F FISHERIES AND FAUNA

ESTERN AUSTRALIA

MONTHLY SERVICE BULLETIN

Vol. XIV, No. 6. July, 1965

STAFF NOTES

Our congratulations are extended to Capt. and Mrs. C.J. Seabrook on the occasion of the birth of their son, Ewen, and to Inspector and Mrs. F.J. Campbell on the occasion of the birth of their daughter, Janine Heather.

We congratulate Cadet Inspector R.G. Lindsay, who has been promoted to the position of Assistant Inspector, effective from June 4.

* * *

Inspector A.T. Pearce relieved Inspector G. Clifford, master of p.v. "Dampier", during the latter's absence on annual leave from June 14. Other officers who commenced annual leave last month were Mr. P.W. Smith (Head Office) on June 28 and Senior Inspector J.E. Munro. The latter has gone overseas and will not return to duty until after the expiration of four months long service leave plus annual leave. Officers to commence leave this month include Assistant Inspector G.J. Hanley and Cadet Inspector P.W. Harrison, on July 5, and Assistant Inspector R.G. Lindsay, on July 19.

FISHERIES TRAINING SCHOOL

The Hon. Assistant Minister for Fisheries and Fauna has approved that three officers attend the Australian fisheries school for field officers to be held over a period of three weeks, commencing August 30 at the C.S.I.R.O. Marine Laboratory, Cronulla, N.S.W. Those selected are Inspector F.J. Campbell, of Shark Bay and Assistant Inspectors I.L. Cardon, of Albany, and R.G. Lindsay, of Perth.

MOVEMENTS OF DEPARTMENTAL VESSELS

P.V. "Leschenault" has been transferred to Perth from Bunbury and is being refitted for the purpose of patrolling and training in the Swan and Canning rivers.

PERSONAL

Mr. R.J. Bond, who retired as Public Service Commissioner on December 31, 1964, has been appointed President of the National Parks Board of W.A., and the Acclimatisation Committee (usually known as the Zoological Gardens Board) as from July 1, following the relinquishing by Mr. C.G. Shedley of these positions.

RECENT SHARK BAY FISH MORTALITY

The great 1962 Shark Bay fish mortality repeated itself last month, when many thousands of dead and dying fish littered beaches on Dirk Hartog Island and in the South Passage

Research Officer R.J. Slack-Smith, who visited the affected area, brought down samples of seawater and brown slime to Perth, where laboratory tests showed big quantities of dead plankton in the water.

Mr. Slack-Smith and Dr. Brian Logan of the Geology Department of the University, have advanced the theory that due to calm weather and water conditions generally, heavy concentrations of highly saline water had moved into the area from the salt pans at the head of Shark Bay. This killed the plankton, causing a substantial build-up of bacteria and other micro-organisms. These depleted the oxygen content of the water, causing the death of both bottom and surface fishes. The affected area lies approximately 30 miles from Denham.

TRANSFER OF BOAT LICENSES

The attention of the staff is drawn to a departmental requirement regarding the transfer of boat licenses. Before an officer issues a license to another person in respect of a licensed fishing vessel, he must be satisfied that the new licensee is legally the owner of the vessel. Documentary evidence should be sought to substantiate the new ownership. In the past this duty has frequently been neglected or overlooked but close attention must in future be paid to the matter.

The late Keith Sheard

VALE KEITH SHEARD

With great regret we record the sudden death at his home at Nedlands on June 15 of Dr. Keith Sheard, who until his retirement was a senior research officer of the Division of Fisheries and Oceanography, C.S.I.R.O.

Born at Cue, W.A., on October 21, 1903, the son of a P.M.G. telegraphist, Keith Sheard lived with his parents in several outback areas of the State, eventually moving to Perth. Here he took up school teaching and for some time was on the staff of Perth Boys School. When his father was transferred to an executive position in South Australia, Sheard joined him and became a member of the staff of the South Australian Museum in Adelaide.

In the early 1940's, Sheard transferred to the then Fisheries Division of C.S.I.R.O., as technical officer, and two or three years later returned to Western Australia to take charge of the Division's crayfish research programme. Earlier he had devoted a good deal of attention to a study of the plankton collections made by B.A.N.Z.A.R.E

Soon after his return to this State, Sheard enrolled at the University of Western Australia, graduating B.Sc. Later he took his M.Sc. and then a D.Sc.

Sheard published several useful papers on plankton and crayfish, and following his retirement and right up to the time of his death continued his plankton studies. For some years he had been a member of the Senate of the University and of recent times had taken a lively interest in the activities of the one or two Senate committees of which he was a member.

Keith is survived by his widow.

CAMP ALLOWANCE

The Department is in the process of obtaining a caravan for use by research personnel.

The Public Service Commissioner has advised that the following allowance will apply:-

(a) Married Officer - 13/- a day
(b) Single Officer - 8/- a day

Plus 4/- a day when cook is not provided
Plus 4/- a day when north of the 26th parallel
Less 3/- a day for provision of caravan.

