# DEPARTMENT OF FISHERIES AUSTRALIA

# MONTHLY SERVICE BULLETIN

Vol. XI, No. 8 September, 1962

## OBITUARY

Suddenly, on August 15, Mrs A.E. McLaughlan, mother of Fauna Warden N.E. McLaughlan, passed away. To Neil and all other members of the bereaved family we extend our sincere sympathy.

## STAFF NOTES

The Director, Mr A.J. Fraser, accompanied by the Fauna Protection Officer, Mr H.B. Shugg, visited Benger on August 9 to attend a night meeting of honorary wardens of the Shire of Harvey. As reported in the previous issue, Mr Fraser and Mr Shugg will this month attend the biennial meeting of the Australian Fauna Authorities to be held in Hobart. The Director will fly direct from there to Thursday Island as the guest of Pearls Pty. Ltd. before attending the Commonwealth-State Fisheries Conference in Sydney. He expects to return to Perth on September 25.

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A number of officers have suffered during the current influenza epidemic and have had to take out sick leave. Those affected included Fauna Warden S.W. Bowler, Senior Research Officer B.K. Bowen, Miss M.C. Crofts, and Senior Inspector J.E. Munro, Mr C.J. Seabrook, and Mr A.T. Pearce who were taken ill in Cronulla while attending the Fisheries Officers' School. Mr Munro and Mr Seabrook were both very ill and Mr Munro was still on sick leave at the month's close. Mr Seabrook, however, resumed duty on August 28.

We welcome to the staff Mr C.W. Ostle, who commenced duties as an assistant inspector on August 6. Unfortunately, Mr Ostle had to commence sick leave a week later due to the unsatisfactory healing of an injury previously sustained to his left thumb.

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The resignation from the Service of Inspector H.D. Kavanagh has been accepted from close of business on September 6. Inspector T.B. Baines, who was to have been transferred to Shark Bay later in the month will now take over the district from September 7. Assistant Inspector E.H. Barker is being promoted to Inspector and will take over the Bunbury district on September 3.

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Officers on annual leave this month include Misses H.M. Sivwright and M.C. Crofts, of Head Office. Both girls commenced one week's leave on August 27. Inspector J. Traynor, of Perth District Office, will commence three week's leave on September 10, while Inspector B.A. Carmichael, of Albany, will begin his annual leave entitlement on September 24.

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Fauna Warden N.E. McLaughlan left Perth for Broome on August 7, in a new l.w.b. Landrover van recently purchased to replace the old vehicle used by Pearling Inspector R.J. Baird. The new vehicle has been fitted with extra tanks for fuel and water and with other extras to fit it for service in the north. In it Mr McLaughlan and Mr Baird will carry out a patrol through the Kimberleys to police the opening of the finch season and carry out general departmental duties. It is understood that they detected two instances of pre-season trapping shortly after leaving Derby towards the end of August. When the patrol has been completed, Mr McLaughlan will return to Perth by air as the old vehicle will be offered for sale in Broome.

## PERSONAL PARS

Two internationally renowned ornithologists will arrive in this State this month. They are Capt. Jean Delacour, of California, U.S.A., and Mr A.H. Chisholm, O.B.E., of Sydney. Capt. Delacour is, perhaps, best known for his work on waterfowl. His three-volume publication - "Waterfowl of the World" - being the outstanding and

authoritative work on that family. Mr Chisholm is a retired journalist and one-time staff member of the publishing firm of Angus and Robinson, of Sydney. He was a past president of the Royal Australian Historical Society and was Editor-in-Chief of the Australian Encyclopaedia. Dr D.L. Serventy, Principal Research Officer of the Division of Wildlife Research, C.S.I.R.O., will take the distinguished visitors on an extended tour which will include, as its highlight, a visit to Albany and Two People Bay to view the habitat of the Noisy Scrub-bird.

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Mr J.D. Macdonald, keeper of the Birds Department of the British Museum (Natural History) of South Kensington, U.K., will disembark his collecting expedition at Fremantle on November 18. Mr Macdonald will spend some time in Perth as the guest of Dr D.L. Serventy, before proceeding overland to the eastern States where the Museum's collecting expedition will get under way. The trip across Australia will be used as a shake-down journey.

