



MENT, WESTERN AUSTRALIA

SERVICE BULLETIN

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STAFF NOTES

The Minister for Fisheries (Mr. Ross Hutchinson) accompanied by the Director, Mr. Fraser, will attend the inaugural dinner of the Rock Lobster-Crayfish Industry Development Association of Australia, to be held at the Palace Hotel on Thursday, November 7. Also present will be the Hon. L.F. Kelly, M.L.A., former Minister for Fisheries, the Administrative Officer, Mr. B.R. Saville, and the Supervising Inspector, Mr. J.E. Bramley.

Toasts will include one to be proposed by the Minister to the Crayfishing Industry of Australia, while the Hon. L.F. Kelly, M.L.A., will propose a toast to the Association.

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The Director, Mr. A.J. Fraser, will leave Perth on November 27 for a two months' visit to the Eastern States, incorporating official business and annual leave. While in Melbourne, Mr. Fraser will attend the Commonwealth-States Fisheries Conference which will be followed by a one-day seminar on fisheries administration, and then by a meeting of both Commonwealth and State representatives to discuss the Tuna Industry. He will make official calls while in Sydney and Brisbane before proceeding on leave to Townsville, Queensland, where he will visit his daughter. Mr. Fraser, who will be accompanied by his wife, will return to Perth about the end of January.

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Last month, on October 4, the Director attended a meeting of the Mandurah Licensed Fishermen's Association. Early this month he will attend a meeting of the Pemberton Hatchery Board. He will be accompanied on this occasion by the Administrative Officer, Mr. B.R. Saville.



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Our congratulations are extended to Inspector F.J. Campbell who, on November 2, will be married in St. Aidan's Church, Claremont, to Miss Patricia Hartfield, of Claremont. The newlyweds will make their home at Shark Bay, whither Mr. Campbell has recently been transferred as Inspector-in-Charge.

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We welcome to the Head Office staff Miss M.D. Riddett and Mr. G.E. Dixon, who commenced duty with us on October 14 and 28 respectively. Mr. Dixon has been appointed to the newly-created item on our clerical staff. He was previously employed by the Public Works Department. Miss Riddett occupies the senior typist's position; she replaces Miss M.A. Austin, who was recently transferred to the office of the Town Planning Commissioner.

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We also welcome to the staff Mr. J.W. White and Mr. P.V. Clarke. Mr. White, who was appointed on October 28, has taken command of the r.v. "Peron". Mr. Clarke, who was appointed on October 14 as Assistant Inspector, will assist Inspector E.I. Forster. The latter has succeeded Inspector Campbell as skipper of p.v. "Vlaming".

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Technical Officer E.H. Barker and Inspectors T.B. Baines and D.P. Gordon arrived back in Perth on October 1, after attending the 1963 Australian Fisheries School for field officers, held at the C.S.I.R.O. Marine Laboratory, Cronulla. The school was under the leadership of Dr. G.L. Kesteven, Assistant Chief (Fisheries) of the Division of Fisheries and Oceanography, C.S.I.R.O. It commenced on September 9 and finished on September 27 with a written test. The main emphasis was on the role that fisheries inspectors and other field officers can and should play in fisheries investigations, the use to be made of the data they collect, and how their work fits into the overall plan of fisheries management.

Inspector Bains, who gave a talk to the school on the Shark Bay district, will transfer his home to the metropolitan area following his promotion to take charge of the new mobile patrol unit. Mr. Gordon returned to his district at Bunbury but commenced annual leave on October 21.

The Senior Research Officer, Mr. B.K. Bowen, commenced annual leave on November 1. He will spend his holiday at Rottneet Island.

Mr. D. Wright, mate of the r.v. "Peron", will also take a week's annual leave this month, commencing on November 4.

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Fauna Officer H.B. Shugg, accompanied by Fauna Warden S.W. Bowler, will leave for Albany on November 4, to attend for a few days the camp-out of the Royal Australasian Ornithologists' Union which is being held in the Albany district. Several inspections of proposed and existing sanctuaries will be made en route.

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Technical Officer J.S. Simpson returned to Perth on November 4 from Pemberton, after carrying out the Hatchery's annual trout deliveries.

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Several staff movements will take place during the month. They include the transfer of Mr. D.H. Smith from the position of Assistant Inspector, Albany, to that of Inspector-in-Charge, Dongara, a newly-created station. Mr. I.L. Cardon, who has been promoted from Cadet Inspector to Assistant Inspector will transfer to Albany as assistant to Inspector B.A. Carmichael. On his return from annual leave on November 12, Inspector R.M. Crawford will take charge of the Mandurah district from Inspector G.C. Jeffery, who commenced long service leave on October 28. Cadet Inspector P.C. Willey will be stationed at Fremantle from November 12, while Assistant Inspector G.J. Hanley will transfer from Lancelin to Mandurah on November 9. Mr. Willey is being promoted to Assistant Inspector.

