DEPARTMENT
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STAFF NOTES.

The Director, Mr. Fraser, will accompany the Minister for Fisheries (Mr. Ross Hutchinson) on a visit to Mandurah on February 5. They will meet a deputation from the Mandurah Chamber of Commerce to hear complaints regarding the alleged deterioration of fishing and feeding grounds of fish, and will visit some of the areas involved. They will be accompanied by the Minister's private secretary, Mr. J. Driscoll.

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Congratulations are extended to Mr. A. J. Buchanan, of Head Office, and Mrs. Buchanan, on the birth of a son, Ian James, on January 5.

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Mr. C. R. C. Haynes, mate of r.v. Lancelin, will enter St. Omer Private Hospital, Rheola Street, West Perth, on February 8. He is to undergo an eye operation, and will be in hospital for three weeks. He will then take at least another week's sick leave during convalescence.

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We welcome to the staff Misses Wendy M. Rowland and Vicki L. Lothian, who commenced at Head Office on January 5 and 6 respectively.

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Senior Inspector J. E. Munro will commence three weeks' annual leave on March 7.

Inspector H. D. Kavanagh has taken over the Shark Bay district from January 31. He succeeds Mr. N. E. McLaughlan, who was transferred to Perth in the new item of Fauna Warden on December 7. Mr. McLaughlan will continue in charge of the mobile patrol until his replacement is appointed.

PERSONAL PAR.

Dr. Hobart van Deusen, Curator of the Archvold Collections in the American Museum of Natural History, called at Head Office during the month. He was introduced to members of the staff by Dr. W. D. L. Ride, Director of the Western Australian Museum. Dr. van Deusen has been visiting various museums in the eastern States subsequent to the completion of a collecting trip to New Guinea.

CONDITIONS OF SERVICE IN THE NORTH-WEST.

The Public Service Commissioner has advised that the Government has recognised the special disabilities of staff located in the North-West and decided to make conditions of service there more attractive. Approval has been given to the principle of three weeks' annual leave, in lieu of biennial leave, for officers stationed in the North-West, with free passages south each year for the officer, his wife and dependent family. It has also been decided that in future no term of duty in the North will exceed four years unless the officer himself desires to remain for a further period.

The Government is also impressed with the need for additional amenities in the North, and intends to make every effort to provide adequate housing, electric light, refrigeration and cooling units. No hard-and-fast standard has been laid down, and each case will be considered on its merits.

The Commissioner also advises that the greatest difficulty is being experienced in obtaining engineering personnel for projects in the North-West. A special endeavour to attract engineers and other specialists employed by the Public Works Department will be made, and will include the payment of a child allowance of £50 per annum (with a limit of £200 per annum per family unit) for each one of an officer's children of school age who is resident in the North. Favourable consideration will also be given to the payment of special responsibility allowances to engineers working in remote places where it can be shown that a classification does not recognise the added responsibility carried because of the absence of executive advice and direction.

The Commissioner said that if other Departments considered there was a claim for the extension of similar treatment to their officers, submission should be made to their respective Ministers for determination.

ABROLHOS CRAYFISHERY.

Advice has been received from the Acting Director, Fisheries Division, Department of Primary Industry, Canberra, that action will be taken to open to crayfishing Commonwealth-controlled waters in the Abrolhos area as from March 1. This will make the opening dates uniform in both Western Australian territorial and Commonwealth "proclaimed waters". It was also advised that complementary measures to introduce a close season in proclaimed waters between the 30th and 26th parallels would be gazetted later this year. The closure of State waters in that area from August 15 to November 14 in each year from 1961 inclusive will be gazetted shortly.

In consequence of the decision to station inspectors on each island group at the Abrolhos, Inspector E. I. Forster will be located on Burnett's Island in the Southern (Pelsart) Group, Assistant Inspector D. P. Gordon in the West Wallabis, and Assistant Inspector E. H. Barker on Rat Island in the Easter Group. The p.v. "Lancelin", under command of Inspector C. J. Seabrook with Cadet Inspector G. Hanley as crew, will patrol in the North Island area and elsewhere as required. The officers concerned will remain until the crayfish season opens on March 1.

P.V. "DAMPIER" DAMAGED.

Inspector C. J. Seabrook has reported that on January 25 the p.v. "Dampier" ran over a crayfish pot float and damaged her propellor. On returning to the anchorage that afternoon, Inspector Seabrook dived and inspected the underwater gear. The only damage appeared to be that one blade of the propellor was bent, but not badly enough to make any noticeable difference to the operation of the screw. This is believed to be the first occasion on which a patrol vessel has suffered any damage from hitting a float, although on many occasions pot ropes have fouled propellor shafts.

The "Dampier" will be brought to Fremantle and slipped on February 9.

