FISHERIES AND FAUNA

WESTERN AUSTRALIA

MONTHLY SERVICE BULLETIN

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STAFF NOTES

The Department will shortly welcome Mr. K. Ammerer, who has been appointed to a new item in the Clerical Branch. He will commence duties on June 8. Mr. Ammerer comes to us from the Lands and Surveys Department, where he was engaged in staff and training work, and it is expected that the experience he brings will be of benefit in his new position. The duties of his position will include coordinating prosecution action, training activities and the secretaryship of the two newly established Fishermen's Advisory Committees. Mr. Ammerer holds the Diploma in Public Administration of the Perth Technical College.

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The Clerical Branch will also be strengthened by the appointment of Mr. B. Kerr, who is being transferred from the Agriculture Department. Mr. Kerr will commence work on June 13 and will assume the duties of licensing and statistical officer.

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We further extend a welcome to Miss Helen Ryan, Typist, and to Miss Mary Jolob, Clerical Assistant. Miss Ryan transferred from the Department of North West, and replaces Miss R. Bower. Miss Jolob takes over the duties of Miss M. Harrison, who has resigned from the public service.

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Inspector G. Hanley proceeded on annual leave on May 16. Inspector A.T. Pearce commenced annual leave on May 23, and Inspector D.P. Gordon and R.G. Emery will take leave from June 7. Relieving Inspector Crawford will relieve at Albany and Relieving Inspector Cardon at Bunbury.

Miss Dale Patrick of Head Office will take one week's leave from June 13.

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Miss Marlene Clayton resumed duties on May 30 after visiting Adelaide, Melbourne, Sydney and Canberra during her annual leave.

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We were pleased to see Miss Violet Woods, Librarian, resume duties on May 30 after an illness which caused her to be absent for a period of four weeks.

FAUNA OFFICER TO STUDY IN BRITAIN

A study by Mr. H.B. Shugg of conservation agencies in Britain will be commenced soon. The Minister for Fisheries and Fauna, Mr. MacKinnon, announced this recently. The investigation will be made to obtain information as a guide to future conservation measures in Western Australia. The Government is keenly aware of the necessity to ensure that progress in the conservation of its wildlife keeps pace with the State's rapid industrial and agricultural development.

Mr. Shugg will look into the organisation, functions and staffing of the Nature Conservancy and its inter-relationships with other statutory professional and semi-official organisations operating in the conservational sphere in England and Scotland. He will also make contact with the National Parks Commission, the Severn Wildfowl Trust and other agencies and centres, and will attend two international ornithological meetings, one at Oxford and the other at Cambridge.

On his way to Britain, Mr. Shugg will stop over at Lucerne, Switzerland, to attend the 9th Congress of the International Union for the Conservation of Nature and Natural Resources. The theme of the Congress will be "Towards a new relationship between Man and Nature in temperate lands" and will make special reference to Australia. The Department has been a member of the union since its inception, but this is the first occasion on which it will be directly represented.

The Minister stated that the Government recognised that it had international responsibilities in the conservation field and that the rest of the world had a right to know what

same time, he said it was necessary to keep abreast of overseas thought and development. The best way to do that was to find out at first hand what was going on so that we the State could profit from the experience of pacemakers like Britain and the United States.

Mr. Shugg leaves by air on June 14. We extend to him the best wishes from the staff for an instructive, fruitful and enjoyable period overseas.

DIRECTOR'S VISITS.

The Director (Mr. Fraser) will visit Pemberton and Manjimup early this month. He will preside over a meeting of the Pemberton Hatchery Board on the evening of June 3. The following afternoon he will address some 75 representatives of South-West Junior Farmers' Clubs who will spend the long week-end at Manjimup. The subject of his address will be "The value of the Fishing Industry to the Economy of W.A."

Last month the Director visited Albany and Denmark where he addressed well attended public meetings on successive evenings. The meetings were held under the auspices of the local committees of Technical Training Year in W.A., 1966. Mr. Fraser had been asked to address the meetings on the subject "Fisheries of the South Coast - Past, Present and Future". In token of the theme of Technical Training Year, he spoke also at some length on the need for training courses for fishermen.

Later in the month Mr. Fraser visited Mandurah and discussed with the local Shire Council certain matters in dispute between the Department and the Council, viz., the desire of the Shire to acquire one chain of departmental land on the foreshore of Soldiers' Cove (where our office and official quarters are situated) for the construction of a road, and the question of transferring to the Department the control of Creery and Channel Islands, both nesting sites of pelicans. Both matters were resolved quite satisfactorily.

THE MANDURAH YELLOW-EYE MULLET FISHERY.

Mr. B.K. Bowen, Senior Research Officer, has submitted his report on an investigation he has carried out on the problems created by the exceedingly large catches of yellow-eye mullet at Mandurah during the winter fishery and the consequent glutting resulting in low prices to the

fishermen. The waters of the Peel Inlet are said to be "alive" with yellow-eye mullet, but they are not being fished to the capacity of the fishery because of the low return.

As a solution to this problem it has been proposed by the Metropolitan Market Trust that the legal minimum length of yellow-eye be raised from nine to ten inches.