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#### PERSONAL PARS

A recent visitor to Western Australia was Dr. G.A. Prowse, Director of the Fish Culture Research Institute, Batu Berendam, Malacca, Malaysia. During his stay, Dr. Prowse visited the trout hatchery at Pemberton and had discussions with the Director and other officers of the Department.



Mr. Roy Schapera, of Cape Town, South Africa, was another recent visitor. Mr. Schapera is associated with the fishing industry in South Africa, principally with crayfish tail processing. He has been touring Australia on a fact-finding mission. While in Perth he expressed his interest in the possible establishment of a sea pilchard fishery off our coast.

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Mr. Graham Pizzey, a freelance photographer of Victoria, recently called on the Director. Mr. Pizzey has been commissioned by the A.B.C. to plan and film 6 quarter-hour films in southern Western Australia on many aspects of natural history. At a meeting of the Fauna Protection Advisory Committee on October 4, it was agreed that Mr. Pizzey's work was worth encouraging and it was recommended that he be provided with whatever assistance the Department could make available.

#### LOCAL TRAINING SCHOOL

On November 4 an induction and refresher school will begin at the Perth district office. Its purpose will be to instruct new field officers in their duties and to provide a refresher course for others who will be transferred to new duties before the coming crayfishing season. An address will be given by the Director, Mr. Fraser, while lectures on procedures will be given by Supervising Inspector J.E. Bramley and Senior Inspector J.E. Munro. Our own research and technical officers will also address the school.

#### SERVICE OF SUMMONSES

In view of recent comment by the Crown Law Department on the service of a particular summons, the attention of all inspectors is drawn to the article published in the May, 1962, issue of this Bulletin. This duty is of the utmost importance and it is necessary that officers serving summonses familiarize themselves with and adopt the procedure set out in that article. For the benefit of new inspectors, the main points of the previous article are reiterated below, together with the recent legal comment made by the Crown Law Department.

In the majority of cases a fisherman's actual place of work is known to one or another of the Department's inspectors. Hence, to simplify service, and to ensure that no undue delay occurs in bringing cases to Court, the Department some years ago decided to take over the duty of serving summonses.



Section 56 of the Justices Act provides that a summons must be served upon the person to whom it is directed by delivering a duplicate thereof to him personally, or, if he cannot be found, by leaving it with some person for him at his last known place of abode.

The Crown Law Department has told us that in the view of a senior metropolitan Magistrate (with which the Chief Crown Prosecutor concurs) this does not mean that if the defendant is out for the moment, or cannot be found for the particular moment, the summons may be left with some person for him at his last known place of abode. This latter mode of service, we are told, is available only if, after due diligence, the defendant cannot be found. In other words, section 56 requires the person serving the summons to make search for the defendant - not perfunctory but diligent search - before leaving it at his last known place of living.

To simplify court process, therefore, and to avoid the necessity for calling as a witness the inspector who served the summons to prove that he had made "diligent search", it is desirable, although the form of certificate does not provide for it, that the fact of this substituted service be endorsed on the summons. In future a signed statement in or to the effect of the following words should be written below the certificate on the back of the summons when it has not been served personally -

"I have made diligent search for the within named defendant, but I have not been able to find him - (Signature)"

The certificate itself must also be completed and signed.

The requirements for proper service of a summons are very strict and must be observed at all times. The major requirement is that every reasonable effort must be made to serve the defendant personally. If an officer is aware that a fisherman will be away for some time - at Green Islets for example - he should attempt to serve the summons there. It is only if he is unsuccessful, despite diligent attempts to serve the defendant, that he may leave the summons with some person at the defendant's "last known place of abode". These words are also strictly interpreted, and in one case in the past it was held that leaving the summons with a person about seven yards from the defendant's home was not service at his "place of abode".

It is in an officer's own interest that every care be taken, when effecting service and completing the endorsements of service, to ensure that all requirements are properly observed. Careless and incorrect completion of the endorsement is regarded as a most serious offence and is punishable by a maximum of 6 months' imprisonment with hard labour.

FISHERIES PRODUCTION IN WESTERN AUSTRALIA

1959-60 to 1962-63

(Live Weight and Total Gross Value to Fishermen)

Year	Production					Value
	Crayfish	* Fish General	Prawns	Crabs	Total	
	lb.	lb.	lb.	lb.	lb.	£A.
1959-60	19,545,400	10,468,500	131,800	74,700	30,220,400	3,663,500
1960-61	18,019,200	9,664,300	106,100	48,400	27,838,000	3,660,400
1961-62	19,237,600	11,775,000	239,000	59,000	31,310,600	4,528,000
1962-63	20,512,181	10,236,704	1,016,751	35,685	31,801,321	5,228,413

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\* Live weight, estimated where necessary from cleaned or processed weight.