ALBANY, BUNBURY DISTRICT BOUNDARIES AMENDED.

Henceforth Broke (or Brookes') Inlet, on the south coast west of Walpole, will be included within the Bunbury district. Previously this inlet was in the jurisdiction of the Albany inspector but, due to the recent introduction there of additional closed waters and net mesh size restrictions, it has been decided to make Walpole the boundary between the two districts. It is anticipated that much of the extra patrolling necessitated by the new rules will clash with the whaling season. An additional inspector will eventually be stationed in the Albany district, probably at Denmark. It has also been decided to allow on next year's Estimates for the supply of an outboard motor to facilitate patrols.

HARBOUR IMPROVEMENTS.

Inspectors may be interested to know that dredging to enlarge the fishing boat harbour at Fremantle has commenced. It is anticipated that the tipping of stone to construct the new breakwater will commence about the third week of February as the tenders for the supply of stone will close on February 4.

Inspector R. M. Crawford has advised that dredging of the new fishing boat harbour at Geraldton commenced some time ago. Part of the turning bay, he says, has been completed without incident. The dredge effluent has been pumped ashore and raised the foreshore level several feet.

TRAVELLING ALLOWANCES.

For the guidance of officers, many of whom appear to be unaware of their entitlements, the scale of allowances for camping and travelling is set out hereunder. All officers should realise that the rate payable is often governed by the circumstances of the individual case, i.e. whether the officer is married or single, or maintaining an establishment elsewhere in the State, whether he is at a fixed camp provided by the Department or in one provided partly by himself, or whether he is travelling and staying in a hotel only occasionally, and so on.

Transferred officers' allowances are payable if an officer is transferred from one headquarters to another and furniture removal expenses up to £100 are paid. When notified that he is to be transferred or sent on special duty away from his normal headquarters, or to a mobile or stationary camp, each officer should, if he is in doubt, ascertain what allowances he may reasonably claim.

Travelling.

(a) Involving continual hotel accommodation -

(i) For the first 14 days - 43/- a day.
(ii) After 14 days in one place - 40/- a day.

(b) When travelling does not necessitate overnight absence from headquarters, meals actually purchased will be reimbursed at the rate of 8/- a meal.

For travel north of 26°S - including Shark Bay - an extra 4/- a day is paid.

Transfer Expenses.

(a) For the first 14 days - 43/- a day.

(b) After 14 days, if satisfactory accommodation has not been obtained, reimbursement in respect of living expenses will be paid at such rate as may be approved by the Public Service Commissioner, until such reasonable time as suitable accommodation is secured.

(c) Reimbursement of the cost of conveyance of most items of furniture (including the cost of their insurance in transit) will also be made under certain conditions. Before removal is undertaken at least two quotes should be obtained from carriers unless the furniture is to be removed by Government or public transport.

Relieving or on Special Duties Away from the Normal Headquarters.

(a) For the first 21 days - 43/- a day.

(b) After 21 days - (i) if a married man - 20/- a day.

(ii) if a single man not maintaining an establishment elsewhere in the State - 12/- a day.

Mobile Camp or Mixed Camping and Hotel Accommodation.

(a) If the officer maintains an establishment elsewhere in the State - 16/- a day.

(b) All other cases - 12/- a day.

Note: (i) If a cook is not provided (it is not normal for this Department to supply one) each of these two rates is increased by 4/- a day.

(ii) When the mobile camp is north of 26°S (i.e. Shark Bay and farther north) an additional 4/- a day is payable.

Fixed Camp Provided by the Department.

(a) If the officer maintains an establishment elsewhere in the State - 10/- a day.

(b) In other cases - 6/- a day.

Note: These rates may also be increased by the same amounts as for mobile camps where no cook is provided and/or where the camp is situated at Shark Bay or north of 26°S.

Seagoing Allowance.

(a) If the officer maintains an establishment elsewhere in the State - 12/- a day.

(b) In other cases - 8/- a day.

Note: These rates may be increased by 4/- a day when the vessel is north of 26°S.

HOURS OF DUTY.

In accordance with a previous instruction from the Public Service Commissioner, a return of the hours worked by land-based inspectors during 1959 was prepared and forwarded recently. The Commissioner has since advised that he approves the continuance of the arrangement whereby inspectors receive three weeks' annual leave as compensation for additional hours worked. A similar return for 1960 must be forwarded. All officers are requested to state their daily hours of duty in their diary and to show the total hours worked each week.

REPORTS ON PATROL VESSELS.