In an attempt to ascertain the likely effect of a change of this nature, reference was made by Mr. Bowen to papers on yellow-eye mullet by Dr. J.M. Thomson, University of Queensland (formerly of the Division of Fisheries and Oceanography, C.S.I.R.O.), an earlier report of his own on mesh selectivity in the Mandurah waters and statements supplied by Supervising Inspector J.E. Bramley and the Inspector in charge of the Mandurah district, Mr. A.V. Green.

Two main aspects were revealed as requiring consideration.

They were:-

1. The effect of raising the minimum legal length from nine to ten inches.

2. The effect that an improved presentation of fish for sale at the market would have.

Mr. Bowen reports that there is evidence to indicate that an increase in the legal minimum length would benefit the fishermen by making quantities of larger yellow-eye mullet available in December, when prices offered are high. However, such a measure would need to be treated as an experiment because there is no evidence to show whether the major portion of the ten-inch fish would actually be in the estuary at that time. Also, because of its experimental nature, it would be necessary to obtain the full support of most of the fishermen concerned.

The presentation of fish he says leaves much to be desired. It seems that the method of handling the fish during the winter glut causes them to reach the market in an unattractive condition, and this has an important bearing on the price received. It is possible that the glut quantities could be reduced by requiring all two-inch set nets to be made of cotton. With a reduction in the take of small fish the fishermen would have more time to handle their catch.

It is felt that either method of tackling the problem would require a considerable amount of extension work amongst the fishermen to convince them that a change, either in the legal minimum length, or in the methods of handling, could be of benefit to them. A change in the legal minimum length is not favoured if it means a lower total financial return to the fishermen.

A decision has not yet been reached as to what steps will be taken to overcome the problem.

HOUTMAN ABROLHOS CRAYFISHERIES

Senior Inspector B.A. Carmichael, reporting from Geraldton, writes that 50 crayboats have already returned from the Abrolhos. The fishermen concerned have, as always, a variety of reasons for coming back. Many, of course, take their families to the Islands for the whole season and do not, except in an emergency, return until the season closes on August 15. Others who have not had a particularly successful season are compelled willy nilly to remain so that they may, as Mr. Carmichael puts it, "make every post a winner". Others again, those who have done well, come back to Geraldton for a "break". The inspector says there is little doubt that those who do stay for the whole five-month season easily cover costs and made a good income to boot. Heavy taxation undoubtedly induces some men to reduce their earning capacity by finishing early.

Mr. Carmichael goes on to say that the larger vessels have not been as successful this season as in earlier seasons, and with smaller catches and increasing overheads are struggling to make ends meet. The smaller vessels, on the other hand, seem to have done much better. Crew troubles have bugged some of the larger boats. One big boat operator is said to have already had 15 different crew members, his permanent crew comprising only two or three men.

Mr. Carmichael concludes his report with the observation that undersize crayfish have this year been conspicuous by their absence. He attributes this to the greater care being exercised by fishermen because of the much higher penalties now imposable by the courts.

W.A. FRESHWATER FISHERIES.

In November last year, Dr. D.D. Francois (then Senior Biologist but now Director of N.S.W. State Fisheries), visited W.A. at our invitation to advise on such matters as

trout acclimatisation, marron farming and the suggested introduction of warm water species from U.S.A. for planting in our freshwater streams.

Dr. Francois' report, publication of which has now been approved by the Minister, makes the following points -

* Trout fishing in this State, although limited to a relatively small area, is comparable with that obtainable in Lake Eucumbene, N.S.W.

* Suggestions that local trout streams carry little natural food are not consistent with the fact that quite large fish (up to 4lb. in weight) are being taken by anglers.

* Before considering bringing into the State fishes from other parts of the world -- introductions are always dangerous -- species native to Australia, e.g., the eastern States catfish and silver bream, should first be tried.

* Farming of marron should not be difficult, but there are grave doubts whether it could profitably be undertaken as a commercial proposition.

* There is scope for scientific research in relation to our inland fisheries. If it be desired to enter upon such research, another graduate research officer and technical officer should be appointed.

Dr. Francois' report is now being processed for issue in the Department's "Report" series. A copy will at an early date be sent to each member of the staff.

SEARCH FOR ABALONE

In recent weeks a well equipped team of abalone divers from New South Wales has been searching off the south coast for this shellfish to assess its commercial potential.

This group has fished professionally for abalone on the east coast for some time and decided to move to Western Australia because of decreasing returns in their normal fishing areas. The team was organised and equipped by the Circle Canning Corporation Pty. Ltd., of Burwood, New South Wales.

Mr. W. Mars, who was in charge of the team, stated that initial catches would be forwarded by road or refrigerated transport to N.S.W. Eventually, if catches warranted it,

consideration would be given to establishing canning facilities in Western Australia.

The team carried out diving investigations in a number of promising areas along the coast near Esperance, around some of the adjacent islands, and in the Hopetoun area. To date they have located only small numbers of green abalone Schismatis laevigator and smaller numbers of black abalone Haliotis conicopora.