All parking fees will be met by the Department and the senior officer in the party will include such fees on his monthly allowance claim.

When the caravan is moved to another centre and a variation in park facilities is involved, the matter will be re-examined.

STAFF CONFERENCE

All staff are advised that the 1965 conference of departmental officers will be held during the week of November 1 to 5.

While many factors have necessitated postponement from the original date in July, it is hoped that the period now selected will be more suitable. It will allow informal discussions on:-

1. New legislation which will by then have at least passed the second reading stage in Parliament.

2. Policing requirements and policy formulated for the then approaching crayfishing season.

3. The 1965 school for Fisheries Officers and many other facets of the Department's activities.

District Inspectors are advised that reports on the main events and trends will be required and suggestions for any improvements in the functioning of their districts will be welcomed.

Branch heads will give an account of their stewardship, while research officers should be prepared to summarize past results and likely future developments in their respective research programmes.

All field staff will be required to participate on one or more sessions and their contributions, deportment and

general behaviour will be rated and noted in connection with future promotion policy. Further details will be announced subsequently, but written suggestions for the general improvement of the conference will be welcomed and should be addressed to the Administrative Officer.

It must be realized that the purpose of the conference is to improve the efficiency of the Department as a whole and departmental business and conference arrangements must take complete precedence over personal activities.

CURRENT CERTIFICATE OF SEAWORTHINESS

In pursuance of the provisions of Section 17 of the Fisheries Act, 1905-1964, the Hon. Minister for Fisheries and Fauna directed that all licensing officers are refrained from granting or renewing any fishing boat license in respect of any boat unless there is first produced to him a current certificate of seaworthiness in respect of that boat in pursuance of regulations made under the Western Australian Marine Act.

LEAVE OF ABSENCE - TRAINING WITH THE DEFENCE FORCES OF THE COMMONWEALTH

The Public Service Commissioner advises that subject to departmental convenience, leave of absence may be granted by the permanent head to an officer or employee who is a volunteer member of the Defence Forces for the purpose of attending a training camp, school, class or course of instruction under the following conditions:-

(a) Attendance at a camp for annual continuous obligatory training

A period of not exceeding ten working days on full pay in any period of twelve months commencing on July 1, in each year.

(1) If the Commanding Officer of a unit certifies that it is essential for an officer or employee to be at the camp in an advance or rear party, a maximum of four extra days on full day may be granted.

(2) Any temporary employee who has completed at least twelve months continuous service before

the date of commencement of leave of absence to attend the camp of continuous training shall be eligible for this grant of leave on full pay. A temporary employee with less than twelve months continuous service, shall be granted leave with pay at the rate of difference between his normal pay as a public servant and the military pay to which he is entitled, if this does not exceed civilian pay.

(b) Attendance at one special school, class or course of instruction

In addition to the leave granted under (a), a period of not exceeding sixteen calendar days in any period of twelve months commencing on July 1 in each year.

(1) The permanent head must be satisfied that the leave required is for a special purpose and not for just another routine camp of continuous training.

(2) This leave may, at the option of the officer or employee, be granted from annual recreation leave due.

(3) If the leave is not take from annul recreation leave, salary during the period shall be at the rate of difference between the normal remuneration of the officer or employee as a public servant and the military pay to which he is entitled if this does not exceed civilian pay.

Military pay is calculated on a ten-day basis and pay for Saturdays, Sundays and public service holidays is excluded and no allowance is made for the value of board and lodging when determining whether there is any difference in pay to be made up.

Applications for leave of absence for the above reasons shall, in all cases, be accompanied by evidence of the necessity for attendance. At the expiration of the leave of absence granted, the officer or employee shall furnish a certificate of attendance to the permanent head. Where leave of absence has been granted with pay at the rate of difference between normal remuneration and military pay, the officer or employee

shall also furnish a detailed certificate of the military pay received.

The condition set out in this instruction applies equally to female officers and employees.

PROMOTIONAL EXAMINATION

In another circular the Public Service Commissioner advises that there has been some doubt as to the status of University Matriculation English in relation to the promotional examination for Clerical Division officers.

After investigating the position, it has been decided to accept Matriculation English as being equivalent to Leaving English. It follows therefore, that Matriculation English will be accepted as an alternative to Leaving English for Promotional Examination purposes.

However, English in the mature age matriculation examination is not acceptable as the equivalent of either Leaving English or Matriculation English.

MINISTER'S SOUTHERN TOUR

Accompanied by the Director and attended by his private secretary, the Honorary Assistant Minister for Fisheries and Fauna (Mr. MacKinnon) visited Gnowangerup, Bremer Bay and Albany during the week ended June 5. At Gnowangerup discussions were held with members of the local Shire, some of whom accompanied the Minister to Bremer Bay. Also included in the party were Messrs. T.G. Hart, M.L.A., for Roe, and E.C. House, M.L.C. - elect.