Seagoing inspectors should note that the care and maintenaince of patrol vessels is primarily the concern of the skippers and the Fleet Maintenance Officer, Mr. A. J. Bateman. Mr. Bateman must be notified by each skipper of anything in connection with his boat which requires attention. Each skipper must also forward the monthly reports on his boat's performance, and any special reports which may be required, to the Fleet Maintenance Officer, Fisheries Department, Fremantle. If it appears to a skipper that his vessel is likely to be out of commission, or if his patrols may in any way be delayed, he should separately notify the Supervising Inspector, Mr. J. E. Bramley, direct.

FISHERMEN AS PRIMARY PRODUCERS.

The Minister for Fisheries, Mr. Hutchinson, has received advice that his representations to have the license fees for fishermen's vehicles reduced have been refused. Certain types of primary producers are granted concessions in license fees and it has long been considered that fishermen should receive parity treatment. The Commonwealth Government has, for the purposes of taxation, classed fishermen as primary producers, but this does not automatically entitle them to any benefits under State Acts.

The Minister for Transport, Mr. Perkins, has told Mr. Hutchinson that the fisherman's real tool of trade is his boat, and that when he lands his catch or wants to shift gear from one point to another, the fisherman is not in a very different position from others who move goods and gear from one point to another in the course of their business.

YOUTH COMMITTED FOR TRIAL.

Last month two youths, Brian John Meredith (18), naval rating, of Gertrude Street, Geraldton, and his 16 year old accomplice, were committed for trial at the March sitting of the Geraldton Court of Session in connection with the theft of the LFB "New Mexico". At the hearing the Magistrate, Mr. K.A. Philp, was told that Meredith had admitted that he "got on the grog the night before and pinched the boat". Meredith was detained in custody while the other youth was released on £500 bail with a similar surety.

"New Mexico" was completed only last year and is operated by the well-known Basile fishing family of Geraldton.

PROGRESS REPORT FROM MR. B. K. BOWEN.

Because of their general interest to all staff, we reproduce the following extracts from a letter the Director received from the Research Officer, Mr. Bowen, recently. Writing on the ss Monowai between Wellington and Sydney, Mr. Bowen said -

"We are nearly back in Australia now and this is a good opportunity to bring you up to date with happenings since my last letter from Auckland. A few days after I had written to you I went to the Fisheries Branch and met Mr. E. W. Gilliver who is District Inspector of Fisheries in charge of the Auckland District. It would be a position similar to our Supervising Inspector's. He is responsible to the Director of Fisheries in Wellington. He was extremely good to me and introduced me to a couple of the leading buyers of fish and crayfish.

It was here that I saw for the first time specimens of the packhorse cray (Jasus huglei) which is extremely large. The load I saw averaged 12 lb per cray. I wrote to Dr. Ray George, at the Perth Museum, about specimens of these and he asked me to forward a male and female together with specimens of the southern crayfish. Ray may have mentioned this to you. However, I was able to obtain, free of charge, six cooked specimens which I duly cleaned leaving the bare shell. These were formalised for a couple of days and then airfreighted to the W.A. Museum. I have since heard from Ray that the specimens arrived in good condition. I have also obtained two formalised specimens of J. lalandii from the Dunedin University which are in the process of being airfreighted. Ray wanted the J. lalandii because he is not too sure about the correctness of this single circumpolar distribution theory.

I happened to be at one of the fish dealers at morning tea time and the usual old discussion arose concerning closed areas. This time it was with regard to snapper areas which the Government had closed. The discussion drifted along very similar lines to those at home when crayfish restrictions are discussed. I guess fishermen and operators are just as dissatisfied the world over whatever restrictions are enforced. By the way, the number of trawlers is limited to 48, a figure which includes 34 otter trawlers.

The following day I went out on the Fisheries Research Vessel Ikatere. She is 72 feet in length and capable of 14 knots. She seems mainly to be used for trawling and tagging snapper and tarakihi. If a large quantity of fish is taken during trawling operations the excess is sold on the market and the proceeds paid to consolidated revenue. The day I went out we trawled for snapper. The operation is very similar to our method of trawling for prawns except, of course, the mesh is larger. There are no traps whatsoever within the bay and they trawl at about 3-3½ knots. The net is also picked up at this speed and evidently the fish do not escape.

Snapper are trawled all the year but there is also a limited hand line fishery for a couple of months when the snapper are schooling to spawn. I guess this fishery is comparable with our Shark Bay season. With all this intensive trawling for the past 14 years or so the fishery still seems to be in reasonably good shape. This doesn't seem to tie up at all with the suggestion that the use of snapper pots, which are more efficient than hand lines, for a couple of months a year is likely to be harmful to the Shark Bay fishery.

With regard to policing area regulations, the Auckland chaps seem to have things pretty well tied up. A plane is used (or rather it has been as it is not so necessary now) for spotting and there is also a Navy Fishery Protection Vessel capable of high speeds. She is powered by 2 x 240 H.P. Foden engines.