## CORRIGENDA

We regret that it is necessary to correct two of the figures shown in the table headed "W.A. FISHERIES PRODUCTION" and published on page 144 of the previous issue. The 1961 production of Australian Salmon should have read 2,697,115 lb. and consequently, the actual overall total for that year should have read 28,655,688 lb.

## STATE FISHERIES ACT

The table on page 168 sets out details of the licenses issued and value of the boats and equipment registered at each of the licensing stations in the State. It should be noted that, particularly in respect of the Fremantle, Perth, Geraldton and Shark Bay areas, the figures do not represent the actual number of men and boats engaged in fishing in those districts.

## AUSTRALIAN FAUNA AUTHORITIES CONFERENCE

The biennial conference of fauna authorities in Australia will be held in Tasmania in the first week of this month. As reported elsewhere, the Director and the Fauna Protection Officer will represent this State. With delegates from all other States, the Northern Territory

STATE FISHERIES ACT.

Licenses issued and value of Boats and Equipment by Districts - 1961.

| District | Professional Fishermen | Amateur Fishermen | Fishing Boats | Value of Boats | Value of Equipment |
|---|---|---|---|---|---|
| | | | | £ | £ |
| Albany | 105 | 47 | 79 | 69,488 | 34,460 |
| Broome | 11 | - | 2 | 6,000 | 300 |
| Bunbury | 84 | 127 | 74 | 68,780 | 32,810 |
| Carnarvon | - | 3 | - | - | - |
| Esperance | 5 | 3 | 2 | 9,000 | - |
| Fremantle | 977 | 135 | 402 | 1,770,525 | 498,425 |
| Geraldton | 515 | 24 | 287 | 810,220 | 184,505 |
| Mandurah | 96 | 75 | 90 | 29,730 | 29,395 |
| Onslow | 2 | 1 | 1 | 260 | - |
| Perth | 168 | 506 | 118 | 76,015 | 50,480 |
| Port Hedland | 8 | - | 3 | 910 | - |
| Port Samson | 19 | - | 6 | 3,030 | 250 |
| Shark Bay | 49 | 4 | 52 | 31,365 | 4,930 |
| Total | 2,039 | 925 | 1,116 | £2,875,323 | £835,555 |

Total Value of Boats and Gear - £3,710,878

and Australian Capital Territory, together with representatives from the Commonwealth Departments of Primary Industry, and Customs, they will assemble in Launceston on Sunday, September 2, and go overland to Hobart the next day, where the formal sessions will be held. The full agenda includes about thirty items, a number of which indicate new approaches or attitudes to the overall problem of conservation. Included among them are four which we have had listed for discussion and in respect of which background papers have been submitted. As they summarise current thought and policy in this State, these papers are reproduced here in full.

(a) Training of Fauna Field Officers

Although until recently relatively few fauna field officers had been appointed by the different States, they are now playing an increasingly important role in the administration of the fauna laws. Their chief duty is to police the legislation and to supervise measures designed to conserve and protect fauna. In the course of duty they are called on to investigate and report upon the desirability of initiating conservation measures. They are asked to make crude ecological surveys of areas set aside, or proposed to be set aside, as sanctuaries. They are required to carry out public relations functions, to attend and address meetings of local governing authorities and bodies with rural and other interests. In short, they are the eyes and ears, and often also the mouthpiece, of the administration.

So far as is known, no formal training is available for prospective fauna field officers, and one is compelled to be guided very largely by instinct when selecting men for vacancies. Training in some form or other is consequently essential after appointment.

In many respects fauna officers' duties are comparable with those of fisheries field officers. It is now acknowledged, by Commonwealth and State authorities alike, that the task of a fisheries field officer is of sufficient importance to warrant the establishment of annual schools of instruction, but no move has hitherto been made to provide similar training for fauna field officers. It is true, of course, distributed among the States there are between 120 and 150 fisheries field officers, whereas the total number of full-time fauna field officers probably does not exceed 15 or 20. Nevertheless, in their particular field they carry out duties equal in value to those performed by their co-workers in fisheries.

The fisheries field officers school, inaugurated in 1961 and repeated this year as a co-operative venture on the part of State and Commonwealth administrations (including C.S.I.R.O.), will, it is hoped, become an annual feature. Initially it is being held at the headquarters of the Division of Fisheries and Oceanography, C.S.I.R.O., at Cronulla, N.S.W. That Division has provided the principal of the school and lecturers in certain subjects, and the Commonwealth Fisheries Office and certain of the States are making lecturers available.