Technical Officer N.E. McLaughlan contacted the group at Esperance, and Mr. Mars expressed to him his willingness to co-operate with the Department and provide any data that may be required. Mr. McLaughlan was generally very impressed with the ability of the team, and considers that they will be able to give a reasonably accurate assessment of the commercial potential of abalone in any areas they visit.

TECHNICAL TRAINING YEAR 1966

The following are extracts from some of speeches made at the opening of T.T.Y.

Training for a Trip to the Moon.

During the opening ceremony of TTY in Government House Ballroom, Perth, Captain Schirra (U.S.N.) gave a graphic, first hand account of preparations for a trip to the moon and the role of technology in manned space flights.

He referred to a "pyramid" of scientists and technicians supporting the space shots, including many Australians. "The station at Carnarvon is about 95% Australian -- Australian men who are technicians and engineers. These men are completely trained, knowing how to handle the complex electronics, the computers, the radar systems -- all of the paraphenalia that is involved in acquiring a spacecraft as it approaches the west coast of Australia".

The vertical assembly building at the launching pad had an important, if little considered, aspect. "This type of building is part of the imagination, is part of can-do. Can-do is possibly the most important goal when you add things together with a goal in mind".

The manned pyramid demonstrated an important part of technology -- the involvement of everyone. "Each of us as astronauts, as technicians, as engineers, as scientists must rely on the man who takes a rivet machine and stamps a rivet in,

who cuts a piece of metal that will fit accurately, who applies his technique, his training, a developed mind, to put these components together".

Astronaut Schirra emphasised that a "part of what I would call technical training" was "to have confidence in your fellow man, to have faith in a product that is built by so many....."

Space Programmes Dependence on Training

At the Western Australian Institute of Technology, Bentley, as part of TTY, Astronaut Borman emphasised the importance of the technical teams in the space shots and the benfits which resulted from fresh demands on technology.

Col. Borman told the students: "I am also here today as a representative of a vast technological team, a team that very often is lost in the glare of the floodlights and the movie cameras that are focused on the astronauts, but there is no one involved in our space business that recognise more than the flight crews the dependence we place on thousands, and I dare say millions, of people the world over."

"They are people that are trained, trained to do the job that they have done so well in all of our space flights."

"I think perhaps the greatest value that the space business, or the space activities, have brought to my particular country has been the fact that through the education and the training of the vast numbers of people in the electronic industries and so on, we have increased our wealth of trained people far more than we could have if we had never undertaken the space programmes".

W.A.'s. Premier Stresses Value of Training

Taking up the theme of the value of training, the Premier of Western Australia, Mr. David Brand, at the opening of TTY, called for "a revolution in our attitude to training".

"Firstly, it is necessary for everyone in every walk of life to think hard about the need for training and its advantages to society."

"Secondly, we must all accept the fact that the rate of change today is so rapid that one dose of training will

Referring to the potential for development, the Premier went on: "The key to success lies in the one resource that is probably the least developed of all and yet has the greatest potential of all.

"The key resource is ourselves".

Stress on Personal Worth of Training

The Governor of Western Australia and Patron of TTY, Sir Douglas Kendrew, stressed the personal value of training: "It is my firm belief, and I think it is yours as well, that training makes for better men and women in this world.

"And it is the discipline of training that does so much to individuals so that they can acquire the skills which obviously they need."

ADVANCES IN WESTERN AUSTRALIAN PRAWN RESEARCH

PRAWN STAINING PROGRAMME 1966

During March approximately 6,000 king prawns and 4,000 tiger prawns were marked by staining and released in the Shark Bay closed area in the vicinity of Herald Bight. All prawns were stained with a bright blue dye so that they could be seen readily on the sorting tables of commercial trawlers. In addition, small spots of 3 different fluorescent dyes dissolved in petroleum jelly were injected into various parts of the prawn tails to indicate the particular day on which they were released.

The research team is led by Research Officer R.J. Slack-Smith, is depending entirely on fishermen and processing factory workers to return these prawns to the Department. A reward of $1.00 is paid for each one handed in. It is essential that the area where the prawn in captured is recorded for each prawn returned.

By analysing these returns the research workers will be able to calculate the migration rates of prawns over the fishing grounds and the paths they follow. When this study is completed they should be able to make much more accurate assessments of the size of the Shark Bay prawn population. Furthermore, a knowledge of the rate of migration will also help fishermen to follow the schools.

C.S.I.R.O. CHARTERS VESSELS FOR RESEARCH

Advice has been received from the Division of Fisheries and Oceanography, C.S.I.R.O., that it has chartered two vessels for operations in West Australian waters.

The f.v. "Degei" has been chartered for 28 days at sea, and her spotter plan for 80 hours to search for and mark sperm whales between Port Lincoln and Esperance. "Degei" started operations off Port Lincoln in the second week of May.

The f.v. "Estelle Star" left Port Lincoln May 19 to catch and tag tuna off Albany for a period of 28 days.

BRANCH HEADS MEETING

The remaining items arising out of the departmental conference held in 1965 were considered at a meeting of branch heads held on May 12.

(1) Policing of activities of freezer-boats.