While in Auckland I received a letter from Ian Bayley, a lecturer at the Queensland University, asking whether it would be possible for me to see him as he was going to be in Auckland a couple of days before he got married. Bayley had written to me just before I left W.A. asking for plankton samples from fresh water ponds and lakes in Western Australia. Although the letter was received a day before I left Auckland, I returned again in about 10 days as the opportunity to meet and talk with him was too good to miss. Samples of our dam plankton hauls are going to be forwarded to him for species identification. Bayley is just one of many who have left N.Z for jobs in Australian Universities and by doing so have doubled their salary.

The next place I worked was at Queenstown in the South Island. This is a holiday resort on the shores of Lake Wakatipu, one of the many lakes in the Southern Districts. The chap in charge of fisheries management in Queenstown is Chris Ulberg. He again was most helpful in discussing the work in progress and showing me some of the smaller lakes nearby. These lakes are really ideal, varying in size from very large (112 square miles and 1,239 feet deep) to small (100 acres and 20 to 30 feet deep) and with many feeder streams suitable for spawning. All the lakes are of glacial origin which means that there are vast areas of stony beds and trout even spawn in the splash zone at the edge of the lakes.

A certain amount of research is being prosecuted at Lake Hayes. This lake has a single feeder stream which arises from a spring about 1 mile up from the lake. This is an ideal set up as the stream is non-flooding and a single trap across the stream traps all migrating fish. In addition the "reds" can be counted without a great deal of difficulty. The research is designed to obtain information on population numbers and changes in relation to the abundance or scarcity of spawning fish from year to year.

The species of fish in the lakes varies in dominance from lake to lake. Some have mainly rainbows and some mainly browns. However, all the streams which flow directly to the sea are stocked with browns. Salmon are also present in the lakes and streams in small quantities. As in Western Australia the brown trout are much harder to catch than the rainbows and although the percentage of browns in a lake might be say, 30%, the catch would only be about 3% of the total.

At Dunedin I did a fragment of work. I went looking for Southern crayfish for Ray but without a great deal of success. As I was only there overnight it was impossible to reproduce the Auckland routine so I visited the Museum to see what I could find. I was able to find half a dozen crays in their collection, two of which I was allowed to take with me. As they were already formalised this was very useful and they are now in the Holden and will be airfreighted per kind favour of the N.S.W. Fisheries Department (I hope). The only trouble about the specimens is that there was very little information available as to date and place of capture. However, they may still be of limited value to Ray.

Then on to Christchurch where A.M. Burnet is working on a small section of the South Branch of the Waimakariri River. This river has a large indigenous population of eels (2 species) and an introduced population of brown trout. For some eight years information on weights and growth rates has been obtained over a mile section. The stream has now been closed to the free travel of the eels and trout by a natural dam at one end and a fish trap at the other. All the eels are being systematically taken from the area with a view to ascertaining the effect they had on the trout population. It is hoped that the population will increase in growth rate and number. A contiguous 1 mile section is being used as a control. Did I mention before that not one of the research officers in New Zealand trust scale readings for age determinations of trout? They consider that one returned tag is worth 100 scales. The trouble seems to be that breaks tend to appear on the scales which are not, in fact, year breaks.

The population in the mile section can be very accurately assessed by the use of an electric fishing machine. This would have been a blessing to Lake in his work on N.S.W. streams. I saw the machine working and it is indeed very efficient in this stream. The stream bed is stony which allows the machine to perform more efficiently than if working in mud streams. Two men move along the stream and the trout literally jump to the surface and are easily scooped up with a dip net.

There are many small streams flowing to the sea in the Canterbury area and there have been difficulties because of the action of the Drainage Board. Its function is to ensure that the plains do not flood excessively and hence they have cleared all the small streams of trees and grass and cover which means that the streams are now no more than drains. When the rains come the water flows quickly down the streams because of the lack of trees etc. and hence the bottom, which is alluvial rock, becomes very unstable and the holes are filled up. The final result is the ruination of the stream from a fishing viewpoint.

Burnet took me for a run out to Lake Ellesmere, a few miles from Christchurch, where I was amazed to see thousands of black swans. As far as we could see there were swans in all directions. Each year there is a swan shoot when hundreds of gunmen line the lake and blast away at the slow moving swan. Often they are shot down and just left in the water. It seems a great pity.

We also visited the North Canterbury Acclimatisation Society Hatchery. This hatchery has virtually been out of operation since 1939 but they are now restoring operations. The hatchery is about 50 yards long and probably the largest in New Zealand. Before the war they used to hatch about 5 million eggs and supply other societies. This is now done from Rotorua. They hope to hatch about 24 million fry this year, mostly rainbow, for stocking small lakes in the area. The presence of lakes with feeder streams makes it a simple matter to obtain ripe fish by the use of fish traps. I have mentioned on occasions the fish migrating from lakes and passing through fish traps. In the streams which run to the sea this sort of thing wouldn't work. Most of the streams have large areas of suitable spawning grounds and here the stream fish do not seem to move a great deal. Burnet has found this to be so to a marked extent by the use of tagged fish. The same fish is picked up from the same place on a number of occasions.