CONVICTIONSJULY - SEPTEMBER, 1963

Date	Defendant	Court	Charge	Result
	<u>FISHERIES ACT</u>			Fined
8.7.63	TATULLI, Leonardo	Fremantle	U/S Crayfish	£30.17.6.
8.7.63	BINNINGTON, Raynor W.	"	" Craytails	15. 9.0.
8.7.63	BINNINGTON, Raynor W.	"	" "	10. 0.0.
8.7.63	BINNINGTON, Raynor W.	"	" "	11. 9.0.
8.7.63	ARAVIDIS, Cilos	"	" Crayfish	17. 6.0.
1.7.63	KINGFISHER CORP.	"	" Craytails	21. 7.6.
22.7.63	CAPPA, Carmelo	"	" Crayfish	13.15.0.
5.8.63	ENGINEER & MARINE SERVICES 1963 PTY. LTD.	"	" Craytails	13.10.0.
5.8.63	JAMES, BOWES PTY. LTD.	"	" "	77.15.0.
5.8.63	JAMES, BOWES PTY. LTD.	"	" "	34.15.0.
5.8.63	KAILIS, Michael G.	"	" "	32. 5.0.
5.8.63	GOLDEN GLEAM FISH PROCESSING CO. PTY. LTD.	"	" "	13. 0.0.
12.8.63	TROPICAL TRADERS LTD.	"	" "	60.12.6.
12.8.63	TROPICAL TRADERS LTD.	"	" "	13.19.0.
12.8.63	TROPICAL TRADERS LTD.	"	" "	13.19.0.
26.8.63	PITTORINO, Joseph	"	" Crayfish	10. 0.0.
5.9.63	DAWES, William Edward	Geraldton	" "	16. 4.0.
5.9.63	MILLETT, Eric John	"	" "	24. 4.0.
5.9.63	VUOTO, Unto	"	" "	14.16.0.
19.9.63	HEALY, Donald Alexander	"	" "	10.14.0.
19.9.63	FULLSTON, David James	"	" "	27.18.0.
19.9.63	HENNERBERRY, John	"	" "	11.19.0.
19.9.63	GARTON, Percival Robert	"	" "	31.10.0.
19.9.63	GARTON, Percival Robert	"	" "	15. 0.0.
19.9.63	PALMIOTTI, Corrado	"	" "	18. 1.0.
19.9.63	MORLEY, Cecil	"	" "	11. 8.0.
12.9.63	DAWE, Reginald Lewis	Mandurah	Netting closed waters.	5. 0.0.
12.7.63	MINEIF, Nicolas	Perth	U/S Crayfish	10.10.0.
12.7.63	PARRY, Victor	"	No Fishing license.	2.10.0.
12.7.63	PARRY, Victor	"	U/S Crayfish	33. 7.0.
12.7.63	SERRA, John	"	" "	20. 0.0.
12.7.63	SERRA, John	"	" "	80.18.0.

CONVICTIONS (Contd)

Date	Defendant	Court	Charge	Result
<u>FISHERIES ACT</u>				
19.7.63	ROSS INTERNATIONAL FISHERIES PTY. LTD.	Perth	U/S Craytails	Fined £28. 5.0.
25.7.63	FRASER, Jack	"	" Crayfish	26. 2.0.
25.7.63	COWLEY, Brian Athol	"	Netting closed waters.	13.17.0.
25.7.63	NYGH, Rein	"	U/S Crayfish	44. 3.0.
25.7.63	KOCKS, Donald	"	" "	10.18.0.
26.7.63	SIGNORILE, Gino	"	" "	12.10.0.
26.7.63	ALONZO, Antonino	"	" "	18.10.0.
26.7.63	DEFRANCESCO, Gerardo	"	" "	18.10.0.
9.8.63	STARR, George	"	Obstructing inspector.	30. 0.0.
13.8.63	ADAMS, Brian McCORMICK, Roderick W. }	"	U/S Crayfish	136. 4.0.
13.8.63	ADAMS, Brian McCORMICK, Roderick W. }	"	Overweight container.	5.17.0.
10.9.63	ROSS INTERNATIONAL FISHERIES PTY. LTD.	"	Underweight craytails.	26. 6.0.
10.9.63	ROSS INTERNATIONAL FISHERIES PTY. LTD.	"	U/S Crayfish	25.19.0.
24.9.63	FERRO, Vincenzo	"	" "	23.10.0.
<u>FAUNA PROTECTION ACT</u>				
11.9.63	PINKER, Marshall William	Perth	Taking protected fauna	£10. 0.0.
19.9.63	JONES, Doreen	Geraldton	Keeping fauna w/o license.	3. 0.0.
4.9.63	LORENZI, Dominico	Midland	Taking protected fauna	3.11.0.) Warned.) Court costs only.)



