on the eastern goldfields. Having been drawn into the dispute through our traditional responsibilities to game and the shooter, we made an effort to establish a number of shooting preserves on Crown land where sporting shooters could operate without having to seek the approval of pastoralists. Apart from the establishment of the Rowles Lagoon area, however, the scheme was not vigorously pursued for amicable agreements were reached between the shooters' organisation and the goldfields district committee of the Pastoralists Association. In recent months, however, some station owners have requested police protection of their property from what they describe as "certain aggressive shooters" who committed serious acts of trespass. The chairman of the Association, Mr J. Maund, of Edjudina Station, was recently reported to have commented on three incidents where pastoralists had actually been threatened with violence by shotgun parties. Although there had been no actual bodily violence, damage which Mr Maund claimed was caused by shooters included -

* road and direction signs damaged by shotguns fired at close range;
* furniture stolen from out-stations;
* sheep killed or stolen.

Mr Maund said that professional kangaroo shooters gave little trouble. They operated on various properties with the consent of the station owners. Many of those who caused the trouble, he said, visited the goldfields from the metropolitan area during holiday weekends. It is understood that some pastoralists have sought the establishment of a special police squad (along the lines of the gold-stealing squad) to protect pastoral property.

TERRITORIAL RIGHTS ON THE CONTINENTAL SHELF

The results of the present international disagreement over rights to control crayfishing on the continental shelf of South America, may have profound legal implications for conservationists in Australia. Early

last month the authorities in Brazil seized six French boats which it claimed were illegally fishing its waters. The French Government despatched its corvette "Tartu" on February 22 to prevent a recurrence of the seizure which arose from Brazil's determination to clear all foreign lobster boats from waters within 60 miles of its shores. In a subsequent counter-move to the French action, the Brazilian Government ordered six destroyers out of its eastern ports to enforce the embargo.

Although no binding international agreements have been reached, there seems to be considerable support among experts in international law for the extension of the once traditional three-mile territorial limit to one of twelve miles where free-swimming fishes are concerned. There seems to be a growing acceptance, too, of the tenet that a country which has and is practising conservation measures in a shelf-fishery can enforce restrictions in respect of demersal species to the limits of its continental shelf. Most of this State's crayfishing grounds are beyond our State territorial limits, but are well within the boundaries of the proclaimed waters under the Commonwealth Fisheries Act.

LOCAL PRAWNS

Senior Inspector J.E. Munro has reported that large quantities of greasy-back or school prawns were being taken by professionals and amateurs at Mandurah last month. Many were taken during the daytime, which, he said, was most unusual. Commenting on the size of the hauls, Mr Munro said that one Perth distributor was known to have received a half-ton consignment. Another Perth firm was cooking and exporting the prawns to the eastern States where a market for small prawns existed. Mr Munro said that although the public there does not like small prawns, the current run was of a good size by our old standards and were of excellent flavour. Mr Munro pointed out that Swan River prawns were traditionally larger, and being nearer the market should reach it in even better condition. He thought that local fishermen should explore conditions in the Swan, as he knew of one instance where a gallon of prawns had been caught at Como in the morning. He also suggested that Mandurah fishermen might try cooking the prawns before they were sent to Perth to prevent deterioration.

PRESERVATION BY IRRADIATION

Following enquiries from within the industry

on the effectiveness of irradiation in the preservation of crayfish, the Minister for Fisheries, Mr Hutchinson, has received the following advice from the Commissioner of Public Health -

"Irradiation is one of the most effective means of destroying bacteria and organisms. Irradiation penetrates packaged material and can therefore be applied after the package has been wrapped. Provided the wrapping material is impervious to infecting organisms, the package remains sterile. This method of sterilization is extensively used for the sterilization of medical equipment. When this method of sterilization is accepted for use on foods, the whole food industry will be revolutionised and freezing and canning will virtually disappear. Unfortunately it has been shown that the process denaturises proteins and destroys some vitamins, and food submitted to radiation has been associated with toxic manifestations. Taste changes also take place in a number of foods. Consequently the irradiation of food is not accepted in any country as a means of sterilization.

Small doses of radiation which do not cause changes in the food have been used for the prevention of spoilage by fungus and insects, and this limited application of radiation to food has apparently been accepted in Canada."

BLACK MARLIN AT ALBANY

Early last month we received advice from Inspector B.A. Carmichael that a large fish had been found dead in Princess Royal Harbour, Albany, on January 27. Mr Carmichael took the opportunity to examine it and after identifying it as a Black Marlin (Istiompax marlina), he forwarded the following biometrics to Head Office.