In concluding my remarks about the various pieces of work I have done, I might add that the Christchurch Museum is the best I have seen so far. The bird hall is very good and the dioramas with bird foregrounds are most impressive.

We travelled by boat from Christchurch to Wellington and then boarded the Monowai. We will arrive in Sydney on February 1 and I will go off with Lake and probably Milward for 5-6 days. We will also be going to the Australian Museum and Cronulla and then off to Melbourne by February 18. Well that brings our wanderings up to date."

FISHERMEN'S ADVISORY COMMITTEE.

Mr. Noel Wright, of Quindalup, Busselton, will represent deepsea fishermen on the Fishermen's Advisory Committee. This was announced recently by the Minister for Fisheries when he said that he had selected Mr. Wright's name from a panel of nominees and appointed him for a period of three years from January 1, 1960.

Mr. Wright is one of our successful post-war fishermen, a graduate of the Commonwealth Rehabilitation Training School for fishermen held at Cronulla, N.S.W. He is Vice President of the South West Licensed Fishermen's Association.

The Committee is now comprised as follows:-

Chairman:
Mr. A. J. Fraser, Director of Fisheries.

Representative of deepsea fishermen:
Mr. N. Wright, of Quindalup, Busselton.

Representative of crayfishermen:
Mr. G. Travia, of Geraldton.

Representative of beach and estuarine fishermen:
Mr. W. Matthei, of Yunderup.

Representative of persons not commercially engaged in fishing:
Mr. Roland Smith, of Perth.

Mr. N. K. Swarbrick, of Albany, who previously represented the interests of deepsea fishermen, advised at the expiration of his term that, for business reasons, he was unable to accept re-nomination. Mr. Swarbrick had been a member of the Committee continuously since his appointment in 1951. During his long term of office he served the Committee and the industry truly and well.

DEPARTMENTAL VEHICLES.

The Department intends to dispose of the Austin A40 utility WAG 2036 used by the Fleet Maintenance Officer at Fremantle and to obtain in lieu a Holden panel van WAG 4231 from the Bush Fires Board. Previously the Mechanical and Plant Engineer reported that the Austin which was obtained secondhand from Government Stores in 1958, required extensive repairs. Rather than have this done, it was considered more economical that the vehicle be sold.

Land Rover WAG 2685 has been shipped to Broome for the use of the Pearling Inspector, Mr. R. J. Baird. This is the first time in the long history of the Department that the Pearling Inspector has had a vehicle for official use. It is anticipated that he will, during the off season for pearling, spend some time investigating fauna matters in the Kimberley Division, particularly during the open season for finches.

CLEARING HOUSE.

Does Fishing Really Affect Abundance of Sardines.

Does fishing really affect the abundance of such fish as sardines to any significant degree?

This was perhaps the prime question faced by the recent Rome conference on world sardine problems; and it found the State of California standing almost alone on the affirmative side. Answers from the rest of the world were largely in the negative. But to go back a bit:

Having decided that it was neither meet nor proper to speak of herring in a sardine meeting, and that the subject of commercial usage and nomenclature had no place in a world meeting on sardines, the Rome conference got to work under an agenda as follows:

1. Population identification.
2. Fluctuations and abiotic factors.
3. Fluctuations and biotic factors.
4. Fluctuations and fishing.
5. Fluctuations and sardine behaviour.
6. New outlook on sardine research.

Each subject was handled by a panel chairman and rapporteur.

Population Identification: For the first discussion, which was really on how to identify sub-populations within a species, the chairman was Dr. Rad Muzinic of Yugoslavia with John Marr, U.S.A., as rapporteur.

There seemed to be a good deal of difference of opinion on how to do it. Nearly every country was using a different technique and nobody seemed to think very well of the other fellow's methods. There was, however, an amazing agreement that it should be done.

One of the purposes of the meeting was to explore the possibilities of standardization of procedures.

Then the fun started. Dr. Kesteven of F.A.O. posed the question, "Why should this work be done? What useful purpose is served?" A multitude of voices arose to the defense of this type of study. Summarized, the collective thinking seemed to be that it was necessary to identify the various components of any total population in order to get enough data ultimately to be in position to predict the abundance of a population in any given area.

It is difficult to describe the intricate theories and procedures of these biologists, but they do seem to be working to the end that some day they will know enough to be able to predict the availability and abundance of the sardine, so that the industry, including fishermen, can plan their work for the season.