30TH PARALLEL RESTRICTION STILL APPLIES

An article which appeared on page 15 of the September, 1963, issue of "Fisheries Newsletter" (published by the Department of Primary Industry, Canberra) has been misinterpreted in some quarters. The paragraph stated, under the heading "Crayfish Regulation Amended", that "the new regulations will eliminate the previous division of areas by the 30th parallel".

It must be clearly understood, however, that the new regulations were referring only to the open season, which is now to be uniform from November 15 to August 14 throughout the whole of the crayfishing grounds (except Houtman Abrolhos) between the 24th and 34th parallels.

The restriction which prohibits any boats from crayfishing south of the 30th parallel if it has fished north of that parallel in the same calendar year, and vice versa, still applies and is being enforced.

SETTING OF POTS

To avoid chaotic conditions in the limited loading areas of the fishing boat harbour at Fremantle, and to ensure uniformity throughout the whole of the open season area, it has been agreed that fishermen will be allowed to set their pots, unbaited, on the grounds at any time from November 8, 1963. This applies throughout all the crayfishing areas lying between the 24th and 34th parallels. However, no pots shall be baited before November 14 and no crayfish shall be taken before November 15.

MINIMUM LENGTH OF WHITE CRAYS UNCHANGED

An application by fishermen and processors for the reduction of the minimum legal size of crayfish from 3" to 2 $\frac{7}{8}$ ", even if only during the "white" crayfish season, has been refused. This was announced last month by the Minister for Fisheries, Mr. Hutchinson. He had received the report of the committee of three he had set up to examine the proposal put to him earlier by deputations representing the Confederation of Licensed Fishermen and the recently formed Rock Lobster-Crayfish Industry Development Association of Australia. The members of the committee were Mr. B.K. Bowen, Senior Research Officer of this Department, Dr. R.G. Chittleborough, of the Division of Fisheries and Oceanography, C.S.I.R.O., and Dr. R.W. George, of the Western Australian Museum, each of whom



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is currently engaged in crayfish research. In its report to the Minister the committee warned, among other things, that while to reduce the legal minimum length of "white" crayfish as asked would probably result in an increase in overall production in the first year of some 1,300,000 lb, the long-term effect would be a decrease in the annual sustainable yield.

#### THE BLOWFISH PEST

Replying last month to a question in Parliament, the Minister for Fisheries commented on the prevalence of blowfish in coastal waters. He pointed out that blowfish populations fluctuated widely, being present in large numbers in some years and almost completely absent in others. He agreed with Mr. Crommelin, M.L.A., (who had asked whether something could not be done about the ridding the sea of them) that blowfish posed quite a problem to line fishermen - professional and amateur alike. He added, however, that it would be a waste of time and money to attempt to rid the waters of these fish as their fluctuations in abundance were caused by fluctuations in natural conditions obtaining in the sea. When conditions became less favourable to them, the blowfish would automatically decrease.

#### CONCESSIONS FOR COUNTRY APPELLANTS

Country members of the Public Service will be pleased to learn that the Public Service Commissioner has approved of certain concessions, to assist members who must travel to Perth to present reclassification appeals. These include time off to attend the hearing in Perth, issue of travel warrants where necessary, and recoup of reasonable out-of-pocket expenses. The Commissioner points out, however, that normal travelling allowance will not be paid.

#### LEAVE FOR 1964 OLYMPIC GAMES

The Premier has determined that officers who are selected as competitors or appointed as officials may be granted special leave on full pay during the period September 23 to October 22, 1964, or September 30 to October 25, 1964, for the purpose of participating in the 1964 Olympic Games in Tokyo.



Leave may be approved provided that written advice from sectional team managers is produced, in the case of competitors, or from the Australian Olympic Federation, in the case of officials.

The Premier's instruction continues that any leave required in addition to that approved as above may be granted as leave without pay or taken from recreation or long service leave entitlements. Application for additional leave of this nature must first be considered by the Public Service Commissioner.

Any application for leave in accordance with this determination must be forwarded to the applicant's branch head with all necessary supporting documents.