The syllabus comprises lectures, demonstrations, practical work, tutorials, as well as a visit to a fishing port. The first school was of a fortnight's duration, but the 1962 school was extended to three weeks. This will probably be the length of succeeding schools.

The purpose of the school is the elucidation for field officers (this term includes both inspectors and technical officers) the meaning and the application of fisheries science. Its function is to fill the gaps in training which the State Departments themselves are unable to fill. Accordingly the syllabus is devoted principally to teaching the various aspects of fisheries science, although some attention must necessarily be paid to administration and technology.

Each State is free to send as many of its officers as desired to the school. At the 1961 school 19 students were present. Six of these came from New South Wales, 4 each from Victoria and South Australia, 2 each from Queensland and Western Australia and 1 from Tasmania. Each State is required to pay the travel and sustenance costs of its own students.

It is proposed that conference consider the desirability of establishing a similar school for fauna field officers. Perhaps it could express an opinion as to whether schools of the nature indicated are feasible or necessary, and, if so, to set up a small ad hoc committee to prepare recommendations for submission to the participating instrumentalities through the conference secretariat. Without being too specific, the subjects which could be embraced by the proposed school are administrative and regulatory procedures, report writing, legal aspects, reserve management, interpretation and recording of field conditions, habitat changes, etc., field recognition of fauna, elementary ecology and zoogeography. Schools would not at the outset be held annually, having regard to the paucity of candidates, but perhaps every three or four years.

(b) The Menace of Acclimatization

Reference was made at the previous conference to the desirability of the States obtaining legislative authority to control (a) the keeping of exotic species in captivity, and (b) their movement between the States (vide Resolution 10). It is noted that provisional agenda item 5c provides for the discussion of Resolution 10, but we believe that the question needs much wider consideration and discussion than it had previously. We hold that fauna authorities should be vested with absolute power to prevent, in respect to vertebrate animals at least, their introduction, movement and acclimatization into or around the continent.

We urge that Conference establish the principle that there must be no introduction of exotics of any description except for approved scientific or agricultural purposes. Before the introduction of any exotic fauna is allowed, the likelihood of its becoming acclimatized and its possible effect on the native biota should be studied by competent biologists and ecologists. Admittedly there are Commonwealth regulations restricting the introduction of animals into Australia, but a number of species, particularly of birds, are already here. Other species again could find their way into the country without the approval of any State, either by being smuggled in, or by carelessness or ignorance on the part of the administration. Additionally, all birds, with the exception of parrots, may freely be introduced into Australia from New Zealand. Such imports are certainly subject to certain provisos, but while these are satisfactory so far as they apply, they do not go far enough. The fact also remains that the States still need complete authority over the exotics already within their own boundaries. They require adequate powers to deal summarily with unauthorised attempts to introduce or acclimatize exotics, and they require power to police any introductions made with the necessary approvals.

These matters need to be dealt with on an Australia-wide basis because the political divisions, with the possible exception of Tasmania, do not form discrete zoogeographical regions. Reports of recent attempts said to have been made to acclimatize grouse in South Australia, coupled with what appears to be a continuing demand to acclimatize other game birds, including waterfowl, illustrate the pressing need for early decision. Accordingly we ask conference to recommend that appropriate complementary legislation be introduced in each State and Territory to prohibit any acclimatization of exotics,

except by the approval of all States and Territories. The consent of all States and Territories to any introduction is essential, for although certain species of fauna might not have thrived in one State or Territory, or become a pest there, it does not necessarily follow that in an entirely different environment they will not become well established and assume pest proportions elsewhere in the Commonwealth.

We also recommend that a pamphlet be prepared for release by all authorities setting out the dangers of acclimatizations and the need to consider all their possible side-effects on a continental basis.

(c) Mammalian Conservation and Research

At the 1960 Brisbane conference, several references were made to the gaps in our knowledge of mammals, including our extraordinary marsupials. In the report on the proceedings of the conference (p.20) a general survey of marsupial abundance and status was said to be in hand, but it was not detailed. Under Item 15, the need for the preparation of a checklist was discussed and it was recorded (p.56) that a "revised checklist of mammals could be considered as getting near the first draft". Resolution 11 of the conference sought to enlist the co-operation of the Australian Mammal Society in the preparation of such a list.