It is remarkable to see the dedication these people have to their job and the time and energy they expend in developing, proposing and defending the particular line of endeavour each has undertaken. They slug it out among themselves but close ranks against all comers who suggest that the work is not necessary or not likely to produce a usable result.

Fluctuation and Abiotic Factors: The second subject opened up another area of controversy. These are the abiotic factors, which means not biological. For a great many years, particularly in California, sardine research was largely a biological and statistical endeavour. Now, factors completely outside of this area are being recognised and pressed as research goals.

The discussion was led by Dr. Z.Nakai of Japan, assisted by Garth Murphy of the United States. Because of the language difficulty, Dr. Nakai had a charming lady interpreter in Chei Adachi, but even then he needed an assist from Murphy in the conduct of the meeting. The rapporteur was John Radovich, U.S.A.

Dr. Nakai didn't need an assist from anyone, however, in forcefully setting forth the abiotic factors which, in his opinion, exercised fully as much, and perhaps more, influence on the fluctuation problem as the biological factors. In his opinion, temperature, salinity, transport, and plankton blooms have a great influence on survival, abundance and availability. Some excellent discussions took place with many participants on this one, but the collective conclusions seem to be pretty close to Dr. Nakai's hypothesis.

Temperature may affect the length of larvae life. It may affect the time of spawning. This has been noticed in the North Mediterranean and elsewhere. It may alter the length of the spawning period. The average number of eggs spawned per female might then be changed, influencing the total eggs spawned. The mass die-off of adult sardines off Korea has been attributed to extreme low temperatures.

It has been proposed that the transport of eggs and larvae to unfavourable areas could be a major factor in survival. There is evidence that this has happened off Japan.

Off Southwest Africa high concentrations of hydrogen sulphide, as a result of plankton blooms, have caused mass mortalities.

Dr. Nakai made his point that abundance could easily be influenced by temperature. Availability as well as abundance is obviously affected if temperature causes a change in the migratory habits.

Fluctuations and Biotic Factors: The chairman of this discussion was Dr. R. Margalef of Spain. His rapporteur was Dr. B. vD. DeJager, South Africa.

This was one of the most technical of all subjects and evoked a tremendous amount of controversy over "Eco-systems," whatever they are. The subject matter was of interest to the biologists present and some of them are still trying to understand this new term.

This discussion developed the interesting agreement that "fluctuations" were not "cyclical." You might have thought it was a plague the way nearly everyone shied away from any suggestion that abundance, or lack of it, occurred in cycles.

It also disclosed that fluctuations were of two kinds - short term and long term - and each is occasioned by different factors.

"Terminology" The problem of terminology was causing confusion among the delegates. The terms "abundance," "availability," "population," did not mean the same thing to all of the delegates. A special group went to work to see what could be developed as a recommendation for Universal terminology.

Here is a simplification of the result, and if it should be accepted, it will be a boon to all segments of the industry and the Western legislatures. In brief:

Biological Population - This covers the total bio-mass of a species, including eggs, larvae, juveniles and adults within its range.

Available Population - This is the "stock." Essentially the adult usable population. Recruitment to this "stock" will come from the yearly crop of eggs.

Accessible Population - This is the portion of the "stock" or "available" population that can be reached for capture.

Vulnerable Population - This is that portion of the stock which is captured, destroyed, or otherwise removed from the "accessible population.

There will be some quarreling with this highly simplified version of a complicated proposal, with a lot of "ifs" and "buts". However, it serves to show that each "population" is progressively smaller than its predecessor.

This is where the industry and our lawmakers may be able to see that fishing fits into a small area of the whole.

Fluctuations and Fishing:

Here we got into a subject that should have produced a good free-for-all. For 25 years on the Pacific Coast we have heard that, "We overfished the sardine. Legislation should be passed to regulate the catch to perpetuate the fishery. Man's activities must be controlled or the sardine will go the way of the dodo bird."

Surprise. The State of California's voice was the only one raised in support of this theory. The 26 nations, including the United States Bureau of Commercial Fisheries, were unanimous that fishing for sardines was one of the least significant factors in the matter of fluctuation.

Japan has this to say on the subject:

"It is further concluded that decline in catch in the 1940's was not due to overfishing the population, but to reduced recruitment resulting from increased mortality among the larvae in consequence of shifts in spawning grounds, inadequacy of food supply for the larvae and to the operation of other environmental factors. Nor finally can the author (Nakai), basing on the analysis of age composition, agree that overfishing has been the cause of the low status of the fishing since 1949. The available data suggest that exploitation of 0-age fish in these days also has not seriously affected the stock size of the sardine."

South Africa was asked about the tonnage limitation in use there (bag limit of 250,000 tons. The replay was: We biologists have consistently advocated removing this limitation. It not only does no good for conservation, but it actually interferes with research because we never know what the potential of the fishery might be.