It was considered that a long-term policy in relation to freezer-boats and their future in the industry needed to be determined after reference to the Minister. Increased penalties of $2,000 to $4,000 for a first offence and $4,000 to $10,000 for any subsequent offence, which had come in to effect on January 1, 1966, were having a salutary effect on the activities of freezer-boats.

(2) Improved methods of policing pot restrictions.

It was thought that the commissioning of a new patrol vessel ("Pelsart") and the utilisation of two mobile patrols have met the suggestions made at Conference.

(3) Use of fishing-nets in estuaries by amateur fishermen.

Many of the staff believed that fishing-nets used by amateurs in estuaries should be banned. The branch heads agreed that amateur fishermen should continue to be permitted to use fishing-nets in estuaries where netting was permitted. It was felt there were insufficient grounds for withdrawing from amateurs what was in effect traditional in this State and, moreover, a common law right

(4) District licensing problems. It was decided that temporary clerical assistance would be sought during the "rush periods" in the months of January and February at Fremantle and Geraldton.

(5) Nuisance of speedboats in estuaries, etc. It was agreed to seek closer liaison with the Harbour and Light Department on the gazettal of speedboat areas.

(6) Restriction on crab drop-nets. It was felt that further restrictions were not required as there was no evidence of depletion of crab populations. A general statement of ministerial policy in relation to crabs was published in the April-May Monthly Service Bulletin.

NEW ACCOMMODATION - RESEARCH BRANCH.

Due to increases in staff at Head Office, it has become necessary for the Research Branch to find new accommodation, which also will, provide it with more room and better facilities.

The proposed laboratory and aquarium at Waterman's Bay will not be ready for 12 or more months, hence it has become necessary to find a temporary location. Premises at 15 Outram Street, West Perth have now been rented, and the Branch expects to move in about mid-June.

Any officer desiring to communicate direct with Mr. Bowen or any member of his staff should address his letter asabove.

SENIOR RESEARCH OFFICER GOING BACK TO SCHOOL

Senior Research Officer B.K. Bowen has been selected by the Public Service Commissioner to attend the next ten weeks' residential course in advanced management conducted at the Australian Administrative Staff College at Mt. Eliza, Victoria, which commences about the beginning of July.

Established in 1955 to raise the standard of administrative performance in Australia, the college is a non-profit company sponsored by leading Australian business, government and statutory authorities. Each sponsor designates an individual, usually its senior executive, as a member (i.e., a shareholder) of the College. The members elect a council composed of twenty individuals from the senior ranks of business and government to control the

activities of the College in association with the College Principal.

Into the advanced course are admitted men and women of substantial experience in industry, commerce, government, trade unions, the armed services and other bodies. The course provides opportunities for the members to study the methods used in enterprises outside his own field, to consider on the basis of his experience the principles which underlie sound administration in whatever field, and to examine the significance of his own work in relation to the national economy and its development.

Mr. Bowen will return to Perth about mid-September. The whole of the staff offers its congratulations and wishes Mr. Bowen a worthwhile, profitable and enjoyable period of study. During his absence, Mr. Slack-Smith will assume control of the Research Branch.

NEW SENIOR APPOINTMENTS MADE

It will be recalled that applications were called some time ago for two new Senior positions (a) Senior Research Officer (Development) - P.II.9-11· and (b) Extension Officer - P.II.3-8. The duties of the former will be to take charge under the Officer-in-Charge of the Research Branch, of all investigations, exploration and planning in relation to the new development programme, including assistance to industry. The Extension Officer's duties will be to maintain constant communication with all levels of the fishing industry, to interpret to industry the findings of science, to prepare bulletins, news-sheets and the like for the information of industry, the organisation of lectures and so on, and possibly the direction of training courses for fishermen.

Appointments to both positions have now been made. For the position of Senior Research Officer (Development), the choice has fallen on Mr. J.P. Robins, B.Sc., Research Scientist, Division of Fisheries and Oceanography, C.S.I.R.O. The new Extension Officer will be Mr. V.J. Edwards, B.A., who is at present in private employment in Toowoomba, Queensland.

Both new appointees are expected to take up duty early in July.

CLEARING HOUSE

MECHANISING AND AUTOMATING FISHING VESSELS.

The words 'mechanisation' and 'automation' are loosely applied to many aspects of fishing. Usually a fleet is described as mechanised when its boats are powered by anything from small outboard motors to complicated diesel-electric machinery: we have seen the term automated applied to vessels who cut their crew needs by a combination of ingenious design and various mechanical labour saving devices. But there is no such thing as an automated ship, and there are very few fishing boats mechanised in the real sense of this word. Perhaps the closest we have come in fishing is the purse seine boat of Peru. Seeking its fish with a forward probing echo sounder, it traps and catches the shoal in a net worked by a hydraulic power block. Transfer from net to boat is done by a pump ashore. Most boats of this type have their engines controlled from the bridge and they maintain high productivity with very small crews.

Purse seine boats taking pilchards and anchovey off the coast of Southern Africa are similarly mechanised. Last year one such boat working out of the small South West African harbour of Luderitz where there is one fish meal factory brought in 14,000 tons of pilchards which grossed around $60,000 for her skipper and crew of nine. She found her fish with a Simrad sonar set, handled her net with a Puretic power block and, if she has not done so already, will soon be bringing it aboard with a pump.