At Bremer Bay a public meeting was held. There was an excellent attendance of local residents, and a lively discussion ensued on to the rights and wrongs of declaring Bremer Bay a proclaimed fishing zone (for the protection of the rights of professional salmon fishermen). The Minister and, to a somewhat lesser extent the Director, were kept on their feet for 1½ hours answering questions and defending the Department's action.

An inspection of several salmon beaches east of Bremer Bay was made, following which Mr. MacKinnon and his party left for Albany. Here the salmon cannery and the whaling station were visited, Inspector Gordon and Assistant Inspector Cardon joining the ministerial party.

During the course of his stay in Albany the Minister met the Mayor and discussed with Mr. J.F. Robins, of C.S.I.R.O. and Captain Broder (Skipper of Catriona B) the tuna-tagging programme then in train off Albany.

MINISTER MEETS FREMANTLE FISHERMEN

On June 1, the Honorary Assistant Minister (Mr. MacKinnon) received a deputation from the Confederation of Licensed Fishermen of W.A. This body, despite its name, comprises only fishermen whose home port is Fremantle. The President, Mr. F. Ianello, led the party. The Director (Mr. Fraser) was in attendance.

The deputation put forward suggestions related to the conservation of the crayfish industry, as well as a number of other propositions.

Hereunder is set out briefly the tenor of the discussions:-

1. The deputation stated that the Confederation strongly supported the moves taken by the Government to save the crayfish industry. It proposed to establish branches at all fishing ports between Fremantle and Dongara, with a view to the fishermen themselves either imposing sanctions on offenders against the crayfish conservation laws or making full reports to the Department in relation to the activities of offenders. It was hoped that the Department would consult the local branches concerning prosecutions and the imposition of further conservation measures and controls.

   The Minister in reply said that he thought that the Confederation should first set about getting branches or local committees established. He personally was all for this sort of thing. When something had been done and he was satisfied that the branches or committees comprised sound, reasonable men, he would be prepared to give the matter further consideration.

2. The deputation said that the Confederation believed that penalties for breaches of the crayfish conservation laws should be increased substantially. It recommended that in addition to fines the following additional penalties be imposed -

For a first offence - suspension of licenses for three months.

For a second offence - suspension of licenses for 12 months.

For a subsequent offence - cancellation of licenses for life.

All suspensions, it was said, should take effect from the commencement of the next "white" crayfish season. This was the fishermen's most productive and lucrative period and to suspend a license as from the date of conviction, as the Act now provided imposed no hardship at all on the offender if the conviction was recorded in mid-winter for example. The Confederation was of the opinion that skippers were not always to blame for packing undersize crays, but that crew members who were given the responsibility of packing should accept some at least of the blame. On occasion crew members packed undersize crays out of pure vindictiveness and to prosecute the skipper in every case was scarcely fair.

Mr. MacKinnon said that the Government had already decided to bring down legislation this year for this purpose, among other things, of increasing penalties. Regarding the measure of guilt as between skippers and crew members, he appreciated that it was not a simple matter to decide the degree of blame. He would need time to consider the matter.

3. Reference was made by the deputation to the standard crayfish gauge now used by fisheries inspectors and also by a number of fishermen. It was said that it was subject to a measure of distortion if dropped. This resulted often in the inclusion of undersize fish, and although this was not intentional prosecution invariably followed.

The Minister replied that when the gauge was originally issued it was made quite clear by the Department that the gauge was a gauge and not necessarily an accurate measure. The Department never relied on a measurement made by a gauge unless it had been checked against a rule made by a reputable maker. He (the Minister) considered it fundamental that every skipper should have screwed

to his vessel at a convenient place a stainless steel plate measuring exactly 3 inches against which the gauges used by his crew could be checked from time to time.

4. Members of the deputation drew attention to the difficulties met by fishermen in establishing the legality of crayfish tails. This was because of the dual standard - a 3" carapace length and a 5 oz tail. It was well known that crayfish of less than 3" in carapace measurement would produce a 5-oz tail, and, conversely, that some crayfish over 3" would yield a tail less than 5-oz. The Confederation desired to recommend that the minimum legal carapace length be reduced to $2\frac{7}{8}$ inches.

Mr. MacKinnon said that at 3 inches a crayfish was barely mature, and whatever difficulties were imposed on the industry he could not agree to any reduction. In discussion with the Director, the latter had said that if any alteration at all were made, the minimum tail weight should be increased to $5\frac{1}{4}$-oz, or even $5\frac{1}{2}$-oz. He was in full agreement with that proposition, and to do so would be more in the interests of conservation than to reduce the carapace measurement.