One of the other papers tabled at that conference was titled "Australia's Threatened Mammals", by J.H. Calaby and F.N. Ratcliffe. It drew attention to the paucity of basic data on our mammals and said that "with a few exceptions, information on the habits and biology of Australian mammals is sadly lacking". It included a list of those mammals which, on the evidence then offering, seemed most endangered by the processes of civilisation. Included among them was the Mardo (Antechinus flavipes leucogaster), which was described as probably extinct. Since then specimens have been collected fortuitously from three or four different localities in the South-West Land Division of Western Australia. The creature was presumed extinct apparently because no specimens had been received for some years at the Western Australian Museum. Similarly, the Western Ring-tailed Possum and the Woilie were listed as rare, but in the last twelve months or so reports of their occurrence in the South-West have come to hand. Both may in fact be more common then was thought, particularly the Ring-tailed Possum. There is a faint hope that another Western

Australian mammal on the list, the Marl (Perameles myosura), which has been described for many years as extinct, still survives in country along the south coast, similar to that at Two People Bay, where the Noisy Scrub-bird was re-discovered last December, and where a number of other rare birds have been found subsequently. A report of the occurrence of the Marl is entirely unverified, and unless some evidence is brought to light we must presume that a mis-identification has occurred. It is not desired to criticise the authors of the paper concerned. It was prepared with utmost care from the information then available. It is the intention merely to illustrate how little is really known.

A good deal of the south coast vegetation is soon to fall before the bulldozer as development progresses. We fully realise it should be surveyed thoroughly as soon as possible and reserves created where necessary. Unfortunately the strength of the arguments for the setting aside of permanent reserves is weakened by our inexact, if not total lack of, knowledge of the distribution of our fauna, especially of the lesser-known ones. We feel that there is an urgent need for a survey on an Australia-wide basis to establish authoritatively what species still exist, the broad limits of their range and the priorities to be allotted to each in conservation work. Once this has been done more detailed surveys could be commenced to ascertain their ecological relationships and what are the critical factors necessary for their survival.

The administrator charged with responsibility for the conservation of native fauna requires definite information. As a farmer cannot hope to manage his herds unless he knows what they comprise and where they are, so we must have similar basic data to conserve fauna. The literature on the present-day distribution and occurrence of native mammals needs to be brought up to date, and in this respect the survey carried out by Marlow on marsupials in New South Wales seems a good starting point.

## (d) Protection of Reptiles

As they are an integral part of the natural Australian scene, reptiles are as worthy of protection as are other classes of indigenous fauna. In Western Australia they have had, or certain species have had, protection for more than a decade and the need for protection is generally accepted. It would assist conservation and protection in our State, however, if other States and

Territories exercised similar or complementary controls.

While definite knowledge is lacking, it does appear that reptiles are suffering less from the pressures of civilisation than are other classes. However, in Western Australia there are two species in respect of which protection appears absolutely necessary. They are the Johnston's Freshwater Crocodile and the Short-necked Tortoise. In respect of the former, protection appears necessary to ward off increasing commercial exploitation which could cause a drastic diminution in numbers. The tortoise, on the other hand, appears to be limited to such a small area that protection is absolutely essential.

In Volume 29, part 4, of the Transactions of the Zoological Society of London (April, 1961), Dr Hugh B. Cott, of the University Museum of Zoology, Cambridge, presented the results of a scientific inquiry he had conducted into the ecology and economic status of the Nile Crocodile (Crocodilus niloticus) in Uganda and Northern Rhodesia. Among other things the inquiry dealt with the exploitation and decline of the species. Cott concluded that the inroads being made into the population provided a classic example of exploitation and mismanagement of a valuable resource. Referring to the scientific status of the order generally, the writer said, "Crocodilians also merit protection in their own right. Crocodiles essentially like the modern species existed in Jurassic times and were contemporaries of the dinosaurs. As the only remaining members of the archo-saurian stock which have survived the age of reptiles, they are of quite exceptional scientific importance, not least from the indirect light which studies of anatomy, physiology, ecology and behaviour can throw upon the biology of ancestors long extinct. It would be a grave loss to science and research, and to posterity, if these saurians - which have survived for over a hundred million years - were now to be sacrificed to the demands of uninformed public opinion, and subordinated to a passing fashion in leather goods".