Total length (upper jaw to tip of tail)	13'6"
Length from tip of upper jaw to caudal fork	12'5"
Tip of upper jaw to centre of eye	2'8"
Tip of upper jaw to end of gill cover	4'0"
Tip of upper jaw to beginning pectoral fin	4'0"
Tip of upper jaw to beginning ventral spikes	4'2"
Tip of upper jaw to beginning dorsal fin	3'9"
Tip of upper jaw to beginning 2nd dorsal fin	10'0"
Tip of upper jaw to anus	7'6"
Tip of upper jaw to beginning 2nd anal fin	10'0"

Tip of upper jaw to beginning 1st anal fin	7'10"
Tip of upper jaw to beginning of keels	11'5" (Tail Peduncle)
Height of dorsal fin	1'7"
Depth of body from base of dorsal fin	2'6"
Length of pectoral fin	2'0"
Height of caudal fin	2'6"
Width between upper caudal and lower caudal	4'4" (Tip to Tip)

Mr Carmichael's identification of the species was confirmed by Technical Officer R.J. McKay, who commented that some (apparently inconsequential) anomalies could be seen in the measurements. However, the length of the pectoral fin, which is rigid in this species, was correct.

CULTURE PEARL PROGRESS

A report from Pearls Pty. Ltd., of Melbourne, indicates that the year ending December 31, 1962, was a satisfactory one from the company's point of view. Labour was rather hard to come by, but the company was employing a number of natives at Kuri Bay and they seemed to be working quite well. The charter of the lugger "Otama Maru" had been terminated at the end of October and was anchored in Samson Inlet. It was now being used as caretaker's quarters. The caretaker looks after the pearl-breeding oysters which are concentrated at Samson Inlet and Brecknock Island. Previously, the valuable oysters and associated equipment had at times to be left unattended. The company's new cargo boat, the m.v. "Broome" went into operation last year and is now doing the cargo run between Broome and Kuri Bay.

TASMANIA'S FOSSIL TORTOISE

We await with interest the ultimate taxonomic classification of the fossil of a tortoise found near Taroona, Tasmania, by a 16-year old Hobart High School student last month. The Professor of Geology at the University of Tasmania, Professor W. Carey, was reported to have declared the species to be new to science. He anticipated that it might be placed in a new genus and might even be a member of a previously unknown family. The speciation of tortoises in Australia, which perhaps culminated in the evolution of our short-necked tortoise, is a fascinating story yet to be revealed. The Tasmanian fossil may play an important part in helping us to understand the evolution of these creatures in our continent.

CLEARING HOUSE

Naturalist's Notebook

by Eric Hardy, F.Z.S.

What governs the size of fish? From time to time we hear of unusually big fish - like the 26-stone halibut landed at Hull some time ago by Kingston Sapphire, and sold for £59 to a local restaurant, the highest price paid locally for a single fish.

Halibut, skate and tunny often hit the headlines of the popular dailies because of very large specimen weights. Unlike most other animals, fish increase much more in proportion to their food supply. There isn't such a restriction on size as in many animals.

Fish in the northern hemisphere grow largest in the northernmost part of their range. Halibut and hake from Arctic regions are bigger on the average than the same kind of fish from mid-Atlantic or, in the case of hake, Mediterranean waters. This is known as Bergmann's rule.

There is a difference between average size or weight of fish, which is affected by Bergmann's rule, by sex (females are the larger), by types of nets in use (the larger the mesh the larger the ultimate average in fish size providing it doesn't lead to over-population of the food range), by population density (size is in inverse relation to overcrowding like young plaice on a maturing bank), which is linked with over or under-fishing, and specific characteristic - and individual or specimen weights which produce the "record" specimen due perhaps to age, glandular influence or feeding opportunity.

The latter chiefly interest sport anglers, the former the commercial fisherman.

Heincke's Law or Rule relates size (and age) of plaice in the North Sea inversely in relation to their density on the ground, but directly with depth and distance from the coast, which was, of course, fairly obvious in the Irish Sea last century when Herdman showed that baby plaice matured on the shallow inshore sand and mud areas. In other words, the smaller North Sea plaice are in the shallower water near the coast.

When we come to halibut, however, we have a species which is normally the largest of flatfish. The 364-lb. specimen landed at Hull is not so very outstand-

ing, because greater specimens have been caught, e.g., 456-lb. from Icelandic waters and the biggest about 700-lb. and more than 10 ft. long, from the north Atlantic.

The Pacific race of halibut is not quite so large, attaining a maximum of about 200-lb., while there is a smaller Greenland species. As I have often mentioned before, mere weight is no fair criterion of a "big" fish unless other measurements like length and width are added, as in the famous Mona's scale of assessing specimen fish.