#### WESTERN FISHERIES RESEARCH COMMITTEE

The third meeting of this important committee was held in Perth on October 23, 24 and 25, under the chairmanship of the Director, Mr. A.J. Fraser. Other members present at the meeting were Dr. G.L. Kesteven, Assistant Chief (Fisheries) of the Division of Fisheries and Oceanography, C.S.I.R.O., Cronulla, N.S.W.; Dr. A.R. Main, Department of Zoology, University of Western Australia; Dr. W.D.L. Ride, Director, Western Australian Museum; Mr. A.C. Bogg, Director of Fisheries and Game, Adelaide; Mr. R.M. Taylor, representing the Director of the Fisheries Division, Department of Primary Industry, Canberra. The Department's Administrative Officer, Mr. B.R. Saville, was present as Secretary to the committee. Also in attendance as consultants were Drs. A.G. Nicholls and D. Vaux, of the Division of Fisheries and Oceanography, C.S.I.R.O.; Mr. A.E. Stark, biometrician, Commonwealth Bureau of Census and Statistics (attached to C.S.I.R.O.); Dr. R.W. George, Western Australian Museum; Messrs. B.K. Bowen, Senior Research Officer, R.J. Slack-Smith, Research Officer, and R.J. McKay, Senior Technical Officer, Fisheries Department.

It will be remembered that Dr. J.M. Thomson, who had been the committee's project leader, resigned from the C.S.I.R.O. in August last to take up a new appointment. Dr. R.G. Chittleborough, who since then has been acting in that capacity, was confirmed in his appointment.

During the technical sessions situation reports and papers concerning the following items came before the committee:-



Crayfish

Mr. Bowen presented reports on length-frequency and growth-rate studies, and on the effectiveness of escape gaps in craypots. He also outlined the results of his work on the availability of coral crayfishes in northern waters, and detailed the evidence which had now been accumulated to determine whether crayfish had been deliberately "brushed". Dr. R.G. Chittleborough brought forward a report on crayfish in their juvenile stages.

Papers were also presented on the effect of reducing the legal minimum length of crayfish and investigation of a crayfishery in the East Aden Protectorate on behalf of F.A.O. by Dr. R.W. George.

Prawns

A report on the prawn research programme was submitted by Mr. Slack-Smith. It summarized work done on the delimitation of "nursery" areas, species distribution and abundance, and various biological observations including growth-rates.

Australian Salmon

Reports on the commercial catch, population estimate and egg survey were presented by Dr. Nicholls, who had taken charge of this work following Dr. Thomson's transfer (prior to his resignation) to prawn research in Queensland waters.

Whales

Dr. Chittleborough reported that, with the help of Messrs. J.M. Gullard, S.J. Holt, D. Chapman and K.R. Allen at the International Whaling Commission's Scientific Meeting in Seattle last December, the analysis of humpback whale data was carried to the point where population size, sustainable yield and recovery periods had been estimated. The results of the whole programme had been incorporated in a paper submitted for publication. He added that the data would be condensed into a detailed species synopsis when time permitted.

Dr. Chittleborough added that in the sperm whale programme, the geographic limits of the population(s) must be determined. This could be done only through international co-operation. The age structure needed to be determined for catches in local waters.



Tuna

A report on tuna tagging, by Mr. J.S. Hynd, C.S.I.R.O., was elaborated by Dr. Kesteven.

Other

A number of papers were presented on other matters, including a proposal concerning geological research at Shark Bay, and its impact on prawn research, by Dr. B.W. Logan, Geology Department, University of Western Australia; the economic survey of the crayfish industry of Western Australia now in progress, by A.G. Bollen, Fisheries Division, Department of Primary Industry, Canberra, presented by Mr. Taylor; taxonomic work in Western Australia in 1962-63, by Mr. McKay, submitted by Mr. Bowen; and crayfishing packing records, given by Mr. Stark.

Members of the committee and guests were entertained at a buffet dinner during the evening of October 25. The Minister for Fisheries, Mr. Hutchinson, who was indisposed, was unfortunately unable to attend.

FAUNA NOTES

A duck sent in from Meekatharra has been identified as a Plumed Tree Duck (Dendrocygna cytoni). Mr. C. Fisher, of Meekatharra, who shot the duck, advised that it was one of twenty five seen at Irridabubba Pool on the Murchison River, 75 miles west of Meekatharra.

This is the first report to be received for many years of the taking in this State of a tree duck south of the Kimberley Land Division, where two species of the genus occur. Known usually as the Plumed Tree Duck and the Whistling Tree Duck, they are both thought to be more closely related to swans and geese than to ducks. However, they have not been studied very closely and nothing much is known about them. One member of the genus, Dendracygna bicolor, known as the Fulvous Whistling Duck, has the widest distribution of any bird in the world. It occurs in widely separated areas, in both Americas, in Africa and Asia, but, strangely enough, not in Australia. The Plumed Tree Duck is limited to Australia, but the Whistling Tree Duck is found all over southern Asia and in the Pacific Islands north of the Philippines. Both species occasionally penetrate into southern Australia, more commonly in the eastern States, and wanderers have also been picked up in Tasmania and New Zealand.