The Johnston's Crocodile, which is closely related to the Nile species, appears to be quite common in the Kimberley Division of Western Australia. Long regarded as harmless and timid, it has, according to crocodile hunters, suddenly assumed plague proportions. It is now said to prey heavily on native fishes, such as barramundi. There have been allusions to its ferocity and suggestions that it would attack man at almost every opportunity. These remarkable changes in its feeding habits and general behaviour coincide with technological advances in the preparation of the skin for market and with a reported

diminution in the numbers of the saltwater crocodile. We consider the animal worthy of protection and in need of conservation.

With controls over export exercised at ports, the legal protection afforded the creature can be enforced with some measure of efficiency. However, we are somewhat embarrassed by claims that consignments of skins have been brought into this State from animals taken in the Northern Territory. We are concerned too that consignments could easily be transported from this State to the Northern Territory or Queensland for shipment from ports outside our control. It would be of considerable help if the Northern Territory and Queensland were to bring in complementary measures in their areas - if only in relation to control over imports and exports - so that there could be co-operation in respect to the policing of illegal trading in this State. The Commonwealth, too, could assist by refusing permission to export until the State authority granted an export permit similar to that issued for other fauna.

We in Western Australia have so far been able to resist attempts by traders to bring freshwater tortoises into Western Australia for sale. As delegates might recall, the fad of keeping immature specimens of those creatures in bottles flared up some time ago, and branches of chain-stores in Perth sought to bring in large numbers. Fearing that their owners would tire of them and release them in lakes and streams, we gave short shrift to the proposal to introduce the fad and the animals into this State. Too little was known of the life history of our Short-necked Tortoise (Pseudemydura umbrina) to say whether the eastern States animal (Emydura macquarii) would be a competitor in the same ecological niche. However, the risk that it could be so was not worth taking. The provisions of section 92 of the Constitution loom as a threat to local protection laws, particularly when there are no complementary ones in other States. It would, therefore, be of considerable assistance to Western Australia if the other States and the Territories would take power to exercise control over reptiles, so that we could secure their co-operation in these matters.

## NOTES FROM THE NEWS

Spotlighting on Roads:

A Bill introduced into Parliament last month is

expected to assist to some degree the problems of fauna wardens in policing illegal kangaroo shooting. The Bill seeks to strengthen the control over spotlight shooting on roads throughout the State by amendment to the Firearms and Guns Act. On the other hand, the result might be that shooters will be forced to operate deeper in forest country where illegal hunting will be more difficult to intercept.

Crayboat Disabled:

Sea and air searches were organised when the l.f.b. "Shirley", a 21-foot vessel operated by J. McDougall, of Geraldton, was reported to be overdue. Returning from the Wallabi Group, the boat developed engine trouble about 5 p.m. on Saturday, August 18. Mr McDougall dropped anchor but was not found until Monday afternoon when an R.A.A.F. Dakota sighted the disabled craft and radioed her position to the fishing boats "Emmalou" and "Atlantic Ocean". The "Shirley" was towed back to port that night by the "Emmalou".

Control of River Craft:

Amendments to the Marine Act contained in a Bill introduced into the Legislative Assembly recently, propose that all craft using the Swan River will be liable to registration fees and have their movements controlled. The amendments also provide power to confer a private right to a particular area of the river for mooring. It is not expected that government craft will be affected.

Natural History Expeditions; Report on Night Parrot:

Considerable publicity has been given in the press in recent weeks to three inland natural history expeditions. The first is being led by honorary warden and well-known naturalist, schoolteacher and Museum associate, Mr W.H. Butler, the second by Perth Technical College lecturer, Mr J.R. Ford, and the third by Museum preparator Mr E. Car.

Mr Butler's expedition to the country south of the Warburton Range has been in progress for some time. He is accompanied by Mr A. George, of the Botany Branch of the Department of Agriculture, and a press reporter.

Mr Ford, who is also an honorary warden and secretary of the Western Australian branch of the Royal Australian Ornithologists' Union, is being accompanied by fellow lecturer Mr G. Leahy and another honorary warden,

Mr H. Atkinson, of Bibra Lake. They will visit the sand dune country at the southern end of the Canning stock route. A press report of their projected trip and hopes of finding certain rare fauna and of re-discovering the night parrot, induced a report from Messrs Deane and Robin Davies, of Doolgunna Station, via Meekatharra, that they had made about 12 sightings of what they believed must have been this rare bird in spinifex country near their two properties. Unsighted in Western Australia for about 80 years, the night parrot is so named because it is believed to fly only at night.