Mechanisation, however, becomes more of a problem when it has to be applied to a trawler even if she is a modern stern fishing vessel. But it is being achieved.

In a new British trawler the fish spills from the cod-end through a chute into working areas under cover. There gutting is still done mainly by hand. But not, perhaps, for long. In this particular trawler there is a Baader machine under test and, if it is proved, it will take over the preparation of the catch for the freezing stage. In some German, Russian and other trawlers even more advanced stages have been reached.

A Dutch yard has built factory trawlers for the Soviet Union and has installed in them a blast freezing system in which the product passes through on an endless belt conveyor. This freezing plant can be operated by two men.

It is when the largely mechanised freezer trawler comes alongside to discharge that we encounter a still unresolved problem of handling. Frozen fish, in fillets or in the round, have still to be removed by plumbing the hold. It may be lifted and swung ashore in the good old fashioned way of cargo discharge, or owners may turn to some form of conveyor. This is being tried in the British ports of Hull and Grimsby where a method used to discharge banana carriers has been adapted. The conveyor consists of a number of open-sided pockets arranged in a continuous belt. One end of the conveyor is lowered through the hatch, it starts moving and the blocks are placed by hand into the pockets to be carried to the quayside. There they are removed, by hand and stacked on to pallets which are lifted by fork trucks on to waiting vehicles.

This ingenious improvisation is, however, only half-way towards a rate of discharge equal to the catching and processing efficiency of the vessel. For the future designers of large freezer or factory trawlers may well have to look at the side discharge method now being tried in some cargo ships. Perhaps there will come a time when freezer trawlers will move up to their own special port or wharf; a side opening will give direct access to the fishroom and a fixed retractable conveyor, working like a gantry in some passenger ship terminals, will link the ship to the cold store ashore. Ships operating far from their base ports may one day even carry their own conveyors.

(Fishing News International London April, 1966)

ADMINISTRATION AND PUBLIC RELATIONS.

We are hearing a great deal these days about public relations. Perhaps this is because of the increased growth of mass media. Only a brief fifty years ago, most information if not gained within hearing distance of a speaker, was from books, monographs or newspapers. The silent motion picture opened a new world of communication because differneces in language were not a great handicap. Pictures were a universal language and inability to read the captions was a minor obstacle. When sound and colour were added the moving picture became more enjoyable and interesting as its audience increased. Radio and later television brought the outside world into the home to an extent never imagined in the silent movie days, to say nothing of the period when the printed word was practically the only means of contact with those

beyond speaking distance. Most of this development has come in our life-time and its final stage has not yet appeared.

We are seeing these new devices used for both education and propaganda. Every social institution has made use of them - business, religion, education, and government. The average man has never been as well supplied with information causing a reduction in the amount of time required for learning. However, during this period in which learning has been reduced the amount of information has greatly increased with each new mass medium, until most of us cannot absorb more than a small amount of what we hear and see. Thus, the problem for social institutions which use mass media is to convey their message in such a way as to appeal to a discriminating public. The answer is a new technique called "public Relations."

(Modern Government Connecticut May, 1966)

JAPAN EXPECTED TO RATIFY GENEVA SEA CONVENTIONS

Japan is expected to ratify two Geneva Conventions, the convention of the territorial sea and the contiguous zone and the convention on the high seas, according to information from Japan early in March. The Japanese Foreign Ministry and the Fisheries Agency were planning to present the recommendations to ratify these two bills to the Japanese Diet which convened late in January. The conventions were adopted at the 1958 Geneva United Nations Law of the Sea Conference.

The move to seek ratification of the two conventions marks a departure in Japan's fishery policy. Until recently, Japan had strictly adhered to the principle of the 3-mile territorial sea limit and the principle of freedom of the seas. However, as a result of the most recent development wherein Japan accepted the principles of the Geneva convention in defining fishery zones in the Japanese-Republic of Korea fisheries agreement, it is reported that the Japanese government has decided to defend Japan's rights on the seas on the basis of the principles embodied and the two conventions.

(Pacific Fisherman California April, 1966)

LOBSTER OFFENDERS WILL LOSE LICENCE.

Canadian fishermen have been given a warning that their Fisheries Minister is to introduce stronger measures 'against those who continue to break lobster regulations.'

"An increase in the obstruction of fishery officers in carrying out their duty against offenders has got to stop, and I intend to take every step within my power to bring more severe measures to bear against those fishermen who repeatedly fish illegally," said the Minister, Mr. H. J. Robichaud.

For years there has been a particularly serious situation in the Canadian lobster fishery where a minority group of fishermen have persisted in breaking regulations. Some have, on occasion, attacked fishery officers and damaged patrol boats in attempts to obstruct Department of Fisheries officers.

Mr. Robichaud now intend to adopt the policy of issuing individual warnings against chronic offenders. "If they continue to disregard regulations they will have their licences cancelled", he said.

No more leniency.

"We cannot continue to show leniency to those who repeatedly break the law and show complete disregard for regulations which are designed to keep lobster stocks at a level which will ensure a sustained yearly income. I will be taking an increasingly serious view of infractions of regulations not only in the lobster fishery, but in other fisheries as well".