Other matters discussed were the "mile-limit" closure from January 1 to August 31 each year, escape gaps in crayfish pots, the activity of foreign vessels in Western Australian waters, public relations, the recommendations of the Royal Commission on Boat Safety and the general question of freezer-boat activity.

INTRODUCTION OF NEW REGULATIONS

The Assistant Minister (Mr. MacKinnon) has announced Cabinet's agreement to proposals that the fisheries laws be tightened to give greater protection to the crayfisheries and to substantially increase penalties for breaches of the crayfish conservation regulations. He said that the existing penalties had proved to be no deterrent to hardened offenders. The widespread illegal practices which were now going on would ruin the crayfish industry if allowed to continue, and the Government was determined to do all in its power to save this important and valuable fishery, which was showing unmistakable signs of strain.

In addition to stepping up penalties, legislation to be brought down in the forthcoming Session would give powers to inspectors to deal more effectively with craypots and other gear used illegally. The Bill would also provde for the abolition of the existing fishermen's advisory committee. Instead there would be established two committees one to deal solely with the crayfish industry and the other with the general fisheries.

Another amendment would repeal the law relating to the registration of trout acclimitisation societies. Only a handful of these bodies remained, and general policy was formulated and hatching operations carried out by a Board which operated under Government subsidy. The Societies need not necessarily go out of existence, they could still perform a useful function as angling clubs, publicity media and so on. The powers which they now enjoyed but rarely exercised to make by-laws relating to fishing in their respective districts would, however, revert to the Government.

LEGAL RIGHTS OF ENTRY

In the past, on some occasions, inspectors in the course of their duty experienced difficulty in gaining access to cold stores which have been locked and the lessee or the proprietor has not been in attendance.

The Crown Law Department was recently consulted for a legal opinion in relation to the proper interpretation of Section 7 of the Fisheries Act, which provides:-

> "Every inspector shall have the right of entry on all lands whatsoever for the purpose of giving effect to or carrying out any of the provisions of this Act or the regulations".

In reply the Crown Law Department advises that the power in Section 7 of the Fisheries Act is limited and does not include a power to enter premises forcibly to carry out the provisions of the Act. There is no doubt that inspectors are entitled to enter premises which are open and also to enter on land, but if the premises are closed and locked, it is doubtful whether an inspector has the power to force his way in under the particular section. The only other power to search available is under Section 711 of the Criminal Code, but here the inspector must have formed a conclusion on reasonable grounds that evidence connected with an offence

is available in the premises. Here again, the inspector has no power of forcibly entry. Similarly there is no statutory power for the inspector to demand a key, nor to take an impression so as to obtain a key. In a case of an individual undoubtedly acting deliberately to cause inspectors embarrassment and delay, there will be no alternative but to wait for a member of the firm to open the particular room or store.

While it is costly and time-consuming, it is suggested that where an inspector suspects that fish are being stored which are undersize, or that a contravention of the Act is occurring, he should obtain a warrant to search and remain on the premises until the particular room or store is opened for him.

PRAWNING LICENSES TRANSFERRED

Lombardo Fisheries Pty. Ltd., has been commissioned to assist in an urgent undertaking for the drilling of holes, 100 miles north of Port Hedland preparatory to the construction of a deepwater jetty. Their licensed prawn trawler "Valma" (Shark Bay area) has been chartered for 30 days for this undertaking and is therefore most unlikely to be engaged in the prawn fishery this season.

An application by the Company for its other vessel "Carmela" to trawl for prawns in the Shark Bay waters in lieu of "Nelma" has been granted.

Another temporary approval has been given for l.f.v. "Western Star" to engage in prawn fishing in Shark Bay during the currency of the season in lieu of l.f.v. "Atlantic Ocean" presently being rebuilt and expected to be ready for crayfishing at the commencement of the season and, at the conclusion of crayfishing, to engage in prawn fishing again.

Nominated by M.G. Kailis (1962) Pty. Ltd., l.f.v. "Dolphin", owned and licensed by R.D. Horn, was found unsuitable for trawling and has been replaced by l.f.v. "Aurora Australis" to trawl for prawns this season in the waters of Exmouth Gulf.

Temporary approval has been granted for l.f.v. "Hadjuk" to replace l.f.v. "Vis" to trawl for prawns in the Exmouth Gulf waters to the end of August 1965. "Vis" herself will replace "Santa Lucia" which has been found to be unsuitable.

MARINE SEISMIC SURVEY

The Burmah Oil Co., of Australia has been given approval to conduct a marine seismic survey for the purpose of oil exploration in offshore areas up to a distance of 200 miles off the coast of Western Australia. These areas extend from the northern offshore boundary of Western Australia to an area immediately north of Monte Bello Islands.

In the course of the survey, small charges of an average of approximately 28 lbs. will be detonated near the ocean surface at intervals of $\frac{1}{4}$ to $\frac{3}{4}$ miles along the line traversed.