The third party, led by Mr Car, will comprise a large party of members of the W.A. Naturalists' Club. They went to the Carnarvon district principally to collect marine specimens and blind fish and blind shrimps from inland caves for the 1962 Wildlife Show.

## TUNA SURVEY DISAPPOINTS

As had been anticipated of late months, the final summation of the 12-month tuna survey carried out in south coastal waters of this State revealed that there was no basis for a commercial tuna fishery there. Advice to this effect has been received from the Fisheries Division of the Commonwealth Department of Primary Industry.

## CRAYFISH EXPORT MARKETING CRITICISED

Local exporters reacted strongly to statements purported to have been made by a South Australian exporter of craytails that inferior packaging of the local product was producing a bad reaction on the United States market. Various representatives of local firms were quick to point out that the Western Australian product commanded the highest prices and was continually in demand. Commenting on the reports, the Minister for Fisheries, Mr Hutchinson, said that the criticism was surprising in view of the exceptionally keen demand for our product. Nevertheless, he said, it behoved exporters to be continually abreast of developments in the presentation of export packs. He pointed out that any improvement effected must benefit the industry.

A report from Canberra advises that complaints have been made in writing on an official basis and will be investigated by officers of the Department of Primary Industry. It added that they were along the same lines as a number of unofficial complaints made from time to

time to the Department of Trade as well as to the former. No adverse report has been received from the Australian Trade Commissioner service in the United States.

## FAUNA NOTES

Responding to our request published in the July issue for records of sightings of gannets in southern waters, Fleet Maintenance Officer A.J. Bateman advises thatvery few of this species have been seen this season. He says that they are a good indicator of surface fish and always precede skipjack occurrences. It is probably more than coincidental, he thinks, that gannets should be scarce when a poor skipjack season, as this has been, is suffered.

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Last May we recorded the sighting by Mr Bateman of five Senegal Doves near the Chapman River crossing between Geraldton and Northampton. We are now advised that, on July 24, while on his way to Shark Bay to work on the p.v. "Garbo", Mr Bateman saw a group of this species at least five miles north of that point. Three were on the ground, he said, and one was perched on the telegraph line at a point near the northernmost tomato garden. On the same trip he saw only a few Black Swans and several ducks on the man-made pools at Hamelin.

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Fauna Warden N.E. McLaughlan, accompanied by honorary warden D.G. Bathgate positively identified a tammar in forest country near Treesville in the Shire of Harvey during the night of July 15. In different boronia swamps in the same area a maze of tracks and runways were seen and this area will be revisited in the early summer. Forest workers told the wardens that animals sighted in the area in recent years included chudiches or native cats, echidnas, brush-tailed possums, bandicoots (probably quendas) and a numbat.

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Further to the note in the previous issue on the observation of a White-breasted Sea Eagle in the metropolitan area, Assistant Inspector L.R. Frizzell recorded that on August 15 he found the nest of this species, containing two eggs, on an island in the Wallabi Group of Houtman Abrolhos.

# CLEARING HOUSE

## Palatability of Grasses

Research at Armidale, N.S.W., promises to show why sheep and cattle will avidly consume some grasses while they ignore others. Although there is sometimes a simple and obvious explanation for these grazing preferences, frequently there is no apparent reason.

Mr R. Roe and Mr B.E. Mottershead, of the Division of Plant Industry, used five strains of reed canary grass (Phalaris arundinacea) in an attempt to clarify this intriguing question. 'Cafeteria'-type grazing tests in which sheep had access to all five strains showed that - at all stages of growth - two were palatable, one was intermediate, and two were unpalatable.

It was not just a matter of relative differences. There appeared to be something inherently distasteful in the latter two strains. This was confirmed in a later experiment, comparing pure stands, in which sheep grazing a palatable strain consumed 50% more digestible organic matter than sheep grazing an unpalatable one.

The Armidale workers next tried to find out what substance was responsible. By using organic solvents, they extracted a substance from the unpalatable grasses which, when sprayed on palatable grasses, makes them unattractive to sheep. Furthermore, after leaves of the unpalatable lines have been extracted by solvents, the residue is palatable.