The limitation was put on before we had any well-established research facility and it was strongly advocated in California. We now cannot remove it because the industry has found it to be a convenient method of limiting production to maintain prices."

Canada was asked about the herring limitation. The answer was the same as that given by Dr. Needler some years ago: "There is no biological basis for a limitation, it is simply a convenient method of limiting production to control price."

Author's note: The anti-trust laws of the U.S. would make this type of limitation, for such a purpose, illegal.

Fluctuations and Sardine Behaviour: Led by Dr. D. H. Cushing of United Kingdom and the rapporteur was Dr. F. J. Verheijen of Holland.

Very interesting material was developed in this discussion. The success of fishing effort may be substantially influenced by the behaviour of the fish. Their reaction to light, sound, and impulses from echo soundings; the colour, size of twine, kind of webbing in the nets, and all such matters can, and do, influence the behaviour of fish and can very well be factors in the success of fishing.

There is a great deal of interest in all countries over the possibilities of using lights and electrical impulses for fishing.

New Outlook in Sardine Research:

This subject was led by Professor M. Fontaine of France. His rapporteur was Professor Umberto D'Ancona of Italy.

Little of interest to the industry was developed here. Most of the proposals were for the improvement of techniques and suggestions for exploring hitherto unexplored areas to fill in the gaps. There was a real recognition of the necessity to study the whole picture - oceanography, weather, and environment, and not confine the research to too narrow a field of biology and statistics.

In the discussions on all of the subjects, it was very noticeable that the American delegates dominated the meeting to a large extent. Close behind them came the British.

The Americans were quite prone to disagree among themselves and encourage discussion. They were in true form, as representatives of a free country and freely acted individually. It was very evident that the other participants from each country had a uniform policy that allowed for no disagreements between them.

The British didn't disagree among themselves but were quite ready to collectively tangle with anybody. They were in general agreement with the Europeans and the Japanese.

Spain and Portugal had very positive ideas and pressed them at most every opportunity.

For the most part, the representatives of the other countries either sat silent and listened or spoke only when they had a specific point to make.

Taken as a whole, the meeting was a success and each country gained valuable information.

It will be interesting to watch what changes, in direction, our American researchers make, and how they benefit from this broader viewpoint to which they were exposed.

The countries represented at the conference were Ghana, U.S.A., Chile, Italy, Turkey, Israel, United Kingdom, Norway, United Arab Republic, U.S.S.R., Spain, Union of South Africa, Netherlands, Japan, France, Germany, Australia, Morocco, Venezuela, South West Africa, Nigeria, Yugoslavia, Canada, Philippines, Portugal and Belgium.

The American biologists in attendance are Donald McKernan, John C. Marr and Elbert Ahlstrom of the U.S. Bureau of Fisheries, John Radovich, California Department of Fish and Game and Garth Murphy, Co-ordinator, Marine Research Committee of California.

(Pacific Fisherman Portland, Oregon. December,1959.)

Another Rise in World Fish Catch.

The world total commercial fish catch last year registered a 3,000,000 ton increase over that of 1957, according to the "Yearbook of Fishery Statistics" released last month by the Food and Agriculture Organisation. Japan, with a catch of 5.5 million tons, continued to be the largest producer of sea fish.

The Yearbook, published jointly with a yearbook on statistics on international trade in fish, covers the catch of fish from 1953 to 1958. The total 1958 catch was 33.7 million tons live weight, almost 13 million tons above the single years of 1938 and 1948, just before and after the Second World War. Russia reported the highest catch in her history, at 2.6 million tons.

The 1958 total includes a rough estimate of six million tons for production of sea and fresh water fish by mainland China. This figure has been released by the government of that country and, if correct, represents a 100 per cent. increase over its reported catch in 1957.

Asia had 50 per cent. of the world total catch, with Japan contributing 17.2 per cent of the Asian total. European fishermen, excluding these from Russia, caught more than 22 per cent., and North Americans about 10 per cent.

The U.S.S.R. reported catches amounting to more than eight per cent. of the world total. Africa contributed five per cent.; an outstanding increase over last year's figure.

(South African Shipping News Cape Town December 1959)

Outboard Motors up to 35 h.p.

A new British plant which will be producing 150 streamlined outboard motors every eight hour shift was opened recently at Peterborough, by Perkins Limited. It will supply world markets, the biggest sales being to North America, the Far East, Commonwealth countries and Europe in that order. Three engines are being produced in a power range of 6, 16 and 35 h.p.

French Vessel Packs Lobster Tails in Vacuum-Sealed Plastic Bags.

The French vessel 'Francoise Christine' is the world's first craft equipped with an installation for packing lobster tails in vacuum-sealed plastic bags. Launched in February 1959, the vessel sailed for Port-Etienne in Mauritius a few weeks later.