A vigilant quarantine inspector, Mr. S. Cook, of the Department of Agriculture, whose officers inspect all inward and outward consignments of animals passing through the Perth Airport, recently detected a box of illegally imported snakes. They were consigned from South Australia to a showman's address in Victoria Park, but arrived without either the necessary import license or the required health certificate.

Inquiries were made immediately by Fauna Warden S.W. Bowler, as well as by Mr. Cook, but the consignee could not be found and, consequently, the reptiles were returned to the sender.

This is the second consignment of vertebrates to be returned to the sender (at his expense) in recent months. The previous one was a shipment of tortoises which arrived from Singapore addressed to a local dealer in aquarium fishes. These animals were returned on the next plane as there is a complete ban on the import of all vertebrates with the exception of some fish.

#### NOTES FROM THE NEWS

A quick and wet departure from a dinghy in which they were fishing probably saved a Boyanup couple from snake bite. Bob Fielder and his wife were fishing for whiting from a dinghy in the Bunbury Estuary. A 6-ft. dugite, with a quiet splash, slid over the gunwale into the boat. The boat, at the time, was anchored 20 yards offshore. Fielder and his wife quickly departed over the opposite gunwale with considerably louder splashes and left the dinghy to the snake. After swimming ashore Fielder decided to rescue his boat. While his wife went along the beach for help, he swam back and towed the boat to shore by pulling the anchor line. With assistance he quickly killed the snake with an oar. After recovering from their experience the Fielders continued to fish, farther up stream.

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The annual blessing of the fishing fleet was held in the fishing harbour, Fremantle, on October 20. About 14,000 people watched Monsignor E.J. Collins, of Fremantle, officiate at the traditional blessing of the gaily bedecked fleet. Earlier, 1,000 people, many in colourful national costume, walked in procession from St. Patrick's Roman Catholic Church in Adelaide Street to the new fishing harbour. Footpaths along the route were packed with spectators. The celebration was continued at night with dancing in the open air and a brilliant fireworks display.



## CLEARING HOUSE

### DEEP SEA TELEVISION FOR SCIENTIFIC FISHING

As an aid to studying fish behaviour and breeding habits the Fisheries Laboratories of the Ministry of Agriculture and Fisheries at Lowestoft, are to use a Marconi television camera able to operate on the sea bed.

The equipment ordered by the Ministry is the revolutionary new Series 321 camera, which is completely automatic in operation and can be enclosed with its control unit, in a pressure casing at the bottom of the ocean, without the need for adjustments of any kind.

A single supply of electrical power is all that is necessary to run the entire channel on the sea bed, and the output television signal is in a final form which can be carried over an almost unlimited length of cable from the bottom of the sea to the surface.

Experts will be able to study the fish and the operation of trawl nets, as much as 12,000 feet away from the ship on a 24-inch television monitor screen. The pressure casing to contain the equipment will be designed and built by the Fisheries Laboratories at Lowestoft.

#### Extreme Stability

The great depth is possible only because of the extreme stability of this camera channel in unattended operation, and its ability to give excellent pictures at very low light levels. In all previous underwater television work the camera control unit has been installed in the boat with only the camera head itself on the sea bed.

The length of cable connecting the camera to its control unit and hence, the maximum operating depth of the system has been limited to about 1,000 feet, due to the delay imposed on the essential synchronising pulses which control the camera, but which are generated in the control unit.

With this automatic camera, however, the on off switch is the only control used in the entire channel once the equipment has been set up. The control unit can therefore be enclosed in the pressure casing with the camera, and lowered to the sea bed to produce, automatically, a constant, high definition picture controlled electronically over variations in scene illuminations of over 1,000 to 1 at any given lens aperture.

Usable pictures can be obtained with as little as 0.1 foot candles of light falling on the vidicon tube face plate.



TEACH A MAN TO FISH AND YOU FEED HIM FOR LIFE

High on the list of priorities in the Freedom from Hunger Campaign is the increased production and efficiency of the fishing industry. In the Far East, fish represents a large proportion of vital protein in the average diet and it is here that their campaign has taken the form of intensive education in modern methods.

This includes mechanisation of fishing boats, improvement in nets and fishing tackle, modern preparation of fish meal and methods of preserving and salting as well as new methods of marketing and sale.