(The Fishing News London January 18, 1963)

South African Fishing Zone Will be Extended to 12 Miles

Legislation will be introduced in the South African Parliament this year to permit the extension of South and South West African territorial waters from three to six nautical miles, measured from the coastal base line. According to a statement issued by the Prime Minister, Dr H.F. Verwoerd, on December 31, this legislation will also provide for a contiguous fishing zone of six nautical miles to extend South Africa's territorial fishing waters to 12 miles.

The Government, said the statement, has had under review for some time the desirability of changing the law and practice of South Africa with reference to the breadth of the territorial sea and the protection of its natural resources of the sea and its bed, in order to bring the position in this country more into line with trends that have been developed elsewhere.

Traditionally, the breadth of the territorial sea has been three nautical miles, and this is the limit of jurisdiction hitherto claimed by the South African Government.

But in the last century an increasing number of countries have abandoned this tradition, and at the Conference of the Law of the Sea, convened by the United Nations in Geneva in 1958, the concept of the three-mile territorial sea, as a recognised canon of international law, was implicity abandoned.

No other formula, however, received sufficient support to secure recognition by two-thirds of the countries attending the conference. In these circumstances

a further attempt was made to reach international agreement at a second Geneva conference held two years later.

Second Conference

The second conference in 1960 failed by only one vote to give the requisite two-thirds majority to a formula covering the width of both the territorial seas and the fishing zones, in which fishing rights are reserved to the nationals of the coastal states.

This formula was known as the "six plus six" formula, and its principal provisions were twofold.

Firstly, a state was entitled to the breadth of its territorial sea up to a maximum of six nautical miles measured from the applicable base line.

Secondly a state was entitled to set up a fishing zone in the high seas, contiguous to its territorial sea, extending to a maximum limit of 12 nautical miles from the base line from which the breadth of its territorial seas was measured, in which it should have the same rights in respect of fishing and the exploitation of the living resources of the sea as it had in its territorial sea.

Fishing Rights

The formula also recognises the rights of the state which acquired such rights by usage and continued to fish for a further specific limited period in the outer six miles of the fishing zone established by the coastal state.

The formula does not preclude the conclusion of bilateral or multilateral agreements for the purpose of regulating matters of fishing.

Although this formula failed by the narrowest of margins to secure recognition by the Conference, it was supported by the great majority of states, including South Africa, and the Government is, therefore, satisfied that at the present time it is an arrangement which commands the widest measure of international acceptance.

The Government believes that it would be imprudent and detrimental to South African interests and those of South West Africa to continue to apply the three-mile limit in circumstances where this concept has become obsolete, and no certainty exists as to when a

new generally accepted rule of international law, with respect to the breadth of the territorial sea, will come into operation.

Accordingly, the Government proposes to introduce legislation to provide for the establishment of the limit of the territorial sea in respect of South Africa, as well as those of South West Africa, at a distance of six nautical miles, measured from the applicable base line.

The legislation will also provide for the establishment of a fishing zone, contiguous to the territorial sea, extending to the limit of 12 nautical miles from the base line from which the breadth of the territorial sea is measured, in which the same rights in respect of fishing and the exploitation of the living resources of the sea will apply as in the case of the territorial sea.

The effects of this legislation will, therefore, be to apply the six plus six formula, with respect to that aspect of the formula which provides for the continuation, for a limited period, of the exercise of fishing rights in the outer six miles of the fishing zone by states whose vessels have traditionally fished there.

The Government believes that in respect of South African and South West coastal waters, no problems of any significance will arise.

The Government is prepared to consider sympathetically, and in keeping with the spirit of the six plus six formula, the representations of any state which may consider its interests affected by the application of this legislation.

Finally it is the intention of the Government to accede to the Convention for the Conservation of the Living Resources of the High Seas, and the Convention on the High Seas, which were also adopted at the 1958 Conference on the Law of the Sea.

The primary aim of the former convention is to obtain through international co-operation the optimum sustainable yield from the living resources of the high seas. Procedures for securing agreement between the states concerned are laid down therein.

The Convention on the High Seas, on its part,

codifies the existing international law concerning these seas.

(Shipping News South Africa January, 1963)

No Unexploited Grounds Left in N. Atlantic

200-Ship Increased Fishing Effort in Six Years

In an interesting leaflet issued by the Fisheries Laboratory, Lowestoft, prepared by Mr John Corlett, the Newfoundland fishing grounds and catch rates in recent years come under thorough scrutiny. The hydrography and characteristics of the area, the state of the cod and haddock stocks, and the recent increased fishing effort there, are fully reviewed, and the leaflet concludes with an excellent precis of the effect of this increased fishing effort and prospects for the future.