Further attempts are being made to identify the substance or substances responsible. In the meantime a most interesting discovery has come to light. The five 'strains' of reed canary grass varied in chromosome number as well as palatability: the higher the chromosome number, the lower the palatability. - Nature Vol. 193, pp. 255-6 (1962).

(Rural Research in C.S.I.R.O., Victoria, Aust. June, 1962)

## Some Researches into Escape

The FAO Indo-Pacific Fisheries Council current affairs bulletin in its current issue reports on the experiments at Cambridge and Aberdeen into the speeds of fish, experiments which may have an effect on trawler net and gear design.

Research - already completed states the report -

indicate that fish do not swim at such high speeds as was supposed.

Until recently 96 km./hr. was thought to be reasonable for a really fast one, but the highest accurately recorded is that of 43.3 km./hr. for a barracuda in American waters. The speed was measured with a piscatometer - a fishing line fitted with gauges to measure tension on the line and speed at which it runs out.

Two methods

At Aberdeen where marine fish are being studied, two methods are employed for measuring maximum speeds.

One is to put fish into a tube through which water can be pumped at varying known speeds.

The fish is placed in the tube through a small hatch and is prevented from swimming out by screens. When the fish touches the screen at the downstream end of the tube, it usually swims upstream at its maximum speed to the other screen, and this spurt can be measured with a stopwatch and speed calculated.

Second method is to place the fish in still water in a concrete trough 9.75m. long and 0.61m. wide. This trough is marked off in metres and the speed can be measured by timing movements with a stopwatch.

The fastest

Sea trout, brown trout and mackerel were found to be the fastest swimmers; herring, haddock and whiting next, and cod and saithe slowest.

Surprisingly, goldfish swim as well as herring.

To relate the maximum speed of fish to their ability to escape a net it was ascertained for how long they can sustain at near maximum speed by the number of body lengths swum before becoming exhausted. Here the herring's endurance is highest, followed by sea trout, mackerel, saithe, haddock, whiting and cod.

All white fish were found to have a much lower endurance, one-quarter or less, than herring. Small individuals of a particular species have a greater endurance than large individuals.

Conclusions

Once the speeds and endurance of fish are known and information becomes available on the distance at which fish first react to different nets, it should be possible to work out their chance of escape. By this means, the best conditions for capture could be calculated for each species.

(The Fishing News London July 13, 1962)

## Big purse for Big fish

Torque converter drive controls the purse strings as Pacific seiner spreads her giant net in quest of tuna.

Until recently there was only one way to catch tuna, and that was with hook and line. But then some adventurous tunamen began experimenting with the purse seining method and quickly convinced the skeptics that a seiner can bring in more tuna in less time than the traditional baitboat. As a result, the tuna clipper may soon become a museum piece. In the past two years along, more than 20 California clippers have been converted into purse seiners.

A typical baitboat-turned-seiner is West Point. Owned by Carl Hanken, Chris Jangard and Sverre Jangaard, this 112-ft. vessel works out of San Diego. She features a raised deck aft similar to the poop-deck of 15th Century galleons. This raised deck over the turntable confines water to the vessel's waist so that the men working the net will be relatively unhampered by the wash from boarding sea.

West Point's net is 430 fathoms long by 42 fathoms wide (2580 x 252 feet). Haul ropes attached to the net run over a block supported by a heavy davit on the working deck. The job of hauling in almost half a mile of nylon net filled with fish is handled by a giant purse winch chain-driven off a General Motors 80-h.p. diesel. The winch engine drives through a Twin Disc Torque Converter.

Why a torque converter on a purse winch? A surging sea can cause wide variations in the load and put heavy strains on the winch. The torque converter selects the exact amount of torque needed - instantly and automatically - and applies it to the line. There's steady

tension all the way no matter how skittish the sea becomes. The engine slows down but resumes normal speed after the momentary surge of pulling against the water, the weight of the net, and the catch.

West Point's owners are unanimous in their praise of the torque converter drive. Capt. Hanken says, "We plan to convert our other tuna clipper Cape Falcon to a purse seiner in the near future, and when we do its winch will have a torque converter drive".

(Twin Disc Production Road, Wisconsin Vol.22, No.3)

## Migratory Birds Carry Disease Germs

Dr Henry Hoogstraal, U.S. Naval Medical Research Unit N. 3, Cairo, Egypt, contends that migratory birds carry disease germs which affect man. Dr Hoogstraal, the head of medical zoology at the Naval Research Unit, has conducted extensive investigations of wild birds and animal life in various parts of the world. He discovered in Egypt that Salmonella typhmurium, a germ which caused fatal epidemics in some animals and food poisoning for man, could be traced to ticks in the trees used by herons as roosting places.