While the Minister, under authority vested in him under the Fisheries Act, is returning some lobster boats, which were confiscated last year when their owners were fined in court for infractions of the Lobster Fishery Regulations, he has stated that he will not release any more boats to fishermen who have been found guilty of infractions.

Lobster boats are now being returned only to fishermen who had no previous convictions and did not obstruct fishery officers in the performance of their duty. And these boats will be returned to owners only after payment of a substantial proportion of their assessed value.

HIGHER PRODUCTION FOR SAME CATCH

A step that may help to relieve the world-wide shortage of protein was announced last month as a joint venture between the Gorton Corporation of Gloucester, Massachusetts, through its subsidiary, Gloucester, Peruvian S.A., and Ionics Inc., of Watertown, Massachusetts.

The desalting of stickwater to make this valuable protein of beneficial use is the purpose of the joint venture. Stickwater is a liquid by-product of the manufacture of fish meal, seven thousand million lb. of which were produced in 1965. It is a salty solution of fish protein, huge quantities of which are presently wasted because of high salt content.

Announcing the agreement, Mr. Robert E. Kinney, President of Gorton, and Mr. Russell L. Haden, President of Ionics, stated: "Ionics' electrodialysis desalting equipment has started operation at Gloucester Peruvian's fish meal plant at Vegueta, Peru. The desalination of stickwater opens a promising new field for both companies."

Output of the modern Vegueta plant will be significantly increased without catching more fish, by using the electrodialyzed stickwater.

(Fishing News International London April, 1966.)

TRAINING SCHOOLS IN NEW ZEALAND.

Two New Zealand fisheries training schools for skippers and crews are expected to be arranged shortly. One will be on seamanship and safety and the other on food technology, including fish handling and processing. Each will last about a fortnight. The schools are being arranged by the Marine Department and on behalf of the Fishing Industry Board and the industry itself. They arise from the recommendations of a committee established at a conference on fisheries education and training last year. The conference was to have been reconvened to consider progress, but the department has decided instead to push on with its plans. Later this year, a Canadian fisheries expert will visit New Zealand for six months under a fellowship financed by Commonwealth funds and administered by the NZ University Grants Committee. He will advise on future fisheries training and education in New Zealand.

(Fishing News International London April, 1966.)

AUSTRALIA - SAFCOL BUYS TUNA SEINER AND PROVES NET EFFECTIVE.

South Australian Fishermen's Co-operative, Ltd., late in 1965 took delivery at Adelaide of the tuna vessel Espirito Santo, purchased from Frank Perry of San Diego, U.S.A. It was put to work immediately in the New South Wales tuna fishery, operating both as a seiner and as a mothership for smaller fishing boats.

In spite of many initiate problems, R. M. Fowler, SAFCOL general manager, reports the vessel caught some 150 tons of fish, mostly southern Bluefin tuna, with weight ranging from 40 to 80 lbs.

About the end of January she was obliged to shift from fishing to mothership and transport service. In this duty she accompanied the fleet, freezing any excess catch above which the near canneries could handle, and then transporting it to more distant canneries of the SAFCOL, group - principally the plant in Melbourne.

Commenting on the initial operations of the Espirito Santo, Mr. Fowler says: "The interesting point about this so far is that we have proved that tuna can be caught in Australian waters by the purse seine method-which is a big step forward. However, we have not yet proved it is an economic proposition to catch Australian fish by the purse seine method. That will probably take a year or two to determine."

(Ocean Fisheries California April, 1966)

TRUTH ABOUT EAGLES

When will the truth prevail? It's a long, hard road for the creatures that man instinctively regards as opposition to his own predatory outlook so statements by the C.S.I.R.O. on the role of predators are likely to be received coldly by some men on the land.

Crows, eagles, foxes, pigs and dingoes were amongst those listed recently. A C.S.I.R.O. Wildlife Officer stated the truths of his findings in Melbourne - an examination of hundreds of dead lambs had shown that only about one in 50 had been killed by predators. The balance had been scavenged. In other words the wicked predators only move in to clean up the mess most of the time. A minority of so-called "attacks" on dying animals are only part of the natural process and while it may horrify some that crows pick out the eyes of dying sheep, the economic point is that much of the predator destruction is

economically wasteful. It costs more than it's worth in benefits to landholders.

Examination of the contents of dingoes' stomachs show they do NOT dine exclusively on calves and sheep but principally on other wild creatures. It's the same with cormorants. The truth is known and proved in science but prejudice and straight out ignorance result only in continued killing - like blowing up a cormorant rookery as was attempted in Tasmania. Predator control may be necessary in places - but we could at least be honest enough to examine our motives in these things. Or even become really radical and act on facts rather than fiction.

(Australian Outdoors New South Wales June, 1966.

THE ADVENTURE OF OCEANOGRAPHY

When I first came into oceanography about 20 years ago it still was possible to write a single article describing what went on. This is no longer possible. Even on one single discipline one can only touch the highlights. Marine biology which was the major interest of oceanography until about 1940, became a step-child for several reasons beside the lack of money, principally the fact that the biologists were stumped for lack of knowledge of the physical and chemical aspects of the ocean. Now the situation has changed again and a large number of people are engaged in studying all aspects of marine life, ranging from the basic productivity of microscopic algae to the sounds produced by whales and the physiology of these, the world's largest creatures.