Results of the past few years suggest that over the year the best cod catches are obtained:

January and February -

Belle Isle area;

February to April -

South-west Newfoundland, South of St. Pierre and Green Banks, Southern slopes of the Grand Bank;

May to September -

North-east Grand Bank, Bonavista area, and northwards;

August to October -

South-east Grand Bank;

November and December -

Belle Isle area.

The best haddock fishing is on the southern slopes of the Grand Bank from February to April and on the South East Shoal from July to October.

Heavily fished

A study of the past data of catches, amount

of fishing, and size and age of fish shows that the stocks in the Western Atlantic are moderately heavily fished. Thus the stock abundance, and the catch per hour, have in some areas been markedly reduced from their original level. As the stocks in one area have been reduced to a low level, other concentrations in other areas have been exploited. The increase in fishing intensity in recent years, particularly by trawlers, has resulted in previously unexploited stocks being fished; and the decline in catch per unit effort over the area as a whole is less marked than the decline in local areas. Thus the catch per effort on the southern Grand Bank has decreased considerably since 1953 and so fishing in that area has decreased. Since about 1957 there has been some decrease in the catch per effort on the northern Grand Bank and the trawl fishery has expanded further north towards Belle Isle and Labrador. At the same time the fishery on the south-western stock has increased. There is no clear indication yet that these northern and western stocks have been substantially reduced.

It seems fairly certain that, in the North Atlantic as a whole, there are now no further completely unexploited stocks of cod left - all grounds of a suitable depth for cod are now fished to some extent - and a further expansion of fishing will have to be on the presently known grounds. The size of the future stock, and the level of catch per hour, therefore depend critically on how much fishing is being done. In this context the whole of the West Atlantic grounds from Nova Scotia to Cape Farewell, and probably also the Bear Island and Barents Sea grounds, must be considered together. In all the western areas a major and increasing part of the fishing is done by east European factory trawlers, and trawlers working with a mother ship, and by big salting trawlers from France, Spain and Portugal. These fleets are highly mobile, staying at sea for months at a time and moving rapidly from area to area according to the catches - for instance, in May of this year there were many trawlers fishing Hamilton Bank off Labrador at a time of year when little or no fishing had previously been done.

Statistics are given below of the total number of trawlers fishing in the West Atlantic in 1953, 1956 and 1959, arranged in size classes, according to their gross tonnage.

Exaggerated

The increase in the trawling fleet, especially

of the very big trawlers, is obvious (the fleet in 1953 is in fact exaggerated, through the inclusion of the exceptional number of over ninety British trawlers which each made 1 or 2 trips to the Cape Farewell area), and this increase has certainly continued since 1959. The prospect is therefore of declining stocks and catches per hour for the immediate future throughout the North-west Atlantic, though probably the stocks will not become "over-fished" in the sense of the total catch declining, though it will certainly not increase as fast as the total amount of fishing.

Trawlers Fishing Western Atlantic

Size of Trawler	1953	1956	1959
51- 150 tons	224	229	227
150- 500 tons	132	129	166
501- 900 tons	126	97	209
901-1,800 tons	78	85	95
Over 1,800 tons	-	1	38
Total tonnage (app.)	240,000	240,000	410,000

(World Fishing London February, 1963)

Report on Synthetic Drift Nets

Despite the rapid growth in the use of synthetic twines in the seine net and other fisheries since the war, the synthetic herring drift net has remained an unknown quantity and even a subject of controversy. In 1958, 1959 and 1960, however, comparative fishing trials were carried out with two types of synthetic drift nets, in conjunction with conventional cotton nets, aboard Scottish drifters under operational conditions. These trials were sponsored by the Herring Industry Board and Department of Agriculture and Fisheries for Scotland in collaboration with interested netting and twine manufacturers. The results of these trials have recently been summarised and analysed by Mr B. Parrish and Mr I.G. Baxter of the Marine Laboratory of the Department of Agriculture and Fisheries for Scotland, Aberdeen. Their report is available from the laboratory.

The reluctance of herring driftermen to adopt the synthetic net is attributed by the authors to the following factors - high initial cost, insufficient sales effort by manufacturers, uncertainty as to the

best type of synthetic twine and, finally, the satisfactory performance and lower price of cotton nets, which can be used for different fisheries as they progressively shrink in mesh size. One could perhaps add to this an early history of knot slippage, which has since been overcome.