An identical survey has been carried out by this Company last year. Similar surveys with a much greater density have been carried out in the North Sea, Gulf of Mexico, Persian Gulf and other areas with no noticeable damage to the fishery.

CARNARVON TROPICAL FESTIVAL

The Rotary Club of Carnarvon is organizing a festival to be held between September 1 and 4. One of the attractions will be a tagged fish competition, and to facilitate the tagging, the Department has given approval for the necessary netting to take place in fascines during the festival.

Arrangements have been made for Technical Officer, E.H. Barker to supply the required fish tags.

SIX MONTHLY REPORT ON THE SHORT NECKED TORTOISE

Following the research in connection with the ecology of the short necked tortoise, a six monthly report was submitted by the University of Western Australia.

Nine animals were fitted with radio transmitters and released on the two reserves during November, 1964. Due to the difficulty in catching the animals, only two of these were from the Warbrook Road reserve. The technical problems of fitting transmitters to the animals proved to be greater than expected and only four of the instruments stayed on the air for more than a week or two. All were fitted to animals

released on the 21-miles peg reserve. Radio location showed conclusively that the animals on this reserve retire to the "crabholes" for the summer months. Only one radio stayed on the air for more than three months and this animal (Zoo Dept. No. 18) was dug up on March 18, 1965. It proved to have a large sebaceous cyst on its plastron (not near the radio) and died a few days later. The other animal handled since the last report is a young female (Zoo Dept. No. 19) which was found on the highway next to the 21-mile peg reserve on January 27 by Mr. J.A.D. Treloar, of the Town Planning Department. This animal is being held at the Zoology Department for the present.

Following information received, swamps in the Mogumber area were inspected during early March. It seems possible that the short necked tortoise occurs in this area, particularly on property owned by a Mr. Neames, of Yericoin. Further searches will be made after the swamps have filled.

THE TURTLE

The turtle lives 'twixt plated decks

Which practically conceal its sex

I think its clever of the turtle

In such a fix to be so fertile.

Odgen-Nash

CLEARING HOUSE

ANIMALS OF WIRRIMBIRRA

The Lyrebird

Among the unique birds which inhabit Australia and her halo of islands are the mound builders, big shy birds with large raking feet. Only during the last twenty five years have ornithologists been initiated into the spectacular domestic secrets of these birds. It should be recalled that John Gould spent weeks hearing but never seeing the elusive lyrebird, indicating the magnitude of the achievement of Mr. Harold Pollock who has recently completed a colour film after three months work in the Dandenongs.

The lyre-shaped tail which gives the birds its name (Menura means "mighty tail") is possessed only by the cock. It consists of two wiry lyre-shaped feathers, and sixteen display feathers, the outer two being broad, barred and lyre-shaped with the space between filled by fourteen osprey feathers. These display feathers arch forward during display, but can be moved individually or carried behind during normal activity. His powers of mimicray are legendary. A noted lyre-bird of Sherbrook imitated over twenty birds, as well as car horns, cats, dogs, a rock crusher, a hydraulic ram, and axemen, not to mention his own tribal songs of love and family contentment.

All this is very impressive and has earned the male bird much publicity. But what of the female bird? She too has a tail. It is a utilitarian one and soon develops a wry kink through being draped along her side while she is incubating. She too has powers of song, and uses them to inform her mate of her presence and to give the young their first lessons. She alone builds the nest, a down-lined chamber of interwoven twigs and fibrous roots built in wet weather when material is pliable. It is often protected from rear attack by a rock or sapling stand and from aerial attack by a camouflage strip of eucalyptus bark. She feeds her young with worms, snails, grubs and slugs and has been noted to offer the more repulsive item of a centipede first. Another human corollary!

The single purplish-grey egg is laid in early August and takes a month to hatch. It is a year before the chick is fully feathered, four before the young cock matures, grows his tail feathers and leaves the parental territory to find a mate.

Said Harold Pollock, "I spent ten days switching on and off the lights before they grew accustomed to them. The time spent capturing those few shots will have been worth it if people realise that Australia has rare beauty worth protecting."

(Wildlife Research News Sydney June, 1965)

(It is of interest to recall that the Noisy Scrub-bird shows some phylogenetic (evolutionary pedigree) affinities to the Lyrebird, particularly in behaviour. - Editor)

INTERIOR DEPARTMENT CLASSIFIES ATLANTIC SALMON AS "ENDANGERED" SPECIES

Atlantic salmon has been included in a U.S. Department of the Interior list of "endangered" fish, birds, and mammals. A species is endangered when its survival is seriously threatened.

New Englanders once sought the Atlantic salmon as an important sport and commercial fish. But in the past 75 years both the sport and the commercial catch have dropped sharply. Today the Atlantic salmon is found in limited numbers in only 8 Maine streams. Smaller than the Pacific salmon, the adult Atlantic species reaches 10 to 15 pounds. It is succumbing to pollution, obstructions caused by dams, and changes in waterflows.