In Ceylon there has been remarkable success in increasing the fish yield by revolutionising boat design. An enterprising Finnish architect designed a 28 ft. inboard motor vessel known as the E.26 which can be mass produced and which increases the total fishing catch by as much as 10 times.

By these means and by putting outboard motors on the native fishing craft, the improvement of tackle and nets and a far-seeing programme by the Ceylonese Government of easy loans to the fisherman, the national catch has been doubled in one year.

There is even hope that the country will become completely self-sufficient in fish, and in a country where three out of every four pounds of fish was imported, this is a big step forward.

A curious situation has arisen in Vietnam, for not only is there a long coast line with plentiful fishing fields, but her population is already primarily fish eating, preferring this form of diet, when they are able to get sufficient supplies, to animal meat. Logically the industry should be one of the country's main assets, but in fact it is poorly organised, and operates by the traditional and out of date methods.

Fishing is still by small sampans which are unable to go far off shore and are wasteful of manpower and time. In the sudden gales the mortality in these unsuitable craft is alarmingly high. Nor can they hope to tap the richer waters further offshore.

Organisation of the industry is primitive. Each boat is owned by an individual fisherman and his family - usually it represents the only capital they possess, and there is little co-operation between the boats or any overall planning.



The Government is backing to the hilt any plans for modernising the industry, not only for its food value in proteins and its importance to the health of the population, but its effect on the whole economy of the country.

In a wider context, Vietnam is dependent on the fluctuating markets of rice and rubber, but the Government is anxious that the economy should be based on a wider range of agricultural products. Encouraging basic industry such as fishing is part of their programme and it is calling in foreign experts to help in the instruction of modern techniques.

An interesting experiment is taking place in two or three villages where the Oxford Committee for Famine Relief has given over £4,000 to buy 10 fishing boats of a completely new design. From the light small boats with little draught the conservative fisher folk will be handling longer and heavier boats with 10-20 h.p. engines that are capable of far greater distances at sea.

A previous pilot scheme by the Catholic Relief Service in heavier boats has proved successful and it has been estimated that the monthly catch per boat can be increased several times over.

The effects of this project will be widespread. The boats are manned with larger crews and represent for these people quite a sizeable co-operative venture. It is estimated that the increased catch will give 200 days of work per month for the women in the villages who make the local fish soup, whilst increased income from catches will enable the fishermen to repay the cost of the boat. This will go into a revolving fund for further developments.

The immediate effects will not only be increased employment and better food in the vicinity, but localities further inland will benefit from more plentiful and cheaper fish. If the experiment is successful, taking the longer view, a canning industry can be built up with a possible export trade.

But to progress to this later stage, sufficient fleets of this boat will have to be built, and it is therefore vital that these initial projects meet with large scale success. For the scope of this experiment could be far wider than that normally envisaged by the launching of 10 boats in two or three small fishing villages in Eastern Vietnam. Not only would the country's economy be given a vital shot in the arm, but the health of her people could be improved out of all recognition.

Half the trouble is the deadly inertia which comes from years of bad feeling. A population which is seriously



malnourished can not produce the effort or will power to improve its standard of living. This is one of the most vicious of vicious circles. It has been estimated that an acre of water can contain as much food value in protein as an acre of land and thus intensive "cultivation" of the water is as important as on shore.

There is much truth in the Chinese proverb that you can give a man a fish and feed him for a day - but teach a man to fish and you feed him for life.

(Fishing News

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Sept. 13, 1963)

PAINLESS KILLING OF CRABS AND  
OTHER LARGE CRUSTACEANS

Large crustaceans used for food are customarily scalded to death. This is unnecessary torture, for it can be avoided easily. It is possible to kill the animals quickly, without pain, by placing them in cool fresh water and raising the temperature steadily to about 40°C.

The ability to feel pain and avoid it is probably an absolute necessity for motile organisms, but where pain cannot be avoided it is useless, and to inflict it only results in the torture of helpless creatures, whatever the circumstance. Predatory animals quite generally inflict pain in the process of getting food, and C.S. Sherrington pointed out some years ago that life existed for eons on the earth without the manifestation of pity or compassion, until the relatively recent advent of the human mind. Attitudes of kindness are not uniformly present in the human race, but probably the more civilized components of this group agree with the zoologist W.K. Brooks (1), who said, "As for myself, I try to treat all living things, plants as well as animals, as if they may have some small part of a sensitive life like my own..." Thus, there is some tendency for civilized man to avoid inflicting unnecessary pain upon lower animals. Recent laws concerned with the painless killing of cattle in slaughterhouses are a case in point. However, these laws, and public sympathy, largely apply to mammals, and the invertebrate animals are given very little consideration, as yet.