Much has been written recently about the vast and almost inexhaustible resources of the sea. The ocean is indeed an enormous sump of chemical material, most of it, however, dissolved in a great deal of water. Moreover, the nutrients necessary for the basic growth of plants are not distributed evenly.

Most of these nutrients have sunk below the level where sunlight can penetrate and thus are not available for photosynthesis. Some areas are rich in nutrients and consequently form good fishing grounds. This happens mostly on banks and shallow seas where storms plow the water and bring nutrients back to the surface.

Upwelling.

Off the west coast of continents where prevailing winds drive the surface water offshore, there is upwelling of deep nutrient-rich water, hence the rich fishing grounds off West Africa and, recently explored, potential good fishing

stares mankind in the face, but [illegible] solved to some extent by the use of the ocean, not only in

areas in the Indian Ocean.

What plagues biologists is the extreme patchiness both in time and space of the distribution of marine organisms. For years people have been towing plankton nets through the ocean, generally for half-an-hour or so along a straight line wherever a ship happened to be. This raised many questions when the availability of plankton was compared to the number of higher organisms present.

Only recently was it discovered that the plankton is not generally distributed but has a tendency to collect in lines downwind separated by poorly occupied water. Thus, one might tow between two such lines of so-called Langmuir circulation and conclude that but few plankton were available in that area. Furthermore, there was a missing link in the food chain in some areas and in winter in northern latitudes when there is not enough sunlight available to produce phytoplankton to sustain the shrimp-like creatures of the zooplankton. Not it has been found that organic particles, a source of food, are constantly created in the ocean by a process of adsorption of dissolved organic matter to air bubbles. The air bubbles are created by storm waves, particularly in the autumn and winter in northern latitudes, precisely when the sun is low, of short duration, and frequently absent behind cloud cover.

Another interesting find, occasioned through advances in nuclear physics, is that the basic marine life apparently needs trace elements. Practically all trace elements which have been discovered recently on land are also found in sea water. Thus, many algae need copper, zinc, cobalt (found in vitamin B12) manganese and iron; some need molybdenum and others boron.

Problems.

This scavenging of rare material can lead to problems as in the case of one algae, Acantharia, which builds its skeleton of strontium sulphate, the fifth most abundant metal ion in sea water which most organisms hardly can distinguish from calcium, the third most abundant element. Now, with the availability of Strontium 90 from nuclear testsfallout, the acantharia -- which are also found in fresh water -- have obtained the nasty habit of collecting some of that stuff!

What all the above leads up to is that we need to do a great amount of basic research if we want to use the ocean efficiently and effectively. The food problem which not only stares mankind in the face, but kicks it from behind, can be solved to some extent by the use of the ocean, not only in

direct food but by using the ocean as a means to control climate and rainfall and thus obtain more areas for agriculture.

The food already is being provided in greater quantities. The weather control is further away and not within the scope of this article. Suffice it to say that the political and economic problems connected with such control will be difficult indeed.

Precisely the same problems - political, economic and sociological - plague the fisheries. No one owns the ocean or can exercise control over a particular fishing area. True, there are some international and interstate agreements in some areas but these apply to generalities, i.e. not to catch fish over a certain size or not to fish in certain periods, but do not apply to ownership. What would happen if cattle were grazing wild, as the buffalo of yore, and anyone could come along to take some?

This is the state of sea fisheries. It is a hunt, not 'aquaculture', although there are some minor shallow water farms for seaweed in Japan and for shell fish in other regions. Still, there are so many 'wild buffalo' in the sea that the world fisheries have expanded and are expanding at a great rate; from some 25 million metric tons in 1952 to more than 40 million tons in 1961 and nearly 52 million tons in 1964.

Where is all this fish suddenly obtained? Traditionally most of the world fisheries were in the northern hemisphere and in shallow areas; marginal seas and banks. Since World War II large vessels have gone after tuna and other pelagic fish in the open ocean, whereas tuna formerly were taken mostly when they became available during their migration in coastal waters.

Many of these newer ships also are accompanied by mother ships, while it was principally the new method of brine freezing that made such a far ranging fishery possible. But the greatest developments are in the sardine, herring and anchovy fisheries. Off South Africa, where virtually no fishery existed, more than a million tons of pilchards and anchovies are now taken annually and mostly made into fish meal and oil. South Africans also make a good profit selling spiny rock lobster tails in US markets.

An amazing thing happened in Peru which climbed from 30th rank in world catches to top place in about ten years. Everyone has heard of guano. This was built up to depths

thousands of seabirds gorging on sardines. The guano was exported as fertilizer, until Mr. Du Pont kicked the bottom out of that market with artificial fertilizers. Someone decided that the birds were not so useful any longer, as a result the anchoveta catch increased from about 50,000 tons in 1948 to nine million tons in 1964. And so it goes. Off West Africa some 90 Japanese vessels catch tuna in the Equatorial Current. The tuna are transferred to West German freighters, brought to Puerto Rico for canning, sailed to the US, trucked for instance to Cape Cod, Massachusetts, where it sells cheaper than the tuna caught five miles away.