The list of endangered species was sent for comment to all State game and fish departments and other interested organizations. The co-operation of those groups is being sought for a steeped-up programme to preserve endangered wildlife. The U.S. Department of the Interior is considering seeking legislation that would enable it to carry out a 10-year programme of land acquisition to preserve the essential habitat of rare and endangered species.

(Commercial Fisheries Review Washington February, 1965)

SPINY LOBSTERS TOO HIGH-PRICED FOR SYDNEY (AUSTRALIA) RESTAURANTS

Lobsters (spiny) were omitted from the menu of most restaurants and night clubs in Sydney, Australia, during the latter part of 1964 because they were too high-priced. According to the president of the Master Fish Merchants Association

it was impossible to sell lobsters even at a small profit to cover expenses without being accused by customers of "robbing the public".

Night clubs shared part of the blame for prices termed fantastic that were paid for lobsters at the local market auctions. Low-cost meals for club members were said to be subsidized with profits made from gambling machines, and as a result night clubs did not care what they paid for lobsters which was considered unfair competition to other businesses.

The financial position of many retail fish stores in Sydney was described as critical because of the scarcity of fresh fish and the high prices for shrimp and lobsters which made if difficult for some stores to meet overhead expenses. (Australian "Fish Trades Review", January 1965.)

(Market News Service New York March 24, 1965)

ARTIFICIAL "SEAWEED" HALTS SHORE EROSION

Experiments with an artificial "seaweed" developed by a Danish firm in an attempt to control currents and waves, thereby protecting the shoreline, have attracted the attention of the Danish Maritime Board which is undertaking further tests.

The object of the experiments is to retard bottom currents by the use of an artificial obstacle. The artificial "seaweed" used as the obstacle consists of polyesterene strings which are tied together and weighted at one end. This permits the other end of the string to wave and float about in the currents, retarding the flow. The polyesterene string has a density of about 0.9 which gives it a tendency to float.

The first experiment with the artificial "seaweed" by the manufacturing company resulted in the deposit of almost 3,000 tons of sand over a period of 12 weeks in a 1,600 sq. metre area long the western coast of Jutland.

The Danish Maritime Board test is being conducted off the western cost of Jutland in an area where the Atlantic surf has been washing away the coastal area. It is taking place between two concrete jetties extending into the Atlantic, the purpose being to protect the shoreline by building

up sand deposits near the end of the jetties which are about 300 metres apart.

Between the jetties, 10 lines of rope have been laid about $1\frac{1}{2}$ metres apart. The ropes are weighted and the polyesterene artificial "seaweed" has been tied to the ropes. In this test, the polyesterene strings used have more resemblance to a flat ribbon than those used in the first test by the manufacturing company. It is expected that the flat ribbon design will set up more resistance to the flow along the ocean bottom.

(Fishing News International London Jan - Mar, 1965)

WORLD RESEARCH ON TUNA MAKES HEADWAY

Since the war, tuna has become one of the most valued and exploited fishery resources of the ocean. Because of its importance, increasing attention is being devoted to its stock to achieve conservation while, at the same time, attaining maximum sustainable catch.

Following the important meeting at La Jolla, California, in July, 1962, of world scientists interested in the biology of tuna, an Expert Panel for facilitating tuna research was established by FAO. This was done in terms of a comprehensive resolution passed at La Jolla. The first meeting of the panel was held at Rome in June, 1964. The panel is composed of scientists appointed in their personal capacity by the Director-General, FAO, with account taken of regional representation. While the panel will work mainly by correspondence, meetings will be convened from time to time according to need.

A report now available says that notable progress has been and is being made in various lines of research, including the establishment of three centres for the taxonomic study of tuna specimens collected on a world wide basis. These centres are at the U.S. National Museum, Washington, D.C., the Museum National d'Histoire Naturelle, Paris, and the Fisheries Department of Kyoto University, Japan.

Other recommendations relate to the indentification of larvae and juveniles, the adoption of uniform common and scientific names, the standards of collecting instructions and the publication of an illustrated review of the various kinds of tuna tags now in use. Attention is also being

given to the need for training, educating, and exchanging scientists and the establishment of working groups of senior or junior scientists to facilitate the acquisition and exchange of knowledge.

Production Costs

Pilot studies are also to be undertaken of comparative production costs in selected tuna fisheries operating over large areas and employing a variety of techniques. The areas recommended are in California and Japan and the study should extend over three years. Marketing studies should follow such research.

The importance of world ocean study is also recognised in relation to tuna oceanography and ecology. A comprehensive programme and detailed study has been arranged by various working groups and it has been decided that a second session of the panel shall be held in Tokyo in March, 1966, immediately before a symposium of tuna fisheries to be held in April of that year by the Japanese Society of Fishery Scientists.