The synthetic nets used in the 1958 trials were rigged in conventional fashion, using natural fibre roping, cork floats and lead weights to the specification of the suppliers (J. & W. Stuart, Ltd., Musselburgh). Underwater observation by frogmen showed that they hung satisfactorily. The twine used was a 6-ply 50 : 50 mixture of filament Terylene and spun Nylon yarns and the nets were dyed brown. Four mesh sizes were made available, 35, 35½, 36 and 36½ rows/yard, the mesh used being, as far as possible, related to the size of herring being fished.

Second trials

In the 1959 trials, two vessels took part, one using Terylene-Nylon nets as before, and the other 9-ply spun Nylon twine supplied by the Gourock Ropework Co. Ltd. These were rigged with Terylene cork and sole ropes and, once again, satisfactory hanging was confirmed by frogmen. Mesh size was 35 and 35½ rows/yard.

Both types of net were again used in the 1960 series of trials, though this time the Terylene roping was doubled to improve handling.

The object of the trials was to obtain reports on the following -

1. Comparative catching power of synthetic nets fished among cotton nets in the same fleet.

2. Amount of damage to fishes' gill covers, number of fish beheaded and inadequately meshed.

3. Amount of mending necessary on synthetic and on cotton nets.

4. Other factors such as heating up, knot slippage and general ease of handling.

The fishermen's observations were supplemented by those of H.I.B. officers and scientific observers, who sampled catches and assessed the size and composition of each net's catch.

Shrinkage

The result of this analysis is given in some detail in the report, but it is pointed out that allowance must be made for the variation in mesh size of the cotton nets, due to natural shrinkage. This tended to favour the cotton nets when the size of the more stable synthetic net mesh may have been unsuitable for the size of herring being fished. Sometimes larger fish were caught by the nose when the mesh was small, and these tended to be lost during hauling.

The experience gained from these trials can be summarised, broadly, as follows -

The catching power of the synthetic nets tested was comparable with, and even greater than, that of cotton nets of the same mesh size. They tend to hold the fish tighter, possibly due to the elasticity of the twine, and therefore need more shaking and cause more damage to the fish. The thinner the twine, the greater the damage, and fishermen tended to favour the heavier 9-ply spun Nylon nets.

If low-shrink synthetic nets are used, some allowance must be made to provide the right mesh size for various areas or seasonal fisheries. This would call for a stock of nets of various mesh size, or for a mesh size varying throughout the net.

Damage reduced

The greater tensile strength of synthetic reduces damage to nets considerably and with it the amount of time spent in mending. Cotton nets sometimes needed five times the amount of time for repair by comparison. There is also a reduction in the time spent in applying preservative (barking) to cotton nets, and a longer working life for synthetic nets could reasonably be expected.

The problem of knot slippage has now been overcome by such manufacturers' treatments as double knotting, tarring and bonding by heat or chemical means. The level of slippage can now be said to be acceptable so far as Scottish fishing vessels and methods are concerned.

Although there is no question of damage to synthetic ropes and netting by rot due to bacterial action, the heating-up caused by such action is undesirable and should be checked by the application of salt in the traditional manner.

The report deals only with two types of synthetic net, but it should not be thought that other equally satisfactory materials or combinations of materials may not be available. Other types are at present being tested in the herring fisheries, and some of these appear to be equally satisfactory.

While it is apparent that reduced maintenance and increased life favour the use of synthetic nets and ropes, fishermen are still reluctant to change over to them on the grounds of cost. The future of synthetics in this field would seem to depend largely on the ability of manufacturers to achieve a reduction in price.

(World Fishing London February, 1963)

It's Too Cold For Conger Eels To Survive

Big conger eels are being picked up dead or dying on beaches on the East Coast, and it is clear that they had been frozen to death. Fish have been found at Frinton, Lowestoft, Pakefield, Gorleston and Great Yarmouth.

A former official of the Ministry of Agriculture and Fisheries at Lowestoft recalled that there were similar incidents in 1917 when there was a sharp freeze up during World War I.

What happens

This expert said: "What happens is that conger eels instead of going off into deep warmer water for the winter prefer to stay inshore among wrecks and rocks. They are all right in the normal winter but in an Arctic freeze such as we are going through now they cannot stand the cold water. They gradually weaken and finally have no fight left in them. Near inshore now the water is at freezing point and that kills them."

Old fishermen say that the conger is susceptible to cold water and love to remain near the shore. But when a period of such exceptional severity as we have had of late sets in they cannot stand it.

One conger eel which was picked up on the South Beach at Lowestoft scaling 2½ or 3 stone and 5½ ft. long was placed on show in a local fish shop. Another picked up at Frinton scaled 60 lbs, and its head was 18 inches in circumference.

(The Fishing News London January, 1963)