The more hardy crustaceans, such as several kinds of crabs, lobsters, spiny lobsters, and the like, are generally taken alive and sold alive, because the consumer has come to believe that a dead crab or lobster is a spoiled one. The assumption is not always justified, but it is a good rule of thumb, and its widespread application has prevented a great deal of food poisoning. Because of the fact that a live crustacean is the only accepted guarantee of an unspoiled one,



these animals are killed at the time of cooking. In the home the prevalent custom is to scald the crabs to death in boiling water. Commercial packers and canners make use of live steam for the same purpose. Some people think nothing of this because the victims are lower animals, and others excuse themselves on the grounds that the process only lasts a few seconds. However, anyone who watches the violent reactions of crabs being scalded to death can see that they suffer extreme pain, and fishery marketing agents have pointed out that thousands of American housewives will not cook fresh lobsters or crabs because of that fact.

The purpose of this report is to describe an easy and painless way to kill large crustaceans, which depends upon the simple fact that most aquatic organisms can withstand very little heat. Marine organisms, especially those in tropical and warm temperate regions, live in their natural environment much closer to the lethal limit of heat than to the lethal limit of cold. Most tropical marine invertebrates cannot survive when water temperatures rise above  $37^{\circ}\text{C}$ , and nearly all of them are killed by the equivalent of mammalian blood heat. (These remarks do not apply to intertidal animals.) Crustaceans from colder climes may even be killed by temperatures of  $30^{\circ}\text{C}$ . Further details are given in the "Treatise on Marine Ecology and Paleoecology" (2).

Some people try to kill crabs by placing them in fresh water. This is not effective with euryhaline organisms, such as the blue crab, which sometimes invade fresh water (3). However, fresh water has some anesthetizing effect because it leaches salt from the body fluids. Only one more thing is needed for painless killing of crabs and that is a low flame under the pot, which slowly raises the water temperature to about  $40^{\circ}\text{C}$ . Crustaceans subjected to this treatment die quickly and easily without showing distress. The water feels only lukewarm to the hand, and the dead crabs or lobsters are perfectly limp because death from heat occurs long before coagulation of the protein which takes place at about  $70^{\circ}\text{C}$  (4). Occasionally, a crab in the bottom of the pot, where his legs are in direct contact with the metal, will stir about because he feels the heat. This can be prevented by using a small wire or metal lattice to keep the animals on the bottom from direct contact with the vessel.

I have demonstrated this little experiment several times, but the facts deserve wider publicity because they may lead to some lessening of the practice of inflicting unnecessary pain. There is a false idea in some quarters that crabs are not good unless they are scalded to death suddenly. With the procedure described above, as soon as the crustaceans are dead, the heat can be turned up and the water boiled quickly; the meat of crabs treated in this manner is just as good as that of animals killed by scalding.

(Gordon Gunter - Field Laboratory, February 3, 1961)  
(Texas Game and Fish Commission, Seabrook.)



BIG POSSIBILITIES OPENED UP  
BY NEW FISH DRYING PROCESS

Fish can now be dried in 30 hours compared with up to six weeks for sun drying as the result of a new technique developed at the Torry Research Station in co-operation with Yarrow & Co., the Glasgow shipbuilders.

The method was demonstrated on Wednesday during the Station's open day which coincided with the British Association meeting in Aberdeen.

Although not often seen in this country, dried fish is a major source of protein for millions elsewhere.

This market is at present controlled by Iceland and Norway, but the new method could enable Britain to compete in countries like Nigeria which spends £8 million every year on stock fish.

The accelerated mechanical drying process developed at Torry on a pilot scale, consists of a specially designed tunnel 40 ft. long, through which fish move on two conveyors. Sets of thermostatically controlled electrically heated plates heat air as it is drawn over the fish, and a high drying rate is maintained all the time.

The speed of the conveyors can be adjusted according to the size of fish which are dried to a 17 per cent moisture by the time they reach the end of the tunnel.

Secret of the process lies in being able to raise the temperature of air in the tunnel without cooking the fish.

Using this process fish can be dried either on shore or on board specially designed trawlers and as there are no preservation problems with this kind of fish, trawlers could operate in, say, the unexploited waters of the Antarctic, and completely fill holds before returning to port.

On Wednesday, dried fish dishes, prepared in West African fashion, were served to visitors.

(Fishing News

London

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FOUND IN WHALES

Twenty fish, up to 4½ ft. and weighing 100 lb., have been found intact by Soviet whalers in the stomachs of three sperm whales killed near Tierra del Fuego. They were so well preserved that they even retained their original colouring.

(Fishing News

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Sept. 13, 1963)