Two specialists, a packaging expert and an engineer, accompanied the craft on her first trip but remained on board only 15 days until the crew had been trained to handle the vacuum-sealing plastic-packaging machinery.

Although the actual catch and packing on the first trip was not revealed, it is estimated that average production per trip will be around 25 metric tons. The 'Francoise Christine' uses drag nets for catching the lobsters, which are cut, packed in plastic bags, vacuum-sealed, and then frozen.

Freezing is carried out in three tunnels with a capacity of three tons per 24 hours. The tails are then stocked in a cold storage hold with a temperature of -9°F. The hold has a capacity of 25 tons.

The 'Francoise Christine' can also carry live lobsters in tanks with a capacity of 70,000 to 80,000.

A second craft, 'Le Charleston', which will be slightly longer, 99 feet instead of 90 feet, will have a larger capacity, and will soon be ready to enter service. It is estimated that these two vessels will, between them, produce from 200 to 250 tons of frozen products, equal to 500 tons of live lobsters.

Special crushing equipment crushes the discarded edible part of the body for use in the making of lobster bisque.

(Market News Service N. York December 9, 1959)

Preserving Whale Carcases.

Biomycin introduced into the carcase of a fin whale immediately after killing makes it possible to preserve the high quality of meat and fat for 30 hours. The meat of an untreated fin whale becomes useless within 18 hours, while the quality of the fat also deteriorates considerably. Still better results have been obtained by introducing biomycin into carcases of sperm whales. Such carcases differ in no way

The engines are basically American Oliver designs which have been bought out by the British company. The units have been modified and will be produced more cheaply than they could be in the United States.

A production figure of 40,000 units a year has been mentioned and this leaves ample tooling capacity for expansion. Apart from North America, big sales are expected in the Far East and Asia where waterways have a big traffic of small craft transport. The Perkins organisation already has selling connections in all parts of the world with associate companies in France and Brazil and subsidiaries in Canada, South Africa, Australia and Germany.

(South African Shipping News Cape Town December, 1959)

10 Top Problems of Pacific Fisheries.

The ranking problems for the Pacific fisheries were stated candidly and crisply for the Pacific Marine Fisheries Commission meeting in San Francisco in mid-November by William E. Warne, director, California Department of Fish and Game.

He made these choices, and offered them in these words:

1. Rising costs - everything goes up faster than the price of fish.
2. Static market - the per capita consumption of fish does not rise.
3. Foreign competition - this will get worse before it gets better.
4. Declining resources - by and large this is more imaginary than real so far, except for the salmon, but industrial pollution, water and power projects and possible overfishing are constant threats.
5. Inadequate basic knowledge of the resource - we just don't know enough about the resources to manage them adequately.
6. Lack of technological advances, both in fishing and in processing - there have been some break-throughs but not enough to counteract the first three problems listed.
7. Regulations that stifle efficiency, and increase costs - although frequently enacted as conservation measures, they are essentially sociological.
8. Gear fights, of two kinds - commercial vs. commercial and sport vs. commercial.
9. Military closures of fishing areas - a reflection of the national disregard for the fisheries.
10. Inter-agency conflicts - the rivalry between conservation agencies.

(Pacific Fisherman Portland Or. December 1959)

from fresh ones even 47 hours after killing. The results of experiments now being conducted by members of the U.S.S.R. Pacific Research Institute for Fishing and Oceanography will be of great importance for the development of the whaling industry at great distances from shore bases.

(South African Shipping News Cape Town December, 1959)

Argentina's Prawn Fishing Industry.

Fleet: Argentina has about 25 vessels active in the prawn fishery. These vessels are about 66 feet in overall length and are powered with 6-cylinder 160 hp. diesel engines. According to reports, there are no immediate plans for the expansion of the fleet in the near future.

Ex-Vessel and Export Prices: In November 1959 Argentine prawn vessels were paid about 25 pesos a kilogram (about A1/3d a pound) for heads-on prawns counting between 15 and 30 to the pound, the only sizes exported by Argentina. Ex-vessel prices for medium prawns (31-50 count) were 12 pesos a kilogram (about A7d a pound) and for small prawns (over 50 count) 8 pesos a kilogram (about A5d a pound)

The price of processed headless prawns (15-30 per pound size) for export loaded aboard reefer ships at Buenos Aires is about A4/10d a pound, which includes all costs except the profit to the exporter. Export prices in November 1959 averaged about A5/2d a pound. Export taxes amount to 10.5 percent, levied on the exporter's gross proceeds.

Since the prawn prices dropped in the United States market, the export trade is not very attractive to Argentine exporters because of the low margin of profit for the processor-exporter.

(Market News Service New York December 10, 1959)