(Fishing News International London Jan - Mar, 1965)

NATURALIST'S NOTEBOOK

Whilst it has long been known that several ducks feed upon crustacea, recent research by an American, V.W. Proctor, of Texas Technical College, indicates that they may also be an agent in the distribution of crustacean eggs.

After recovering a wide variety of viable crustacean eggs from the lower digestive tracks of wild duck, he came to the conclusion that ingestion by ducks would appear to be an effective means for dispersal of many species of fresh water crustaceans found in his investigations.

The same would, apparently, apply to sea duck that feed on marine crustaceans along our coasts - a finding worth further investigation. Piebald shelduck, black diving duck and the common sea duck are among species to be found feeding on shellfish and crustaceans along our shores from autumn to spring.

(Fishing News London May 14, 1965)

AUSTRALIA GETS SURVIVAL RADIO

A hand-portable, water-tight, floating radio-telephone for use by survivors of disabled or abandoned ships and fishing vessels now is available in Australia. Named "Linkline" it can be carried only in ships and vessels which already are voluntarily equipped with fixed radio-telephone equipment. The emergency equipment weighs five pounds and may be used when a distressed vessel's main radio-telephone fails, or thrown overboard when a ship sinks and operated by a swimmer.

Transmission and reception are on 2182 kcs and when used at sea level reliable working range with shore stations is claimed to be 75 miles or more. Battery life is 300 hours transmitting of a 9 to 1 duty cycle or two years in storage at 20 deg. C. The radio-telephone is designed specifically for simple operation by a ditched survivor. Where survival is almost wholly dependent on speed of rescue, the ability to "talk-in" a rescuing craft will cut delays to a minimum.

Full information can be obtained from Electronic Industries Ltd., Communications and Navigation Division, 161-173 Sturt Street, Melbourne.

(Fisheries Newsletter Canberra May, 1965)

NEW METHOD OF PREPARING FOR SHUCKING

A firm in New Orleans, La., has developed a new method of preparing oysters for shucking. The new method causes the oysters to gape, allowing easy removal from the shell. It also results in a thorough cleaning of the shell-stock, a factor which has impressed health officials who have observed the operation.

(Commercial Fisheries Review Washington April, 1965)

HIGHLY ORGANISED

Fisheries research in Japan is highly organised with a fisheries university, 14 universities with chairs in fisheries studies and 35 colleges specialising in fisheries technical education.

(Fish Trades Review Sydney February, 1965)

BASIC LINK IN MARINE FOOD CHAIN DISCOVERED

Three United States scientists have recently discovered what they believe to be a vast unsuspected food supply for marine life.

This previously unknown link in the marine food chain, they believe, consists of non-living organic particles constantly being caught on air bubbles in the sea. These bits of brown matter are eaten by the tiniest animals, called zooplankton, which in turn are the basic food supply for higher marine life.

For the past 100 years, scientists believed that the tiny sea animals ate only tiny sea plants, and that these these plants absorbed the inorganic matter that came from decomposed fish and other sea creatures. In other words, they believed that the cycle of life was fed only by life or remains of life.

Now, scientists understand that the zooplankton eat accumulated particles or organic nonliving material. This explains the former mystery of how the tiny sea animals could live during the winter months when the food supply furnished by tiny plants (photoplankton) was depleted and how they could live in the deep dark water beyond the depth of the tiny plants which need sunlight for their life processes.

Long aware of large quantities of both dissolved and clumped organic matter in the oceans, scientists have estimated the total nonliving organic nonliving organic content of sea water to be at least 50 times larger than the living portion. Joint discoveries of this vast source of food in the sea were made by a scientist at Yale University and two scientists at the Woods Hole (Mass.) Oceanographic Institution. Their research was conducted under grants from the National Science Foundation.

"We don't exactly yet know what these brown particles are," one of the scientists said. "But we do know they are mixtures of such things as fatty acids, proteins, carbohydrates, and polypeptides." These organic particles, all essential parts of the building blocks of life, are formed when dissolved organic matter in the sea sticks onto air bubbles. The scientists discovered this process in the laboratory and found that continued bubbling resulted in the buildup of larger clumps of particles.

One of the scientists said that, in the ocean, the process works something like this: As waves break across the ocean and form white caps, they drop foaming water twice as deep into the sea as the wave is high. Churning air bubbles provide a surface upon which the dissolved substances of the sea adhere to form larger particles.

As the air bubbles rise to the surface of the ocean the wind blows the foam into long lines or windrows of spume and brings the particles together in a film which might be a molecule thick. This film is pushed around by the wind and the waves and becomes wrinkled, piled up, and folded over to form aggregates of particles which are large enough for tiny sea animals to eat.

Some of these particles begin to sink slowly through the ocean, and as they drop, more dissolved matter adheres to them. All this forms part of the "marine snow" which has been often reported but never until now understood. The Yale University scientist who took part in the original discovery is continuing his studies of organic particulate matter with emphasis on deep-sea studies. Many of the processes involved in the formation of organic aggregates and their relation to the marine community as a whole are not yet well understood. Further research should better illuminate these processes and their significance.