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## Nutritional Aspects Claim Worldwide Attention

by J.L. Kast, Chairman, Fisheries Research Board of Canada.

From a talk given to the Fisheries Council of Canada at the Seventeenth Annual Meeting held in Quebec from April 25-27.

Fish in human and animal nutrition have received a great deal of national and international attention recently. In the national field this has come about primarily because of occasional stubborn marketing problems encountered with some fish commodities. Marketing has also received some attention in the international field but the role of fish in animal and more particularly, in human nutrition, has received most consideration and emphasis.

The rapidly growing international interest was highlighted last year by two large international conferences, both sponsored by the Food and Agriculture Organisation of the United Nations. A conference on fish meal

was held in Rome in March, 1961, and in September a Fish Nutrition Conference was held in Washington, D.C.

The inevitable conclusions that emerged from these and numerous other national and international discussions on this subject in recent months is that fish stand very high and are gaining in nutritional prestige and that it possesses some rather important and essential constituents for human and animal nutrition which only a few other edible products contain.

Also fish possess some therapeutic qualities that are only now becoming understood and which are still being actively explored and may prove to be unique in the prolongation of human life and health.

Special qualities

What are these special qualities or important properties that fish and fish products possess?

The principal constituents of food are protein, carbohydrates, fats and water with some lesser though nevertheless necessary accessory components such as vitamins and minerals. All these products are important in complete nutrition and energy production, but protein (the word derives from the Greek meaning "holding first place") is particularly important since it is necessary for growth and tissue repair and hence is basic to the whole living and growing process. Fish contains some of all of these essential nutrients but its protein, its fats and its vitamins have some characteristics that are shared by few foods of comparable availability and cost.

Complex substance

Protein is a very complex substance. It is composed of various combinations of up to 22 simpler chemical units called amino acids. The human body can manufacture about 14 of these itself but the remaining eight must be supplied from foods that contain them. These important eight are sometimes referred to as "essential" amino acids. Protein of animal origin, rather than those of vegetable origin, tend to contain the highest proportion of these essential amino acids. Thus fish, meat, poultry, eggs and milk are generally referred to as sources of complete protein as contrasted with certain incomplete proteins which are derived from cereal, grains, beans, peas and peanuts.

That is why a supplement of animal protein is so necessary for complete nutrition for those peoples

whose principal item of diet is rice, corn, wheat or other cereal grain. As fish contains all essential amino acids, vitamins and minerals, also various types of fats, it forms one of the select group of complete foods, despite its relative lack of carbohydrates which are so readily available to the diet from other sources such as sugars and cereals.

Generous portions

Fish is important in nutrition for other reasons than being just a good all round food. Fish oils or fats contain generous portions of what chemists and nutritionists call "un-saturated" fatty acids, particularly the "poly-unsaturated" ones. For example, a codfish lives in cold water and has some fat or oil in its muscle and a great deal in its liver. If its characteristic oils were "saturated" they would harden like lard or butter, at the temperatures in which codfish live. It is this highly "unsaturated" nature of most fish oils that keeps them liquid at low temperatures and helps to keep injurious fatty particles from forming in the blood serum and becoming lodged in the walls of the blood vessels. This factor is very important to people who have a tendency to hardening and narrowing of the arteries which leads to cardio-vascular trouble, which in turn is the cause of half the deaths of all adults in North America and two-thirds of our adult males. Hardening of the arteries (arteriosclerosis) is caused by a scaly deposit on the walls of arteries. This is largely composed of cholesterol, a fatty crystalline alcohol and its chemical cousins.

If we include in our diet a reasonable amount of fish oils, their characteristic types of unsaturated fatty acids are said to inhibit cholesterol formation in the blood serum and even to encourage lessening of its amounts in the blood and on the artery walls. This very important therapeutic property gives further reason for rating fish high in the human diet.

Still other characteristics

There are still other characteristics that make fish important in nutrition. Fish livers, at one time formed a principal source of the fat-soluble vitamins A and D. Cod liver oil, halibut liver oil and shark liver oil were all important accessory foods and most older men and women have taken generous doses of one or another of these especially during our growing period.

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