The Russians have expanded their fisheries greatly and are fishing also in so-called 'traditional'* American areas. But they are catching mostly hake and herring which we will not touch. A single boat load of herring brought into New Bedford, Massachusetts, would not find a buyer. Actually we should be thankful since the Russians are catching what we consider 'weeds', weeds which eat food that now may become available for the growth of our preferred fish species.

Selective

Fisheries are selective. They take the preferred species and leave the trash or 'weeds'. It has become possible to make an excellent protein-rich, non-smelling, easily stored and transported fishmeal from trash fish, i.e. non-marketable fish such as hake, etc. This is one way to solve the problems of protein-poor diets of many people. But people are strange and their preferences are diversified. There are perhaps more squid in the ocean than any other forms of marine life. The Italians, Puerto Ricans and other Latins eat squid but who else? We prefer clams, the Europeans eat mussels, and so forth.

I am quite convinced that we can obtain far more food from the ocean than we do today. Estimates vary widely from four times to 100 times as much. The problem of overfishing immediately comes to mind. This problem has been studied for some 50 years now and rarely has it shown to be so serious. By the time a fishery becomes unprofitable the fishermen go after another source; most fish lay an enormous amount of eggs and the stock rebuilds itself. There is one significant example of this, the Pacific halibut fishery. Time and again the herring stock in the North Sea (fished hard since about the year 1200) was said to be in danger. But 1964 and 1965 have been outstanding years for North Sea herring.

What does oceanography or marine biology have to do with all this? For an intelligent fishery management we shall need to know all we can about the life in the sea, which

*This statement in itself is not true. Fench fishermen occupied the Grand Banks before the Pilgrims came to Plymouth.

includes the study of the circulation of the water masses, the chemistry of the ocean, and even the sediments of the bottom.

Oceanographic studies of the acoustical properties of sea water are aiding in the location of fish. The noises made by many marine animals are being recorded and analyzed and many lead to the making of acoustical fences to scare or attract certain species. The investigation of the physical properties of equatorial water masses led to new tuna fisheries and presently are examined by many ships in the International Tropical Atlantic Investigation. The International Indian Ocean Expedition (some 40 ships from 24 countries) sponsored by UNESCO, has done much to find fishery resources, particularly through the work of the Research Vessel Anton Bruun of the National Science Foundation.

Many questions remain to be answered: What is the seasonal distribution and the abundance of marine life? What is their productivity? Can the ocean's productivity be increased for instance, by artificial means of upwelling? (It has been suggested that the Gulf Stream moving through Florida Straits could be stirred up to bring more nutrients into the north-west Atlantic.) What causes mass mortality of fish in some regions? What is the distribution and ecology of the organisms that foul ships' bottoms, plug salt water lines and damage harbour installations? With the increased funds - now available although infinitesimal compared to space funds - much is being accomplished. Surprisingly, perhaps, the largest funds for marine biology in the United States come through the Office of Naval Research, with other funds from the National Science Foundation, the Atomic Energy Commission and the Public Health Service and the US Bureau of Commercial Fisheries.

(Fishing News International London April, 1966.)

A SALMON NAMED "INDOMITABLE"

A salmon named Indomitable has completed one of the most phenomenal migration ever recorded, reports the August Commercial Fisheries Review, of Washington, U.S.A.

Early in 1964, the salmon (then 1½ years old) was taken from his tank in the hatchery at Orick, California, marked by removal of the fin, and placed in a stream some miles distant.

This year, the fish made its way back to the hatchery

courses ever constructed.

"Indomitable" swam up two creeks, through a culvert under a highway, and into a 4-inch drain pipe with a 90-degree turn. Then the fish had leaped through a 2½-feet high pipe and over a 2-feet high wire net.

At one point, the salmon had a choice of five pipes - four of which were dead-ends, but it chose the right one. This fishy story is a fact, said the Review.

(Fisherman New South Wales Summer 1965/66)

AMERICANS are eating more shrimps than ever before says a report of the Bureau of Commercial Fisheries. Total consumption in 1965 is estimated at 323 million pounds compared with 299 million pounds in 1964. About 75 per cent. more shrimps are being eaten than in the years immediately following World War II.

THE FOSSILISED remains of a whale estimated to be about 26 million years old have been found at Blanchestown, South Australia about 75 miles inland.

(Fishing News International London April, 1966)

INDIAN OCEAN FISHERY TRENDS.

Indian Ocean operations of the Soviet fishing fleet are expected to be greatly increased during the next 5 years. By 1970, the Soviets plan to catch 190,000 metric tons in that area; much of the catch may consist of tuna. Soviets began large scale fishing operations in the Indian Ocean in 1964-65. By 1964, they had developed a successful Indian Ocean shrimp fishery, and in 1965 they began tuna fishing in the area with Japanese-built factoryships.

Total landings from that area, however, were small. Most of the Soviet vessels come from Black Sea ports through the Suez canal, but their exact number is unknown.

(Commercial Fisheries Review Arlington April, 1966)