A further sidelight of research into the nature of organic particulate matter and its formation in the sea is a theory proposed by another marine biologist at Yale University. By bubbling a mixture of artificial sea water containing inorganic and organic compounds in solution, he found that the organic compounds could be concentrated on bubbles. Further bubbling may cause these compounds to form more complex organic molecules, he said.

He believes that this mechanism of absorption by bubbling may have been an important step in the long process of evolution from inorganic chemicals to life in the sea. "Even if life did not trace its ancestry back to air bubbles in the sea", he said, "it seems certain that if a stable marine food supply created from a vast reservoir of dissolved organic matter did not exist, there would be less life today and fewer stable forms. Probably most deep-sea life would be nonexistent since organic particulate matter appears to be their basic food source". (National Science Foundation, October 5, 1964, and Science News Letter, October 17, 1964.)

(Commercial Fisheries Review Washington April, 1965)

SEA COWS DO DITCH DUTY

Five manatees, aquatic mammals also known as sea cows, have eaten nearly two miles of weeds and hyacinths clogging a Florida drainage canal, and their appetites apparently are insatiable. The Central and Southern Florida Food Control District put the big plant-eaters to work last spring as an experiment.

(The Local Government Journal of Western Australia Perth May, 1965)

HERMIT CRAB BEHAVIOR

Member Michael Philp offers an interesting observation on land hermit crabs seen in the Fiji Islands in response to an article on the subject appearing in Vol. 10, No. 5, Sea Frontiers, December, 1964. Philp watched a number of hermit crabs of the family Coenobitidae which lived in long-spiked whelk shells. Philp writes: "If you spike one of these shells into firm sand by its longest projection and then sit quietly for ten or twenty minutes, the crab sticks its head and large claws out and looks around. After a few false starts, the crab pulls itself out of the shell, climbs down the spike, buries its tail in the sand, takes a firm purchase on the buried spike with both its large claws and levers backwards with its tail. After some tugging, the shell is pulled out of the sand and topples over, often on top of the crab. The crab screws itself back into its shell, withdraws a few moments for a breather, and then extends itself and walks away. Seems to argue for a more sophisticated intellect than you'd expect doesn't it?

(Sea Secrets Miami March, 1965)

TRANS-PACIFIC TUNA

Two bluefin tuna tagged in August, 1962, off Baja California, have been captured near Japan. A 23-pound fish increased its weight to 53 pounds while traveling a minimum distance of 4,820 miles in twenty-two months. The other fish weighed 22 pounds when tagged and weighed 67 pounds when captured two years later. These two returns were the second and third recoveries near Japan of bluefin tuna tagged along the Pacific coast of the American continent.

(Sea Secrets Miami March, 1965)

MARINE PRODUCTS EXPORTS UP 16 P.C.

Worth £5m for Eight Months

Exports of Australian marine products for the eight months ended February, 1965, were valued at £5,758,000 an increase of 16.5 per cent on the corresponding period in 1963-64.

Craytails again were the main export item, and were worth an estimated £3,329,000 for the period, compared with £3,264,000 for the first eight months in 1963-64. Whole crayfish exports were valued at £202,000 (£269,000) prawns, £656,000 (£334,000); scallops £330,000 (£137,000); whale products, £345,000 (£393,000), and cultured pearls £536,000 (£340,000).

Western Australia remains Australia's main exporter of craytails, sending £2,661,000 worth overseas in the first eight months of 1964-65. United States continues to be our main customer for craytails, taking 3,773,000 lb., valued at £3,264,000, in the eight months ended February 28, 1965.

France was the main outlet for whole cooked crayfish taking 3[illegible],000 lb., valued at £133,000, during the eight-month period. Imports of crayfish into U.S.A. for the 1964 calendar year were on a similar level to those in 1963. Australia was the second biggest supplier to this market, sending 8,114,000 lb. in 1964, compared with 9,255,000 lb. in the previous year. South Africa was leading supplier with 12,324,000 lb. in 1964, and increase of 21 per cent over 1963. According to the U.S. Bureau of Commercial Fisheries, Canada has a big trade in live lobsters to U.S.A., sending 20,458,000 lb. in 1964.

Exports of prawns for February were low, due to seasonal factors, However, exports for the eight months were still well above those for the corresponding period in 1963-64. Japan was the best customer, taking 1,153,000 lb., valued at £462,000.

Exports of frozen scallops showed an increase on those for January, although they were will below the peak reached in October, 1964. France is our best market, 907,000 lb., worth £241,000, going there in the eight months to February 28, 1965. (Source - Trends in Australian Marine Export Markets, published by the Fisheries Branch, Department of Primary Industry).

(Fisheries Newsletter Canberra May, 1965)